FEASIBILITY STUDY

Durham
Mineral Springs Road (SR 1917)
From US 70 to Sherron Road (SR 1811)
Durham County
U-2808

Prepared by
Program Development Branch
Division of Highways
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Date

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I. GENERAL DESCRIPTION

This preliminary study describes proposed improvements to Mineral Springs Road (SR 1917) in Durham. A vicinity map of the studied area is shown in Figure 1, and the project details are illustrated in Figures 2 and 3. It is recommended to widen Mineral Springs Road, on existing alignment, to a five lane, 68 foot wide face to face curb and gutter section, from US 70 to Sherron Road (SR 1811), a distance of approximately 1500 feet. Further, at the intersection of US 70 and Mineral Springs Road it is proposed to widen the eastbound approach on US 70 by 24 feet and the northbound approach on Miami Boulevard (SR 1959) by 14 feet. It is also proposed to revise the existing traffic signal. The total estimated cost for the recommended improvements is $2,800,000.

This is not an exhaustive environmental or design investigation but a preliminary study to define feasible project alternatives and determine estimated right of way and construction costs for these alternatives.

II. NEED FOR PROJECT

The purpose of this project is to alleviate the severe peak hour traffic congestion at the intersection of Mineral Springs Road and US 70. Presently, during the morning and afternoon peak traffic periods, motorists on Mineral Springs Road must wait through two or three cycles of the traffic signal at the US 70 intersection.

US 70 is an east-west route from Durham to Raleigh and Mineral Springs Road/Miami Boulevard is a major link between the residential areas north of US 70 and the Research Triangle Park south of US 70.

There are plans for new commercial development in the southeast quadrant of the intersection which is expected to add to the congestion.

US 70, Mineral Springs Road, and Miami Boulevard are all Federal Aid Urban Routes. US 70 is classified as an Urban Principal Arterial Route in the North Carolina Statewide Functional Classification System, while both Mineral Springs Road and Miami Boulevard are classified as Minor Arterial Routes. Sherron Road and Miami Boulevard are shown as Major Thoroughfares on the 1991 Durham Thoroughfare Plan and US 70 is shown as a Freeway Thoroughfare. Mineral Springs Road is not on the Thoroughfare Plan. Land use is primarily retail/commercial around the intersection of US 70,

Mineral Springs Road, and Miami Boulevard. However, at the intersection of Mineral Springs Road and Sherron Road development is residential.

The existing cross section on Mineral Springs Road varies from a two-lane, two-way section between Sherron Road and 500 feet north of US 70 to a three-lane, curb and gutter section with two travel lanes and an eastbound left turn lane at the intersection of US 70 and Mineral Springs Road. See Figure 2 for the existing intersection geometry. The pavement width on Mineral Springs Road varies from approximately 24 feet at Sherron Road to 40 feet face to face of curbs at the US 70 intersection. Miami Boulevard's cross section consists of four travel lanes; two in each direction. Pavement width is approximately 48 feet. A triangular shaped traffic island allows eastbound traffic from Miami Boulevard to merge with eastbound traffic on US 70.

US 70 is a four lane median divided section east of the Mineral Springs Road/Miami Boulevard/US 70 intersection and is a five lane shoulder section with four travel lanes and an auxiliary lane west of the intersection. Another triangular shaped island permits the US 70 southbound lane to flow freely onto Miami Boulevard.

Mineral Springs Road is designated as a desirable touring route on the 1991 Durham Bike Map. Mineral Springs Road is one of a few secondary roadways on the east side of Durham which give bicyclists access to the Research Triangle Park Area. The bicycle program has requested that extra roadway surface, either wide curb lanes or widened paved shoulders, be included as part of the improvements to accommodate the safety of cyclists.

Capacity analysis on the intersection of US 70, Miami Boulevard, and Mineral Springs Road indicates a level of service E based on the existing geometrics and 1991 traffic volumes. Using the same traffic volumes with the recommended intersection improvements, the intersection operates at a level of service D with a 45% reduction in intersection delay. With the recommended improvements, the intersection is expected to operate at a level of service E through the year 1997, however, the intersection delay time remains improved by 16% compared to the unimproved conditions.

III. RECOMMENDATIONS

It is recommended that Mineral Springs Road be widened to a five lane curb, 68 foot wide face to face curb and gutter section centered on the existing roadway from US 70 to 300 feet north of Sherron Road. The total distance is approximately 1500 feet. The outside lanes should be 14 feet wide to accommodate bicycle traffic as requested by the NCDOT Bicycle Program.

Further, it is recommended to add a dual right turn lane on the eastbound approach of US 70 at the intersection of US 70 and Miami Boulevard. See Figure 3 for the proposed intersection. Two lanes of traffic can then flow alternately, from US 70 and Mineral Springs Road, under traffic signal control, onto Miami Boulevard. The full width of widening on US 70 will extend 400 feet from the intersection and an 800 foot long taper will tie into the existing pavement. The US 70 cross-section will be curb and gutter for the dual right turn lanes and the new curb and gutter will tie into the existing outside curb on Miami Boulevard at Belden Road (SR 1958). Belden Road at Miami Boulevard should be closed and the pavement removed.

The project also includes adding a 14 foot lane on the east side of Miami Boulevard. A 300 foot full width lane will be required with a 200 foot taper. The Miami Boulevard improvements will be a curb and gutter cross-section and will transition to match the existing four lane curb section south of the intersection. This widening will provide northbound traffic with an exclusive thru lane in addition to the existing exclusive left turn lane and combination thru-left-turn lane.

This project will require three residential relocations. Additional right-of-way will be required for each section of this project. Medium utility conflicts are expected in relation to this project.

The total estimated cost for the recommended improvements is:

R/W Cost	:	$ 2,100,000
Construction Cost	:	700,000
Total Cost	:	$ 2,800,000

IV. STUDIED ALTERNATIVES

A five lane curb and gutter section on new location was also considered instead of widening Mineral Springs Road. This is shown on Figure 4. For this alternative, Sherron Road would become the major thoroughfare and Mineral Springs Road would form a Tee intersection with the Sherron Road realignment.

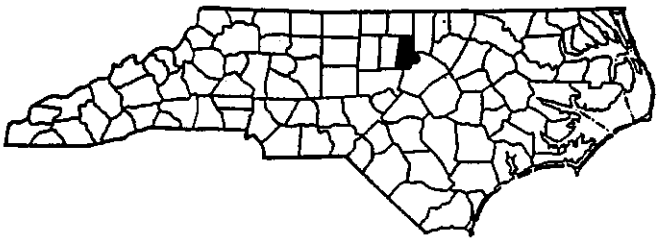
This alternative is estimated to cost $ 3,500,000 as follows:

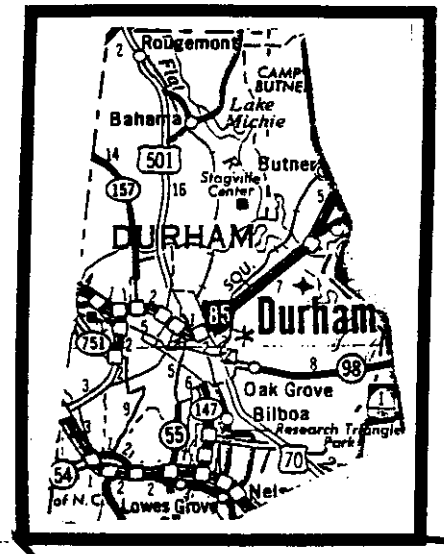
R/W Cost	:	$ 2,400,000
Construction Cost	:	1,100,000
Total Cost	:	$ 3,500,000

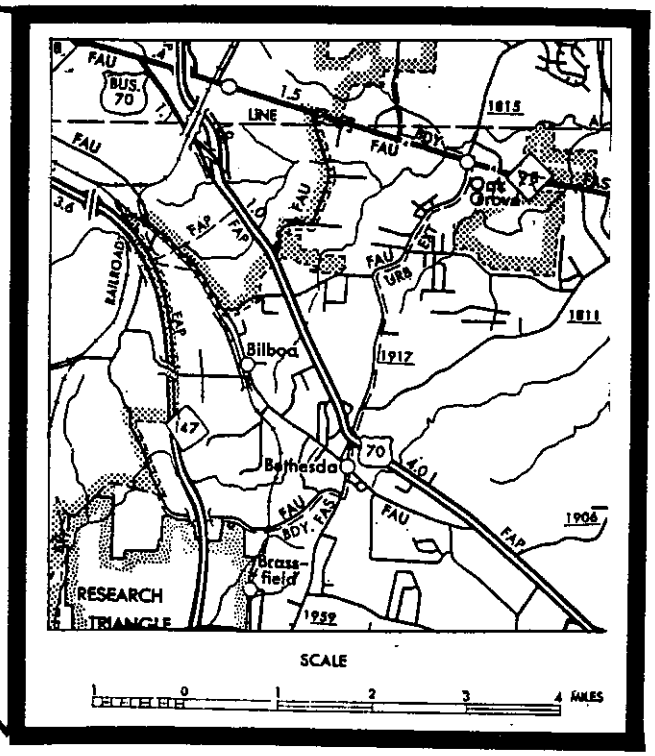
This alternative was not recommended because of the uncertain status of Sherron Road on the thoroughfare plan at this time and because this alternative is approximately $700,000 more costly than the recommended improvements.

V. ADDITIONAL COMMENTS

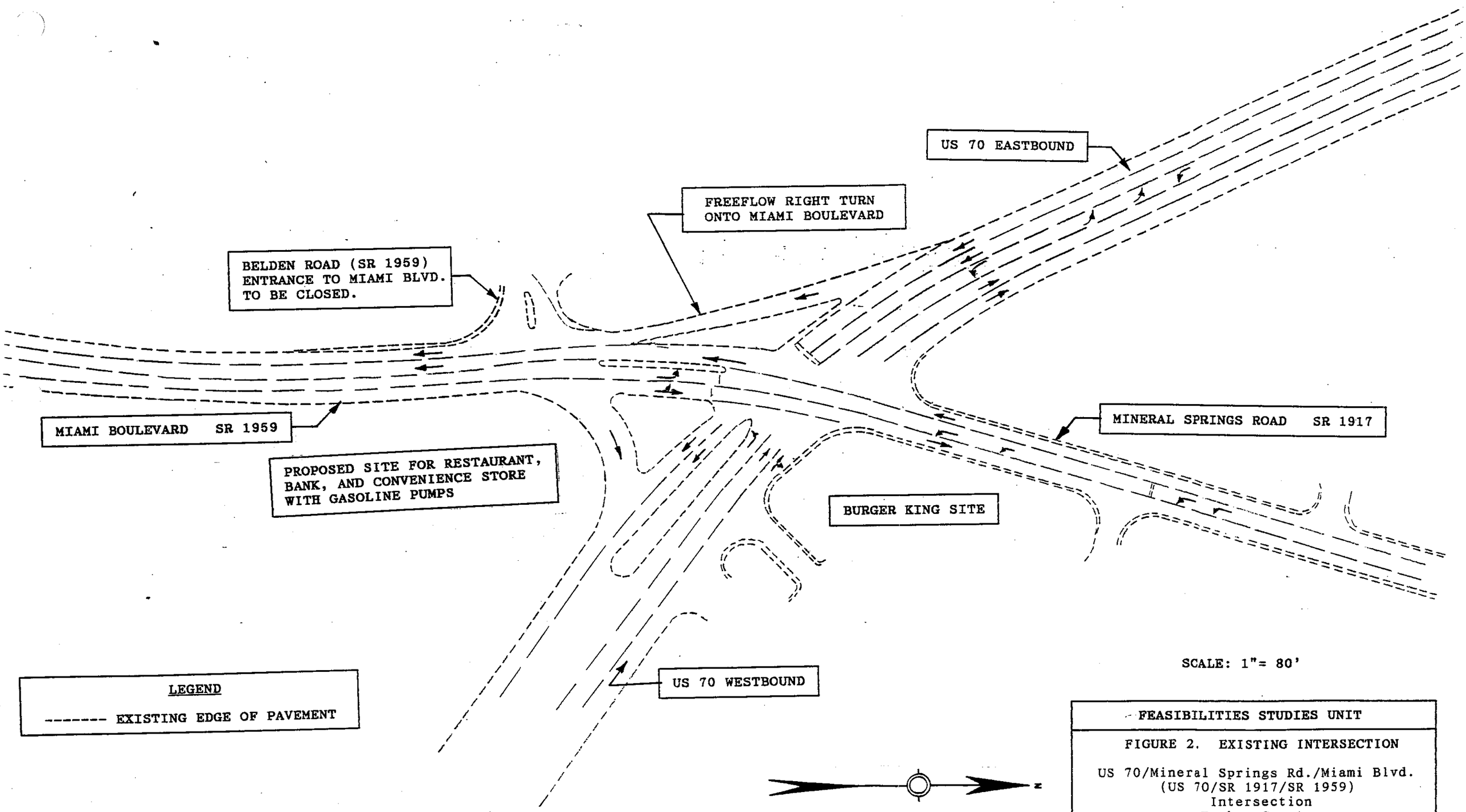
An environmental screening was not made for this study, however, no significant environmental problems are foreseen for this project since the improvements are being made to an existing urban facility.







FEASIBILITIES STUDIES UNIT	
FIGURE 1. VICINITY MAP US 70/Mineral Springs Rd./Miami Blvd. (US 70/SR 1917/SR 1959) Intersection Durham County	
U-2808	FIGURE 1



FEASIBILITIES STUDIES UNIT

FIGURE 2. EXISTING INTERSECTION

US 70/Mineral Springs Rd./Miami Blvd.
(US 70/SR 1917/SR 1959)
Intersection
Durham County

U-2808 FIGURE 2

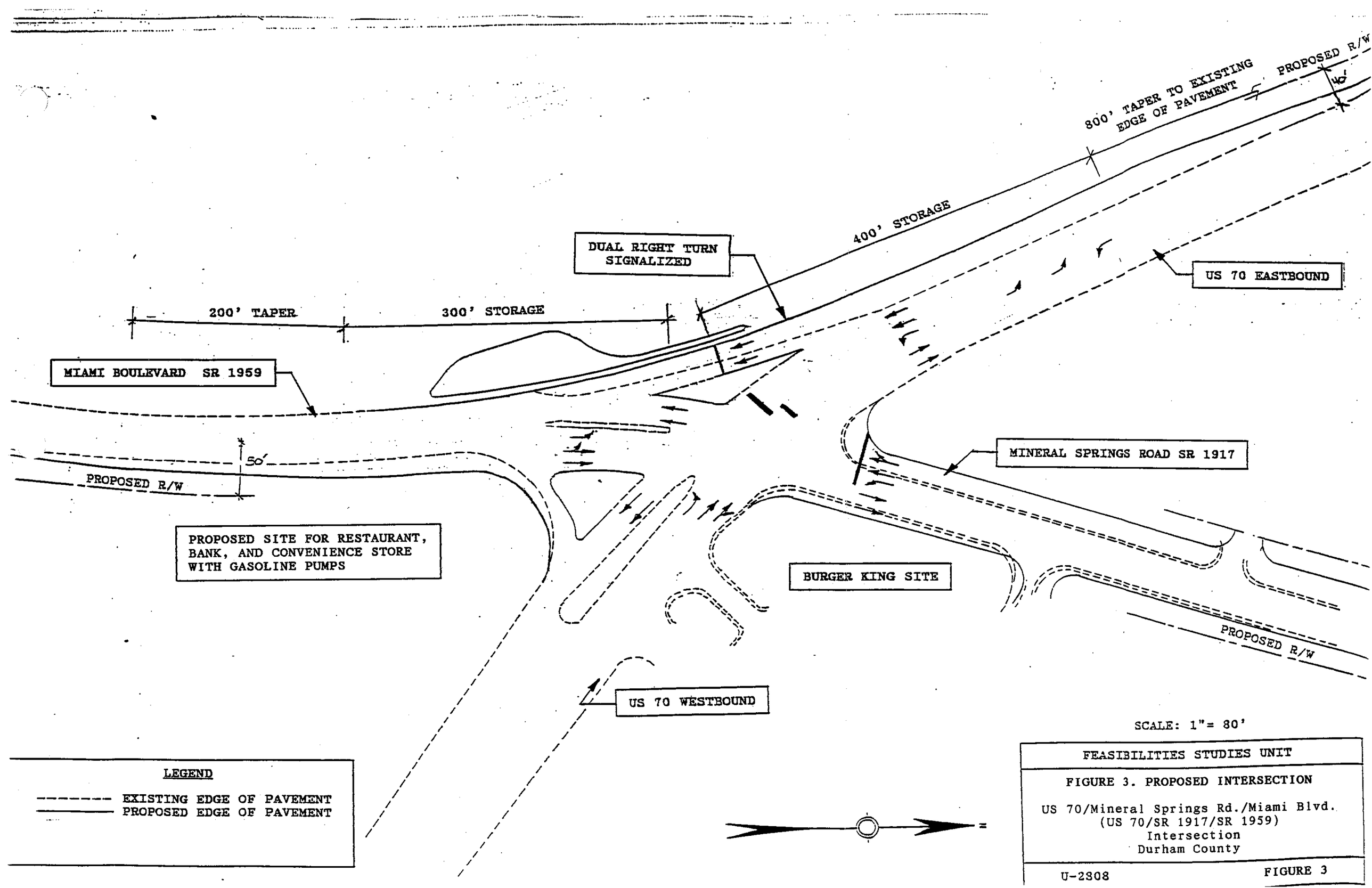

800' TAPER TO EXISTING EDGE OF PAVEMENT
PROPOSED R/W
40'
400' STORAGE
DUAL RIGHT TURN SIGNALIZED
US 70 EASTBOUND
200' TAPER
300' STORAGE
MIAMI BOULEVARD SR 1959
50'
PROPOSED R/W
MINERAL SPRINGS ROAD SR 1917
PROPOSED SITE FOR RESTAURANT, BANK, AND CONVENIENCE STORE WITH GASOLINE PUMPS
BURGER KING SITE
PROPOSED R/W
US 70 WESTBOUND
LEGEND
EXISTING EDGE OF PAVEMENT
PROPOSED EDGE OF PAVEMENT
SCALE: 1"= 80'
FEASIBILITIES STUDIES UNIT
FIGURE 3. PROPOSED INTERSECTION
US 70/Mineral Springs Rd./Miami Blvd.
(US 70/SR 1917/SR 1959)
Intersection
Durham County
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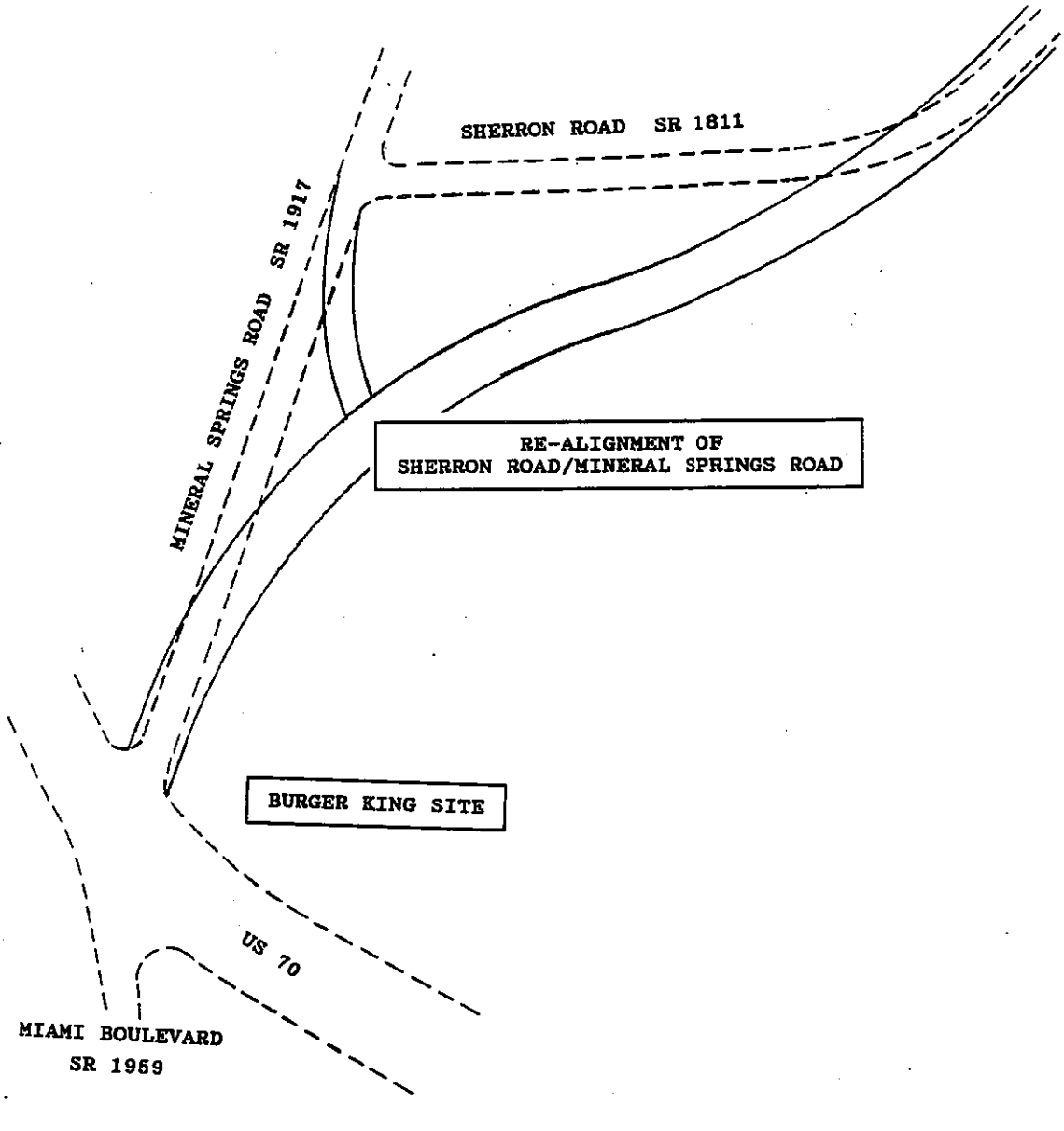
FIGURE 3



SCALE 1"= 320'

LEGEND

-------- EXISTING PAVEMENT
———— PROPOSED PAVEMENT

FEASIBILITIES STUDIES UNIT

FIGURE 4. ALTERNATIVE 2

US 70/Mineral Springs/Miami Boulevard
(US 70/SR 1917/SR 1959)
Intersection

U-2808 FIGURE 4