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DATE

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

1534 MAIL SERVICE CENTER, RALEIGH, N.C. 27699-1534

W. LYNDO TIPPETT  
SECRETARY

January 8, 2002

MEMORANDUM TO: Mr. Edward C. Dolby, Member, Board of Transportation  
Mr. Larry S. Helms, Member, Board of Transportation  
Mr. B. G. Payne, P.E., Division Engineer, Division 10  
Mr. David D. King  
Mr. C. W. Leggett, P.E.  
Mr. T. A. Peoples, P.E.(3) Attention: Jim Dunlop, P.E.  
Mr. J. B. Williamson  
Mr. Bill Gilmore, P.E. (2)  
Ms. D. M. Barbour, P.E.  
Mr. J. E. Alford, P.E.  
Mr. Blake Norwood, P.E.  
Mr. A. L. Avant  
Mr. Van Argabright, P.E.  
Mr. J. D. Lane  
Mr. H. A. Tasaico, P.E., Attention: Omar S. Sultan

FROM: Derrick W. Lewis, P.E.  
Feasibility Studies Unit

SUBJECT: Feasibility Study # FS-0010A, Removal of the existing at grade railroad crossing at Winecoff School Road (SR 1790) between South Main Street (SR 1008) and Ridge Avenue (SR 2001) and replace it with a new crossing at an extension of Mr. Olivet Road westward to S. Main Street, Kannapolis, Cabarrus County

Feasibility Study #FS-0010B, Railroad Grade Separation Study – Dakota Street and Universal Street (SR 1766) / Rogers Lake Road (SR 1625), Kannapolis, Cabarrus County.

Our staff has completed a feasibility study for the subject proposed project. This brief analysis suggests improvements that would be logical if the project were to be funded. A copy of our report is attached for your information.

DWL/dl

Attachment

cc: Mr. R. L. Hill, P.E.  
Mr. L. A. Sanderson, P.E.

FILE COPY  
DO NOT REMOVE

**FEASIBILITY STUDY**  
**RAILROAD GRADE SEPARATION STUDY**  
**DAKOTA STREET**  
**and**  
**SR 1766 (UNIVERSAL STREET) / SR 1625 (ROGERS LAKE ROAD)**

**KANNAPOLIS**  
**CABARRUS COUNTY**

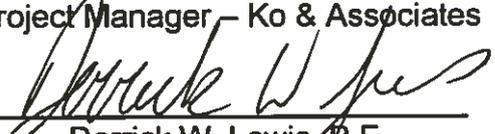
**DIVISION 10**

**FS 0010B**



Feasibility Studies Unit  
Program Development Branch  
Division of Highways  
N.C. Department of Transportation

Documentation Prepared by Ko & Associates, P.C.  
David G. Modlin, Jr., P.E.  
Project Manager - Ko & Associates

  
\_\_\_\_\_  
Derrick W. Lewis, P.E.  
Feasibility Studies Engineer

12/10/01  
Date

# **FS-0010B**

## **KANNAPOLIS**

### **RAILROAD GRADE SEPARATION STUDY DAKOTA STREET and SR 1766 (UNIVERSAL STREET) / SR 1625 (ROGERS LAKE ROAD)**

#### **CABARRUS COUNTY**

#### **DIVISION 10**

#### **I. Introduction**

This feasibility study describes the preliminary studies relative to providing a railroad grade separation at either Dakota Street extended westward beyond S. Main Street or at Universal Street / Rogers Lake Road, both in Kannapolis. The project study area is shown in Figure 1.

#### **II. Executive Summary**

Two grade separation alternates were studied: (1) the extension of Dakota Street westward to and beyond S. Main Street (SR 1008 and formerly US 29A) and (2) the combination of SR 1766 (Universal Street) and SR 1625 (Rogers Lake Road).

A functional design for each studied alternate was prepared to ensure their feasibility. Figure 2 (Dakota Street) and Figure 3 (Universal Street) graphically depict the studied alternates. The estimated costs of the alternates are as follows:

##### **ALTERNATE 1 - DAKOTA STREET EXTENSION**

Construction	\$ 8,100,000.00
Right of way	\$ <u>1,800,000.00</u>
Total Cost	\$ 9,900,000.00

##### **ALTERNATE 2 - UNIVERSAL STREET / ROGERS LAKE ROAD (Recommended)**

Construction	\$ 5,300,000.00
Right of way	\$ <u>1,500,000.00</u>
Total Cost	\$ 6,800,000.00

This study is the initial step in the planning and design process for this project and is not to be considered the product of exhaustive environmental or design investigations. The purpose of the study is to describe the problem, recommend a feasible treatment including estimated costs, and identify potential problem areas that deserve consideration in the planning and design phases.

### **III. Purpose and Need for the Project**

There are 55 daily trains utilizing the railroad tracks that separate S. Main Street and Ridge Avenue. Of these, 49 are daily freight and 6 are passenger trains with a maximum speed of approximately 60 miles per hour (97 kmph). In 1997, a *Traffic Separation Study* was completed for Kannapolis. For the past 10 years of recorded accident data, all of the crossings in Kannapolis have had train / vehicle collisions except for East "C" Street. Fatalities have occurred at five of the crossings, with two each having occurred at Winecoff School Road, Universal Street and East 22<sup>nd</sup> Street. The recommendation to replace the at-grade crossing at Universal Street with a railroad grade separation arose from the Kannapolis *Traffic Separation Study*. This project is also endorsed by the City of Kannapolis and the Cabarrus - South Rowan Metropolitan Planning Organization.

### **IV. Existing Conditions**

The Norfolk Southern Railroad line is a portion of the planned High Speed Corridor linking Raleigh and Charlotte. Currently, the double tracks carry 55 trains, 49 freight and 6 passenger, at a maximum 60 miles per hour (97 kmph). The ultimate goal would be to remove all at-grade rail crossings in this rail corridor to maximize safety and the speed capability of the trains.

Universal Street / Rogers Lake Road, Ridge Avenue and Dakota Street are shown as Minor Thoroughfares on the Cabarrus - South Rowan Thoroughfare Plan (map dated February 21, 1996) (See Figure 4). S. Main Street (SR 1008 and formerly US 29A) is shown as a Major Thoroughfare. On the Statewide Functional Classification System, Universal Street / Rogers Lake Road and Ridge Avenue are classified as Urban Collectors. S. Main Street is classified as an Urban Minor Arterial. Because Dakota Street and its westward extension are part of the long-range thoroughfare plan, it is currently not functionally classified.

The development along Dakota Street, Ridge Avenue, S. Main Street and Universal Street / Rogers Lake Road is a mix of residential, commercial and light industrial uses.

Along Dakota Street, the land use is residential. At the existing intersection of Dakota Street and Ridge Avenue, a new veterinary hospital and a dance studio are along the west side of Ridge Avenue and will be impacted by the Dakota alternate. Development along S. Main Street is

mostly residential in the area of the proposed Dakota Street extension. One (1) residential and one (1) business relocation are possible with the implementation of this alternate. Of particular note, one house on the west side of S. Main Street, in the proximity of the proposed grade separation and shown in Figure 5, could possibly be a Section 106 property.

Along Universal Street, in the vicinity of S. Main Street and Ridge Avenue, the land use is mostly commercial. As you move away from S. Main Street and Ridge Avenue along Universal Street and Rogers Lake Road, the land use becomes residential. Seven (7) residential relocations and two (2) business relocations are possible with the implementation of this alternate.

The current average daily traffic (ADT) within the project limits ranges from 3,500 vehicles per day (vpd) to 4,900 vpd on Ridge Avenue, 11,500 vpd to 13,600 vpd on S. Main Street, 4,600 vpd to 7,200 vpd along Universal Street and 1,500 vpd on Dakota Street. Depending on the studied alternate, the design year 2025 estimated volumes range from 5,500 vpd to 11,100 vpd along Ridge Avenue, 13,800 vpd to 20,800 vpd along S. Main Street, 1,700 vpd to 12,000 vpd on Dakota Street (especially alternate sensitive) and 4,000 vpd to 8,300 vpd along Universal Street.

Level of service (LOS) is a measure of congestion. LOS A is found under very light traffic conditions and LOS F is found under the most heavy traffic conditions. LOS D is an acceptable level of congestion in urban settings. The three potential signalized intersections in the Dakota Street alternate are expected to function at LOS C/D in the design year 2025. The two potential signals as part of the proposed grade separation at Universal Street / Rogers Lake Road are expected to function at LOS B/C. The resulting tee-intersections at Ridge Avenue and S. Main Street under the Universal Street / Rogers Lake Road alternate are expected to function at LOS C and LOS D respectively in the design year. Estimated 2025 year traffic volumes on S. Main Street suggest a major widening project by year 2025.

During the period from January 1, 1998 through December 31, 2000, there were 21 accidents on Universal Street between S. Main Street (SR 1008 and formerly US 29A) and S. Ridge Avenue. During this period, there were no reported fatalities. There were 8 personal injury accidents. The most prevalent accident types were angle (29 %), rear end (33 %) and left turn-same road (19 %). The separation of through traffic from local turning traffic provided by the new crossing will hopefully reduce these types of accidents. The accident rate for this short 0.09-mile roadway is 19,354.12 accidents per 100 million vehicle miles of travel. Due to the very short section and high number of accidents, a comparison with a statewide accident rate is not valid.

## V. Studied Alternates

Two alternates were studied for this feasibility study.

**Alternate 1** requires the extension of Dakota Street westward to and beyond S. Main Street to construct the desired railroad grade separation. The extension of Dakota Street is an element of the Cabarrus - South Rowan adopted thoroughfare plan. The thoroughfare plan identifies long-range transportation needs and the Dakota Street extension is not included in the current 2002 – 2008 Transportation Improvement Program (TIP). The functional design of this proposed crossing is shown on Figure 2. This design will require extensive bridging (approximately 1000 feet [305 meters]) to span Ridge Avenue, the railroad, Crescent Street and S. Main Street.

Until the final westward extension of Dakota Street as shown on the thoroughfare plan is completed (Figure 4), the through traffic flow will use S. Main Street north and south to access an acceptable east-west road. The loops shown to access S. Main Street and Ridge Avenue will still provide their primary access function when Dakota Street is ultimately extended to Saw Road as shown on the thoroughfare plan.

This alternate is estimated to impact one (1) residence and one (1) business. On Ridge Avenue, the relatively new veterinary hospital will be directly impacted. Peacehaven Road at Dakota Street and Brookshire Avenue will be cut off with a cul-de-sac and traffic will be required to use the existing Peacehaven Road / Dakota Street intersection farther east.

**Alternate 2** utilizes Universal Street and Rogers Lake Road to construct the desired railroad grade separation. This alternate will span Ridge Avenue, the railroad, and S. Main Street requiring approximately 510 feet (156 meters) of structure. This alternate begins on the west side utilizing the existing Rogers Lake Road alignment, continues eastward as a grade separation and then extends further eastward on new location to tie with East Universal Street. The existing East Universal Street / Rogers Lake Road corridor, like Dakota Street, is a minor thoroughfare on the adopted plan and currently provides a connection with NC 136 on both its east and west ends. The proposed grade separation would provide improved east – west access while maintaining acceptable north – south access to both Ridge Avenue and S. Main Street.

This alternate is estimated to impact seven (7) residences because of the new location connectors and possibly two businesses on the existing Universal Street at the S. Main Street intersection. As shown in Figure 3, the west end of Rogers Lake Road will be relocated to improve the intersection geometry and Rogers Lake Road will be extended eastward as a grade separated roadway and will tie to Universal Street east of Ridge Avenue. All of the intersections in this alternate will be tee intersections.

## VI. Recommendations

Based on our analysis, Alternate 2 creating a grade separation of the Norfolk Southern Railroad using Universal Street and Rogers Lake Road (See Figure 3) is the recommended alternate. This alternate creates an east-west through movement without train/vehicle conflicts connecting E. Universal Street and Rogers Lake Road. The existing intersections at Universal Street and Ridge Avenue and Universal Street and S. Main Street would be converted to tee intersections with three-phase traffic signals. As tee-intersections, they will operate at a higher Level of Service compared to the existing four-legged intersections.

The Universal Street / Rogers Lake Road alternate requires a shorter bridge and minimizes right of way impacts compared to the Dakota Street alternate. With the Universal Street / Rogers Lake Road alternate, there is immediate connectivity, whereas with the Dakota Street alternate, the greater benefits come only with the further westward extension of Dakota Street to Saw Road as shown on the Cabarrus - South Rowan Thoroughfare Plan.

The estimated cost of implementing the Universal Street / Rogers Lake Road grade separation is as follows:

Construction	\$ 5,300,000.00
Right of way	\$ 1,500,000.00
Total Cost	\$ 6,800,000.00

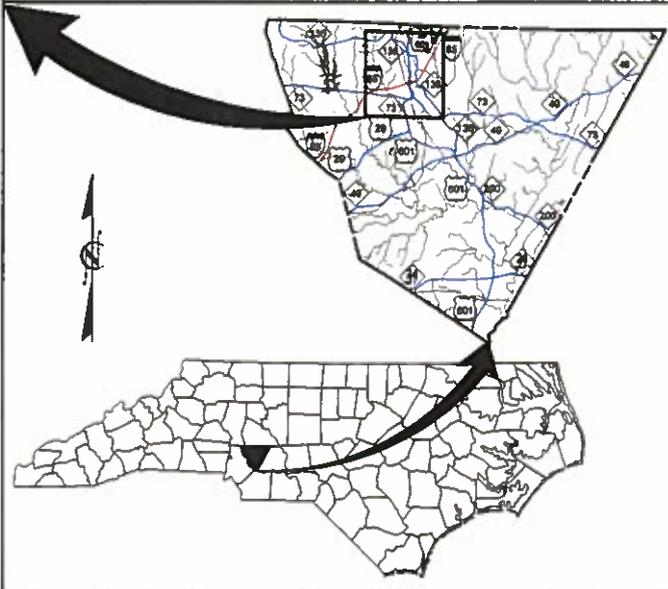
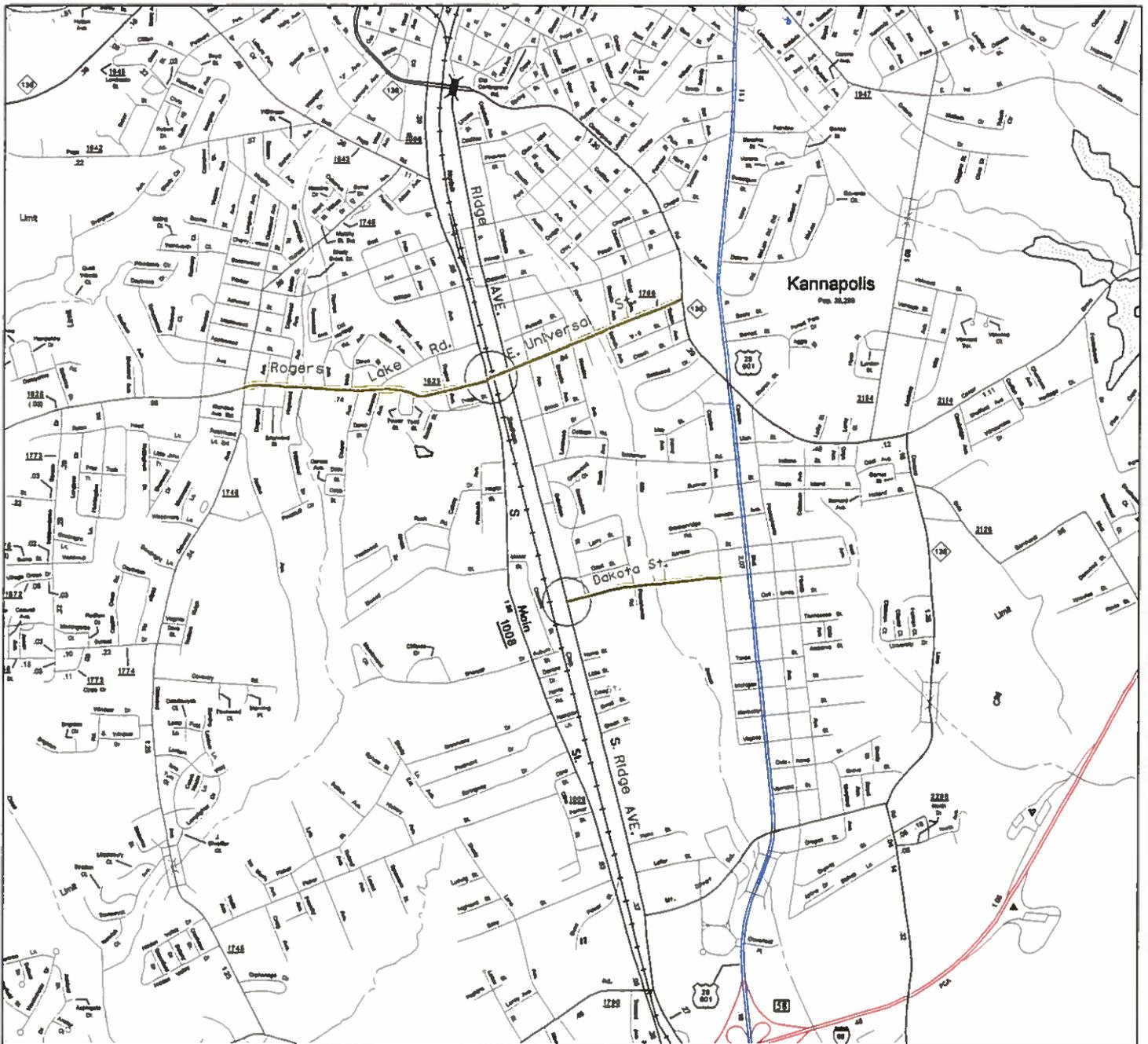
## VII. Other Comments

An environmental screening by a certified environmentalist was not conducted for this study. However, based on maps at the Department of Environment, Health and Natural Resources – Natural Heritage Section, no threatened or endangered species were identified in the project corridor. In addition, no wetlands or historic properties are anticipated to be impacted by the recommended alternate.

No special accommodations for bicycles or pedestrians are recommended on this project.

There is a question concerning the actual width of right of way owned by Norfolk Southern Railroad. The right of way shown in Figure 3 is 100 feet (30.5 meters). The right of way allegedly owned could be 200 feet (71.0 meters), which would include portions of the existing developed property. Owing to the significant number of obvious encroachments within a 200-foot (71.0-meter) right of way, this issue will need verification during later planning stages of this project.

There is a structure shown in Figure 5 that may have some historic significance. The structure is obviously older than 50 years and appears to have what may be its original siding. Should the Dakota Street alternate prevail, the significance of this structure will have to be fully investigated.



**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH**

**RAILROAD GRADE SEPARATION STUDY  
DAKOTA STREET and ROGERS LAKE ROAD / UNIVERSAL STREET  
KANNAPOLIS  
CABARRUS COUNTY  
FS-0010B**



**FIGURE 1**



"FIGURE 2"



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROGRAM DEVELOPMENT BRANCH

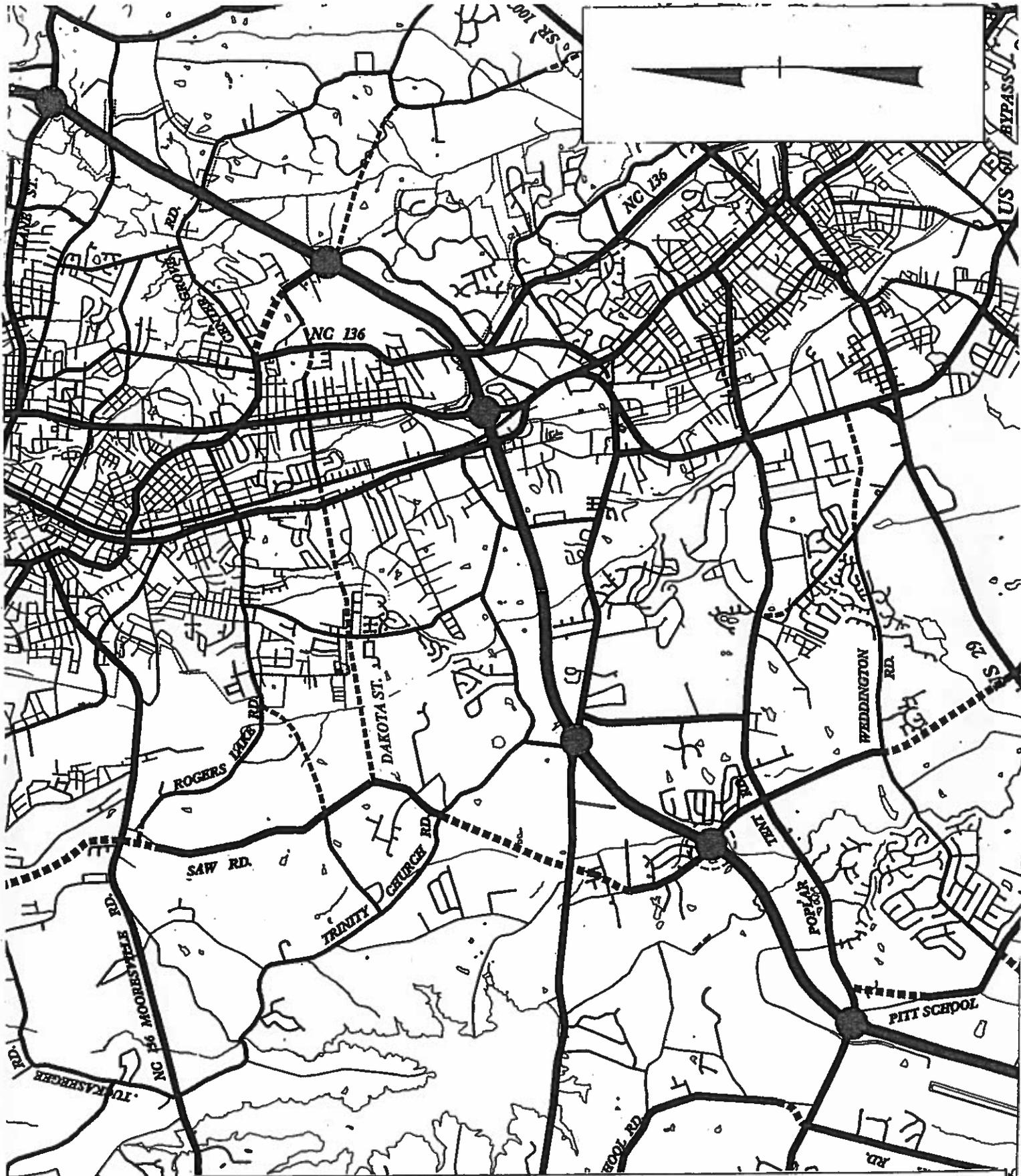
DAKOTA STREET EXTENSION  
CABARRUS COUNTY  
FS-0010B





FIGURE 3

	<p>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PROGRAM DEVELOPMENT BRANCH</p>
	<p>ROGERS LAKE RD/UNIVERSAL ST CONNECTOR CABARRUS COUNTY FS-0010B</p>
<p>200 100 0 100 200 SCALE IN FEET</p>	



<p>RECOMMENDED BY          STATEWIDE PLANNING <i>Nov. 11, 1996</i> <small>N.C. DOT</small>          N.C. DEPT OF TRANSPORTATION  <i>June 3, 1996</i>          TRANSPORTATION          ADVISORY COMMITTEE  <i>Apr 24, 1996</i></p>	<p><b>THOROUGHFARE PLAN</b></p> <p>MAP DATE          FEBRUARY 21, 1996</p>	<p><b>CABARRUS - SOUTH ROWAN</b></p> <p>CABARRUS COUNTY          ROWAN COUNTY          NORTH CAROLINA</p> <p>FINANCED BY          NORTH CAROLINA DEPARTMENT OF TRANSPORTATION          STATEWIDE PLANNING BRANCH - OR BRANCH          IN COOPERATION WITH THE          U. S. DEPARTMENT OF TRANSPORTATION          FEDERAL HIGHWAY ADMINISTRATION</p>
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**FIGURE 4**

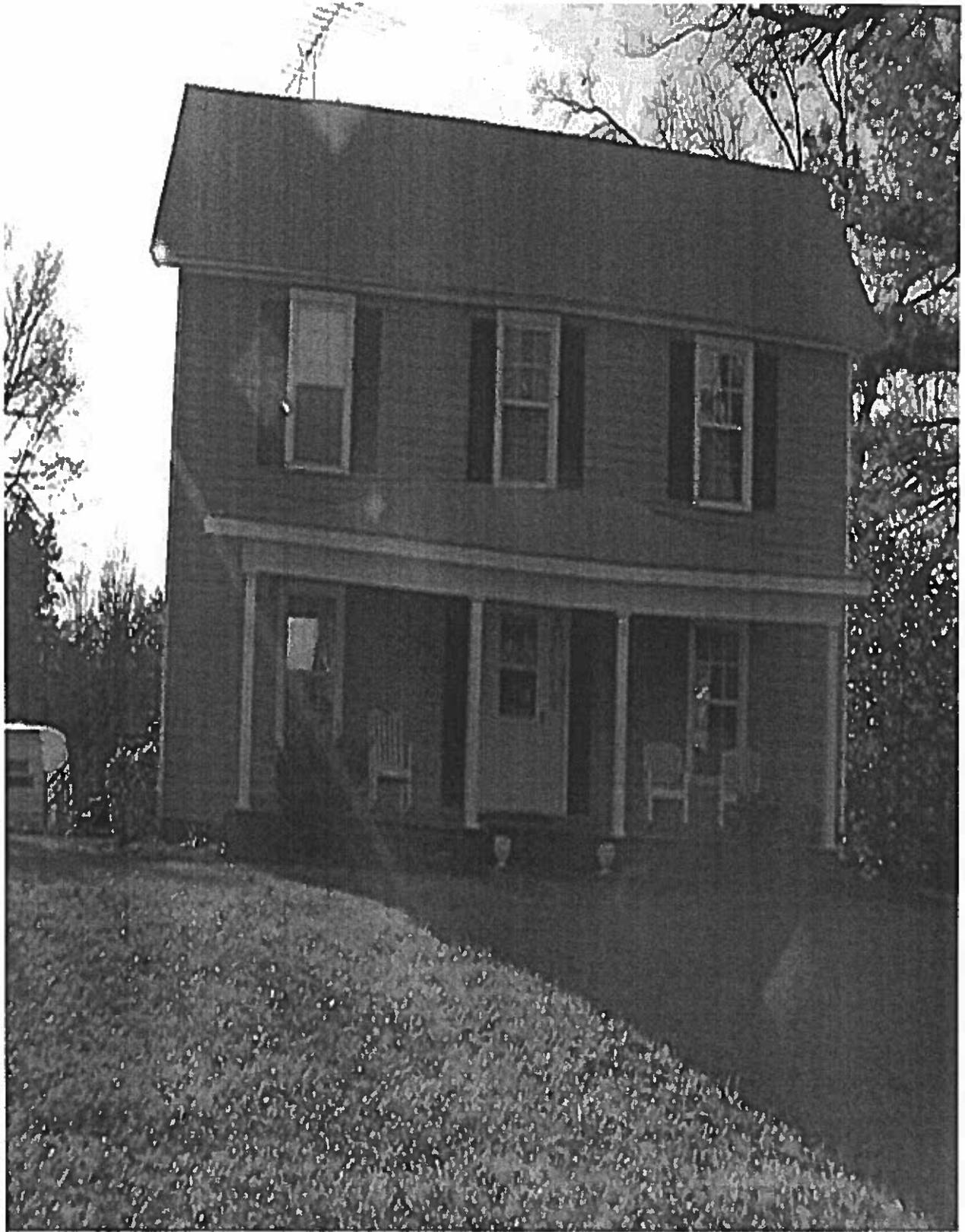


Figure 5  
Old Home On  
S. Main Street