

FEASIBILITY STUDY

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NC 55, New Interchange at
Southern Parkway, Durham
Durham County

U-2405

Prepared by
Planning and Research Branch
Division of Highways
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I. DESCRIPTION

This report addresses the feasibility of adding an interchange on NC 55 at the Southern Parkway. The interchange location is shown on Figure 1. This project appears as a proposed interchange on the Durham-Chapel Hill-Carrboro Urban Area Thoroughfare Plan (see Figure 2). It also appears in the 1988-1996 Transportation Improvement Program for feasibility study and/or right of way protection and is not currently funded.

II. PURPOSE OF PROJECT

Existing Facilities

NC 55 is a major north-south thoroughfare south of Durham and functions as an urban principal arterial passing through this project. It presently carries 12,500 vehicles per day (vpd) south of Cornwallis Road (SR 1121) and 13,000 vpd to the north. North of the project and continuing for 1.5 miles, NC 55 is a 4-lane divided facility with 22 feet of pavement northbound (marked for 2 lanes), 24 feet southbound (also marked for 2 lanes), and a 30-foot median. South of the intersection, the 2-lane pavement is 22 feet wide.

Cornwallis Road (SR 1121) currently intersects NC 55 from the east, at an angle, just north of the proposed Parkway location (see Figure 1). This route's alignment to the east, stretching approximately 1.1 miles to the Alexander Drive intersection, is to be upgraded to serve as a segment of the Southern Parkway. It currently carries approximately 8,100 vehicles per day.

CSX Railroad tracks and Alston Avenue (SR 1945) closely parallel NC 55 to the east near the proposed project and are intersected at an angle by Cornwallis Road (SR 1121). The CSX tracks presently are used by 6 trains per day. SR 1945 carries 1000 vpd to the north of Cornwallis Road and 2000 vpd to the south.

~~The proposed Southern Parkway would intersect NC 55 approximately 850 feet south of the current NC 55/Cornwallis Road intersection (see Figure 3). Existing development in the area of the proposed interchange consists of a concrete manufacturing plant and light commercial and residential property.~~

The total number of accidents that occurred at the existing intersection for the past three years is 34. There were no fatalities and the predominant accident type was left-turn conflicts.

Need For Project

Justification for an interchange at the project location stems from the need to provide continuity of the Southern Parkway, higher levels of service, and improved safety. A grade separation with access to NC 55 would be a positive step in this direction. Related sections of the Southern Parkway have been constructed or are in planning stages. The only project included in the 1988-1996 Transportation Improvement Program for construction is identified on U-2206 (US 15-501 to Chapel Hill Road).

III. RECOMMENDATIONS AND COSTS

The recommendation of this study is for an interchange at the NC 55/Southern Parkway intersection. Also recommended in conjunction with the interchange construction is a grade separation for Alston Avenue (SR 1945) and the CSX Railroad with the proposed Southern Parkway east of NC 55. The recommended improvements are part of NCDOT's commitment to the City of Durham (see attached correspondence).

The recommended interchange layout is as shown on Figure 3. This plan was prepared by the Roadway Design Unit. Site constraints dictate that a partial clover (with ramp and loops in the west quadrants) be located along the proposed crossing of NC 55 approximately 850 feet south of the existing NC 55/Cornwallis Road intersection. The topography favors grade separating Alston Avenue and the CSX railway and allows for acceptable vertical alignments on the new Parkway alignment. This alignment to allow these grade separations would tie into Cornwallis Road approximately 1,800 feet to the east of NC 55 and tie into an alignment that is being reserved by the City of Durham west of NC 55.

This interchange design is based upon projected traffic volumes for the year 2010. Traffic volumes on NC 55 are expected to increase to 25,700 and 31,500 vpd. The Southern Parkway is anticipated to carry from 45,800 to 50,200 vpd in the year 2010.

The total estimated cost for an interchange at the project location is \$21,000,000, including \$9,000,000 for construction and \$12,000,000 for right-of-way. Right-of-way costs reflect premium land values for property in and around the Research Triangle Park. This estimate includes grade separations for Alston Avenue (SR 1945) and the CSX railway. Cost estimates were prepared by the Preliminary Cost Estimate Engineer and the Right of Way Branch.

IV. ALTERNATIVES

A studied alternative to an interchange at this location is an at-grade intersection. A signalized intersection has merit since it would offer a significant cost reduction and would be consistent with other major at-grade intersections along the Parkway. A studied design calls for two through lanes per direction north/south, and three through lanes per direction east/west. Also discrete right turn and double left lanes on all approaches would be required. This design should suffice for many years. However, an ultimate upgrade to an interchange may be

required to be assured of a continuing acceptable level of service. As also stated above, grade separations for Alston Avenue and the CSX railway are included in this intersection alternative.

The total estimated cost for an at-grade intersection at this location is \$8,300,000, including \$4,300,000 for construction and \$4,000,000 for right-of-way. This represents a total cost savings of approximately \$12,700,000 when compared to the cost of providing an interchange.

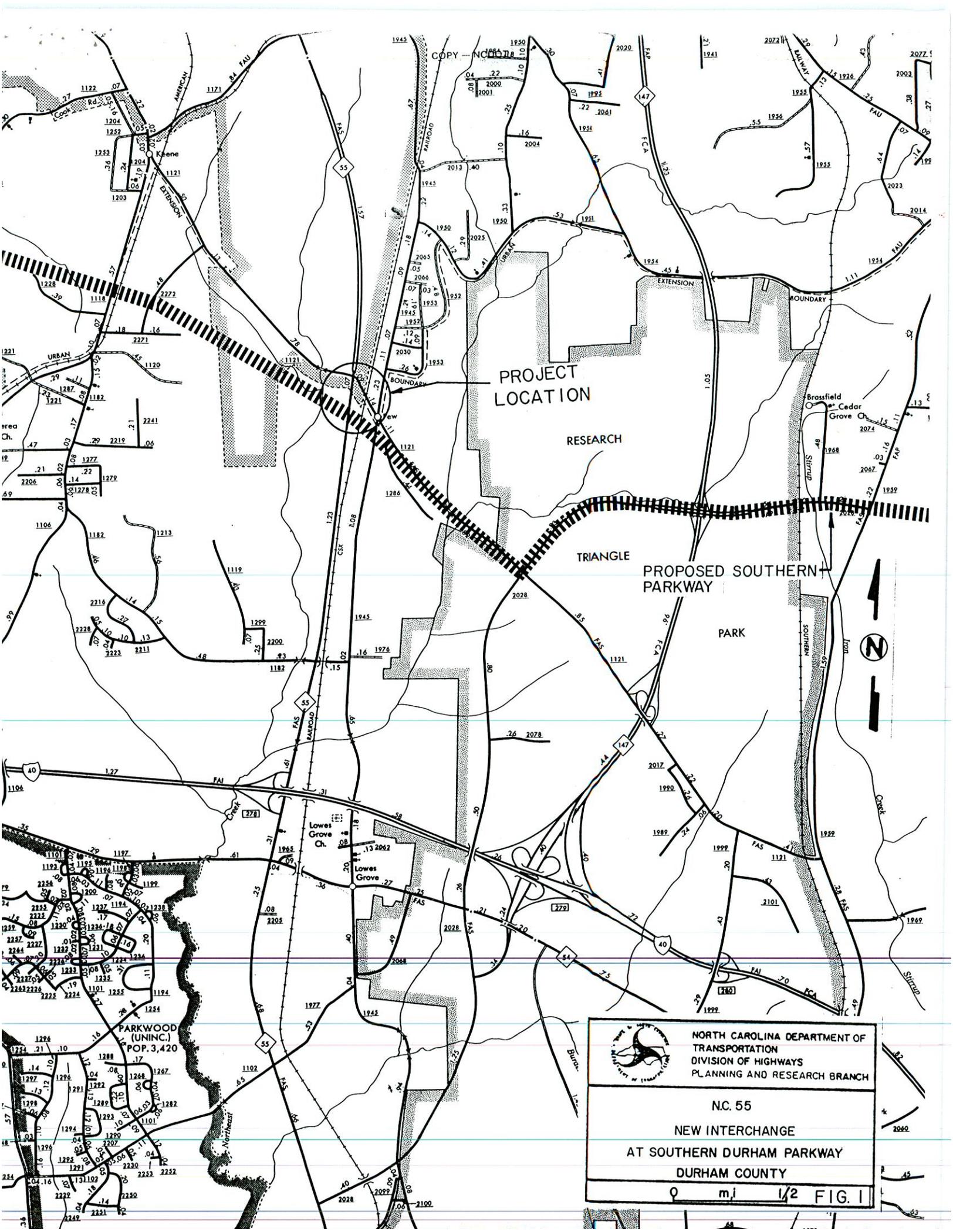
V. COMMENTS

There is strong local government support and valid capacity-related design requirements for an interchange at this location. However, increasing land values in Research Triangle Park result in a premium right-of-way costs. If these costs prove prohibitive, the option of an at-grade intersection should be given serious consideration.

Possible negative impacts of the proposed interchange include the displacement of 7 residences and 1 business, and the potential minor loss of wetlands. The at-grade intersection alternative would require less land acquisition and negative impacts on existing development.

If the project is to be implemented at a future date, all feasible alternatives and their associated impacts will have to be evaluated in a planning and environmental document prior to that time, and a final decision made as to the most appropriate improvement.

MLH/rm

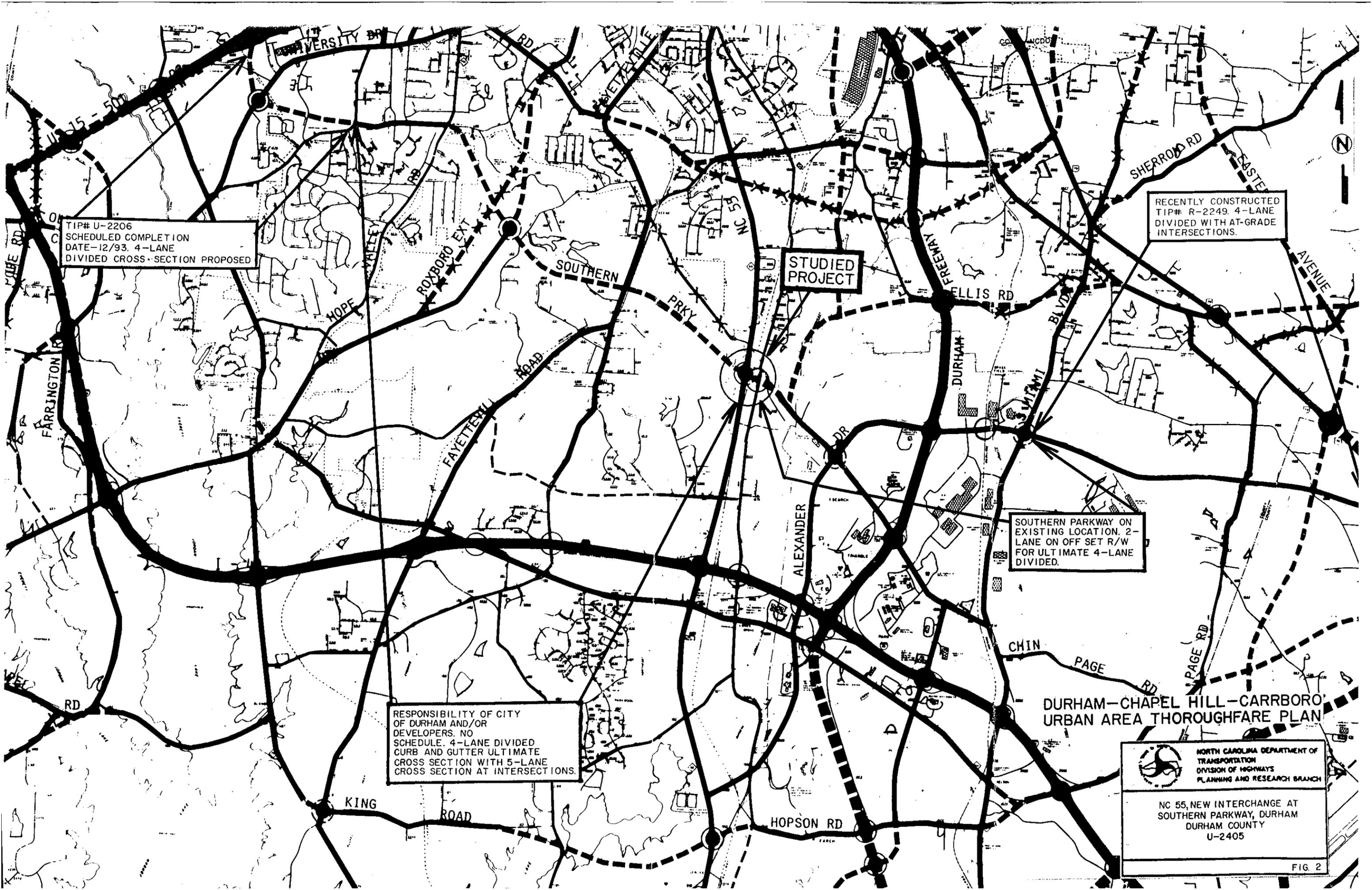




NORTH CAROLINA DEPARTMENT OF
 TRANSPORTATION
 DIVISION OF HIGHWAYS
 PLANNING AND RESEARCH BRANCH

NC. 55
 NEW INTERCHANGE
 AT SOUTHERN DURHAM PARKWAY
 DURHAM COUNTY

9 mi 1/2 FIG. 1



TIP# U-2206
 SCHEDULED COMPLETION
 DATE-12/93. 4-LANE
 DIVIDED CROSS-SECTION PROPOSED

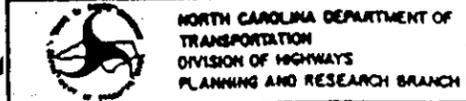
RECENTLY CONSTRUCTED
 TIP# R-2249. 4-LANE
 DIVIDED WITH AT-GRADE
 INTERSECTIONS.

STUDIED
 PROJECT

SOUTHERN PARKWAY ON
 EXISTING LOCATION. 2-
 LANE ON OFF SET R/W
 FOR ULTIMATE 4-LANE
 DIVIDED.

RESPONSIBILITY OF CITY
 OF DURHAM AND/OR
 DEVELOPERS. NO
 SCHEDULE. 4-LANE DIVIDED
 CURB AND GUTTER ULTIMATE
 CROSS SECTION WITH 5-LANE
 CROSS SECTION AT INTERSECTIONS.

DURHAM-CHAPEL HILL-CARRBORO
 URBAN AREA THOROUGHFARE PLAN



NC 55, NEW INTERCHANGE AT
 SOUTHERN PARKWAY, DURHAM
 DURHAM COUNTY
 U-2405

VILLAGES OF CORNWALLIS
APARTMENT COMPLEX

STA 121+75.95
Y- STA 28+57.85

PROPOSED SOUTHERN PARKWAY

PROPOSED ALSTON AVENUE (SR 1945)
GRADE SEPARATION

CSX RAILWAY
GRADE SEPARATION

-L- STA 136+5

SEWER

WATER
ELEVATION
301.0

WATER
ELEVATION
329.0

NC 55



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NC 55 NEW INTERCHANGE AT
SOUTHERN PARKWAY, DURHAM
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0 1 200 FIG. 3