



Executive Summary





US 64 west of
Jordan Lake
(October 2009)

EXECUTIVE SUMMARY

This summary provides an overview of the materials included in this Corridor Study Report and present the findings and recommendations of the study. For more detailed information please consult the individual chapters of this report.

S.1. INTRODUCTION (CHAPTER 1)

The US 64 corridor has been identified in the state's Strategic Highway Corridors (SHC) initiative. The Strategic Highway Corridors initiative seeks to identify, protect and maximize the use of highway corridors that play a critical role in regional or statewide mobility in an ongoing effort to enhance transportation, economic development and environmental stewardship throughout North Carolina.

The study is being conducted as a joint effort between the North Carolina Department of Transportation (NCDOT), the Capital Area Metropolitan Planning Organization (CAMPO), Town of Apex, Town of Cary, Town Of Pittsboro, Wake County and Chatham County for the segment of US 64 from the US 64/US 64 Business split on the east side of Pittsboro to the US 1/US 64 interchange in Cary.

The report is organized as follows:

- Chapter 1 provides an introduction to the study, presents the purpose and goals for the study and the context of the study in relation to the overall planning process;
- Chapter 2 provides an overview of the existing and anticipated future conditions along the corridor;
- Chapter 3 describes the alternatives considered for the short-term and long-term solutions for the corridor and presents the master plan for the corridor;
- Chapter 4 describes how the master plan for the corridor will be implemented and presents the steps required before the recommended improvements are constructed;
- Chapter 5 describes the integration of alternate travel modes such as transit, bicycle and pedestrian into the recommended short-term and long-term solutions;
- Chapter 6 provides an analysis of the effects on the human and natural environments for the short-term and long-term solutions;
- Chapter 7 provides an evaluation of the land use along the corridor and provides recommendations for future zoning along the corridor; and
- Chapter 8 describes the efforts made to engage the public in the development of this study as well as the coordination with regulatory agencies and the Corridor Study Team (CST).

S.1.1. DESIGNATION OF US 64 AS A STRATEGIC HIGHWAY CORRIDOR

The Strategic Highway Corridors initiative was adopted by the North Carolina Board of Transportation on September 2, 2004, as a part of North Carolina's Long-Range, Multimodal Statewide Transportation Plan. Following adoption, a formal policy statement on the initiative was endorsed by the Departments of Commerce, Environment and Natural Resources, Transportation, and the Governor's Office. The NCDOT Board of Transportation approved revisions to the SHC Vision Plan in March 2007 and July 2008.

The North Carolina SHC initiative represents the first major implementation step to be advanced under the state's Long-Range Multimodal Statewide Transportation Plan. The concept defines a new focus for NCDOT to improve, protect, and maximize the capacity of existing highway corridors deemed critical to statewide mobility and regional connectivity. The SHC initiative represents an opportunity for NCDOT in partnership with corridor stakeholders to create a long-range corridor vision. This vision encompasses decision-making consistency, land use and transportation relationships, and roadway design and operational elements.

NCDOT has identified the US 64 corridor as a Strategic Highway Corridor. The US 64 corridor is considered to possess the following characteristics consistent with Strategic Highway Corridors criteria:

- Potential to carry significant traffic;
- Connect existing major activity centers;
- Connect existing and planned Interstate facilities;
- Potential to serve as an Interstate reliever route; and
- Part of the National Highway System (NHS).

S.1.2. NEED FOR THE STUDY

Increasing traffic volumes over the past several years have substantially reduced the traffic flow and increased congestion along US 64. This congestion is expected to worsen as the Raleigh-Durham metropolitan area continues to experience rapid growth. An estimated 1.2 million new residents are expected to move within 30 miles of downtown Raleigh by the year 2035.

The proposed extension of NC 540 (Raleigh Outer Loop) is expected to enhance the desirability of the western Wake and eastern Chatham County area further, as motorists traveling to the Research Triangle Park (RTP), one of the major employment centers in the region, will experience shorter travel times. Roadways connecting to the proposed extension of NC 540, such as US 64, are anticipated to see an increase of traffic resulting from motorists using the new highway to travel to and from RTP. Without additional improvements to US 64, congestion and travel times are expected to substantially worsen.

S.1.3. PURPOSE OF THE STUDY

The goal of the study is to develop a master plan to preserve and enhance mobility and safety along US 64, while balancing community access and interests. This plan will be used to guide development and improvements along the corridor from US 64 Business in Pittsboro to US 1 in Cary.

The master plan includes two distinct components, a short-term plan and a long-term plan:

- The short-term plan consists of interim strategies to improve mobility, safety and pedestrian accessibility at major intersections; and
- The long-term plan consists of improvements needed to serve the anticipated amount of traffic in the year 2035 and later. It proposes to convert many of the major intersections to interchanges or overpasses.

One of the most important elements of this study is to establish a framework and collaborative process for the decision making for land use and transportation along the corridor. Numerous agencies and groups are responsible for overseeing elements of the corridor, including environmental agencies, NCDOT, counties and local municipalities. This study will provide a comprehensive plan for the corridor that will provide the decision makers with the tools to collaborate and make decisions that are consistent with the vision for the corridor. Once the study is completed, it is anticipated that it will not be the end of the process, but the beginning of the stage where the partners along the corridor work together to implement solutions that enhance the corridor for users, residents and businesses along the corridor.

Just as important as defining what is the purpose of the study, it is important to define what the purpose of the study is not. The results of this study and the recommended solutions will not directly result in the construction



of any of the solutions identified, but will act as a basis for developing additional studies to implement solutions that are consistent with the vision for the corridor.

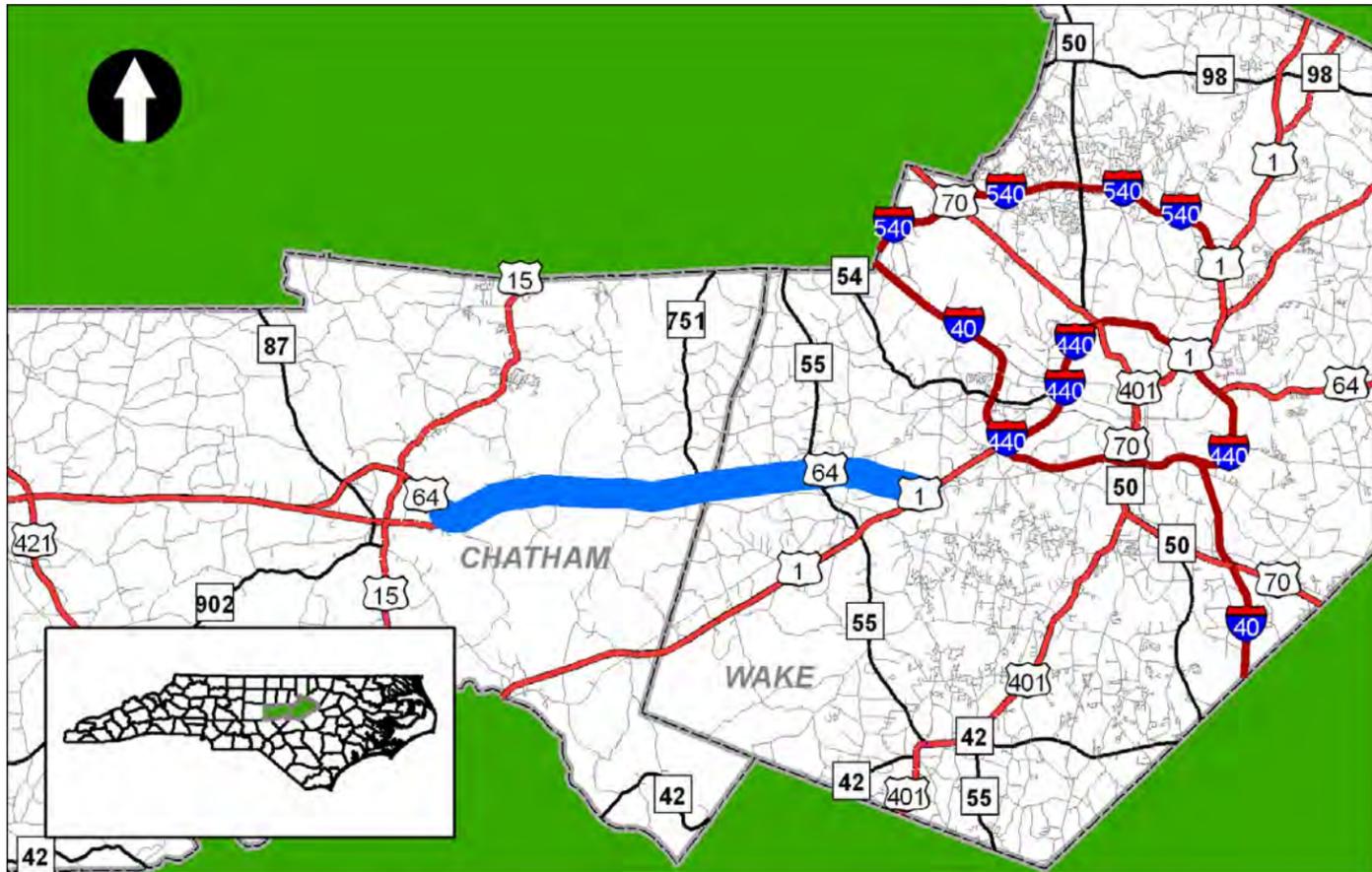
The study will establish a guide for the corridor, and is based on existing data and projections of how the corridor is expected to evolve in the future. The results of the study are meant to be flexible and allow for innovation and enhancement of the solutions in the event that the future trends change or better solutions are developed. With a collaborative effort by the stakeholders along the corridor, it is likely that elements of this study may be improved upon and changes made that will better balance the community's needs while maintaining the overall vision for the corridor.

S.2. EXISTING AND ANTICIPATED CONDITIONS (CHAPTER 2)

S.2.1. STUDY AREA DESCRIPTION

The US 64 corridor study area begins at the US 64 Business/US 64 Bypass Interchange, east of Pittsboro (Chatham County) and extends east to the US 1/US 64 interchange in Cary (Wake County). The study area is approximately 19 miles in length, which includes two miles across Jordan Lake. The study area includes approximately 1500 feet on each side of existing US 64. The study area also includes a segment of US 1 at the east end of the corridor for potential modifications to the US 1/US 64 interchange. The study area for the corridor is shown in Figure S.1. The corridor includes ten miles in Chatham County and nine miles in Wake County and passes through the towns of Apex and Cary.

Figure S.1: Study Area



S.2.2. POPULATION AND DEVELOPMENT

The Triangle area is one of the fastest growing areas in the nation and has been identified on numerous "Best Places" lists. According to the US Census Bureau in March 2009, Raleigh-Cary was the fastest growing metropolitan area in the nation. In 2009 alone, according to the Greater Raleigh Chamber of Commerce, the Triangle area received over 35 accolades and based on the strong growth in the past and the continued strong outlook for growth in the future, the Triangle region is poised for a substantial amount of growth in the coming years.

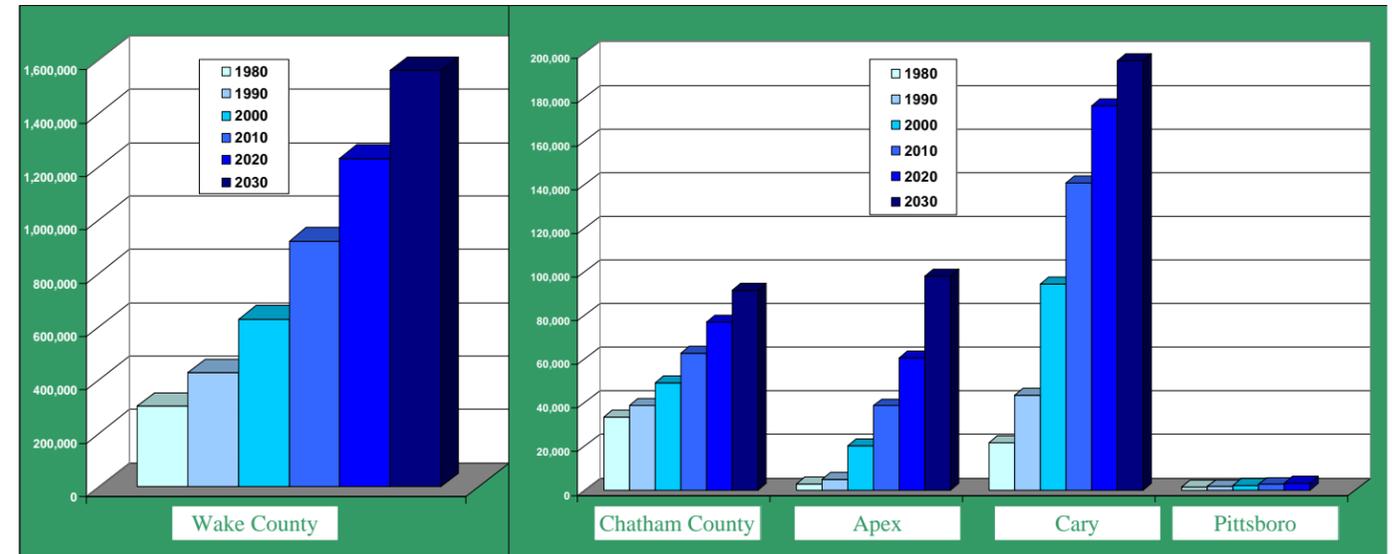
S.2.3. POPULATION PROJECTIONS

The current population and the projected population for the next 20 years are summarized in Table S.1

Table S.1: Population Projections

Area	Population				Growth % Change		
	2000	2010	2020	2030	2000-2010	2010-2020	2020-2030
North Carolina	8,046,813	9,502,904	10,966,956	12,465,478	18.1	15.4	13.7
Wake County	627,846	920,298	1,230,382	1,560,026	51.4	33.7	26.8
Chatham County	49,326	62,887	77,008	91,491	27.5	22.5	18.8
Town of Apex	20,212	38,659	60,614	98,091	91.3	56.8	61.8
Town of Cary	94,536	140,871	176,072	196,806	49.0	25.0	11.8
Town of Pittsboro	2,226	2,678	3,120	n/a	20.3	16.5	n/a

Figure S.2: Current and Projected Population



S.2.4. EXISTING AND FUTURE NO-BUILD TRAFFIC CAPACITY ANALYSIS

The methodology used to determine the traffic operations for the US 64 corridor are based on the procedures defined in the *Highway Capacity Manual* (HCM) published by the Transportation Research Board. The HCM includes procedures to define the operational qualities of roadways based on the concept of capacity and Level of Service (LOS) and is based on the peak one hour period of the day. The LOS is defined with letter designations from A to F where LOS A represents the best operating conditions along a road or at an intersection, while LOS F represents the worst conditions.

S.2.5. EXISTING AND FUTURE NO-BUILD LEVEL OF SERVICE

The LOS for the major intersections along the corridor was evaluated based on the 2007 existing traffic volumes and the projected 2035 traffic volumes along US 64 without any major upgrades to the corridor.

The analysis indicates that 4 of the 11 signalized intersections and 6 of the 7 unsignalized intersections (with a total of 17 individual movements) are currently operating at an unacceptable LOS E or F. If no improvements are made to the corridor, 10 of 11 intersections and all 5 unsignalized intersections (with a total of 22 individual movements) will be operating at LOS E or F in 2035.

S.3. ALTERNATIVE ANALYSIS (CHAPTER 3)

The alternatives considered for the study are described in this section. Each alternative is evaluated with respect to its ability to meet the needs of the study. A number of alternatives were considered during the early phases of the project studies, including the following:

- No-Build Alternative;
- Transportation System Management Alternatives;
- Transportation Demand Management Alternatives;
- Mass Transit Alternatives; and
- Build Alternatives.

Based on the evaluation, only the build alternatives would meet the goals of the study. For the Build alternatives, three types of facilities were considered, freeway alternatives, expressway alternative and signalized intersection alternatives. The three types of alternatives are summarized as follows:

Freeway Alternative

Freeways are characterized by a divided roadway with full control of access and include grade separations or interchanges at cross streets. Freeways provide the highest level of mobility of all types of roadways and the lowest level of access, which is allowed only at interchanges. Based on the evaluation of a freeway alternative in previous studies and by the CST it was determined that a freeway alternative would meet the goals of the study and would be most appropriate for the portion of the corridor between the US 64 Pittsboro Bypass and NC 540 with the exception of the portion across Jordan Lake.

Expressway Alternative

Expressways are characterized by a divided roadway with limited or partial control of access. Access is provided only at interchanges for major cross streets and at-grade intersections for minor cross streets. Expressways do not allow traffic signals and strongly discourage direct driveway connections. Based on the evaluation of an expressway alternative in previous studies and by the CST it was initially determined that an expressway alternative would meet the goals of the study and be appropriate for the portion of the corridor across Jordan Lake and from NC 540 to US 1.

Signalized Intersection Alternative

Signalized Intersections are roadways with traffic signals. A corridor of signalized intersections is commonly referred to as an arterial or boulevard and is the existing classification for a majority of the US 64 corridor within the study area. Based on the evaluation of a Signalized Intersection alternative by the CST it was determined that a Signalized Intersection alternative was not likely to meet most of the goals of the study; however, based on the potential impacts associated with freeway and expressway facilities it was decided that signalized intersection alternatives could be considered, where appropriate, as a means to minimize the effects on the local communities. The CST determined that the only portion of the corridor where a signalized

intersection alternative may be appropriate is the section of US 64 from east of Lake Pine Drive to the US 1 interchange.

S.3.1. SHORT-TERM SOLUTION

Due to the likely expense and timeframe for implementing the Build Alternatives, it was decided by the CST that Short-term Concepts or Transportation System Management (TSM) Alternatives would also be developed that would enhance mobility, safety and pedestrian accessibility along the corridor with minimal capital expenditures, extending the lifespan of the corridor until a time when the long-term Build Alternative needed to be implemented.

S.3.1.1. Initial Evaluation of Short-term Concepts

The initial evaluation of short-term concepts was geared toward evaluating the potential signalized intersection concepts and selecting a short-term solution that would best meet the short-term goals established for the corridor. The following intersection types were considered for the initial evaluation of the short-term solution:

- Traditional Intersection Treatments
- Superstreet
- Median U-turn Crossover
- Quadrant Roadway
- Quadrant Roadway with Grade Separation
- Jughandle
- Split Intersection
- Continuous Flow Intersection

S.3.1.2. Initial Selection of Short-term Solutions

Based on the initial evaluation of short-term solutions, it was determined that the Superstreet with Direct Major Street Left-turns would be the initial preferred solution for each of the intersections along the US 64 corridor and was presented to the public at a workshop on April 27-28, 2009. Based on comments received at the workshop and during the comment period following the workshop, a community meeting was held on July 16, 2009 to further discuss the long-term and short-term solutions for the corridor.

S.3.1.3. Further Detailed Evaluation of Short-term Concepts

Due to the public's concerns, the CST decided to re-evaluate the corridor for both the short-term and long-term solutions. The CST decided that the corridor, while it functions as a system, has unique circumstances at different intersections and that, for this reason, a single concept and configuration cannot be used as the short-term solution along the entire corridor. Additionally, it was determined that some of the concerns with pedestrians and bicyclists may not be able to be accommodated to an acceptable level by a signalized intersection concept, such as those considered for the short-term solution, and that expressway options may be the best way to address the concerns. The CST decided that, if a viable short-term solution was not available, the intersection would be prioritized for an upgrade to a long-term solution that could better address the needs without spending money on a short-term solution that would not provide adequate benefits.

Based on the re-evaluation of the signalized intersection concepts, three concepts emerged as strong candidates to address the public's concerns to the greatest extent possible and provide for a short-term solution that addresses the goals for the corridor. Additionally, long-term concepts such as interchanges would be evaluated if none of the three concepts were determined to be adequate. The three signalized intersection concepts that were re-evaluated were:



- Superstreet with Direct Major Street Left-turns
- Superstreet with Indirect Major Street Left-turns
- Median U-turn Crossover

S.3.1.4. Short-term Solution Corridor Evaluation

The CST evaluated the US 64 corridor on an intersection-by intersection basis to determine the most appropriate short-term solution at each location. For each location the unique circumstances and context of the intersection were evaluated and a preferred solution was selected.

S.3.1.5. Determination of Final Draft Short-term Solution Recommendations

The results of the short-term corridor evaluation for the intersections within Wake County were presented to a select group of stakeholders for review and comment at the stakeholder meeting held on October 22, 2009. Based on the comments and discussion at the stakeholder meeting, the CST met and developed the Draft Final Recommendations for the Short-term Solution.

Summary of Final Draft Short-term Solution Recommendations

A summary of the Final Draft Short-term Solution Recommendations is included in Table S.2.

Table S.2: Final Draft Short-term Solution Recommendations

Intersection/Interchange	Final Draft Short-term Solution
Firefox Trace	Superstreet with Direct Major Street Left Turn
Mt. Gilead Church/Pea Ridge Road	Superstreet with Direct Major Street Left Turn
Big Woods/Seaforth Road	Superstreet with Direct Major Street Left Turn
Farrington/Beaver Creek Road	Superstreet with Direct Major Street Left Turn
NC 751/New Hill Road	Superstreet with Direct Major Street Left Turn
Jenks Road	Superstreet with Direct Major Street Left Turn
Kellyridge Road	Left-in/Right-in/Right-out
Kelly Road	No change from configuration constructed as part of NC 540 project
NC 540	No change from configuration constructed as part of NC 540 project
Green Level Church Road	No change from configuration constructed as part of NC 540 project
NC 55	No change from existing configuration
Fern Valley Lane	No change from existing configuration
Davis Drive	No change from existing configuration
Laura Duncan Road	Tight Interchange (Modern Roundabout Configuration Preferred) Note: Interim solution may include Median U-turn Crossover if privately funded
Knollwood Drive	Left-in/Right-in/Right-out
Lake Pine Drive	Median U-turn Crossover
Autopark Boulevard	Left-in/Right-in/Right-out
Mackenan/Chalon	Superstreet with Direct Major Street Left Turn with U-turn to eastbound US 64 at Autopark Boulevard
Gregson Drive	Superstreet with Direct Major Street Left Turn
Edinburgh Drive	Superstreet with Direct Major Street Left Turn Note: Town of Cary plans to add additional eastbound lane on US 64
US 1 Interchange	No change from existing configuration

S.3.1.6. Short-term Solution Traffic Volumes and Traffic Operations

The goal of the Short-term Solution is to improve traffic operations along the corridor and extend the lifespan of the existing corridor until the long-term solutions are needed and can be implemented. Based on this, the goal of the short-term solutions is to provide for adequate traffic operations until the year 2025.

Short-term Solution Level of Service

The LOS for the major intersections along the corridor was evaluated based on the 2025 traffic volumes for the Short-term Solution design. The analysis indicates that 11 of the 32 signalized intersections and 5 of the 7 unsignalized are projected to be operating at an unacceptable LOS E or F in 2025. For those intersections operating at LOS E or F, upgrading to the long-term solutions should be considered. An additional measure to show the traffic operations along the corridor is through the use of travel time.

S.3.2. LONG-TERM SOLUTION

The goal of the long-term solution for the corridor is to enhance mobility, safety and pedestrian accessibility along US 64 for the design year 2035. The process used to select a recommended long-term solution is described in this section.

S.3.2.1. Evaluation of Initial Long-term Concepts

The first step in developing the long-term solution was to develop general concepts for the corridor. These general concepts were evaluated for their potential to meet the goals for the corridor and did not include an evaluation of detailed design elements, such as the interchange configuration or detailed location of service roads. The initial evaluation included five long-term scenarios, labeled as Long-term Scenarios A-E.

S.3.2.2. Development of Preliminary Long-term Solution (Alternatives 1, 2 and 3)

Following the evaluation of the initial five concepts, three of the scenarios were carried forward for additional detailed study. The three scenarios were labeled as Preliminary Long-term Solutions, given the names Alternative 1, 2 and 3, and detailed design layouts were developed for presentation to the public at Workshop #1 on May 19-20, 2008.

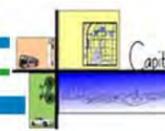
S.3.2.3. Development of Preliminary Recommended Long-term Solution (Alternative 4)

Following Workshop #1 the CST met and discussed the public comments and developed a Preliminary Recommendation for the Long-term Solution, which was a combination of elements from all three of the Preliminary Long-term Solution Alternatives as well as a variation of Alternative 3 that reduced the magnitude of the design in the residential areas through Cary and Apex. Because the Preliminary Recommended Alternative was a hybrid of the previous alternatives, it was named Alternative 4. Following discussions with the CST and the determination of the Preliminary Recommended Long-term Solution, the design plans and traffic capacity analysis were completed for Alternative 4 and the results were presented to the public at Workshop #2 on April 27-28, 2009. A Community Meeting was held on July 16, 2009 to further discuss the long-term and short-term solutions for the corridor.

S.3.2.4. Recommended Draft Long-term Solution Evaluation

Following the Community Meeting, the CST decided to reevaluate the corridor for both the short-term and long-term solution based on the community input. The CST evaluated the US 64 corridor on an intersection by intersection basis to determine the most appropriate long-term solution. For each location, the unique circumstances and context of the intersection were evaluated and a preferred method selected. The CST determined that, based on the potential impacts associated with freeway and expressway facilities, signalized intersection alternatives could be considered, where appropriate, as a means to minimize the effects on the adjacent areas. The CST determined that the only location where a signalized intersection alternative may be appropriate is the section of US 64 from east of Lake Pine Drive to the US 1 interchange.





S.3.2.5. Determination of Final Draft Long-term Solution Recommendations

The results of the long-term corridor evaluation for the intersections within Wake County were presented to a select group of stakeholders at the Stakeholder Meeting held on October 22, 2009 for review and comment. Based on the comments and discussion at the Stakeholders Workshop, the CST met and developed the Draft Final Recommendations for the Long-term Solution

Summary of Final Draft Long-term Solution Recommendations

A summary of the Final Draft Long-term Solution Recommendations is included in Table S.3.

Table S.3: Final Draft Long-term Solution Recommendations

Intersection/Interchange	Final Draft Short-term Solution
Firefox Trace	Access Closed and new roadway constructed to provide access to Hanks Chapel Road and US 64 Business
Mt. Gilead Church/Pea Ridge Road	Compact Diamond Interchange
Big Woods/Seaforth Road	Partial Cloverleaf Interchange with ramps and loops on west side of Big Woods/Seaforth Road
Farrington/Beaver Creek Road	Compact Diamond Interchange
NC 751/New Hill Road	Tight Diamond Interchange with US 64 relocated to the north
Jenks Road	Partial Cloverleaf Interchange with loop in southwest quadrant
Kellyridge Road	Right-in/Right-out connecting to eastbound collector-distributor road
Kelly Road	Configuration constructed as part of NC 540 project with revised connections to collector-distributor roads in both directions along US 64
NC 540	Configuration constructed as part of NC 540 project with revised connections to collector-distributor roads in both directions along US 64
Green Level Church Road	Configuration constructed as part of NC 540 project with revised connections to westbound collector-distributor road
NC 55	Improvements to NC 55, new bridge over US 64, improvements to US 64 ramps and connects to westbound collector-distributor road
Fern Valley Lane	Right-in/Right-out connecting to westbound collector-distributor road and new connection to Old Jenks Road by extending Sandy Hill Court
Davis Drive	Improvements to Davis Drive and US 64 Ramps
Laura Duncan Road	No change from Short-term (Tight Interchange)
Knollwood Drive	Right-in/Right-out subject to interchange design at Laura Duncan Road and Lake Pine Drive
Lake Pine Drive	Tight Interchange with modern roundabout configuration preferred
Autopark Boulevard	6-lane US 64 and Left-in/Right-in/Right-out
Mackenan/Chalon	6-lane US 64 and Superstreet with Direct Major Street Left Turn with U-turn to eastbound US 64 at Autopark Boulevard
Gregson Drive	6-lane US 64 and Superstreet with Direct Major Street Left Turn
Edinburgh Drive	6-lane US 64 and Superstreet with Direct Major Street Left Turn
US 1 Interchange	No change from existing configuration except for additional lane on ramp from US 1/64 Southbound

S.3.2.6. Long-term Solution Traffic Volumes and Traffic Operations

The goal of the long-term solution is to improve traffic operations along the corridor and enhance the safety and mobility of US 64 until the year 2035. The analysis indicates that all basic freeway segments, ramp junctions, and multi-lane segments, as well as a majority of the freeway weaving sections and signalized

intersections are projected to operate at an acceptable LOS D or better in 2035. Three locations along the corridor were projected to operate at LOS E or F in 2035.

An additional measure to show the traffic operations along the corridor is through the use of travel time. Table S.4 shows the approximate travel time for the 19-mile US 64 corridor from the US 64 Bypass west of Pittsboro to the US 1 interchange in Cary for each direction of US 64 in the AM and PM peak periods for the 2007 existing timeframe, the 2035 No-Build scenario, the 2025 Short-term scenario and the 2035 Long-term scenario.

Table S.4: Travel Time Summary

Roadway	2007 Existing AM/PM Travel Time	2035 No-Build AM/PM Travel Time	2025 Short-term AM/PM Travel Time	2035 Long-term AM/PM Travel Time
US 64 Eastbound	29 /26 minutes	54 /40 minutes	39/31 minutes	21/21 minutes
US 64 Westbound	27 /27 minutes	39 /51 minutes	28/36 minutes	20/22 minutes

Based on Table S.4, it is shown that the Short-term and Long-term Solutions improve the mobility of the US 64 to a substantial degree. The implementation of the Short-term solution will provide immediate benefits by reducing the delay along the US 64 corridor. The 2025 travel time for the corridor is slightly longer than the 2007 existing conditions, but shows an improvement over the 2035 No-Build conditions. For the 2035 Long-term Solution, the implementation of the recommendations is projected to reduce the travel time along US 64 by as much as 33 minutes over the 2035 No-Build scenario.

S.4. IMPLEMENTATION PLAN (CHAPTER 4)

This section of the study includes developing a plan for implementing the recommended short-term and long-term solutions for the corridor.

S.4.1. DEVELOPING CORRIDOR INTERSECTIONS AND SEGMENTS

For the purposes of determining how the recommended solutions will be implemented it was determined that a measured approach would be taken and the corridor would be evaluated on an intersection by intersection basis for the short-term solution. The recommended Short-term solution includes revisions to 14 intersections along the corridor. Because the recommended improvements are individual solutions at each of the intersection locations, they can be implemented either individually or as a part of a larger corridor project to upgrade multiple locations. Due to public concerns with the Short-term solutions it is recommended that initially the improvements be taken incrementally and only when needed. If following the implementation of several of the recommendations a consensus emerges that the improvements are beneficial then the combination of multiple intersections into a single project may be beneficial from a cost standpoint.

The partitioning of the corridor for the Long-term solution is a less straight forward endeavor than for the Short-term solution as several of the recommended improvements would require multiple portions of the corridor be upgraded as a part of a single project. This is because some segments of the corridor are tied together with a common improvement that would need to be constructed as a single project in order to be effective. In general, many of the intersections that are recommended as future interchanges can be implemented individually if necessary, or as a part of a larger project to upgrade a longer section of the corridor. Each segment could be developed as a stand alone project and provide benefits to the overall US 64 Corridor. The segments were developed in a manner such that they would eliminate bottlenecks along the corridor and address any potential safety issues of converting the corridor while maintaining driver's expectations. The evaluation of the corridor resulted in the development of 12 segments.

S.4.2. DEVELOPING IMPLEMENTATION TIMEFRAME AND PRIORITY OF IMPROVEMENTS

For planning purposes it is important to anticipate when projects will likely be needed. Therefore, based on the current information known along the corridor, the projected timeframe and priorities will be developed to aid in





the planning process. The first step in the development of the implementation plan is to determine when the existing intersections along US 64 are no longer functioning in an acceptable manner and need to be upgraded to the short-term improvements. The second step is to determine when each of the short-term solutions will no longer be functioning in an acceptable manner and require upgrading to the long-term improvements. The timeframes being considered for the implementation plan coincide with the timeframes used in the CAMPO Long Range Transportation Plan and include 2015, 2025 and 2035. 2015 projects are projects already underway that will occur between 2010 and 2015 with an expected completion date by 2015. The 2025 projects are programmed to occur between 2015 and 2025 while the 2035 projects are for programmed for the time period between 2025 and 2035 and include sections of roads forecasted to be beyond capacity by 2025 or 2035 and that can potentially be funded with existing revenue streams or reasonably foreseeable new revenue streams. A fourth timeframe (post 2035) will also be included for those improvements that will not be over capacity in 2035 but will eventually need to be upgraded to fulfill the Strategic Highway Corridor vision and accommodate traffic volumes beyond 2035.

The implementation plan for the US 64 corridor includes recommendations based on what is currently known along the corridor and what is expected to occur in the future. If a substantial safety or traffic operations problem develops along the corridor, NCDOT may implement solutions to improve safety and mobility along the corridor outside of what is included in this study.

One item that was clear from the public involvement efforts of the study was that the public wanted to see what effect the construction of NC 540 would have on the corridor, prior to implementing any of the improvements. The assumption is that once completed, NC 540 would allow some regional and statewide traffic to bypass the section of US 64 through Cary and Apex and allow the existing configuration to operate at an acceptable level. The CST considered this effect and agreed that the implementation of any of the Short-term solutions for the US 64 Corridor, from NC 540 to the US 1 interchange should be delayed until the time that NC 540 is open to traffic and the effects of the change in travel patterns can be evaluated. Therefore, none of the Short-term solutions for Intersections 8 through 14 will be recommended prior to the 2015 timeframe.

S.4.3. IMPLEMENTATION TIMEFRAME

The traffic operations analysis for the corridor was used to determine when each of the improvements would need to be implemented. Once it was determined when each of the improvements would be needed, the timeframe for implementation was developed. The selected timeframe for each of the improvements also includes other more qualitative considerations, such as the availability of funding and includes the consideration of the concerns from the public. For example, the highest priority along the corridor would be to upgrade Laura Duncan Road to an interchange; however due to the cost and the need to develop an environmental document for the improvement, it was moved to the 2015-2025 timeframe. Conversely, the intersection improvement at Jenks Road may not have the highest volumes along the corridor, but as an unsignalized intersection it became a higher priority because it will need to become a signalized intersection soon. Additionally, due to development in the area of Jenks Road, the recommended improvements may be included in the development plans and constructed by private entities.

The recommendations included in this section are based on the best available data and assumptions about the future growth in this area, are in no way to be seen as definitive measures for when the improvements should be implemented. Ongoing review of the safety and mobility along the corridor is essential to ultimately meeting the goals of the study. It is recommended that the Agreements signed as a part of this study include a working group that meets periodically to coordinate planning efforts along the corridor and monitor the changes along the corridor compared to the assumption made as a part of this study. It is likely that through ongoing coordination that the plans included in this study may be refined and improved as new data becomes available.

Prior to implementing any project along the corridor, the following two conditions need to be met: (1) a well defined need for the improvement based on empirical analysis including, traffic studies and/or crash analysis and safety studies; (2) an identified funding source.

The results of the analysis for when improvements should be implemented are shown in Table S.5.

Table S.5: Implementation Timeframe

Short-term Solution Intersections	Implementation Timeframe	Final Draft Short-term Solution
Intersection 1 – Firefox Trace	2015-2025	Superstreet with Direct Major Street Left Turn
Intersection 2– Mt. Gilead Church/North Pea Ridge Road	2015-2025	Superstreet with Direct Major Street Left Turn
Intersection 3 – Big Woods Road/Seaforth Road	2015-2025	Superstreet with Direct Major Street Left Turn
Intersection 4 – Farrington Road/Beaver Creek Road	2015-2025	Superstreet with Direct Major Street Left Turn
Intersection 5 – NC 751/New Hill Road	2015-2025	Superstreet with Direct Major Street Left Turn
Intersection 6 – Jenks Road	2010-2015	Superstreet with Direct Major Street Left Turn
Intersection 7 – Kellyridge Road	2015-2025	Left-in/Right-in/Right-out
Intersection 8 – Knollwood Road	2015-2025	Left-in/Right-in/Right-out
Intersection 9 – Shepherds Vineyard Drive	2015-2025	Included in Median U-turn Crossover at Lake Pine Drive
Intersection 10 – Lake Pine Drive	2015-2025	Median U-turn Crossover
Intersection 11 – Autopark Boulevard	2015-2025	Left-in/Right-in/Right-out
Intersection 12 – Mackenan Drive/Chalon Drive	2015-2025	Superstreet with Direct Major Street Left Turn with U-turn to eastbound US 64 at Autopark Boulevard
Intersection 13 – Gregson Drive	2015-2025	Superstreet with Direct Major Street Left Turn
Intersection 14 – Edinburgh Drive	2015-2025	Superstreet with Direct Major Street Left Turn
Long-term Solution Segments	Implementation Timeframe	Final Draft Long-term Solution
Segment A – West of Haw River	Post 2035	Access Closed and new roadway constructed to provide access to Hanks Chapel Road and US 64 Business
Segment B – Mt. Gilead Church/North Pea Ridge Interchange	Post 2035	Compact Diamond Interchange
Segment C – Big Woods Road/Seaforth Road Interchange	Post 2035	Partial Cloverleaf Interchange with ramps and loops on west side of Big Woods/Seaforth Road
Segment D – Jordan Lake Area	2025-2035	Convert to right-in/right-out access
Segment E – Farrington Road/Beaver Creek Road Interchange	Post 2035	Compact Diamond Interchange
Segment F – NC 751/New Hill Road Interchange	2025-2035	Tight Diamond Interchange with US 64 relocated to the north
Segment G – Jenks Road Interchange	2025-2035	Partial Cloverleaf Interchange with loop in southwest quadrant
Segment H – Kelly Road/NC 540/Green Level Church/NC 55 Area	2025-2035	Kellyridge Road -Right-in/Right-out connecting to eastbound collector-distributor road. US 64 with collector-distributor roads in both directions along US 64.
Segment I – Davis Drive Interchange Area	2025-2035	Improvements to Davis Drive and US 64 Ramps
Segment J – Laura Duncan Road/CSX Railroad Crossing Area	2015-2025	Tight Interchange with modern roundabout configuration preferred
Segment K – Lake Pine Drive Interchange	2025-2035	Tight Interchange with modern roundabout configuration preferred
Segment L – East of Lake Pine Drive to US 1 Interchange	2025-2035	Upgrade short-term solution to 6-lane roadway along US 64 and add additional ramp lane to US 1 SB to US 64 WB ramp



S.4.4. PRIORITIZATION OF IMPROVEMENTS

The priority of the projects was developed for the 2010-2015, 2015-2025, 2025-2035 and post 2035 timeframes using a similar process to the one used to determine the implementation timeframe. The prioritization is based on both the projected traffic operations and more qualitative measures such as community input and projected growth trends. The project priority for each implementation timeframes is included in Table S.6.

Table S.6: Prioritization of Improvements Summary

2010-2015 Implementation Timeframe		
Priority	Intersection/Segment	Recommended Solution
1	Intersection 6 – Jenks Road Intersection	Superstreet with Direct Major Street Left Turn
2015-2025 Implementation Timeframe		
Priority	Intersection/Segment	Recommended Solution
1	Segment J – Laura Duncan Road/CSX Railroad Crossing Area	Tight Interchange with modern roundabout configuration preferred
2	Intersection 10 – Lake Pine Drive Intersection 9 – Shepherds Vineyard Drive	Median U-turn Crossover
3	Intersection 5 – NC 751/New Hill Road	Superstreet with Direct Major Street Left Turn
4	Intersection 3 – Big Woods Road/Seaforth Road	Superstreet with Direct Major Street Left Turn
5	Intersection 14 – Edinburgh Drive	Superstreet with Direct Major Street Left Turn
6	Intersection 13 – Gregson Drive	Superstreet with Direct Major Street Left Turn
7	Intersection 11 – Autopark Boulevard Intersection 12 – Mackenan Drive/Chalon Drive	Superstreet with Direct Major Street Left Turn with U-turn to eastbound US 64 at Autopark Boulevard
8	Intersection 7 – Kellyridge Road	Left-in/Right-in/Right-out
9	Intersection 4 – Farrington Road/Beaver Creek Road	Superstreet with Direct Major Street Left Turn
10	Intersection 2 – Mt. Gilead Church/North Pea Ridge Road	Superstreet with Direct Major Street Left Turn
11	Intersection 8 – Knollwood Road	Left-in/Right-in/Right-out
12	Intersection 1 – Firefox Trace	Superstreet with Direct Major Street Left Turn
2025-2035 Implementation Timeframe		
Priority	Intersection/Segment	Recommended Solution
1	Segment K – Lake Pine Drive Interchange	Tight Interchange with modern roundabout configuration preferred
2	Segment H – Kelly Road/NC 540/Green Level Church/NC 55 Area	Kellyridge Road -Right-in/Right-out connecting to eastbound collector-distributor road. US 64 with collector-distributor roads in both directions along US 64.
3	Segment L – East of Lake Pine Drive to US 1 Interchange	Upgrade short-term solution to 6-lane roadway along US 64 and add additional ramp lane to US 1 SB to US 64 WB ramp
4	Segment I – Davis Drive Interchange Area	Improvements to Davis Drive and US 64 Ramps
5	Segment F – NC 751/New Hill Road Interchange	Tight Diamond Interchange with US 64 relocated to the north
6	Segment G – Jenks Road Interchange	Partial Cloverleaf Interchange with loop in southwest quadrant
7	Segment D – Jordan Lake Area	Convert to right-in/right-out access

Post 2035 Implementation Timeframe		
Priority	Intersection/Segment	Recommended Solution
1	Segment E – Farrington Road/Beaver Creek Road Interchange	Compact Diamond Interchange
2	Segment C – Big Woods Road/Seaforth Road Interchange	Partial Cloverleaf Interchange with ramps and loops on west side of Big Woods/Seaforth Road
3	Segment B – Mt. Gilead Church/North Pea Ridge Interchange	Compact Diamond Interchange
4	Segment A – West of Haw River	Access Closed and new roadway constructed to provide access to Hanks Chapel Road and US 64 Business

S.4.5. FUNDING

The ability to fund any of the improvements along the corridor is subject to the availability of funds. Currently, transportation funding is not able to keep pace with growing need for improvements and the rapid inflation in construction costs. North Carolina's Long-Range Statewide Multimodal Transportation Plan, completed in 2004 identified the need for over \$84 billion over the next 25 years with a projected \$55 billion in revenues, generating a \$29 billion shortfall. A 2006 update to this report showed that the gap had expanded to \$65 billion over the next 25 years. Locally, the CAMPO Long Range Transportation Plan identifies \$13.6 billion in needs over the next 25 years with only \$8.2 billion in expected revenue, generating a \$5.4 billion shortfall.

As shown above, the competition for the limited amount of project funding is very high and it is likely that the timeframes shown in this plan may be optimistic with the actual implementation lagging behind due to a growing number of unmet needs. The current CAMPO Long Range Transportation Plan allocates approximately \$11 million of the nearly \$430 Million estimated to upgrade the entire corridor included in this plan to the long-term solution in the next 25 years. The priorities in the Long Range Transportation Plan are updated every four years, but it is unlikely that, due to the competitive nature of funding situation, any major improvements needed to improve mobility along US 64 will be undertaken without strong community support. It should be noted that any safety needs that arise along the corridor will be undertaken by NCDOT in order to provide a safe roadway for the traveling public.

S.4.6. STUDY RECOMMENDATIONS

In addition to the detailed recommendations on the design of the short-term and long-term solutions, several additional recommendations are being made for the corridor by the Corridor Study Team, including the following:

- Conduct a speed study for the purpose of setting an appropriate speed limit along US 64 from Kellyridge Road to US 1 before NC 540 opens and after NC 540 opens.
- Place landscaping in the median and fencing along US 64 to encourage students to use the crosswalk at the Laura Duncan Road intersection.
- Make any improvements as aesthetically pleasing as possible (keep the green/boulevard feel along the corridor).
- Consider lowering the speed limit between Laura Duncan Road and US 1 when short-term solutions are implemented.
- Recommend the towns of Cary and Apex consider developing a no compression braking ordinance to reduce noise concerns.
- The Corridor Study Team recommends that NCDOT pursue the signing of US 64 along NC 540.

- This recommendation would request that NCDOT consider a formal recommendation to designate the NC 540/US 1 roadways as US 64 Bypass and re-designate existing US 64 as US 64 Business by submitting an application to the American Association of State Highway and Transportation Officials (AASHTO) for approval. If approved by both NCDOT and AASHTO there may also be some legislative issues that would need to occur to allow the signing of a US route along a toll road.
- Recommend Town of Cary study extending Mackenan Drive to Regency Parkway over US 1 via a new bridge as part of next Comprehensive Transportation Plan.
- Recommend that the Long-term Solution be coordinated with the CAMPO Triangle Regional Intelligent Transportation System (ITS) Strategic Deployment Plan. The plan includes recommendations for the use of network surveillance through detectors and cameras and Dynamic Message Signs along US 64. The plan also recommends Emergency Management including a roadway service patrol vehicle for the portion of the corridor between NC 540 and US 1.
- Recommend that Chatham County review their land use policies and develop land use controls that would not allow the portion of the corridor within Chatham County to develop with strip mall type developments. Additionally, Chatham County and the Town of Pittsboro should consider the recommendations in this report as they evaluate emergency response times and provide additional fire stations as needed to accommodate the population growth.
- Recommend that the study partners take an active role in the development of local and regional transit efforts and take a proactive role in identifying park and ride facilities to enhance transit operations.

S.5. SYSTEMS LINKAGE EVALUATION (CHAPTER 5)

An evaluation of the multi-modal systems along the US 64 corridor is the focus of this chapter. The primary means of transportation along US 64 is by motor vehicle; however, there is a substantial need to provide for improved connectivity for all modes of transportation, including transit, bicycles and pedestrians. Please refer to Chapter 5 of the CSR for the detailed systems linkage evaluation.

S.6. ENVIRONMENTAL ANALYSIS (CHAPTER 6)

The human, cultural and natural environments are analyzed in Chapter 6 of the Corridor Study Report. The evaluation determines what the effects on environmental features will be as a result of the implementation of the Short-term and Long-term Solutions for the Study. Please refer to Chapter 6 of the CSR for the detailed environmental analysis.

S.7. LAND USE EVALUATION (CHAPTER 7)

The purpose of the land use evaluation presented in this report is to define a specific land use study area along the proposed corridor, analyze development trends, potential growth areas, and existing and future land use within the US 64 corridor. This evaluation includes the evaluation of land use compatibility with the proposed design concepts, and will identify long-term and short-term transportation and land development strategies for transitioning the corridor from its current state to the long-term solution. Please refer to Chapter 7 of the CSR for the detailed land use evaluation.

S.8. PUBLIC, CORRIDOR STUDY TEAM AND AGENCY INVOLVEMENT (CHAPTER 8)

The US 64 Corridor Study was conducted with extensive input from the public, agencies and local leaders. The Corridor Study Team (CST) guided the study and had substantial influence over its direction. The public was engaged through two large workshops, one large community meeting, smaller group meetings and through other outreach activities and materials. Early coordination with environmental regulatory agencies was initiated through two agency meetings. A summary of the collaboration and involvement that took place throughout the study is provided in this section. Detailed information is available in the appendices referenced.

S.8.1. PUBLIC INVOLVEMENT

The US 64 Corridor Study garnered substantial attention from the communities surrounding the US 64 corridor. The methods and involvement opportunities used to reach out to the public are summarized as follows:

- Mailing List
- Newsletters
- Telephone Hotline
- Project Website
- Visualizations
- Public Notices

S.8.1.1. Summary of Public Involvement Opportunities and Major Comments

Two workshops, one community meeting and two stakeholder meetings were held during the course of the study. The workshops were announced through public notices, newsletters and on the US 64 Corridor Study website.

Workshop #1

Two public workshops were held on May 19 and 20, 2008.

Workshop #2

Two public workshops were held on April 27 and 28, 2009.

Community Meeting

A Community Meeting was held on July 16, 2009.

Small Group Meetings

Throughout the study meetings were held with small groups of stakeholders who had an interest in the study.

Local Officials Meeting

Prior to the Workshop #1 meetings a special meeting for local elected officials was held to allow elected officials the opportunity to preview the materials that would be presented, ask questions and provide input.

Stakeholder Meetings

A Stakeholder Meeting was held at the Apex Town Hall on October 22, 2009 from 8:00 AM to 4:00 PM. Stakeholders requested a follow-up meeting be held to review the decisions made by the CST, which was held on December 16, 2009.

S.8.2. CORRIDOR STUDY TEAM INVOLVEMENT

A CST was created to provide guidance to and oversight of the study. A total of eight meeting were held with the CST.

S.8.3. AGENCY INVOLVEMENT

A team made up of the different permitting agencies with an interest in a project met jointly two times throughout the corridor study in order to facilitate early agency coordination.



S.9. ADDRESSING PUBLIC CONCERNS FROM THE DRAFT CORRIDOR STUDY REPORT

The Draft US 64 Corridor Study Report was made available to the public on May 5, 2010 with comments on the plan being accepted until June 30, 2010. Chatham County requested an extension to provide comments and was provided additional time to review the draft study. Chatham County provided comments on August 30, 2010. A total of 83 comments were provided by individuals, groups, local governments or elected officials. The most substantial comments related to a desire to provide a facility that met what some local stakeholders envisioned for the corridor. Further, stakeholders stated their desire to maintain the existing aspects of the corridor that they perceived to be the positive. In general, a majority of the comments received on the study felt that the recommended solutions were too large and disruptive to the communities along US 64 as well as did not fit the unique context of the US 64 Corridor.

In response to comments received, this section presents the background information on how the study was developed, what assumptions were made in developing the solutions for the study and how the public concerns can best be addressed.

The goals of the study were developed based on a set of assumptions of what will occur within the study area in the future. The primary goal of the Corridor Study was to develop a master plan to preserve and enhance mobility and safety along US 64, while balancing community access and interests. The need for the study was based on the projected growth along the corridor and the corresponding increase in traffic along the corridor. The current population projections show that the population of Wake County will increase by nearly 70% in the next two decades, while Chatham County's population will increase by 45%. The study area surrounding the US 64 corridor is anticipated to grow by nearly 41,000 persons, or an increase of 66% by 2030.

The result of this rapid growth is a substantial increase in traffic volume along US 64. Future traffic volumes for the corridor were projected based on the population projections mentioned above and the land use plans developed by each of the local governments along the corridor. As stated, the goal of the study was to develop plans that would enhance mobility by providing for adequate traffic operations along the corridor. The recommended short-term and long-term solutions were developed to provide for mobility and safety while considering the community access and interests.

A majority of the comments received on the Draft Corridor Study Report concluded that the benefits of the plan would be outweighed by the negative effects that they perceived would occur as a result of the implementation of the plan. This corridor study was completed based on the assumptions for future land use and population growth and the resulting increased traffic volumes with the goal of finding a solution that satisfied those assumptions. One of the benefits to developing long range plans is that it allows one to envision what will happen in the future based on a set of reasonable assumptions. This study has been very effective in showing how this corridor will emerge in the future if the underlying land use and population projections are accurate. Based on the lack of support for the recommended solutions for the corridor, it would be prudent to look at the underlying assumptions and determine if changing these assumptions would allow for the corridor to better match the community's vision for the corridor.

S.9.1. LINK BETWEEN LAND USE AND TRANSPORTATION

The development of transportation systems and the land use along the transportation systems are both interrelated and interdependent. Transportation systems stimulate growth and development due to improved access and reduced travel times. Over time, the improved transportation system results in increased development pressure along the corridor and eventually the growth exceeds the capacity of the transportation system, which must be improved to accommodate the development pressure. This is what has been occurring along US 64 since it was widened from two-lanes to four-lanes in the mid-1990's. The study shows that portions of US 64 are currently experiencing operational problems; however, the construction of NC 540 as an alternate route will likely reduce the traffic volumes along US 64, east of NC 540. Growth along a corridor necessitating additional improvements to the transportation system has been identified as a cycle known as the transportation-land use cycle (Figure ES-1). The transportation-land use cycle can continue indefinitely until an inability to further expand either the land use or the transportation facility occurs. Alternatively, the

cycle can be broken by creating a better balance between the transportation system and the adjacent land uses.

Based on the comments received on the Draft Corridor Study Report it appears as though the stakeholders along the corridor do not desire to move forward with another expansion of the transportation system and there is a strong desire to break the cycle. As stated, the only way to break the cycle is to create a balanced environment where the magnitude of the development along the corridor matches the abilities of the transportation network to carry the associated traffic. The primary means of accomplishing this balance is through an exercise of visioning and scenario planning.

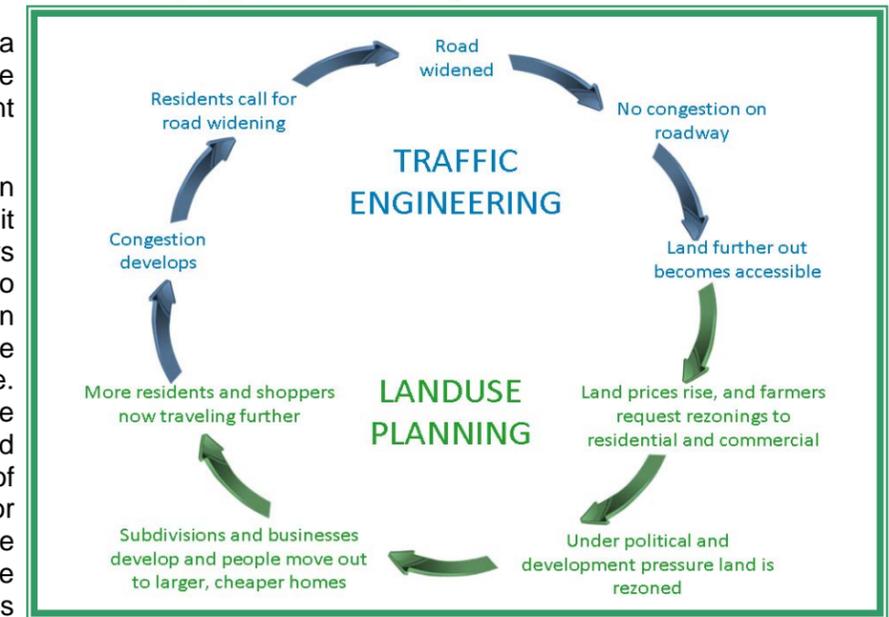


Figure ES-1: Transportation-Land Use Cycle

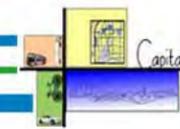
S.9.2. VISIONING AND SCENARIO PLANNING

The first step in the process of balancing the transportation and land use along US 64 would be to establish a vision for the corridor. Throughout the community involvement process the notion of maintaining the sense of community along the corridor emerged as a key desire along with maintaining the green boulevard feel through Wake County and the rural character through Chatham County. Scenario planning is an analytical tool that can help planning professionals prepare for what lies ahead. Scenario planning provides a framework for developing a shared vision for the future by analyzing various forces that affect growth (e.g., health, transportation, economic, environmental, land use, etc.). Scenario planning tests various future alternatives that meet state and community needs. A defining characteristic of successful public sector scenario planning is that it actively involves the public, the business community, and elected officials on a broad scale, educating them about growth trends and trade-offs, and incorporating their values and feedback into future plans.

S.9.3. RECOMMENDATION FOR THE US 64 CORRIDOR

One of the objectives of this study was to be proactive in identifying transportation solutions that would accommodate the growth anticipated by the local governments along the corridor. Upon further consideration, what has been made clear over the past three years as this study has been developed is that the stakeholders along the corridor do not support the further expansion of the roadway, thus do not support the future growth plans established by the local governments along the corridor. The study has shown that a majority of the traffic along US 64 is projected to be local traffic. For example, 90% of the traffic passing Apex High School on US 64 has an origin or destination within 15 miles of the school.

In retrospect, the objectives of this study may serve a different role than originally intended. This report should be seen as a glimpse into the future of what will be needed from a transportation perspective if the growth plans that are currently in place are allowed to come to fruition. The land use and development along the corridor is under the jurisdiction of the Towns of Cary, Apex and Pittsboro as well as Wake and Chatham Counties. It is recommended that the local governments determine if the outcome of this study is consistent with the goals and objectives of the towns. If the plan is not consistent, then it is recommended that the local governments undertake an effort to determine the community vision for the corridor and through scenario planning develop a solution that meets the vision for the corridor by balancing the interaction of land use and transportation.



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