



GARNER TRANSPORTATION 2010 PLAN



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Acknowledgements

The Citizens of the Town of Garner
 The Transportation Plan Steering Committee
 The Town Council of Garner
 The Town Staff, with special thanks to Brad Bass, Frank Powell, and Hardin Watkins
 The Louis Berger Group, Inc. and Earth Tech | AECOM





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Executive Summary

THE TOWN OF GARNER UNDERTOOK THE UPDATE OF ITS TRANSPORTATION PLAN to ensure that as the Town grows, so does its vision of itself as a dynamic community sensitive to a changing transportation environment. Garner’s strategic location along a Class I railroad influenced its earliest development, and connections to the City of Raleigh, Raleigh-Durham International Airport, and the Research Triangle Park campus have, along with its persistent small-town character, made it a popular choice for residents and businesses alike. With over 26,000 residents at the time of this writing, Garner recognizes that it must change to accommodate the wishes of its citizens as well as the demands of the outside world. As this plan was being written, the country was experiencing severe economic hardship, felt by the Town as well in terms of declining revenues. Public transportation, bicycling, and walking as modes of travel were all seeing significant increases as a result of spikes in fuel prices, while vehicle miles of travel (VMT) flattened out and even declined for the first time in several decades.

However, hardships can be viewed opportunistically, and the Town chose to take a non-traditional approach to planning for its transportation future. As a result, this transportation plan contains a number of short-range actionable items and recommendations for all modes of travel, as well as longer-term, visionary elements. Policy and program recommendations are also included that will help leverage private sector resources to shape the community positively, according to the many comments received at open houses and completed surveys. The following is a summary of the contents of each of the five major sections of the Transportation Plan; we also invite you to take a closer look at the items that interest you and to contact our staff with any questions (see text box at left).

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Chapter 1: Past Events and Plans discusses the history of Garner and the planning context that will shape the recommendations of the Transportation Plan. The Transportation Plan isn’t the only relevant guidance that will influence transportation systems, since the North Garner Plan, Comprehensive Growth Plan, Comprehensive Parks and Recreation Plan, and Hazard Mitigation Plan contain recommendations that influenced the development of the Transportation Plan. The Comprehensive Growth Plan (2006), for example, suggested the creation of a different system of street typology that includes tree-lined boulevards; mixed-use development streets; and rear lanes or alleyways. Other plans spoke to specific improvements (e.g., greenways) that have

to be considered in the recommendations for bicycle and pedestrian facility recommendations.

Chapter 2: The Planning Process discusses the Vision and Goals of the planning study process, which are included below in their entirety. The planning process was driven by a 15-member Steering Committee appointed by the Town Council. The Steering Committee was comprised of elected officials, business owners, and residents of Garner, and formulated their own procedural ground rules. They met a total of ten times between 2008 and 2009 to discuss specific recommendations and learn more about how transportation systems work in their Town.

Vision Statement *Garner’s transportation system provides its citizens and businesses with efficient and safe travel options for auto, bicycle, pedestrian, and public transit users that serve transportation needs in a balance with land use development patterns as well as regional and local partnerships.*

Goals **Goal Number One:** The Garner Transportation Plan will be a visionary document that includes a variety of strategies and partners from adjacent communities and our own to address transportation needs.

Goal Number Two: The Garner Transportation Plan is achievable because it includes both short-term and longer-term actions that respect political and regulatory frameworks, and can be undertaken with currently available or projected resources.

Goal Number Three: The Garner Transportation Plan considers users of all modes of transportation to produce a community that is more walking-, bicycling-, and public transit-friendly than it is today.

Goal Number Four: The Garner Transportation Plan will provide efficient and reliable access for its citizens and businesses, while maximizing their safety.

An important part of the planning process was the contact that was made with the public, which was always reported back to the Steering Committee at each meeting. Over 160 people responded to the survey that was provided, 40% of whom were Garner residents, with many respondents citing extending Timber Drive eastward, public transportation, and cycling / walking options as core concerns for the Town. Appendices A and B provide detailed reports of the public comments that were received throughout the planning process.

Chapter 3: Existing Conditions reports the existing conditions assessment for Garner’s roadways, transit services and Bicycle/Pedestrian modes of travel, highlighting deficiencies as appropriate. Along with the input received from the public, analyses were conducted based on outputs of the Triangle Regional Model (TRM) and Quality-Level of Service software to estimate before-and-after performance. Notable issues identified in this Chapter include the lack of east-west connectivity across the Town; a trends towards lower connectivity between neighborhoods that is reducing the number of options for all modes of travel and increasing pressure on minor and major thoroughfares; the lack of town-wide transit service; and the notable number of people, including school-age children, that are walking and bicycling throughout the Town. Appendix C contains detailed cross-section diagrams for 11 of the Town’s most important roadways, each of which includes recommendations for improvements.

Chapter 4: Recommendations opens with a primer on some of the changing trends that will affect the recommendations in the Plan as well as the demands that will be placed on the transportation system. While the current economic downturn has stifled rapid development, business conditions and traffic demand were expected to resume. However, past trends such as women entering the workforce in large numbers; a trend towards decentralization in housing; reduction in household size; flat public transportation usage; and artificially low fuel prices are all at an end or nearing their end as significant drivers of transportation usage and travel patterns. The new trends that are expected to influence transportation in the coming decades; comments from the public and Steering Committee; and technical analyses were used to shape the recommendations for specific travel modes.

A one-page summary of the key recommendations for each mode of travel is shown on the following page.

Roadways While generally in good repair, Garner’s roadway system lacks east-west connectivity due to topographic and, now, development constraints. While the addition of Southern Wake Freeway will help divert through traffic, that project is many years away and faces stiff environmental and financial challenges. Recommendations for creating a collector system in less-developed areas of Town, extending thoroughfares, and widening on surface streets are critical, as is preserving valuable roadway capacity through better management. New interchanges at Timber Drive/US 70 and I-40/White Oak Road are long-term suggestions, while three conceptual inter-section redesigns can be accomplished in the near term. Further recommendations include studying traffic flow and operations around schools conceptually to support actions that can improve traffic flow during peak pick-up and drop-off periods of the school day.

Public Transportation Expanding the Capital Area Transit (CAT) service is an important mid-term recommendation, and can be partially financed with Job Access/Reverse Commute (JARC) and New Freedom grants. The proposal is to provide a circulator route in the center of town that would connect the existing local and express routes that then go to downtown Raleigh with major shopping destinations; current and historic downtowns; and higher-density residential units. Ultimately, rail service on the existing Norfolk Southern/NCRR line would tie into downtown and suburban park-and-ride stations.

Walking The Steering Committee focused on increasing connectivity around schools and access to parks and shopping areas, resulting in a program of 62 sidewalk projects totaling 56 miles in length prioritized into three tiers (short-, medium- and long-term). Priorities include finishing the downtown pedestrian “loop” and connecting Lake Benson and Lake Wheeler parks. Another 3.4 miles of greenway facilities are also shown in the Plan. Importantly, the study recommends that pedestrian accessibility to schools be further studied.

Cycling Bicycle recommendations include 18 miles of sharrow pavement markings, 25 miles of bicycle lanes (plus six miles from new road construction), and 12 miles of paved outside shoulders. A road “diet” (narrowing of the number of travel lanes) is proposed for Aversboro Road and Lakeside Drive, and 19 intersection treatments are also recommended.

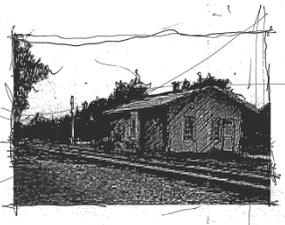
Chapter 5: Implementation Guidance outlines how transportation projects are typically financed, and provides distinct recommendations for additional (or modified) policies and programs that influence how the transportation system is created over time or how it is used now. These program recommendations are focused on alternative modes of transportation since the default mode of transport in our current society – riding along in a private automobile – needs no additional encouragement. Program recommendations focus on awareness and encouragement, and include recommendations for starting a Safe Routes to School Program. This section also contains information about revenue sources and project capital and operating costs for high-priority bicycle, pedestrian, roadway, and transit projects.

A separate design guide chapter ties together the recommendations from the Comprehensive Growth Plan (2006) and expands it in terms of detail to include specific practices for incorporating public transportation, bicycling, and pedestrian accommodations into the overall transportation system. A separate guidance document (Appendix D) provides specific information on how to enact higher access management standards, the purpose of which is to increase safety and maintain long-term capacity on existing roadways.

While the Garner Transportation Plan is a fair and accurate representation of the beliefs and understanding of the Steering Committee and technical staff, no planning document lives very long or successfully if it is not updated. The Transportation Plan should be updated every five (5) years, at a minimum, and an annual monitoring report prepared in the interim years highlighting the progress towards achieving its specific strategies and recommendations.

Chapter 1 : Past Events and Plans

1.1 History of Garner



TRANSPORTATION HAS PLAYED A MAJOR ROLE in defining Garner’s history, first with the expansion of the railroad through the area in 1847; then with Garner’s position along North Carolina’s Central Highway, which linked the mountains to the sea in the early 1900s.¹ Today, transportation has emerged as a focal point again for Garner, only this time it is centered on commuter rail and new transportation corridors that link Triangle communities. The Central Highway has become US 70, which now bypasses downtown Garner, but still provides a vital link in the town’s and region’s transportation system. The Southern Railroad is now owned by the State of North Carolina and is part of a strategic plan to connect the Triangle region and other reaches of the state with passenger and commuter rail.

It would have been hard to envision a present-day Garner with more than 26,000 residents when the area was originally incorporated in 1883 under the name Garner’s Station. The name itself is of unknown origins as the original postmaster, Thomas Bingham, had requested the name Garner’s Station in 1878 from the postal service and then departed shortly thereafter to Clayton without ever explaining the name.² Furthering the Town’s mysterious origins, the Village of Garner’s Station had its charter revoked in 1891.³ Its limits covered only 400 square yards at that time and had grown to only a half-square mile when the area was re-incorporated in 1905 as the Town of Garner.

The Town’s early days reflect a common historical link to other municipalities and their issues at the time, as well as current issues of today. The Town began paying its Mayor a stipend of \$125 per year in 1907 after an expansion of local authority, and also began taxing the owners of dogs that would run loose on the streets. License fees for certain merchants – farmers were almost universally excepted – were commonplace and incredibly detailed: rope / wire dancing, tumbling, traveling salesmen, itinerant photographers were all subject to a business license. By the mid-1910’s a portion of Garner Road had been paved with

concrete to allay safety concerns, the first paved road in the State and predating electricity in the Town by nearly a decade. A five-mile stretch between Garner and Raleigh was delayed to work out right-of-way issues with Southern Railway.

By 1950, the passenger rail era had passed and the town's population had reached only 1,200 residents.⁴ This modest population growth is attributable to the agrarian lifestyle that dominated Garner for almost 200 years, from the founding days of Wake County in the 1770s to the 1950s when cotton and tobacco were the primary crops grown in the area. As state government grew and Raleigh expanded after the 1950s, existing Garner residents and newcomers were drawn to government, education and other jobs in North Carolina's Capital City, the Research Triangle and nearby communities. While the agrarian era has passed, Garner has significant remnants of agricultural and industrial uses within the town limits. The 2006 *Comprehensive Growth Plan* indicated approximately 4,500 acres of agricultural land, primarily east of Benson Road.

Much of Garner's recent growth, however, has been reflective of its position adjacent to Raleigh and other municipalities, colleges, universities, employment centers, museums and seasonal events like the State Fair.⁵ The small-town character combined with proximity to regional job centers, Interstate 40, other key regional corridors and the hub of state government has created an urban and suburban society that is highly dependent on the automobile for daily travel.

Garner's strategic location along the North Carolina Railroad has given the Town an opportunity to re-create its history as a community dependent on the rails. In the early 1900s, one could hop the train to Raleigh for a dime in the morning or afternoon and make the return by noon or 8 o'clock in the evening.⁶ Today, it is envisioned that peak period commuter rail services could once again connect downtown Garner to Raleigh, Durham and Greensboro as well as points east to Goldsboro.

The core of Garner's history – its downtown – remains largely intact from its early days, although its importance as a center of commerce has declined dramatically in the intervening years. The narrow strip of commercial buildings fronting the railroad tracks and Main Street; the old neighborhoods south of downtown are part of what created the small-town feel; and the larger estate homes along Garner Road (formerly the Central Highway, and the first paved road in North Carolina) reflect a bygone era when well-to-do citizens desired a highly visible location for their residences along new, fashionable highways.

Like many North Carolina locales, Garner's downtown has yet to fully recover from the decline in railroad traffic and the impacts of bypassing the central business district. As the town and region grew, the traffic volumes for Garner Road (then US 70) became so burdensome that the State sought a route to relieve downtown Garner from traffic congestion. The current alignment of US 70 is now a congested roadway that will likely require further relief in the future.

Meanwhile, the lack of traffic volumes in the tens of thousands per day along Main Street and Garner Road may be seen as an advantage for the Town of Garner and the future of its downtown. The Town's residents now desire a historic and cultural centerpiece for their community and a renewed sense of place for downtown.⁷ Downtown Garner offers that opportunity and the Downtown Streetscape Plan will identify the design treatments and strategies to create this centerpiece.

Beyond downtown, Garner has grown into a collection of commercial and residential developments, each reflective of its era in terms of design and orientation. The Cloverdale, Hilltop, Forest Hills and Heather Hills housing developments were the first of their kind in Garner and are indicative of 1950s and 1960s era ranch-style homes. The growth patterns since then have primarily followed nationwide trends in modern housing and commercial development practices, with a division of uses and lack of connectivity within the roadway system.

The Town's roadway system is also a collection of streets that reflect the era in which they were constructed. Meandering country roads traverse rolling hills in and around Garner and many previously served as farm-to-market corridors. While Garner's recent growth has strained the transportation system to the point that capacity improvements are desired along many of Garner's key corridors, many of these corridors remain unimproved from their original dimensions. When combined with the desires of current residents for more of a sense of place and aesthetics, there are many positive examples within Garner to build upon in developing a new Transportation Plan to define how and where Garner's current and future residents will go. Clearly, Garner's history as a crossroads of transportation will also help define its future.

1.2 Planning Context

SEVERAL PLANNING EFFORTS COMPLETED IN THE PAST 10 YEARS will help define portions of the Town of Garner Transportation Plan and Downtown Streetscape Plan. Below is a summary of those documents and how they will relate to or inform the current planning effort.

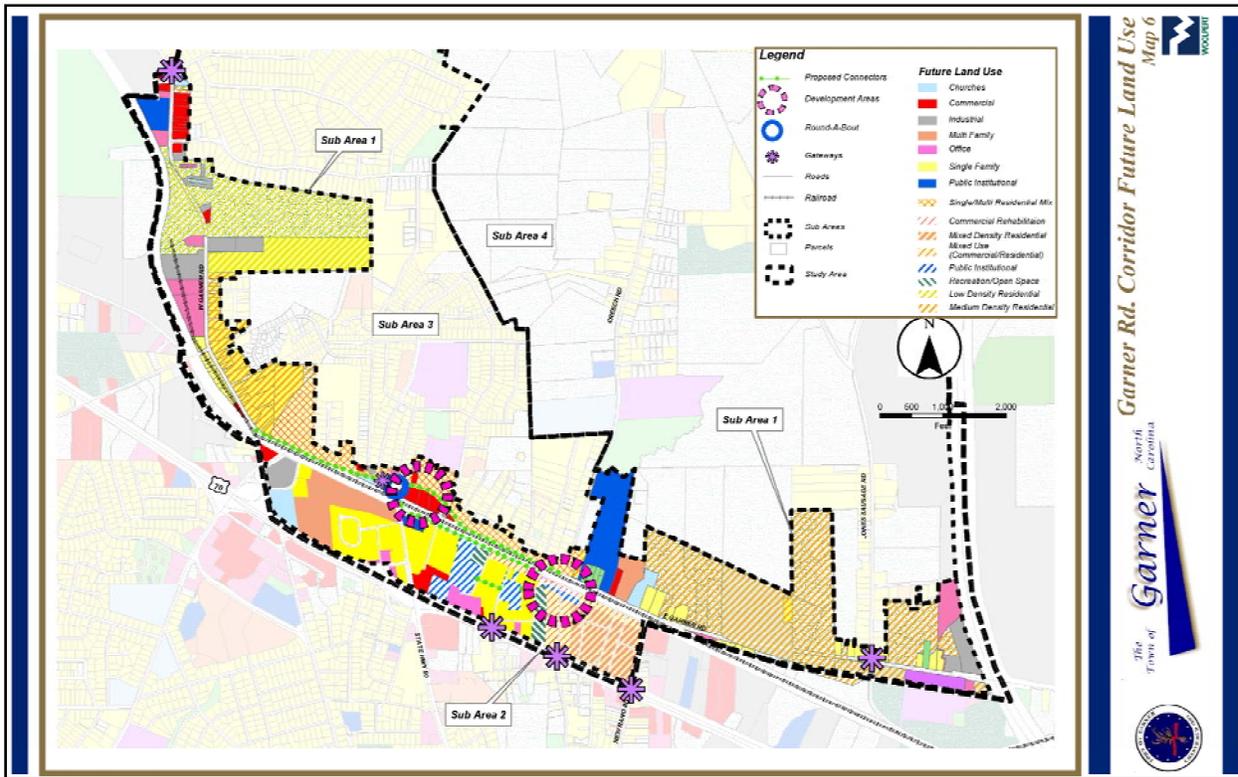


FIGURE 1. GARNER ROAD CORRIDOR FUTURE LAND USES – NORTH GARNER PLAN

Historic Downtown Garner Plan (2010). A three-phase process – market analysis, charrette, and implementation plan – resulted in a plan for a study area encompassing 660 acres as well as proposed rail station locations and other transportation services discussed in this (transportation) plan. The recommendations in the Downtown Plan generally support the concepts of creating a space that is more amenable to transit, walking, and bicycling. Other recommendations include a number of street changes, including a Purvis Street extension to US 70 and redesigns of existing intersections at Montague Street. Better connectivity with US 70 is an important theme in this document.

North Garner Plan (2004). The North Garner Plan developed as a small area plan with a primary focus on downtown Garner. The Downtown Streetscape Plan is a direct result of the North Garner Plan, which included several recommendations for the transportation system in the area. These included:

- Enhanced appearance and function of Garner Road;
- Investment in existing neighborhoods;
- Multi-modal system enhancements;
- A bikeway map for the North Garner area; and
- A connection of Rand Mill Road to US 70.

The prospects of the railroad emerging as a commuter rail corridor were also a major component of the Plan, which identified potential station areas and opportunities for transit-supportive residential densities within ½-mile of the station. The Plan acknowledged that a commuter bus service could be the short-term option for service to this area, but that is was advantageous for Garner to plan for land uses to support the future commuter rail option.

Comprehensive Growth Plan (2006). The land use plan for Garner was updated in 2006 and provides direction for growth in the Town through 2020. The 2006 Plan continued the focus on nodal development previously adopted in the 1989 Plan, including a desire for regional centers and transportation corridors to connect these nodes. Citizen input indicated that there was strong desire to establish a community focal point and create a cultural and historic centerpiece for Garner, as well as a sense of place for the downtown area. The Plan also identified the need for design improvements to new development and public spaces, which included streetscape improvements on the Garner Road corridor, street design guidelines and improved aesthetics for US 70 and US 401. Additional transportation recommendations included: a need for more east-west corridors; improvements to the bus system; greater connectivity of major and minor roadways; and strategic expansion or extension to some corridors.

North Garner Greenway/Urban Pedestrian Way: Feasibility Study Report (2005). This plan focuses on only a small subarea of Town north of US Highway 70, and provides specific trail recommendations for a portion of North Garner. Two trail types are suggested: a 10'-wide bike/ped trail with 2' clear zones, and a traditional 5'-wide sidewalk with 5' planting buffers (note: it is not clear how bicycles are to be accommodated on

those sections of the trail that consist solely of sidewalk). Construction costs, as well as suggested maintenance costs (\$2,900 per mile of greenway annually) are provided in the document. The key references from this report to the Transportation Plan are the location of trail components along Adams Branch and Big Branch Creeks, as well as Curtiss Drive and Creech Road. These design recommendations have been incorporated into recommendations and mapping for the bicycle and pedestrian components of the Transportation Plan (Figure 2).

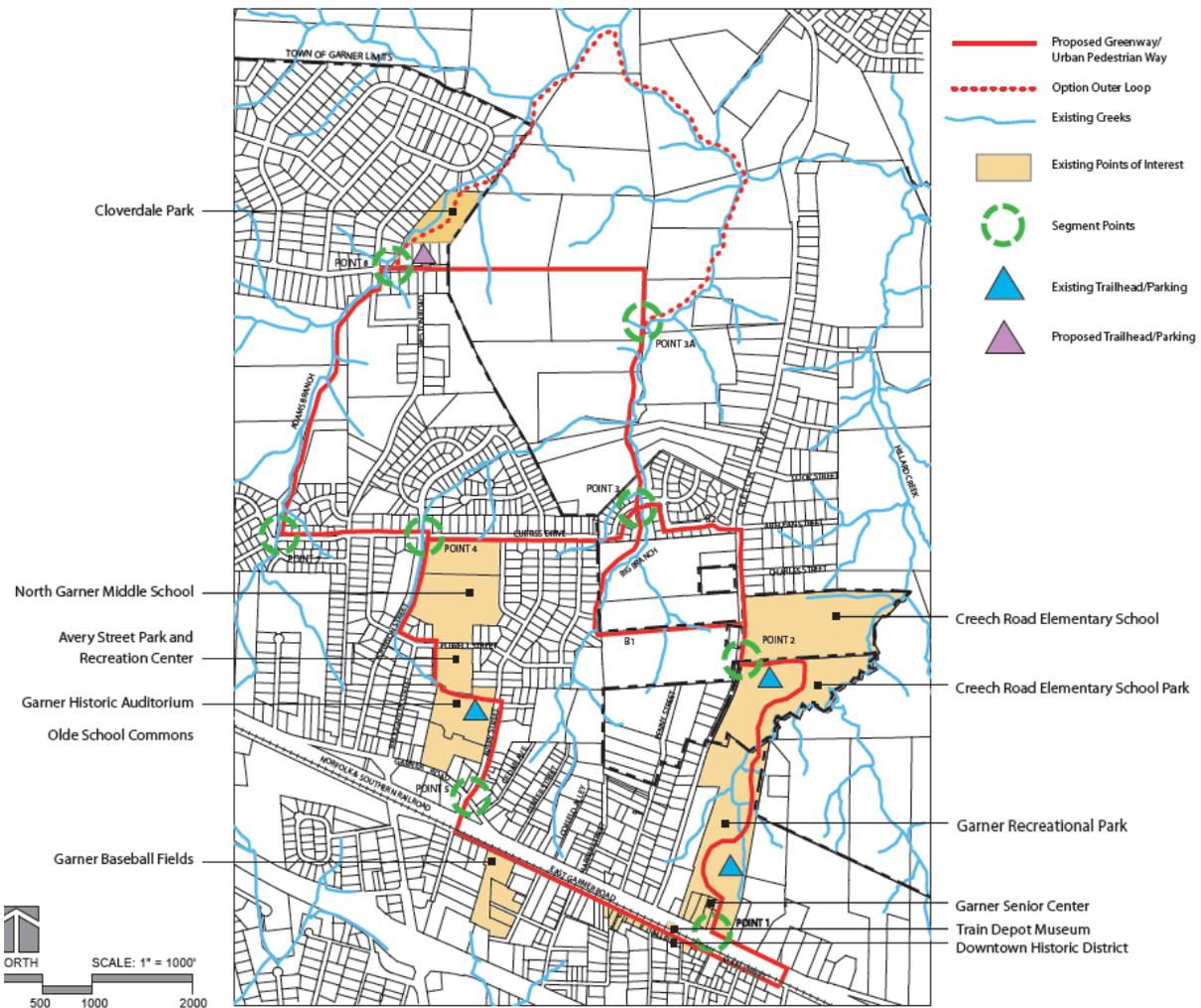


FIGURE 2. NORTH GARNER GREENWAY / URBAN PEDESTRIAN WAY (2005)

2025 Thoroughfare Plan (2004). The original 2025 Thoroughfare Plan was developed in 1999 and amended in 2004. The result of the plan is a map indicating existing and proposed freeways as well as major and minor thoroughfares. The facilities identified on the map consist primarily of

roadways under the authority of the North Carolina Department of Transportation. Major new facilities identified in the Plan included: the extension of Timber Drive to the east, with a split connecting to Jones Sausage Road and Greenfield Parkway; the extension of Vandora Springs Road to the west connecting to US 401 and Lake Wheeler Road; an interchange at the intersection of US 70 and Timber Drive in northwest Garner; and the completion of the southern portions of the I-540 Outer Beltway.

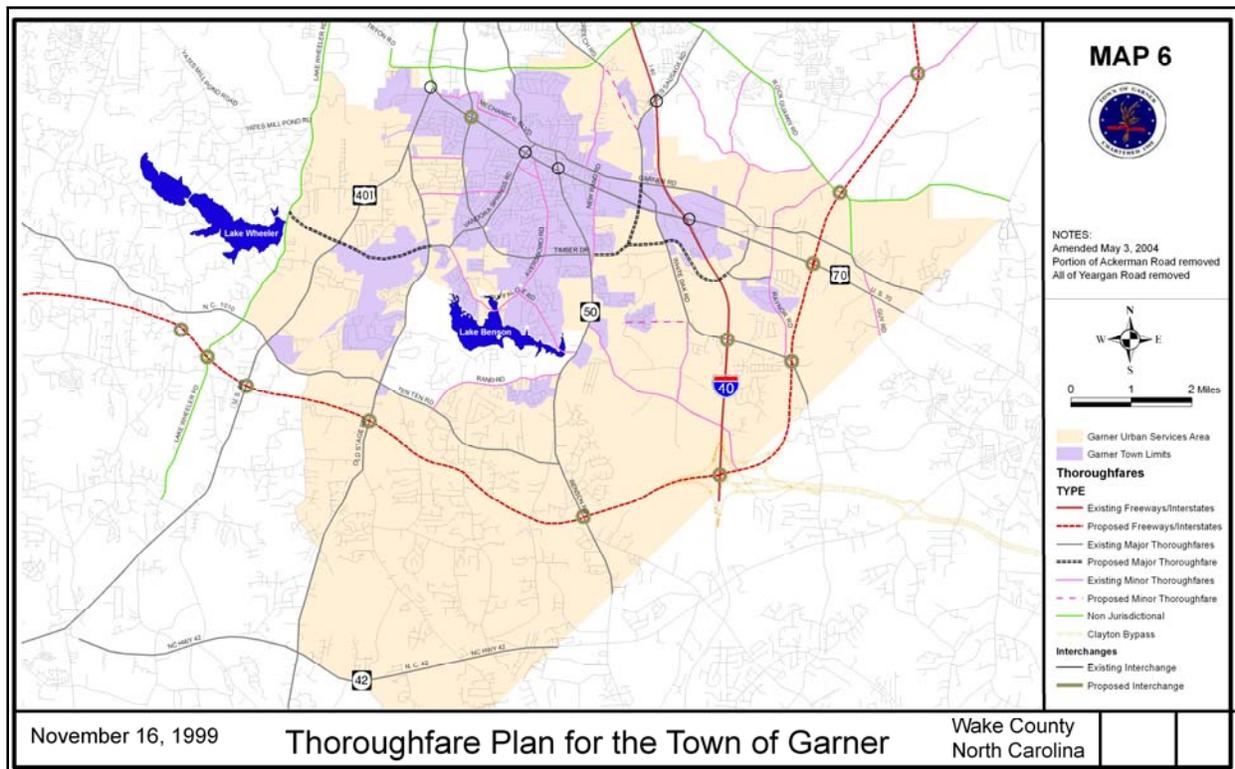


FIGURE 3. 2025 THOROUGHFARE PLAN DEPICTING FUTURE CORRIDORS IN GARNER

Parks and Greenways Master Plan (2007). The Parks and Greenways Master Plan identified several action items to expand and enhance the system of parks and greenways provided by the Town of Garner. Of particular interest are the recommendations for Greenway and Sidewalk Needs contained in Chapter 4 of the 2007 Plan. There was nearly unanimous consensus that a greenway system was needed in Garner to link community gathering places. Several immediate and long-term facilities were identified as part of this effort and will help guide the Transportation Plan’s update of the Sidewalk Master Plan and identify street design components to further these goals. Of particular interest

are: the Downtown Pedestrian Route that is proposed to link North Garner with US 70; the six-mile Garner Sidewalk Loop to connect the library, parks, Town complex and schools; and the overall greenway system. Some of the recreation facility needs identified in the plan may also inform the Downtown Streetscape Plan as this design effort may incorporate some of these facilities into the preferred design.

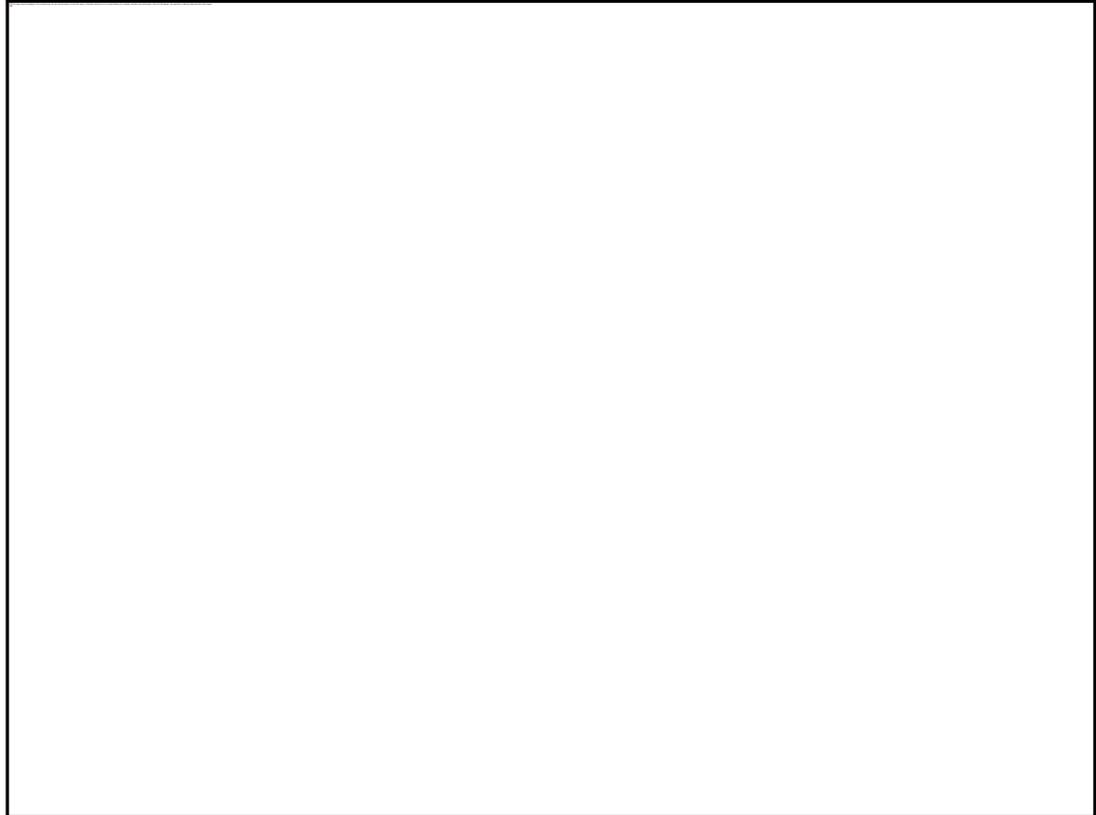


FIGURE 4. MASTER PLAN MAP FROM PARKS AND GREENWAYS MASTER PLAN

Unified Development Ordinance (2003). The Unified Development Ordinance (UDO) provides for the regulation of development within the town and planning limits of Garner. Intended to provide for the general welfare of Garner’s residents, the UDO is the implementation tool for the Comprehensive Growth Plan and ensures the adequate provision or availability of transportation, police and fire protection, water, sewage disposal, parks and other recreational facilities, affordable housing, disaster evacuation and other public services through the review of development applications and enforcement of the Town’s Municipal Code. Articles 6, 7 and 8 of the UDO are of most relevance to the

Transportation Plan. Article 6 provides for Development Standards of different types of land uses while Article 7 outlines landscaping and parking requirements for development. These sections will help inform the process and may be recommended for modifications for the Garner Road and Main Street areas based on the outcomes of the Streetscape Plan.

Sidewalk Master Plan (2001). The sidewalk master planning effort resulted in a map covering the Garner Extraterritorial Jurisdiction (ETJ) as of 2001. The plan identified existing sidewalks and greenways and proposed primary and secondary connections. New facility recommendations consisted solely of improvements connecting the sidewalk system to schools, Town Hall and the library. Although not specifically documented on the map, the plan also identified those improvements that could post a construction constraint. The Sidewalk Master Plan has been updated as part of this Transportation Plan.

Hazard Mitigation Plan (2004). The Hazard Mitigation Plan was developed to comply with federal and state requirements and to reduce Garner's exposure to natural hazards by limiting development in hazard sensitive areas, including floodplain or flood hazard areas. While there was limited inclusion of transportation-specific measures in the plan, there were some mitigation actions that related to the Streetscape and Transportation Plan for Garner. These include:

- Keeping infrastructure extensions out of hazardous areas in order limit development in known hazardous areas;
- Zoning ordinances that minimize impervious surface coverage;
- Implementing soil erosion and sedimentation control measures in the development approval process;
- Addressing street connectivity as well as paving and widening of roads for evacuation routes; and
- Amending landscape ordinance requirements for maintenance of pervious surface areas for stormwater detention.

Wake County Transportation Plan (2003). The Wake County Transportation Plan focuses on unincorporated areas of Wake County, including many corridors that connect to and through Garner. One goal of the Garner Transportation Plan was to match or recommend modifications to create a seamless future transportation system between the Town of Garner and Wake County. Ideally, this transportation system would be consistent or transition smoothly from one jurisdiction to

another, particularly in relation to number lanes, lane widths, pedestrian facility connections, transit routes and bikeway connectivity.

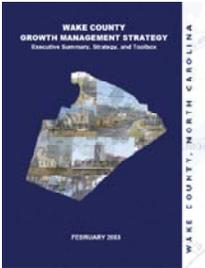
There are some specific elements of the Wake County Transportation Plan that relate to Garner. The Outer Loop is one such facility, as is the “future transit corridor” identified along the US 401 / Norfolk Southern Corridor. The concept for this service shows transit activity centers designated in Garner, east of Garner and south of Garner near the proposed intersection of US 401 and the Outer Loop.

The Plan also indicates planned Intelligent Transportation System improvements along US 70 and US 401 through Garner. These improvements are designated to be for traffic signal control systems and Closed Circuit Television (CCTV) at the intersection of US 70 and US 401. The Plan also identifies CCTV installation as part of a freeway management system along the US 70 corridor east of Garner.

“All jurisdictions must do a better job of ensuring that land-use planning and regulation take into account local transportation needs and constraints. A major contributor to traffic congestion is the amount and type of development that is approved in many places in the county, without regard to the capacity of the roadway system.”
 - Wake County

Wake County Growth Management Strategy (2003).

One of the more impressive and comprehensive efforts undertaken by Wake County and all of its municipalities culminated in the Wake County Growth Management Strategy and report. The report covers a number of areas like governance and intergovernmental cooperation; land use and community character; open space and recreation; and schools. A section is devoted to transportation as well, and identifies a



number of recommendations that are still relevant to mainstream, integrative transportation planning today:

- Coordinating high-priority preservation areas with future transportation improvements to avoid conflicts and negative, secondary growth impacts;
- Conversely, in areas where growth is “preferred,” work to set minimum development densities and growth thresholds in part to reduce vehicle miles of travel;
- Tailor parking, pedestrian, and land use codes to promote mixed-use development in growth areas; and
- Develop and administer cooperative transportation strategies and plans between jurisdictions, the Capital Area Metropolitan Planning Organization (CAMPO), and the state department of transportation

that includes unincorporated areas of the county as well as a multimodal secondary street system.

Specific strategies like developing a new financing mechanisms for local road improvements and implementing a larger and more aggressive menu of travel demand options (e.g., carpooling, employer flex time scheduling) seem even more compatible with circumstances today than when they were written, given the current fiscal conditions in which state and federal transportation authorities find themselves. It is worth noting that when this report was written, counties in North Carolina did not carry the authority to purchase street rights-of-way or build and maintain transportation facilities. However, the authority to do so has since been granted by the N.C. State Legislature. Other relevant, current conditions such as the current economic recession that has forced many more people to turn to walking, bicycling and transit modes were not foreseen at the time of this committee's actions.

North Carolina Railroad Shared Corridor Commuter Rail Capacity and Ridership Studies (2008, 2010). The North Carolina Railroad Company completed capacity and ridership studies for a commuter rail service that would operate in a shared corridor with freight traffic from Greensboro to Goldsboro. The North Carolina Railroad is a private company owned by the State of North Carolina and extends from Morehead City to Charlotte. The proposed commuter rail service would operate along this corridor, with four different service segment anticipated along the corridor between Greensboro and Goldsboro. Garner is included in the eastern sector of the corridor in an 84-mile segment that would connect West Durham to Goldsboro. A preliminary schematic of the service indicates two stations in the Garner area (South Raleigh / West Garner and Garner Area), with an additional station shown for the future Outer Loop location east of Garner. The Garner Area station would provide about 190 boardings daily (out of over 4,500 for the system), and is in the highest-ridership segment of the Greensboro-Goldsboro line.

CAMPO 2030 Long-Range Transportation Plan (2005). The North Carolina Capital Area Metropolitan Planning Organization (CAMPO) Long-Range Transportation Plan identified more than 20 roadway projects in and around Garner to be completed by 2030. The plan also identified several other projects that were unfunded but identified as needs with the year 2040 designated for these projects. The project list consists primarily of capacity projects, with only a few identified for bicycle facilities. Additionally, expansion of bus services along US 401, US 70 and Vandora Springs / Old Stage Road were identified in the plan, including park-and-ride facilities. Freeway management systems were tabbed for



US 401, US 70 and NC50 by the NCDOT Intelligent Transportation Systems Section.

FIGURE 5. GARNER AREA PROJECTS IN THE 2030 CAMPO LONG-RANGE TRANSPORTATION PLAN

Facility	From	To	2004 # of Lanes	Future # of Lanes	Bicycle Facilities	CAMPO ID
2010 Projects						
Jones Sausage Rd	Rock Quarry Rd	I-40 (South)	2	4	✓	A91
Tryon Rd	Norfolk Southern Rail	Exist. Tryon Alignment	0	4		A46b
Tryon Rd	New Alignment	S. Wilmington St.	2	4	✓	A46c
2020 Projects						
I-40 (South)	I-440	US 70	4	8		F44a
I-40 (South)	US 70	NC 42	4	8		F44b
Timber / Jones Sausage Conn.	US 70	Timber Dr. Extension	0	4		A138a
Timber / Jones Sausage Conn.	Jones Sausage Rd	US 70	0	4		A138b
Timber Dr East	White Oak Rd	New Rand Rd	0	4		A142b
Tryon Rd	Lake Wheeler Rd	Norfolk Southern Rail	2	4	✓	A46a
Tryon Rd Extension	Garner Rd	Rock Quarry Rd	0	4		A120
US 401 (South)	US 70	East Pkwy (Fuquay)	4	6		A480
2030 Projects						
Creech / Jones Sausage Conn.	Creech Rd	Jones Sausage Rd	0	4		A200
Garner Rd	Tryon Rd	Rock Quarry Rd	2	3	✓	A214
I-540 (Southern Wake Expy)	NC 55 Bypass	US 401 (South)	0	6		F5
I-540 (Southern Wake Expy)	US 401 (South)	I-40 (South)	0	6		F6
New Rand Rd	NC 50	Old Garner Rd	2	3		A88
Old Stage Rd	US 401 (South)	Ten Ten Rd	2	4		A137a
Timber / Jones Sausage Conn.	White Oak Rd	I-40 (South)	2	4	✓	A138c
Timber Dr East	US 70	White Oak Rd	0	4		A142a
Vandora Springs Rd & Extension	Timber Dr	Old Stage Rd	2	4		A140a
White Oak Rd	US 70	NC 42	2	4		A143
2040 Projects						
Auburn-Knightdale Rd / Raynor Rd	Grasshopper Rd	White Oak Rd	2	4		A203
Lake Wheeler Rd	SR 1010	Simpkins Rd	2	3	✓	A136c
Lake Wheeler Rd	Simpkins Rd	Tryon Rd	2	3	✓	A136d
NC 50	Timber Dr	US 70	2	3		A144
NC 50	NC42	Timber Dr	2	4		A228
Old Stage Rd	Ten Ten Rd	Rock Service Station	2	4		A137b
Rock Quarry Rd	Battle Bridge Rd	East Garner Rd	2	4		A201b
Ten Ten Rd	Bells Lake Rd	Old Stage Rd	2	4	✓	A400a
Ten Ten Rd	Old Stage Rd	NC 50	2	4	✓	A400b
Vandora Springs Rd & Extension	Old Stage Rd	US 401 (South)	2	4		A140b
Vandora Springs Rd & Extension	US 401 (South)	Lake Wheeler Rd	2	4		A140c

Chapter 2: The Planning Process

THE GARNER TRANSPORTATION PLAN IS INTENDED TO BE A COMPONENT OF BROADER framework of planning efforts undertaken by the Town of Garner. Previous studies, in particular the current Comprehensive Plan, have pointed toward the need for Garner to conduct a specific transportation planning effort. The Plan will guide future updates of the relevant components of Garner’s Comprehensive Plan and Unified Development Ordinance. Additionally, the Transportation Plan established a vision and set of strategic transportation improvements that will guide future budget and capital program considerations for Garner. It is also anticipated that Garner will utilize the Transportation Plan to provide input to CAMPO, Wake County, NCDOT and Triangle Transit for consideration of future transportation and service investments.

2.1 Vision and Goals

THE GARNER TRANSPORTATION PLAN IDENTIFIED A NUMBER OF GOALS and objectives for the outcome of the Plan and planning process as well as an overarching Vision. The definition of the terms “Vision Statement” (and Mission Statement), “Goal,” and “Objective” are commonly misunderstood and were defined to the Transportation Plan Steering Committee as follows:

Mission Statement: Focuses on the Town’s *present* state relative to its customer focus, capabilities, and composition reflecting the views of both internal and external stakeholders.

Vision Statement: Describes the *future* state of an organization, and should express the viewpoints of primarily the internal Town staff, elected officials, and steering committee about future directions.

Goals: Describe where the Town is going; each goal does not conflict with other goals or Mission and Vision statements; and contain information about time frame and expectations of outcomes.

Objectives: Provide information on specific strategies to achieve the goals.

The Steering Committee developed the following Vision, Goals, and Objectives for the Plan; these were later used to help target strategies as well as performance measures for the Plan alternatives.

Vision Statement

GARNER'S TRANSPORTATION SYSTEM PROVIDES ITS CITIZENS AND BUSINESSES WITH EFFICIENT AND SAFE TRAVEL OPTIONS FOR AUTO, BICYCLE, PEDESTRIAN, AND PUBLIC TRANSIT USERS THAT SERVE TRANSPORTATION NEEDS IN A BALANCE WITH LAND USE DEVELOPMENT PATTERNS AS WELL AS REGIONAL AND LOCAL PARTNERSHIPS.

Goals

Goal Number One: The Garner Transportation Plan will be a visionary document that includes a variety of strategies and partners from adjacent communities and our own to address transportation needs.

Goal Number Two: The Garner Transportation Plan is achievable because it includes both short-term and longer-term actions that respect political and regulatory frameworks, and can be undertaken with currently available or projected resources.

Goal Number Three: The Garner Transportation Plan considers users of all modes of transportation to produce a community that is more walking-, bicycling-, and public transit-friendly than it is today.

Goal Number Four: The Garner Transportation Plan will provide efficient and reliable access for its citizens and businesses, while maximizing their safety.

2.2 The Planning Process and Steering

The Garner City Council appointed 15 people to a project steering committee to guide the development of the Transportation Plan, and to ensure that it was reviewed by a range of interests. The following is a list of people that participated in the planning process at this level.

- Douglas Ball
- Fred Huebner
- Jim Hunnicutt
- Carol Hutchison

- Norm Karr
- Council Member Buck Kennedy
- Council Member Ken Marshburn
- Tim Montgomery
- Neal Padgett
- Keith Roberts
- Ralph Smith
- Donna Sorrell
- Charles Williams

In all, ten meetings of the Steering Committee were conducted between January of 2009 and January of 2010. Each meeting featured an agenda and a follow-up summary of the meeting. The premier content of each of these meetings is shown in [Table 1](#).

TABLE 1. STEERING COMMITTEE MEETING SUBJECTS

Meeting No./ Date	Meeting Topics
1 / January, 2009	Review of the planning process and committee “ground rules”
2 / February, 2009	Draft Vision and Goals statements and review of roadway considerations
3/ March, 2009	Review of the on-line citizen survey and transit considerations
4/ April, 2009	Project priority review and cycling / pedestrian considerations
5 / June, 2009	Review of preliminary roadway, transit, and bike/pedestrian recommendations
6 / July, 2009	Second review of preliminary recommendations and intersection review
7/ September, 2009	Third review of draft plan and discussion of public meeting
8/October, 2009	Discussion of candidate transit stations, first review of conceptual intersections
9/November, 2009	Discussion of conceptual intersections, roadway priorities, transit stations
10/January, 2010	Did final “walk-through” of Planning document prior to Public Workshop review

Chapter 3: Existing Conditions

IN ORDER TO APPROPRIATELY MEASURE OUR PROGRESS towards our recommendations, it is necessary to understand the current conditions of our roadways, public transportation, bicycle, and pedestrian systems. The following sections highlight the current status and conditions of each mode of transportation, beginning with major roadways.

3.1 Roadway Conditions



Old Stage Road

This two-lane, rural roadway is anticipated to operate at or above 80% of its capacity south of Vandora Springs Road in 2035 even with a five-lane cross-section. Due to right-of-way constraints and the desire to preserve a rural character in this corridor, the recommendation for Old Stage Road is to transition to a three-lane (center, two-way left-turn lane) cross-section to accommodate left turning movements throughout the corridor. As Vandora Springs Road is widened, additional northbound turning lanes should be

installed at the intersection with Old Stage Road to maximize turning movement capacity.



Vandora Springs Road

Vandora Springs Road is anticipated to operate at or above 80% of its capacity in 2035 southwest of its intersection with Timber Drive as a two-lane roadway. The recommended cross-section is (1) four-lane, median-divided between Old Stage Road and Timber Drive; and (2) three-lane with center two-way left-turn lane from Timber Drive through the ramp complex at US Highway 70. The bridge over US

70 would ultimately be replaced as a three-lane cross-section to accommodate left-turn storage deficiencies, as well as provide sidewalks with vertical separation on both sides of the structure.



US 401 (Fayetteville Road)

Typically a four-lane, median-divided cross-section south of US 70 transitioning to a median-divided, four-lane section, this roadway is anticipated to operate at or above 80% of its capacity in 2035 even as a six-lane roadway. The dual bridge structures over the CSX rail line south of Legend Drive are a significant cost constraint to widening the roadway beyond the existing four lane configuration. The recommendations for this roadway are (1) transition to a six-lane cross-section between Old Stage Road and US Highway 70 as a priority;

(2) prioritize the extension of Vandora Springs Road Extension between Old Stage Road and US 401/Fayetteville Road as a four-lane, median-divided roadway; and (3) in the near-term begin working with landowners throughout the corridor on driveway consolidations and cross-access improvements. A review of this corridor indicates that 11 driveway eliminations, consolidations, or reductions could be accomplished, and reduce the number of accidents and increase throughput between US 70 and Old Stage Road. Typically, this requires financial compensation, design/construction services, or roadway enhancements to secure the cooperation of landowners.



Timber Drive/Hammond Road

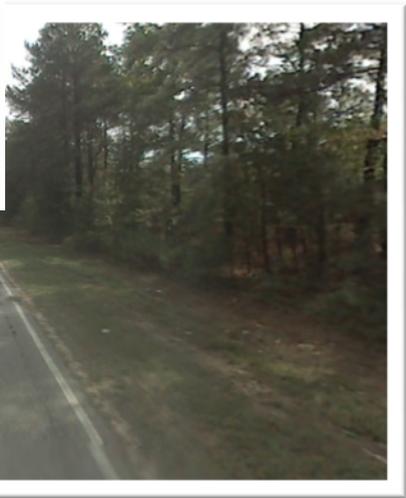
The transition of Timber Drive, a major circumferential and connector to the core of Garner, to Hammond Road north of Mechanical Boulevard, is accomplished with a large intersection at US 70 featuring dual left-turning lanes on every approach and high-speed, right-turn lanes. Nowhere is the separation of Garner created by US 70 more apparent than at this location. Hammond Road is forecasted to operate at or above 80% of its capacity in year 2035 even as a six-lane facility north of Tryon Road. Recommendations include (1) widening

to six lanes with a median north of Tryon Road; (2) maintaining the four-lane cross-section south of Tryon Road to US 70; and (3) redesigning the intersection to accommodate an interchange with US 70, acquiring necessary right-of-way in the short-term.



West Garner Road

The travel demand model predicts that West Garner Road will be largely operating at or above 80% of its capacity as a two-lane roadway. The recommendations for this road are (1) to carry a center turn lane from Vandora Springs Road to Tryon Road; and (2) implement the recently adopted overlay district that respects the historic nature of the roadway and properties along its edges; better access management and driveway improvements to reduce conflict points; and the interaction with the railroad and many cyclists that use this corridor.



East Garner Road

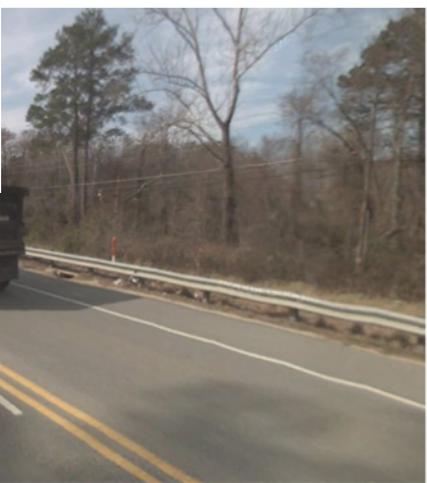
More rural in nature than West Garner Road, East Garner Road nevertheless connects the historic downtown, future proposed rail service, bus service, shopping, and industrial uses along its length. Right-of-way constraints associated with the CSX/NCCR railroad on the south side make widening this roadway problematic in some sections, although a north-side, asymmetrical widening is possible starting east of downtown. The recommendation for East Garner Road is to widen the roadway to three lanes with a center two-way left-turn lane to facilitate turning movements.



White Oak Road

Currently a two-lane roadway, White Oak will still experience volumes in excess of 80% of its future capacity as a four-lane road in 2035, according to traffic forecasts. The road provides a convenient circumvention of Interstate 40 and US Highway 70, and provides direct access to the White Oak Shopping Center. The recommendation for White Oak Road is to continue the four-lane cross-section with a landscaped median such as has been constructed at its north end. While not

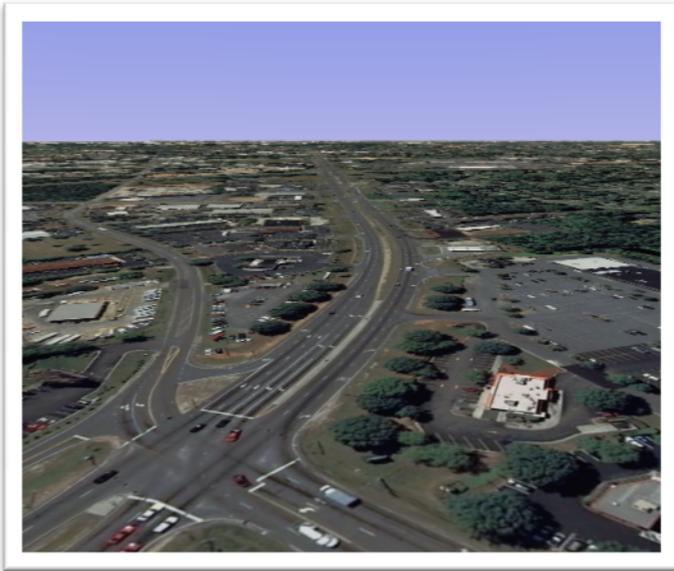
providing for Level-of-Service “D” conditions, right-of-way and cost constraints will play a discouraging factor in additional widening. The narrow, two-lane bridge over Interstate 40 is particularly noteworthy as a constraint to widening the roadway; hence, prioritizing the section between the southern terminus of the existing four-lane, median-divided section and Hebron Church Road is also recommended.



NC 50 (Benson Road)

Providing an important north-south relief route between Interstate 40 to the east and Old Stage Road to the west, Benson Road is currently a two-lane road. The completion of the Southern Wake Freeway would increase this road’s importance and traffic burden; it is projected to experience volumes in excess of 80% of its capacity in 2035 even as a four-lane, divided facility. Recommendations for Benson Road are (1) employ stricter access management and driveway spacing guidelines now to preserve

limited roadway capacity; (2) construct to a median-divided, four-lane roadway; and (3) redesign the multi-leg intersection of New Rand Road and Timber Drive to reduce the queuing conflicts that currently occur.



US Highway 70

This four- to six-lane divided highway has traditionally been both the major commercial corridor that binds the Town together economically as well as the major barrier to north-south travel with the notable exceptions at several grade-separated interchanges (i.e., Yeargan Road, Vandora Springs Road, and Benson Road/NC 50 as well as Interstate 40). The high-speed intersection at US 401 marks a gateway of sorts for travelers heading south from Raleigh, as well as providing a nearly impassable obstacle for pedestrians and cyclists. The land uses are strictly

commercial, accessed by frequent driveways. The 5.2-mile corridor from US 401 to I-40 needs a thorough conceptual re-design, followed by an incremental phasing of improvements. This would include driveway consolidation, consideration of “super-street” concepts to eliminate some left-turning movements, and parallel collector-distributor roadways on each side of the facility in conjunction with bicycle/pedestrian and streetscaping improvements.

3.2 Transit Conditions

Public transportation service nationally has seen strong ridership gains throughout the past decade, culminating in sometimes double-digit gains in 2007 and 2008 (when compared to similar time periods in the preceding years) due to the spikes in fuel prices. For example, Jacksonville’s “Loop” transit system experienced a 19% increase in 2006; Concord/Kannapolis, in only its second year of operation, increased ridership by over 30%. Some of this growth in North Carolina’s public transit systems is attributable to increased public outreach and improved service offerings.

Locally, Garner is serviced directly by three transit operators which, along with other operators in Durham, Cary, and Chapel Hill, have increasingly focused on efforts at collaboration to provide more seamless services in the Triangle Region. One of the most easily observed efforts is the recent GoTriangle.com service that provides route and transfer information among the major transit providers in the Region depending on user-

defined starting and ending points. Another recent effort is the offering of regional bus passes that allow travel on Triangle Transit (Triangle Region), DATA (City of Durham), CAT (Raleigh), and C-Tran (Cary) systems. Additional, ongoing efforts to procure new funding sources (by county referendum, if passed in the State legislature) may also create new opportunities for increased services and inter-operator cooperation. The current discussion surrounding future funding centers on the ability of North Carolina counties to levy a half-cent sales tax to finance bus and rail services. Another potential source of financing is the recent American Recovery and Reinvestment Act of 2009 (aka, the “Stimulus Bill”). A part of this bill includes not only monies for acquiring new buses for existing service providers (although the omission of additional operating funds was an oversight towards expanding service), but also includes \$8 billion for new high-speed rail improvements. North Carolina, with recent increases in rail ridership and continuous improvements on its Raleigh to Charlotte trackage for the last decade, is in an excellent position to compete effectively for some of these funds to get it closer to implementing the Southeast High Speed Rail Corridor (maximum speeds of 110 mph).

The following is a brief description of the three primary transit providers serving Garner and the surrounding area; their current performance characteristics; and proposed modifications to service that are anticipated to occur in the near-term. After the descriptions of service, a brief summary and investigation into two recent studies that would have a direct bearing on the future of public transportation in Garner are provided.

[City of Raleigh Transit System](#) (*Capital Area Transit, CAT*). Transit service in the Capital City has a significant history, beginning with mule-drawn carriages in 1886; the service was short-lived, being replaced by electric trolleys by 1891 operated by CP&L electric company. The era of electric streetcars would not last longer than 1933, in turn replaced by gasoline buses. As ridership fell in the early 1950’s, CP&L abandoned the service, which was eventually taken over by City Coach Lines, Inc. The City of Raleigh only recently took control over its own system in the early 1990s.

Today, CAT service is provided by 39 routes (including seven connector routes) covering an area of 97 square miles. Additionally, CAT provides 12 “demand responsive zones” that operate in the early morning and evening or late evening time periods to extend their service hours in sections of the City. CAT also provides subsidies to taxicab and 'handicab' companies to serve those unable to ride CAT buses (Accessible Raleigh Transportation, or ART). CAT also services the annual State Fair, providing \$4.00 two-way or \$3.00 one-way fares for nearly 32,000 people (2002). In 2008, this service included a park-and-ride stop in Garner at the

intersection of US 70 and US 401. The complete fare structure is indicated in Table 1. Sunday transit service is provided on nine routes; Saturday service is very similar to weekday service with the exception of two routes (Routes 19 and 35 at Apollo Heights and Poole Road). Hours of service vary by route, but all routes generally cover a 6:00AM to 8:00PM time period. Notably, the downtown circulator service is provided by hybrid electric vehicles.

TABLE 2. CAT FARE SCHEDULE

Type of Fare	Full Fare	Senior Citizens (65+) & Persons with Disabilities
Capital Area Transit		
Cash Fare	\$1.00	\$0.50
31-Day Pass	\$36.00	\$15.00
Unlimited Rides		
Weekly Pass Unlimited Rides	\$11.00	\$4.00
11-Ride Pass	\$9.00	Not Available
10-Ride Pass	Not Available	\$4.50
Day Pass Unlimited Rides	\$2.00	\$1.00
Regional Day Pass Unlimited rides on CAT, Triangle Transit, and DATA	\$4.00	\$2.00
Children less than 40" tall	Free with a paying passenger	

While comprehensive, the City of Raleigh system has had serious issues with its garaging capacity, but the issue has been addressed by relocating from the former facility on South Wilmington Street. In spite of recent increases in ridership, passenger revenues account for approximately 23% of service costs, estimated at nearly \$16 million for FY 2009. This recovery percentage is a typical indicator of the economic efficiency of a public transportation system and, for North Carolina, is fairly high compared to most of the other systems. Currently, two routes enter Garner: Route 27, that travels down Wilmington Street and connects Garner Station Shopping Center to Southgate Shopping Center and downtown Raleigh; and Route 28 connecting the Raleigh Oaks Shopping Center, downtown Raleigh, and swinging out as far west as Buck Jones Road.

It is worthwhile to note that CAT also operates the relatively new (start: July, 2008) circulator bus route, or “Loop,” in Wake Forest (CAT operates this system since the garage is closer to the service and thus less expensive). The Loop route is free to ride, subsidized entirely by the Town of Wake Forest for the first year of operation; the fare gets reassessed at the end of Fiscal Year 2009. This service operates between 6:00AM and 8:20PM, Monday through Friday only. A new express route between Wake Forest and Raleigh is also in operation, and synchronized with the Wake Forest Loop route as well as CAT Route 1 (Capital Boulevard). The fare for the express route is \$2.50 one-way. The elderly and disabled ride at half-price on the CAT system. Approximately \$90,000 per year of the \$185,000 service cost for the Loop route is financed by the Town, with the rest provided by the City of Raleigh and grants, including Job Access Reverse Commute (JARC) and New Freedom grants. The Wake Forest to Raleigh Express route is subsidized by the City of Raleigh (\$100,000 for operating costs) and a JARC grant (\$125,000), with the remainder of the \$375,000 annual cost (\$150,000) supplied by Triangle Transit. Triangle Transit may end up taking over the entire cost of the Express Route at some point in the future.¹

[Triangle Transit](#). The Triangle Transit service is regional in scope, serving Durham, Orange, and Wake Counties. Authorized in 1989 by the North Carolina General Assembly, then provided with the ability to levy vehicle registration fees in 1991 and license plate fees in 1997 (subject to the approval of county governments), Triangle Transit is unique in the scale of its service as well as its range of services, providing vanpooling, ridematching, and emergency ride home services as well as fixed-route bus service. Triangle Transit also provides support for teleworking and bike/walk to work options on its website. Triangle Transit continues to take a leadership role in rail service planning, as well as extending its services to local governments. These services recently included helping to plan circulator and express routes in Wake Forest and planning for an eastern service connecting Knightdale, Wendell, and Zebulon in Wake County. Triangle transit is governed by a 13-member Board of Trustees.

The existing bus service is comprised of 12 weekday routes, three evening routes, three regular Saturday routes, five express routes, and shuttle services to Raleigh-Durham International (RDU) airport (one of which runs on Saturday) and Research Triangle Park. Hours of fixed-route bus service generally run between 6:00AM to 10:30PM Monday through Friday and 7:00AM to 5:30PM on Saturdays. Door-to-door paratransit (for those unable to ride Triangle Transit buses) operates for trips between

¹ Landfried, Erik, Transit Service Planner, Triangle Transit. Conversation on March 3, 2009 at 2:00PM.

Raleigh, Cary, Durham, RTP/RDU, and Chapel Hill at a one-way fare of \$4.00. Notable for Garner residents is the park-and-ride lot at the Forest Hills Shopping Center (Seventh Avenue) served by Route 102 which links to the White Oak Shopping Center and downtown Raleigh via US 70 and Hammond Road.

Triangle Transit currently operates one vanpool serving Garner. It originates in Clayton at 7AM, stops in Garner, then proceeds to the RTP. It returns to Clayton/Garner at 4:40PM from the RTP.

TABLE 3. TRIANGLE TRANSIT FARE SCHEDULE

Type of Fare	Full Fare	Senior Citizens (65+) & Persons with Disabilities
Triangle Transit		
Cash Fare	\$2.00	\$1.00
Express Service Routes	\$2.50	\$1.25
Regional Day Pass (not used on Express Routes)	\$4.00	\$2.00
<i>Unlimited Rides on C-Tran, DATA, and CAT</i>		
Bundles of Six and 12 Available for Discounted Price		
Express Day Pass	\$5.00	\$2.50
Unlimited Rides on DATA and CAT		
30-Day Pass (not used on Express Routes)	\$64.00	32.00
Unlimited Rides on C-Tran, DATA, and CAT routes		
Express 30-Day Pass	\$80.00	\$40.00
Unlimited Rides on C-Tran, DATA, and CAT routes		
10-Ride Card	\$16.00	Not Available
\$25 Value Card	\$20.00	Not Available
Children less than 40" tall	Free with a paying passenger	

Triangle Transit has recently undergone a name change (formerly Triangle Transit Authority), rebranding efforts, and changed its central hub station to the Imperial Center in Durham (901 Slater Road), the last in part due to the inability of renewing its lease at the former hub site. The most recent five-year transit plan suggests that, in Fiscal Year 2011,

the Garner Route 102 will extend to Clayton. In so doing, the route will become more of an express route with one stop in Garner. The location of the stop is as yet unknown, but would need to be worked out between the Town and Triangle Transit. Finally, Triangle Transit has created and adopted new language about financial partnerships with municipalities. The policy states that if a town wants to create a local service to connect to an existing Triangle Transit Route, a financial contribution of one-third of the total operating cost will be required. The final apportionment may change as the organization reviews this policy.

[Wake County Coordinated Transportation Services](#) (*Transportation and Rural Access, TRACS*). Wake County operates both a human service system oriented towards Medicaid, Public / Mental Health, and Work First program-eligible persons, and a general service called TRACS. TRACS service is available Monday through Friday for door-to-door service anyplace in non-urbanized (i.e., not inside or between Cary and Raleigh due to restrictions on the Rural Program grants used in part to fund TRACS) Wake County between 7:00AM to 12:00PM and 1:00PM to 6:00PM. Service is requested by telephone on a first-come, first-serve basis 24 hours in advance of the start of the trip. TRACS provides this service through a van fleet operated by Wake County, as well as additional private sector transportation providers. The service has been focusing on technology improvements, including mobile data computers and automatic vehicle locators to help dispatching, improving scheduling and productivity. The fare structure is divided into four service zones, with Garner being the only municipality in the Southern zone; trip costs are doubled for service that cross these zone boundaries, as illustrated in Table 4.

TABLE 4. TRACS FARE SCHEDULE

Type of Fare	Regular Fare
TRACS Service (Wake County)	
Cash Fare Inside Single Zone, One Way	\$2.00
Cash Fare Between One of Four Zones, One Way	\$4.00

Initially envisioned as a limited service option to accommodate a few residents, TRACS has encountered problems with over-demand for its services in recent years, with approximately one out of four requesting riders being denied service. Garner currently provides approximately \$3,000 of monetary compensation to TRACS and Wake County, but short of the \$10,000 per year amount requested by Wake County to ensure a limited number of seats for Garner residents (Apex, Morrisville, and

Wake Forest contribute \$10,000 currently). Towns that do provide full support are given preferential service, even within a zone, a move in response to some towns providing funding support and others in the same zone not contributing financial support. The service requires a one-hour window around the pick-up and drop-off times that may inconvenience some riders. Future impacts include Triangle Transit’s consideration of rolling out regional services to the east and south (including Garner), as well as assigning dedicated vendors, or even drivers, to certain geographic areas to improve performance.

Public Transportation Service Summary

Table 5 indicates a snapshot summary of the major public transportation providers and their service profiles. The most recent data available was used to compile this summary, but complete operating characteristics usually lag for several years, so the actual data is typically from Fiscal Year 2006.

TABLE 5. SUMMARY OF GARNER-AREA PUBLIC TRANSPORTATION PROVIDERS

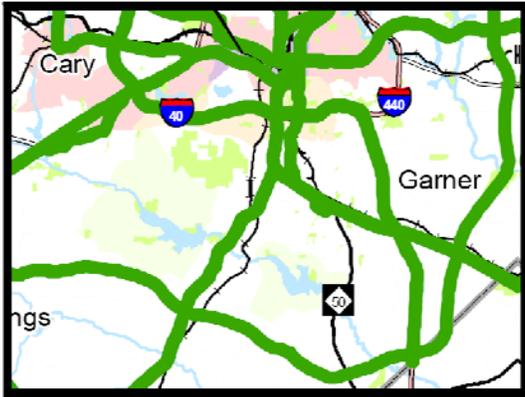
Agency	Annual Trips ⁽¹⁾	Annual Expenses	Buses in Service	Typical Peak Headway	Typical Off-Peak Headway	Revenue Hours(4)	Fare Revenue / Expenses
Capital Area Transit (CAT)	3,937,310	\$12.1 m	48	15	30	165,178	16.9%
Triangle Transit	802,570	\$8.1 m	49	15	60	89,932	9.3%
Town of Cary (CTRAN)	23,354	\$0.60 m	5	30	60	9,946	4.6%
Wake County (TRACS)	140,000	\$0.19 m	35	NA	NA	1.4 trips / hr	15%

Table Notes:

- Refers to Unlinked Passenger Trips.
- Data typically refers to Fiscal Year 2006.
- Sources include: American Public Transit Association; Public Transportation Division, NCDOT Operating Statistics Summary 2005-2006; individual public transportation agency representatives.
- TRACS uses a trips / hour measure for productivity since they are not a fixed-route service like the others.

The trends toward increased ridership on most transit systems have already been identified, trends that exist in part due to increased fuel prices and incremental service improvements. The following two studies specifically affect the Triangle Region and the Town of Garner’s transit future.

Special Transit Advisory Commission Regional Transit Vision Plan (STAC). The STAC consisted of 38 people that were appointed by the Triangle Region’s two metropolitan planning organizations (MPOs) to create a Regional Transit Vision Plan. The report concluded that rush hour service only would be provided to “outlying” communities; this service would consist



of high-frequency bus lines and enhanced bus service for Garner. The recommended rail service would not include Garner, but connect north Raleigh to Durham (light rail would connect Durham to Chapel Hill). The figure at left indicates the regional bus service envisioned for the Garner area; generally, every major highway is shown as having enhanced bus service, including US 70, US 401, West Garner Road / Benson Road and Timber Drive. The bus service option is the most viable in the shortest period of time, and would provide both flexibility and connectivity to future rail corridors. For Garner, implementing this service implies

political support for the necessary financing mechanisms to create and operate the regional service, and commit to the kinds of design, density, and diversity (often termed the “Three Ds” of transit-oriented developments, or TOD) necessary in land use patterns to support such a major transit investment.

Shared Corridor Commuter Rail Capacity and Ridership Studies (North Carolina Railroad). These reports address the potential ridership and costs for establishing commuter rail service on the Norfolk Southern-owned line between Goldsboro and Greensboro (the line actually extends further, into Charlotte, but that segment was not discussed in this study). The motivations for the report are many, including the following list.

- Anticipated fuel price increases and shortages
- The recommendations made by the 21st Century Transportation Commission that would, if implemented, allow local governments to raise taxes to support transit projects
- The recommendations made by the Special Transit Advisory Commission (STAC) for a regional transit system
- Increasing congestion and air quality concerns
- Recent increases in passenger rail ridership in recent years, including the successful start-up of the Lynx system in Charlotte

The North Carolina Railroad has trackage rights based on a 1999 agreement. NCCR has focused its attentions to improving the line between Raleigh and the port at Morehead City, to the tune of \$60 million that will eventually total \$161 million of improvements. The trackage agreement specifies that passenger rail is allowed on the NCCR

lines, as long as it does not interfere with Norfolk Southern freight operations.

The definition of commuter rail service employed by NCRRT for this study describes station locations between two and 10 miles apart. This minimum distance would preclude having a station location both near the I-40 / US 70 interchange – a desirable park-and-ride configuration for commuters inbound from Johnston County – and another station located near the historic downtown of Garner. However, the focus of the study was specifically focused on commuter traffic, examining four trains in the morning and four trains in the evening peak periods. The route was broken into three lines, one of which, the “Red Line,” would travel between Goldsboro to University Station Road in west Durham, and includes the Garner area.

Providing service on the Red Line is complicated by the anticipated increases of both freight (19 more trains per week) and AMTRAK service (two more round trip trains between Raleigh and Charlotte) anticipated in 2012 by the report. The cost estimate for construction the portion of the Red Line that runs 49 miles between Raleigh and Goldsboro is \$115.7 million (2008 dollars). This figure assumes nine stations and no additional right-of-way acquisition costs, and has the lowest per-mile cost of any of the five segments reported. Another \$1.013 billion would be needed for the initial capital start-up costs for purchasing train sets and station / maintenance facility development (2010 dollars).

The cost feasibility study concludes by noting that additional environmental and ridership studies; detailed cost studies for insurance and maintenance; additional design standards for station development; and financing studies are still required to solidify the conclusions of this report.

Ridership was forecasted using the three regional travel models in the study corridor plus an additional area created by the consultant. The modeling effort was enhanced by a stated preference survey completed by a sample 1,670 respondents to assess travel behavior. Assuming a zonal fare system ranging from \$2 to \$10 and 40-minute peak period headways, daily ridership averaged 4,558 in 2012 (16th among current US rail systems) with \$3.21 million in revenue. Notably, ridership peaks in the Raleigh-Garner section of the corridor, underscoring the potential of Garner for commuter rail, although total daily boardings in Garner were forecasted to be about 190 riders in 2017.

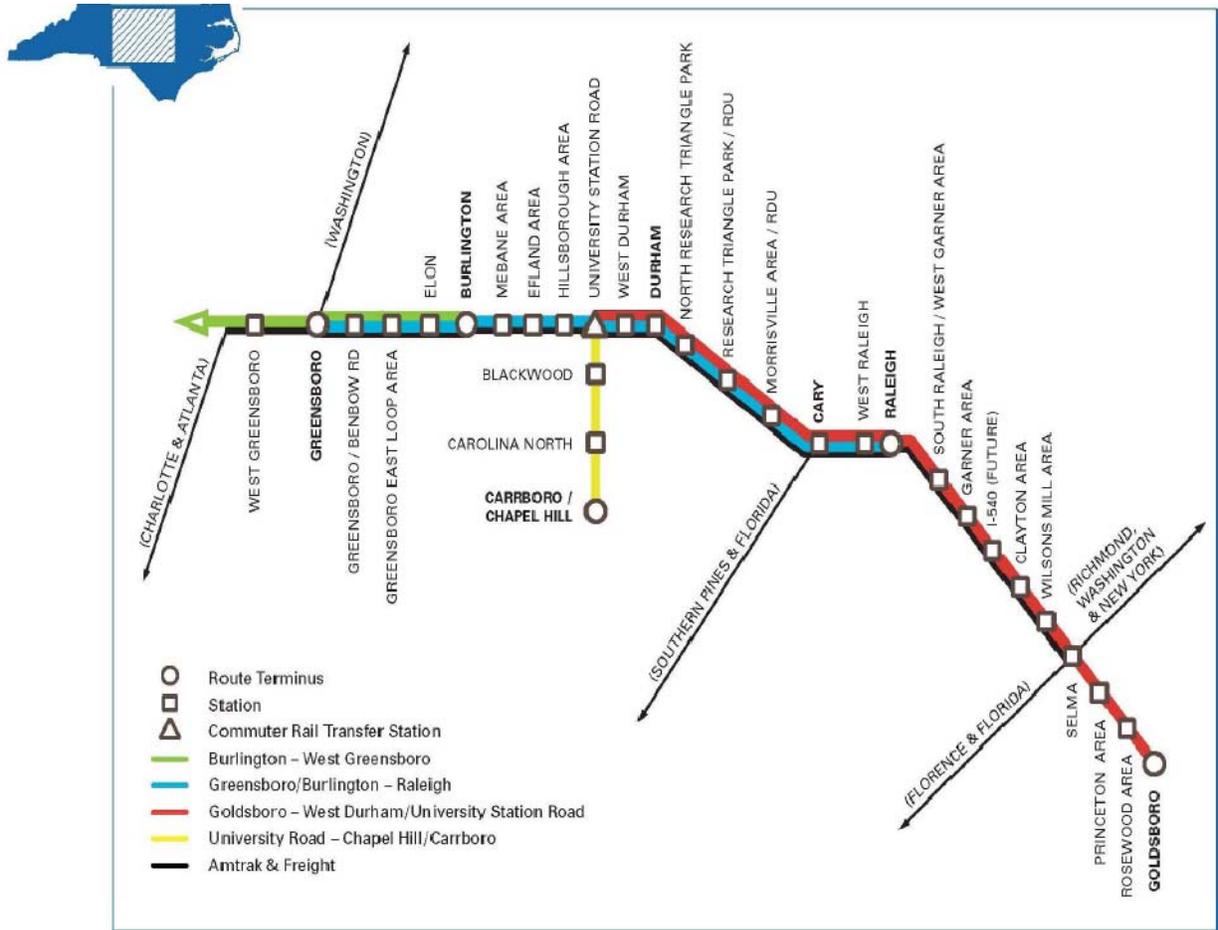


FIGURE 6. NCR PASSENGER RAIL SERVICE STUDY ASSUMPTIONS

As Garner continues to grow and evolve, the type of transit services available to its citizens will also evolve. This will occur in the context of what is developed by other transit agencies in the region and what Garner is able to accomplish in terms of its population, density and resources to support such services. The most balanced public transportation systems in the United States contain a variety of different modes that correspond to the unique needs of citizens and service areas within a region. This is why some communities have services such as light-rail while others may only have express buses.

In the future, new services such as commuter rail may replace existing express bus services. Express bus service may replace vanpools. And light rail could someday replace commuter rail and local bus services. In all likelihood, Garner’s future transit services will continue to be a mix of different mode and service types.

Table 6 provides a summary of various transit services and their key characteristics.² These modes have been identified by the existing service providers as possible future service to or within Garner. This table can help guide Garner in considering the type of services that best fit the community and provide its citizens with a comparative table to reference when the region’s transit interests conduct public outreach.

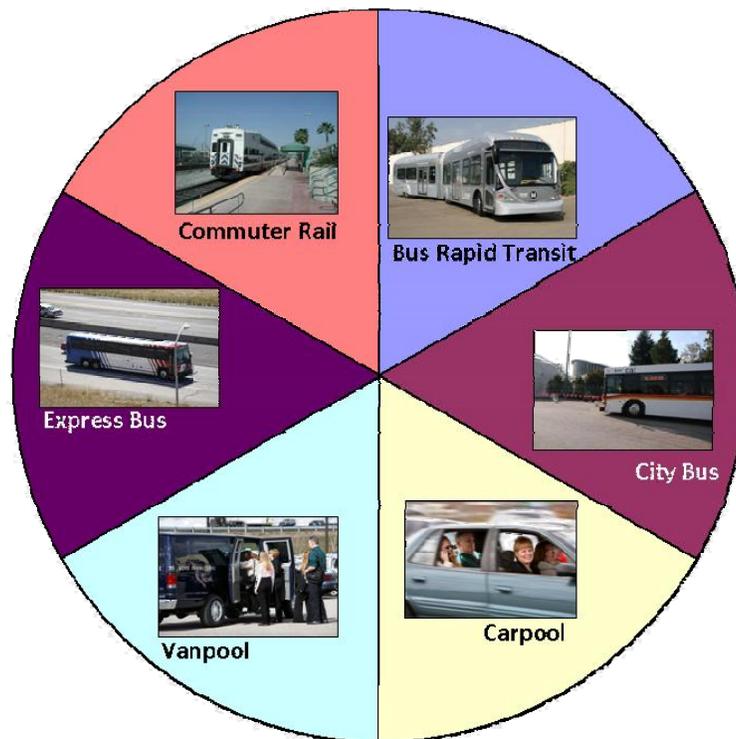


FIGURE 7. EXISTING AND EMERGENT FORMS OF PUBLIC TRANSPORTATION IN GARNER

² Note: Service characteristics represent typical systems and may vary due to local circumstances, operating authority and other financial or feasibility limitations.

TABLE 6. TRANSIT SERVICE MODE CHARACTERISTICS

Mode Characteristics	Commuter Rail	Bus Rapid Transit	Express Bus	City Bus	Vanpool	Carpool
Vehicle Type	Locomotive, with passenger cars	Varies, can be unique design or standard city bus	Charter-style bus or standard city bus	Transit bus or “cutaway” shuttle vehicle	Mini-van or 15-passenger van.	Varies
Geographic Service	Region-to-Region; City-to-city; or Suburb-to-City	Suburb-to-City; Neighborhood-to-Neighborhood	Suburb-to-City	Neighborhood-to-Neighborhood	Suburb-to-City; City-to-Suburb; or Region-to-Region	Region-to-Region; Suburb-to-City; or City-to-Suburb
Service Length	> 15 miles	< 15 miles	> 10 miles	< 10 miles	> 10 miles	Varies
Frequency	30 – 60 min.	5 – 30 min.	During morning & evening peak	5 – 30 min.	Varies	N/A
Operating hours	Weekday work hours	Same as city bus services	Weekday work hours	5 am to Midnight; varies by city	Weekday work hours	Varies
Stop Spacing	> 1 mile	¼ mile to > 1 mile	Typically at designated locations such as park-n-ride	¼ mile to 1 mile	Typically at designated locations such as park-n-ride	N/A
Stop Type	Platform or depot	Platform or sheltered bus stop	Shelter at park-n-ride or other location	Bus stop sign, some with bench or shelter	Shelter or bench if located at park-n-ride or transfer facility	Varies
Capital Costs	High	High	Moderate	Moderate	Low	Low
Operation Costs	Moderate	Moderate	Moderate	High	Low	Low
Weekend service	Probably not	Yes	No	Yes	Possible	Yes

3.3 Bicycle and Pedestrian Conditions

In order to understand bicycle and pedestrian needs in Garner, an existing conditions analysis was conducted to assess the current bicycle and pedestrian network and its relationship to residential/commercial development as well as major local attractors. The existing conditions analysis is an important element of the planning process, as it builds the foundation for and guides the development of any project, program, and policy recommendations. To address the needs of cyclists and pedestrians, the existing conditions analysis considers not only physical conditions, such as roads, parks, and schools, but also less concrete items, such as demographic information, public perceptions, and travel behaviors.

This section reviews the following items:

- Land-use and Transportation Linkages in Garner
- Existing Bicycle/Pedestrian Facilities
- Major Roads
- Major Destinations including Schools, Parks and Greenways
- Transit Access
- Bicycle/Pedestrian Crash Analysis
- Demographic Analysis
- Designing for Accessibility

Land Use and Transportation Linkages in Garner

As did many communities in North Carolina, the Town of Garner started with humble beginnings in the late 1800's around the North Carolina Railroad (NCR) corridor, which was expanded through the small township in 1847. Several successful general stores and a train depot followed as did the Central Highway or old US 70, which is now Garner Road. Garner Road and the adjacent rail line connected the heart of downtown Garner to nearby Raleigh, which helped to anchor the Town's economic growth and physical expansion for years to come. Traffic on US 70 picked up as rail travel tapered off, and the roadway was eventually realigned south of the original Garner Road and NCR corridor. Commercial development re-oriented toward the new US 70 alignment and the Town filled out to the south through new residential and commercial areas reaching just beyond the scenic Lake Benson.

Today, Garner is still experiencing growth, especially along the north-eastern edges of the Town near the US 70 and I-40 interchange. With its small town feel and a combination of rural and urban-suburban attractions, Garner continues to increase in popularity for Triangle area

families and businesses looking to relocate. The Town is home to ten parks and a number of recreational centers including the Garner Senior Center, Avery Street Recreation Center and Garner Historic Auditorium. Part of the Wake County School System, Garner has 11 public schools within the Town limits, several of which are magnet schools: eight elementary schools, two middle schools and one high school. Other popular destinations include the Wake County Southeast Regional Library, local YMCA, a number of historic landmarks and the Greenfield Parkway Business Park. [Figure 8](#) illustrates a number of important bicycle and pedestrian destinations in Garner, as well as an inventory of existing sidewalk and bicycle facilities.

FIGURE 8. IMPORTANT BICYCLE AND PEDESTRIAN DESTINATIONS



Legend

Pedestrian Destinations

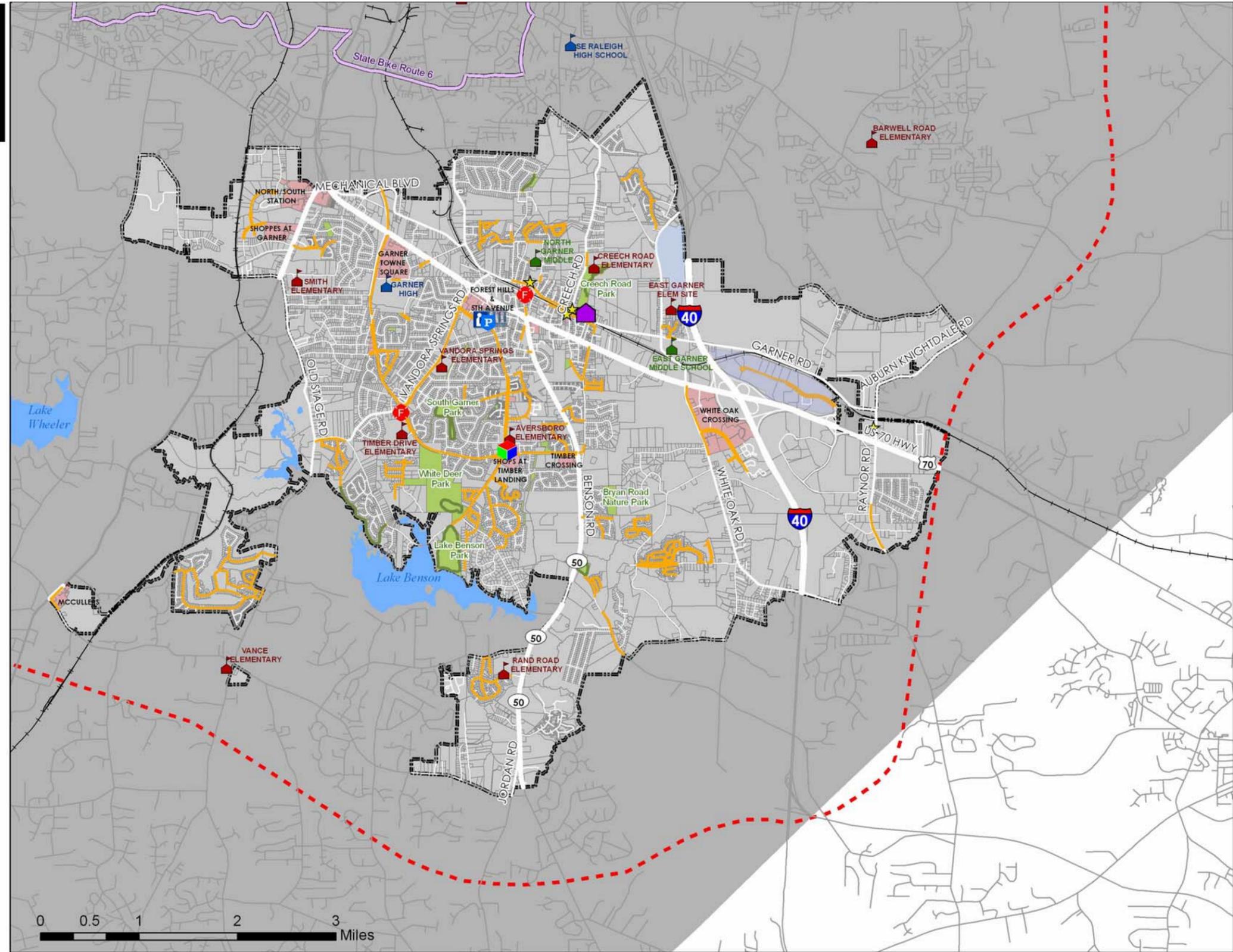
- Garner Senior Center
- YMCA
- Police Station
- Fire Station
- Churches
- Greenfield Business Park
- Shopping Centers
- Con Agra Foods
- Town Parks
- Garner Planning Jurisdiction
- Cemeteries
- Town Hall
- Library
- Historic Landmarks

Schools

- Elementary School
- Middle School
- High School

Other Features

- State Bike Route
- Existing Trails
- Existing Sidewalks
- Johnston County
- Wake_Streets_2009_09
- Proposed 540 Outer Loop
- Railroad



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Existing Conditions Analysis

Part of the answer as to why people walk and bike in Garner – and why more people don’t – can be found in the level of accommodation for pedestrians and cyclists. While Garner’s downtown and some older neighborhoods in the center city were developed with sidewalks and well-connected streets, the Town has experienced much suburban and commercial growth in recent years that has not always complemented non-motorized transport. The rail corridor and several major roadways create barriers to walking and biking, and many outlying areas of town have few pedestrian and bicycle amenities or tend toward cul-de-sac streets with sparse land use patterns. These types of development create long distances between destinations and may discourage walking or biking for transportation, but can be retrofitted with sidewalks, bikeways, traffic calming and greenways, as well as infill development, to create a much more bikeable, walkable environment. In the outlying areas of town, Garner’s rural roadways create scenic bikeways for recreational cyclists looking to achieve fitness and enjoy fresh air on the weekends or after work.

Figure 13 includes an inventory of existing sidewalk facilities in Garner, most of which are concentrated along major roads in central Garner such as Timber Drive, Aversboro Road and Vandora Springs Road, as well as within various residential areas throughout town. Many of these existing sidewalks are discontinuous due to gaps in the sidewalk network, but the Central Loop Project completed in August 2009 helped to create connectivity along nearly 4.5 miles of the aforementioned roadways, giving pedestrians and child cyclists access to many attractions such as the Southeastern Wake Regional Library, Town Hall, Forest Hills Shopping Center, as well as Aversboro and Vandora Springs Elementary. Many adult and child pedestrians were observed



Top Photo. Worn paths between sidewalk segments suggest that pedestrians are walking along Aversboro Road, despite gaps.

Middle Photo. A greenway trail opportunity exists to connect Vandora Springs Elementary to residences along Vandora Avenue.

Bottom Photo. Supervised and unsupervised children walking/biking home from Aversboro Elementary School.

walking in the central Garner area, and worn paths or “desire lines” are evident where gaps in the sidewalk network appear. Such desire lines can often help identify areas where sidewalks are needed due to existing

demand. Reviewing the map in [Figure 8](#), it is easy to see that many pedestrian destinations are concentrated in the central Garner area, which reinforces the need for sidewalks here. Additional east-west connections (such as along Vandora Avenue) should also be considered, as well as opportunities for connections between parks, neighborhoods and schools.



Top. Pedestrians were observed taking advantage of sidewalks along Greenfield Parkway within the office park during lunch, but those sidewalks do not continue outside of the development.

Bottom. The Streetscape Plan recommends pedestrian improvements at the tricky intersection of Garner Road and Benson Road.



East Garner is growing in popularity and as development occurs will draw more residents, shoppers and employees. When the proposed Timber Drive roadway connection is achieved, sidewalks should be constructed incidental to that project in order to provide better pedestrian connectivity to/from White Oak Crossing. The Greenfield Parkway office park should also be considered a bicycle and pedestrian destination in East Garner. As a major employment center, this concentration of offices and shipping centers will attract employees from throughout town. During a field inventory of the area, pedestrians and cyclists were observed walking to/from the park during the lunch hour, some most likely partaking in a regular fitness routine, while others may have been walking to nearby residential areas to go home for lunch. Sidewalk, greenway and bikeway connections to the office park should be considered, especially as or if development occurs nearby.



Top. Lake Benson Park's greenway trails are quite popular with bicyclists and pedestrians.

Bottom. White Oak Road, a potential scenic bikeway for recreational cyclists.



Additionally, sidewalk and bikeway connections to other schools, parks and shopping centers should be prioritized, such as in North Garner around Creech Elementary, Avery Recreation Center and the Garner Senior Center, as well as to/from downtown Garner. Several neighborhood streets such as sections of Curtiss Drive and Johnson Street have sidewalks, but many of the adjacent collector streets lack pedestrian facilities. Given the number of bicycle and pedestrian attractors in the area, further study was necessary to recommend sidewalks, bikeways and greenway trails to access nearby civic destinations. Recommendations for this area are partially addressed by the complementary Garner Streetscape Plan and include wide sidewalks and high-visibility crosswalks in and near downtown, plus intersection re-designs at Main Street and Benson Road (near Creech Elementary School), as well as at Garner Road and Benson Road, to create safer, more pedestrian-friendly crossings. These proposed crossing improvements will greatly enhance the appearance of and access to downtown Garner, as well as improve pedestrian and bicycle access to North Garner Middle School, Creech Elementary School, Creech Road Park, Hope Park, Cloverdale Park, the Garner

Senior Center, the Avery Recreation Center and other destinations north of Garner Road. The Streetscape Plan also recommends street trees, directional signage, benches, trash cans, bicycle parking and other amenities within its study area to create a more appealing biking and walking environment. Bike lanes are recommended along Garner Road from Benson Road to Jones Sausage Road, which will help encourage safe bicycling in the corridor.

Garner has a number of bicycle and pedestrian trails in local parks, such as Lake Benson Park, South Garner Park, Creech Park, Centennial Park, Cloverdale Park, and White Deer Park though no specific on-road bicycle facilities (e.g. bicycle lanes) are in place. The Town should consider building off of the existing greenway trail network and take advantage of opportunities for short bicycle connections in order to expand its bicycle network in the near-term. Roadways with wide outside lanes (14'-16') should be evaluated for opportunities to mark bike lanes. Roadways with wide cross-sections may be suitable for road diets to provide room for

bike lanes and improve traffic flow for all roadway users. Additionally, local residential and low-speed/low-volume streets should be considered for shared bikeway, or “sharrow,” markings and/or bike route signage. Several scenic, rural roadways might be targeted for paved shoulders and/or “Share the Road” signage, and all proposed new roadway and road widening projects should be considered opportunities for new bicycle (and pedestrian) facility construction incidental to the roadway improvements. Furthermore, the local policy environment and culture towards cyclists and pedestrians should be considered, as many other factors impact mode choice such as intersection design, the location of shops, businesses and homes, education and enforcement of traffic behavior, and the encouragement inherent in a sense of community among cyclists and pedestrians.

Finally, transit stops and related amenities should be considered major bicycle and pedestrian attractors, as most transit users access stops by bike or by foot. For this reason, Garner Station shopping center in the northwestern quadrant of town should be considered a bicycle and pedestrian attractor, as both Triangle Transit and Capitol Area Transit buses stop at this location. Any new, future transit locations for buses, light rail or other forms of public transportation should be considered for safety- and access-related improvements in the bicycle and pedestrian transportation systems.

Bicycle/Pedestrian Crash Analysis

A bicycle/pedestrian crash analysis is useful because it can be an indicator of the friendliness of a community to non-motorized modes, and can also provide information on key locations or educational outreach areas where improvements could be made to enhance safety. A crash analysis can often indicate popular biking and walking routes, and sometimes illustrate conflict areas between pedestrians and cyclists. Crash data for Garner was available from the North Carolina Department of Transportation (NCDOT) for the period of time between 2003 and 2008; a summary of this data is provided in [Figure 9](#).

Bicycle and pedestrian crash data for Garner does not in all cases mimic vehicular crash data. Many crashes in Garner appear at intersections, reinforcing a need to consider safety improvements for cyclists and pedestrians at intersections throughout the City. The recommendations for the Bicycle and Pedestrian Element of the Garner Transportation Plan incorporate such elements focused on crossing improvements at crash sites. Clusters of crashes are particularly notable, as they may indicate a design flaw that negatively impacts bicycle/pedestrian safety. Clusters of bicycle/pedestrian crashes appear at several major intersections, including the intersection of Fayetteville Road (US 401) and US 70,

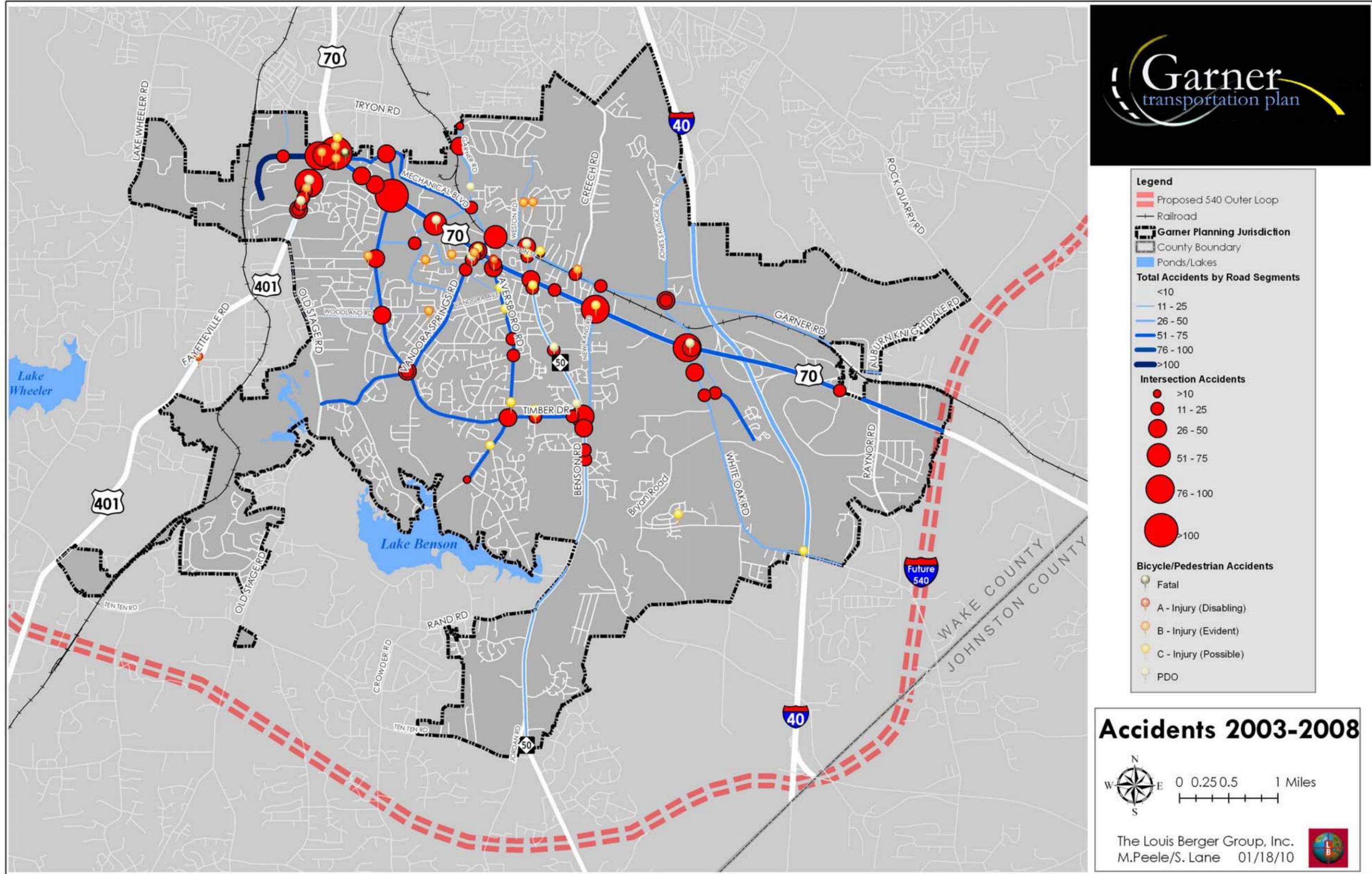
Vandora Springs Road and US 70, as well as the askew intersection of Benson Road (NC 50) and Main Street. The only fatal bicycle/pedestrian crash occurred at the intersection of US 401 and US 70, prior to the installation of pedestrian signalization at that location. Many of the severe crashes with evident and/or disabling injury incurred by the pedestrian or cyclist occurred along major thoroughfares.

In the case of the US401/US70 intersection, the wide fork where US70 splits into US401 and US70 creates a wide crossing distance for pedestrians that could be addressed through a road diet, signal timing changes, the addition of median refuge islands and/or other alternatives that will be addressed in the Plan's recommendations. The cluster of crashes at the intersection of Benson Road (NC50) and Main Street are likely attributed to the skewed angle of the intersection and use of slip lanes. These two design elements create wide crossing distances for pedestrians and increase the speed of turning vehicles at an intersection. The Garner Streetscape Plan recommends several improvements to this intersection to create a traffic calming effect and safer, more pedestrian friendly environment.

The cluster of bicycle/pedestrian crashes at the intersection of Vandora Springs Road and US70, along with the individual crashes occurring throughout the central Garner area, may be somewhat attributed to a higher volume of bicycle and pedestrian traffic in and around the center of the city. Numerous pedestrians were observed in this area, including children and parents biking/walking from school at Aversboro Elementary and Vandora Springs Elementary. The proximity of schools, parks, shopping areas and other destinations to residential developments in central Garner create a walkable mix of land uses. The Central Garner Loop project to install sidewalk connections on Vandora Springs Road, Timber Drive and Aversboro Road will greatly enhance the walking environment (and bicycling environment for child cyclists) in this area. As appropriate, the Town might consider future crossing treatments to improve intersections for bicyclists and pedestrians in this area to connect sidewalks with various attractions within the individual corridors.

Finally, as with any comprehensive bicycle and pedestrian program, educational outreach and enforcement may also be warranted in some cases to improve bicycle and pedestrian safety at intersections and to encourage safe travel behavior by all roadway users.

FIGURE 9. VEHICLE AND BICYCLE/PEDESTRIAN CRASHES



Demographic Analysis

Hispanic: People who identify themselves as Latino, Spanish or Hispanic (the terms are used interchangeably by the US Census Bureau, and different people will recognize themselves by different terms) are noting their country of origin as Puerto Rico, Central America, Mexico, South America, Cuba, or Spain. Hispanics may be of any race.

Median: The median is a mathematical statistic that identifies the number where half the responses fall above and half below. Compared to an average (or “mean”), the median is less susceptible to being skewed by a small number of radically different values in a group.

US Census: The U.S. has taken a decennial (once every 10 years) count of its people since 1790 with few breaks. Most people have answered the “short form” questionnaire which asks basic questions about race, ethnicity, age, and so forth. One in seven people answer the long form, which is used to estimate many other characteristics of the population.

ABOUT DEMOGRAPHICS

It is important to examine a city’s demographics before developing a transportation plan because demographic information provides valuable clues about citizen travel behavior and preferences. Characteristics such as age, income, vehicle ownership, and commute time can suggest a population’s potential for various travel modes, such as biking and walking. The following paragraphs provide a summary of the demographic analysis for the Town of Garner and explain the implications of the analysis for the recommendations made in the Garner Transportation Plan.

According to 2000 U.S. Census data, middle-aged adults from 25 - 44 collectively make up 47.7 percent of the town's overall population. This is relatively similar to state and national demographics where this age group accounts for 44.5 percent of the North Carolina population and 43.6 percent of the United States population. Children age 14 and under make up one-fifth of the population at 20.8 percent, also mimicking state and national trends. Overall, Garner’s age demographics strongly correlate to state and national demographics and indicate that the town’s age pyramid is fairly evenly distributed and does not lean heavily to any age group due to any unusual circumstances in the community. This fact reinforces the notion that Garner is a popular home to many families in the Triangle and very appealing to people of all ages and lifestyles.

Garner's population is 67.0 percent Caucasian and 27.1 percent African-American, with no other group occupying a significant share of the total. These figures are very similar to state averages, where Caucasians make up 72.1 percent of North Carolina’s population and African-Americans make up 21.6 percent. Both the town and state figures are more racially balanced than national averages, where Caucasians make up 75.1 percent of the overall US population while African-Americans account for only 12.3 percent. Interesting, 4.7 percent of Garner’s population self identify as Hispanic which is only slightly less than in Wake County’s (5.4%) and the same as the state (4.7%), though dramatically lower than the nation (12.5%).

Garner has Median Household Incomes and Median Family Incomes well above state and national averages. Garner also has a significantly lower percentage of individuals living below the poverty level. Poverty levels in Garner appear to affect seniors more than other age groups. While the 10.5% of seniors over

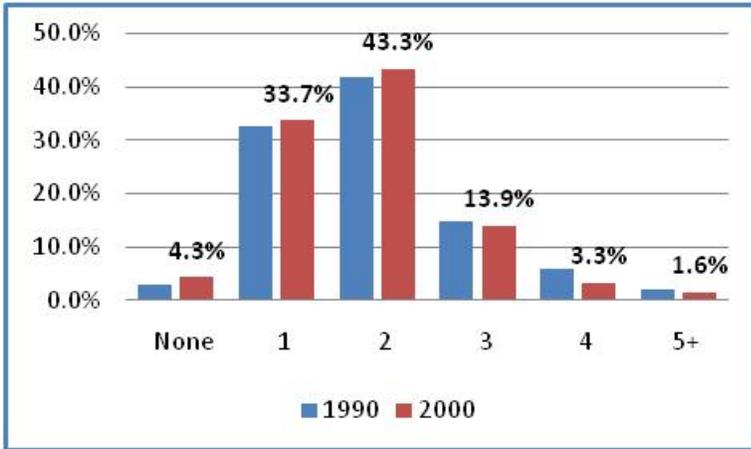


FIGURE 10. VEHICLE AVAILABILITY

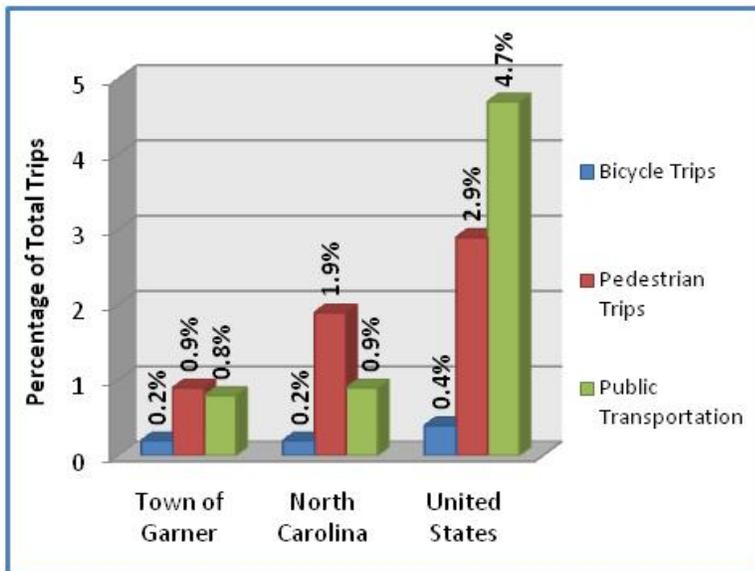


FIGURE 11. GREEN MODE SHARE

the age of 65 live below the national poverty level in Garner, 7.8 percent of children under age 5/6 live below the poverty level and only 6.8 percent of all individuals live below poverty level. In contrast, 11.9 percent of the state's population lives below poverty level and 12 percent of the nation's population do so.

The Town's household vehicle availability statistics reflect the higher than average median incomes for Garner as compared to the state and nation, with far fewer households having no car available. Only 4.3 percent of Garner residents have no vehicle, as compared to 7.5 percent of North Carolinians and 10.3 percent of the national population. Garner households with access to one vehicle trends toward the state and national average, while Garner households with access to two vehicles is slightly higher at 43.3 percent than the state (39.9%) and national (38.4%) averages. Given the widespread availability of vehicles, 82 percent of commuters drive alone to work which is somewhat higher than the state and national averages. Far fewer Garner workers commute by public transit (0.8% compared to 4.7% nationally), and all who reported commuting via public transportation took taxicabs to work. With Garner's lack of local or regional transit service at the time of the 2000 Census, this data is not reflective of current trends. Similarly, according to the 2000 Census, few commuters are walking (0.9%) or biking (0.2%). Garner's bicycle mode share mimics the county and state average (both at 0.2%) and is slightly lower than the national average at 0.4 percent. However, pedestrian mode share is higher at the county (1.7%), state (1.9%) and national (2.9%) level than in Garner. It can be assumed that the next Census will

show a shift in commute modes as Triangle Transit and Capital Area Transit now service Garner, which should result in a direct rise in commutes via public transportation and may indirectly impact walk/bike mode shares.

The demographic analysis also reveals that the majority of Garner commuters travel between 15 minutes and 34 minutes to work, indicating that many Garner residents work outside of town, most likely in Raleigh, RTP or other nearby communities. However, 21.7 percent of Garner residents live within 14 minutes of work, wherein walking or biking might be a realistic goal thereby setting this group as a potential target audience for increased bike and pedestrian commute trips.

Designing for Accessibility

The *Americans with Disabilities Act* (ADA) of 1990 and subsequent regulations established by the United States Access Board (Access Board) were instituted to ensure accessibility to public facilities and programs for mobility-impaired populations. While these regulations are intended for mobility-impaired populations, a well-designed pedestrian system provides for accessibility for persons of all ages and abilities, from the parent pushing their child in a stroller to a senior citizen who finds it difficult to navigate a driveway crossing due to its slope.

ADA provides comprehensive civil rights protections to persons with disabilities in the areas of employment, state and local government services, access to public accommodations, transportation, and telecommunications. Title II of ADA is of most concern regarding pedestrian facilities, as it states “no qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any such entity.”⁸ Title II also requires a public entity to evaluate its services, programs, policies, and practices to determine whether they are in compliance with the nondiscrimination requirements of the ADA.

The Access Board’s work on design standards for public rights-of-way are intended to guide municipalities in the proper methods by which to design pedestrian facilities and parking spaces for accessibility (<http://www.access-board.gov/prowac/>) Of most relevance within the Garner Transportation Plan are the design of sidewalks and curb ramps.

The general condition and design of sidewalks and curb ramps within Garner were analyzed as part of the street system inventory. In general, the configuration, widths and slopes of Garner’s existing sidewalks

conform to existing regulations for design of such facilities. The key design features for sidewalks are that they are at least 5' wide (they can be 4' wide if there is a "passing" area at least 5' wide every 200') and do not have a cross-slope greater than 2%. Garner's existing Unified Development Ordinance provides for adequate width on sidewalks but does not specify the need for a cross-slope no greater than 2%.

Of most concern was the design of curb ramps. The Unified Development Ordinance, Article 8.2 Streets, Section Q, regulates the design of curb ramps through reference to North Carolina Department of Transportation Division of Highways standards. Unfortunately, NCDOT's design standards for curb ramps do not comply with the Access Board's regulations for accessible curb ramps in that they do not require a 4'x4' flat landing either at the top of the typical ramp design or inset into a diagonal ramp. Figure A depicts the typical design for curb ramps in Garner, showing the top of the ramp lacking the 4'x4' landing area.

The figures on this page illustrate the standard drawing as developed by NCDOT, and depict curb ramp designs that comply with the landing requirements.

It is recommended that Garner modify its UDO to reference a drawing for curb ramps that is in compliance with the public rights-of-way guidelines as established by the Access Board. This would specify the ramp landing configuration and slope requirements as noted previously. Additionally, while the concrete coloring to highlight the curb ramp can make the ramp more visible, it is not required in addition to the placement of a detectable warning device.



Figure A: The standard curb ramp being constructed in Garner does not conform to ADA-related standards that require a 4'x4' flat landing at the top of the ramp to allow a person in a wheelchair the space to orient themselves to their desired direction of travel.

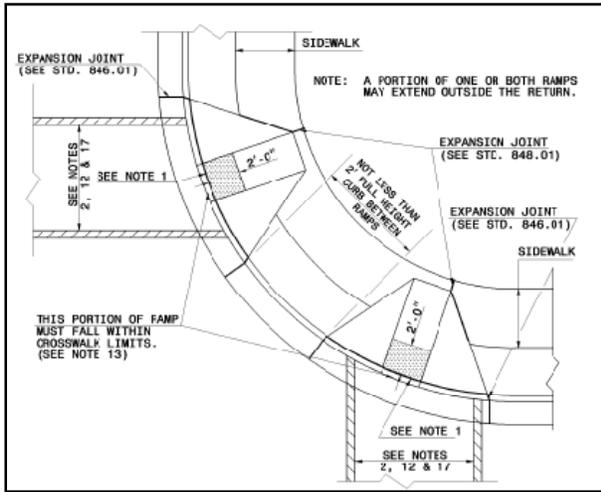


Figure B: The standard drawing provided by NCDOT (drawing 848.05) does not provide for the 4'x4' flat landing or specify that the landing have less than a 2% cross-slope.

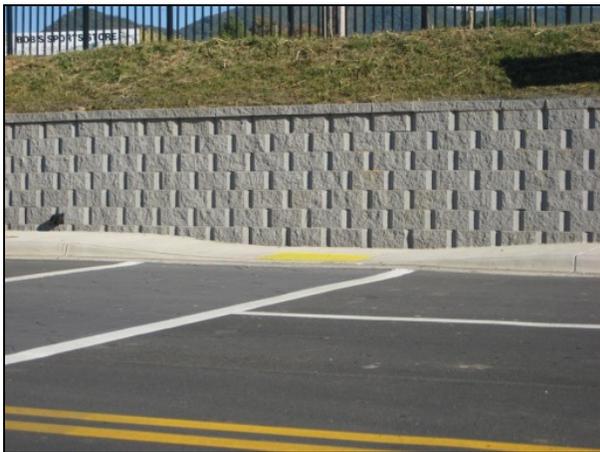


Figure C: The curb ramp shown below accounts for the need to have a 4'x4' landing area at the top of the ramp and allow for bi-directional sidewalk access to the ramp.



Figure D: Where existing buildings or topography will not allow for a flat landing at the top of a curb ramp, the 4'x4' landing area can be provided at the bottom of the ramp, with the ramp sloping up to connecting sidewalks.

Chapter 4: Recommendations

4.1 Changes in Transportation and How We Live

The first decade of the new millennium, while not bearing out the degree of change feared or anticipated by many an astrologist⁹ and credible journalist,¹⁰ the actual outcome of the Y2K fear, Millennium Bug, and other associated concerns was generally limited to a sharp increase in the sales of portable generators, services of computer technicians, and similar reactions. A secondary reaction may also have been the further deterioration in the credibility of any forecast predicting fundamental changes in social structure that would dramatically affect everyday experiences. An excellent example of a credibility war is the ongoing debate over fundamental shifts in climate change; while the overwhelming evidence and weight of scientists are moving behind the basic tenants of sea-level rise, temperature changes, and associated effects created by man-made carbon emissions, countervailing views are still published and cast uncertainty over the technical underpinnings of the theory.¹¹ Even the notion that there is a broad-based scientific consensus about carbon emissions and the role of man-made emissions¹² has received recent - and credible - criticism¹³ even as climate change legislation is working its way through the Congress as of this writing. The relevant lesson from this debate is that while credibility of forecasting

should always be a goal, it is important to examine the assumptions behind the forecasts. As regards transportation and travel behavior, and therefore the recommendations contained in the Garner Transportation Plan, a number of important “prime mover” issues are worthy of mentioning since these factors have the power to affect past trends that practitioners and decision-makers have taken largely for granted in the past 30 to 40 years of transportation planning.¹⁴

“Of the more than 29,000 observational data series, from 75 studies, that show significant change in many physical and biological systems, more than 89% are consistent with the direction of change expected as a response to warming...”
- International Panel on Climate Change, 2007

Many of the past trends that have shaped U.S. transportation policy since World War II are currently undergoing major directional changes or at least slowing their rate of increase. Since it is the purpose of this report

to recognize scenarios that are reasonably foreseeable, these changes need to be acknowledged (Table 7).

TABLE 7. CHANGES IN PAST TRENDS INFLUENCING MACRO-SCALE ECONOMIC DEVELOPMENTS

Trend Element	Past	Potential Future Shift and Implications
Household Size	The trend has been towards shrinking household sizes, from 4.5 persons per household in 1915 to 2.6 persons in 2007.	Lowered household size indicates more households and more demand for travel; however, there is a logical limit and anticipated plateau – perhaps even a reversal – of this trend that would lead to lowered vehicle miles of travel (VMT) from reduced trip lengths.
Women in Workforce	The labor force participation rate of women has risen since World War II, increasing from 46% to nearly 59% between 1975 and 1996. ¹⁵	The increase in women’s participation in the US labor force stopped in the early 1990’s then resumed; this trend will eventually level off. In 2004, the labor force participation rate (59.2%) has not changed since the 1996 figure. As fewer women enter the labor force, vehicle miles of travel and (perhaps) trip frequency also decline.
Vehicle Occupancy	The vehicle occupancy rate dropped from 1.89 persons per vehicle in 1977 to 1.59 in 1995.	This trend of declining vehicle occupancy rates (VOR) has to level off above 1.0, and there are signs it is already doing so; for example, a 2007 vehicle occupancy survey in Richmond, VA indicated a slight rise in VOR from 2002. ¹⁶ The national VOR also slowed its rate of decline between 1977 to 1995. Fewer people riding alone implies fewer trips and lower VMT.
Public Transportation Usage	Decades of generally declining ridership figures for much of the country from 1945 (19 billion passenger trips) to 1990 (6.0 billion passenger trips).	Recent price spikes in the global oil market are credited with recent jumps in transit usage since 2004, although the number of public transportation trips has actually been increasing nationally since 1990. ¹⁷

For every variable and trend listed above, which have collectively shaped the economic and transportation policy decisions for six decades, there are indications that their rate of change is tapering now or will decline in the near future. The overall implication is that the historic rise of vehicle miles of travel for six decades – often faster than the rate of population growth – is reaching a plateau. A Brookings Institute report cited that the

rate of VMT increase actually stopped in 2004 and showed a decline in 2007 for the first time since 1980. Per capita miles driven probably stopped growing as early as 2000. It is worth noting that the most driving per capita occurred in southern states during the 2000 to 2008 time period.¹⁸ Underlying some of these changes is the rising trend in gasoline prices, which is expected to generally continue over a long duration but fluctuate dramatically in the short term. The secondary implications of a leveling off of VMT in the United States are (a) that demand for new roadway capacity may also decline, although regional demand will continue in rapidly-growing metropolitan regions like the Triangle, for example; and (2) that the ability of the fuel tax as a meaningful revenue source to fund new capital expansion projects will also decline.

Seldom is any credibility battle decided with the finality and expediency of the Y2K phenomenon; more often, history simply forgets or reinterprets the loser. In the case of finding solutions for Garner's transportation issues, this response is particularly difficult to accept, since our decisions have profound effects on how an increasingly limited financial resource is expended: we shouldn't assume that there will always be more money available to create a significant change of course should our forecasts of travel demand and behavior prove inaccurate. Reassessing these assumptions frequently is the only rational response when confronted by changes created by many different operators in an imperfect state of understanding; a key recommendation is that Garner work closely with the Capital Area MPO on four-year intervals to reassess and update their individual transportation plan, including the key underlying assumptions. A final issue worthy of mentioning is that there is a misconception about the effect of creating new government policies and the effects that new regulations have on innovation or the private marketplace. Programs and policies have substantial long-term power to shape the "free" market, which will typically respond to these changes with innovations to increase efficiency and maximize short-term

profitability. Private sector representatives must work with their public sector counterparts to craft policies to help ensure equity and a thorough cost accounting, but the need for thoughtful and innovative public sector leadership in areas of long-term change is paramount.

A recent example of both the need to frequently reexamine past assumptions as well as the positive aspects of policy changes rests with the light bulb. On July 5th 2009 the *New York Times* reported that the incandescent light bulb, long thought to be on the way to being replaced by the more energy-efficient fluorescent bulbs, is staging a comeback.

“ ‘Due to the 2007 federal energy bill that phases out inefficient incandescent light bulbs beginning in 2012, we are finally seeing a race’ to develop more efficient ones.”

- Noah Horowitz



When Congress passed an energy law in 2007 that set energy efficiency standards for 2012 that no incandescent light bulb could then meet, the industry responded by revising the design of the incandescent bulb. The new bulb has lower mercury content than compact fluorescent bulbs, the same favorable light color quality of the Edison bulb, and works with dimmer switches. The new incandescent is being sold in some stores now, and new technologies are also under development.¹⁹

As we proceed forward, the emphasis with which each of the following recommendations receives attention, financial or otherwise, will be in part due to the changing course of transportation and its interaction with lives and businesses.

4.2 Roadway Capacity Improvements

While the amount of public capital available to create large, new roadways or make major expansions of existing roads has decreased in relative terms, the importance of roads to all kinds of vehicles – cars, buses, bicycles, and shoes – remains the paramount concern in transportation planning and design practice. The street catalog and best practice design guidance located in this document help to ensure that the following recommendations discussed in this section of the Transportation Plan address every element of the street and its use. This section begins, however, with a brief comparison of the current and anticipated performance of major roadway corridors in Garner under three main scenarios: current, future (2035) recommended, and future recommended with the completion of the Southern Wake Freeway project. While the current and recommended (in this plan) scenarios are self-explanatory, the rationale for considering the future conditions with the Southern Wake Freeway project may not be as immediately intuitive. This multi-billion dollar project connects the proposed western leg of the I-540 beltline to the I-40 near the Wake and Johnston County boundary. In so doing, it provides a viable relief valve for the bedroom communities of Johnston County to access Research Triangle Park, RDU Airport, the City of Raleigh and other premier destinations without first going through Garner on I-40, Tryon Road, NC 50, US 70 and smaller, less-capable secondary roads. Due to the expense and promises tied to this roadway in previous decades and iterations of transportation plans in Garner, examining the impacts of this project were felt to be worthwhile.

Finally, the Plan recommends conceptually studying the pedestrian and automobile accessibility and traffic flow around the high school and middle schools. Such a study can be done for a relatively modest cost, and should coordinate with the Town, Wake County Public Schools, and the North Carolina Department of Transportation.

Tables 8A, 8B, and 8C on the following page illustrates performance

measures created for several of the major roadways in Garner under these three scenarios. This analysis depended on three important resources: the input of the Steering Committee, Town staff, and public; the Triangle Regional Travel Demand Model; and the Quality/Level of Service Handbook and *LOSPlan 2007* software. The public and stakeholder input processes have already been explained. The Triangle Regional Model (TRM, for short) uses local forecasts of population and employment, anticipated roadway improvements, and other variables to calculate future

travel demand and traffic on major roadways throughout the Region for various time periods. The *LOSPlan* software is a quick method of calculating link and intersection performance for cars, buses, cyclists and pedestrians on arterial streets, and is based on the nationally accepted standard for calculating these measures, the Highway Capacity Manual (2000 edition). Both the TRM and *LOSPlan* software represent simplifications of a complex and inter-related set of circumstances that comprise the day-to-day reality of travelers, and therefore cannot be expected to replicate future conditions with a high degree of accuracy. But they also represent commonly accepted ways of forecasting a complicated future involving many factors, and thus are very useful in studying alternatives. Three scenarios are reported: a baseline scenario that represents approximately current conditions in the peak period of traffic; a 2035 scenario for a scenario that does not include the Southern Wake Freeway; and a 2035 scenario (bottom table) that does include the Southern Wake Freeway. Although these tables are worth examining in detail, a few notable observations can be made.



Recommendation: Conduct a conceptual study of traffic (and pedestrian) access and mobility around Garner’s High School and middle schools. These areas are congested twice a day on school days, and are deserving of further attention for the sake of our children and our drivers.

TABLE 8A/B/C. CURRENT (TOP), 2035 BUILD W/O S. WAKE FREEWAY (MIDDLE), AND 2035 BUILD W/S. WAKE FREEWAY (BOTTOM) CONDITIONS ON 10 STREETS IN GARNER

Road Name	V/C Ratio	Delay (secs)	Speed	Auto LOS	Bicycle Score	Bicycle LOS	Pedestrian Score	Pedestrian LOS	Bus Score	Bus LOS
Aversboro Road	0.37	42	29.2	B	4.1	D	2.9	C	0.0	F
Garner Road	1.23	194	13.2	F	4.8	E	4.8	E	0.3	F
Jones Sausage Road	1.59	314	7.6	F	5.1	E	5.9	F	0.0	F
NC 50 (Benson Road)	1.47	265	20.1	F	4.3	D	3.5	C	1.1	E
Old Stage Road	1.25	166	23.7	F	4.6	E	5.8	F	0.0	F
Ten Ten Road	0.82	73	31.6	F	4.5	D	5.4	E	0.0	F
Timber Drive	0.63	33	29.8	B	4.4	D	4.7	E	0.7	F
US 70	0.94	55	25.9	F	4.6	E	5.6	F	0.0	F
US 401	1.49	254	11.0	F	4.9	E	7.2	F	1.0	F
Vandora Springs Road	0.69	41	21.0	C	4.3	D	4.3	D	0.0	F

8A

Road Name	V/C Ratio	Delay (secs)	Speed	Auto LOS	Bicycle Score	Bicycle LOS	Pedestrian Score	Pedestrian LOS	Bus Score	Bus LOS
Aversboro Road	0.74	53	23.6	C	2.5	C	3.2	C	2.0	E
Garner Road	1.17	177	15.9	F	4.6	E	5.0	E	0.5	F
Jones Sausage Road	2.51	740	6.3	F	5.1	E	4.7	E	0.9	F
Benson Road (NC 50)	0.94	82	31.5	F	3.1	C	6.1	F	0.4	F
Old Stage Road	2.46	710	9.0	F	4.6	E	4.0	D	2.1	D
Ten Ten Road	0.87	45	33.9	B	3.1	C	5.2	E	0.0	F
Timber Drive	0.59	32	30.1	B	2.9	C	4.9	E	0.0	F
US 70	1.00	66	24.3	F	4.6	E	5.7	F	0.8	F
US 401	1.94	458	6.9	F	5.0	E	8.2	F	1.5	E
Vandora Springs	0.71	63	20.3	F	2.9	C	3.4	C	0.0	F

8B

Road Name	V/C Ratio	Delay (secs)	Speed	Auto LOS	Bicycle Score	Bicycle LOS	Pedestrian Score	Pedestrian LOS	Bus Score	Bus LOS
Aversboro Road	0.58	48	24.7	C	2.4	B	2.9	C	2.0	E
Garner Road	1.11	160	16.6	F	4.6	E	4.9	E	0.5	F
Jones Sausage Road	2.41	684	5.2	F	4.9	E	7.1	F	0.0	F
Benson Road (NC 50)	0.82	64	33.7	F	4.5	D	4.0	D	1.1	E
Old Stage Road	2.11	553	10.5	F	4.9	E	7.3	F	0.4	F
Ten Ten Road	0.80	44	34.5	B	3.0	C	5.1	E	0.0	F
Timber Drive	0.81	38	27.7	B	2.9	C	4.8	E	0.0	F
US 70	0.96	52	25.9	C	4.6	E	5.7	F	0.8	F
US 401	2.09	527	6.3	F	5.1	E	8.6	F	1.5	E
Vandora Springs	0.69	53	21.3	C	2.9	C	3.3	C	0.0	F

8C

Automobile Performance. The bottom table (8C) indicates that the Southern Wake Freeway does make an important difference on several roadways. However, the most recent travel demand model does not indicate the degree of issues associated with not building the proposed freeway, which would work as a bypass around the Town. Some roadways are still performing at poor (LOS “F”) levels even with the Southern Wake Freeway being constructed (Garner Road, Jones Sausage Road, Benson Road, Old Stage Road and US 401).

Bicycle and Pedestrian Performance. The recommendations for bicycle and pedestrian system performance should be compared against either Table 8B or 8C, since there is not much difference between them (the bicycle LOS score does vary in one instance because of some traffic reductions with the Southern Wake Freeway in place). Some roadways, such as Old Stage Road, clearly benefit from the recommendations, jumping two categories of level-of-service. Others stay in fairly poor condition due to the absence of bicycle facilities. One factor that hurts the pedestrian ratings almost universally for these 10 streets is the lack of a greater than three-foot separation from the roadway, principally due to right-of-way and cost constraints.

Public Transportation Performance. The public transportation performance, which hinges on the frequency of bus services in this example, is nearly always poor in the current scenario (Table 8A). Some positive movement does occur in the future scenario, but only in a few instances. Even with the recommendations in place, bus frequency is still typically only 2-4 vehicles per hour in one direction, not enough to shift the LOS very far from the current scenario.

Figure 12 on the next page identifies the recommendations for improvements for each street in the Town, as well as their hierarchy (purpose) in the transportation system. Intersection improvements are also indicated as variously colored or styled dots on this figure.

The Southern Wake Freeway (now termed the “Southeast Extension” of I-540 by the NC Turnpike Authority) has started forward movement through the National Environmental Policy Act (NEPA) planning process. The Town of Garner should request quarterly small group meetings with the project consultant and NEPA manager of NCTA/NC DOT to ensure that this project is designed in accordance with the goals of Garner. This recommendation is critical: no other single project stands to impact the traffic and travel patterns of automobile traffic to the degree of this proposed project.

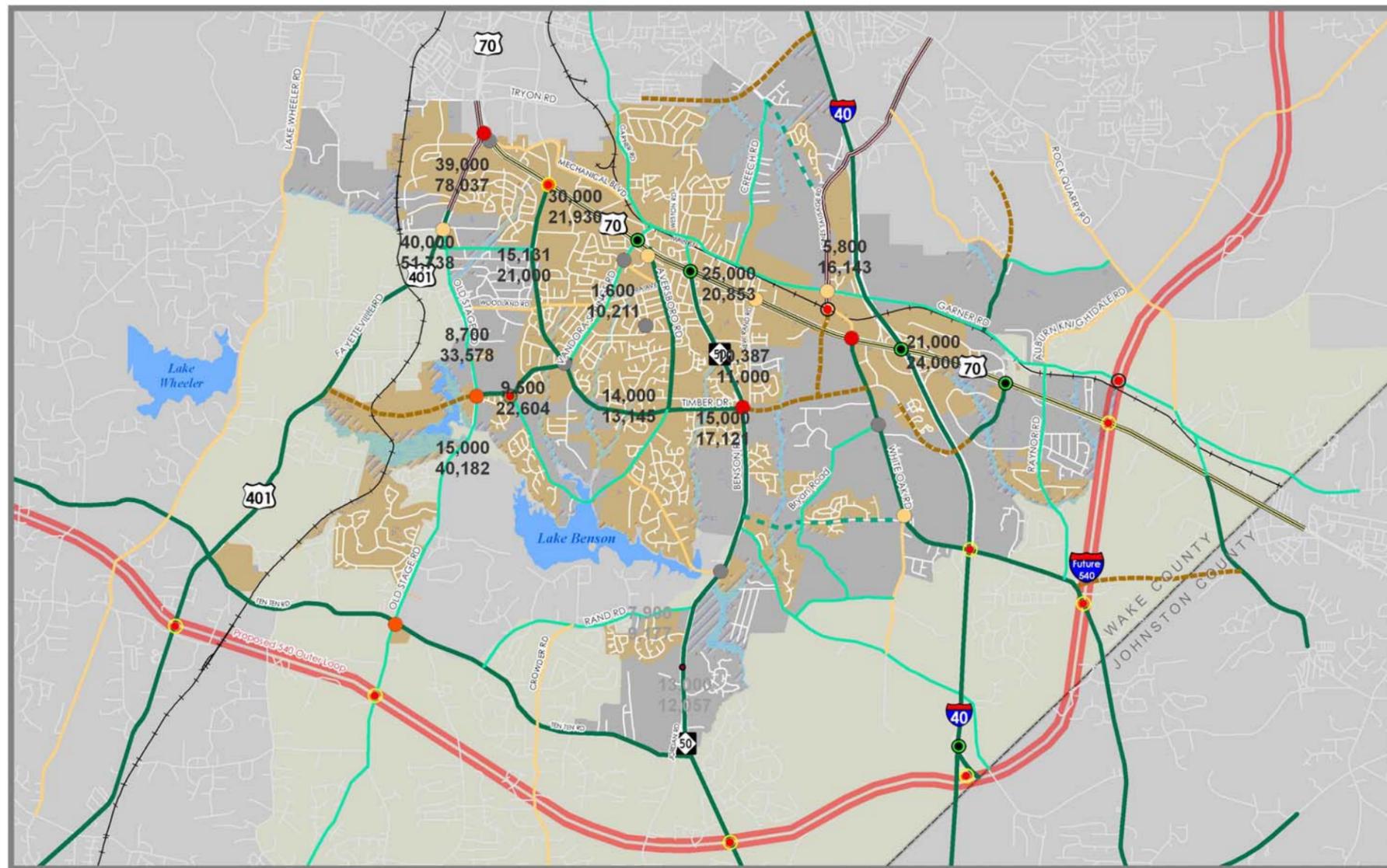


FIGURE 12. ROADWAY AND INTERSECTION RECOMMENDATIONS

Intersection Improvements

- Proposed Grade Separation
- Existing Interchange
- High Priority
- Medium Priority
- Low Priority
- Not Prioritized
- Proposed Roundabout
- Proposed Interchange

Roadways in 2035

- 6 Lane Existing Roadway
- 5 Lane Existing Roadway
- 4 Lane Existing Roadway
- 4 Lane Proposed Roadway
- 3 Lane Existing Roadway
- 3 Lane Proposed Roadway
- 2 Lane Existing Roadway

Roadway Recommendations

0 0.5 1 Miles

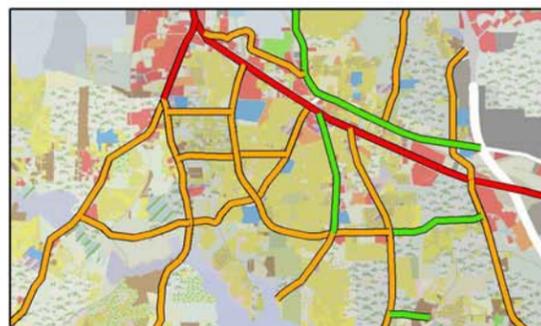
The Louis Berger Group, Inc.
MP/SL 10/1/2009

Discussion

This graphic illustrates major roadway and intersection priorities (top); Access Management Tiers (bottom-left); and the Garner Street Hierarchy (bottom-right). East-West street connectivity has been hindered by the topography of the area, with major ridge lines tending to run north-south.

Priorities
The relative priorities are based on construction feasibility and input from the public, steering committee, and town/consultant staff recommendations. The final approval rests with the Town Council of Garner.

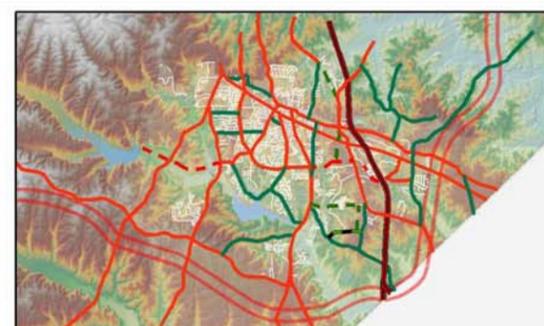
Key Issues
The following are key considerations in the development of the Garner Transportation Plan recommendations:
(1) With or without the very costly to construct Southern Wake Expressway, additional roadway capacity improvements are needed now and in the future to maintain the target "D" level-of-service. Rural roads like Jordan Road (see bottom-left of main map) are generally poorly suited to developing fringe areas, having no paved shoulders and geometry at intersections that aren't suited to high traffic movements.
(2) There are important cost and other constraints involved in the widening of major thoroughfares through the Town. Additional connections between existing roads are crucial to providing residents an alternative route and maintaining accessibility, and applying stricter controls on new private development in terms of the number of driveway cuts and cross-access provisions between adjacent properties will help preserve limited roadway capacity.



Managing Access

access management land use (2008)

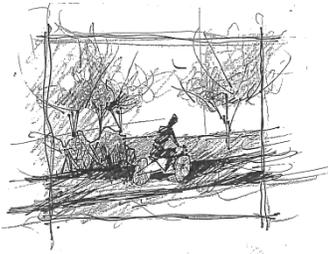
- Tier One
- Tier Two
- Tier Three
- Agriculture, Forestry, Horticulture
- Estate Residential (less than 2 units per acre)
- Low Density Residential (2 to 4 units per acre)
- Medium Density Residential (5 to 8 units per acre)
- High Density Residential (over 8 units per acre)
- Mobile Homes and Mobile Home Parks
- Apartment
- Cemetery
- Church
- Schools, Educational & Daycare Facilities
- Fire and Rescue Stations
- Old Couriers and driving ranges
- Livory
- Non-profit private club
- Senior / elderly housing
- Mixed (water, sewer, electric)
- Private Open Space
- Garner Parks
- City / Town
- County
- State
- Federal
- Office
- Commercial
- Industrial
- Vacant



Street Hierarchy

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4.3 Bicycle and Pedestrian



This section presents the pedestrian and bicycle project recommendations for the Garner Transportation Plan. Projects are the physical improvements that will make the Town more bicycle- and pedestrian-friendly. In order to identify a wide range of projects to serve a variety of users, the recommendations include on-road projects such as adding sidewalks and bike lanes along roadways, to off-road projects such as greenway trails and small neighborhood connections. Projects also address trail and street crossings to make it easier for pedestrians and cyclists to pass through intersections or cross major roads. All of these improvements will help to create an interconnected pedestrian and bicycle network in Garner.

Project recommendations are organized into three sections below: pedestrian projects, bicycle projects and intersection improvements. The pedestrian projects include a variety of short sidewalk recommendations, called “spot improvements,” and longer sidewalk corridor projects. Sidewalk recommendations have been prioritized based on criteria identified by the Steering Committee and public feedback, as well as safety and economic considerations. The bicycle projects identified in the Plan include bike lanes, sharrows and paved shoulders to accommodate cyclists on Garner streets and raise motorist awareness of the presence of bicyclists on local roadways. The proposed intersection improvements include safety enhancements of various roadway crossings throughout the Town.

Though not identified in a separate table, shared-use greenway trail recommendations are included in the Plan to provide off-road options for cyclists and pedestrians of all skill levels. Greenway trails should be constructed at 10-14 ft in width to serve as dual-purpose facilities for both pedestrians and bicyclists and meet ADA requirements. The greenway recommendations in the Plan include previously proposed greenway trails from the Wake County Greenway Plan and North Garner Plan, in addition to new recommendations for connector trails that will link important bicycle and pedestrian destinations in town.

Pedestrian Project Recommendations

Pedestrian facilities can include sidewalks, greenways, and intersection improvements, as well as streetscaping projects and traffic calming efforts. Such facilities can be built “incidentally” as part of a roadway construction project, or independently. The Transportation Plan

identifies a number of proposed pedestrian facilities that can help make Garner a more walkable community. These projects were identified through the public involvement process, survey results, discussions with staff and Steering Committee members, as well as field and data reviews by the consultants. All pedestrian project recommendations should be considered as new roadways or developments are constructed, so that new streets or reconstructed streets include proposed sidewalk facilities.

Recommended locations and treatments for each project type are summarized, respectively, in the tables below. Each table shows the project and proposed action. All sidewalk projects have been prioritized based on criteria set by the Steering Committee at their April 4, 2009 meeting, which include proximity to local schools, parks, shopping venues and major employment centers (see [Figure 6](#) for local pedestrian destinations), as well as factors such as connectivity to existing sidewalks and economic development opportunities such as accessibility within and to downtown Garner. The original sidewalk prioritizations suggested by the steering committee and by public comments are shown in [Table 9](#). [Table 10](#) shows the costs of the sidewalk projects and tiered priorities refined by the steering committee and Town staff.

TABLE 9. RECOMMENDED SIDEWALK CORRIDOR LOCATIONS

On Road	To Road	From Road	Priority Score	Length (mi)
Ackerman Rd	White Oak Rd	Existing sidewalk	85	0.64
Aversboro 1	US 70	Vandora	118	0.36
Aversboro 2	Vandora	Lakeside	206	0.43
Avery 1	Existing sidewalk (Belhaven St)	Curtiss Dr	206	0.35
Benson 1	Garner Rd	Existing sidewalk	187	0.25
Benson 2	Main St	Plaza Cir	164	0.33
Benson 3	Circle Dr	Timber Dr	157	1.41
Benson 4	Timber Dr	Centennial Park	149	1.06
Benson 5	Centennial Park	Buffaloe Rd	182	1.43
Bryan 1	Ackerman Rd	White Oak Rd	63	1.36
Bryan 2	Ackerman Rd	Clifford Rd	82	0.99
Buffaloe 1	Aversboro Rd	Old Scarborough Rd	130	0.32
Buffaloe 4	Misty Meadow Ln (existing trail)	Vandora Springs	139	0.98
Buffaloe 3	Dunnhaven Ct	Benson Rd	22	0.59
Buffaloe 2	Old Scarborough Rd	Dunnhaven Ct	65	0.58
Buffaloe 5	Misty Meadow Ln	Lake Benson Park (existing sidewalk)	124	0.99
Claymore 1	South Garner Park	Aversboro Rd	208	0.58
Claymore 2	Aversboro Rd	Elementary Dr	172	0.15
Clifford Rd	New Bethel Church Rd	Hebron Church Rd	85	1.04
Creech 1	Powell Dr Extension	Garner Rd	282	0.49
Creech 2	Charles St (existing sidewalk)	Town Limits	201	0.90
E Garner 1	New Rand Rd	Ashlyn Ridge Dr (existing sidewalk)	193	0.74
E Garner 2	Ashlyn Ridge Dr (existing sidewalk)	Greenfield Pkwy	115	0.85
Forest Dr	Aversboro	Benson	157	0.28
Fowlers Dr	Vandora Springs Rd	South Garner Park	124	0.24
Garner Station 1	Existing sidewalk	Fayetteville Rd	123	1.16
Garner Station 2	Junction Blvd	Mechanical Dr	122	1.07
Greenbrier Rd	Roxanne Dr	Winterlochen Rd	145	0.39
Greenfield Pkwy	Auburn Rd	Waterfield Dr	65	0.90
Hebron Church Rd	Clifford Rd	New Bethel Church Rd	48	0.56
Jones Sausage Rd	Garner Middle School	US 70	130	0.90

On Road	To Road	From Road	Priority Score	Length (mi)
Kentucky Dr	Benson	New Rand	128	0.34
Lakeside Dr	Vandora Springs	Aversboro	199	0.81
Main St	Benson	Pear St	208	0.29
Maxwell Dr	Vanessa	Greenbrier	126	0.61
Meadowbrook Dr	Garner Rd	Weston Rd	126	0.74
Mechanical Dr	US 70	McCormick Ct	99	0.51
New Bethel Church 1	Existing sidewalk	Clifford Rd	87	0.65
New Bethel Church 2	Town Limit	Hebron Church Rd	85	1.06
New Rand Rd	Rand Mill Rd	Existing Sidewalk (Timber)	119	0.67
Old Mechanical Ct	McCormick St	US 70	65	0.44
Park Ave	Vandora Springs Rd	Lakeside Dr	202	0.59
Spring Dr	Buckhorn Rd (Existing Sidewalk)	Vandora Springs	157	0.88
Thompson Rd	Timber Dr	Existing sidewalk (Briar Rose Ln)	152	0.28
Timber 3	Thompson	Aversboro	199	1.04
Timber 2	Woodland	Vandora Springs	140	0.62
Timber 1	US 70	Spring Dr	119	0.64
Timber 4	Aversboro	Benson (existing sidewalk)	214	0.55
Vandora Ave	Vandora Springs	Aversboro	194	0.53
Vandora Springs 1	Seventh	US70	140	0.14
Vandora Springs 2	N Gleneagle	Seventh	189	0.97
Vandora Springs 3	Buffaloe Rd	Timber Dr	127	0.64
Vesta Dr	Longneedle Ct (existing sidewalk)	US 70	154	0.74
Wakeland Dr	New Rand Rd	Dead End	103	0.33
Waterfield Dr	Greenfield Pkwy	Raynor Rd	48	0.89
West Garner Rd	Creech Road Park (existing sidewalk)	New Rand Rd	234	0.08
Weston 1	Curtiss Dr	Meadowbrook Dr	162	0.53
Weston 2	Garner Rd	Curtiss Dr	151	0.40
White Oak Rd	Existing sidewalk (Hillandale Ln)	Town Limits	81	1.86
Woodland Ave	Ford Gates	Vandora Springs	106	0.58
Woodland 1 (south)	Brompton Ln	Vandora Springs Rd	179	0.41
Woodland 2 (north)	Old Stage Rd	Existing sidewalk (Timber Dr)	179	0.71

*Projects denoted with an asterisk correspond directly to the more detailed Streetscape Plan, created concurrently with the Garner Transportation Plan

NOTE: Planning-level cost estimates are based on a \$50/linear foot cost for sidewalk construction and do not include line item details for grading, curb-and-gutter, retaining walls, or other engineered elements.

While these project priorities represent community input on the importance of access to parks, schools and downtown Garner, connectivity to existing sidewalks, and other factors discussed on pages 71-73, the Town should take advantage of opportunities that may arise “out of order” for new sidewalk construction. Such opportunities might include roadway reconstruction, citizen or developer funded sidewalks, or access to location-specific funding, such as through a Safe Routes to School grant. Flexible decision-making and the combination of independent and incidental construction will allow the Town to most effectively apply limited resources toward implementation of sidewalk segments that will, in the end, create a well-connected pedestrian network.

Sidewalk Project Prioritization & Phasing Recommendations

Following project development, sidewalk corridor projects were prioritized. As can be seen, the proposed sidewalk corridor projects are extensive – they cover over 41 miles of roadway in Garner on 39 named roads. In addition, 6.1 miles have been identified for 10 projects in Garner to fill small gaps in the existing sidewalk network. Even if Garner plans to expand its budget for pedestrian facilities, it will still take a long time for all of these projects to be constructed. To help the Town determine which projects to construct first, an analysis was performed to prioritize projects and create a recommended phasing schedule of short-term, mid-term, and long-term projects for construction.

Prioritization and scheduling were based on the following factors:

- **Public input:** Comments from the Steering Committee and participants in the Open Houses, survey, and other public forums
- **Project characteristics:** During the fourth Steering Committee meeting, committee members were asked to identify their priority projects regardless of cost. Members then discussed the priority criteria that contributed to the identification of those projects, including access to schools, parks and existing sidewalks. Other priority criteria included access to commercial areas and major employment centers, as well as safety factors such as whether the project was located along a corridor with a proclivity to frequent bicycle and pedestrian crashes. From this discussion, the following items were identified as important project characteristics to making a project a priority:
 - **Accessibility:** Proximity to schools, parks/greenways, commercial areas and major employment centers
 - **Town Marketability:** Project ability to create a walkable downtown and connect residents or visitors to/from downtown Garner
 - **Safety:** Measured by crash frequency along a project corridor
 - **Connectivity:** Project's potential to complete a critical connection from one location to another, measured by the project's connection to existing sidewalks
- **Constructability and Cost:** Ease of constructing the project, including preliminary design analysis and engineering preparation, right-of-way purchase and actual construction

Project prioritization and scheduling was a layered process which incorporated all of the above factors in the following steps:

1. **Rate projects on key characteristics.** Projects were rated on accessibility, town marketability, safety and connectivity. A project received points for any of the following characteristics:
 - **Accessibility: Schools.** Is a school located within the project limits?
 - Yes, between 0 to 1/8 miles = 4 points
 - Yes, between 1/8 to 1/4 miles = 3 points
 - Yes, between 1/4 to 1/2 miles = 2 points
 - Yes, between 1/2 to 1 mile = 1 point
 - No = 0 points
 - **Accessibility: Parks & Existing Greenways.** Is a park or greenway located within the project limits?
 - Yes, between 0 - .125 miles = 4 points
 - Yes, between .125 - .25 miles = 3 points
 - Yes, between .25 - .5 miles = 2 points
 - Yes, between .5 – 1 mile = 1 point
 - No = 0 points
 - **Accessibility: Commercial Areas.** Is a major shopping center located within the project limits?
 - Yes, between 0 - .125 miles = 4 points
 - Yes, between .125 - .25 miles = 3 points
 - Yes, between .25 - .5 miles = 2 points
 - Yes, between .5 – 1 mile = 1 point
 - No = 0 points
 - **Accessibility: Major Employment Centers.** Is the project within one quarter mile of an employable land use?
 - Yes, near 4 or more employable uses = 4 points
 - Yes, near 3 or more employable uses = 3 points
 - Yes, near 2 or more employable uses = 2 points
 - Yes, near 1 or more employable uses = 1 point
 - No = 0 points
 - **Marketability: Downtown Garner.** Is the sidewalk project linking surrounding areas to/from downtown Garner such that it would add value to a downtown revitalization?
 - Yes, from between 0 - .125 miles = 4 points
 - Yes, from between .125 - .25 miles = 3 points
 - Yes, from between .25 - .5 miles = 2 points
 - Yes, from between .5 – 1 mile = 1 point
 - No = 0 points
 - **Safety.** Was there a recent pedestrian crash within the project corridor?
 - (Yes = 1 point, No = 0 points)

- **Connectivity.** Does the project link one destination to another by way of existing sidewalk?
(Yes = 1 point, No = 0 points)
2. **Assess cost estimates and constructability.** Next, projects were assessed a cost estimate based on proposed treatments and existing conditions. Cost estimates for treatments were as follows:
- *High Cost: > \$200,000 (one-side only)*
 - Generally, high cost projects entail construction of significant sections of sidewalk or installation of sidewalk on roadways without existing shoulder width to accommodate sidewalks as is. The latter would prove costly due to the need to pipe existing drainage ditches and install curb and gutter on roadways with shoulder sections.
 - *Moderate Cost: \$140,000 - \$200,000 (one-side only)*
 - Projects in this range generally have some curb and gutter and are less lengthy sidewalk installations on roadways that may have some existing sidewalk in place.
 - *Low Cost: < \$140,000 (one-side only)*
 - Projects in this category are generally short sidewalk segments (“spot improvements”) on roadways with adequate width to install new sidewalks without significant roadway engineering.
3. **Place projects into schedule.** The project cost analysis was then compared to the list of projects organized by rating to determine the appropriate phased implementation schedule. Projects which were estimated to be low cost and also received high ratings were placed in the short-term project category, whereas projects with high cost and low ratings were placed in the long-term project category. Mid-term projects included those projects with low costs and low ratings, and those with high cost but high ratings. By organizing projects in a short-term, mid-term, and long-term fashion, the Town has a list of projects that it can implement quickly in order to take immediate steps towards making Garner more pedestrian-friendly in the interim before more intensive, long-term projects are undertaken. Table 10 (following two pages) and Figure 13 (page 72) show projects organized by high, short-, mid-, and long-term priority, or phases. Short-term projects would typically occur between 1-5 years, mid-term projects would occur between 6-10 years, and long-term projects would occur in 11 years or more.

Facility Type	Mileage
Sidewalk	56.0
Greenway Trails	3.4

TABLE 10. SIDEWALK / GREENWAY PHASING SCHEDULE AND PROJECT COSTS

Phase	Location	From	To	Estimated Cost (one-side)
High Priority	Buckingham	Flanders Rd	Leary Rd	\$141,000
High Priority	Spring Drive	Timber Dr	Vandora Springs Rd	\$579,000
High Priority	Timber Drive and Briar Rose Lane	Thompson Rd	Timber Drive Elementary School	\$138,000
High Priority	Don Miller Dr	Claymore Dr	Timber Dr	\$96,000
High Priority	North Garner Middle School Connections	Belhaven St	Curtiss Dr	\$148,000
High Priority	Main Street	Benson Rd	Downtown Area	\$70,000
High Priority	Benson Rd	Garner Fire Department	Garner Rd	\$79,000
High Priority	Greenway	White Deer Park	Timber Dr	\$512,000
High Priority	Greenway (Option 1)	Christian Road	White Deer Greenway	\$560,000
High Priority	Greenway (Option 2)	Christian Road	Thompson/Sewer	\$517,000
High Priority	Buffalo Rd 5 (Option 3)	Misty Meadow Lane	Lake Benson Park	\$1,137,840
High Priority	Buffaloe 1	Aversboro Rd	Old Scarborough Lane	\$271,040
High Priority	Buffaloe 2	Old Scarborough Rd	Dunnhavan Rd	\$175,560
Short-term	Avery St	Garner Rd	Existing sidewalk	\$ 25,000
Short-term	Garner/Benson Rd *	Weston	Main St	\$ 49,000
Short-term	Timber Drive	Don Miller Dr	Harth Dr	\$27,500
Short-term	Lakeside Dr	Aversboro Rd	Existing sidewalk	\$17,000
Short-term	New Rand Rd (East) *	US 70	Existing sidewalk	\$33,000
Short-term	New Rand Rd (West) *	US 70	Main St	\$ 50,000
Short-term	Powell Dr	Existing sidewalk (School)	Avery St	\$17,000
Short-term	St Mary's St (North)	Forest Dr	Existing sidewalk	\$25,000
Short-term	Benson Rd *	US 70	Plaza Cir	\$25,000
Short-term	Curtiss Dr	Weston Rd	Avery St	\$46,000
Short-term	West Garner Rd	Creech Road Park (Existing Sidewalk)	New Rand Rd	\$20,000
Short-term	Weston 2	Garner Rd	Curtiss Dr	\$105,000
Short-term	Woodland 1 (south)	Brompton Ln	Vandora Springs Rd	\$109,000
Mid-term	Ackerman Rd	White Oak Rd	Existing Sidewalk	\$169,000
Mid-term	Claymore 1	South Garner Park	Aversboro Rd	\$154,000
Mid-term	E Garner 1	New Rand Rd	Ashlyn Ridge Dr (Existing Sidewalk)	\$196,000
Mid-term	Hebron Church Rd	Clifford Rd	New Bethel Church Rd	\$147,000
Mid-term	Maxwell Dr	Vanessa	Greenbrier	\$162,000

Phase	Location	From	To	Estimated Cost (one-side)
Mid-term	St Mary's St (South)	Existing sidewalk	Benson Rd	\$ 14,000
Mid-term	Vandora Springs Rd	Existing sidewalk	Timber	\$ 17,000
Mid-term	Vandora Springs Rd	Foxwood Dr	Existing sidewalk	\$ 9,000
Mid-term	Park Ave	Vandora Springs Rd	Lakeside Dr	\$157,000
Mid-term	Timber 1	US 70	Spring St	\$168,000
Mid-term	Timber 2	Woodland	Vandora Springs	\$165,000
Mid-term	Timber 4	Aversboro	Benson (exist. sidewalk)	\$146,000
Mid-term	Vandora Ave	Vandora Springs	Aversboro	\$141,000
Mid-term	Vandora Springs 3	Buffaloe Rd	Timber Dr	\$169,000
Mid-term	Vesta Dr	Longneedle Ct (Existing Sidewalk)	US 70	\$195,000
Mid-term	Weston 1	Curtiss Dr	Meadowbrook Dr	\$141,000
Mid-term	Woodland 2 (north)	Old Stage Rd	Existing sidewalk (Timber Dr)	\$188,000
Mid-term	Woodland Ave	Ford Gates	Vandora Springs	\$154,000
Long-term	Lakeside Dr	Vandora Springs	Aversboro	\$214,000
Long-term	E Garner 2	Ashlyn Ridge Dr (Existing Sidewalk)	Greenfield Pkwy	\$225,000
Long-term	Spring Dr	Buckhorn Rd (Existing Sidewalk)	Vandora Springs	\$232,000
Long-term	Waterfield Dr	Greenfield Pkwy	Raynor Rd	\$236,000
Long-term	Creech 2	Charles St (Existing Sidewalk)	Town Limits	\$236,000
Long-term	Jones Sausage Rd	Garner Middle School	US 70	\$237,000
Long-term	Greenfield Pkwy	Auburn Rd	Waterfield Dr	\$238,000
Long-term	Vandora Springs 2	N. Gleneagle Dr	Seventh	\$255,000
Long-term	Buffalo Rd 4	Misty Meadow Lane	Vandora Springs Rd	\$492,800
Long-term	Buffalo Rd 3	Dunnhaven Rd	Benson Rd	\$181,720
Long-term	Bryan 2	Ackerman Rd	Clifford Rd	\$262,000
Long-term	Timber 3	Thompson	Aversboro	\$274,000
Long-term	Clifford Rd	New Bethel Church Rd	Hebron Church Rd	\$275,000
Long-term	Benson 4	Timber Dr	Centennial Park	\$280,000
Long-term	New Bethel Church 2	Town Limit	Hebron Church Rd	\$280,000
Long-term	Garner Station 2	Junction Blvd	Mechanical Dr	\$284,000
Long-term	Garner Station 1	Existing sidewalk	Fayetteville Rd	\$306,000
Long-term	Bryan 1	Ackerman Rd	White Oak Rd	\$359,000
Long-term	Benson 3	Circle Dr	Timber Dr	\$372,000
Long-term	Benson 5	Centennial Park	Buffaloe Rd	\$376,000
Long-term	White Oak Rd	Existing sidewalk (Hillandale Ln)	Town Limits	\$490,000



*Projects denoted with an asterisk correspond directly to the more detailed Streetscape Plan, created concurrently with the Garner Transportation Plan.
NOTE: Planning-level cost estimates are based on a \$50/linear foot cost for sidewalk construction and do not include line item details for grading, curb-and-gutter, retaining walls, or other engineered elements.

New road construction and roadway widening projects are opportunities to install sidewalks in a cost-effective manner as incidental improvements. In addition the ranked projects above, there are a number of planned roadways for Garner that should include sidewalks and bike lanes upon construction. These future roadways include, but are not limited to the following:

- Ackerman Drive Extension
- Clifford Road – New Bethel Road Connector
- Jones Sausage Road Extension
- Powell Drive Extension
- Poole Drive Extension
- Timber Drive Extension
- Vandora Springs Road Extension

Finally, the Plan recommends conceptually studying the pedestrian and automobile accessibility and traffic flow around the high school and middle schools. Such a study can be done for a relatively modest cost, and should coordinate with the Town, Wake County Public Schools, and the North Carolina Department of Transportation.

FIGURE 13. PROPOSED SIDEWALK PROJECTS



Legend

Pedestrian Destinations

- Garner Senior Center
- YMCA
- Police Station
- Fire Station
- Churches
- Greenfield Business Park
- Shopping Centers
- Con Agra Foods
- Cemeteries
- Town Hall
- Library
- Historic Landmarks

Schools

- Elementary School
- Middle School
- High School

Sidewalk Recommendations

State Bike Route

Existing Trails

Existing Sidewalks

Johnston County

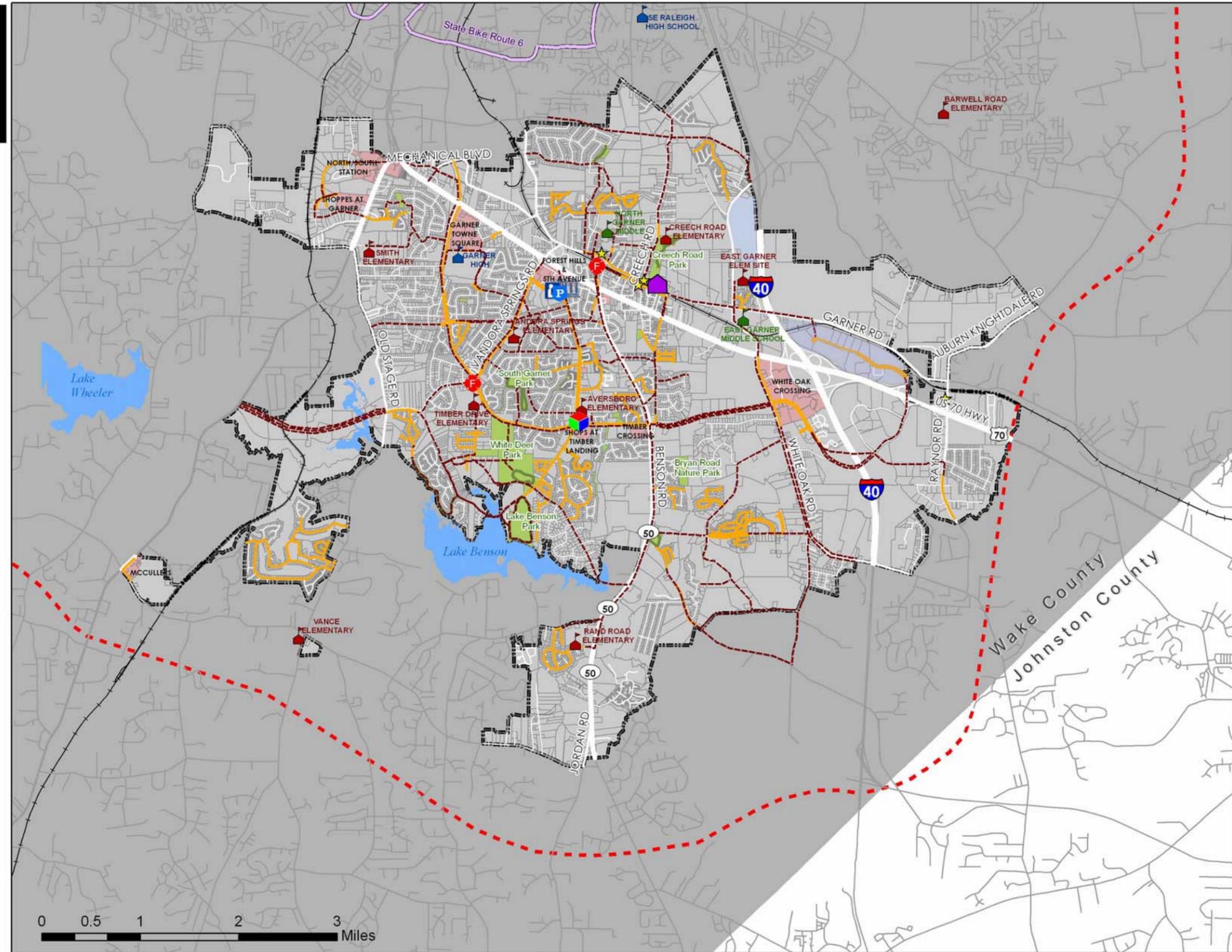
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Proposed 540 Outer Loop

Railroad

Town Parks

Garner Planning Jurisdiction



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Bicycle Project Recommendations

A number of on-road bicycle projects are recommended in order to provide quick, convenient and safe cycling access to local destinations along Garner’s existing street network. On-road projects are improvements to existing or planned roads in Garner that incorporate bicycle facilities such as bike lanes, sharrows, or paved shoulders to make a roadway more conducive to bicycling. On-road projects often form the backbone of a local bicycle network because they are built on pre-existing roads that already provide access to many of the most important destinations in a city.

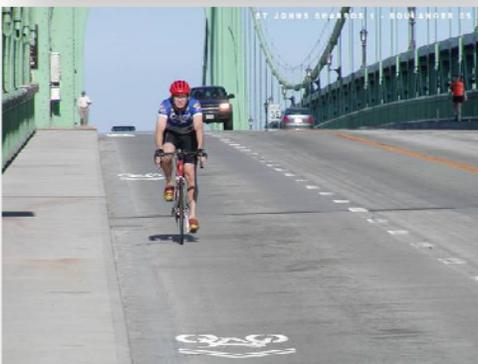
It is important that Garner consider implementing on-road projects quickly, because they are sometimes the easiest, most cost-effective measures to improving the bicycle-friendliness of a town. Frequently, on-road projects require little more than additional painting and signage on a road. Other times, on-road projects can be constructed incidentally to other roadway improvements (such as a resurfacing or widening), which can save on mobilization and construction costs. Road diets are also a common practice for converting a roadway relatively easily into a cross-section that better accommodates bicyclists. All of these practices should be considered in the implementation of the Plan, keeping in mind that

bicycle-related improvements can often make roadways safer for vehicles and improve maintenance conditions by providing additional shoulder width.

Project development for the on-road bicycle projects was a multi-step process which included the identification of locations for potential projects and determining the appropriate treatments for those projects. Typically, bike lanes are recommended for urban roadways that with 4 lanes or less. Sharrows, or shared lane markings, are recommended for smaller, local streets or those roadways with constrained right-of-way. Paved shoulders are recommended for more rural facilities that might experience truck and tractor traffic and/or high-speed but low-volume automobile traffic. Each of these facility types is described in more detail in Appendix E (Design Guidelines).

Bicycle lanes are designated bicycle travel lanes on a roadway, specifically marked by striping, signage and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes are usually 4-6 ft wide.

Sharrows are a pavement marking used to indicate a



Bicycle Lane (Top) and Sharrows

Source: www.pedbikeimages.org

shared lane facility, and are often used for roadways without quite enough width or opportunity to mark bicycle lanes. Sharrows can be painted or stenciled onto the travel lane, and are intended to raise motorist awareness of bicycle use on a marked roadway while indicating to cyclists where to ride in the travel lane. Though sharrows have not yet been adopted in the national Manual for Uniform Traffic Control Devices (MUTCD), they have been pre-approved by the Federal Highway Administration and are expected to be included in the upcoming MUTCD update.



Paved Shoulders are 4-6 ft striped shoulders to the right of the travel lanes, which are not marked as bike lanes but serve as a “safe zone” for cyclists. Typically, paved shoulder treatments are used on rural roads without curb and gutter, and offer space for cyclists to ride between the travel lane and the ditch or shoulder. Since paved shoulders are not marked as bike lanes, they can double as an emergency lane for vehicles and also help to prevent asphalt buckling at the edge of pavement.

Paved Shoulder (Top)

Source: www.pedbikeimages.org



Off-Road Facilities is a term used to refer to shared-use paths or greenway trails for pedestrians, bicyclists, skaters and other non-motorized users. Such facilities are often along linear parks, stream buffers or green space corridors, and are favored by recreational and beginner cyclists for their scenic qualities. Shared-use paths can provide important links to on-road bicycle facilities and complete a network that is more convenient and accessible for bicycle transportation. These paths can also be useful for child and senior cyclists, as well as important recreation routes for exercise.

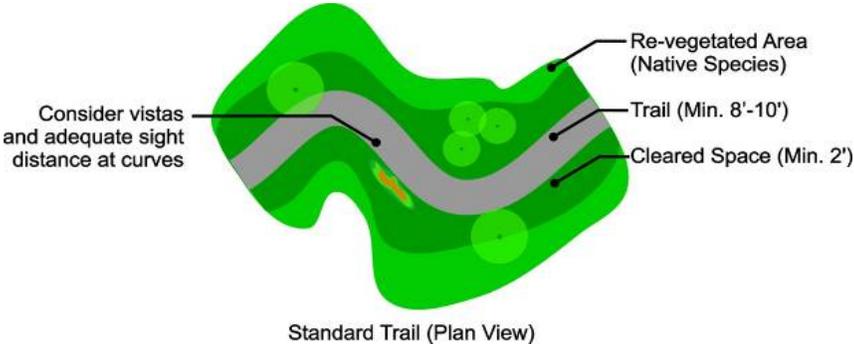


Several shared-use paths are recommended in the Garner Transportation Plan. Though it may take years for the Town to acquire contiguous easements for trail construction through future development and right-of-way purchase, these facilities can be a worthwhile investment and valuable asset for any community. In addition to providing transportation and recreational options for residents, shared-use paths can be an economic development tool to attract tourists and newcomers, and have also been known to raise property values for adjacent landowners. The Town of Garner should consider policy changes and new ordinance language that requires dedication of trail easements for future construction and/or construction of connector trails to proposed and existing greenways during all new development.

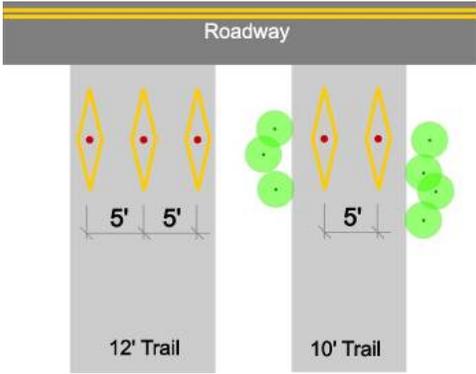
Shared-use Trails

Source: Louis Berger Group

Minimum easements for a shared-use path include width for a 10-14 foot trail surface, in addition to a minimum four-foot buffer (two feet on each side) with a recommended 10-20 foot buffer, depending on the nature of the corridor. Typically, a wider buffer provides a more scenic greenway. The Town should consider inclusion of the recommended greenway trails into any future Open Space and Trails or Parks and Recreation Plans, and may also consider educating development review staff and developers on any new requirements for trail easements to ensure appropriate right-of-way dedication. Additionally, the Town might work with a citizen advisory committee on concept development for the proposed greenway trails and related amenities.



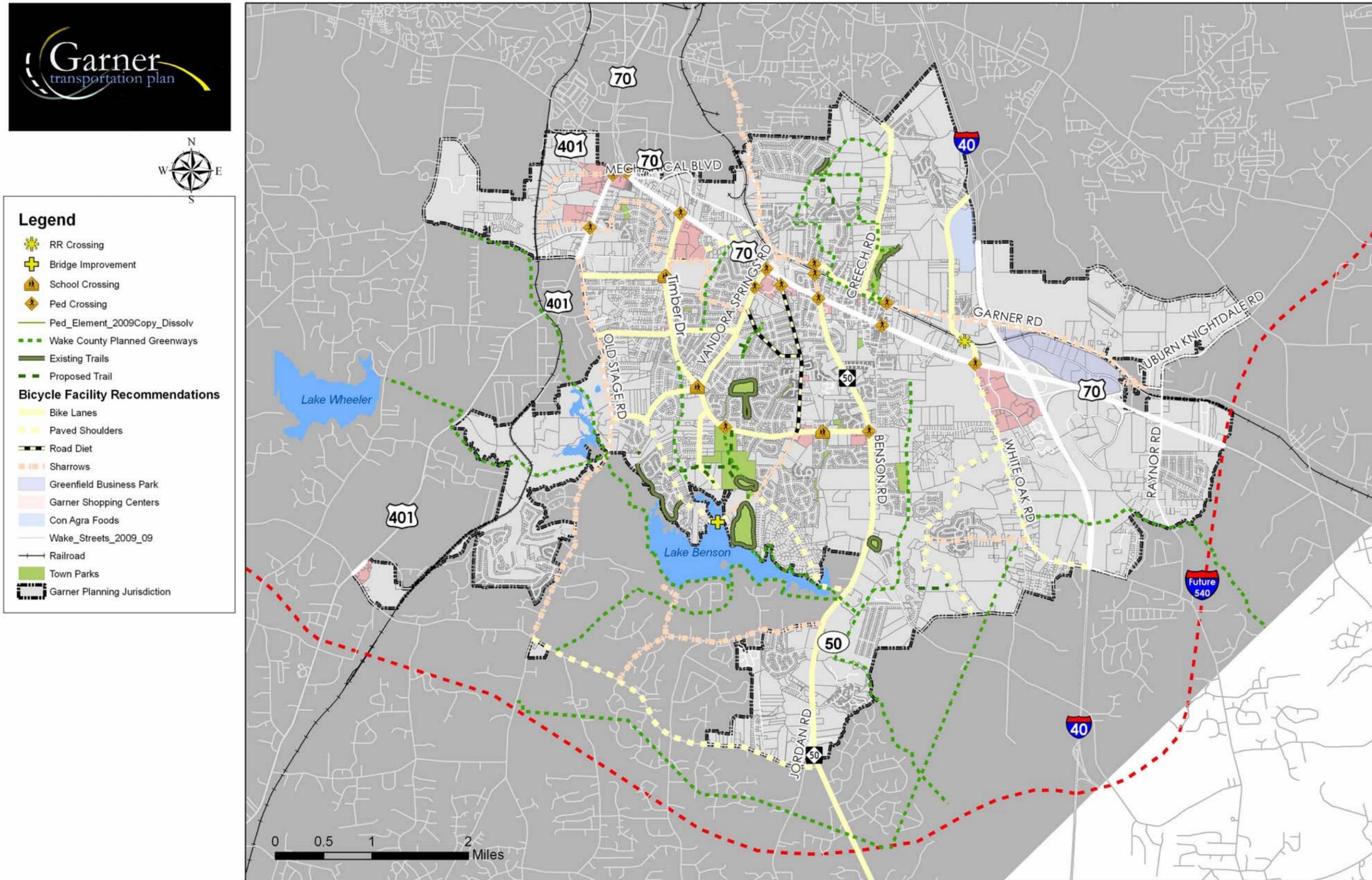
The greenway cross-section provides two-way bicycle and pedestrian traffic. Bollards and markings (below) help ensure that only pedestrians and cyclists use the trail; the bollards can be of the lock-down variety to help emergency vehicles to gain access to the trail.



Facility Type	Mileage
Bicycle Lane	25.0
Paved Shoulders	12.0
Greenways	3.4
Sharrows	18.4

Figure 14 on the following page maps the recommendations for bicycle facilities in the Town of Garner, including greenways, bicycle lanes, paved roadway shoulders, and sharrows. Bicycle lanes connect most of the core area of the Town; sharrows and wide outside lanes are used on high traffic facilities. Note that Aversboro Road and Lakeside Drive are recommended to have a road diet, restricting their lanes to down to two travel lanes and a two-way, center turn lane to calm traffic, reduce accidents, facilitate left-turning movements, and accommodate cyclists.

FIGURE 14. PROPOSED BICYCLE FACILITIES



Crossing Improvements

Crossing improvements are a critical step in creating a safe and convenient pedestrian and bicycle network. Safe crossings are necessary to provide access across major roads and bridges, as well as through key intersections that could otherwise be major barriers to walking and biking. Primarily, crossing improvements should involve adjusting traffic signals to allow for adequate travel time for non-motorized users to cross, especially at large intersections, and installing pedestrian countdown signals to provide visual cues to pedestrians and cyclists crossing Garner streets. At some intersections, signage might be provided to alert motorists of the potential presence of pedestrians and cyclists, and in some cases, medians might be installed to offer refuge to pedestrians and cyclists on large roads with wide crossing distances. [Table 13](#) and [Figure 14](#) summarize recommended crossing improvements for Garner, along major roads and bridges, and over railroads.

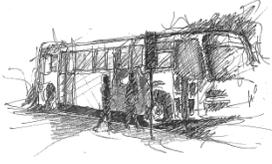
TABLE 11. CROSSING IMPROVEMENT LOCATIONS

Location	Recommendation	Crossing Type
Timber Dr @ Harth Dr	Add high-visibility crosswalk and median refuge island	school crossing
Timber Dr @ Vandora Springs Rd	Add high-visibility crosswalk & ped signal	school crossing
Garner Rd @ New Rand Rd	Add crosswalks & ped signal (see Streetscape Plan)	ped crossing
US 70 @ New Rand	Remove slip lanes; add crosswalks & pedheads (see Streetscape Plan)	ped crossing
Garner Rd @ Benson Rd	Remove slip lane; add crosswalks & pedhead (see Streetscape Plan)	ped crossing
Main St @ Benson Rd	Add roundabout with sidewalks (see Streetscape Plan)	ped crossing
Fayetteville Rd @ Purser Dr	Add high-visibility east-west crosswalk & ped heads	ped crossing
Timber Dr @ Grovement Rd	Add pedheads	school crossing
Buffaloe Rd @ Lake Benson Bridge	Add sidewalks and shoulder/bike lane on new bridge OR construct adjacent bike/ped bridge	bridge improvement
E Garner Rd @ RR Crossing	Create pedestrian crossing over or under railroad tracks for access to future transit stop	RR crossing
Mechanical Blvd @ Fayetteville Rd (401)	Add crosswalks and pedheads	ped crossing
Mechanical Blvd @ US70	Add crosswalks and pedheads	ped crossing
Timber Dr @ US70	Add median refuge island, crosswalks & pedheads	ped crossing
Vandora Springs @ 7th Avenue	Add crosswalks & pedheads	ped crossing
Aversboro @ 5th Avenue	Add crosswalks & pedheads	ped crossing
Benson Rd @ Timber Dr	Add pedheads	ped crossing
Jones Sausage Rd @ US 70	Add crosswalks & pedheads	ped crossing
Vandora Springs @ US 70	Extend sidewalks to 5 ft on bridge	ped crossing
Benson Rd @ US 70	Improve sidewalk approaches to bridge	ped crossing

The images below illustrate one of many opportunities to improve pedestrian crossings in Garner. This school crossing on Timber Drive at Harth Drive is presently marked with a sign and a standard crosswalk striping, barely visible to a motorist. As shown in the bottom-most visualization, a high-visibility crosswalk and median refuge island could be installed to improve the appearance of this location as well as the safety of child pedestrians using the crossing.



4.4 Public Transportation Services



Garner's transit options are limited today, however the Town's proximity to downtown Raleigh and its status as one of the fastest growing communities in the region will lead to greater options for Garner residents in the future. In preparation for these future transit options, the Town of Garner can begin exploring and enacting policies to provide for existing and future transit services. By establishing policies to promote existing and future transit, Garner can improve its position within the region as a community that will be a future candidate for more fixed-route regional services such as commuter rail or bus rapid transit.

There are several short- and long-term policies and actions that can be implemented by the Town of Garner following the adoption of the Transportation Plan. Of primary interest are the pursuit of expanded or new bus service in Garner, which can be achieved through coordination with the City of Raleigh, Triangle Transit and CAMPO. Additionally, the Town of Garner should pursue the location of two stations (a downtown center station and a I-40/US 70 park-n-ride) along the proposed commuter rail service that would extend from downtown Raleigh to Goldsboro.

New and Expanded Bus Services in Garner

Garner has several options to explore expanded bus services to its residents. Current transit service is provided only to the western fringes of the Town and is focused on Wake Tech students and commuters. By working with existing service agencies to link these routes, either through extension or development of a circulator route, the Town of Garner should work to provide service to likely ridership generators, such as high density residential areas (including apartment complexes), downtown Garner, the senior center, the senior residences located in the old school, and areas near Town Hall and the Library.

Through discussions with the Raleigh Transit Administrator, David Eatman, there appears to be several opportunities Garner can pursue to expand existing CAT services in the town limits. Mr. Eatman recommends working through CAMPO to apply for Job Access / Reverse Commute and New Freedom funding; applications will go out in March 2010 and be due back in 30 days. CAMPO has fully funded all previous requests; 50/50 match required by the Town for approximately \$200,000 per year for the entire MPO. Wake Forest is using these funds this year for the express and loop services, and they are also being utilized for the Triangle Transit

regional call center. With the new Raleigh bus garage coming on-line in 2010, the facility can readily handle the new buses for Garner, if desired. System capacity generally is more amenable to an 18-month timeframe than it is right now.

There is an existing route to the Wake Technical Campus (Express Route 40) that Raleigh would like to have a park-and-ride location for (outside the Town), and the Wal-Mart shopping center (No. 7) which cannot be extended without the provision of an additional bus. The Town would need to provide 12% of the vehicle cost (about \$360,000 ea. translating to about \$35,000). The Town has to provide all of the funds for operation of a circulator, but Raleigh may provide some cost offsets for an extension of No. 7. The Town needs to provide 15'x20'x4" concrete pads for furniture and shelter in back of sidewalk or between the sidewalk and curb (depending on available space). Lighting is provided or adjusted on existing lamp heads by Progress Energy to provide lighting, although pedestrian-scale lighting is highly desirable. Raleigh would be interested in looking at creating a stop for the Wake Tech Express Route in Garner, which may provide the best, near-term option for new service. \$75/revenue service hour is the break-even point on the Raleigh system and the amount that the Town should plan on covering through grants or general revenue.

Below are service options identified through discussions with CAT, Triangle Transit, and the Plan Steering Committee.

Express 40E. The stop into Purser Drive is currently difficult to get in and out of the Super Wal-Mart, and it seems possible to synchronize this route with the No. 7 route should a stop be added here. However, the AM peak period is running very heavy, even factoring in three (2 in the morning and one in the evening) rush hour day trippers to handle the additional volumes. April 2009 counts for this route indicates a passenger volume of 5,785. An extension to Fuquay-Varina over the next 18-24 months will entail adding still more vehicles to this route. The fare for this route is still \$1.00 since it does not meet all of the characteristics of a true express route; however, if improvements to the route and service were made then the fare would probably be increased (Note: students ride for no cost). The Wake County Technical College is paying the majority of the costs for operating this route, so any changes would need to be approved by them as well.

The City of Raleigh and Town of Garner have been negotiating a leasing agreement for some time to create a transit station at the Wal-Mart site. When this issue is resolved, the City of Raleigh is prepared to spend \$25,000 (approximately) to extend sidewalk, add a shelter, add a bench,

add a garbage receptacle, and add a bicycle rack as part of the station redesign at the Super Wal-Mart. Additionally, the Food Lion (US 401 and Ten-Ten Road) stop location is very desirable from the viewpoint of the CAT staff. They would like to see 25 dedicated and 25 undedicated park-and-ride spaces at this location, as well as an easement to accommodate the 15'x20' concrete shelter pad.

Downtown Circulator The Wake Forest and Knightdale circulators are funded by those towns with participation from JARC / New Freedom funding, which can cover 50% of the costs. Working with Triangle Transit, the Town and City of Raleigh could package a trial service for 1-2 years in this manner. The proposed lines in downtown Garner would certainly be circulator routes, not an extension of Route No. 7. The City of Raleigh is considering adding 15 – 17 passenger vehicles to service the circulator routes, which would reduce the hourly operating costs from approximately \$80/revenue service hour to \$50/revenue service hour. The South Saunders (Route 7) service is high-performing, and in early 2010 seven additional vehicles were added to this route on Saturdays to reduce the headways to 30 minutes all day. This level of acceptance is a solid indicator of the potential for a new circulator service to feed this enhanced north-south route.

Identification of Future Station Areas along the North Carolina Railroad

The region is in the planning stages of implementing a commuter rail service which includes a potential line from Raleigh to Goldsboro, linking Garner to downtown Raleigh and other major employment centers of the region. The Town of Garner is an advantageous position as its proximity to downtown Raleigh has the potential for residents to be offered a limited stop option for a commute to downtown or a short ride to a connecting service to Research Triangle Park or points west in Wake County or Durham.

Much of the discussion to-date as centered on located a Garner station east of downtown near the interchange of the Interstate 40 and US Highway 70. While this location could be very beneficial to commuters from the White Oak area, eastern Wake County and Johnston County, it is not likely to be beneficial to the Town of Garner or many of its residents in terms of transit access or potential for transit-oriented development. The prospects of locating such a station at this regional transportation hub will be a service to long-haul commuters from points south and east of the interchange to use as a park-and-ride lot on their daily commutes.

As such, the Town of Garner should also pursue the location of a potential stop in or near Garner, perhaps west of the existing downtown core. Through the Transportation Plan development process, the consultant team examined commuter rail services in other parts of the country to make the best fit recommendation for services in Garner. It is recommended that Garner pursue a downtown station in addition to the Interstate 40 / US Highway 70 station. This is a common occurrence in many of the existing commuter rail services in the United States that serve two distinct markets within their services areas – commuters and historical small town / suburban centers.

History has shown that towns that proactively plan for future transit stations are almost universally granted those stations once service begins as transit agencies are oftentimes searching for partnerships to help fund and develop station locations. By proactively planning for a downtown station (as identified in the Streetscape Design Plan) along with a park-and-ride station on its eastern boundaries, and incorporating appropriate design and siting of stations and parking facilities, the Town of Garner can help ensure the best combination of station types for its residents and commuters who currently rely on the transportation system in and around Garner to access employment in Raleigh and elsewhere in the Triangle.

The Streetscape Design Plan for Garner Road and Main Street includes a discussion on potential siting of a future commuter rail station. Once the preferred location is selected through the Streetscape Plan or future downtown redevelopment plans, the Town of Garner can implement design and density standards to ensure the location is supportive of transit once service is initiated. The Town may also identify parcels for future acquisition that can serve as parking facilities, potentially for dual use by downtown businesses and transit patrons. Other future transit actions should consider:

- **Work with Capital Area Transit (CAT) and Triangle Transit to identify end-of-trip needs.** Through consultation with CAT, Triangle Transit, the Town of Garner can identify end of trip needs that can be pursued by either local or federal funding sources. These may include transit shelters, benches or common transfer locations. The



Big box stores are starting to adapt to local land use ordinances that require more transit and pedestrian-friendly design

Town of Garner may also pursue appropriate land use regulations to help ensure end of trip businesses are present at future transit stops to help riders reduce trips and reliance upon the automobile. End of trip businesses that are important to commuters include dry cleaners, coffee shops, daycares, and grocery stores.

- **Pursue park-and-ride agreements with area landowners.** Large commercial developments and churches typically have parking facilities that are under-utilized during weekday work hours. Oftentimes, these facilities are located adjacent to transit routes and can serve as designated park-and-ride stalls during these times. The Town of Garner can explore formal agreements with these property owners or require dedication of spaces for these purposes through the development approval process. NCDOT may also have remnant parcels from past projects that can be developed as park-and-ride lots. Where possible, the designated parking stalls should be adjacent to the corridor being served by transit so that riders are not required to walk across a parking lot to access services.



Parking spaces designated for carpool and vanpool riders can be pursued as part of the development review process for commercial and office complexes

- **Require construction or easements for bus stop facilities.** Once future transit services are identified along key corridors in Garner, the Town may pursue the requirement of construction of bus stop facilities or establishment of an easement for future facilities from developments proposed along existing or future transit routes. Construction requirements should be established in consultation with the relevant transit authority to ensure consistent treatment and accessibility and may need to occur on a development-by-development basis depending on local service standards.
- **Require transportation management associations as part of major commercial or office developments.** To reduce the burden on the local roadway system and provide encouragement for area businesses to promote alternative transportation, the Town of Garner may require the establishment of transportation management associations (TMAs) through its development review process. TMAs are typically organized through a tenant association or the management company and provide services such as: carpool partner identification; organization of vanpools; distribution or sale of bus

passes; providing incentives to employees who regularly use alternative modes of transportation; inviting area transit services to conduct lunchtime information forums; and fund guaranteed ride home programs. New commercial and office development may also be required to designate parking spaces for employees who commute via a carpool or vanpool. Other facility considerations may also include shower and locker facilities for bicycle commuters, bicycle storage areas, and kiosks containing information about area transit services.

Figure 15 on the following page illustrates many of the recommended public transportation improvements. These recommendations include a downtown circulator loop with service to central and west Garner (green loop), east side to access the White Oak Shopping Center (yellow), and the preferred route (orange) that combines the two. Also proposed are more frequent north-south bus service to connect Garner with downtown Raleigh, one additional stop, and long-term rail service described below.

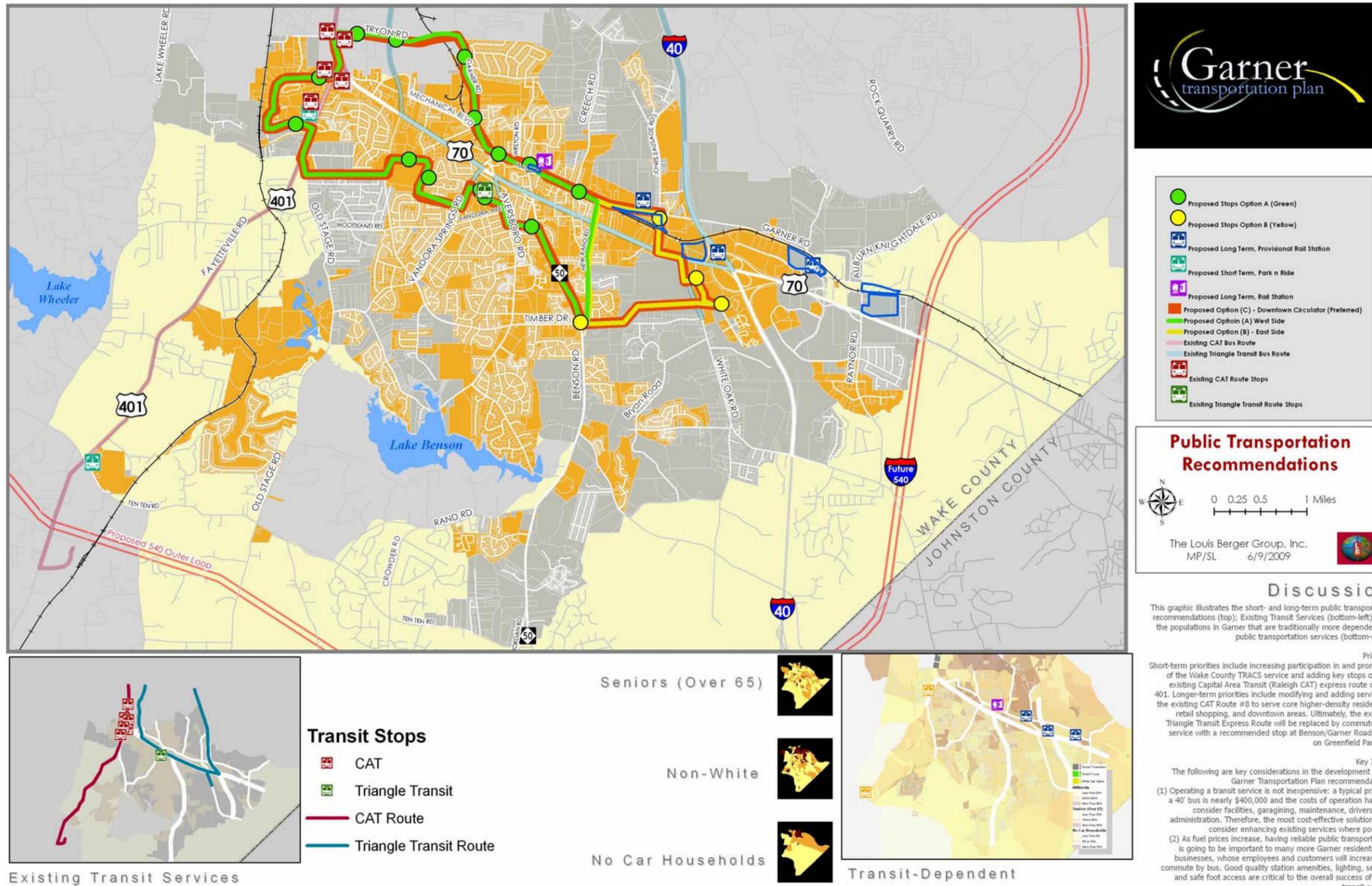
During the discussions with the Plan Steering Committee, the St. Mary’s Street station, which would be primarily a walk-access location to serve a revitalized downtown, was preferred over six other candidate station locations. Three other candidates that could be options, or chosen in addition to the St. Mary’s Street station to serve commuter volumes, are also indicated in this figure. The evaluation of these three stations is shown in Table 12, but are not prioritized in this Plan.

Site ID Number. Location	Parking Accommodation	Platform Accommodation	Walk Access	Transit Access	Roadway Access	Economic Development Potential	Site Acquisition / Preservation	Station Spacing	Complimentary Development Potential
2. Garner / Jones Sausage Road	3	1	1	1	3	3	2	3	2
3. Interstate 40 / US Highway 70	2	3	2	2	1	2	3	2	1
4. Greenfield Parkway	1	2	3	3	2	1	1	1	3

TABLE 12. EVALUATION OF THREE DRIVE-ACCESS RAIL STATIONS



FIGURE 15. PUBLIC TRANSPORTATION RECOMMENDATIONS



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Chapter 5: Implementation Guidance



The need for additional guidance to implement the recommendations of the Transportation Plan is driven by three key factors:

1. There will always be more desire than capital. Since the transportation needs of the Garner area significantly exceed what can be expected to be purchased from all revenue sources in any given year – or 10-year span – there exists a need to be able to establish a long-term solution to transportation financing.
2. The project recommendations alone are insufficient to recall their motivation. The informed opinions expressed by the Steering Committee and public are highly valuable, paid for with tax revenues and considerable effort on the part of many participants in the planning process. However, they are also ephemeral and not succinctly captured on a map or table of project needs. Hence, there exists a need to monitor the progress of the Transportation Plan and update it again according to a reasonable schedule.
3. Both major and minor decisions determine the transportation environment in a community, usually over a great deal of time. While a Town may celebrate the opening of a new roadway, briefly, once or twice every decade, every day in-between presents decisions that collectively shape the way the transportation system performs for diverse users of that system. Therefore, a need exists to provide best practice guidance to the staff and decision-makers, as well as private developers, which can be used to create a better community over a long period of time. Even “best practice” is not static but will change over time as our understanding of transportation dynamics grows and changes occur in vehicle design and modal trends shift in reaction to fuel prices or external policy changes.

The following sections illustrate important concepts such as guidance that exhibits best practice in the design of streets, available revenues, and policies and programs that can help implement the recommendations contained in this Plan.

5.1 Best Practice Design Guidance

The Transportation Plan is intended to be a comprehensive examination of transportation facilities within and connecting to the Town of Garner. One component of this plan is the development of a Street Catalog and best practice guidance for street design. The Catalog contains an inventory of roadway design elements along existing streets within the Town Limits or in nearby communities, where necessary. The Design Guidance in Appendix E illustrates additional, multimodal design considerations.

The Street Catalog is one of the tools used for input into the future street design standards that will be developed through the Garner Transportation Plan. Other inputs will include: street design recommendations from the 2006 Comprehensive Growth Plan, the Garner Streetscape Plan, the Town staff, and the Transportation Plan Steering Committee.

What is a Street Catalog? A street catalog is a collection of photographs from existing streets. The catalog outlines the unique design elements of those streets that can then be used to develop new roadway cross sections for the Town of Garner. The Transportation Plan Steering Committee will use this catalog to identify and define various elements to roadway design that should be incorporated into the design elements of the plan. The street catalog documents pedestrian facilities, sidewalk buffers, bicycle facilities, travel lanes, parking lanes and land uses along a dozen various streets in and around Garner.

Thinking about Streets in their Context. Different users have different needs along different streets. The Garner Comprehensive Plan addressed these different needs and provided some conceptual street design techniques that the Town should explore as part of the Transportation Plan. The driver who wants to quickly get from home to work will likely prefer a higher speed facility with as few distractions as possible. The child walking to school needs an environment that ensures safety while navigating driveway crossings and intersections. The bicyclist needs space within the street that will minimize conflict with vehicles and/or pedestrians.

Considering these diverse yet interrelated needs to design a street that is accommodating to all users can become a challenge. In order to understand what is needed across different contexts within Garner the evaluation of street design begins with land use, then evaluates the needs of the different types of users in that context. For this reason, the street design considerations can be examined by zone.

- **Land Use Zone.** Defining the needs for pedestrians, bicyclists, drivers and transit riders begins with an assessment of the existing or planned land use and its design features. A house that addresses the street can create a very different feel for users than one whose backyard or fence creates a blank wall along the roadway. A town center retail area where the front door is accessed directly from the sidewalk creates a different feel along the street than a big box commercial development with a large parking lot separating the street from the buildings. This is why it is important to first define the land use zone prior to designing other street facilities.
- **Pedestrian & Access Zone.** The pedestrian and access zone is defined as the area within the street right-of-way that is behind the curb and typically includes the sidewalk, buffer strip, and curb and gutter, as well as street furniture in some cases. Much more occurs in this zone than is typically considered within street design (Figure 16).

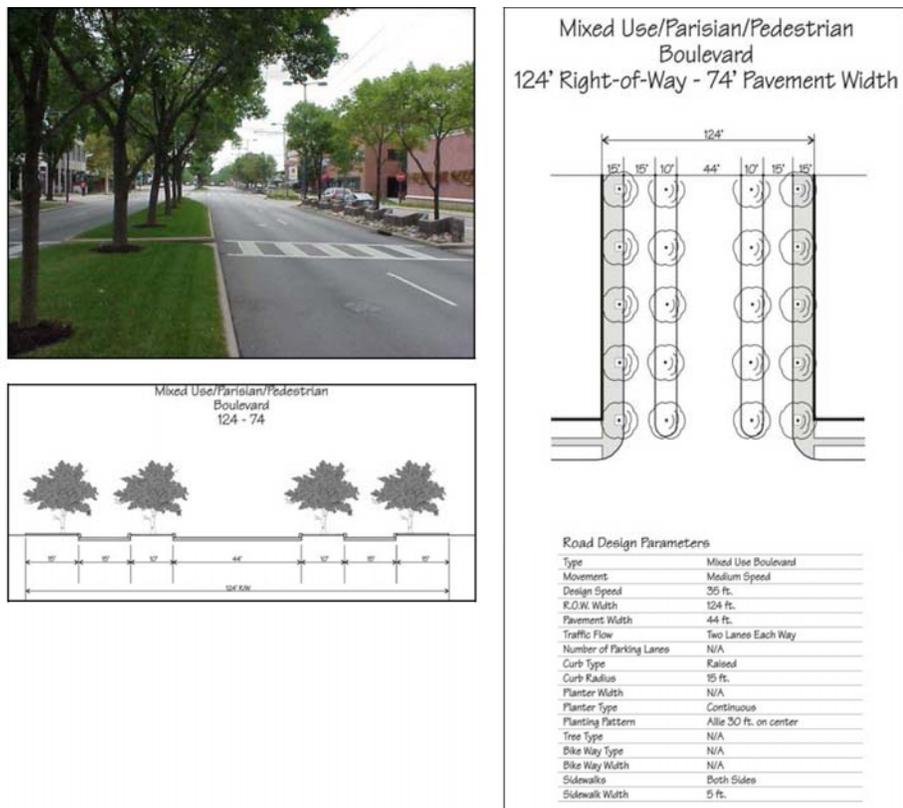


FIGURE 16. EXAMPLE OF A MIXED USE STREET DESIGN FROM THE GARNER COMPREHENSIVE GROWTH PLAN

Obviously, pedestrians operate in this zone but they share this space with many other uses. It is in this zone that driveways access the street, utilities are placed, street signs are erected, bus stops are built and trash is placed for pickup. In the central business district, this zone might also function as an extension of downtown businesses, housing outdoor café

seating or retail bins. Careful consideration must be given to all of these activities to ensure a safe environment for the pedestrian, transit riders, crossing vehicles and compliance with the Americans with Disability Act.

- **Parking Zone.** The presence of parking along a street is dictated by the surrounding land use and its orientation to the street. Parking may only be necessary on one side of the street; the parking lane may need to be wider in certain contexts based on anticipated use; stalls may be diagonal or parallel; or accommodation of parking may not be necessary along a street designed for mobility.
- **Bicycle Zone.** The bicycle zone is typically within three to five feet of the curb, where a standalone bicycle lane is present or proposed, or where bikes are typically positioned in a shared curb lane. Bicyclists might also mingle within the Pedestrian & Access Zone (in the case of a rare parallel multi-use path) or the Mixed Vehicle Zone (in the case of low speed / low volume roadways or other shared lane situations). Bicycle lane widths should be considered in the context of the roadway, its existing or proposed speeds, and the type of bicyclists that use the facility.
- **Mixed Vehicle Zone.** Travel lanes, turn lanes and medians are all part of the vehicle zone, which is used primarily for automobile travel. Other uses, such as buses and bicycles, may be present in this zone. The widths of the travel and turn lanes can vary based on the function, speed and proportion of vehicle types that use the street. For example, a street designed for low speeds and anticipated to have low truck volumes can have 10-foot travel lanes (as already exist on many streets within Garner), whereas a high speed mobility corridor with high volumes and measurable truck volumes may need 11-foot or 12-foot travel lanes.



FIGURE 17. HORIZONTAL CLEARANCE “ZONES” FOR A SIDEWALK, MOST TYPICALLY FOUND IN A CENTRAL BUSINESS DISTRICT

Source: Derived from FHWA/USDOT “Accessible Sidewalks and Street Crossings” Informational Guide

How is the Street Catalog used? While no single street in Garner is a full-scale representation of the “perfect roadway”, there are many positive design elements within the existing street system that can be used to develop a set of new cross sections that meets the goals of previous Garner planning efforts to develop a multi-modal transportation system. A cross section is a graphic representation of a street to show the public, developers, town staff and others the preferred design of a new street. Cross sections can vary greatly in width and character based on their location, land uses and needs for a particular type of street (e.g. an arterial, collector or local road).

It is likely that the design features of one roadway, perhaps a sidewalk and buffer width, will be combined with lane widths and bike lanes from another to develop a preferred cross section for, say, a residential collector or a commercial arterial.

Existing and projected deficiencies in the roadway system will be identified through examination of the Triangle Regional Travel Demand Model and completion of the Garner Street Inventory. This will identify where future needs for capacity improvements to roadways or intersections are desired or necessary. The resulting cross sections from

the street catalog will be applied to various roadways and could vary based on the area of town, land use and other factors.

The new cross sections will guide construction of streets by developers, the Town of Garner and perhaps the North Carolina Department of Transportation. The Street Catalog and subsequent products of the transportation plan will examine the following aspects of street design:

- Right-of-way width;
- Pedestrian facility design;
- Aesthetics;
- Number of automobile lanes;
- Width of automobile lanes;
- Type and width of bicycle lanes;
- Type and width of parking lanes;
- Sidewalk buffers;
- Medians;
- Utility placement;
- Intersection features;
- Land use;
- Designing for accessibility; and
- Roundabout design.

Comparing Street Design in Garner. Garner’s transportation system is a combination of multi-lane high speed / high mobility state highways, local and regional mobility routes, two-lane country roads and numerous urban streets that provide a varied level of mobility and function. Like many communities, these roadways are a collection of improved and unimproved streets. Some were constructed by the state or county decades ago; others have been built by developers; and the Town of Garner has built or improved other streets.

Many streets appear to have evolved over time, with spot improvements to satisfy local needs or a new development. While some may not consider this ideal as there is a desire to complete full sections of roadways in an orderly manner, the results are not necessarily negative.

One such example is Vandora Springs Road, south of 7th Avenue near Lakeside Drive. In glancing at this section of roadway it could be asked: What came first, the street or the people? Over time this area has evolved from a farm-to-market corridor into a hybrid of semi-rural and suburban housing. However, the feel of the road has not followed the development trends in the area in terms of its design. The utilitarian street remains narrow with only nine-foot travel lanes (27-foot total pavement width), including the center turn lane; a sidewalk has been

added to the east side, including a two-foot buffer; and there are drainage swales on the west side of the road. Hence traffic is noticeably slower through this section.

As a result, this section of Vandora Springs Road has a human scale despite the nearly 8,000 vehicles per day (vpd) that use this street. If this design were to be repeated along the rest of the corridor, the result would likely be a walkable environment connecting key commercial areas of Garner and the Town complex to residential areas.

Compare these design features to nearby Lakeside Drive ([Figure 18](#)), an east-west residential collector that connects to the north-south corridors of Vandora Springs Road, Aversboro Road, and NC 50 (Benson Road). Lakeside Drive is 43-feet wide from curb-to-curb and has no sidewalks. The street could accommodate three travel lanes and two parking lanes within the existing cross section; however, the street has only 1,500 vpd and almost no parking on the street. The surplus width in the roadway and lack of sidewalks could make it a candidate for a retrofit project to include a pedestrian way within the curb-to-curb section or a more ambitious plan to move the curb line and construct sidewalks on one or both sides of the street.

The existing cross section of Vandora Springs Road could be the starting point for a residential arterial or collector that is projected for moderate traffic volumes (less than 18,000) and few trucks. Possible modifications in a final cross section could include:

- Additional sidewalk buffer space to provide greater separation;
- Sidewalks along both sides of the road;
- Consideration of drainage swales between the edge of pavement and the sidewalk instead of curb and gutter;
- Shared lane markings for bicycles or addition of bicycle lanes; and
- Median treatments in areas with limited access points.

A cross-section using Lakeside Drive as a base would likely need several modifications to represent a cross-section for residential collector or local streets. Modifications could include:

- Narrowing of curb-to-curb section;
- Consideration of parking on one side due to limited usage; and
- Addition of pedestrian and bicycle facilities.

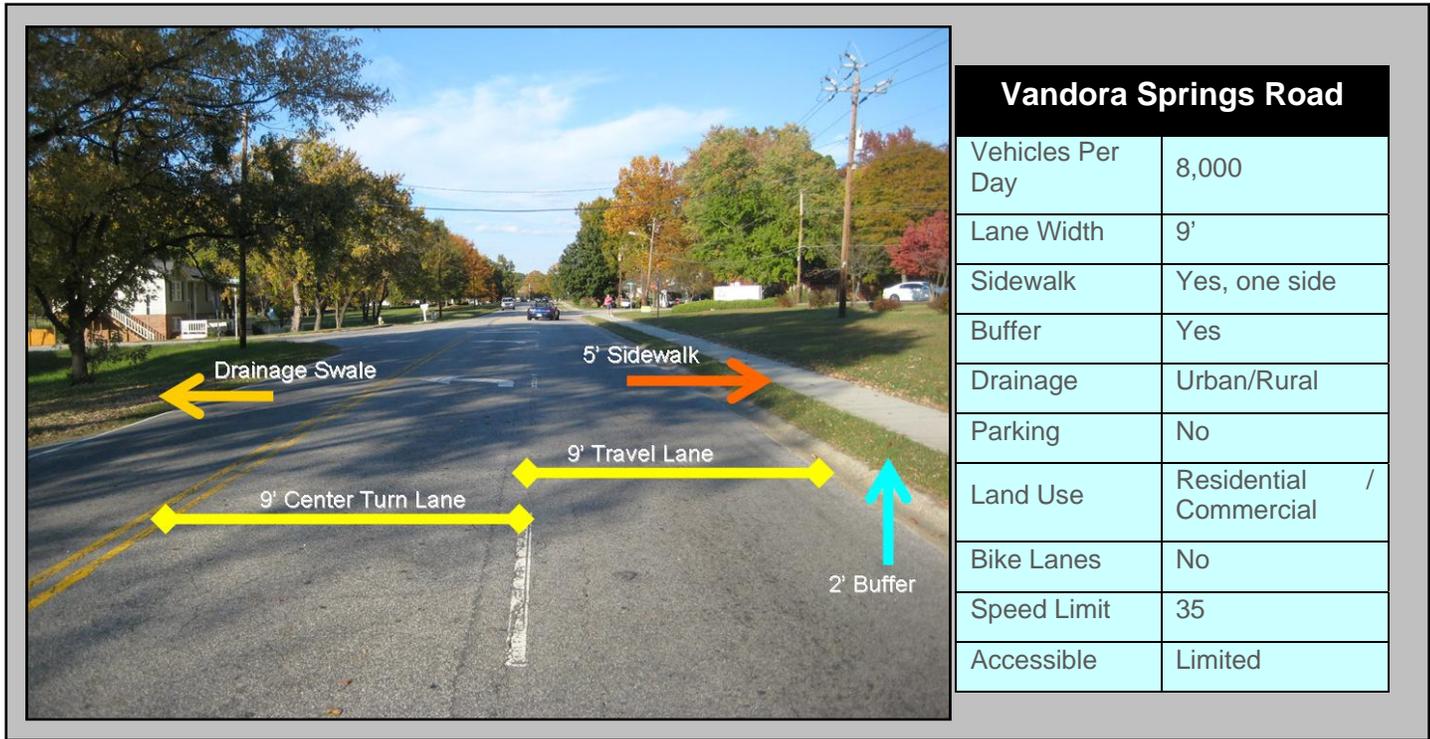
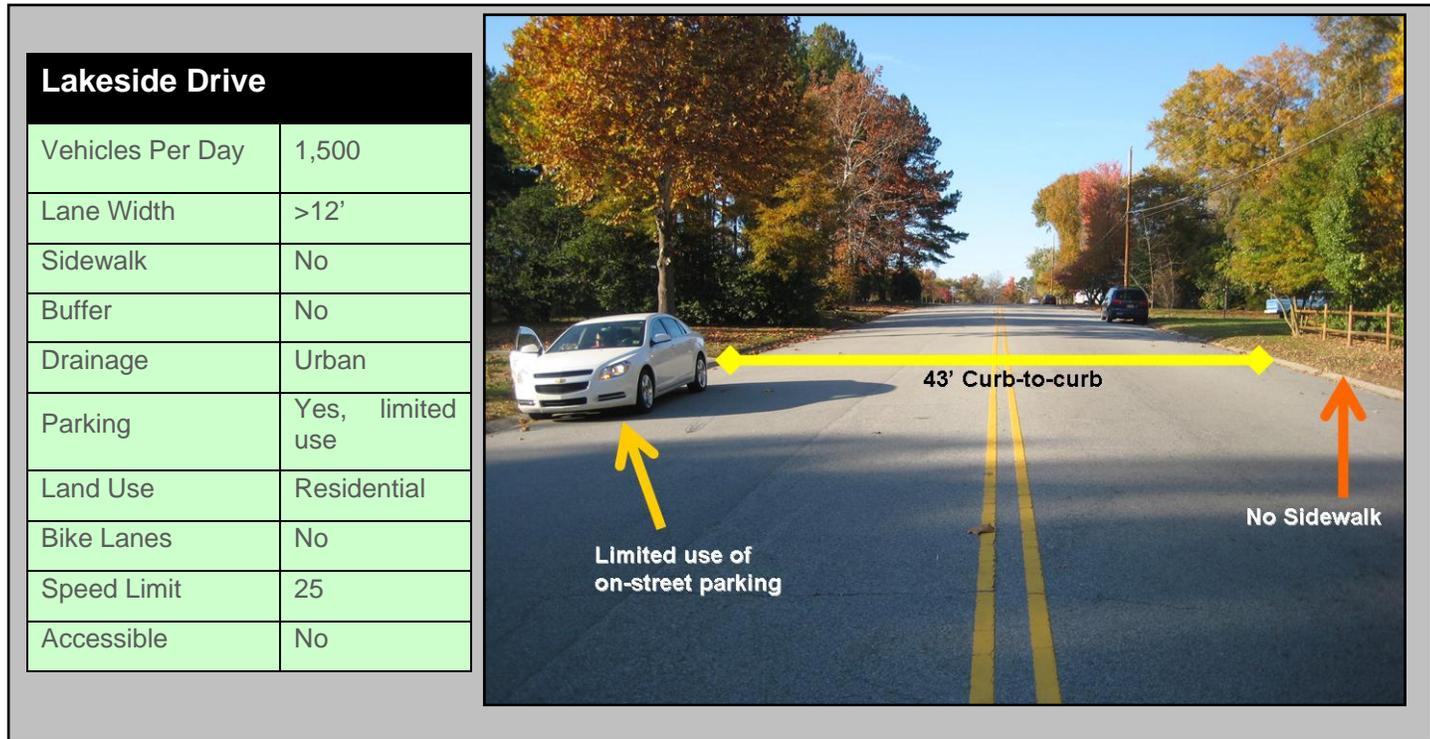


FIGURE 18. COMPARING VANDORA SPRINGS ROAD (ABOVE) AND LAKESIDE DRIVE



The Street Catalog. The following pages contain summary graphics of various streets in and around Garner. These streets were selected after a tour by the consultant team of various commercial and residential streets within Garner to identify best practices in street design elements. Those depicted in the street catalog have elements that reflect current practices related to context-sensitive solutions and multi-modal design considerations. They are intended to be a critique of the design elements of the roadway and not a recommendation on how to improve a specific street (although this may be explored further during the Transportation Plan). Roads evolve over time and the various design elements included in these streets must be understood within the context of the era, topography, existing property lines and fiscal realities in which they were constructed.

As stated earlier, the Transportation Plan will develop new street cross sections for the Town of Garner to help guide future development and construction of streets. These will be based in part on existing elements within Garner’s street system as well as emerging design practices that enhance the vehicular, pedestrian and bicycle elements of the street. Additional design guidance is provided in [Appendix D](#) (Access Management Guide) and [Appendix E](#) (Design Guidance) that builds on best practices for various transportation facilities.

Carillon Drive, White Oak Shopping Center

Carillon Drive is the entrance to White Oak Shopping Center in east Garner. It is a private commercial street with many positive design features. Most notable are the streetscape components (e.g. trees, sidewalk lawns, rock features and the center of the roundabout) and the detached sidewalk. The curb ramps and pedestrian buttons are not compliant with ADA.

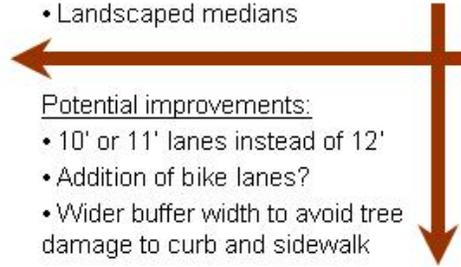


Strengths:

- Detached sidewalks
- Street trees
- Landscaped medians

Potential improvements:

- 10' or 11' lanes instead of 12'
- Addition of bike lanes?
- Wider buffer width to avoid tree damage to curb and sidewalk



Roundabouts: Roundabouts are becoming more popular as traffic control devices. This roundabout has the proper visual cues and landscaping that are part of good roundabout design. It does not have any pedestrian crossings, which must be given particular attention in roundabout design and construction to ensure safety of pedestrian, proper direction for bicyclists, and compliance with ADA.



Timber Drive

Timber Drive is clearly a mobility corridor within the Town of Garner, carrying 15,000 to 20,000 vehicles per day. With that comes a need to accommodate high volumes and high speeds of traffic (45 mph posted speed limit). However, the needs of pedestrians, cyclists and potentially transit riders should also be considered when designing such roadways. Timber Drive has some very positive elements aimed at achieving these goals.

Strengths:

- Detached sidewalks
- Landscaped medians and other aesthetics which give the street a close feel.

Potential improvements:

- Wider sidewalk buffer
- Upgrade or elimination of walls along corridor
- Consider space for bicyclists, potentially a sidepath considering the speed and volume of traffic



Sidewalk Buffers: How wide should they be? There is no set rule for the width of sidewalk buffers, however it is generally recognized that a 5' buffer provides for greater pedestrian safety and feel, as well as giving space for driveways to meet the sidewalk level without compromising ADA requirements. To accommodate trees in the buffer and protect sidewalks and curbing, a buffer should be at least 6' (with root barriers) or 8' without root barriers.

Ackerman Road, at Steel Hopper Way

Ackerman Road is a newly improved street that is built as a residential collector without front-on housing in the new section. It has curb, gutter and sidewalk as well as a center turn lane east of Bryan Road for approximately 2,000 feet to the limits of the subdivision. The street has a "wide open" feel due to the width of the pavement, lack of landscaping, 45 mph speed limit and absence of front-on housing. In 2007 the road carried 1,500 vehicles per day.



Strengths:

- Detached sidewalks
- Marked crosswalk at rec. center
- New infrastructure

Potential improvements:

- 10' or 11' lanes instead of 12'
- Addition of median, particularly with no front-on housing
- Wider buffer width to allow for trees

Front-On Housing: Collector streets with projections of low traffic volumes (<4,000) may be suited for front-on housing even though policies may direct a developer to construct berms or fences to shield homes from the street. Front-on housing can be constructed with an alley access to eliminate driveways on the street but still allow the street to have a pedestrian feel with homes addressing the street.



Aversboro Road, north of Timber Drive

Aversboro Road is a great example of a four-lane roadway with many positive design elements. The most notable is the 10' travel lanes that exist along most of the street north of Timber Drive, particularly in front of Aversboro Elementary School and the churches across the street. During the field observations, traffic was noticeably slower in this section, in part due to the 10' travel lanes and tight feel of the street. The posted speed limit is 35 mph and traffic volumes are 8,000 to 10,00 vehicles per day.

Strengths:

- 10' travel lanes
- Detached sidewalks
- Design & land uses match

Potential improvements:

- Lack of vertical cues in sidewalk buffer
- Increased buffer width
- Improved pedestrian elements near school



Lane Widths: Significant discussions have occurred within planning & traffic engineering circles in recent years regarding lane widths. AASHTO has acknowledged that lane widths between 9' and 12' are appropriate for urban streets, with the wider lanes being acceptable along higher speed and higher volume primary arterials. NCDOT has also acknowledged this in their Traditional Neighborhood Design standards, which show 9' lanes for a traditional neighborhood street section.

Hay River Street

Hay River Street is a common design for residential collector and local streets within the Town of Garner. Generally these roadways have sidewalks on one side of the street, on-street parking for both sides of the roadway and posted speed limits of 25 mph.



Strengths:

- Detached sidewalks
- Low traffic volume

Potential improvements:

- Requirements for trees within buffer
- Consider eliminating parking from one side or both to narrow pavement width and calm traffic

Traffic Calming: Streets with low volumes and wide pavement, like Hay River, can easily become a traffic calming nightmare as there are no visual cues within the roadway to encourage the motorist to drive carefully in this environment. There are design features, such as curb extensions and chokers, that can be required with construction to provide these visual cues instead of retrofitting streets like this one with speed humps once residents start to complain of speeding traffic.



Fifth Avenue, east of Vandora Springs Road

Fifth Avenue is a commercial collector between Vandora Springs Road and Aversboro Road. The commercial development on the north side is a newly constructed neo-traditional commercial town center concept. The resulting street design has on-street parking and a two-tiered pedestrian way for a portion along the frontage of the new buildings. This development proudly displays its Community Appearance Award that was given by the Town of Garner.

Strengths:

- Wide pedestrian space
- Buildings address the street
- On-street parking

Potential improvements:

- Curb extensions to encourage pedestrians to cross 5th Avenue
- Narrowing of travel lanes from 12' & 13' to 10' or 11'
- Redevelopment requirements for big box site on south side



Parking Lanes: The length and width of on-street parking facilities should vary by the type of land use and anticipated characteristics of vehicles using the space. In denser urban areas, a 6' parking lane is adequate to accommodate most vehicles. A 7' lane is the most common width for new developments and often does not include up to 2' feet of gutter space that is also usable space for parked vehicles. These may also vary for diagonal or back-in parking.



Woodland Road

Woodland Road is a residential collector with a 35 mph speed limit. It appears to have been constructed in the 1960s or 1970s and provides connectivity between Old State Road, Timber Drive and Vandora Springs Road. Several homes front Woodland Road, but there is very little parking on the street. This could be due in part to the width of the road and lack of parking lane delineation. The road carries between 2,800 and 4,000 vehicles per day.

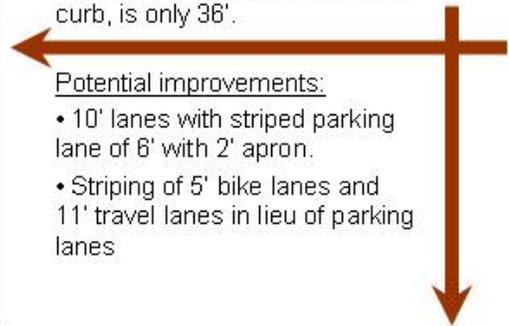


Strengths:

- Detached sidewalks in some areas
- Total pavement width, curb-to-curb, is only 36'.

Potential improvements:

- 10' lanes with striped parking lane of 6' with 2' apron.
- Striping of 5' bike lanes and 11' travel lanes in lieu of parking lanes



Bicycle Lanes: Streets such as Woodland that have low traffic volumes and provide connectivity across a major section of town are prime candidates for installation of bike lanes. With some streets constructed with more than enough space for travel lanes, squeezing in a 4' or 5' bike lane along with the 2' concrete gutter will provide space for bicyclists – and help calm traffic. On narrow streets the addition of shared lane markings – or "sharrows" – has become a popular technique to encourage motorists to share the road.



Raynor Road, near Hein Drive

Raynor Road is a two- and three-lane collector roadway with curb, gutter and sidewalk in some areas and posted speed limit of 35 mph. The land uses near Hein Drive are industrial and warehouses with residential uses further north. The street section has lane widths that are generally narrower than 12', which is acceptable in an urban environment and will handle truck traffic sufficiently in this area. Traffic counts indicate 4,800 vehicle per day in northern segments of Raynor Road.

Strengths:

- 11' travel lanes
- 10' center turn lane
- Detached sidewalks

Potential improvements:

- Lack of vertical cues in sidewalk buffer
- Increased buffer width
- Improved curb ramp design standards (see below).



Curb Ramps: Per the Americans with Disabilities Act (ADA), curb ramps shall have a 4' x 4' flat landing where the ramp interfaces with the sidewalk to allow for a person in a wheelchair or using a walker to turn and orient themselves toward their desired direction of travel. This ramp along Raynor, as well as others within Garner, are not compliant with these standards. The black mat Detectable Warning Device (DWD) meets standards for color offsets required by ADA, however the black concrete coloring in addition to the black DWD is not necessary.

5.2 Anticipated Revenues and Project Costs

Since the Great Depression and the 1930’s, state and federal governments have been the primary providers of major capital infrastructure improvements for transportation, especially in the modal areas of roadways and public transportation. North Carolina, unlike most states, has not reverted control of public streets back to local governments (towns, cities, and counties) and maintains an 80,000-mile or greater roadway network through use taxes. Every two years, the North Carolina Department of Transportation (NCDOT) publishes a compendium of transportation improvement projects that are programmed for the next seven years. Federal regulations stipulate that the first three years of the State Transportation Improvement Program (STIP) are obligated funds; the remaining four years (and beyond, termed “post-year” in the language of the STIP) are forecasted values based on known funding trends and revenue streams. The most recent available STIP at the time of publication is the 2009 – 2015 STIP. [Table 13](#) summarizes the major funding for individual projects, while [Table 14](#) indicates those projects that are currently shown in that document that impact Garner directly. Note that expenditures in FY 2007 and FY 2008 are also included in the 2009 – 2015 program.

TABLE 13. SUMMARY OF GARNER AREA FEDERAL-STATE ROADWAY FUNDING, 2009 - 2015

Prior Years	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	Post-Years
8,046	3,200	2,985	9,600	-	500	5,000	-	-	-	20,000
Funded Total, 2007 - 2015:	\$ 21,285									
Average Annual Funding:	\$ 2,365									

- As can be readily seen from these two tables, the amount of funding that Garner can expect to receive from federal and state sources is under \$2.5 million dollars annually. If only the revenues between FY2007 and FY2012 are averaged, the annual amount increases to \$3.55 million.
- The Timber Drive/US 70 interchange project (State TIP No. U-0515E) alone is expected to cost more than \$10 million, over four times the annual allotment of state and federal funds that are expected to come into the area between 2007 and 2015.
- Funding expected in the later years of the STIP is non-existent, with no funds for capital replacement projects after Fiscal Year 2012 currently programmed.

- The post-year (i.e., after 2015) funding is nearly as great as the total of funds expected to be expended between 2007 and 2015.
- Nearly two-thirds (64%) of the programmed funding between 2007 and 2009 is locked into one project, the extension of Timber Drive east to White Oak Road.

These observations reinforce a trend of generally declining revenue from state and federal sources that have been seen in larger geographic areas, in large part due to declining fuel tax receipts and increases in the costs of construction.

TABLE 14. 2009 - 2015 STIP PROJECTS (GARNER AREA)

On Road	State TIP No.	Description	Length	Stage	Cost (000s)	Status
New Rand Road	U-3607	Timber Drive to US Highway 70: widen to three lanes	1.1 miles	Right-of-Way	3,250	Unfunded
				Construction	3,250	Unfunded
				TOTAL	6,500	
Timber Drive Extension	U-4703	Timber Drive East Extension, NC 50 to White Oak Road: construct four-lane roadway on new location	1.3 miles	Planning & Design	965	Prior Years
				Right-of-Way	2,360	In Progress
				Mitigation	125	FY 08
				Mitigation	500	FY 08
				Construction	1,920	FY 09
				Construction	7,680	FY 09
				TOTAL	13,550	
US 70 and NC 50	B-4946	Replace Bridge Over US Highway 401		Right-of-Way	100	Prior Years
				Construction	500	FY 11
				Construction	5,000	FY 12
				TOTAL	5,600	
NC 50	B-4654	Replace Bridge over US Highway 70		Right-of-Way	300	Prior Years
				Construction	300	Unfunded
				Construction	3,000	Unfunded
TOTAL	3,600					
Creech Rd (SR 2564)	B-3376	Replace Bridge over Big Branch Creek		Construction	2,076	Prior Years
				TOTAL	2,076	In Progress
Old Stage Rd (SR 1006)	B-4299	Replace Bridge over unnamed creek		Right-of-Way	190	Prior Years
				Construction	850	In Progress
				TOTAL	1,040	FY 07
Lake Wheeler Rd (SR 1375)	B-3375	Replace two bridges over Swift Creek and Lake Wheeler Spillway		Construction	4,035	Prior Years
				TOTAL	4,035	In Progress
US 401	B-3916	Replace Bridge over Middle Creek		Right-of-Way	380	Prior Years
				Construction	2,350	In Progress
				TOTAL	2,730	FY 07
US Highway 70	U-0515E	Construct interchange at Hammond Road/Timber Drive intersection		Construction	10,200	Unfunded
				TOTAL	10,200	

This leaves only two premier sources of financing available to transportation capital improvement projects: local (Town of Garner) and private sector financing. [Table 15](#) below is a summary of the capital improvement budget for transportation-related projects financed by the Town of Garner.

Table 15. Garner Capital Expenditures (Anticipated) in Transportation, FY2007 to FY2011

Expenditures	FY07	FY08	FY09	FY10	FY11	TOTAL (000s)
Timber Dr. Extension	\$2,000					\$2,000
Vandora Springs Rd. Straightening		\$150	\$0	\$3,000		\$3,150
Aversboro Sidewalk		\$149				\$149
Vandora Springs Sidewalk					\$100	\$100
White Deer Nature Shelter, Trails	\$120	\$584	\$584			\$1,287
North Garner Greenway	\$10			\$200	\$275	\$485
Swift Creek Greenway				\$200	\$275	\$475
U.S. 70 Median Landscaping			\$34			\$34
US 401 Gateway Planting		\$5				\$5
US 70 East Gateway Planting		\$12				\$12
North Garner Main St. Streetscape		\$80				\$80
Street Maintenance	\$450		\$300		\$300	\$1,050
TOTAL	\$2,580	\$979	\$918	\$3,400	\$950	\$8,827
Funded Total, 2007 - 2011:	\$8,827					
Average Annual Funding:	\$1,765					

Note that this average includes street maintenance (resurfacing and patching) and some allotment towards a nature shelter, which the federal/state summaries does not include. However, local funding is expected to average \$1.7 million annually over a comparable time period to the State TIP, nearly 50% of the state/federal financing.

Private sector contributions typically arrive in the form of required street improvements such as new turning lanes, traffic signal improvements, and limited widening and sidewalk or trail improvements. These requirements are determined during the project review process, but are not catalogued and thus cannot be summarized or predicted with accuracy. However, it is not unreasonable to surmise from the available data and past experiences that the combination of local and private sector contributions to major and minor transportation expenditures is approximately 60% of the state / federal levels. This is not proportionate to the much higher level of ownership that the state has in the roadway system compared to the local (Garner) government. [Tables 16, 17 and 18](#) identify high priority pedestrian, roadway and transit projects and the associated costs.

TABLE 16. HIGH PRIORITY SIDEWALK PROJECT COST ESTIMATES

Project Name	Asphalt Greenway/Multi-Use Trail (mi.)	Sidewalks (mi.)	Wide Shoulder (Add pavement)	Pedestrian Bridge (linear mile)	Curbing (mi.)	ADA Ramp (ea.)	Bike Lockers (1 unit per 2 bicycles)	Bike Racks (Inverted U, 2 bicycles)	Pedestrian Signal (2-way)	Trail Gates (ea.)	Sign and Post (ea.)	Crosswalk (Tape, Transverse Lines, ea.)	Crosswalk (Tape, Ladder, ea.)	Crosswalk (Textured Concrete, ea.)	Farmland/Wooded (ac.)	Neighborhood/Retail (ac.)	Residential (ac.)	Office and Industrial (ac.)	Construction Subtotal	Contingency	Total
Buckingham/Flanders/Leary		0.4				8			4			4							\$127,956	\$12,796	\$140,752
Spring Drive (from Timber Drive to Vandora Springs)		1.9				2													\$526,074	\$52,607	\$578,682
Greenway: White Deer Park to Vandora Springs Road	1.0					2	2			1	2		4	1					\$465,583	\$46,558	\$512,142
Timber Drive and Briar Rose Lane		0.4				2													\$125,483	\$12,548	\$138,032
Don Miller Drive and Timber Drive		0.4				2													\$123,786	\$12,379	\$136,165
North Garner Middle School Area Connections		0.4				8			4			4	4						\$134,989	\$13,499	\$148,488
H1. Christian Rd east to Greenway at White Deer Park	0.8			0.0				2			2						0.5		\$509,233	\$50,923	\$560,156
H2. Christian Road to Thompson Road down Sewer Easements	0.8			0.0				2			2								\$470,400	\$47,040	\$517,440
Buffalo Rd 3 from Dunnhaven Rd to Benson Rd		0.6																	\$165,200	\$16,520	\$181,720
Buffalo Rd 4 from Misty Meadow Lane to Vandora Springs Rd		1.6																	\$448,000	\$44,800	\$492,800
Buffalo Rd 5 from Misty Meadow Lane to Lake Benson Park		1.4	0.1	0.1	0.5														\$1,034,400	\$103,440	\$1,137,840
Benson Road to Gamer Road		0.2				2													\$72,241	\$7,224	\$79,465
Main Street to Benson Road		0.2				2													\$63,703	\$6,370	\$70,073
Total Quantity	3	8	0	0.1	0.5	28.0	0.0	6.0	8.0	1.0	6.0	8.0	8.0	1.0	0.0	0.0	0.5	0.0			
Total Cost (\$1,000)	\$1	\$2,139	\$14	\$758	\$70	\$34	\$0	\$2	\$15	\$2	\$1	\$1	\$2	\$20	\$0	\$0	\$71	\$0	\$4,267.05	\$426.70	\$4,693.75

Notes:

- (1) Costs are subject to variation based on inflation, cost of materials, and other factors.
- (2) Cost Source(s): NCDOT, City of Asheville, City of Durham

TABLE 17. ROADWAY PRIORITY PROJECT COST ESTIMATES

Notes:
 (1) Costs are subject to variation based on inflation, cost of materials, and other factors.
 (2) Cost Source(s): NCDOT, The Louis Berger Group, Inc.

Roadway Segment Description	From	To	3-lane curb and gutter	4-lane curb and gutter	4-lane divided curb and gutter	6-lane divided curb and gutter	4-lane boulevard (shoulder)	2-lane with paved shoulders	New Bridge, over water (sq. feet)	New Bridge, over roadway (sq. feet)	Intersection: Two-Lane	Intersection: Four-Lane	Interchange: full clover	Interchange: w/ 1 collect-dist	Sidewalk: 5 ft., 1-side	Sidewalk: 5 ft., 2-sides	Bicycle Lane on Shoulder Section: add 2 ft. paved shoulders	Wetland Mitigation (ac)	Farmland/Wooded (ac)	Neighborhood/Retail (ac)	Residential (ac)	Terrain Factor (Coastal = 1.00, Piedmont = 1.15, Mountain = 2.00, Rough Mtn = 3.00)	Construction Type Factor (New Location = 1.0, Widening Existing Road = 0.8)	Federal Contingency (1.15) OR Local / State Contingency (1.10)	Total Cost	
Vandora Springs Road Ext	Existing Vandora Springs Rd	US 401	1.6					48000.0	24000.0		2.0			1.6		3.0	17.5					1	1	1.15	\$28,606,519	
Vandora Springs Road Extension	US 401	Lake Wheeler Rd	0.9								1.0			0.9				9.8					1	1	1.15	\$9,949,871
Timber Drive Extension	Existing Timber Dr	White Oak Rd	1.0					12000			1.0	1.0		1.0				2.9	10.3			1	1	1.15	\$14,677,502	
Ackerman Drive Extension	Existing Ackerman Rd	NC 50	0.6					7200			2.0			0.6				2.0		1.9		1	1	1.15	\$6,287,490	
Clifford-New Bethel Connector	Clifford Rd	New Bethel Rd	0.8													0.8	1.0	5.6				1	1	1.15	\$5,968,106	
Jones Sausage Road Extension	Existing Jones Sausage Rd	Timber Dr Extension	0.9						24000		1.0	1.0		0.9								1	1	1.15	\$11,309,154	
Timber Drive / US 70 Interchange	Timber Drive	US 70																				0	0	0	\$10,200,000	
Creech/Garner Rd Connection	Tryon Rd	Sandra St					1.0				1.0			1.0				5.5				1	0.8	1.10	\$4,059,033	
Auburn Church Connector	Future Collector St	Auburn Church Rd					0.5				2.0				0.5			2.7				1	0.8	1.10	\$3,296,583	
Grovemont Extension	Existing Grovemont Rd	US 401	0.1								1.0	1.0		0.1						0.7		1	0.8	1.15	\$1,942,151	
Ten-Ten Road	NC 50	Lake Wheeler Rd				6.2					3.0	2.0										1	0.8	1.15	\$42,576,377	
Garner Road	Auburn Church Rd	Tryon Rd	5.7								4.0			5.7								1	0.8	1.15	\$31,650,441	
Vandora Springs Road	Garner Rd	Timber Dr	1.7																			1	0.8	1.15	\$8,152,235	
US 70	Future 540	US 401 Split			7.0						8.0											1	0.8	1.15	\$61,578,213	
NC 50 (Benson Road)	US 70	Ten Ten Rd		5.2							1.0	3.0										1	0.8	1.15	\$36,016,453	
White Oak Road	US 70	I-40	2.8								2.0		1.0	2.3								1	0.8	1.15	\$52,570,180	
Old Stage Road	US 401	Vandora Springs Rd	1.8								1.0	1.0										1	0.8	1.15	\$9,712,766	
Old Stage Road	Vandora Springs Rd	Ten Ten Rd	2.5								1.0											1	0.8	1.15	\$12,387,570	
Vandora Springs Road	Timber Dr	Old Stage Rd	1.0								1.0			1.0								1	0.8	1.15	\$6,409,609	
Aversboro Road	Seventh Ave	Timber Dr	1.7																			1	0.8	1.15	\$8,336,120	
Aversboro Road	Timber Dr	Lake Benson	1.2								1.0			1.2								1	0.8	1.15	\$7,477,990	
NC 50 (Benson Road)	Main St	US 70	0.4								1.0					0.4		11.4				1	0.8	1.15	\$13,389,617	
Jones Sausage/Garner Rd Connector	Jones Sausage Rd	Garner Rd	2.0								1.0	1.0					1.6					1	1	1.15	\$14,055,990	
TOTAL			17	6	9	7	6	2	67200	48000	22	23	0	1	13	5	2	4	46	11	13				\$400,609,970	

TABLE 18. BUS TRANSIT PROJECT COST ESTIMATES

Route Name	From	To	Cost Per Vehicle Hour	Route Length (Miles)	Area Type (urban, suburban, express, rural)	Average Bus Travel Speed (mph)	Total Round Trip Time (Minutes)	Bus Headway in Peak (minutes)	Bus Headway in Off-Peak (minutes)	Number of Buses in Peak Period	Number of Buses in Off-Peak Period	Weekday Peak Service (Hours)	Weekday Off-Peak Service (Hours)	Number of Regular (40') Buses	Number of Small Bus or Van	Shelters w/Concrete Pads	Benches	Bicycle Rack (Standard)	Trash Receptacle	Pedestrian Scale Lighting and Electrical	Contingency (% of Capital Items)	Annual Operating Cost	Startup (Capital) Cost	First-Year Costs
1 Green Loop Route	US 401	US 401	\$75	11.2	Urban	12	56	30	60	1.9	0.9	4	8	2	0	10	7	5	17	4	10%	\$324,800	\$796,750	\$1,201,225
2 Yellow Loop Ext	NC 50	NC 50	\$75	4.4	Urban	12	22	30	60	0.7	0.4	4	8	1	0	2	3	3	5	2	10%	\$127,600	\$346,700	\$508,970
3 Full Route (Green+Yellow)			\$75	14.6	Urban	12	73	30	60	2.4	1.2	4	8	2	0	12	7	6	19	5	10%	\$423,400	\$727,950	\$1,224,145
TOTALS																						\$875,800	\$1,871,400	\$2,934,340

Notes:

- (1) Costs are subject to variation based on inflation, cost of materials, and other factors.
- (2) Cost Source(s): City of Raleigh

5.3 Policies and Programs

The Town of Garner has adopted and amended policies – development ordinances – throughout its 100+ year history with the intent of creating a better environment for its citizens and more opportunity for economic development. Additionally, the Town can and does underwrite certain programs for generally the same purposes. Examples of beneficial programs and policies include the Music on Main concert series; the Garner Road and Timber Drive Overlay Districts that discourage unsightly and dangerous “strip” development patterns; the creation of an Economic Development Department; creation of a signage enforcement policy and neighborhood traffic calming program. Obviously, state and federal regulations and financial implications must be considered in the development of any new policy. Examples in the transportation arena include NCDOT policies on driveway design or street standards; and federal guidance, particularly the *Manual on Uniform Traffic Control Devices*, *Highway Capacity Manual*, and *Policy on Geometric Design of Highways and Streets*. The following are recommendations for the Town to continue to build on its history of effective and practical policies in the specific area of transportation. For ease of implementation, these recommendations are couched in the same order and under the same headings as existing development ordinances adopted by the Town. Where additional research is required prior to creating detailed recommendations, it is noted. These are only recommendations; the adoption of these recommendations in the Transportation Plan does not indicate immediate compliance but rather a concept that would require further detailing and undergoing the usual review process for an ordinance amendment.

Recommended Policy (UDO) Modifications and Updates

These are only recommendations; the adoption of these recommendations in the Transportation Plan does not indicate immediate compliance but rather a concept that would require further detailing and undergo the usual review process for an ordinance amendment.

1.0 Recommendation: Modifications to the Traffic Impact Analyses Requirements (Unified Development Ordinance: Article 3.5.) Traffic Impact Analyses (TIAs) or studies are used to help determine the impact that new or expanded business or residential land uses have on surrounding streets.

1.1 Include a requirement for calculation of internal trip capture and trip generation rates, respecting the mix of land uses, internal and external connectivity by biking/walking, and transit facilities and services. While

these offsets typically won't counteract the need to make roadway improvements, there will be an increased awareness of the seriousness with which Garner approaches these modes of travel.

1.2 Include mitigation measures for pedestrian and bicycling modes of travel, including interconnectivity and construction of proposed greenway trail and sidewalk network on the property; intersection improvements that may include enhanced crossing measures or signalization; and construction of sidewalk on public right-of-way from proposed major subdivisions to nearby (1/4-mile) major pedestrian generators (parks, schools, and shopping centers or office complexes of greater than 50,000 GLA). For all new public and private development or redevelopment projects, require the dedication of trail easements and construction of proposed bicycle facilities and/or greenway segments for those facilities identified in adopted plans, such as the *Transportation Plan* and previously adopted greenway plans.

2.0 Recommendation: Modification to TND and MXD Planned Development Districts (Unified Development Ordinance: Article 4.7). Traditional Neighborhood Development (TND) and Mixed Use District (MXD) are "floating" zoning categories that encourage non-homogenous land uses which, in turn, promote less automobile trips, reduce fuel consumption and pollution, and promote walking, bicycling and public transportation as viable forms of transportation.

2.1 Reduce minimum tract size for TND use from 40 acres to 25 acres.

2.2 Reduce minimum tract size for MXD use from 75 acres to 40 acres.

3.0 Recommendation: Modify Timber Drive, US 401/US 70, Timber Drive East, and I-40 Overlay Districts (Unified Development Ordinance: Articles 4.10 through 4.12 and 4.15). Another type of overlay zoning category, the overlay district specifies types of acceptable development and various design criteria to make development more amenable to adjacent property owners (e.g., zero foot-candle luminosity from lighting fixtures at property boundaries in the Timber Drive Overlay District).

3.1 Clarify that the restricted placement of "bus stations" does not include bus transfer centers or bus stops.

3.2 Modify the section on Street Access Standards to clarify that the access management guidelines in [Appendix D](#) of this Plan should be observed.

3.3 Add an element to the I-40 Overlay District that restricts new driveways within its area to one per existing parcel, and that this one access point may be required to be a right-in, right-out (RIRO) configuration if the property has adjacent access to another connecting street or to the parking area of an adjacent development.

4.0 Recommendation: Modify Swift Creek Conservation District to allow for pervious pavements for sidewalks, trail areas, and lightly used or overflow parking areas (Unified Development Ordinance: Article 4.13). Pervious pavements allow for infiltration of groundwater, albeit at a sometimes reduced rate compared with natural vegetation. Pervious pavements also require maintenance agreements.

4.1 Add an element to allow for pervious pavements for sidewalks, outlying parking areas, and trails/greenways such that these areas are not counted against the impervious surface calculations contained in this Article. Stipulate that a maintenance agreement with the Town must be in place prior to final approval that will maintain and keep in good repair and functioning condition the public area sidewalks and trails that use these technologies. Additional research on both the form of the maintenance agreement and its content (e.g., suction of debris to maintain a given level of perviousness) is required.

5.0 Recommendation: Modify Off-Street Parking Requirements. The values for required parking spaces do not accommodate shared parking or complimentary parking arrangements (Unified Development Ordinance: Article 7.4). Some additional research will be required to derive exact values for various categories of land use.

5.1 Create parking maximums for general categories of use, particularly retail establishments and office uses.

5.2 Require that no more than 25% of the parking of any new development occur between the fronting roadway and the front of the main structure for non-residential uses. An additional requirement may be considered such that no more than 25% of the parking be located to the side of the building (implying that at least 50% of the parking area is to the rear of the building).

5.3. The current section on joint parking use is couched as voluntary; this should be made mandatory unless clear hardship on one of the property owners is established.

5.4 Require bicycle parking installations at new commercial and institutional developments, as well as at high-density residential developments. A bicycle parking requirement can be achieved as a percentage of motor vehicle parking requirements, or assigned on a per-use basis (e.g. require one bike parking space for every four students at a new school site, etc). Examples of bicycle parking ordinances and specifications are available at <http://www.bicyclinginfo.org/engineering/parking.cfm>. The Town should also develop a retrofit plan for existing facilities at libraries, parks, shopping centers, and municipal facilities where racks are not present.

6.0 Recommendation: Discourage the use of the cul-de-sac (Unified Development Ordinance: Article 8). Cul-de-sacs, while promoting the segregation of housing to achieve higher purchasing prices for some units, also demote the interconnectivity of streets; place more traffic on and reduce performance of thoroughfares; discourage lower levels of transportation-motivated walking and cycling; and are less accessible to emergency vehicles.

6.1 There are several ways to mitigate the negative effects of cul-de-sacs: reducing maximum allowable cul-de-sac length; implementing a connectivity ordinance; or reducing maximum block face lengths or perimeters. This recommendation is often difficult to achieve, must respect the different land use characteristics of different neighborhoods, and should be undertaken with a task force that includes various private development interests, including at least one private developer that has a regular history of promoting interconnected and mixed use developments.

6.2 For all new public and private development or redevelopment projects, require direct pedestrian connections between cul-de-sacs to provide more walkable developments, and/or require greenway connections between adjacent cul-de-sacs and/or from cul-de-sacs to nearby schools, greenways, or other major public destinations (Figure 19).

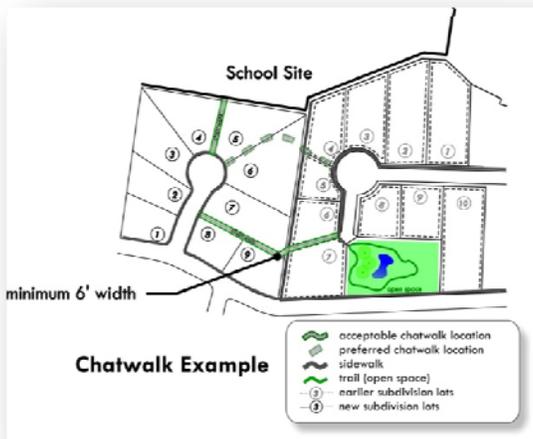


FIGURE 19. CHATWALK

7.0 Recommendation: Improve street design standards for more cycling and walking, as well as general updates and conformity checks (Unified Development Ordinance: Article 8.2). The current street design standards do not seem to conform to the most recent comprehensive land use plan intent, and include too-wide local

streets and non-uniform provisions for other modes of travel. See also the Best Practice Design Guidance in Section 5.1 of this Plan as well as the Access Management Guidance in [Appendix D](#).

7.1 Modify the Table Inset in Part (I) to note that local streets and rural streets (those with existing or anticipated traffic volumes of 5,000 vehicles per day or greater) should have sidewalk on both sides of the roadway.

7.2 Modify the street design standards so that local and non-commercial collector streets have a back-to-back curb width of no more than 27 feet (implying 11' travel lanes instead of 12' and 29' back-to-back widths).

7.3 Modify street design standards to require bicycle facilities on collector streets and thoroughfares. Generally, bicycle lanes are preferred where there are fewer driveway or street intersections that break the plane of a bicycle lane; wide outside lanes or sharrows are preferred in conditions where there is a prevalence of on-street parking or many curb cuts.

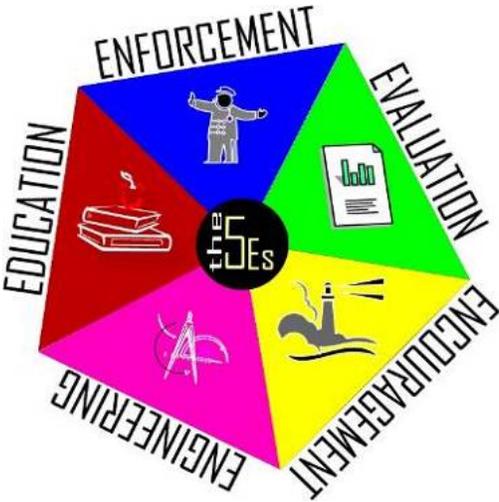
7.4 Revisit the Streets section language, since there is a misuse of subdivision "conformity" instead of "uniformity"; disagreement in table (580') and text (500') of maximum cul-de-sac lengths; lack of clarity about wheel stop overhang requirements (should always be three feet between wheel stop and pedestrian way), and a need for a general update of these requirements to include more up-to-date thinking of these requirements and their support of the comprehensive growth plan. Even on state-owned streets, the Traditional Neighborhood Street Design guidelines created by NCDOT can be applied to afford greater flexibility and lower impacts in downtown and mixed use development areas of the Town.

- Upon installation of bicycle lanes and facilities in the community, amend *Sec. 10-83. Parking in specific places prohibited* to also prohibit parking in/on a striped bicycle lane.
- Engineering Design Standards ("Town Standards") should be updated to include specs and standards for sharrow pavement markings and placement, bike lanes, greenway trail design and minimum sidewalk widths and buffer requirements. Bike lanes and sharrows should follow state and national guidelines; the NCDOT recommended width for a bike lane is five feet (with additional width for gutter apron).
- Update Appendix A of the Subdivision Ordinance to specify a 5' minimum for all sidewalks, with a 2'-3' minimum buffer (planting strip) for curb-and-gutter street sections.
- Develop overlay districts for the downtown area, requiring wide sidewalks (8 ft minimum) and strict requirements for parking lot design (placing parking lots behind buildings), more guidance on

massing, fenestration, scale and other building aesthetics, as well as uniform street furniture specifications (e.g. street lights, trash cans, benches, etc).

- Require direct pedestrian access to a building entrance via perpendicular sidewalks connections from street frontage (sidewalks) to building entrance. Additionally, require clear pedestrian walkways and crossing zones in parking lots.

Roadways and automobile travel are the predominant, even default travel mode for the great majority of people in Garner, and require no additional encouragement for their use. However, local policies, plans and programs can heavily influence the walkability and “bikeability” of a community, and significantly shape the pedestrian and bicycle environment over time. Creating strong policies and programs that help to actively promote good walking and biking conditions will mean a more balanced future transportation network and a shared private/public burden for providing that benefit. Policy amendments and planning activities can often be achieved at a low-cost to a municipality while resulting in substantial outcomes, and could help Garner make notable progress in developing a more livable community.



Garner and Wake County are experiencing and will continue to experience significant growth and development in the years to come. The shape and quality of future development will greatly impact the pedestrian- and bicycle-friendliness of the Town. If the Town can work with the development community to create a more multi-modal transportation network that includes sidewalk connections, bicycle facilities and greenways, Garner will continue to stand out as a Town with a high quality of life that attracts new residents, businesses and further economic development.

While private/public partnerships are important, it is also recommended that the Town create new policies to help guide Town staff in serving the local pedestrians’ and cyclists’ needs. Such policies will help “institutionalize” good pedestrian and bicycle design and programming throughout all Town departments, and create a truly balanced and comprehensive approach to implementing the Bicycle and Pedestrian Element of the Transportation Plan. Policy changes might include instituting local bicycle parking requirements, or develop a set of “green streets” design guidelines to encourage an environmentally-sound approach to future streetscaping, roadway and sidewalk projects. Safe Routes to School programming or a bicycle and pedestrian safety

education campaign could be implemented to encourage and educate the public about the benefits of biking and walking, and practicing safe driving behavior. The recommendations below summarize opportunities for policy and programmatic changes in Garner that will enhance the biking and walking environment.

It is recommended that a Bicycle and Pedestrian Advisory Committee or Task Force be formed to assist the Planning Commission, Town Council and Garner staff in implementing and evaluating the policy and program recommendations. The standing advisory committee could oversee the implementation of the bicycle and pedestrian elements of the Transportation Plan, and coordinate local bicycle and pedestrian policies and actions. The Committee could also coordinate annual bicycling events, review development plans for bicycle and pedestrian friendliness, and create other education and encouragement material and programs specific to Garner. The Committee and/or town staff should also consider creation of a bicycle and pedestrian program website to inform the public of their efforts and help to track progress on the Plan's implementation.

- **Road Construction and Maintenance** – Bicycle facilities such as bike lanes, sharrows, bicycle parking, bicycle-friendly drainage grates and signage should be considered on all new streets, roadway construction projects, and in all transportation maintenance projects. Garner should require other entities responsible for construction to consider bicycle facilities.
- **Interconnected Streets** – The amount of dollars available from traditional federal, state and local (public) revenue sources to finance major new roadway capacity projects continues to shrink. The status of North Carolina as a “Dillon’s Rule” state translates into fewer opportunities for adding new public revenue sources by local governments. And, although the NC legislature has recently modified a statute that now allows counties to construct and maintain roadways (long the purview of the State and, much less frequently, municipalities), there has been no accompanying divestiture of state funding to accomplish county-level roadway construction. Therefore, the need to interconnect streets has become more important to the mobility and economic development of every community. Often, this is accomplished through a combination of site ordinances that require connections to the edge of property lines; development and adherence to a collector street plan; and longer-term planning that speaks to both capacities of public transportation infrastructure and the allowable types and traffic generation characteristics of future land development. Each of these should be undertaken to ensure that

the street system becomes more connected, and monitored using a simple statistic that compares the number of street intersections to the number of street segments to provide a target and performance benchmark. Any new ordinance and practice should be developed with the input of private sector developers to fashion a fair but meaningful standard.

- **School Siting Policy** - The Town should work with Wake County to consider pedestrian needs during all new school placement decisions, especially when determining a rural/suburban site for a new school that is not within walking/biking distance of any residential development.
- **Sidewalk Maintenance** - The Town should consider a payment in-lieu option for limited cases where sidewalk may not be required, and utilize funds for sidewalk maintenance or spot improvements in other areas. In addition, the Town should develop an annual maintenance budget and schedule for routine sidewalk and crosswalk repair.
- **Integrate Explicit Pedestrian and Transit Requirements into Development Review Process** - Making the connection between pedestrians and transit use is a critical endeavor: without safe and consistent pedestrian access to transit stops, transit users often find themselves walking through muddy ground or in busy streets. Both existing and future transit provisions are important to consider, since many future transit provisions are provided on a piecemeal basis as new private development accesses adjoining street and pedestrian systems. An example is requiring all major pedestrian “attractors” (e.g., parks and schools) be shown within a quarter-mile on the location map on the front sheet of any proposed subdivision, rezoning, or construction plans.
- **Provide cursory review opportunities** for any new/proposed development (or an expansion worth 50% of the value of the existing property) that is located adjacent to any existing or proposed transit service line (CAT or Triangle Transit), including proposed Triangle Transit rail stations.
- **Modify the current “checklist” of items that should be reviewed for each new/proposed development** or expansion of 50% of the value of an existing property that cover pedestrian, cycling, and transit provisions. Internal sidewalks, transit connections to the property, mobility-handicapped provisions, and street furniture should adhere to existing minimum standards. (See [Table 18](#) for a comprehensive pedestrian-transit checklist.)

TABLE 19. PEDESTRIAN AND TRANSIT CONNECTIVITY CHECKLIST

Landscaping and Amenities

- Shelters should be well-lit and constructed of materials that do not obstruct views out of or into the shelter.
- Provide a minimum four-foot wide clearance zone from the curb so that opening bus doors are not blocked by street furnishings, sign posts, landscaping, or other obstructions.
- Sidewalks should be provided within designated bus zones with a flat landing area for wheelchair access to transit services.
- Provide open sight lines and avoid placing shelters, furnishings, and vegetation that may obstruct driver and waiting passenger views. Clear zones should be a minimum of 4' wide.
- When there is a planting strip adjacent to the curb, provide a sidewalk slab that extends from the existing sidewalk to the curb so that passengers do not have to cross wet grass or mud during inclement weather.

Traffic and Stop Design Considerations

- Bus pullout locations are often warranted where there are heavy traffic conditions. When pullouts are to be located near intersections, a far-side location is preferred. The needs of the passengers boarding and exiting the bus should not conflict with the needs of pedestrians and bicyclists moving through the area. Curb bulb-outs at the nearby intersection help pedestrian crossing movements, prevent motorists from entering the bus pullout area, and reduce conflicts with bicyclists traveling through. Pullouts should be designed to meet roadway conditions and bus characteristics. Configurations of pullouts should allow buses to pull up directly adjacent to the curb.
- Curb heights should never be higher than the height of the bus step to prevent falls during passenger boarding and departing. Older buses tend to have a bottom step that is 14 to 18 inches above the roadway. Newer buses can have bottom steps as low as 11 inches above the roadway.
- On streets with parallel parking, near-side bus stops can benefit from elongated curb extensions that provide passengers adequate area to board or exit the bus without having to step into the street or the stream of pedestrian travel on the adjacent sidewalk.
- Transit riders need to be able to cross the road safely at transit stops. On a typical two-way street, with residences and development on both sides, half the riders will need to cross the road when boarding or exiting the bus. Mid-block crossing facilities should be provided at mid-block bus stop locations.

Bus Stop Location and Placement

- Provide nine feet of clearance from the curb for wheelchair lift operation; four feet for the lift to extend and 5 feet for the wheelchair to maneuver beyond the lift. The ADA requires a minimum width of three feet for accessible paths of travel but generally, path widths adjacent to transit should be wider to accommodate groups of pedestrians as well as wheelchair users. Six-foot minimum sidewalk width is suggested for paths next to transit. In high-use urban areas, 10 feet minimum is recommended. Design bus stops to accommodate wheelchair lifts. Only as a last resort should a zone or stop be inaccessible, including nearby curb ramps.
- Bus stop design should avoid conflicts with other types of uses. For example, bus stops should not interrupt bike lanes, and waiting areas and shelters should be provided to the side of the walkway so that pedestrians can pass passengers waiting to board.
- Avoid locating bus stops where there are curbs of varying heights.
- All transit stops should be easy to reach by walkways. Transit stops should include sheltered, visible, and comfortable seating areas and waiting spaces, set back from the walkway.
- Strategically locate bus stops to minimize crosswalk movements of transferring passengers if transfer movements between bus routes are heavy. For example, locate bus stops on the same corner of an intersection so users are not required to cross the street.
- Bus stops should provide shelters for protection from weather and a secure waiting place for transit riders based on boarding/alighting counts.

- **Promote pedestrian-oriented transit development**, especially near future Triangle Transit rail transit stations. Additional discussion of development near regional rail stations can be found in *Station Area Development Guidelines for the Regional Transit Stations* (December, 1998). Although somewhat dated, these guidelines were done specifically for rail service of the type being contemplated for this region, and are recognized as important guidance.



- **Create a “Universal Access Certificate” for developers** that exceed minimum standards in the areas of pedestrian, cycling, and transit design. Developers like to acknowledge the merits of their projects during Planning Board and Council reviews, and may be convinced to “go the extra mile” to receive such a commendation from the review committee. Exceeding requirements is interpreted as adhering to the best practice guidelines in Section 5.1, as well as to the transit checklist provided in this section. The determination of the certificate award will be made by the majority of staff conducting reviews during the circulation of the site plan.

- **Annual Bicycle Projects Budget** – Bicycle improvement projects are presently implemented as ancillary construction to larger projects, such as a road widening or multi-use path as part of a new parks and recreation project. Garner’s bicycle needs cannot be met with ancillary projects alone. The major roadblock to increased bicycle projects is financing. Garner should create an annual budget for dedicated bicycle projects as a way to accelerate the process of improving bicycle friendliness in Garner. While roadway construction projects will remain the primary source for incidental installations, other projects that increase awareness of bicycling as a viable alternative to the automobile and implementation of many of the recommendations of this Plan should be considered.

- **Town Employee Bicycle Use** – The Town should support and promote bicycling by Town and other government employees. Garner should establish policies that encourage bicycling, including flexible commuting times and habits that may be needed by cycling commuters. Garner should consider establishing an emergency ride home policy for bicycling commuters. All Town facilities should have safe, secure, and adequate bicycling facilities such as bicycling parking, showers, and dressing areas for workers who cycle to work. These policies should be advertised and distributed to existing Town employees and be included in new employee information packets.



- **Cyclist / Driver Education Pamphlets** – Garner should develop and distribute educational material that clearly explains the rights and responsibilities of motorists and cyclists alike. A good example of one

such pamphlet has been developed by NCDOT. This “Bicycle Laws of NC” provides concise information for road users. These pamphlets should be provided to police as well as the public to ensure those enforcing the laws are educated on the State’s bicycling laws and the bicycle/vehicle relationship. These pamphlets might serve as a good substitute or be provided in addition to a first time offender’s citation. Schools can also serve as an excellent dissemination method for this information. Driver education program providers in Garner could also be provided with copies of the pamphlets and encouraged to review the material with student drivers. This could be of particular benefit during driving lessons by providing real-world examples that reinforce correct behavior and illustrate wrong behavior that should not be copied. Bicycle-related laws are available online at http://www.ncdot.org/transit/bicycle/laws/laws_bikelaws.html. The full bicycle/pedestrian law guidebook is available at <http://www.ncdot.org/transit/bicycle/laws/resources/BikePedLawsGuidebook-Full.pdf>. Triangle specific materials are also available through Triangle Transit’s Commuter Resources department: <http://triangletransit.org/about/directory/#cr>.

- **Annual Bicycling Events** – Garner should develop bicycling events that take place throughout the year. These events could be stand alone events or tied to other special happenings in the community and could be weekly, monthly, yearly or periodic events that are designed to promote cycling in Garner.
 - *Bike to Work Week* - Garner should encourage Town employees, local businesses and the community at-large to participate in a town-wide Bike to Work Week program. This could include a pledge and a town-wide event with contests, incentives, and prizes for employers and their employees who participate in Bike to Work Week activities. Prizes could include gift certificates to area or online businesses that encourage bicycling. More information on national “Bike Month” events is available at <http://www.bikeleague.org/programs/bikemonth/>.
 - *SmartCommute Challenge* - Garner should continue to participate in the annual SmartCommute Challenge event, coordinated regionally by Triangle Transit. This event not only provides social marketing to encourage biking, walking and taking transit to work, but also involves opportunities for major employers to track and report alternative commute rates over time. More information is available at www.smartcommute.org



FREE PEDESTRIAN SAFETY POSTER AVAILABLE FROM FHWA. OTHER AVAILABLE ITEMS INCLUDE BROCHURES, PSAs, MEDIA MATERIALS AND A CAMPAIGN PLANNING GUIDE.

Source:
http://safety.fhwa.dot.gov/local_program/pedcampaign/index.htm

- **Sidewalk Spot Improvement Program** - This is a capital improvement program item that targets short, missing segments of sidewalk; pedestrian crossing aids; signage; and other low-cost improvements costing less than a fixed amount. Maximum return of limited dollars is the goal of the program.
- **Pedestrian Safety Education Campaign** - A pedestrian safety campaign can be a branded town-wide effort involving multiple departments (e.g. Public Works, Planning, Police Department), civic organizations and neighborhood groups in an awareness building effort to address local pedestrian issues. Pedestrian safety initiatives might focus on speeding, reckless driving, unsafe pedestrian behavior, child safety or failure to yield issues. For instance, speeding motorists might be targeted with a “Keep Kids Alive, Drive 25” campaign, while common but unsafe pedestrian behavior is addressed through educational materials and handouts distributed at local events and public venues like the library and schools. TV and radio PSAs on pedestrian safety might be utilized to create local awareness of issues such as school zone safety. Finally, the Town might also consider posting bicycle and pedestrian related laws and safety information permanently on the New Bern Town website for reference. For a list of relevant state statutes, visit www.ncdot.org/transit/bicycle.
- **Safe Routes to School Program** - A Safe Routes to School (SRTS) program is a school-based effort that involves young students, teachers, law enforcement officers and parents in the development of school safety and encouragement initiatives such as Walk to School Day, Walking Wednesdays, pedestrian safety assemblies and bicycle rodeos. These programs can help engage children in safe walking behaviors and encourage more walking and healthier lifestyles. Common steps to creating a successful program are to kick-off with an event on International Walk-to-School Day, then subsequently work with PTA members, teachers and students to identify needs and program ideas while incorporating encouragement measures and education into the school curriculum for students to learn safe walking and bicycling skills and the benefits of an active lifestyle.

Funds are available through the North Carolina Department of Transportation for planning and infrastructure work intended to encourage safe walking and bicycling to elementary and middle schools. Development of a SRTS Action Plan could help with program development and in making key physical improvements within the vicinity of local schools. SRTS workshops are also available through NCDOT to aid in the development of local SRTS Action Plans and are an opportunity to bring together school administrators, faculty, staff, and representatives from related agencies such as health departments, law enforcement, engineering, and town planning to discuss local issues and solutions. Resources and information are available at www.saferoutesinfo.org. NCDOT funding applications and

information on local resources are available at <http://www.ncdot.org/transit/bicycle/saferoutes/SafeRoutes.html>.



- **Start a Self-Guided Walking Tour for the Downtown Loop.** Walking loops, tours, and historic walks are gaining in popularity. A number of Garner residents commented on how much they enjoy the Lake Benson loop walk, and completing the sidewalk sections for the Garner Loop would be popular as well. Suggestions for supporting the Loop Walk include unobtrusive, in-ground mile markers; less-frequent wayfinding and monument signage; and developing a reference map to be given out to local area restaurants and retail centers. More people walking will invariably lead to more support for additional pedestrian improvements and facilities, as well as achieve the goal of a healthier, tighter-knit community.

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Appendix A: Public Engagement Process and Comments

The following pages and table summarize the public engagement comments received through an on-line and paper-based survey instrument, as well as comments received from the Steering Committee and public at a kiosk at the annual July 3rd Celebration at Lake Benson Park (2009). At this last event, consulting and Town staff received 37 comments as people stopped by the booth to look at preliminary recommendations for roadways, public transportation services, and bicycle/pedestrian facilities.



July 3rd Celebration Comments

Roadway Comments	Transit Comments	Pedestrian Comments	Bicycle Comments
Timber extension ASAP! Love Vandora Springs extension idea!	Better access is good	More sidewalks, or at least wider shoulders Thanks for finally building my sidewalk!! - Vandora Springs	More is better - Bike lanes and Green ways Need more!
	You need a bus stop in Garner going to Wake Tech. I do not believe there are enough people to justify a light rail.	Safe sidewalks and crossings are excellent ideas	
Light at intersection of Ten-Ten & Fanny Brown			
	I like the park-and-ride on south 401		
Looking forward to Timber Dr. being completed			
It seems like when it's done, there will be less traffic. It will be more convenient to get out of town.	Not accommodating for my commute, but may alleviate traffic pollution for many		
Too much traffic. Too many people and not enough roadways.	Wasn't aware of transit system. Looking forward to more info.	Lots of areas for walking. Looking forward to the greenways.	Need bike paths. Difficult to share the road with bikers.
Widen 50	We need rail		Restrict riding to bike ways.
Liked the timber extension to 70 & to Lake Wheeler. I strongly agree with the roundabout at Vandora Springs.		Would like to see a pedestrian walking connecting Eagle Ridge to Vandora Springs like the proposed sidewalk at Buffalo Rd. to Lake Benson.	
	Very interested in ability to catch ride connecting to CAT/Raleigh. Wish there was more public transit.	Work on previously proposed greenway to Cloverdale Park.	Work on previously proposed greenway to Cloverdale Park.
Gotten very busy. Keep Garner's small town appeal.		We need more sidewalk construction.	
I-540 would be a huge benefit for our lifestyle; working in North Raleigh.		Living in Eagle Ridge, there is no pedestrian access out of the subdivision.	
401: Old Stage gets backed up a lot. Not sure what can be done.			



Roadway Comments	Transit Comments	Pedestrian Comments	Bicycle Comments
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We live off of Hwy 50 & the volume of traffic has increased greatly, especially in the AM. We would like to see it widened.			
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	Rail system needed.		Like more greenways/ bike lanes.
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Timber Dr. all the way to White Oak		We need sidewalks connecting from Vandora Springs to Buffalo (connecting the existing neighborhoods).	Bicycle path would also be great to have along the road to Lake Benson Park.
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Timber Dr. to White Oak with side walks		Trails to White Oak/ Lake Benson from all directions in Garner	Trails to White Oak/ Lake Benson from all directions in Garner
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Timber Dr. to White Oak! Thanks!		Need sidewalk from Lake Moor to Lake Benson Park.	Share the road signs. Bike lanes.
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Well kept, some areas need work.			I am a bicycle commuter. Bike lanes on Hwy 70 and 401 would be awesome!!
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4 lanes on Hwy 50 to Swift Creek.			
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Do not condemn land for right of way expansion. Need more impact [assessment] before decision.			
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			Bike routes to shopping areas, please!! Trails should terminate at Sharrows!
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Roadways are bad.	We all like transit to get around. It would be good to get Triangle Transit service from Garner to RTP directly.	More sidewalks along Aversboro past Lake Benson.	
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Roadway Comments	Transit Comments	Pedestrian Comments	Bicycle Comments
<p>Timber Dr. between Hwy 50 & Aversboro: add landscaped grassy median in place of center turn lane where possible (there are several long stretches where people don't need to turn - need this for pedestrian access to US Post Office & other stores, etc.).</p>	<p>Great idea to extend Bus #7 route, especially for magnet schools.</p>	<p>Same as Roadway Comment</p> <p>Great idea to add sidewalks. We NEED safe walking on Vandora Springs by Buffalo!</p>	
<p>Continue to protect Lake Benson watershed. Large church with paved parking is being built on Rand Rd. near 10-10.</p> <p>would be nice to have Timber Rd. complete.</p>			
<p>Complete Timber Dr. (near Rex Healthcare)</p>	<p>Check lights at 401 & Old Stage Rd., at times the wait is more than 3 minutes.</p>		<p>Would be nice to see more bike trails.</p>
<p>Ease congestion.</p>	<p>Trail/Train/Bus - Raleigh commuters</p>	<p>More sidewalks. Sidewalks on Vandora Ave. and Lakeside. Good start - 7th Ave.</p>	
<p>Hope it comes - soon!</p>			
<p>Good roads. Well planned.</p>		<p>Excellent accessibility. Glad to see side walks everywhere.</p>	
	<p>At the moment I sometimes take the Triangle Transit to Downtown, so I would be very happy to have more options.</p>		<p>I would like to have the bike trails to start biking!</p>
		<p>Glad to have more pedestrian walkways in Garner for my family.</p>	<p>This is great to help Garner residents stay healthy.</p>

Appendix B: Survey Results

Summary of Survey Methodology. In total, 159 survey responses were received (n=159 unless otherwise noted), 145 of which were conducted through an on-line survey mechanism. The survey tool used allows for cross-tabulation of responses; that is, how a group responds to one question can be compared to how this same group responds to another question. All survey responses were ultimately entered into the on-line system with a label of “Paper Survey” inserted into the comment field for those surveys completed on paper. The survey was open from February 26 through May 30 of 2009, and was promoted at the Steering Committee Meetings, where members were asked to distribute survey reminders with the www.GoGarner.org website prominently visible. Additional reminders were created and distributed at a Chamber of Commerce open house event as well.

Summary of Respondent Demographics. Nearly 65% of respondents lived in Garner or lived and worked in Garner. Over half (55%) stated that they had lived in Garner longer than 20 years, and just 4% less than two years. This is a fairly noteworthy demographic statistic, since the Triangle Region has tended to attract many newcomers over the past two decades. Over three-quarters (76%) stated that they lived with a spouse or partner. Most (54%) of the respondents were between 45 and 65 years of age, with no (0%) persons responding being under the age of 18 years. Since over a quarter (27%) of Garner’s residents were under the age of 19 in the 2000 US Census, this statistic is noteworthy for its probable skew on biking and walking propensity in later questions although slightly more people cited that they bicycled and walked than the US Census indicated in 2000.

Table 1. Comparison of Transportation Plan Survey (2009) with US Census (2000)

Source	Spouse*	Age Over 40	Bike/Walk to Work
Transportation Survey (2009)	76%	59.8%	2.0%
US Census (2000)	52%	42.2%	1.1%

*Includes “partner” (unmarried) option in the transportation survey.

Summary of Survey Findings. Respondents were asked a variety of questions about issues concerning their transportation experiences in Garner, as well as weighing the goals that the Steering Committee had created earlier.

- *Roadway and Intersection Improvements.* NC 50 (Benson Road) was cited most frequently by all respondents as needing improvements, followed by Old Stage Road and US Highway 70. Garner Road was also cited frequently. [Table 2](#) indicates that there are some differences in the way certain groups responded according to their age and their status as residents in Garner. NC 50 (Benson Road) and Timber Drive is the most-cited intersection needing improvements; this will eventually become a four-legged intersection that will accrue only minor improvements in the level of service after Timber Drive is extended. Other intersections needing an improvement were US 70 / US 401, and Ten-Ten Road / Old Stage Road.

Table 2. Comparison of Roadway Priorities by Age and Residency

Road Name	All (n=159)	Over 65 (n=14)	Live in Garner (n=65)
NC 50 / Benson Road	43%	36%	32%
Old Stage Road	38%	50%	28%
US 70	38%	29%	42%
US 401 / Fayetteville Road	31%	36%	35%
Ten-Ten Road	26%	14%	20%
Timber Drive	20%	21%	26%
Garner Road	18%	36%	17%
Jones Sausage Road	15%	7%	9%

- *Bicycling and Walking.* A friend’s house, park/recreation center, and, somewhat surprisingly, a grocery store (11% at least once per week) are the places where people are most often walking or biking now in Garner. Over one-fifth of the respondents noted that they walk to a park or recreation center at least once each week. [Table 3](#) below indicates which improvements in the bicycling and walking environment might have the largest impact to certain destinations. More facilities (sidewalks and bicycle lanes) are important to a great many people, especially for park/recreation center/library, grocery store, and visiting friend trip destinations. Land use planning and organization are almost equally important to many of the respondents, with most citing in the 15% to 21% range of willingness to bicycle and walk more often if the destination were closer to their starting point.

Table 3. More Bicycling and Walking if Improvements Were Implemented

Destination	I would walk/bike there more often if there were more sidewalks or bike lanes.	I would walk/bike there if the location were closer.	I would walk/bike there if one or more intersections were made safer to cross.	I would walk/bike there more often if there were benches, bike parking or other amenities.
work	11%	13%	0%	2%
a school	18%	6%	2%	3%
religious institution	9%	15%	6%	3%
the grocery store	25%	11%	11%	6%
the library	28%	14%	9%	6%
a park or recreation center	39%	15%	6%	8%
a restaurant	23%	19%	5%	4%
shopping	22%	17%	6%	4%
a friend's house or to visit family	37%	15%	7%	3%
the post office	20%	21%	3%	5%

- *Goals for the Transportation Plan.* Creating a safer, more efficient plan was important to the respondents, but so was creating a plan that was achievable and implementation-oriented.
- *Additional Comments.* The comments were typically diverse, but a surprisingly frequent response was the desire for more public transportation in the Town (especially to downtown Raleigh), as well as more bicycle and pedestrian facilities. The area, and the nation, was just emerging from a nearly unprecedented spike in fuel prices which may explain some of the desire to see more of this type of transportation. Other responses were not unexpected, such as the need to complete Timber Drive Extension as well as making minor roadway repairs.

Part I: Tell Us About Yourself

Please tell us if you live or work in Garner...

Response	Response percent	Response total
I live in Garner	39.6%	63
I work in Garner	19.5%	31
I live AND work in Garner	35.2%	56
I neither live nor work in Garner	5.7%	9
Total # of respondents 159. Statistics based on 159 respondents 0 filtered; 0 skipped.		

Please tell us how long you have lived in Garner...

Response	Response percent	Response total
I have lived in Garner less than two years.	4.2%	5
I have lived in Garner between two and five years.	23.5%	28
I have lived in Garner between five and ten years.	16.8%	20
I have lived in Garner longer than 10 years.	55.5%	66
Total # of respondents 159. Statistics based on 119 respondents 0 filtered; 40 skipped.		

Please give us an idea of your family status (check all that apply)...

Response	Response percent	Response total
I live alone.	10.1%	16
I live with a spouse or partner.	76.1%	121
I live with one or more roommates (not a spouse or partner).	0%	0
I live with one or more adult family members (not a spouse or partner).	7.5%	12
I live with one or more children.	42.1%	67
If you have other living arrangements, please describe.	1.9%	3
Total # of respondents 159. Statistics based on 159 respondents 0 filtered; 0 skipped.		

Please tell us your approximate age...

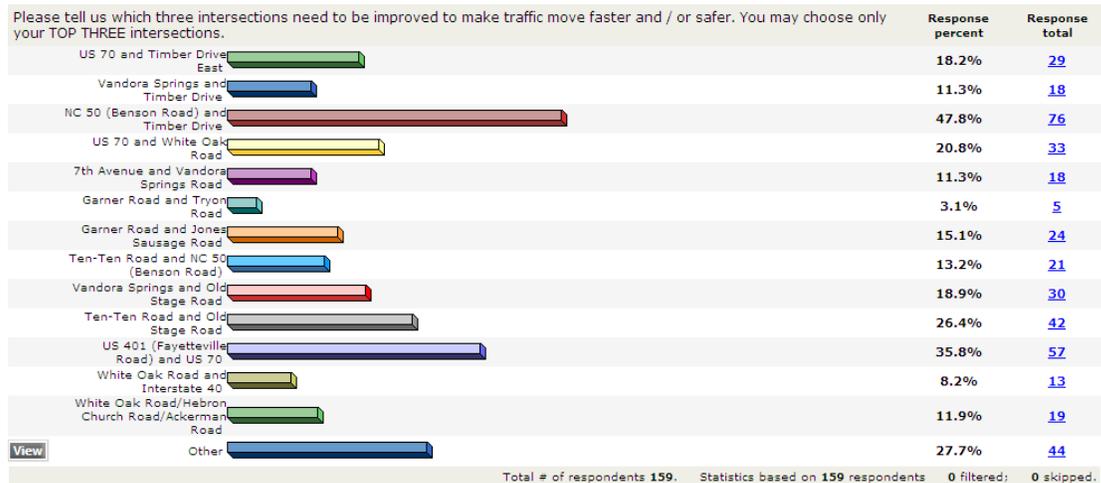
Response	Response percent	Response total
I am younger than 18 years old.	0%	0
I am between 18 and 25 years of age.	5%	8
I am between 26 and 40 years of age.	35.2%	56
I am between 41 and 65 years of age.	54.1%	86
I am older than 65 years of age.	5.7%	9
Total # of respondents 159. Statistics based on 159 respondents 0 filtered; 0 skipped.		

Part II. About Transportation in Garner

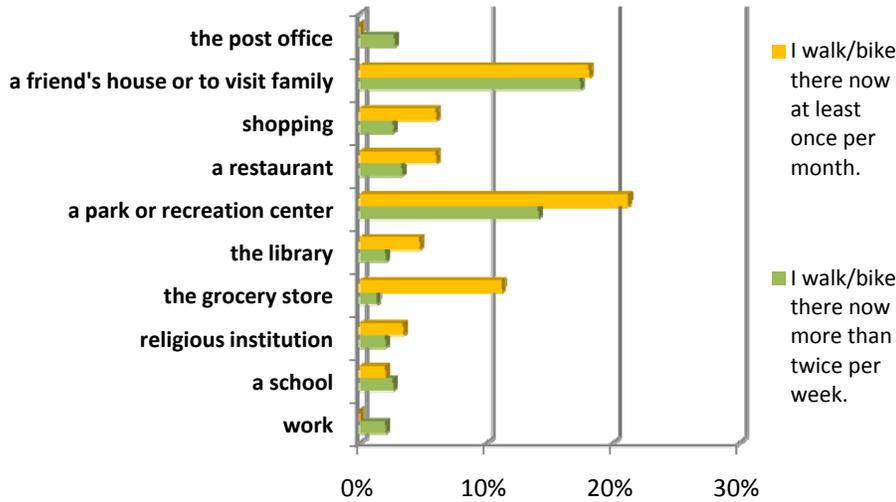
In order of priority to fix, please identify the TOP THREE roads where you currently encounter traffic safety or other problems....



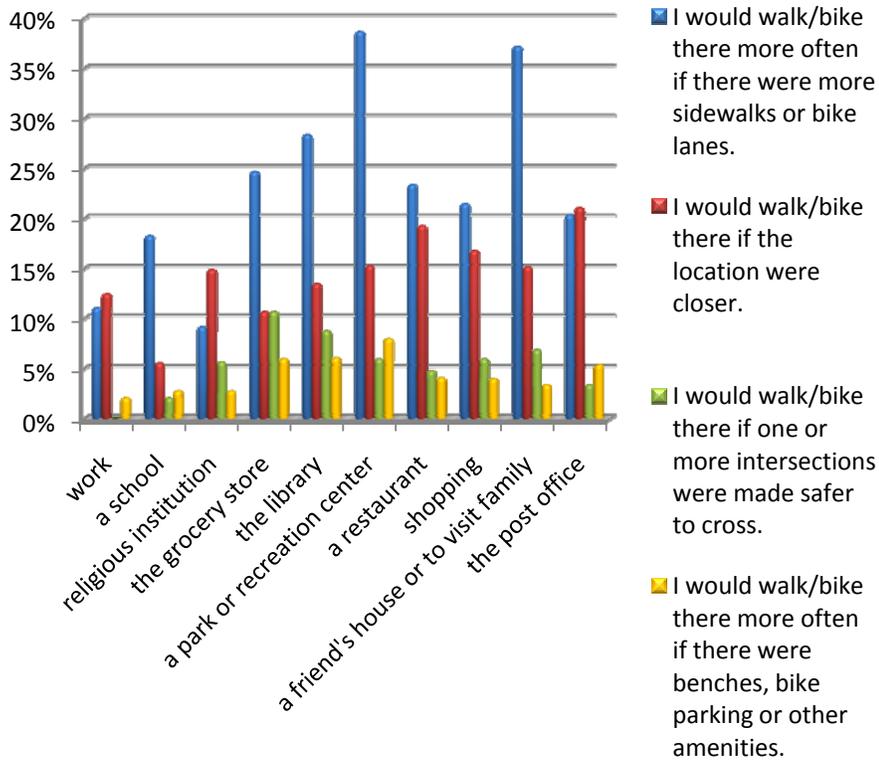
Please tell us which three intersections need to be improved to make traffic move faster and / or safer. You may choose your TOP THREE intersections....



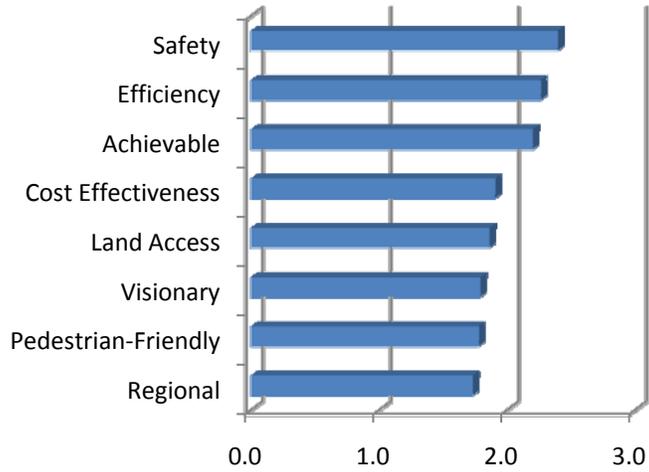
Please tell us how much you walk or bike to the following places NOW ...



Please tell us how much you WOULD walk or bike to the following places if they were made safer....



We always have to weigh our priorities - how would you like to see your time and money spent on the following goals for Garner's transportation future? Please spend EXACTLY \$10 on each of the following goals.





Please tell us if there are any other issues you believe should be a goal of the Garner Transportation Plan	Please tell us if you have any other comments or concerns about TRANSPORTATION issues in Garner
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I would like to see sidewalks, crosswalks, and safe travel areas for pedestrians and bikes to access the library, restaurants, parks, etc.	no
Landscaping along roadways essential, shouldn't be an afterthought or low monetary priority. Pedestrian and cycling areas should be well lighted for safety.	Lack of major connectivity to areas west of Garner may hinder higher income homeowners from locating in Garner . Entrances into Garner from 70 or 401 aren't as appealing as they could be.
Join Hwy 70 to Main Street to have every government office there centrally.	Thanks for having this study!!
Take a bus to Raleigh from where I live. Now the bus leaves Garner and get to Raleigh at 7:30. I need to be in downtown Raleigh at 7:00 am. Triangle Transit Bus	none
We should explore commuter rail and bus service to Raleigh and other surrounding towns.	None at this time
I have 2 young children and we are constantly afraid to have the children out in the yard because of the speed of the vehicles that travel on Lakeside Drive between Aversboro and Vandora Springs. Some of these vehicles exceed 60 mph in a posted 25 mph zone. A 3-way stop at the top of the hill at Frances Drive would be a big help in slowing these cars down.	None
OLD STAGE & US HWY 401 AREA	N/A
none	Consider better traffic flow at the 70/401 split. There are so many retail stores and restaurants that I avoid going to because of the congestion and complicated traffic pattern in that area.
Finish Timber Drive to White Oak (Timber Dr East)	Light is too long at Rand Rd and US 70E as far as the light on 7th Ave and Vandora Springs Rd the NO TURN ON RED between hours don't work. People are turning anyway.
Extend Timber Drive to White Oak SC soon	Garner police should look at safety when pulling a car off the road. Many times that leave both cars in a traffic lane that ties up traffic
Better bus access beyond 5th avenue and white oak	Concerned that there is not enough public transportation and REALLY want sidewalks!
Please pave Bryan Rd. With all the new construction on Bryan it is being used more and more to access Hwy 50. We could also use a light at Bryan & White Oak. This is a dangerous intersection. Thank you	Complete Timber Drive extension!
NEED MORE SIDEWALKS AND NEED A GREENWAY	WOULD REALLY LIKE TO SEE A SIDEWALK ON BUFFALO ROAD NEAR DUNHAVEN--TOO CLOSE TO PARKS BUT TOO DANGEROUS TO WALK. NEED TRAFFIC LIGHT AT BUFFALO ROAD AND BENSON ROAD.
Future planning for businesses associated with the Timber Dr extension.	Overall, the transportation system is very efficient.
Finishing Timber Drive.	N/A
COMPLETE TIMBER DRIVE!!!!!!!!!!!!!!!!!!!!!! This has been in the planning for years. Quit building new parks and complete this plan. It will relieve traffic congestion on HWY 70!	Fix the potholes!
.	Would like to see Triangle Transit service restored to Timber Dr.
Please re-evaluate all the egress onto 50 highway in the stretch of road between Timber Dr. and Van Story Hills Subdivision. Shouldn't we close that access road behind the old Hardees and route people to the light at the intersection? Have you seen this at rush hour?	Extend a turning or additional lane from Timber Drive to Van Story Hills Subdivision. Accidents here, traffic bottlenecks. Close access road that travels behind the old Gas Station/Hardees and route people to use just the Timber/50 intersection.
Transportation to RDU airport and Raleigh downtown with safe pickup and drop off locations so we can leave our cars home. Complete the connection of Timber Road to White Oak.	I moved to Garner because of the accessibility to shopping, Raleigh downtown, the NC beaches and (believe it or not) less expensive gas stations. My bicycle and I feel "trapped" in Vandora Pines subdivision because there are no shoulders, sidewalks or bike paths on Buffalo Road.
We need well planned out bus routes in Garner to cover our area with reasonable walking distance to the bus stop. Our senior population will be	no





Please tell us if there are any other issues you believe should be a goal of the Garner Transportation Plan	Please tell us if you have any other comments or concerns about TRANSPORTATION issues in Garner
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growing and they would possibly use buses much more if timing, connectivity and cost are reasonable. Our students could be using the buses to go to school and cut out the school buses. School bus cost would be transferred to local transportation systems.	
People are running red lights and making U-turns where there are signs not to (additional signs need to be put on the medians- driver's height)	You are doing a wonderful job and I appreciate all that you are trying to do to improve Garner.
beautification - landscape architecture	none
Connect Timber Drive to White Oak	none
More bike lanes! I live in Hunter's Mark on Jones Sausage Road. There should be bike paths to connect East Garner Middle School and Creech Road.	To sound like a broken record, more bike lanes!
Living off Buffaloe, I really want sidewalks and I think this would be quick...a lot of families in this area. Also, with the new park across from Lake Benson going in, more people would utilize it.	Making things look "prettier" along Garner (especially) near 70 and 410.
Synchronize Timber Drive stoplights all the way through Hammond Rd. Synchronize Hwy 70 lights from Timber to White Oak.	none at this time
Develop Timber Drive to White Oak as soon as possible. Also make this more pedestrian friendly. Place as many sidewalks as possible on Timber Drive, Aversboro Rd., Vandora Springs Rd to provide pedestrian access to Town Hall, Library, grocery stores and pharmacies.	none
Extend Timber Dr. To White Oak Shopping Center	We need more sidewalks
light rail. Alternatives to car.	That we not get farther behind in transportation. Thank you for looking ahead.
Timber Dr while we are alive!!!!!!	Hwy 70 because the Timber Dr extension is not done or even started!
Look at doing something in a timely manner. Act on decisions instead of having them be put off for 5 or 10 years. Garner needs bicycle paths, walking paths, safe street crossings - NOW. The Town is growing faster than the Town can provide for the citizens. More people will be looking at moving to Clayton instead of Garner.	I am very excited about the sidewalks finally going in on Aversboro Road and completing a loop. This is a real plus to the Town. Now if we can get some bicycle paths and have some races the Town can make some money and promote our Town as well.
Fix the timing on existing traffic signals. The people changing or setting the green time lengths at the intersections of Timber Dr./Aversboro (green time for Aversboro is like 10 sec), NC50/Timber Dr, Vandora (we need a left turn green arrow from Timber onto NC50)Springs/Timber (just in the last week! Vandora Springs green time cut in half, during morning commute this is causing large back-ups on Vandora from Old Stage)	I believe that putting a roundabout at the intersection of Buffaloe/Vandora Springs is a dumb idea. A roundabout will cause more confusion and accidents than anything and currently the intersection is (based on my daily commutes through the intersection is not bad. Constructing a right turn lane from Buffaloe onto Vandora Springs would be the only improvement I feel is warranted.
I would spend the \$10 on the development for a more accessible transit system throughout Garner especially Aversboro & Timber.	I would love to see Garner have a better transit system because not everyone own a vehicle and better yet if they do they could save on gas money by riding the transit bus. I hope to see Garner have a transit bus that holds the hours of the #7 CAT bus running at least every hour M-Sat.
1) a round-a-bout between the confusing intersection of Fifth Avenue, Village Court Drive, and Aversboro Road. The entire sections of Aversboro Road from Hwy. 70 to the light at Seventh Ave. needs to be widened with curb & gutter and at least a sidewalk along one side of Aversboro Rd. 2) improvements to the intersection of Buffaloe Road and Vandora Springs road; a round-a-bout has been proposed by NC DOT and may be a safe solution. 3) improvements at the intersection of Circle Drive and Benson Road (Hwy 50); the close proximity to the exit ramp off Hwy 70 makes this a dangerous and tricky intersection; need to close this part of circle Drive off and move the intersection south closer to the First Baptist Church. 4) need to provide a straight lane and a turn lane at the intersection of Broughton Street and Garner Road on Broughton St.; the AM traffic from the middle school would flow better if there was a right only lane at Broughton St. and Garner Road. 5) continue the sidewalks along Main Street from where the sidewalk ends all the way to Benson Road.	Continue to push for an accelerated time-line for the completion of Timber Drive east!!





Please tell us if there are any other issues you believe should be a goal of the Garner Transportation Plan	Please tell us if you have any other comments or concerns about TRANSPORTATION issues in Garner
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As I stated before, I am very concerned about the future of Foley Station and our lack of safety with regards to sidewalks, shoulders and the impending extension of Timber Drive. We need to be protected from becoming a pass-through for speeding cars and our families deserve the opportunity to ride our bikes or safely walk outside of our small neighborhood. I'm happy to volunteer for the committee if need be.	Thank you for taking the time to read my comments.
I don't have anything to add.	the lights along US 70 from timber to white oak need to be synchronized during rush hours times especially at 70 and rand rd, traffic is almost backed up to Hwy 50 bridge in the afternoon, and then it lets maybe 10 cars thru at a time. It is ridiculous to have to wait that long on 1 light.
Garner has limited roadway access from east to west with US 70 being about the only corridor that we should still push for trying to connect Vandora Springs to 401 in order to provide more connectivity to White Oak area to 401 area.	Some roads still in bad need of resurfacing such as Rand Road from 70 to 50 and Vandora from 7th Ave across the bridge to Old Garner Road.
always have a good budget number for road maintenance and repaving	Please stop wasting time and taxpayer money Greenbrier traffic calming study.
Highway or Road safety implementation.	None
Dupree St, Circle Dr and Hilltop Ave areas are a constant cut through for Town employees and many others. It desperately need curb and gutter. These locations are behind the chamber of commerce and all surrounding streets have curb and gutter. The town needs to do away with the unsightly ditches along these streets and the streets are entirely too narrow. Another problem is that there are kids in this area and the stop sign at the corner of Dupree and Butler is ran more often than not.	We need more concentration and improvements in older sections of Garner 1st!
More stoplights at dangerous intersections. Eliminate 4-way stop signs since it seems to me that most people don't know when to go or stop. Complete Timber Drive.	Something needs to be done at Timber and Thompson Road during the hours when school is beginning and ending so that the traffic can move more smoothly.
maintenance would be nice. Places sidewalks exist are not always well maintained.	Please finish Timber Drive!
Completion of Timber Drive	Completion of Timber Drive
Updating speed limits when developments go in such as housing developments, shopping centers, etc. Speeds at these locations should be at a lower speed limit or turn lanes or lights be added. Hwy 50 is a prime example of a very unsafe area when it comes to the housing developments just south of the timber drive intersection. The speed limit is too high for the traffic and amount of stops that are going on in that area.	Only one listed above.
Add more medians to the sides of the roads like Vandora springs from timber to old stage road. sad sad how there is no side median. No sidewalk. Sad. I used to live in North Raleigh and we had all of those amenities and it was nice.	I have several but I'd like to hear more about your plans before I fire off. I know that change is like turning around a big ship in the sea. It takes time.
widen nc50	none
Personally, I would probably not use public transportation because my husband and I both have a car. I think that a lot of people in Garner are in a similar position and wouldn't use the transportation frequently. I do think however, that putting money into walking trails, and better walking/biking routes or lanes would be a good use of money.	No, I'm good. But, could the park in the Cloverdale community be developed a little more? It could really be a great asset to Garner. Just to pave or better develop the trail running through it would be great!
I think we should be actively planning for transportation that does not requires family-owned cars as the primary mode.	n/a
Maybe a better bus route and more bus stops at convenient places	More sidewalks and better bus routes
local bus system such as the one in Cary, maybe 3 times a day that circles senior center, recreation areas, Rex wellness shopping centers	Strongly support sidewalks in residential neighborhoods to promote health and fitness as well as safety. See comment about local bus service
Local bus system that was timely and affordable.	None right now.
Fix the Jones Sausage/Garner Road Intersection.	none
complete timber drive more sidewalks to connect housing communities to	thanks for the light at New Bethel and Hwy 50!!





Please tell us if there are any other issues you believe should be a goal of the Garner Transportation Plan	Please tell us if you have any other comments or concerns about TRANSPORTATION issues in Garner
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shopping	
Improve the safety of intersections on Timber Drive , light controlled turn lanes. Walkways to our parks etc. Better maintenance of our existing streets	Years ago the Chamber of Commerce did a study that indicated the desire of our citizens to have better connectivity with 401 South. Nothing has ever occurred with this issue. This survey did not raise that issue in any way. Suggest a more meaningful survey that addresses this issue.
Improve business opportunities.	I hope the plan can ease congestion.
Make the transportation an action plan with achievable low-hanging fruit improvements. The State of North Carolina can no longer be depended upon to handle our "town" transportation needs. We must do it ourselves and our citizens should get accustomed to "doing it yourself". If we can identify that one or two projects that we can achieve on our own, we will go a long way in altering the mindset from waiting for others to do it to self-sufficiency. Let's not make this just another plan but rather an achievable action plan.	1. Improve the appearance of Old Garner Road. The town has a landscaping incentive plan in place and we may need to expand our scope to strategic widening. 2. Realign and improve the grade(s) on the segment of Vandora Springs Road from Old Stage road to Timber Drive. 3. Educating the working public on public transportation opportunities in Garner is an issue of some concern and the Town may be able to assist in this arena. If we can gain more ridership, we can secure support for increased levels of service. I have never liked or used local public transportation; however, the necessity is becoming more obvious with each passing day.
in Garner, we need to build a link or connector between hwy 50 Hwy 70 and Hwy 401; there needs to be an easier route these 2 hways. SR 1010 should be widened to 4 lanes between Hwy 50 all the way to Cary and Apex, NC	we need a local bus that runs along Timber Drive and loops over to White Oak; goes by Kroger at 70 and Timber
Extend Timber Dr to White Oak	Paper Survey
Pot holes, speeding, safety	paper survey
Safe Access to Raleigh	Paper Survey
The future is public transportation. We need to work toward a car less society	Paper Survey. Garner is not pedestrian friendly and all of our overweight citizens need more incentives to walk, run and bike
Fix NC 50/Garner Rd intersection very dangerous. provide Sidewalks on NC 50. Connect parks with trails and greenways	paper survey
connectivity of neighborhoods	paper survey
None	Bus service to expand more into Garner to run more often. paper survey
Re-paving New Rand Rd and Mechanical Blvd	paper survey
More greenways, where biking and walking can be achieved without having to worry about safety	Widen NC 50. Morning traffic is tough especially during school times
I can imagine that you have a hard job weighing the priorities of the vision for Garner. I think we have a great town. I'd like to see an innovative plan that's cost efficient and can meet the needs of a number of various transit methods.	I'd love to see a rail stop near downtown. I'd love for our neighboring towns to get together and work on a mass transportation plan. I think the reality of focusing a lot of money into making Garner more pedestrian friendly is absurd. Keep the pedestrian budget limited to neighborhoods. Garner is spread out, I can't imagine walking anywhere besides my neighborhood.
Make Garner more walkable (pedestrian friendly) There are a lot of shopping near residential subdivision and parks. We currently can only access them safely by driving even though the park is only two blocks away.	I currently do not use public transportation; however I do bike and walk and find it quite difficult to get around safely.
Continue with Timber Dr ext	Accidents at new light on Hwy 70 at Exxon prior to timer drive.
It's already being addressed, but sidewalk connectivity is important. Though I like my house, I regret now that I did not purchase one that is in the older residential area that is more connected to the library, restaurants and shops. I hope the 50 Timber area will become more safely connected as Garner extends Timber Drive.	Again, I see it being addressed, but safer intersections, especially in the residential areas will be key to getting people to walk and bike. Also, I think we need to build awareness to break the assumption that residential and commercial should be separate. Thank you for being proactive on transportation planning!
To provide safe access from my sub-division to the Parks that are close by my neighborhood. Even though we are close there is a feeling of isolation not having sidewalks or bike paths. Also, the fact that the traffic and speed	Thank you for this opportunity to express my concerns regarding connecting my neighborhood with the excellent recreational facilities the Town is investing in. It would be





Please tell us if there are any other issues you believe should be a goal of the Garner Transportation Plan	Please tell us if you have any other comments or concerns about TRANSPORTATION issues in Garner
on Buffalo Road makes walking on the road unsafe.	great to have either bike or walking access to these Parks and more. Regards, Jeff Mullen
New Rand Rd is in need of repaving. It is constantly getting pot holes, most of which are filled in a timely manner but is a terribly bumpy ride	no
accommodate increased traffic	rush hour congestion
Making some of the traffic lights better as far as timing goes.	none
n/a	the traffic on hwy 50
Timber Drive Extension needs to be completed from Hwy 50 to Hwy 70 with access to I-40 as soon as possible.	The regular Traffic Back Up from Rand Mill Road to Lakeside Drive on Hwy 50 with the ancillary back ups on Timber Drive needs serious attention.
Additional east and west corridors through Garner. Timber, US 70 and Garner Road is not enough.	No
complete timber drive extension ASAP, turn timber drive into the Cary parkway of garner	Vandora Springs needs repaved badly, commerce suffers
Be careful when weighing the walking/biking option. If you look at communities where walking and biking are popular it is because they have facilities that people want to go to i.e. parks, museums, theaters, clubs, restaurants, etc. Garner is a bedroom community with no central shopping/entertainment district - things are awfully spread out so biking/walking/running should be examined as an activity in and of itself. In other words. Exercise and not a viable transportation alternative.	I do not.
Alternative modes of transportation, bus route. Better road system with more lanes to accommodate traffic.	none
connecting White Oak Rd. with Timber Dr.	none
speed bumps in neighborhoods to slow traffic especially in neighborhoods that can be used to "cut through" from one major road to another.	possibly increase use of bus stops with Triangle Transit target lower income areas
connect to all wake county towns with a mass transit system.	high priority
Not that I can think of.	Not unless you could get moped drivers a place to ride instead of the street.
Build roads without so many stoplights	There is a lot of maintenance needed
I would ask if the Town would look into improving the crossing at Timber & Aversboro by the Lowes foods. My daughter crosses there 3 days a week and EVEN with the crossing button has almost been hit 3 times!!!! One GPD officer stated that it is a VERY dangerous intersection, and that they write around 30 tickets every week there!!!!Needs help there!!! Thank you for your survey.	not at this time.
repair existing street	no
Segway parking I would love to see a program where you rent a bike ride it to destination and turn it back in- You would need several docking stations for bikes for this to work, i.e. Lake Benson, Timber Crossings, Aversboro school, Town Hall/ Library area, Target shopping Center	We need a healthy mode of transportation system to encourage getting out and moving- a biking system would be great
I appreciate the new sidewalks that are being installed on Aversboro Road. It would be nice to have sidewalks in all residential areas.	No comments or concerns
Get Timber Drive extended to White Oak.	N/A
Cannot think of it right now	Transportation to Raleigh
It would be great if these things could be done without raising taxes.	none
the bus system from Raleigh should be extended into more of garner	none at this time
HAVING CHILDREN ASSIGNED TO NEIGHBORHOOD SCHOOLS SO THEY MAY WALK OR RIDE BIKES TO SCHOOL IF IN A CERTAIN DISTANCE. WOULD SERVE AS A BUS SAVINGS ALSO CARPOOL LANES WOULD NOT CAUSE A TRAFFIC HAZARD.	WIDENING OF TEN TEN & OLD STAGE DUE TO TRAFFIC AS WELL AS DAILY ACCIDENT OCCURENCES. REVAMP ACCESS IN & OUT OF SHOPS AT 401S & TEN TEN.
Senior transportation for those who cannot drive is important. The senior population is expected to quadruple in the next 15-20 years.	none
Fix the traffic light @ Ten Ten rd. & Old Stage for a turning signal, from Old	Pedestrian friendly and less congestion on Ten Ten Rd.; and





<p style="text-align: center;">Please tell us if there are any other issues you believe should be a goal of the Garner Transportation Plan</p>	<p style="text-align: center;">Please tell us if you have any other comments or concerns about TRANSPORTATION issues in Garner</p>
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<p>Stage left onto Ten Ten Rd. Some sort of fix for road congestion and occasional accidents at Ten Ten Rd. & Fanny Brown.</p>	<p>Old Stage and Fanny Brown Rd.</p>
<p>widen highway 50 from 70 all the way to 42 to 4 lanes of traffic. It is impossible to get anywhere at rush hour in AM or PM on 50 or 40</p>	<p>I'd have to see what was on the table for discussion as this survey was not very enlightening as to what is possible nor what is probable nor what is in budget</p>
<p>Improve traffic flow on NC50. Traffic in the mornings and evenings backs up for miles</p>	<p>no</p>
<p>ensure emphasis for commercial growth is matched by adequate transportation infrastructure for all users. also, no specific mention of light rail? for commuter into the beltline, with Garner growth, this element would serve better than bike paths, walkways, or greenways @ this point. Not that those are not important, but first must meet the needs of the folks trying to get to work & not burden them with added commercial traffic generated from the new tax base. -prioritize-efficiency 1st, aesthetics & ambiance later?</p>	<p>fast growing town, right trans plan now, can save huge \$\$modifications later. again key is to prioritize to ensure growth plans & infrastructure plans are in alignment.</p>
<p>traffic flow on main hwy.. timber, 50, 70,401 especially at rush hr time.. light are not sequenced to allow for smooth traffic flow out of Raleigh</p>	
<p>convert hwy 70 to a curb and gutter, sidewalks, tree lined parkway, aesthetically pleasing and friendly to business.</p>	<p>none</p>
<p>I walk within the shopping center where I work also I walk at home but I live outside the city limits.</p>	<p>I think this should be left to the transportation experts. Not people without the knowledge to know all the facts.</p>
<p>Goals should keep the main stream of traffic from residential areas and on the main highways. All high traffic residential areas should have sidewalks or paths.</p>	<p>main problem is too many people speeding and driving on side roads instead of taking the longer main roads, this is dangerous for residents and makes it nearly impossible to leave or get home.</p>
<p>No major issues except the intersection of Jones Sausage and Rock Quarry Rd.</p>	<p>.</p>
<p>Extend Timber to White Oak, close the part of Old Rand Road that bears off to the right off 50, and the mess at 401, 70 & Mechanical</p>	<p>Thank you for all you guys/ladies are doing and have done.</p>
<p>Put more roads in place that will connect North Garner to Southern Garner other than US 70 or E Garner Rd.</p>	<p>N/A</p>
<p>Synchronize stoplights along Hwy 70</p>	<p>None</p>
<p>?</p>	<p>intersection of Aversboro & Village Ct dangerous</p>
<p>I believe the main goal for transportation should focus on pedestrian traffic (walking, bicycling, scooters).</p>	<p>None</p>
<p>Consider transit transportation with the elders of this community in mind.</p>	<p>No</p>
<p>Work on timing the traffic signals</p>	<p>Signal light coordination seems to be one of the most important issues - if it is improved, I believe the traffic on 401 and 70 would flow</p>
<p>Hwy 50 south corridor should be upgraded as well as the corridors from it, i.e. Rand Road and 1010 and i40 and 42 area</p>	<p>not at this time</p>
<p>The extension of Timber Drive from Hwy 50 to White Oak Rd.</p>	<p>The stop light on Hwy 70 at New Rand Rd. backs-up east-bound traffic for three light changes during afternoon rush-hour traffic.</p>
<p>While I do not know its current state, 30 years ago Ames, Iowa was ideal for bicycling. Every major road had a bicycle lane and paved bicycle paths cut between roads to shorten bike trips. The result was lots of bicycles (with baskets or carriers) and trips, even across town, that hardly took longer than driving. Because of the quantity of bicycles, they did have low cost optional bicycle registration stickers from the police department to reduce theft. Garner is still small enough and has enough amenities to approach that if it fits the vision.</p>	<p>I live in Foley Station and many neighbors are concerned about cut through traffic from Benson Rd to New Rand Rd. We understand it will happen, but many cars are going way too fast. It is a broad street so the cars tend to go 25-35 mph. This is a neighborhood with many children aged 2-15 and visibility up the street is poor because of curves, landscaping and parked cars. We all feel lucky no child has been hit and wish we could somehow slow the traffic. Unfortunately, the street is long enough that obstacles seem impractical and the traffic seems almost entirely to be going in and out of Bainbridge so I really don't see a way to reduce it without losing accessibility to our neighborhood.</p>

Please tell us if there are any other issues you believe should be a goal of the Garner Transportation Plan

Please tell us if you have any other comments or concerns about TRANSPORTATION issues in Garner

I would love to see more sidewalks. Especially along Vandora Springs Road so that my family and I could walk to the Food Lion and Swift Creek Coffee area. I believe that sidewalk-heavy communities bring in young people (exercisers) and young families that we need desperately here in Garner, especially now. I have lived in this town for nearly 30 years and I can see the town turning negatively. We need to bring in more desirable residents and stop losing them to Holly Springs and Fuquay. We are located way too close to Downtown Raleigh to not see my co-workers and their ilk moving here. Houses are cheap here and can be fixed up for less than these cookie cutter homes in those mentioned towns. We need to offer a tight community and get people out of their homes and into the community, and I think sidewalks and more recreational areas will help tremendously.

A small, specific, time limited tax for sidewalks and bikeways should be considered.

Thank you for this survey and the voice.

Thank you!

Appendix C: Roadway Maps

The following pages are descriptions of the major roadways in Garner and their existing and anticipated future conditions. Each is accompanied by a graphic showing the current (as of this writing) land use at the top of the page, and major conditions for sidewalk presence, traffic volumes, accidents and other information in alignment down the page. The graphic below shows the location of various elements of the roadway maps on each page.

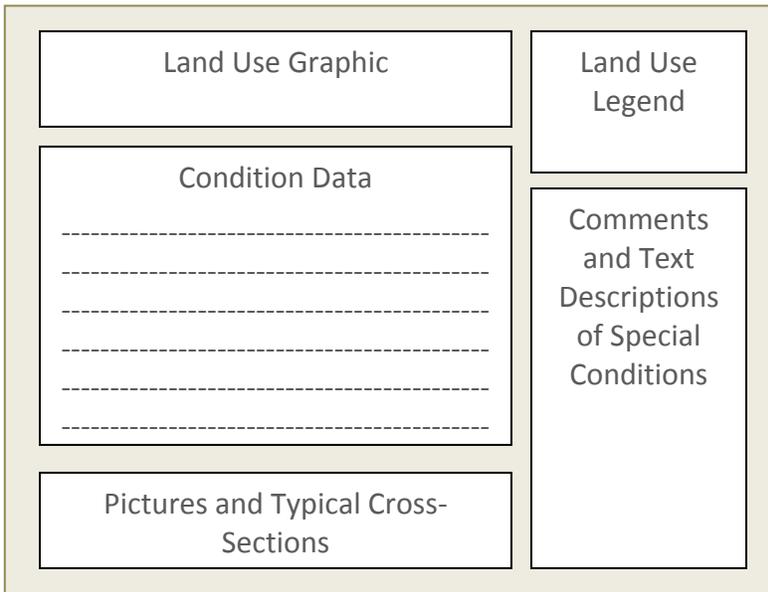
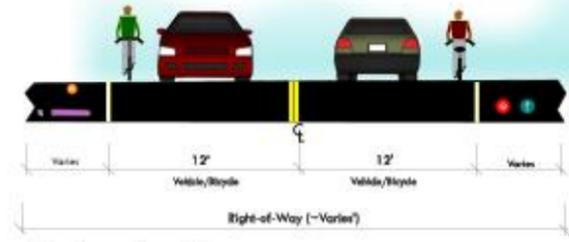


Figure. Roadway Map Page Layout

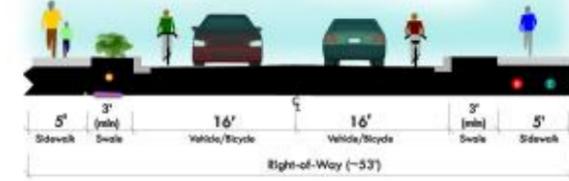
	Number of Lanes	Lane Widths	Median Present	Speed Limit	Sidewalks	Bike Lanes	Wide Outside Shoulder	Curb & Gutter
Tryon Road								
Garner Road to US 401	2	12'		45	✓		2'	
US 401 to Lake Wheeler Road	2	12'		45				
Bryan Road								
White Oak Road to End	2	10'		45				
Seventh Avenue								
Vandora Springs Road to Aversboro Road	2	12' northbound 10' Southbound		35	✓		1'	✓
New Bethel Church Road								
NC 50 to End	2	11'		45			1'	
Raynor Road								
White Oak Road to Bricksteel Drive	2	11'		45				
Bricksteel Drive to Waterford Drive	3	12'		45	✓			✓
King Arthur Road to Hwy 70	1	11'		45				
Lake Wheeler Road								
Ten Ten Road to Tryon Road	2	11'		45			1'	
Rand Road								
NC 50 to Ten Ten Road	2	10'						
Loop Road								
Garner Road to Spring Drive	2	10'		35				2'
Spring Drive								
Timber Drive to Vandora Springs Road	2	11'		35			1'	
Main Street								
New Rand Road to Benson Road	2	10'		35	✓			✓
Ackerman Road								
Hebron Church Road to Woodtrestle Way				35			✓	
Woodtrestle Way to Bryan Road				35	✓			✓
Yeargan Road								
Garner Road to US 70	2	9'		35			4"	
Woodland Road								
Old Stage Road to Timber Drive	2	9.5'		35			6"	
Timber Drive to Brompton Avenue	2	9.5'		35			6"	✓
Brompton Avenue to Vandora Springs Road	2	9.5'		35			6"	
Walls Store Road								
Rock Quarry to Auburn Church Road	2	10'					6"	
Mechanical Boulevard								
US 70 to Garner Road	2	12'		35			6"	
Lakeside Drive								
Hwy 50 to Phillip Street	2	21.5'		25				✓
Phillip Street to Aversboro Road	2	13'		25				✓
Hebron Church Road								
White Oak Road to New Bethel Church Road	2	10'		45			6"	
Guy Road								
Hwy 70 to NC 42	2	12'		45			2'	
Governmont Road								
Timber Drive to Old Stage Road	2	12'		35			1'	
Creech Road								
Garner Road to Tennis Courts	3	10.5'		35				✓
Tennis Court to Creech Road Elementary	2	10'		45				
Buffaloe Road								
Vandora Springs Road to Misty Meadow Lane	2	10'		45			6"	
Misty Meadow Lane to Navan Drive	3	10'		45	✓			✓
Navan Drive to Buffaloe Road	2	10'		45	✓			✓

The chart at left indicates the existing street cross-sections for major and minor streets in Garner.

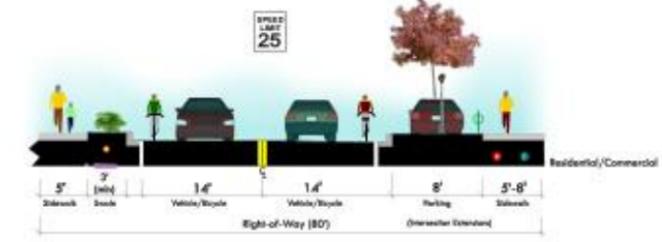
A



B



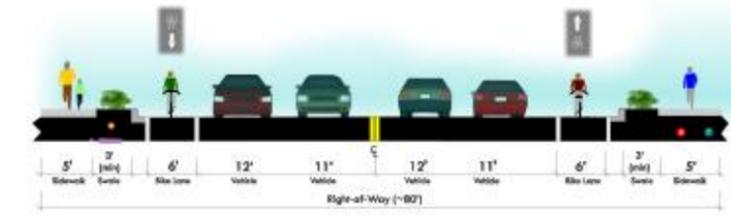
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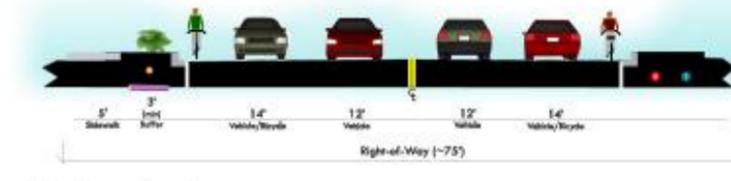
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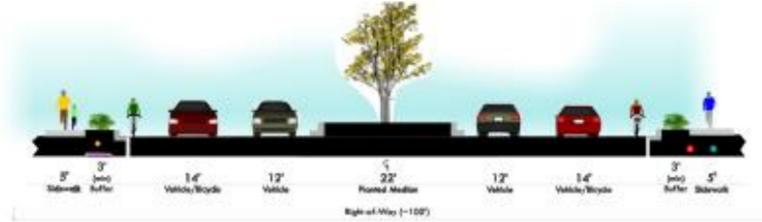
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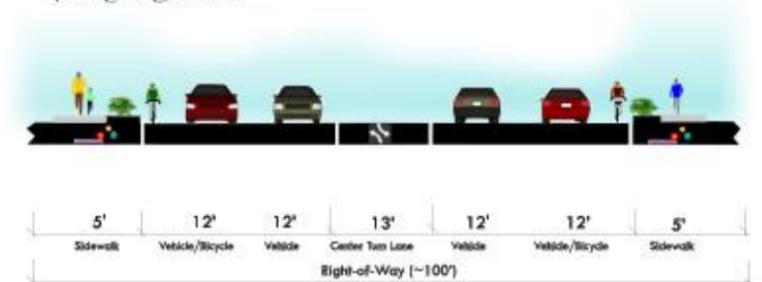
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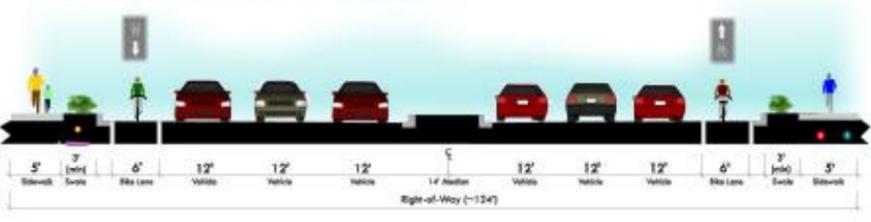
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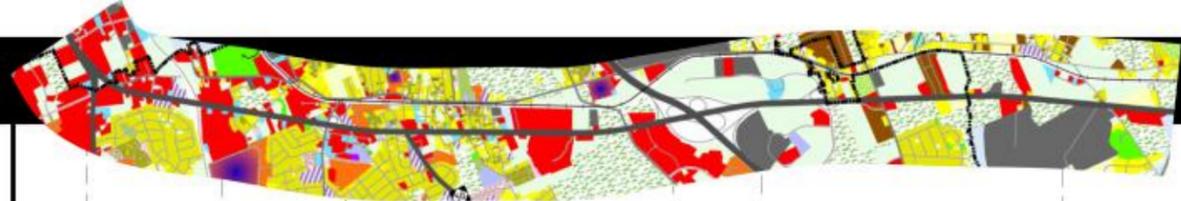
H



I



*ROW AMOUNTS ARE APPROXIMATE AND CAN VARY.



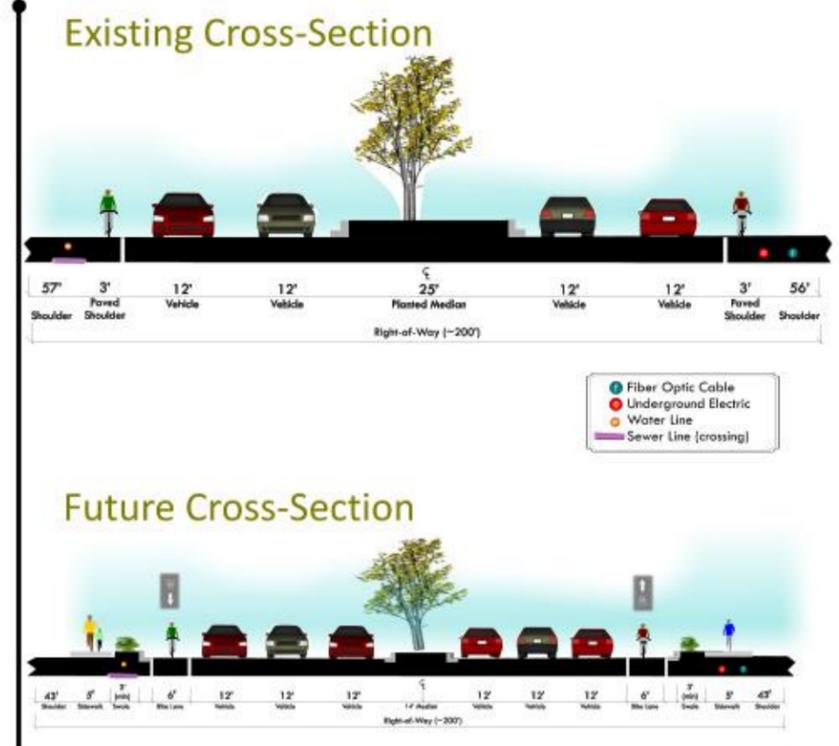
US 70

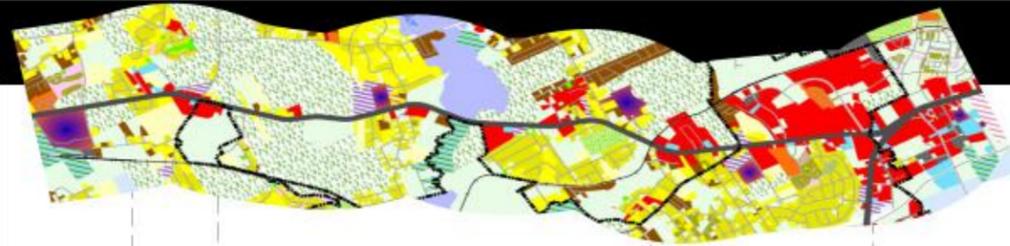
Land Uses	401	Vandora Springs Road	50	White Oak Road	40	Raynor Road
Cross-Streets	Timber Drive					
Speed Limit	45			55		
Sidewalks	NO NO					
Lane Widths (feet)	12'					
Right-of-Way (feet)	200'					
Shoulder Width (feet)	3'					
Accidents (Annual)	190					
Current Volume	22,000	33,000	25,000	29,000		
Future Volume	16,300	23,100	12,700	26,800		
Existing Cross-Section	G					
Future Cross-Section	I					

Legend

Existing Land Use 2008

- Agriculture, Forestry, Horticulture
- Estate Residential (less than .2 units per acre)
- Low Density Residential (.2 to 1 unit per acre)
- Medium Density Residential (1 to 4 units per acre)
- High Density Residential (over 4 units per acre)
- Mobile Homes and Mobile Home Parks
- Apartments
- Cemetery
- Church
- Schools, Educational facilities and daycares
- Fire and Rescue Stations
- Golf Courses and driving ranges
- Library
- Non-profit/ private club
- Senior / elderly Housing
- Utilities (water, sewer, electric)
- Private Open Space
- Garner Parks
- City / Town
- County
- State
- Federal
- Office
- Commercial
- Industrial
- Vacant



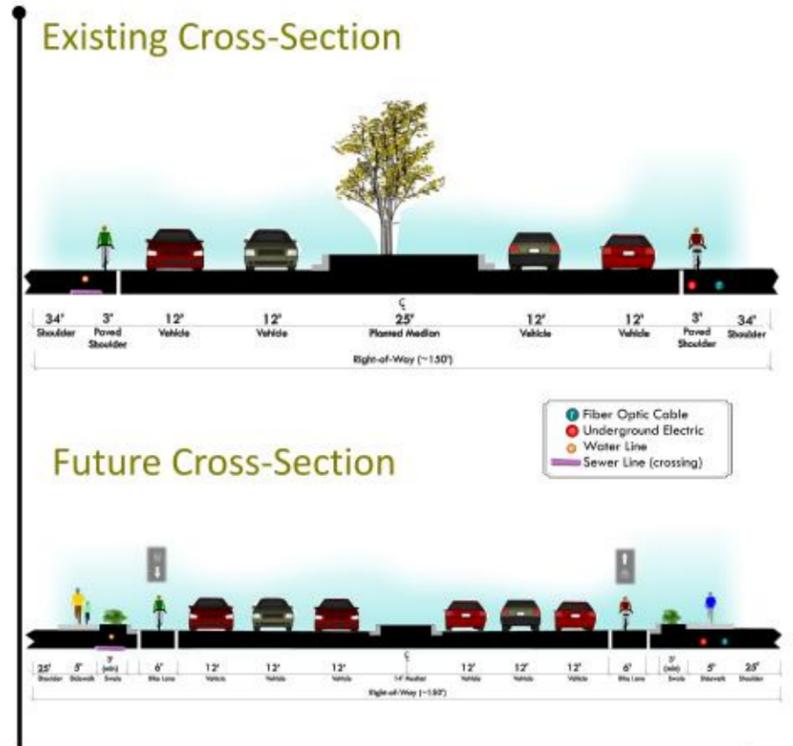


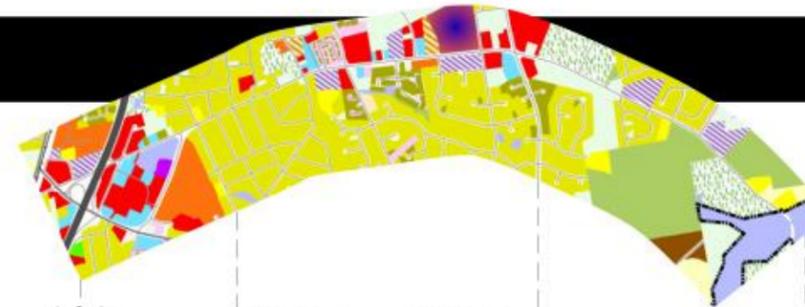
	Wake Technical College	Ten Ten Road	Old Stage Road	US 401
Land Uses	[Map showing various land use colors]			
Cross-Streets	Wake Technical College	Ten Ten Road	Old Stage Road	US 401
Speed Limit	55		45	
Sidewalks	NO			
Lane Widths (feet)	12'			
Right-of-Way (feet)	100'	87'	100'	
Shoulder Width (feet)	1-2'			
Accidents (Annual)	150'			
Current Volume	34,000	40,000	41,000	
Future Volume	48,000	51,000	82,000	
Existing Cross-Section	G			
Future Cross-Section	I			

Legend

Existing Land Use 2008

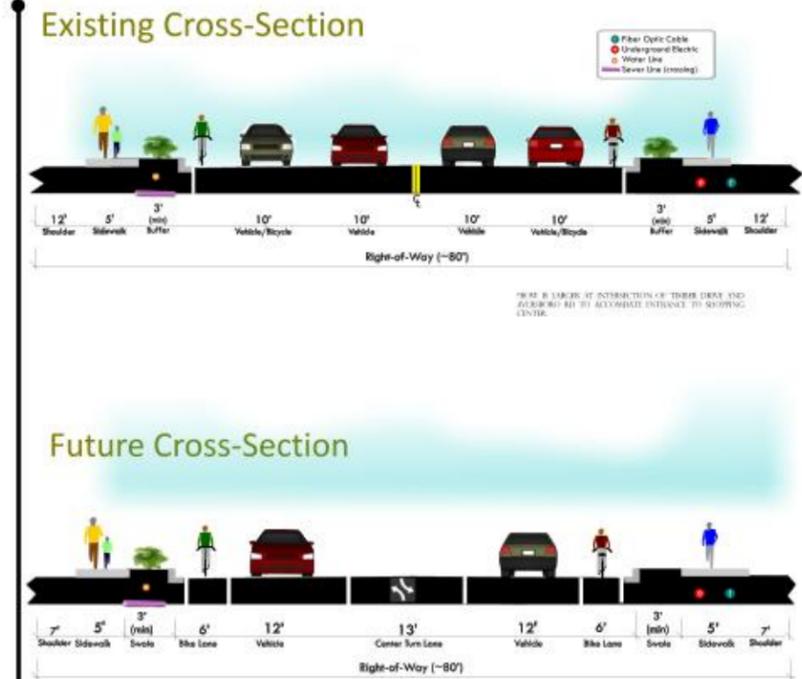
- Agriculture, Forestry, Horticulture
- Estate Residential (less than .2 units per acre)
- Low Density Residential (.2 to 1 unit per acre)
- Medium Density Residential (1 to 4 units per acre)
- High Density Residential (over 4 units per acre)
- Mobile Homes and Mobile Home Parks
- Apartments
- Cemetery
- Church
- Schools, Educational facilities and daycares
- Fire and Rescue Stations
- Golf Courses and driving ranges
- Library
- Non-profit/ private club
- Senior / elderly Housing
- Utilities (water, sewer, electric)
- Private Open Space
- Garner Parks
- City / Town
- County
- State
- Federal
- Office
- Commercial
- Industrial
- Vacant

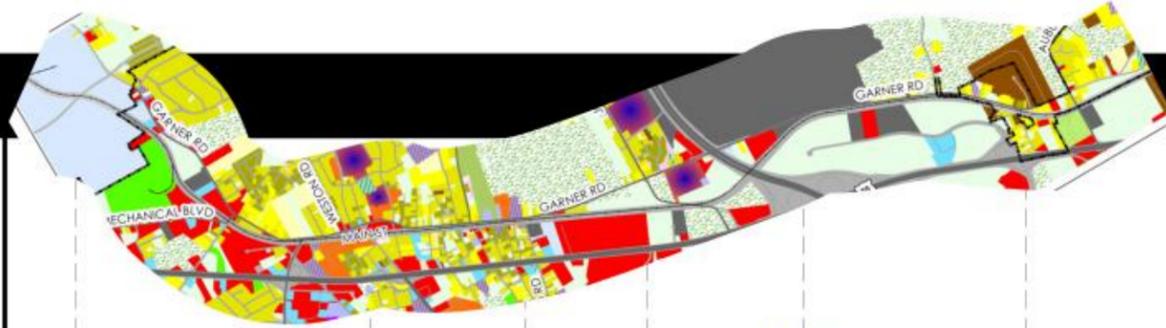




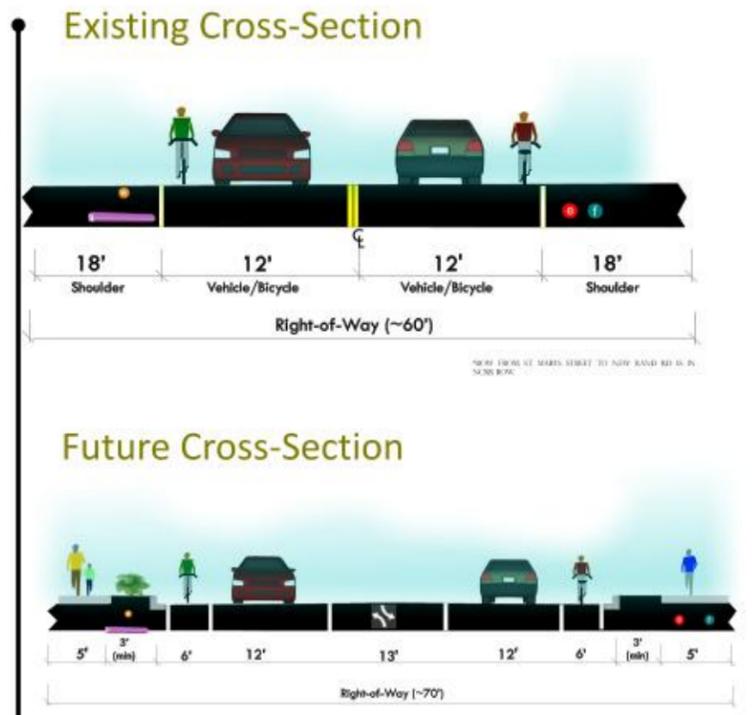
Legend	
Existing Land Use 2008	
Agriculture, Forestry, Horticulture	Non-profit/ private club
Estate Residential (less than .2 units per acre)	Senior / elderly Housing
Low Density Residential (.2 to 1 unit per acre)	Utilities (water, sewer, electric)
Medium Density Residential (1 to 4 units per acre)	Private Open Space
High Density Residential (over 4 units per acre)	Garner Parks
Mobile Homes and Mobile Home Parks	City / Town
Apartments	County
Cemetery	State
Church	Federal
Schools, Educational facilities and daycares	Office
Fire and Rescue Stations	Commercial
Golf Courses and driving ranges	Industrial
Library	Vacant

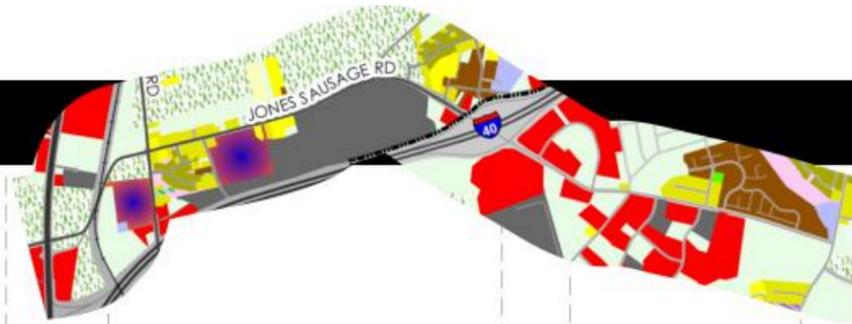
	70	Vandora Avenue	Timber Drive	Lake Benson
Land Uses	[Map]			
Cross-Streets				
Speed Limit	35		45	
Sidewalks	NO	NO	Yes	NO
Lane Widths (feet)	10'			
Right-of-Way (feet)	80'	130'	80'	
Shoulder Width (feet)	1-2'			
Accidents (Annual)	24			
Current Volume	5,500	7,900	6,700	
Future Volume	7,700	9,100		
Existing Cross-Section	F		A	
Future Cross-Section	D			





	Tryon Road	50	Creech Road	Jones Sausage Road	40	Auburn Church Road
Land Uses	[Color-coded land use map]					
Cross-Streets	Tryon Road		Creech Road	Jones Sausage Road		Auburn Church Road
Speed Limit	35			45		
Sidewalks	NO	YES	NO	YES	NO	NO
Lane Widths (feet)	11'					
Right-of-Way (feet)	70'		60'		60'	
Shoulder Width (feet)	1'					
Accidents (Annual)	49					
Current Volume	13,000		12,000		5,800	
Future Volume	15,600		16,100		14,500	
Existing Cross-Section	A		D		A	
Future Cross-Section	D					





Jones Sausage Road

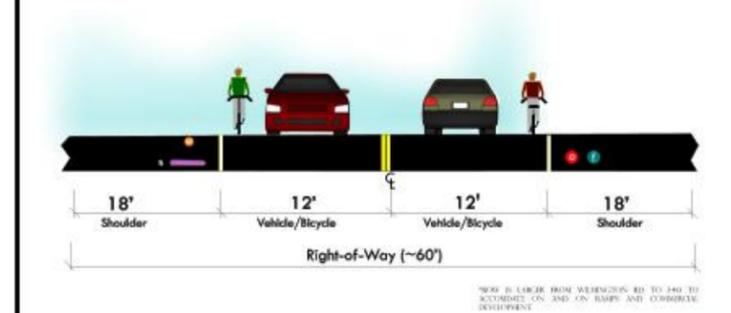
	Garner Road	Auburn Church Road	Rock Quarry Road
Land Uses			
Cross-Streets	70	40	
Speed Limit	35	45	35
Sidewalks	NO	Yes	NO
Lane Widths (feet)	11'	12'	11'
Right-of-Way (feet)	60'	60'	112'-140'
Shoulder Width (feet)	1-2'		
Accidents (Annual)	12		
Current Volume	12,000	16,000	
Future Volume	17,000	30,000	
Existing Cross-Section	A		
Future Cross-Section	H		

Legend

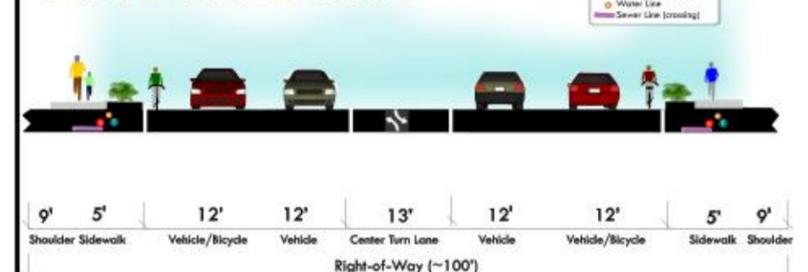
Existing Land Use 2008

- Agriculture, Forestry, Horticulture
- Estate Residential (less than .2 units per acre)
- Low Density Residential (.2 to 1 unit per acre)
- Medium Density Residential (1 to 4 units per acre)
- High Density Residential (over 4 units per acre)
- Mobile Homes and Mobile Home Parks
- Apartments
- Cemetery
- Church
- Schools, Educational facilities and daycares
- Fire and Rescue Stations
- Golf Courses and driving ranges
- Library
- Non-profit/ private club
- Senior / elderly Housing
- Utilities (water, sewer, electric)
- Private Open Space
- Garner Parks
- City / Town
- County
- State
- Federal
- Office
- Commercial
- Industrial
- Vacant

Existing Cross-Section



Future Cross-Section



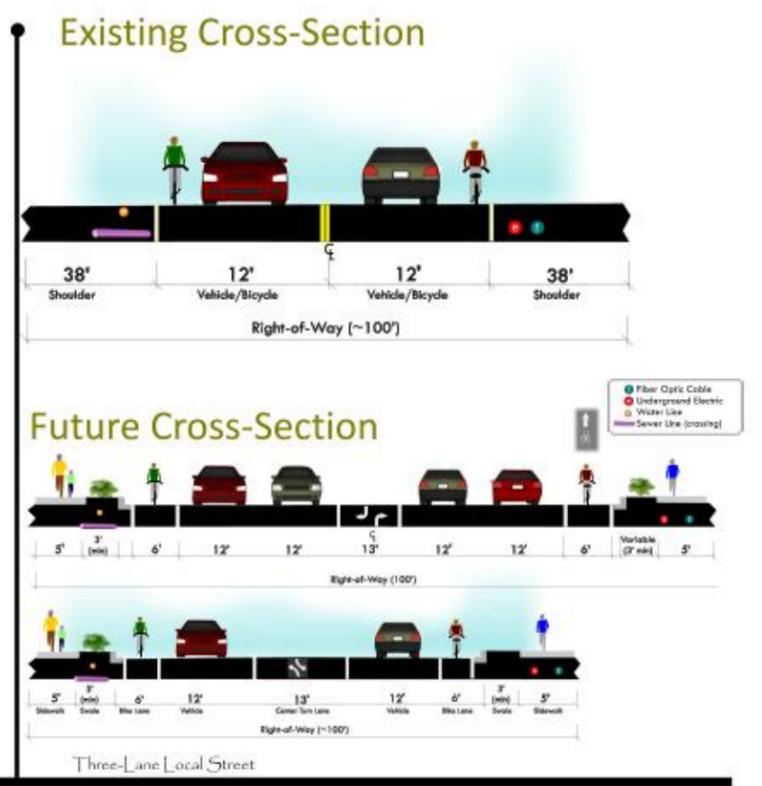


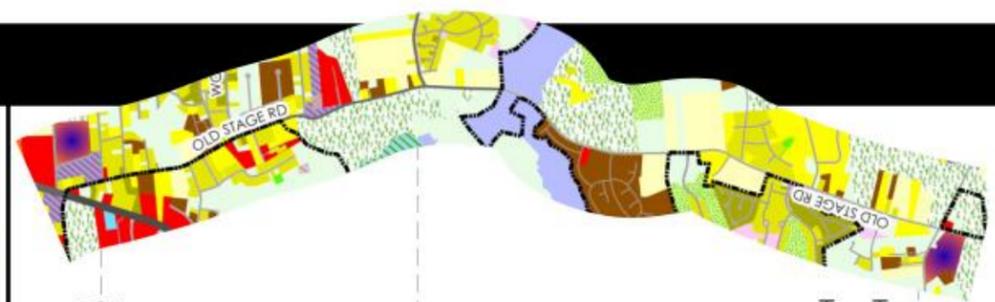
	70	Timber Drive	Rand Road	Ten-Ten Road
Land Uses				
Cross-Streets				
Speed Limit	35	45		
Sidewalks		NO NO		
Lane Widths (feet)		12'		
Right-of-Way (feet)		100'		
Shoulder Width (feet)		1-2'		
Accidents (Annual)		42		
Current Volume	12,000	19,000		
Future Volume	10,300	26,800		
Existing Cross-Section		A		
Future Cross-Section	D	H		

Legend

Existing Land Use 2008

- Agriculture, Forestry, Horticulture
- Estate Residential (less than .2 units per acre)
- Low Density Residential (.2 to 1 unit per acre)
- Medium Density Residential (1 to 4 units per acre)
- High Density Residential (over 4 units per acre)
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- Vacant





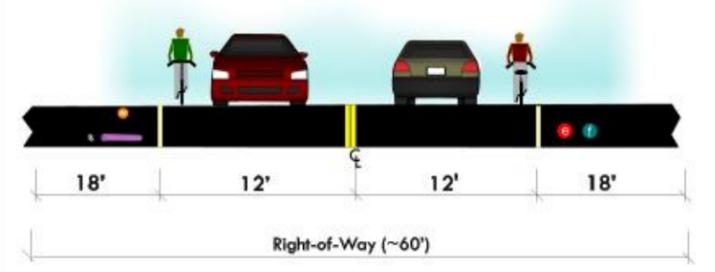
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Existing Land Use 2008

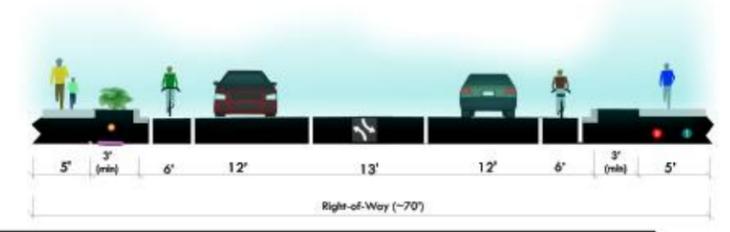
- Agriculture, Forestry, Horticulture
- Estate Residential (less than .2 units per acre)
- Low Density Residential (.2 to 1 unit per acre)
- Medium Density Residential (1 to 4 units per acre)
- High Density Residential (over 4 units per acre)
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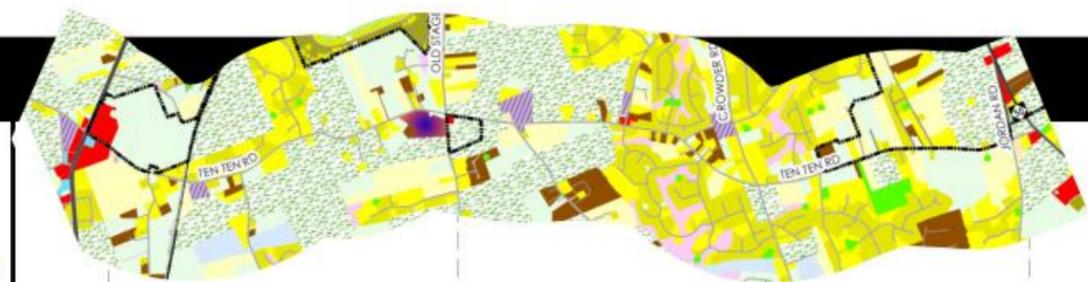
Land Uses	[Map]	
Cross-Streets	401	Vandora Springs Road, Ten Ten Road
Speed Limit	45	
Sidewalks	NO NO	
Lane Widths (feet)	12'	
Right-of-Way (feet)	60'	
Shoulder Width (feet)	1-2'	
Accidents (Annual)	1	
Current Volume	8,700	13,000
Future Volume	16,800	17,700
Existing Cross-Section	A	
Future Cross-Section	D	

Existing Cross-Section



Future Cross-Section





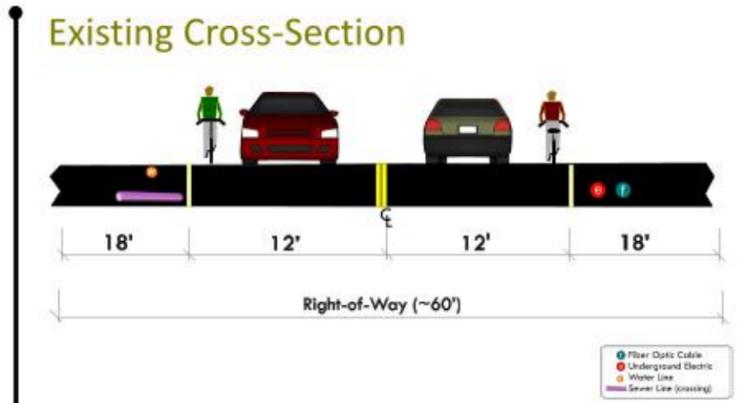
Ten Ten Road

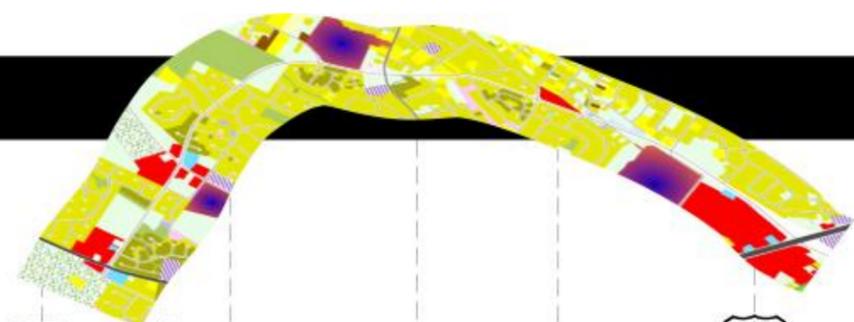
Land Uses	[Color-coded bar]		
Cross-Streets	401	Old Stage Road	Sauls Road 50
Speed Limit	45		
Sidewalks	NO		
Lane Widths (feet)	11'		
Right-of-Way (feet)	60'		
Shoulder Width (feet)	1-3'		
Accidents (Annual)	1		
Current Volume	16,000	3,500	6,700
Future Volume	17,900	25,700	19,200
Existing Cross-Section	A		
Future Cross-Section	H		

Legend

Existing Land Use 2008

- Agriculture, Forestry, Horticulture
- Estate Residential (less than .2 units per acre)
- Low Density Residential (.2 to 1 unit per acre)
- Medium Density Residential (1 to 4 units per acre)
- High Density Residential (over 4 units per acre)
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- Apartments
- Cemetery
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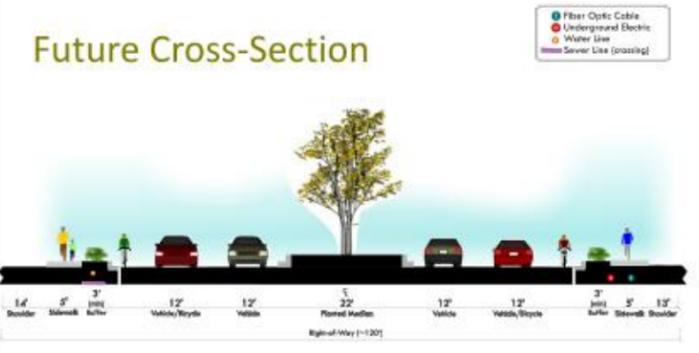
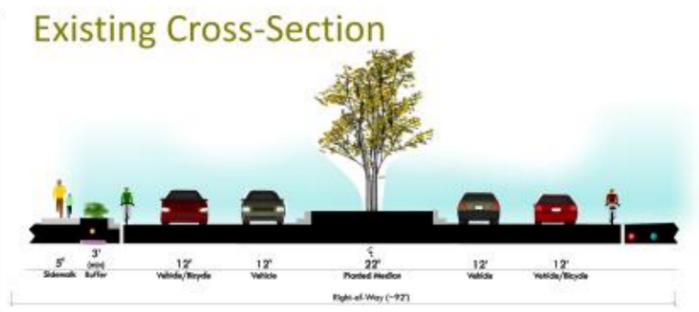


Legend

Existing Land Use 2008

- Agriculture, Forestry, Horticulture
- Estate Residential (less than .2 units per acre)
- Low Density Residential (.2 to 1 unit per acre)
- Medium Density Residential (1 to 4 units per acre)
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- Utilities (water, sewer, electric)
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- Commercial
- Industrial
- Vacant

	50	Aversboro Road	Vandora Springs Rd	Woodland Road	70
Land Uses	[Color-coded bars]				
Cross-Streets	[Color-coded bars]				
Speed Limit	45	35	45	45	
Sidewalks	YES	NO	YES	NO	YES
Lane Widths (feet)	12'				
Right-of-Way (feet)	95'				
Shoulder Width (feet)	1-3'				
Accidents (Annual)	72				
Current Volume	15,000	16,000	18,000	22,000	
Future Volume	17,000	15,000	19,900	28,000	
Existing Cross-Section	G				
Future Cross-Section	G				





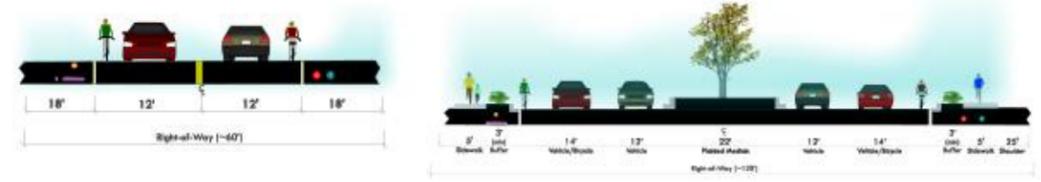
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Existing Land Use 2008

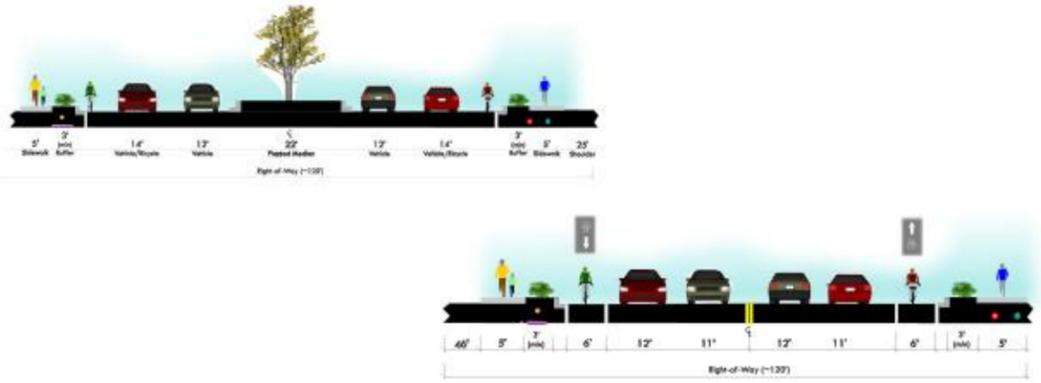
- Agriculture, Forestry, Horticulture
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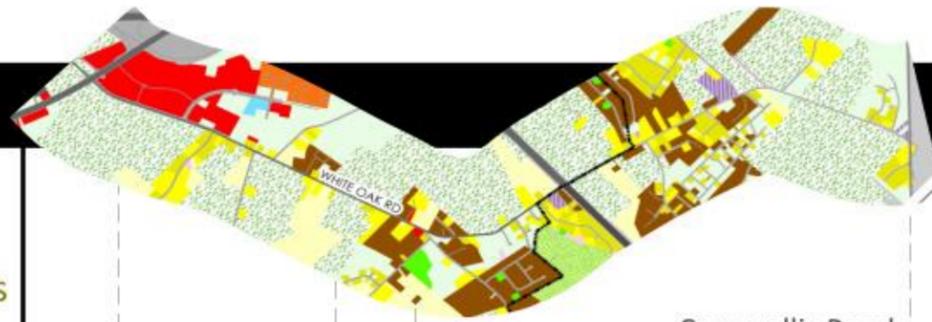
	Timber Drive	Ackerman Rd	Cornwallis Road Wake/Johnston County Line
Land Uses			
Cross-Streets	70		
Speed Limit		45	
Sidewalks	YES	NO	NO
Lane Widths (feet)	12'	10'	
Right-of-Way (feet)	150'	100'	
Shoulder Width (feet)		1-3"	
Accidents (Annual)		19	
Current Volume		21,000	
Future Volume	33,400	22,400	
Existing Cross-Section	G	A	F
Future Cross-Section	G		E

Existing Cross-Sections



Future Cross-Sections





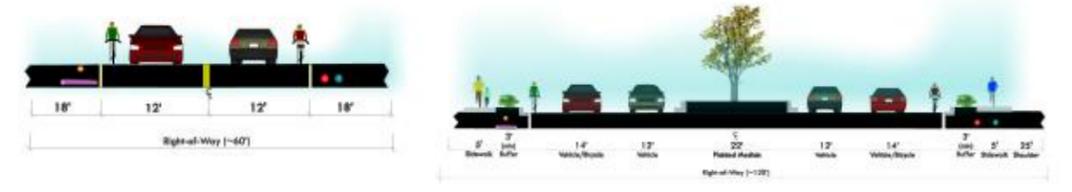
	Timber Drive	Ackerman Rd	Cornwallis Road Wake/Johnston County Line
Land Uses			
Cross-Streets	70		
Speed Limit		45	
Sidewalks	YES	NO	NO
Lane Widths (feet)	12'	10'	
Right-of-Way (feet)	110'	65'	
Shoulder Width (feet)		1-3"	
Accidents (Annual)		19	
Current Volume		21,000	
Future Volume	33,400	22,400	
Existing Cross-Section	G	A	F
Future Cross-Section	G		E

Legend

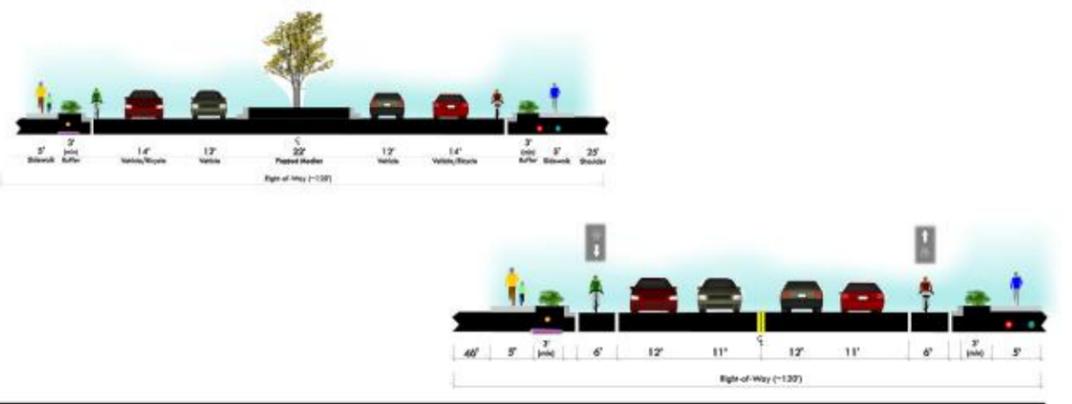
Existing Land Use 2008

- Agriculture, Forestry, Horticulture
- Estate Residential (less than .2 units per acre)
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- Vacant

Existing Cross-Sections



Future Cross-Sections



Appendix D: Access Management Guidelines

The intent of the access management guidelines is to permit reasonably convenient and suitable access to land abutting the road system included in the Garner Transportation Plan while preserving the regional flow of traffic in terms of safety, capacity, and speed. Appropriate access management will protect the substantial public investment in the Garner roadway system and reduce the future need for construction measures that are costly to taxpayers, the environment, and local residents and businesses.

In North Carolina as in few other states, the state owns and maintains nearly all of the public street system. Ultimately, the North Carolina Department of Transportation is responsible for regulating the location, design, construction, and maintenance of street and driveway connections to the roadways that it owns. However, Garner is responsible for regulating land use and development patterns with its town limits and Extra-Territorial Jurisdiction (ETJ: the limits beyond the town boundaries where Garner exercises planning and zoning control with Wake County). Both the State and Garner have a vested interest in working together to address transportation and land use issues that protect the integrity of the roadway system.

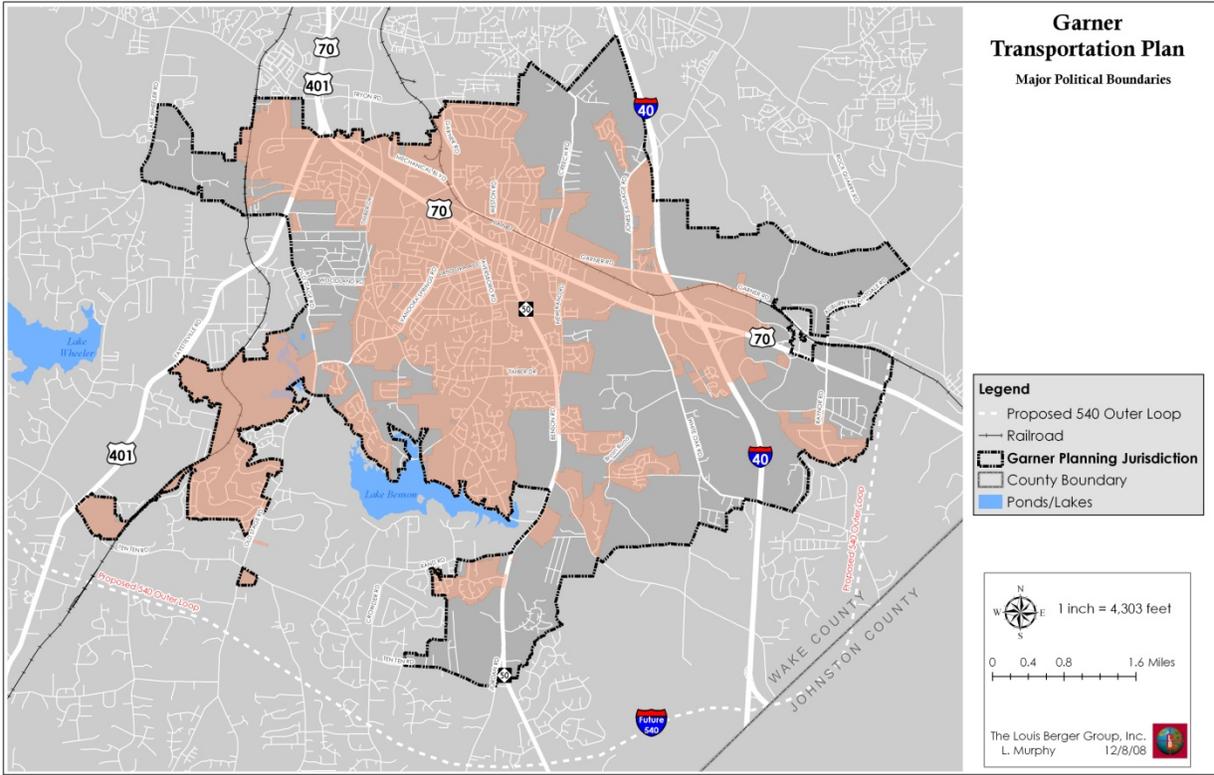


Figure 1. Town of Garner Jurisdictional Boundaries

Administration:

The Policy on Street and Driveway Access to North Carolina Highways published by the North Carolina Department of Transportation (NCDOT) establishes a minimum criteria for granting access connections: however, a provision in the policy manual defers evaluation of a Street and Driveway Access Permit to criteria established by the local government when they are deemed more restrictive than NCDOT requirements. The criteria contained within these guidelines meet or exceed minimum requirements established in the Policy on Street and Driveway Access to North Carolina Highways and should be used for evaluating access connection permits. If there is a conflict between any provisions in the Garner Access Management Guidelines and any provision of Garner's zoning, subdivision, or other regulation, the more restrictive provision shall apply.

An approval of a development application by Garner does not confer any obligation on the North Carolina DOT to allow the same number, location, or design of any of the access or traffic control measures illustrated on the approved development plan without first securing a Street and Driveway Access Permit from the NCDOT for the exact same improvements.

The Garner Town Engineer or his designee shall administer and enforce the provisions of the access management guidelines in cooperation with the North Carolina DOT. Approval of a Street and Driveway Access Permit from Garner and the North Carolina DOT is required prior to any one of the following events; additionally, an encroachment agreement may be required separately.

- The approval of any land subdivision, conditional use permit, interim use permit, site plan, or zoning-related permit for any property located within Garner or the Garner ETJ.
- The construction of any new public or private access to a public street in Garner or the Garner ETJ.
- The reconstruction or relocation of any existing public or private access to a public street.
- A substantial enlargement or improvement occurs at an existing development, defined as an increase in gross floor area (GFA) of a primary or secondary structure by 25% or 500 square feet, whichever is greater, or an increase in parking stalls by 25% or five (5) stalls, whichever is greater.
- An application for a site-specific Street and Driveway Access Permit shall be submitted to the North Carolina DOT and Garner in accordance with the minimum rules and procedures as set forth in

the *Garner Access Management Guidelines* and the *Policy on Street and Driveway Access to North Carolina Highways*.

Requests for new median openings shall be submitted to Garner and the North Carolina DOT in accordance with the minimum rules and procedures as set forth in the *Garner Access Management Guidelines* and the *Median Crossover Guidelines for North Carolina Streets and Highways*. It is the sole responsibility of the property owner to provide the justification necessary for a new median opening.

Requests regarding access locations and /or new median openings requested as part of a development application will be coordinated between the Garner Engineer and the District Engineer for the North Carolina DOT.

Definitions:

For purposes of this guideline, the following definitions will apply. If not defined in the guidelines, the definitions used in Garner's zoning or subdivision ordinances or in the *Policy on Street and Driveway Access to North Carolina Highways* or *Median Crossover Guidelines for North Carolina Streets and Highways*.

Access – A public or private roadway used to enter or leave a public highway from adjacent land using an on-road motor vehicle. An access may be a driveway or a street.

Access Point – The intersection of an existing or proposed access with the public right of way.

AADT – Average annual daily traffic volume – The total two-way yearly traffic volume on a section of roadway, divided by 365; often referred to as the average daily traffic (ADT).

Applicant – The person or organization applying for a driveway permit.

Change of Land Use – Any proposed property use that is different from the current use of the property, or current use that is different than the use identified in a pre-existing driveway permit.

Connectivity – A term used to infer connections between adjoining properties for vehicular and/or pedestrian usage.

Corner Clearance – The minimum distance, measured parallel to a highway, between the nearest curb, pavement or shoulder line of an intersecting public way and the nearest edge of a driveway excluding its radii.

Cross-Access – A service drive providing vehicular access between two or more continuous properties so that the driver need not enter the public street system to travel between adjacent uses.

Directional Median Opening – An opening in a restrictive median which provides for U-turns and or left-turn ingress or egress movements.

Driveway – An entrance used by vehicular traffic to access property abutting a street. As used in this guideline, the term includes private residential, non-residential, and mixed-use driveways.

Driveway Throat – The portion of a driveway between the public road and the internal circulation system or area where parking maneuvers occur.

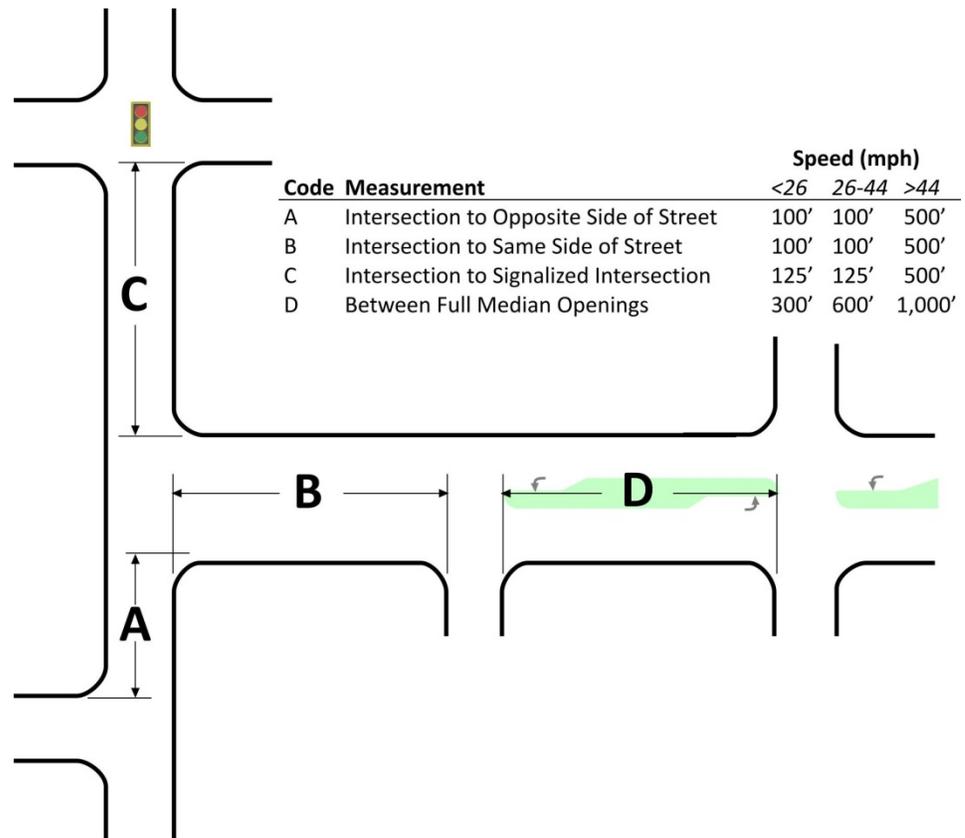


Figure 2. Access Distances Between Driveways and Full Median Openings³

³ Note: Also depends on queuing analysis and professional opinion of Town Engineer.

Frontage – The length along the street right-of-way line of a single property tract or roadside development area between the edges of the property lines. Property at a street intersection (i.e., corner lot) has a separate frontage along each street.

Full Median Opening – An opening in a restrictive median that allows all turning and through movements to be made.

Fully Developed (Type of Area) – The land use adjacent to the roadway is less than 10% vacant.

ITE – Institute of Transportation Engineers.

Joint Driveway – A single access point connecting two or more contiguous sites to a public roadway that serves more than one property or development, including those in different ownership or in which access rights are provided in legal descriptions.

Major Intersection – An intersection with high volumes exceeding the MUTCD warrants for signalization.

Median – The portion of a divided highway separating the traveled ways for traffic in opposing directions.

Median Opening Spacing – The spacing between openings in a restrictive median that allow for crossing the opposing traffic to access property or U-turns. The distance is measured from centerline to centerline of the openings.

MUTCD – Manual on Uniform Traffic Control Devices.

NCDOT – North Carolina Department of Transportation

Posted Speed – The speed limit set and maintained by the NCDOT or Garner.

Sight Distance – This is the area that establishes a clear line of sight for a waiting vehicle to see on-coming traffic and make turning movements into or out of a street or driveway connection safely or for traffic to see entering or waiting vehicles.

Storage Length – Additional lane footage added to a turning lane to hold the maximum number of vehicles likely during a peak period so as not to interfere with through travel lanes.

Throat Length – The distance between the edge of the nearest travel lane to the near edge of an internal drive interior to the site that represents the first opportunity for a car to make a turn into a parking lot.

Traffic Impact Study – A report initiated in response to a proposed development that compares the anticipated roadway conditions with and without the development. The report may include an analysis of mitigation measures.

Access Connections:

All connections in Garner shall meet or exceed the minimum connection spacing requirements as specified in Table 1 (refer also to Figure 2).

Table 1. Minimum Median Opening, Driveway, and Signal Spacing

Posted Speed Limit	Signal Spacing	Full Median Spacing	Directional Median Opening	Adjacent Driveway Spacing	Opposite Street Driveway
≥ 45MPH	2,000 ft	2,000 ft	1,000 ft	500 ft	500 ft
26-44 MPH	1,200 ft	1,200 ft	600 ft	100 ft	100 ft
≤ 25 MPH	600 ft	600 ft	300 ft	100 ft	100 ft

- Spacing between driveways or medians shall be measured along the right-of-way line between the tangent projection of the inside edges of adjacent driveways, opposite street driveways or median openings.
- The Garner Town Engineer may reduce the connection spacing requirements for situations where they prove impractical, but in no case shall the permitted spacing be less than 85% of the standard. Spacing below 85% of the standard will require the issuance of a variance.
- For sites with insufficient road frontage to meet minimum spacing requirements, consideration shall first be given to providing access via connection to a side street, utilization of a joint or shared driveway with an adjacent property that meets the recommended spacing requirement, or development of a service road to serve multiple properties.
- The Garner Town Engineer, in coordination with the North Carolina DOT, may grant access approval for a permanent use not meeting the spacing requirements of these guidelines on an interim basis if an access plan is submitted that demonstrates how spacing requirements will ultimately be met and appropriate assurances in the form of a recordable and enforceable easement of access

agreement will be provided insuring future provision of a conforming access.

- Deviation from these spacing standards may be permitted at the discretion of the Garner Engineer in cooperation with the North Carolina DOT where the effect would to enhance the safety and operation of the roadway. Examples might include a pair of one-way driveways in lieu of a two-way driveway, or alignment of median openings with existing access connections. Approval of a deviation or variance from the minimum spacing standards in this guideline may require the applicant to submit a study prepared by a registered engineer in the State of North Carolina that evaluates whether the proposed change would exceed roadway safety or operational benefits of the guideline standards.
- All road and driveway connections to a single parcel shall be brought into compliance with the minimum connection spacing requirements set forth in the guidelines when the lane use (s) on the single parcel is modified or expanded.
- The North Carolina DOT may additionally prohibit, restrict, or modify the placement of any connection, at any time, to a single property in the interest of public safety and mobility on state-maintained streets.

Corner Clearances:

Corner clearance is the distance between an intersection and the first point of ingress or egress to a corner property's driveway. The purpose of corner clearance is to remove conflicting movements from the functional area of intersections and provide sufficient stacking space for queued vehicles at intersections so that the driveways are not blocked. No driveway will be permitted to enter directly into an intersection. Driveways must turn traffic into the traffic stream of the highway and/or intersecting road or street before it is permitted to pass through the intersection. Unless an exception is granted, the minimum corner clearance for entrances will be established by a queuing analysis or 100 feet for unsignalized intersections and 125 feet for signalized intersections, whichever is larger. If an exception is requested and approved at an intersection where no provision has been made for sight distance or clear vision areas (flared right-of-way), no part of a driveway entrance or exit may be permitted to connect with either the highway or crossroad or street within 50 feet from the outside shoulder line of the adjacent street and the access will be a right-in/right-out. Exceptions may be approved if as a result of Garner or the North Carolina DOT action the property would become landlocked. No part of a driveway entrance or exit may be permitted within a corner radius.

Near a signalized intersection, the location for a full movement driveway connection may be required to exceed the minimum spacing requirements set forth in the guidelines to avoid interference with the operations of the traffic signal and resulting traffic queues. The radius of a full movement driveway connection shall not encroach on the minimum corner clearance.

The minimum lot size for any new corner lot created through the subdivision process shall be of adequate size to provide for the minimum corner spacing as specified in the guidelines.

Joint and Cross Access:

Non-residential and Mixed-Use Projects

- Adjacent land uses classified as major traffic generators shall provide a cross access drive and pedestrian access to allow circulation between sites.
- A system of joint use driveways and cross access easements shall be established if deemed feasible by the Garner Engineer and the building site shall incorporate the following:
 - A continuous service drive or cross access corridor extending the entire length of the property frontage and to provide driveway separation in order to provide the minimum spacing requirements as contained in the guidelines.
 - A design speed of ten miles per hour and sufficient width to accommodate two-way travel aisles designed to accommodate automobiles, service vehicles, and loading vehicles.
 - Stub-out connections and other design features that make it visually obvious that the abutting properties may be tied-in to provide cross access via a service drive.
 - A unified access and circulation system plan that includes coordinated or shared-use parking areas wherever feasible.
 - The property owner shall record an easement with the deed for the property that allows cross access to and from other properties served by a joint use driveway, cross-access, or service drive.
 - The property owner shall record a joint maintenance agreement with the deed for the property defining maintenance responsibilities of the adjacent property owners.

Residential Projects

- Residential subdivisions with lots fronting along the Garner Thoroughfare System shall be designed with joint access points to the

highway. Normally a maximum of two access points shall be allowed regardless of the number of lots served.

- The property owner shall enter into a written agreement with Garner, recorded with the deed for the property, that pre-existing connections along the frontage will be closed and eliminated after construction of joint use driveways.
- The Garner Town Engineer may modify or waive the requirements of this section where the characteristics or layout of abutting properties would make implementation of joint use driveways or development of a shared access circulation system impractical, provided that all the following requirements are met:
 - Joint access driveways and cross access easements are provided wherever feasible.
 - The site plan incorporates a unified access and circulation system.

Median Openings:

- No new median openings shall be allowed along roadways with an existing center median unless it is in conformance with latest edition of Median Crossover Guidelines for North Carolina Streets and Highways published by the North Carolina DOT. In all circumstances, new median openings shall not encroach on the functional area of an existing median opening or intersection. Approval of any new opening lies ultimately with the North Carolina DOT Traffic Engineering and Safety Systems Branch.
- Minimum criteria for evaluating a request for a new median opening may include, but not be limited to, the following:
 - Median openings shall not be located where intersection sight distance (both vertical and horizontal) cannot meet current design criteria required by the North Carolina DOT.
 - Median openings shall not be placed in areas where the grade of the crossover will exceed five percent. Special consideration should be given to the vertical profile of any proposed new median opening that has the potential for future signalization.
 - A median opening shall not be provided where the median width is less than sixteen feet.
 - Median openings that require a traffic signal, or where one may be expected in the future, should be avoided.
 - It is the responsibility of the property owner to provide the justification for new medians.

Throat Length Distances:

The connection depth of a driveway (throat length) as measured from the edge of the abutting roadway to the near edge of the internal circulation road or buffer area shall be of sufficient length to allow a driver to enter the site without interfering with the mainline of traffic. The Figure below shows the minimum throat lengths based on both site activities as well as the category of adjacent roadway (either minor or major thoroughfare).

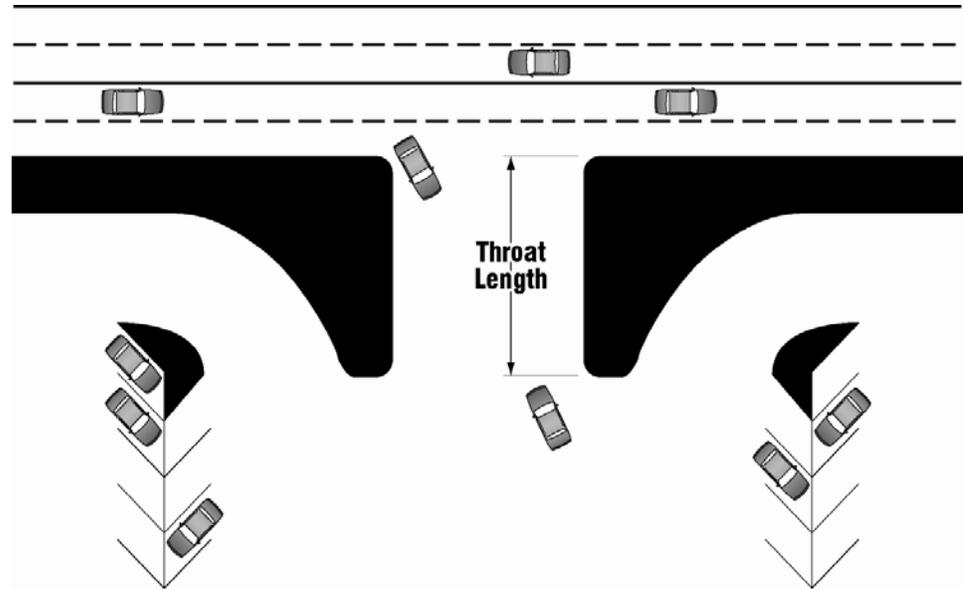


Figure 3. Minimum Throat Lengths for Minor and Major Thoroughfare Entrances

SITE ACTIVITY	THROAT LENGTHS	
	Minor	Major
Regional Shopping Centers (Malls)	250'	250'
Community Shopping Center (Supermarket, Drug Store)	80'	100'
Small Strip Shopping Center	30'	100'
Regional Office Complex	250'	250'
Office Center	80'	100'
Small Commercial Developments	30'	100'

Sight Distance Requirements:

Driveways shall not be permitted to connect with any highway, road, street or frontage road at a location if it does not meet the minimum stopping sight distance criteria, based on vertical or horizontal alignment, terrain or other reasons which will cause an undue hazard to the traveling public. Any driveway application that does not provide adequate sight distance as outlined in the above listed design manual shall be denied. In order to provide adequate sight distance in both directions when entering the highway, driveway entrances and exits

should be at a 90 degree angle. Angles less than 90 degrees should not be constructed unless justified by an engineering analysis and in no case shall be less than 60 degrees with the highway.

Additional Design Criteria:

- **Offset Access Connections:** On undivided roadway segments, access connections on opposing sides of the highway shall be offset at an adequate distance to minimize overlapping left turns and other maneuvers that may result in safety hazards or operational problems.
- **Auxiliary Lanes:** Auxiliary lanes (left or right turn lanes) shall be required for new driveways where they meet the North Carolina DOT or ITE warrants.
- **Out-parcel Access:** All access to an out-parcel shall be internalized using the shared circulation system of the principle development. Access to out-parcels shall be designed to avoid excessive movement across parking aisles and queuing across surrounding parking and driving aisles.

Minimum On-Site Vehicle Storage Area:

Adequate storage must be provided within the internal circulation system for properties that include either a drop-off loop or drive-through facility so that vehicles do not queue onto the highway system. Specific storage areas will be determined by the Garner Engineer in cooperation with the North Carolina DOT on a case-by-case basis during the development review process. However, the following minimum storage lengths are required for specific development types:

- (A) For single-lane drive-in banks, storage to accommodate a minimum queue of six vehicles will be provided. Banks having several drive-in service windows will have storage to accommodate a minimum of four vehicles per service lane.
- (B) For single-lane drive-through full service car washes, storage to accommodate a minimum of twelve vehicles will be provided. Automatic or self service car washes having a multi-bay design will have a minimum vehicle storage length of three vehicles per bay.
- (C) For fast-food restaurants with drive-in window service, storage within the site to accommodate a minimum of eight vehicles per service lane from the menu board/ ordering station will be provided.
- (D) For service stations where the pump islands are parallel to the pavement edge, a minimum setback of 35 feet between the pump islands and the public right-of-way will be provided. For service stations where the pump islands are not parallel to the pavement

edge, minimum vehicle storage of 50 feet in length between the pump islands and the public right-of-way will be provided.

- (E) For land uses that require an entry transaction or have service attendants, gates or other entry control devices, the vehicle storage will have an adequate length so that entering vehicles do not queue back on the adjacent right-of-way. No portion of a parking area, attendant booth, gates, signing or parking activity shall encroach on the public right-of-way.
- (F) For schools, adequate storage for parental drop-off and pick up areas should be provided entirely on the school campus site.

Crossroad Access Spacing at Interchanges:

Minimum access spacing on crossroads for freeway interchange areas is critical for avoiding traffic backups and providing safe maneuvering distances for turning and weaving vehicles to enter the appropriate lanes. No driveway, intersection, or median opening will be allowed less than 500 feet from the end of the taper of the ramp furthest from the interchange. If the proposed distances are less than the minimum spacing then a written justification demonstrating why the recommended distances cannot be met shall be submitted to the Garner and NCDOT for approval as an exception.

Traffic Impact Assessment:

A traffic impact assessment (TIA) study may be required by the Garner Engineer or the North Carolina DOT District Engineer to evaluate one or all access locations proposed in a development application. The estimated trip generation shall be based on the latest edition of the ITE *Trip Generation Report*. If required according to the Garner Unified Development Ordinance Article 3.5, the traffic study shall be completed in conformance with the minimum rules and procedures set forth in the *Policy on Street and Driveway Access to North Carolina Highways*.

Variances:

The granting of a variance shall be in harmony with the purpose and intent of the Garner Access Management Guidelines and shall not be considered until every feasible option for meeting the minimum access management standards is explored.

Applicants for a variance from the standards must provide proof of unique or special conditions that make strict application of the provisions impractical. This shall include proof that:

- Indirect or restricted access cannot be obtained.

- No engineering or construction solutions can be applied to mitigate the conditions.
- No alternative access is available from a side street.
- Under no circumstances shall a variance be granted, unless not granting the variance would deny all reasonable access, endanger public health, welfare or safety, or cause an exceptional and undue hardship on the applicant. No variance shall be granted where such hardship is self-created.

Business Impact Mitigation:

An important aspect of minimizing the impact of access management projects and medians is to maintain open access to businesses during the construction phase. Potential actions to mitigate construction impacts include:

- Clearly sign business entrances from the roadway;
- Provide temporary and/or secondary business access points, where feasible;
- Schedule construction during after-business hours or during times of low usage for seasonally-oriented businesses;
- Avoid blocking business entrances with construction equipment or construction barriers;
- Provide alternative parking, if possible and avoid taking or blocking parking spaces;
- Establish a single point of contact in the agency about the construction project to communicate with property and business owners; and
- Provide regular project progress reports to business and property owners.

DRIVEWAY ACCESS REVIEW CHECKLIST

The following checklist is intended to be used by the Garner engineering staff for an initial review of access permit requests. Standards to be applied are from the *Policy on Street and Driveway Access to North Carolina Highways* and this guideline.

YES NO

- The distance between driveways and adjacent intersections or other intersections meet corner clearances and spacing standards.
Comment:

- Sight distance at the proposed location is sufficient. Proposed signs and/or landscaping do not obscure sight distance.
Comment:

- Driveway grades and widths meet standards.
Comment:

- The driveway throat length meets standards and is sufficient to provide storage for vehicles waiting to enter or exit without creating conflicts.
Comment:

- Shared driveways, frontage roads, rear service driveway or connecting driveways have been considered if appropriate.
Comment:

- Driveway radii for both inbound and outbound are sufficient to accommodate the type of vehicular traffic that is expected to enter the site.
Comment:

- Pedestrian traffic has been accommodated and ADA requirements have been met.
Comment:

- Alternative access to a side street has been considered where available.
Comment:

- Where possible the driveway is aligned with driveways across the street.
Comment:

- For driveways that meet the trip generation standards a traffic impact analysis was conducted. The need for bypass lanes, turn lanes, deceleration lanes, deceleration tapers, and width and number of ingress/egress lanes has been evaluated.
Comment:

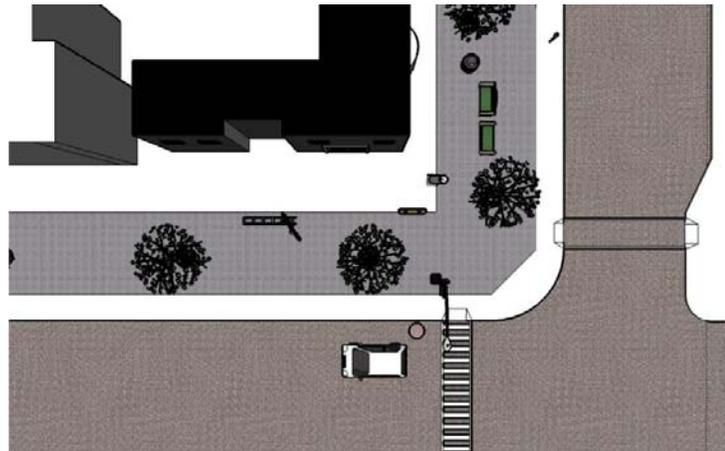
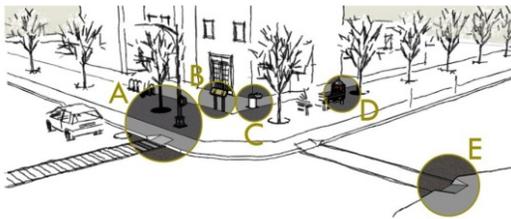
Appendix E: Design Guidance

The following pages illustrate approaches to designing roadways, bicycle/pedestrian facilities, intersections, and rail crossings to meet the goals and objectives of the Garner Transportation Plan. This guidance does not supersede state or federal practices or policies, but as local governments continue to exert more control over local streets, and as federal and state policies move closer to accommodating more modes of travel equally, these policies may be implemented in an increasing number of circumstances. Individual conditions such as topography / grade, land uses, and environmental features will need to be consulted during development phases of work.

DESIGN GUIDANCE

PURPOSES

The Garner Transportation Design Guide on best practices is intended to augment the federal and state policies represented by the *Policy on Geometric Design of Streets*, *Manual on Uniform Traffic Control Devices*, and other established guidance volumes. This guidance is written not as a requirement for every new or retrofitted street, but in the recognition that our standards do change over time to recognize the importance of streets as a means of commerce and enhancing the quality of life of residents. This is in addition to the more traditional goals of moving people and things from one place to another as quickly and as safely as possible.



LOCAL STREET

PURPOSES

To allow connections to low-density residential and neighborhood commercial areas throughout Town

VOLUMES

500 and 3,000 vehicles per day / 500 vehicles in peak hour

VEHICLE TARGET SPEED (85TH PERCENTILE)

15 - 25mph

WIDTH

Maximum of 24 feet for two lanes; narrower limits may be allowed without on-street parking or in tight rights-of-way situations

BICYCLE FACILITY

None, or Sharrows for the internal streets of larger residential developments

PLANTING STRIP

Minimum of five feet



FOREST RIDGE ROAD. This local street is fairly narrow (24' wide from edge to edge of pavement) and features older growth pines and on-street parking to help keep a sense of "enclosure" to the street, driving down speeds by sending a clear message that reflects the purpose of this small street. From this image, it would be impossible to tell that you are only 3,600' from the Timber Drive and US 70 intersection, one of the busiest in the Town.

COLLECTOR STREET

PURPOSES

To create connections between neighborhoods and local streets to Minor and Major Thoroughfares, as well as to service neighborhood retail and small commercial developments.

VOLUMES

500 and 6,000 vehicles per day / 1,000 vehicles in peak hour

VEHICLE TARGET SPEED (85TH PERCENTILE)

25 - 35mph

WIDTH

Maximum of 35 feet or three lanes; narrower limits may be allowed without on-street parking or in tight rights-of-way situations

BICYCLE FACILITY

Sharrows or Bicycle Lane

PLANTING STRIP

Minimum of five feet



LAKESIDE DRIVE. Many of Garner's collector roads have a uniform design: narrow or non-existent shoulders, no sidewalks, and no provision for on-street parking. The wide "clear zones" and lack of parking or landscaping nearby, as well as the straight-ahead construction, promote higher speeds. Lakeside is a perfect example of a collector street, however, with connections to Vandora Springs Road on the west end and Benson Road (NC 50) on the east. Smaller, local streets feed into Lakeside from both sides of the road to eventually access the major roadways on either end.

MINOR THOROUGHFARE

PURPOSES

Minor Thoroughfares typically serve as a connection to Major Thoroughfares, with collector streets feeding into them.

VOLUMES

3,000 and 20,000 vehicles per day / 1,500 vehicles in peak hour

VEHICLE TARGET SPEED (85TH PERCENTILE)

35 - 45mph

WIDTH

Maximum of 35 feet or three lanes; narrower limits may be allowed without on-street parking or in constrained right-of-way situations

BICYCLE FACILITY

Sharrows or Bicycle Lane

PLANTING STRIP

Minimum of five feet

SIDEWALKS

Yes, both sides



GARNER ROAD. *The lack of curb-and-gutter is actually an advantage here, allowing stormwater to run off into the adjacent swale area between the edge of pavement and the sidewalk. The sidewalk and road have a rare and very desirable wide separation in this particular location, although bicycle facilities are not present and, combined with frequent driveway cuts, make this a difficult roadway to traverse by bicycle.*

BOULEVARD

PURPOSES

An important connecting link between cultural and historic areas to the rest of the Town, with local and collector streets feeding into each side. May terminate in a major civic building, park, or thoroughfare.

VOLUMES

10,000 - 40,000 vehicles per day / 3,000 vehicles in peak hour

VEHICLE TARGET SPEED (85TH PERCENTILE)

35 - 55mph

WIDTH

Maximum of six lanes plus 22' (minimum) center median and 6' bicycle lanes

BICYCLE FACILITY

Bicycle Lane or separated facility

PLANTING STRIPS

Minimum of 10' on the outside. Landscaping in the interior of the median will consist of native tree species, respecting the long-term maintenance costs involved. Outside planting areas will also be planted with regularly-spaced trees respecting sight distance and minimum 5' clearance zones behind the back-of-gutter.

SIDEWALKS

Yes, both sides

ON-STREET PARKING

None, unless on parallel collector/distributor streets



TIMBER DRIVE. The role of Timber Drive is important, and increasing as it extends eastward to provide another cross-town route in Garner. However, the nicely landscaped median is fairly low maintenance and provides a degree of aesthetics that compliment the land uses (school, residential subdivisions) and people that have to use the road every day.

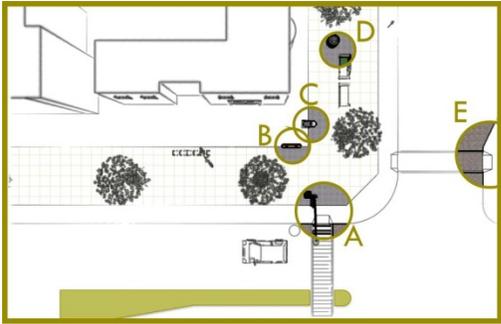
INTERSECTIONS

PURPOSES

Intersections have to strike a balance between vehicular traffic throughput (intersection delays are the major source of delay in urbanized areas) with the need to promote safe walking and bicycling. The following are best practice targets for Garner’s intersections for Local/Collector and Boulevard/Thoroughfare typologies. Note that the turning radii expand with the speed of the intersecting facility, as do the requirements for managing driveway access points.

CHALLENGES

- Maintaining adherence to state and national standards for vehicular throughput that may not be sensitive to the surrounding land uses
- Accomplishing multiple objectives to accommodate cars, bicycles, pedestrians and transit vehicles (on transit routes) safely and effectively



PARTS OF AN INTERSECTION. Strong crosswalk treatments (A) help to ensure pedestrian safety and ADA compliance that otherwise could cost the Town heavily; (B) wayfinding signage at congested locations can help reinforce a welcoming and open public atmosphere that is proven to increase foot traffic and decrease crime; (C) and (D) are amenities like water fountains, trash receptacles, and seating areas that increase the utility and vitality of the street; and (E) indicates curb extensions or “bulb outs” that reduce the pedestrian crossing distance and force traffic to slow to make turns.



The bottom graphic indicates the various zones of a street: the door zone that, on a residential street includes front and side yard setbacks; an amenity zone that may include everything from mailboxes to front porches; a streetscaping zone with planted materials that can serve as a stormwater retention area to improve the quality of drinking water (see Green Streets section); and street interface area, where pedestrians, cyclists, and automobile drivers must interact. Design elements on both sides of the curbline can greatly influence how that interaction occurs.

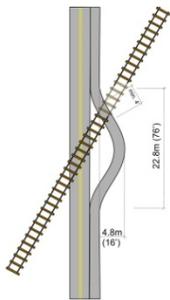
RAIL CROSSINGS

PURPOSES

Rail crossings in Garner are associated with the Norfolk Southern freight line that operates roughly parallel to Garner Road for most of its length. Working with the N.C. Railroad Company (NCRR) that leases rights to the use of this trackage and the N.C. Department of Transportation Rail Division, additional crossing provisions like those shown here can be implemented to improve pedestrian and vehicular occupant safety by reducing the chance of collisions.

CHALLENGES

- Gaining concurrence with multiple authorities responsible for rail and street maintenance
- Implementing new devices or treatments that may be non-standard or set a precedent that is financially unfeasible to apply to many additional crossings
- Extending electric power across rail company rights-of-way and gaining necessary encroachment agreements

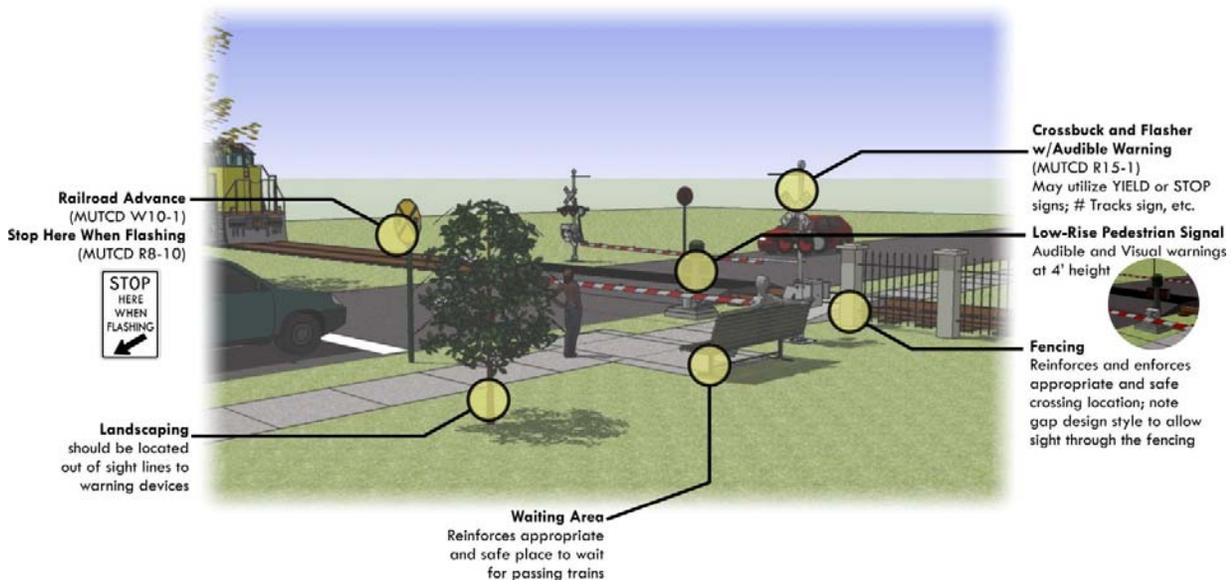


Bicycle Path Crossing RR at Acute Angle (>45°)
 Source: AASHTO Guide for the Development of Bicycle Facilities (Figure 27)

CROSSING SAFELY. Unlike other types of street crossings, rail crossing conflicts typically have low exposure rates but universally high consequences in the event of a train-car collision. The graphic at bottom illustrates various safety devices and measures, which would need to be coordinated with NCDOT Rail Division, NC Railroad Company, and Norfolk Southern before implementation.



The graphic at far left illustrates how to improve a skewed crossing for bicyclists, while the picture at near left is skewed on purpose for pedestrians to make sure they are looking in the right direction for predominant train traffic.



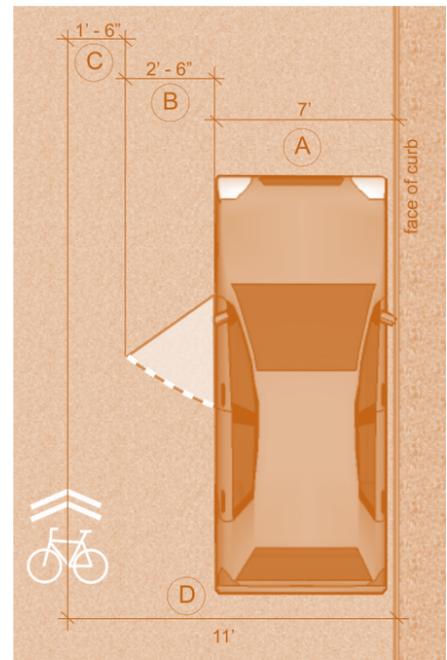
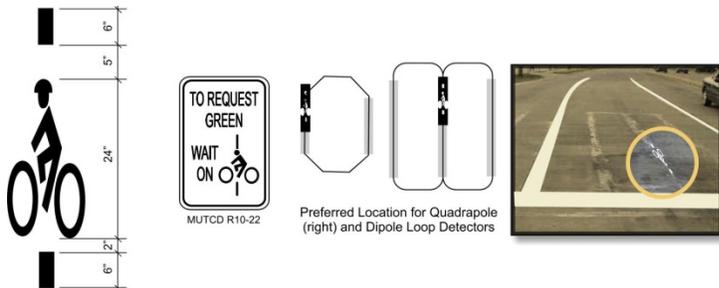
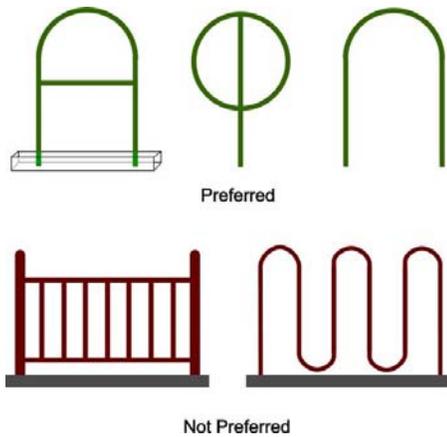
BICYCLE FACILITIES

PURPOSES

Bicycling is an important transportation element, part of a philosophy of providing “complete” street designs to accommodate every user. The number of cyclists is increasing over time in approximate correlation to rising fuel prices and declining automobile availability for lower-income populations.

CHALLENGES

- Providing safe facilities in often-limited rights-of-way
- Accommodating cyclists with varying skill levels, purposes, speeds, and equipment



Sharrows Marking Design

- A=Distance from Driver Side Door to Face of Curb
- B=Door Swing Distance
- C=Distance from Open Door To Centerline of Sharrow Pavement Marking
- D=Distance from Face of Curb to Centerline of Sharrow Pavement Marking

BICYCLE DETAILS. Like walking, cycling occurs at a very personal level: the rider feels every bump, senses more objects passing by, and is more inconvenienced with poor or neglectful design. Casual cyclists have a low tolerance for non-existing or poorly placed bicycle parking devices (top left); can be aided by knowing where to stop at an intersection at the “sweet spot” of a magnetic loop sensor (bottom left); and can be guided safely on busier streets by the appropriate placement of signs and markings like the sharrows marking shown in the graphic at right.

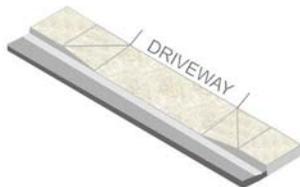
PEDESTRIAN FACILITIES

PURPOSES

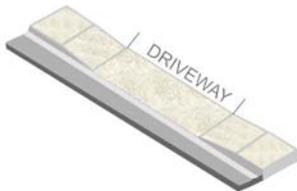
Walking is more than a recreational activity on a warm summer evening, and is a critical part of the transportation system by itself or in conjunction with other modes of travel, particularly public transportation. Especially for those without cars (or for people trying to lower their exposure to higher gasoline prices) walking connects individual residences to shopping, employment, transit stations, parks, and each other.

CHALLENGES

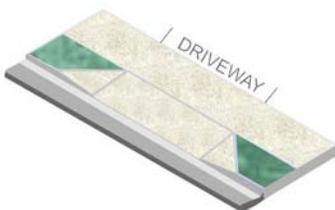
- Long expanses of new sidewalks or greenways are expensive undertakings, particularly if public rights-of-way or existing curb-and-gutter are unavailable
- Creating safe crossings at heavily traveled street intersections



Steep cross-slope makes wheelchair travel along sidewalk difficult

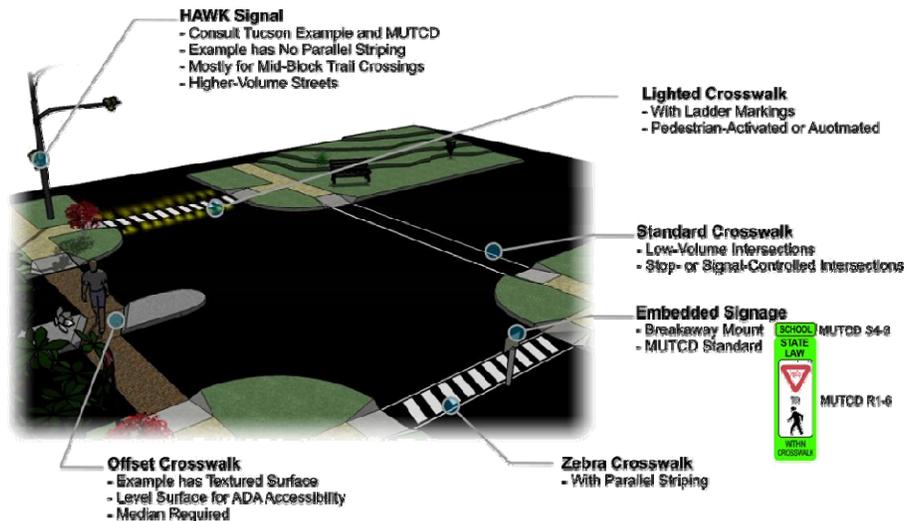


"Dip" sidewalk path OK in areas where this is necessary



The planting strip and sidewalk set back behind driveway apron allows unimpeded wheelchair travel

WALKING IN THEIR SHOES. Walking is the most personal kind of transportation: everyone becomes a pedestrian sometimes. Those that have trouble navigating uneven pavement (graphic at left) benefit from adherence to a 1% to 2% slope, as well as an understanding of the standards prompted by the Americans with Disabilities Act of 1990. At street intersections, the pedestrian enters the realm of the automobile, with the latter having a near-exclusive advantage in almost every sense. Strong indications of pedestrian crossings like those shown in the graphic at bottom illustrate various kinds of crossing treatments where there are fewer (e.g., standard crosswalk) or greater numbers of pedestrians and cars (lighted crosswalk) that may come into conflict.



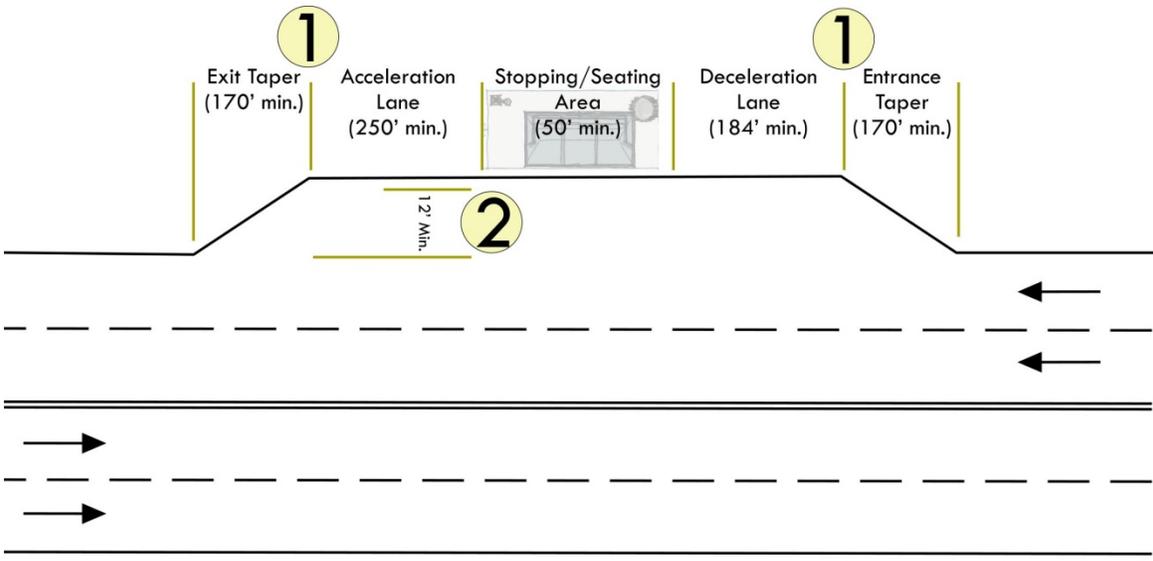
TRANSIT FACILITIES

PURPOSES

Public transportation has enjoyed a surge of ridership and importance in the Triangle Region, Garner, and around the country as people react to rising fuel prices and continue to move into our urbanized areas. Apart from providing a choice for automobile drivers, public transport creates the only means of financially viable long-distance travel for many people. Our best practice design guidance will help Garner create safe transit stops compatible with the standards provided by area transit providers.

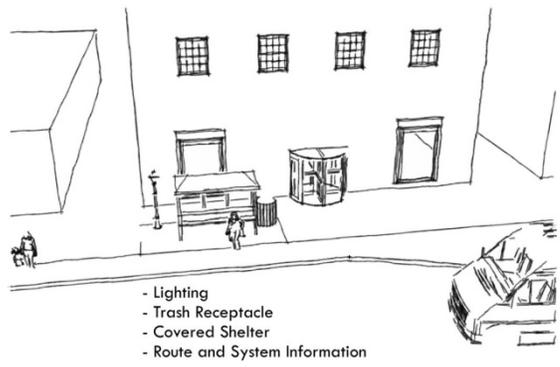
CHALLENGES

- Requiring new / expanded private development to incorporate bus waiting areas into their site designs
- Working with existing private sites and owners to create new public transportation waiting areas, including the development of suitable encroachment arrangements
- Working with local partners to raise awareness of public transportation opportunities
- Financing the operating expenses to provide a stable, long-term bus solution



Source: TCRP Report No. 19: *Guidelines for the Location and Design of Bus Stops* (1996)

- Notes:
- (1) Lengths of acceleration lanes and tapers vary proportionately with posted speed of the adjacent roadway.
 - (2) The depth of the bus bay is preferably 12'; lesser widths can be accommodated to 10' for streets with posted speeds of 30mph or less.



TRAFFIC CALMING

PURPOSES

Due to state and federal standards for street design, as well as the simple nature of many drivers to react to those designs by driving faster than the speed limit allows, there will always be a desire to “calm” (e.g., “slow”) vehicular traffic in residential areas. Traffic calming measures, when properly installed, reduce accidents and average travel speeds. Better street connectivity, more sensitive design that incorporates curves, multi-way STOP controls and so forth can improve the situation on new streets. For retrofitting streets with traffic calming devices, it is important to recognize the adopted calming guidelines of Garner and the following Challenges and other issues that poorly thought-out traffic calming solutions may incur.

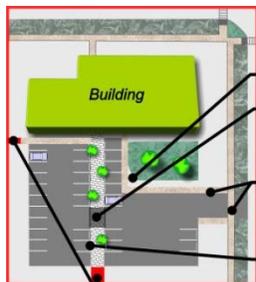
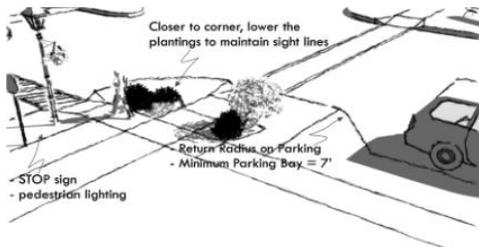
CHALLENGES

- Balancing the need for roadway capacity in any area with the desires of residents to keep traffic moving slowly (or at least generally adhere to the speed limit) in front of their homes
- Creating designs and installations that are safe for all travelers and minimize the potential for expensive legal actions against the Town of Garner

ADDITIONAL RESOURCES

- Institute of Traffic Engineers: www.ite.org/traffic
- Victoria Transport Policy Institute: www.vtpi.org/tdm/tdm4.htm
- Refer also to the adopted traffic calming policy adopted by the Town of Garner

CALMING IN MANY PLACES. The curb extension (far left) is effective in low-speed, downtown locations; parking lots create pedestrians from drivers, and good design practice is often overlooked (bottom-left). In the long-term, creating interconnected streets and pedestrian paths (top right)



Provide Connections to All Adjacent Properties

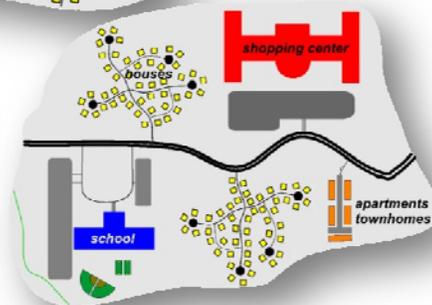
- Parking in Rear
- Clear Sight Lines
- Elevated, Marked Crosswalks to Store Entrance
- Continue Sidewalks to Building Entrance and Across Driveway
- Parking Stops 3' Off Edge to Ensure Clear Pedestrian Passage

offer more opportunities more cheaply than any other public option, and promote better neighborhoods than conventional, segregated land use practices (bottom-right).



Connected ↻

Disconnected ↻



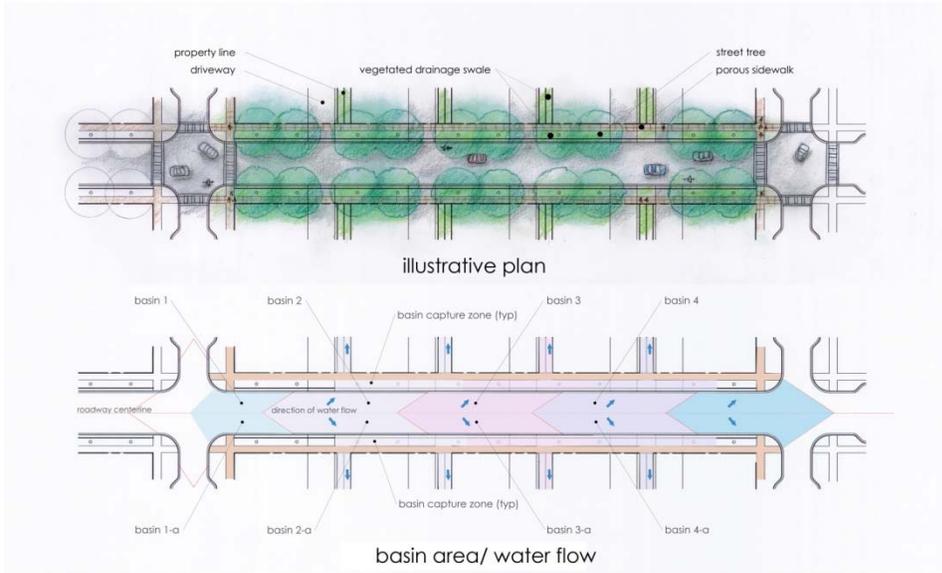
GREEN STREETS

PURPOSES

A rapidly emerging interest in creating sustainable street solutions (and parking solutions) can translate into lower stormwater treatment costs, improved stream quality, and enhanced aesthetics. The following sample techniques have been adopted by the City of Jacksonville, NC and are already being implemented on some new residential streets. A more complete guide can and should be developed in concert with the private development community and a clear mandate from the Town that this aspect of street design is a critical piece of greening Garner.

CHALLENGES

- Green street designs will frequently require exceptions to some state street design policies
- The initial installation costs may be more expensive; a combined approach to treating stormwater and the sizing of underground and above-ground utilities would offset these costs
- There are long-term maintenance costs that can be borne by the Town or, with an agreement, a community organization



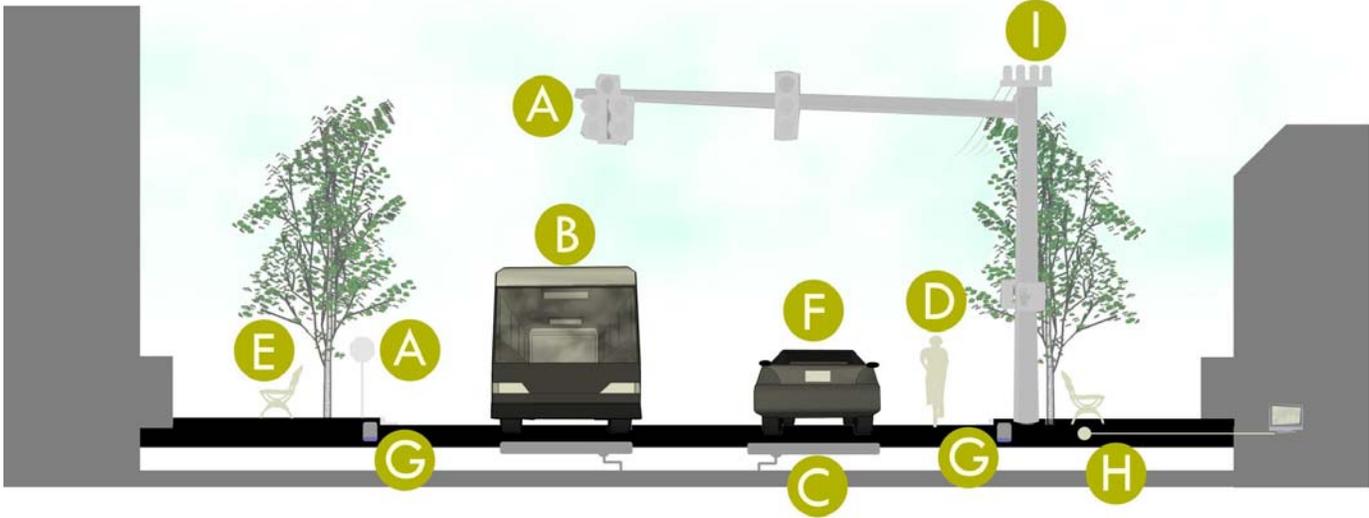
***SAMPLE GREEN STREET.**
The illustration and photograph at left depict how green streets actually work to direct the first ½” to 1” of stormwater into retention areas where water will infiltrate back into the water table, cleaning it of impurities along the way.*



CONTACT NUMBERS

PURPOSES

The streets of Garner are the responsibility of several agencies to ensure that they operate smoothly. The following figure provides contact information about whom to contact for information about different aspects of Garner’s transportation system.



- A Traffic Signals and Signs**
Garner Street: 772-7600 NCDOT Street: 477-2914
- B Buses and Public Transportation including Carpool/Vanpool**
Raleigh CAT Bus or Triangle Transit: 485-RIDE (7433)
- C Street Maintenance and Drainage Issues**
Garner Public Works: 772-7600
- D Bicyclists...Enjoy the Same Rights & Responsibilities as Drivers!**
Report Dangerous Behavior to Garner Police Department: 772-8810
- E Street Trees and Furniture**
Garner Public Works: 772-6880
- F Traffic Enforcement**
Garner Police Department: 772-8810
- G Water/Sewer Problems**
Raleigh Public Utilities Operations Division: 250-2737 (or 829-1930 after hours)
- H Cable Television and Computer Connections**
Time Warner Cable: 866-489-2669
- I Electrical Outage or Downed Power Lines**
Progress Energy: 540-5400

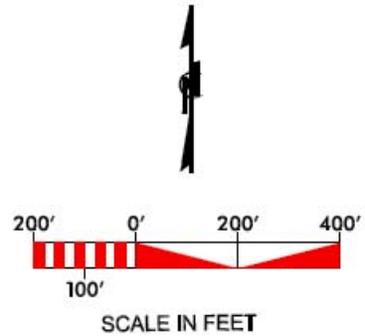
Appendix F: Conceptual Intersection Designs

The Garner Transportation Plan Steering Committee, based on input from the public and staff, chose the following three locations to conduct conceptual design studies. Old Stage Road/US 401; Aversboro/Fifth Avenue (extending to ramp interchange at Vandora Springs Road and US 70); and Ackerman Road/NC 50 were considered for basic improvements that would allow for safer, smoother flows of traffic based on existing knowledge of traffic conditions and congestion points in the study area. This more detailed approach to planning is in concert with the wishes of the Steering Committee and Town of Garner to pursue cost-effective, high-yield solutions to everyday traffic concerns. Preliminary and final designs will probably indicate some changes to the following designs.

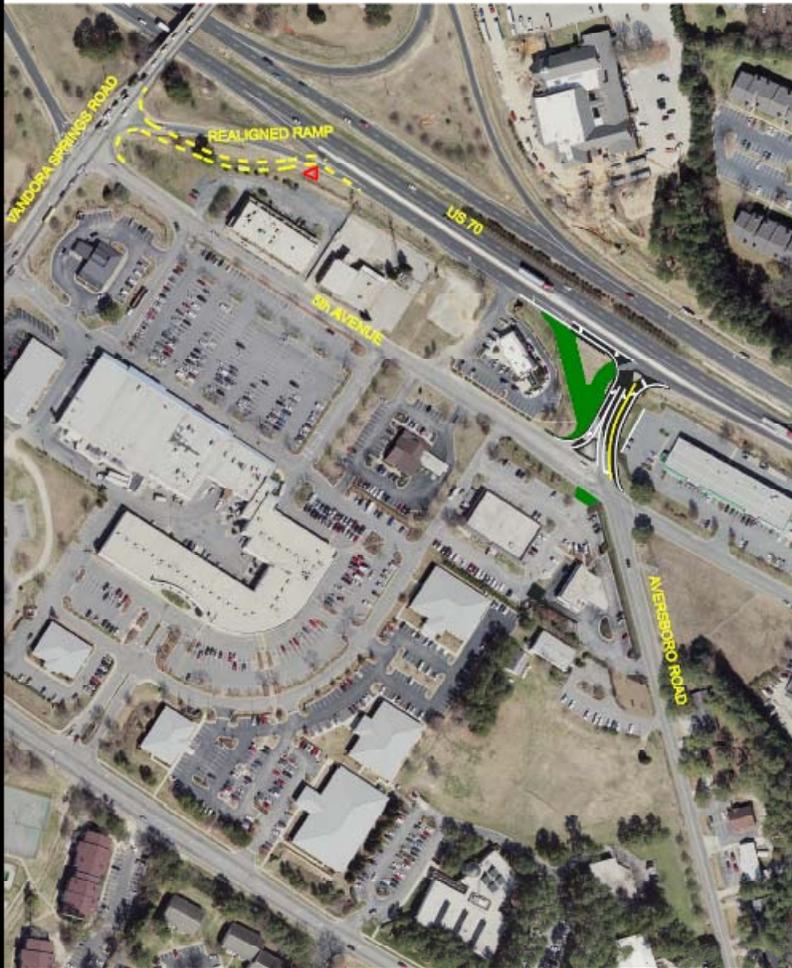
Existing Conditions



5th Avenue at Aversboro Road



Proposed Improvements



Proposed Improvements

- Realignment of ramp from Vandora Springs to US 70 may assist in reducing travel speeds along the collector distributor
- Realign US 70 at Aversboro intersection to form right angle intersection
- Close driveway within the intersection of 5th Avenue at Aversboro Road
- Provide additional access behind First Citizens Bank

* A detailed traffic study is suggested before improvements are implemented.

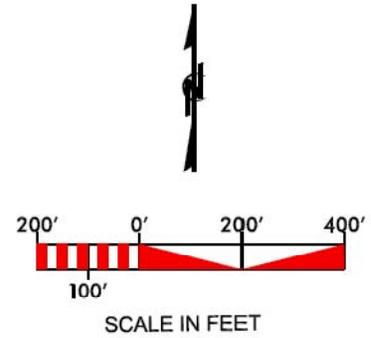


701 CORPORATE CENTER DRIVE SUITE 676
RALEIGH, NC 27607 P 919.854.6200 F 919.854.6258

Existing Conditions



US 401 at Old Stage Road



Proposed Improvements



Proposed Improvements

- Close median at Maxwell Drive
- Cul-de-sac Old Stage Road at US 401
- Realign Old Stage Road to US 401 and install traffic signal if warranted.
- Provide dual WB right-turn lanes from realigned Old Stage Road
- Add NB right-turn lane on US 401 at realigned Old Stage Road
- Add SB left turn lane on US 401 at realigned Old Stage Road
- Reconnect Grovemont Road to Old Stage Road

* A detailed traffic study is suggested before improvements are implemented.

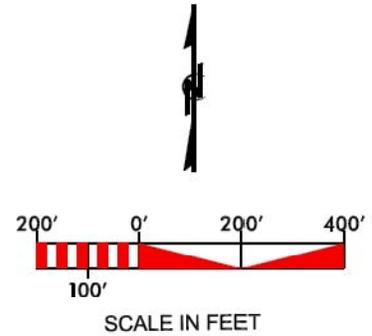


701 CORPORATE CENTER DRIVE SUITE 475
RALEIGH, NC 27607 P 919.854.8200 F 919.854.8259

Existing Conditions



White Oak Road at Hebron Church Road



Proposed Improvements



Proposed Improvements

- Remove Hebron Church Road stub
- Extend Ackerman Road to White Oak Road
- Realign Hebron Church Road to Ackerman Road
- Parcel on SW corner may be used as out parcel for developer if Hebron is shifted far enough west
- Add left turn lane on White Oak Road at Ackerman Road

* A detailed traffic study is suggested before improvements are implemented.



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Endnotes and Resources

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- 19 Vestel, Leora Broydo, "Incandescent Bulbs Return to the Cutting Edge." New York Times, July 5, 2009 (<http://www.nytimes.com>).