

Chapter 5 – Implementation

Introduction

Planning, design, and implementation are all critical components of a successful plan. The citizens of Clemmons have expressed a desire to implement a Village Transportation Plan that will add to the quality of life and unique character of the area. With limited funding resources, however, implementation can be challenging and time-consuming. With this in mind, policy recommendations and an action plan have been developed to help local staff focus their efforts and seek strategic opportunities to expedite the implementation of this plan.

Completion of the *Clemmons Village Transportation Plan* represents an important step toward implementing multimodal improvements that affect travel safety, mobility, development patterns, and the aesthetics of Clemmons. Some of the recommended improvements will be implemented through the development review process. Major infrastructure improvements most likely will be a product of state and federal funding; however, transportation improvement funds are limited and competition for them is great.

This chapter provides general policy recommendations, reviews funding opportunities, and presents an action plan to assist local decision-makers and planning staff in the implementation of the *Village Transportation Plan*.

Responsible Agencies

To successfully implement this plan, responsible agencies have been identified that can influence and authorize recommendations. Policy and program initiatives will, for the most part, occur at the local level. Some of the proposed transportation improvements will encompass right-of-way that is owned by different public or private agencies. Some improvements will occur as a result of development and redevelopment opportunities. The majority of responsibility for implementing these recommendations, however, will be a coordinated effort between NCDOT and the Village of Clemmons.





Funding Opportunities

The construction of a comprehensive and connected transportation network can occur through incremental adoption of local policies and programs and state programs, as well as through the receipt of private contributions. With this in mind, it will be important for the Village of Clemmons to identify funding resources to implement the recommendations of this plan. While some projects and programs will be funded by the Village, alternatives are available to provide financial support for improving the local transportation network.

Local Programs

Local funds should be used for strategic projects identified by the community as being necessary to improve the transportation network in Clemmons. Usually these projects are most successful when additional funding can be secured to help lessen the burden to the Village. Local funding sources tend to be flexible and include general revenue expenditures, as well as proceeds from bond programs.

Powell Bill

Powell Bill funds are collected by the state in the form of a gasoline tax. The amount of these funds distributed to a municipality is based on the number of street miles to be maintained and the Village's population.

Transportation Bonds

Transportation bonds have been instrumental in the strategic implementation of local roadways, transit, and non-motorized travel throughout North Carolina. Voters in communities both large and small regularly approve the use of bonds in order to improve their transportation system. Nearly all of the improvements identified in this plan could be financially supported using a transportation bond program. Where the improvement occurs on a state-owned street, approvals and encroachment permits will be required from NCDOT.





Winston-Salem Urban Area Metropolitan Planning Organization

Clemmons is a member of the Winston-Salem MPO, which is one of 17 MPO's designated by NCDOT. The MPO aids local planning efforts and provides services and guidance in coordinating with NCDOT. As a member jurisdiction, the Village of Clemmons has a responsibility to participate in the Long Range Transportation Plan (LRTP) process.

As a member of the MPO, the Village will have an opportunity to request funding through the MPO for three primary resources: Transportation Improvement Program (TIP), Enhancement Grants, and Congestion Management and Air Quality (CMAQ). All of these are state programs; however, local prioritization by MPO's weighs heavily in the selection of projects for funding. The TIP includes funding for roadway, bridges, maintenance, bike, pedestrian and transit projects.

State and Federal Programs

In comparison with local funds, state and federal funds are not as flexible in terms of their use. Projects funded by these programs usually focus on the needs required by vehicles, either in terms of capacity or safety — for example, widening projects. It can be difficult to secure these funds for alternative transportation projects.

The 1998 Transportation Equity Act for the Twenty-First Century (TEA-21) required NCDOT to set aside federal funds from eligible categories for the construction of bicycle and pedestrian transportation facilities. On August 10, 2005, the President signed into law the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). With guaranteed funding for highways, highway safety, and public transportation totaling \$244.1 billion, SAFETEA-LU represents the largest surface transportation investment in our nation's history. Provisions address specific safety issues, including pedestrian and bicycle safety.

Funds for pedestrian and bicycle projects come from several different sources that are described in this section; however, allocation of those funds depends on the type of project or program and other criteria. The information provided in this section presents a basic overview of the process.

Transportation Improvement Program (TIP)

The state's Transportation Improvement Program (TIP) supports communities through an array of funding resources including Federal Aid Construction Funds and State Construction Funds. As part of the application process, strict criteria must be met before project selection. Criteria include providing right-of-way information, meeting a set of design standards, showing a need for a project, local support of the project, and the inclusion of the project in the community's planning processes.





Surface Transportation Program – Direct Apportionment (STP-DA)

The STP-DA program was established in the state of North Carolina in order to provide the Metropolitan Planning Organizations with additional funding and increased control over the distribution of funds. STP-DA funds provide the municipality full control over the planning and design phases of a project. This enables the MPO to directly program the funding for the project as long as the project continues to conform to STP-DA policies established by NCDOT. However, usage of STP-DA funds requires the local agency to provide a 20% funding match as well as money for project planning and design.

Enhancement Grant Programs

Enhancement Grants are awarded through the North Carolina Call for Projects process. Projects must benefit the traveling public and help communities increase transportation choices and access, enhance the built or natural environment, and create a sense of place. There are twelve categories of eligible projects:



- 1) Bicycle and Pedestrian Facilities
- 2) Bicycle and Pedestrian Safety
- 3) Acquisition of Scenic Easements, Scenic or Historic Sites
- 4) Scenic or Historic Highway Programs
- 5) Landscaping and other Scenic Beautification
- 6) Historic Preservation
- 7) Rehabilitation of Historic Transportation Facilities
- 8) Preservation of Abandoned Rail Corridors
- 9) Control of Outdoor Advertising
- 10) Archaeological Planning and Research
- 11) Environmental Mitigation
- 12) Transportation Museums

In 2008 there was a temporary halt to Transportation Enhancement projects; however, the program is expected to resume in 2009. More information regarding this program can be found at the following:

<http://www.ncdot.org/Financial/fiscal/Enhancement/>

Congestion Management and Air Quality (CMAQ)

CMAQ's primary purpose is to fund transportation projects and programs in Non-attainment and maintenance areas to help achieve and maintain the National Ambient Air Quality Standards (NAAQS). In North Carolina, MPO's and





RPO's select and submit the highest ranked project(s) for their area to the Systems Planning Unit of Transportation Planning Branch, NCDOT. A CMAQ Review committee then discusses the top ranked CMAQ projects and makes recommendations to the NCDOT Secretary and the Board of Transportation for their approval. Eligible projects identified in the Village Transportation Plan generally include:

- Bicycle and pedestrian facility programs
- Travel demand management (TDM)
- Outreach and ridesharing activities
- Traffic flow improvements

Hazard Elimination and Railway-Highway Crossing Programs

These funds are a subset of the State Transportation Improvement Program (STIP) funding, constituting 10% of a state's funds. This program is intended to inventory and correct the safety concerns of all travel modes. These funds can also be utilized to acquire right-of-way.

NCDOT Division Funds

NCDOT separates the state into 14 divisions. Forsyth County is in Division 9. Division funds are another resource that provides allocations or discretionary funding for special projects within each division.

North Carolina's Clean Water Management Trust Fund (CWMTF)

At the end of each fiscal year, 6.5% (or a minimum of \$30 million) of the unreserved credit balance in North Carolina's General Fund is placed in the CWMTF. The revenue of this fund is allocated as grants to local governments, state agencies, and conservation non-profits to help finance projects that specifically address water pollution problems. CWMTF funds may be used to establish a network of riparian buffers and greenways for environmental, educational, and recreational benefits.

Governor's Highway Safety Program (GHSP)

The Governor's Highway Safety Program is committed to enhancing the safety of North Carolina roadways. To achieve this, GHSP funding is provided through an annual program, upon approval of specific project requests, to undertake a variety of safety initiatives. Communities may apply for a GHSP grant to be used as seed money to start a program to enhance highway safety. Once a grant is awarded, funding is provided on a reimbursement basis and evidence of reductions in crashes, injuries, and fatalities is required. More information about the program can be found at www.ncdot.org/secretary/GHSP.





Public/Private Initiatives

Developer Contributions

Through diligent planning and early project identification, regulations, policies, and procedures could be developed to protect future transportation corridors and require contributions from developers when property is subdivided. To accomplish this goal, it will take a cooperative effort between local planning staff, NCDOT planning staff, and the development community.

Impact Fees

Developer impact fees and system development charges are another funding option for communities looking for ways to pay for transportation infrastructure. They are used most commonly for water and wastewater system connections or police and fire protection services, but they have been used recently to fund school systems and pay for the impacts of increased traffic on existing roads. Impact fees place the costs of new development directly on developers and indirectly on those who buy property in the new developments. Impact fees free other taxpayers from the obligation to fund costly new public services that do not directly benefit them. Although other states in the country use impact fees, they have been controversial in North Carolina and only a handful of communities have approved the use of impact fees. The use of impact fees requires special authorization by the North Carolina General Assembly.

Active Living by Design (ALbD)

Active Living by Design is a program sponsored by the Robert Wood Johnson Foundation. ALbD seeks to bring together the health care and transportation communities to create an environment that encourages residents to pursue active forms of transportation such as walking and bicycling. Grants are awarded each year to a selected number of communities that are then required to produce a local match. These grants can be used to create plans, change land use policies, institute education policies, and develop pilot projects. For more information, visit www.activelivingbydesign.org.





Fit Together

Fit Together is a partnership of the North Carolina Health and Wellness Trust Fund and Blue Cross and Blue Shield of North Carolina. The grant initiative “recognizes and rewards North Carolina communities’ efforts to support physical activity and healthy eating initiatives in the community, schools, and workplaces, as well as tobacco-free school environments.” This program awards as many as nine partnerships with up to \$30,000 annually for a two-year period. For more information on the Fit Together grant initiative, visit www.healthwellNC.com.

The Trust for Public Land (TPL)

Founded in 1972, the Trust for Public Land is the only national nonprofit working exclusively to protect land to enhance the health and quality of life in American communities. TPL works with landowners, government agencies, and community groups to create urban parks and greenways, as well as to conserve land for watershed protection. For more information on the Trust for Public Land, visit www.tpl.org.

Action Plan

This section discusses the appropriate steps for local leaders to implement the recommendations of this plan and key agencies that should be involved with the task. It is not expected that all of the listed items would be completed over the next several years; however, the process should be initiated to best take advantage of the momentum gained with the development of this plan.

Beyond the tasks listed below, it is vital to the success of this plan that the Village continue to work with and educate local citizens and businesses. While public support can encourage implementation, opposition can significantly delay a project. The Advisory Committee formed to guide this plan through its formation has been critical to providing a consistent voice from vision through implementation. The continuation of this committee through project implementation would be another potential way to encourage advocacy and maintain focus on those issues identified as important during preparation of the VTP.

Safety

The Village and NCDOT should secure funding to implement safety countermeasures at the high-crash locations in the study area. **Chapter 2** describes crash analysis that was performed for the heaviest traveled segments and for the 10 worst intersections over the three-year period from June 1, 2004 to May 31, 2007.





Policy Measures

The Village should work with the MPO and the County to ensure that roadway corridors are preserved as development applications are considered. Historically, many projects throughout the state were impacted by development that was not responsive to the adopted plans. The Village should work cooperatively with the MPO and County by providing review and comment on proposed development applications. Where corridor preservation isn't feasible, reasonable alternatives should be sought. In an effort to improve corridor protection, copies of the adopted plan also should be forwarded to the MPO, County, Board of Realtors, Chamber of Commerce, and Economic Development Departments. Additional copies should be made available for public review in the Village of Clemmons Planning Department, local library, and on the MPO and County web pages. Key policy measures that are recommended as a part of this plan are included in the Action Plan Matrix shown in **Table 5.1** at the end of this chapter. These, as well as all recommendations shown in this matrix, are classified into short-term (0-5 years), mid-term (5-15 years), and long-term (15-30 years) prioritizations.

Highway Improvements

The Village and NCDOT should conduct necessary studies and secure funding to implement the recommended Highway Map for the Clemmons area shown in **Figure 3.1**. The plan shows new roadway facilities, existing roadway widening, roadway realignments, intersection improvements, and corridor enhancements. Future corridors shown on the map do not represent specific alignments, but rather a series of connections. While topography and natural and built environment were considered during this planning process, specific feasibility studies should be conducted for these corridors to determine the most appropriate alignments. See **Chapter 3** for detailed roadway recommendations. Key roadway recommendations have been summarized into an Action Plan Matrix, included as **Table 5.1** at the end of this chapter. Within this matrix, projects have been prioritized and ranked.

Collector Streets

The collector street plan discussed in **Chapter 3** should be used by local staff and developers to ensure adequate connectivity as development and redevelopment occurs. By expanding Clemmons's transportation system through increasing the number of collector streets, traveling between local streets and arterials is enhanced. Key outcome goals of the plan include improved accessibility to higher intensity residential areas and activity centers while avoiding or minimizing impacts to sensitive areas for the preservation of the natural environment.

It is recommended to use the guidelines in **Chapter 3** when requiring collector street network improvements. Research indicates that a 3,000-foot grid is typically the most appropriate for the mixed suburban and rural development





pattern that prevails throughout most of the study area. For more intense development, a 750-foot grid proves optimal, but this is independent of the costs that would be incurred to build a network of such intensity. The draft collector street plan is shown in **Figure 3.12**.

Collector Street Implementation Policies

- Seek to incorporate the Collector Street Plan and associated roadway design standards and policy requirements within development ordinances of the County and the Village
- Use the plan as a tool to communicate desired roadway connectivity as development projects are proposed
- Review all development proposals for consistency with the approved collector street plan and emphasize connections rather than alignments
- Require that new developments reserve right-of-way for and construct future collector streets
- Integrate future bikeway, greenway, and trail networks with the Collector Street Plan to improve access and enhance connectivity between systems
- Amend the Collector Street Plan as necessary to include new streets as they are identified during the development review process

Sidewalks, Bikeways and Greenways

The Bicycle and Pedestrian Plan elements shown in **Figure 4.1** should be implemented. Non-motorized vehicular facilities can be constructed as stand-alone enhancement projects; however, they often are implemented more effectively when incorporated into public and private infrastructure projects such as roadway widenings, regular street maintenance, utility line replacements, and new road construction. The networks represented in each of these plans are tended to work as a comprehensive network thereby maximizing the benefit to the transportation system and overall community.

Key recommendations identified as a part of the VTP have been summarized in the Action Plan Matrix shown in **Table 5.1** at the end of this chapter, along with prioritizations and rankings. A brief description of these key projects is included in this chapter.

Linear mile costs for pedestrian and bicycle facilities have been developed based on typical material and construction costs. These unit costs are shown in **Table 5.2**. Costs provided in this table do not include right-of-way acquisition or environmental mitigation. **Table 5.3** utilizes these construction cost estimates to develop cost estimates for the recommended bicycle and pedestrian facilities discussed in the plan. Cost estimates for intersection-level improvements are not included in this table.





Table 5.2 Bicycle and Pedestrian Facility Unit Cost Estimates

| Facility Type | Cost Per Mile |
|--|---------------|
| Bicycle Projects | |
| Wide Paved Shoulder | \$480,000 |
| Signed Route | \$1,200 |
| Striped Bike Lanes | \$18,000 |
| Wide Outside Lanes | \$18,000 |
| Signed Route with Striped Parking | \$18,000 |
| Striped Bike Lanes (Additional Pavement) | \$440,000 |
| Greenway Projects | |
| Multi-Use Path | \$600,000 |
| Neighborhood Connector | \$85,000 |
| Pedestrian Projects | |
| 5-foot Sidewalk (One Side) | \$150,000 |
| 5-foot Sidewalk (Both Sides) | \$300,000 |

Sidewalks

In general, sidewalks in the Clemmons area are recommended to have the following characteristics:

- **Width** — Sidewalks should be a minimum width of 5 feet in suburban locations and sized to complement/support the streetscape in urban areas.
- **Set-back** — In areas where curb and gutter exists, sidewalks should be set back from the street by a minimum of 5 feet (planted or hardscaped). In areas where there is not curb and gutter, sidewalks should be located with the open drainage channel between the traveled way and the sidewalk.
- **Material** — Generally, sidewalks should be concrete; however, other decorative materials (if level and smooth) should be permitted in areas where streetscape designs designate other materials.





Table 5.3 Recommended Bicycle and Pedestrian Facility Cost Estimates

| Recommended Facility | Length (Miles) | Cost Estimate* |
|--|----------------|----------------|
| Bicycle Projects | | |
| Stadium Drive Bike Lanes | 0.83 | \$15,000 |
| Glengarriff Road Bike Lanes | 0.82 | \$15,000 |
| Styers Ferry / Peace Haven Road Connector Bike Lanes** | 0.75 | \$330,000 |
| Bicycle and Pedestrian Projects | | |
| Springfield Farm Road Bike Lanes and Sidewalks | 1.08 | \$344,000 |
| Greenway Projects | | |
| Yadkin River Greenway | 0.69 | \$414,000 |
| Harper Road Sidepath | 1.59 | \$954,000 |
| Idols Road Sidepath | 1.88 | \$1,128,000 |
| Pedestrian Projects | | |
| Hampton Road Sidewalk | 1.35 | \$203,000 |
| Middlebrook Drive Sidewalk | 1.57 | \$236,000 |

* - Estimates are for construction costs only, and do not include right-of-way acquisition or environmental mitigation.

** - Project is an incidental improvement, combined with future roadway or development improvements

- **Location** — Sidewalks should be located in accordance with Clemmons ordinances and generally on both sides of all collector streets, minor thoroughfares, and major thoroughfares. In the case that a greenway is shown for a corridor, the greenway takes the place of a sidewalk on one side of the street and a sidewalk may or may not be required on the opposite side of the street (at the Village’s discretion).

Recommendations that should be considered for short-term implementation include:

- Peace Haven Road/Styers Ferry Road Connector – Bicycle and pedestrian facilities are currently being recommended as a part of the preliminary conceptual roadway design plans. In addition, improvements to Springfield Farm Road will create a bicycle and pedestrian-friendly corridor serving the school area.





- Lewisville-Clemmons Road sidewalks – NCDOT is currently working on plans for improvement to this corridor that include installation of sidewalks. These sidewalks will provide important links to nearby school, residential, and retail areas.
- Middlebrook Drive sidewalks – This project is included as a part of the current TIP. Sidewalks are proposed to be constructed from US 158 to Amberly Road. This project will help provide pedestrian connections from residential areas to the government and retail areas to the north.

Bikeways

When considering the implementation of a bicycle facility, elements beyond the location of the facility must be analyzed. It is important to consider the population that the facility will serve, as well as their bicycling preferences. In addition, it is critical to consider neighboring activity centers and destination points. For example, facilities serving an elementary school and a large child ridership will likely be very different than facilities serving a government center.

The bicycle facilities recommended in **Chapter 4** are a result of input from the general public, stakeholder, advisory committee members and technical analysis. Recommendations that should be considered for short-term implementation include:

- Peace Haven Road/Styers Ferry Road Connector – Bicycle and pedestrian facilities are currently being recommended as a part of the preliminary conceptual roadway design plans. In addition, improvements to Springfield Farm Road will create a bicycle and pedestrian-friendly corridor serving the school area.
- Stadium Drive bike lanes – Recommended facilities on this road would serve a school, library, and retail areas as well as residential. This project would aid in promoting the Safe Routes to School program for Clemmons Elementary.
- Glengarriff Road bike lanes – This road has existing width necessary for striped bike lanes. Implementation of this project would have a big impact right away, and would also help calm traffic along the road.

Greenways

Greenways can play a significant role in providing critical linkages in the pedestrian and bicycle network of a community. They connect people to nature and often represent the safest and shortest route between destinations. Often greenways follow natural systems along streams or floodplains which limits their potential conflict with development. While new to Clemmons, an emerging greenway system can evolve in a logical way and may take its origin in the form of hiking trails that over time transform to a formal paved multi-use path. The implementation of trail systems requires cooperation of land property owners but also represents great opportunities for community service projects.





Generally trail systems are natural paths with marked trailhead signs and whose surfaces are generally pervious (dirt, mulch or gravel). As funding become available, more formal infrastructure can be installed. The traditional multi-use path is a minimum 10' wide paved surface. Recommendations that should be considered for short-term implementation include:

- Greenway connection along Yadkin River by Tanglewood – This greenway extension would provide a key link from Tanglewood Park to the Fair Oaks neighborhood, and by extension, northern Clemmons. In addition, this project provides a safer alternate route across US 158 and I-40. An extension of this project to create a greenway link along I-40 right-of-way by the Fair Oaks neighborhood would facilitate a connection with the proposed Harper Road sidepath.
- Harper Road sidepath – This sidepath has been proposed as part of the Village Point Master Plan. Implementation of this greenway will help serve new development as well as connecting to facilities such as the YMCA and other recommended greenways.

Intersection-level Improvements

It is also important to consider improvements to the bicycle and pedestrian network at an intersection level. Often the improvements made at this level will aid tremendously in enhancing the overall walkability and bikeability of a corridor or area. Recommendations that should be considered for short-term implementation include:

- Lewisville-Clemmons Road/Peace Haven Road intersection – Improvements made in this area will improve connectivity to the YMCA and proposed Village Point development.
- Clemmons Road/Lewisville-Clemmons Road intersection – This intersection lies at the heart of the community, serving key activity centers and a school. Recommendations for this intersection include short-term safety and accessibility improvements, as well as long-term integration with bike lane and sidewalk improvements on Clemmons Road.
- Safety improvements along new interchange bridge at Harper Road – Bicycle and pedestrian safety improvements in this area will serve the proposed sidepath along Harper Road. As an alternate measure, enhanced signage directing users to proposed greenways connecting the Harper Road area to Tanglewood Park could help users avoid this intersection entirely.
- Lewisville-Clemmons Road/Stadium Drive connection – Targeted improvements could help establish a bicycle and pedestrian route connecting to Rollingwood Drive in this area. In addition, improvements at the intersection will help users locate and utilize these improvements.
- Intersection of Lewisville-Clemmons Road and Peace Haven Road/Styers Ferry Road Connector – Improvements made at this location would provide a





linkage to school areas, in addition to enhancing east-west mobility for bicycles and pedestrians on the new connector.

Transit

The existing transit services in the Clemmons area include limited taxicab service, rideshare via PART, and dial-a-lift service for paratransit (available for qualifying riders). Several studies conducted by PART suggest that a commuter rail line between the Village of Clemmons and Winston-Salem and the Piedmont Triad Airport is feasible as a long term connection, with the first phase extending to Hanes Mall. This proposed commuter rail corridor may provide excellent service to the Village of Clemmons in the years to come.

While fixed route express bus service to Winston-Salem is not currently available, it does seem logical to plan for future express service. Express service typically includes a single bus dedicated to a limited number of stops (at park and ride lots) providing suburban communities access to public transportation. Many successful express services are offered throughout the state including in the Triangle area as well as the greater Charlotte region.

At present, there are no park-and-ride lots in the Village. With the rapid growth in Clemmons and the introduction of a commuter rail service, the need for additional park-and-ride lots may increase. Telecommuting is also a promising arrangement that could affect congestion levels along major corridors in the area. Public feedback indicates that there will be an even greater focus on providing these services in the future. The Action Plan Matrix provided in **Table 5.1** at the end of this chapter presents these key transit recommendations, along with establishing prioritizations.

Freight

With the completion of the industrial area on the southeast side of Clemmons, truck traffic is likely to increase. Prior to this type of traffic becoming a source of citizen concern, Clemmons should work with NCDOT to designate local and through truck routes. During this process, the following recommendations should be considered:

- **Truck Definition** — Currently, trucks are defined as vehicles with a manufacturer's gross vehicle weight of 33,000 pounds or more. This definition excludes most single-unit trucks, panel trucks, and delivery trucks, as well as public service vehicles like garbage collection trucks. It includes larger trucks — trucks with more than two axles — such as tractor-trailers and tandem axle dump trucks. The Village should review its truck definition to determine if changes might restrict more heavy vehicles, thereby protecting and maintaining the integrity of its streets.
- **Signage** — Designated routes should be marked clearly at and within (as appropriate) Village limits, major highway intersections, interchanges, and other appropriate locations directing truck drivers to permitted routes. This





may include limiting travel to US and NC routes and other designated routes through the Village. Within the Village limits, consideration could be given to amending the local ordinance to specifically prohibit through trucks on local streets. Prohibition of trucks on any segment of state maintained roadways requires approval from NCDOT.

- **Routes** — Truck route designations should be sought for major routes and industrial streets. The following corridors could be examined for truck route designation eligibility: I-40 within city limits, US 158 between the Yadkin River Bridge and Winston-Salem city limits, Idols Road between Middlebrook Drive and US 158, and Lewisville-Clemmons Road between US 158 and US 421.
- **Industrial Use Areas** — In the southern industrial use areas, efficient truck access should be planned and provided to allow unimpeded movement of freight without creating unwanted cut-through traffic.

Additional tasks associated with the establishment of truck routes through the urban area include:

- Working with NCDOT to prioritize resurfacing on designated routes in an effort to reduce noise and vibration from trucks.
- Adjusting signal timing (coordination) along high priority routes to reduce vehicle delay and maintain vehicle speeds within an acceptable range of the posted speed limit. Impacts of the adjusted timing could include travel time (and reliability), reduced noise (from accelerating and braking vehicles), and air pollution.
- Publishing and distributing educational materials to businesses and industries concerning truck routes.
- Working with NCDOT to make improvements to critical intersections on truck routes to more easily facilitate large vehicle movements and encourage their use by truckers. Improvements include providing adequate curb radii, lane width, and exclusive turn lanes.

Truck Route Design Standards

The design of all roadways should be consistent with their intended function and be responsive to the environment through which they pass. Streets serving as truck routes are not an exception. Common high priority design elements include adequate lane width, turning radii, horizontal and vertical transitions, and adequate space between the edge of the traveled way and adjacent pedestrian facilities. The Action Plan Matrix included as **Table 5.1** at the end of this chapter identifies and prioritizes freight policy recommendations.

Environmental Issues

When considering new roadway alignments and extensions, planners and engineers should use a guiding set of principles to make sure the following environmental considerations are adhered to:





- Avoid steep slopes and otherwise unsuitable topography
- Minimize impacts to the built environment
- Stay away from FEMA designated floodplains
- Minimize the number of wetland (National Wetland Inventory) impacts
- Minimize the amount of each wetland impact (e.g., don't cross a wide wetland when a narrower one can be crossed)
- Minimize the number of stream crossings
- Minimize the length of stream crossings
- Minimize impacts to school sites
- Minimize the number and size of impacts to historic features and districts
- Minimize the number and size of impacts to threatened and endangered species
- Minimize the number and size of impacts to hazardous waste sites
- Minimize the number and size of impacts to superfund sites
- Minimize/avoid impacts to neighborhoods
- Avoid unnecessary or disproportionate impacts to low income and minority communities
- Do not impact parks and designated open spaces
- Minimize gameland impacts
- Minimize the number of new facilities in critical watershed areas
- Be aware of existing development patterns
- Look for existing stub streets

Congestion Management

Consider each of the strategies described in **Chapter 3** to manage traffic congestion in the Clemmons area. These strategies should be used as a guide while considering roadway improvements and development.

Projects for Further Study

The following projects should be considered for further study to assess the feasibility and reasonability of each project. For detailed descriptions, see **Chapter 3** and **Chapter 4**.

- NCDOT Lewisville-Clemmons Road Median Feasibility Study (Ongoing)
- Peace Haven Road/Styers Ferry Road Connector Study (Ongoing)
- Idols Road Extension Feasibility Study





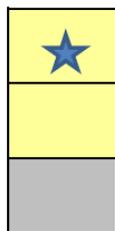
- Peace Haven and Harper Road Roundabout Study
- PART express service
- Park-and-Ride Lots
- Priority Trail Feasibility Studies
- Clemmons Road Median/Bike-Pedestrian Feasibility Study





Table 5.1 – Action Plan Matrix: Roadway & Intersections

| Ranking | Priority | Action Items | Village | County | NCDOT | WSMPO | PART | Developers |
|---------|------------|---|---------|--------|-------|-------|------|------------|
| 1 | Short-Term | Implement Lewisville-Clemmons Road recommendations, north section (STIP U-3119) (see Figure 3.6) | ★ | | ★ | | | |
| 2 | Short-Term | Implement interim Lewisville-Clemmons Road recommendations, south section (see Figure 3.7) | ★ | | ★ | | | |
| 3 | Short-Term | Implement Harper Road recommendations, including roundabout installation at Harper Road and Peace Haven Road (see Figure 3.4) | ★ | | ★ | | | |
| 4 | Short-Term | Implement Idols Road Extension to US Hwy 158 (STIP U-2707) | | | ★ | | | |
| 5 | Mid-Term | Implement US 158/Clemmons Road recommendations, west (see Figure 3.10) | ★ | | ★ | | | |
| 6 | Mid-Term | Implement Kinnamon Road recommendations (see Figure 3.5) | ★ | | | | | |
| 7 | Mid-Term | Implement Peace Haven Road/Styers Ferry Road Connector improvements between Springfield Farm Road and Lasater Road | | | | | | ★ |
| 8 | Long-Term | Implement Peace Haven Road recommendations, west section (see Figure 3.8) | ★ | | ★ | | | |
| 9 | Long-Term | Implement Peace Haven Road recommendations, east section (see Figure 3.9) | | | ★ | | | |
| 10 | Long-Term | Implement US 158/Clemmons Road recommendations, east portion (see Figure 3.11) | | | ★ | | | |
| 11 | Long-Term | Implement long-term Lewisville-Clemmons Road recommendations, south section (see Figure 3.7) | ★ | | ★ | | | |
| 12 | Long-Term | Implement Peace Haven Road/Styers Ferry Road Connector improvements between Springfield Farm Road and Peace Haven Road, including proposed bridge | | | ★ | | | |



Primary Lead

Secondary Lead

Affected Parties

Short-Term = 0-5 years

Mid-Term = 5-15 years

Long-Term = 15-30 years





Table 5.1 – Action Plan Matrix: Transit

| Ranking | Priority | Action Items | Village | County | NCDOT | WSMPO | PART | Developers |
|---------|------------|---|---------|--------|-------|-------|------|------------|
| 1 | Short-Term | Coordinate multi-modal planning between NCDOT, Forsyth County, WSMPO, PART and nearby communities | | | | ★ | ★ | |
| 2 | Short-Term | Evaluate the implementation of express bus service to the Village | | | | | ★ | |
| 3 | Short-Term | Identify and secure a park-and-ride facility within the Village | ★ | | | | ★ | |

| |
|---|
| ★ |
| |
| |

Primary Lead

Secondary Lead

Affected Parties

Short-Term = 0-5 years

Mid-Term = 5-15 years

Long-Term = 15-30 years





Table 5.1 – Action Plan Matrix: Bicycle, Pedestrian, & Greenways

| Ranking | Priority | Action Items | Village | County | NCDOT | WSMPO | PART | Developers |
|---------|------------|--|---------|--------|-------|-------|------|------------|
| 1 | Short-Term | Implement greenway connection along Yadkin River by Tanglewood | ★ | | | | | |
| 2 | Short-Term | Construct Middlebrook Drive sidewalk | ★ | | | | | |
| 3 | Short-Term | Construct Lewisville-Clemmons Road sidewalks** | | | ★ | | | |
| 4 | Short-Term | Stripe bike lanes on Stadium Drive | ★ | | ★ | | | |
| 5 | Short-Term | Stripe bike lanes and construct sidewalks along Springfield Farm Road, as part of Peace Haven Road/Styers Ferry Road Connector improvements | ★ | | | | | |
| 6 | Short-Term | Stripe bike lanes on Glengarriff Road | ★ | | | | | |
| 7 | Short-Term | Construct sidepath along Idols Road extension** | | | ★ | | | |
| 8 | Mid-Term | Improve bicycle and pedestrian connection from Stadium Drive to Rollingwood Drive and improve intersection of Stadium Drive and Lewisville-Clemmons Road | ★ | | | | | |
| 9 | Mid-Term | Improve bicycle and pedestrian amenities at intersection of Lewisville-Clemmons Road and Peace Haven Road | ★ | | ★ | | | |
| 10 | Mid-Term | Implement bicycle and pedestrian safety measures along new interchange bridge at Harper Road | ★ | | ★ | | | |
| 11 | Mid-Term | Improve bicycle and pedestrian amenities at intersection of Lewisville-Clemmons Road and Peace Haven Road/Styers Ferry Road Connector** | ★ | | ★ | | | |
| 12 | Mid-Term | Stripe bike lanes on proposed Peace Haven Road/Styers Ferry Road Connector** | ★ | | | | | ★ |
| 13 | Long-Term | Implement Harper Road sidepath** | | | | | | ★ |
| 14 | Long-Term | Improve bicycle and pedestrian amenities at intersection of Lewisville-Clemmons Road and Clemmons Road | ★ | | ★ | | | |
| 15 | Long-Term | Construct Hampton Road sidewalk | ★ | | | | | |

| | | |
|---|-------------------------|--------------------------------|
| ★ | Primary Lead | Short-Term = 0-5 years |
| | Secondary Lead | Mid-Term = 5-15 years |
| | Affected Parties | Long-Term = 15-30 years |

** indicates project is an incidental improvement combined with future roadway or development improvements





Table 5.1 – Action Plan Matrix: Bicycle, Pedestrian, & Greenways

| Ranking | Priority | Action Items | Village | County | NCDOT | WSMPO | PART | Developers |
|---------|------------|--|---------|--------|-------|-------|------|------------|
| 1 | Short-Term | Implement greenway connection along Yadkin River by Tanglewood | ★ | | | | | |
| 2 | Short-Term | Construct Middlebrook Drive sidewalk | ★ | | | | | |
| 3 | Short-Term | Construct Lewisville-Clemmons Road sidewalks** | | | ★ | | | |
| 4 | Short-Term | Stripe bike lanes on Stadium Drive | ★ | | ★ | | | |
| 5 | Short-Term | Stripe bike lanes and construct sidewalks along Springfield Farm Road, as part of Peace Haven Road/Styers Ferry Road Connector improvements | ★ | | | | | |
| 6 | Short-Term | Stripe bike lanes on Glengarriff Road | ★ | | | | | |
| 7 | Short-Term | Construct sidepath along Idols Road extension** | | | ★ | | | |
| 8 | Mid-Term | Improve bicycle and pedestrian connection from Stadium Drive to Rollingwood Drive and improve intersection of Stadium Drive and Lewisville-Clemmons Road | ★ | | | | | |
| 9 | Mid-Term | Improve bicycle and pedestrian amenities at intersection of Lewisville-Clemmons Road and Peace Haven Road | ★ | | ★ | | | |
| 10 | Mid-Term | Implement bicycle and pedestrian safety measures along new interchange bridge at Harper Road | ★ | | ★ | | | |
| 11 | Mid-Term | Improve bicycle and pedestrian amenities at intersection of Lewisville-Clemmons Road and Peace Haven Road/Styers Ferry Road Connector** | ★ | | ★ | | | |
| 12 | Mid-Term | Stripe bike lanes on proposed Peace Haven Road/Styers Ferry Road Connector** | ★ | | | | | ★ |
| 13 | Long-Term | Implement Harper Road sidepath** | | | | | | ★ |
| 14 | Long-Term | Improve bicycle and pedestrian amenities at intersection of Lewisville-Clemmons Road and Clemmons Road | ★ | | ★ | | | |
| 15 | Long-Term | Construct Hampton Road sidewalk | ★ | | | | | |



Primary Lead

Secondary Lead

Affected Parties

Short-Term = 0-5 years

Mid-Term = 5-15 years

Long-Term = 15-30 years

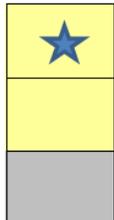
** indicates project is an incidental improvement combined with future roadway or development improvements





Table 5.1 – Action Plan Matrix: Policy Initiatives

| Ranking | Priority | Action Items | Village | County | NCDOT | WSMPO | PART | Developers |
|---------|------------|---|---------|--------|-------|-------|------|------------|
| 1 | Short-Term | Implement Lewisville-Clemmons Road recommendations, north section (STIP U-3119) (see Figure 3.6) | ★ | | | | | |
| 2 | Short-Term | Coordinate to secure spot safety funding to implement safety countermeasures mentioned in Chapter 4 | ★ | | ★ | | | |
| 3 | Short-Term | Implement Harper Road recommendations, including roundabout installation at Harper Road and Peace Haven Road (see Figure 3.4) | ★ | ★ | | | | |
| 4 | Short-Term | Investigate implementation of a connectivity index or other connectivity policy initiative | ★ | | | | | |
| 5 | Short-Term | Increase transportation connectivity by implementing the recommended collector street network incrementally as development occurs | ★ | | | | | |
| 6 | Short-Term | Coordinate multi-modal planning between NCDOT, Forsyth County, WSMPO, PART and nearby communities | | | | ★ | ★ | |
| 7 | Short-Term | Enhance existing sidewalk policy to ensure consistent implementation of pedestrian facilities | ★ | | | | | |
| 8 | Short-Term | Develop a Peace Haven Road/Styers Ferry Road Connector Corridor Protection Overlay District Ordinance | ★ | ★ | | | | |
| 9 | Mid-Term | Coordinate with NCDOT to designate appropriate truck routes <i>within</i> the Village | ★ | | | | | |



Primary Lead

Secondary Lead

Affected Parties

Short-Term = 0-5 years

Mid-Term = 5-15 years

Long-Term = 15-30 years

