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**RSH** Team

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## E.0 Executive Summary

This document summarizes the results of the US 1 Corridor Study. A copy of the full report is contained in the compact disc at the end of this report.

#### E.1 Introduction

The US 1 corridor is located in the northeastern part of the Raleigh, North Carolina metropolitan area and is important for the movement of people and goods in the region. Regional and local development pressure along the corridor has increased traffic congestion along portions of US 1. In an effort to plan and manage future land use and transportation within the corridor the Capital Area Metropolitan Planning Organization (Capital Area MPO) has developed this comprehensive corridor management plan for US 1. This corridor management plan establishes the goal of preserving the functional integrity of this facility and managing development within the study corridor. This coordinated approach to land use and transportation planning will enable state and local governments to provide a framework for the orderly and efficient development of various land uses within the corridor study area while providing for the transportation needs of both local and regional travel along US 1.

#### E.1.1 Project Description and Project History

US 1 is a multi-lane roadway that travels through the City of Raleigh and northeastern Wake County, where it is referred to as Capital Boulevard. It is one of the primary north-south highways serving a rapidly growing area within the Raleigh –

Durham Metropolitan Region. The US 1 study corridor includes both highway and rail facilities beginning at I-540 in Raleigh, and extends northward to Park Avenue (US 1A North) in Franklin County. The study corridor serves multiple travel purposes. The route carries interstate travel linking Raleigh with I-85. The route is also a regional link for commuters traveling between downtown Raleigh and the northeastern suburban area. With the extension of I-540 to the east, its role in commuter travel will continue to serve regional trips and connectivity in the Greater Raleigh area. Finally, this section of US 1 serves as a local circulation route for north-south travel in northeastern Wake and southern Franklin counties, since the secondary road system is not complete. The North Carolina Department of Transportation (NCDOT) includes US 1 in its list of Strategic Highway Corridors and proposes to upgrade the facility between I-540 and I-85 to an urban freeway in the future. Although this future freeway project is part of Capital Area MPO's Long Range Transportation Plan, the improvements are not yet included (unfunded) in the current NCDOT 2006-2012 Transportation Improvement Program (TIP).

#### E.1.2 Project Purpose

The US 1 Corridor Study project developed an integrated multimodal transportation plan that provides for a high level of mobility along the US 1 Corridor while maintaining a high quality environment for the surrounding communities by providing for well-planned and sustainable growth along this corridor.





## E.1.3 Oversight and Study Teams

The Capital Area MPO. through an inter-agency agreement between the City of Raleigh, NCDOT, the Town of Wake Forest, and the Transit Triangle Authority (TTA), has retained RS&H Architects-Engineers-Planners, Inc. (RS&H) to complete this project. The Capital Area Metropolitan Planning



**Oversight Team Meeting** 

Organization served as the lead agency and was responsible for initiating the corridor study and establishing both the oversight and technical oversight committees that were responsible for guiding the development of the study. The oversight committees were made up of representatives from various state and local agencies, as well as citizens living within the study area.

RS&H was the prime consultant for the project, responsible for the technical issues and analysis of various transportation alternatives, ultimately arriving at the locally preferred alternative. Mulkey Engineers and Consultants led the functional design, developed engineering cost estimates, and identified and evaluated cultural and natural features along the corridor. Kittelson & Associates, Inc. provided the transit modeling, analysis and alternatives recommendations. Urban Collage, Inc. collected existing land use and zoning information including identifying future potential land use opportunities. Urban Collage also created several conceptual

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site development plans and photomontages depicting how the US 1 corridor could develop and look in the future. Kimley-Horn & Associates, Inc. led the traffic and transit modeling efforts to evaluate different multimodal transportation alternatives.

### E.1.4 Study Objectives

US 1 CORRIDOR STU

The product of this project was the development of a locally preferred alternative that is best suited to meet the corridor's transportation needs, while minimizing impacts to the surrounding environment. The US 1 Corridor project achieved the following objectives:

- 1. Established a **clear vision** of the transportation role(s) of the US 1 corridor with respect to mobility: trip purpose and distribution (work, non-work, through travel), trip length (interstate, regional, or local travel), and travel mode (auto, truck, transit, pedestrian, bicycle).
- 2. Formulated a **multimodal transportation plan** that incorporated highway, transit, pedestrian and bicycle modes and complements the proposed land use and development patterns while sustaining mobility within and throughout the region.
- 3. Analyzed the **physical layout** and number of general purpose travel lanes needed to serve the US 1 corridor travel demand in 2030.
- 4. Considered **community character** and potential impacts throughout the planning process.

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## E.2 Existing Conditions

The US 1 study corridor is located in Wake and Franklin Counties. The project study area started south of I-540 and extended north to the Park Avenue (US 1A) intersection in Franklin County, a length of approximately 14 miles. Three cities were included in the study area: the City of Raleigh, the Town of Wake Forest, and the Town of Youngsville.

## E.2.1 US 1 Highway

The Capital Area MPO classifies US 1 (Capital Boulevard) as a major thoroughfare/freeway within the study area. The US 1 facility is primarily a four-lane divided highway, north of I-540. The right-of-way varies between 200 and 450 feet in the study corridor; however, the majority is only 200 feet wide. Some non-contiguous two-way frontage roads exist in the corridor. Inside and outside safety shoulders exist throughout the corridor. The median is generally 30 feet wide and depressed to handle the open drainage system for the highway. There are two existing interchanges, at I-540 and, at NC 98 and one interchange that is now opened at the new NC 98 Bypass in the Town of Wake Forest. When the study began 13 signalized intersections existed along the corridor. Over 100 access points currently exist and directly connect to US 1.

## E.2.2 CSX Railroad

The rail line within the study area is the CSX 'S' line and runs from Hamlet, North Carolina to Henderson, North Carolina. This CSX corridor is also part of the future Southeast High Speed Rail corridor from Washington DC to Charlotte, North Carolina. Also, the TTA is considering plans to use a portion of this rail corridor for future commuter rail service.

The CSX railroad alignment basically parallels US 1 in the study area. The railroad alignment is a single-track system currently providing freight service with a frequency of less than five trains per day. The railroad right-of-way within the study area varies between 70 and 180 feet, the majority being approximately 100 feet wide and only approximately 70 feet wide through downtown Wake Forest. The CSX rail alignment potentially may provide a possible transit feature in the study area.

## E.2.3 Traffic Analysis

The 2005 existing conditions capacity analysis was derived by comparing North Carolina Level of Service high-speed arterial capacity thresholds with the 2005 annual average daily traffic (AADT) count data. The majority of the 2005 AADT was obtained from NCDOT and supplemented by several 24-hour traffic counts conducted by the City of Raleigh.

The section between I-540 and Gresham Lake Road has high traffic volumes. However, the current six travel lanes and control of access right-of-way provide acceptable Level of Service conditions for this section of US 1 (Level of Service D). The arterial capacity analysis indicated that on the study corridor between Gresham Lake Road and South Main Street (US 1A South), traffic demand either approaches or exceeds the roadway capacity limits (Level of Service E or F). The section of US 1 between South Main Street in Wake County and Sprint Headquarters' entrance in Franklin County has four travel lanes, lower traffic volumes and greater signal spacing, functions at Level of Service D. From the Sprint Headquarters' entrance to the northern project limits, Park Avenue, US 1





generally operates at LOS C conditions where existing traffic are low. Level of Service E was considered the threshold for exceeding capacity. The three following segments along US 1 exceed the arterials capacity:

- Between Gresham Lake Road and Durant Road
- Between Durant Road and Burlington Mills Road
- Between Burlington Mills Road and South Main Street (US 1A)



**Re-occurring Afternoon Peak Period Traffic Congestion** 

## E.2.4 Safety Conditions

The US 1 Corridor Study included an evaluation of the crashes that have occurred along US 1 from south of I-540 in Wake County to north of Park Avenue in Franklin County. Crash data was obtained from NCDOT for the 36-month period from November 2001 through October 2004. There were approximately 1,100 crashes for this area during the threeyear study period. The US 1 Corridor was divided into eight segments to analyze safety needs along the corridor. The safety analysis calculated the crash rates along the US 1 study corridor by segment and compared the results with the statewide averages. Five out of eight segments were above the statewide crash average rates, indicating an existing safety concern in these sections.

## E.3 Public Involvement

A proactive public involvement program, provided opportunities for the public and various interest groups, to participate in the investigation of corridor alternatives and ultimately provided guidance in forming the locally preferred alternative.



The input received during project meetings proved that people want to have a say

Public Outreach at Triangle Town Center

in transportation-decision making for their community. Public involvement for the project followed guidelines established by the Capital Area Metropolitan Planning Organization (Capital Area MPO).

The US 1 Corridor Study public involvement program addressed the need to have an ongoing information exchange from the very beginning of the study throughout its end. Major components of the program included the following:





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- Developing a detailed website with study updates and electronic comment feedback
- Creating two printed newsletters
- Developing a database list of interested parties and emailing notices and updates
- Conducting two public information workshops in March and July, 2006
- Direct outreach using a storefront display at the Triangle Town Center Mall
- Advertising in the Raleigh News & Observer, the Carolinian, Que Pasa and Wake Weekly newspapers
- Sending press releases via the City of Raleigh Public Affairs Office
- Advertising in Spanish formats



First Public Information Workshop

## E.4 Potential Development Opportunities

The study area has tremendous potential for attracting growth and development based on its location and land availability. While the 2030 Long Range Transportation Plan anticipates mostly commercial development along US 1, recent trends show a large number of single-family, duplex and townhouse communities currently underway. Based on the team's analysis, future growth is anticipated to be both infill redevelopment projects and the development of vacant land. Prominent infill areas within the corridor are located at the Gresham Lake Industrial Park, which could support higherdensity uses, and the Towns of Youngsville and Wake Forest. Infill development should be sensitive to the historic fabric and compatible with the existing scale and architecture of the Towns. Additionally, there are numerous opportunities for redeveloping older retail uses or apartment complexes; with many such properties having direct access to US 1.

Opportunities for developing vacant land can be found throughout the study area; with a significantly greater amount of vacant land in southwestern Franklin County, the northernmost section of the study area. While the study area has over 3,500 acres of vacant land and 2,900 acres of agricultural or forested land, new development should aim to preserve environmental resources and be focused at strategic locations with adequate infrastructure. The interchange at I-540 and the south side of the NC 98 Bypass are such locations appropriate for higher intensity uses.



#### E.5 Conceptual Transit Alternatives

The transit elements considered during the US 1 Corridor study included the Southeast high-speed rail line, TTA Regional rail, bus rapid transit, commuter bus, and local bus service. Ultimately the corridor plan included two commuter bus routes from downtown Wake Forest to downtown Raleigh and the Research Triangle Park (RTP). Each route would operate only during the weekday AM and PM peak period at a 20-30 minute frequency; with limited off-peak runs (in the future). Additional long range transit improvements included an extension of the regional rail system north of Spring Forest Road. This would only be feasible after phase one of the rail system is developed and land use density was sufficient along the corridor to support this service.



**Commuter Bus Option** 

### E.6 Screening Process

The size and diversity of the US 1 corridor make it likely that a variety of transportation improvements will be needed for the existing system to meet all of the corridor's future needs. Therefore, the study examined a variety of transportation modes and improvements. A screening process was used based on an understanding of the corridor conditions, needs, and goals. The process enabled the study team to evaluate alternatives using both general and detail criteria to screen from four alternatives to a final locally preferred alternative.

The US 1 Corridor Study used a three-phase process to screen, evaluate and select viable alternatives. This threephase screening process, allowed assembly of a large array of competing criteria in matrix format for evaluation. The screening process gave the project team the ability to sort a large array of complex alternatives to obtain several viable comprehensive, long-range land use and transportation alternatives suitable for further analysis. The Phase One process provided a first-cut analysis of the alternatives to screen out the "fatally flawed" concepts so that only viable corridor alternatives are carried forward into the Phase Two analysis. The locally preferred alternative is done as an outcome of the Phase Three analysis. The results from each step of the screening process were presented to and discussed by the oversight teams, coordination with NCDOT, and the evaluations of opinions and concerns expressed at the public meetings. This coordination enabled the project team to identify and present a locally preferred alternative (LPA).

The US 1 Corridor Oversight Team and the US 1 Technical Oversight Group had determined the inclusion or elimination of specific transportation and land-use elements to produce a single comprehensive, long-range multi-modal transportation

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Capital Area Metropolitan Planning Organization

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plan for the US 1 Corridor. The transportation plan takes into account cost, constructability, environmental impacts and construction staging. The analysis of the alternatives led to the conclusion that all of the major components evaluated in this corridor study (general purpose lanes, special purpose lanes, transit and compatible land use) are necessary elements of the LPA. The LPA provides congestion relief by having an acceptable LOS throughout the corridor. The new controlled access freeway design presents a great opportunity to improve public safety in the corridor; and coordinates well with the Triangle Transit Authority's (TTA's) and Capital Area Transit's (CAT's) plans for transit in the corridor and promotes economic development along the corridor with the implementation of an improved local roadway system. The Capital Area MPO Transportation Advisory Committee (TAC) is the policy board that will be ultimately responsible for adopting the LPA.

## E.7 The Locally Preferred Alternative

Alternative III-A including highway plus transit alternatives was selected as the locally preferred alternative whose elements are listed below. Exact alignments and interchange/grade separation locations, will be decided during the future design phases. A conceptual planning cross-section of the LPA is shown in Figure ES-1.

- Three general-purpose lanes in each direction from I-540 to US 1A North, Franklin County, plus auxiliary lanes where appropriate
- Either one special use HOV lane or one additional general purpose lane in each direction from I-540 to NC 98 (Durham Road)

- Two-way, three lane frontage roads paralleling US 1 or backage roads in each direction to provide access to adjacent properties
- Sufficient right-of-way to accommodate an ultimate eight-lane freeway facility, three-lane frontage roads and raised landscaped planting beds
- Ten interchanges (three existing) at major cross-streets
- Nine grade separations (two existing) to provide eastwest multimodal connectivity
- Wide outside traffic lanes for shared motorized vehicles and cyclist use for the proposed frontage and backage roads
- Sidewalks along the frontage or backage roads, adjacent to the development
- Park and ride lots and transit stops along the frontage or backage roads

Figure ES-1 provides a cross section diagram of the Locally Preferred Alternative and Figure ES-2 at the back of the report illustrates the improvements:



### **EXECUTIVE SUMMARY**

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#### E.7.1 Transit Locally Preferred Alternative Components

The locally preferred alternative for transit in the US 1 corridor focuses on the initial development of limited premium bus service (in the form of commuter bus service) to downtown

Raleigh and the Research Triangle Park. As development density increases in the US 1 corridor over time, the commuter bus service could be transformed into more of a bus rapid transit operation, still with limited stops given the conversion of US 1 to a freeway facility south of NC 98, but with improved service frequency and hours of operation. Also over time added fixed-route bus service on cross streets in the US 1 corridor would be provided as development density increases and the street network develops. Continued paratransit service will be provided to serve lower density areas and to

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serve the elderly and handicapped that can't use regular fixedroute service. The plan calls for the development of key transit stations along the US 1 corridor south of NC 98, with smaller park-and-ride facilities developed initially to support the commuter bus service and to encourage added formation of carpools and vanpools. With development increases in the future, these park-and-rides would be expanded as needed, potentially becoming structured facilities perhaps tied to adjoining transit-oriented development.

In the long-term, the configuration of the transit system in the US 1 corridor will be influenced by whether or not regional rail is extended into the corridor. If regional rail is extended north of Spring Forest Road, a logical terminus would be at the NC 98 Bypass on the south side of Wake Forest, with an intermediate station at Burlington Mills Road to intercept US 1 traffic from the north. With regional rail service, the bus service along US 1 should be viewed as a support service to regional rail, serving areas between the regional rail stations, with greater service frequency and hours of operation. This could take the form of bus rapid transit service along US 1 and/or local bus service on the US 1 frontage roads.

These proposed transit improvements should be coupled together with the highway improvement as identified in the LPA.

#### E.7.2 Pedestrian and Bicycle Facilities

US 1 CORRIDOR STUD

Within the US 1 corridor there are various existing and proposed pedestrian and bicycle facilities. Future greenway and bikeway plans along the corridor include the following primary features:

- Rerouting the Mountains to Sea Trail to cross beneath US 1 at the Neuse River crossing
- Constructing the Perry Creek Greenway
- Constructing the Richland Creek Greenway
- Various new on-road and off road bicycle routes and greenways in the vicinity of the US 1 corridor, including the Town of Wake Forest, Wakefield and the Triangle Town Center Mall
- Frontage and backage roads along US 1 between I-540 and Park Avenue in Franklin County with widened outside lanes for bicycles and sidewalks for pedestrians

Enhanced pedestrian and bicycle connections are suggested to be maintained across the US 1 Corridor at the seven proposed grade-separated crossings., Grade-separated crossings will generally be more pedestrian and bicyclefriendly than interchanges due to the size of the structure, higher vehicular cross-street volumes and heavy ramp movements associated with entering and exiting traffic from US 1. Therefore pedestrian and bicycle movements should be encouraged and integrated into the design at all the gradeseparated crossings except at the CSX railroad.

## E.7.3 Land Use and Economic Development Opportunities

New development will occur over several years, but planning a framework for the integration of land use and transportation improvements is a key objective of the US 1 Corridor Study. While the scope of the effort did not allow for a detailed Future Land Use Plan, key considerations affecting land use and zoning have emerged from the analysis and input of stakeholders and interests. Given the length of the corridor, future land use and development will, as today, likely vary from more intense urban development near I-540 to less intense

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development and more rural preservation on the periphery of the study area to the north.

## E.7.4 Planning Construction and Right of Way Cost Estimates

Planning-level construction cost estimates were developed for the locally preferred alternative. The right-of-way and construction cost estimates were based on 2006 average unit costs obtained from the NCDOT's Project Services Unit.

Table ES-1 summarizes the Year 2006 planning-level construction and right-of-way cost estimates. The below LPA estimate, however does not include the estimated costs associated with the US 1 and I-540 interchange reconstruction or the three sets of raised landscaped planting beds along the corridor.

<u> </u>	
Parcels Impacted	343
Total Takes	37
Total Acreage Taken	296 Acres
Right-of-Way Costs	\$103,716,000
Construction Costs	\$383,311,000
Total Estimated Costs	\$487,027,000

# Table ES-1: Right-of-Way and Construction Estimates



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Proposed US 1 at Gresham Lake Road

E.7.5 Implementation of the Recommended Locally Preferred Alternative

The planning process focused on ensuring that the US 1 corridor would accommodate multiple modes of transportation, and a set of land uses that would enable people and goods to move through the corridor efficiently. The locally preferred alternative is displayed in a series of ten maps in Figure ES-2. The implementation sequence for this plan has been outlined as follows:

- LPA adoption by the Capital Area MPO Transportation Advisory Council
- Local jurisdictions execute the Memorandum of Understanding
- NCDOT access management, traffic signal system and ITS planning
- NCDOT schematic design and environmental documentation
- TTA and CAT transit planning
- NCDOT plans, specifications, and estimates
- Construction





US 1 at Gresham Lake Road Today

## E.8 US 1 Corridor Memorandum of Understanding

The Memorandum of Understanding, drafted by the participating local planning agencies is a key step in realizing the interrelationship of transportation facility design, development standards and desired land use. Through the Memorandum of Understanding, participating agencies would use the organizing committee as a forum to jointly agree upon land use changes to realize the multimodal transportation and land use vision of the US 1 Corridor Study. This agreement could be supplemented over time with more detailed considerations of area-specific land use, zoning and transportation improvements. While the Memorandum of Understanding will provide the framework for future land use changes, the study team recommends that the constituent jurisdictions conduct an additional localized study into specific future land use, zoning modifications and local street/access networks. As of November 2006, the Memorandum of Understanding is under consideration for adoption by participating local jurisdiction.























