FEASIBILITY STUDY

Charlotte
I-77 Widening
from
I-85 to Proposed Northern Outer Loop
Mecklenburg County
I-3311

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 I-77 in and north of Charlotte. I-77, within these project limits, is a 4-lane, median divided facility. The proposed improvements include replacing one structure and widening two structures in the area of the I-85 interchange, and adding additional lanes in the median between I-85 and SR 2116 (the approximate location of the proposed outer loop). The project location and surrounding area is shown on Figure 1, the project location enlarged is shown on Figure 2, and the I-77/I-85 interchange area is shown on Figure 3.

Generally, the widening will result in a 6-lane facility from a point approximately 2000 feet (610 m) south of I-85 to a point approximately 2400 feet (732 m) north of I-85. Between this point and the proposed Northern Outer Loop an 8-lane facility will be provided. In addition to the new travel lanes, a 10-foot (3.0-m) wide breakdown lane will be provided in the median for each direction of travel.

The total length of construction is approximately 7.0 miles (11.3 km). No new right-of-way will be required. The total estimated cost is $26,400,000.

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

II. NEED FOR PROJECT

The purpose of this project is to increase the traffic carrying capacity and improve the level of service on I-77 between I-85 and the proposed outer loop in Charlotte. This facility now provides two traffic lanes in each direction of travel. The 1994 traffic volumes vary between 47,000 vehicles per day (vpd) and 75,000 vpd. These traffic volumes result in Levels of Service (LOS) that vary from Level C to Level F. Upon completion of the proposed improvements, and based on 1994 traffic volumes, the expected LOS will vary from Level B to Level C.

Traffic volume projections for the design year 2015 vary from 75,000 vpd to 114,000 vpd. Without the proposed improvements the projected LOS in the design year will be Level F throughout the facility. With the proposed improvements the LOS will vary from Level C to Level D in the 2015 design year.

I-77, within the project limits, provides 2 travel lanes in each direction, with 4-foot (1.2-m) paved shoulders in the median and 10-foot (3.0-m) paved outside shoulders. The median width varies from 100 feet (30.5 m) to 220 feet (67.1 m). The structures carrying US 21, SR 2112, and SR 2113 over I-77 have sufficient lateral clearance in the median so that the proposed widening can be accomplished in the median. Two structures in the area of the I-85 interchange will require widening, and one structure in this area will require replacement.

Bridge Number 308 will be replaced with a wider structure. Bridge Number 308 carries 2 northbound I-77 lanes over 2 southbound I-77 lanes. The location is shown on Figure 3. This structure was built in 1971 and has a sufficiency rating of 93.9. The structure is approximately 321 feet (98 m) in length, and 40 feet (12.2 m) wide. The new structure will be approximately 330 feet (101 m) long, 60 feet (18.3 m) wide, and will provide 3 northbound lanes and 12-foot (3.6-m) shoulders over 3 southbound lanes with 10-foot (3.0-m) wide paved shoulders.

Bridge Number 303 will be widened approximately 22 feet (6.7 m). Bridge Number 303 carries 5 southbound I-77 lanes over I-85. The 5 lanes on this structure include 2 through lanes, 1 exit lane, and 2 entrance lanes. The location is shown on Figure 3. This structure was built in 1970 and has a sufficiency rating of 89.0. The structure is approximately 257 feet (78 m) in length, and 78 feet (23.8 m) wide. The widened structure will be approximately 100 feet (30.5 m) wide, and will allow addition of 1 southbound through lane. Shoulders 12 feet (3.6 m) wide will be provided on the widened structure.

Bridge Number 302 will be widened by approximately 17 feet (5.2 m). Bridge Number 302 carries 4 northbound I-77 lanes over I-85. The 4 lanes on this structure include 2 through lanes, 1 exit lane, and 1 entrance lane. The location is shown on Figure 3. This structure was built in 1970 and has a sufficiency rating of 97.0. The structure is approximately 259 feet (79 m) in length, and 71 feet (21.6 m) wide. The widened structure will be approximately 88 feet (26.8 m) wide, and will allow addition of 1 northbound through lane with shoulders 12 feet (3.6 m) wide.

During the three year period between April 1, 1991, and March 31, 1994, there were 221 accidents reported on I-77 within the project limits. Two of these accidents resulted in 4 fatalities, and 72 of the accidents resulted in 100 non-fatal injuries. These accidents resulted in a total accident rate of 53.0 accidents per 100 million vehicle miles (acc/100mvm). This compares to a statewide accident rate of 119.4 acc/100mvm for urban interstate roads in North Carolina for 1993.

The most prevalent type accidents were Rearend (44%), Sideswipe (20%), and Ran Off Road (16%). The additional travel lanes provided by this project should reduce the potential for these type accidents.

III. RECOMMENDATIONS

It is recommended to widen I-77 in, and north of, Charlotte. The proposed improvements include replacing one structure and widening two structures in the area of the I-85 interchange, and adding additional lanes in the median between I-85 and SR 2116 (the approximate location of the proposed outer loop). The project location and vicinity is shown on Figure 1, the project location enlarged is shown on Figure 2, and the I-77/I-85 interchange is shown on Figure 3.

Generally, the widening will result in one additional lane in each direction (a total of 6 lanes) from a point approximately 2000 feet (610 m) south of I-85 to a point approximately 2400 feet (732 m) north of I-85. Between this point and the proposed Northern Outer Loop, two additional lanes will be provided in each direction of travel, for a total of 8 lanes. In addition to the new travel lanes, a 10-foot (3.0 m) wide breakdown lane will be provided in the median for each direction of travel.

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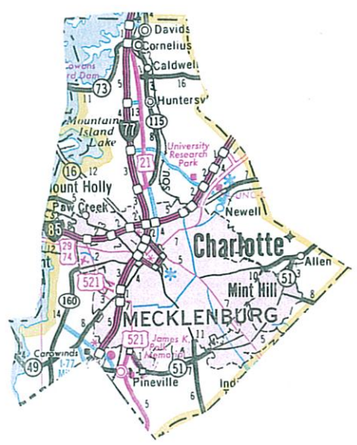
The total length of construction is approximately 7.0 miles (11.3 km). No new right-of-way will be required. The total estimated cost is $26,400,000.

IV. OTHER COMMENTS

An environmental screening was not conducted for this study. The project will be built within existing right-of-way.

This study does not address future interchange configurations. Since the proposed widening is in the median it seems likely that it will be compatible with future interchange designs.



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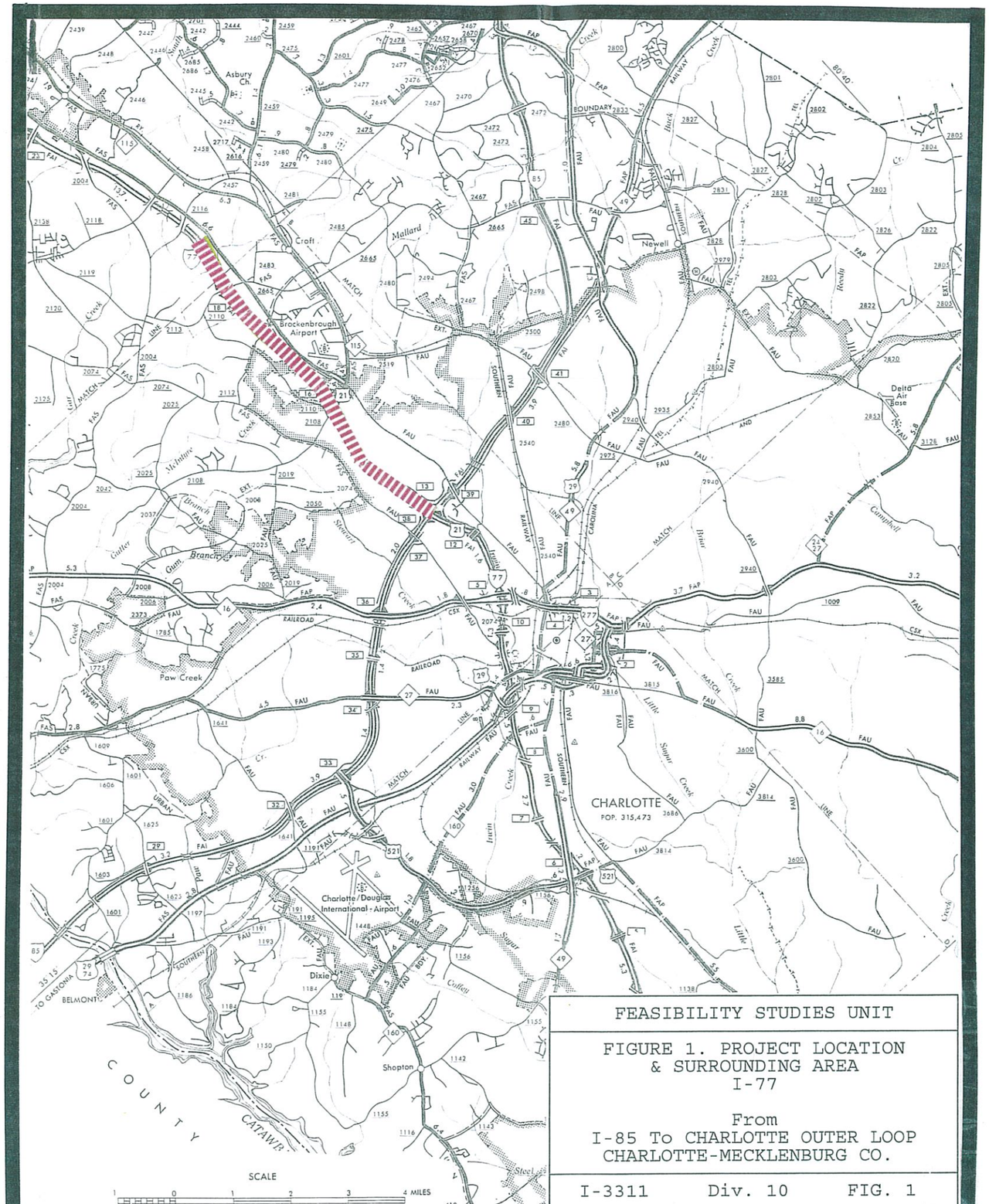
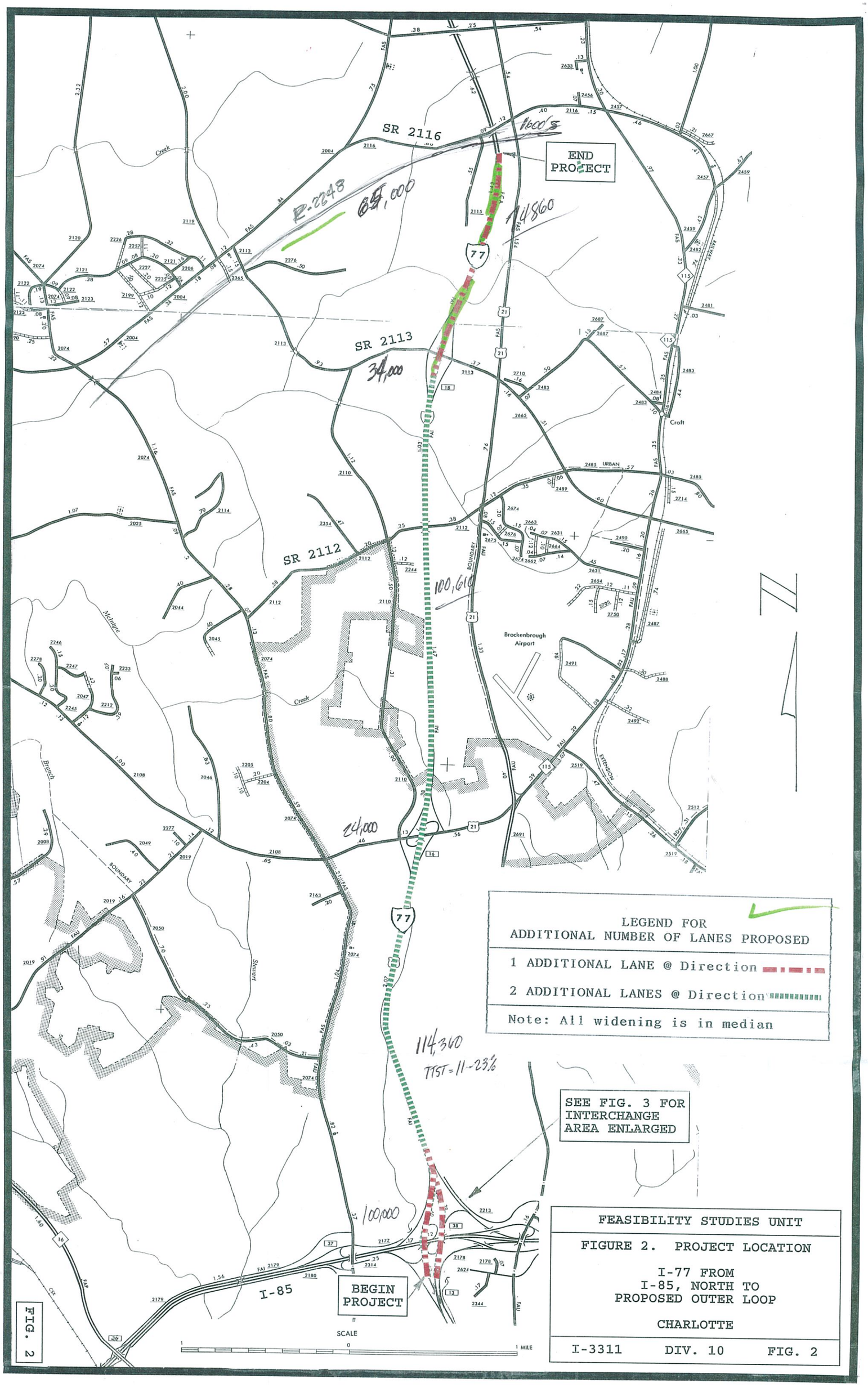


FEASIBILITY STUDIES UNIT

FIGURE 1. PROJECT LOCATION
& SURROUNDING AREA
I-77

From
I-85 To CHARLOTTE OUTER LOOP
CHARLOTTE-MECKLENBURG CO.

I-3311 Div. 10 FIG. 1



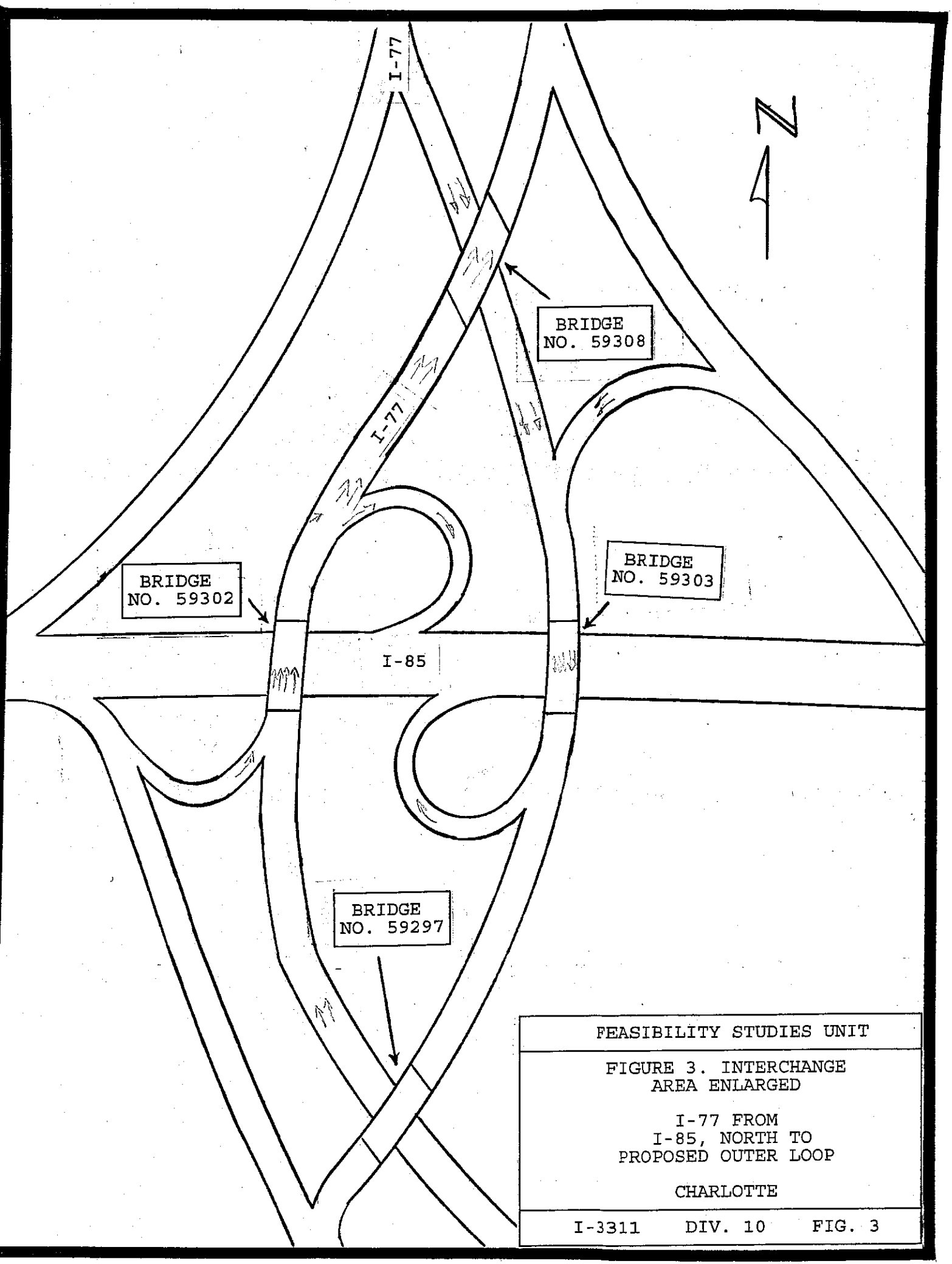
FEASIBILITY STUDIES UNIT

FIGURE 2. PROJECT LOCATION

I-77 FROM
I-85, NORTH TO
PROPOSED OUTER LOOP

CHARLOTTE

I-3311 DIV. 10 FIG. 2



FEASIBILITY STUDIES UNIT

FIGURE 3. INTERCHANGE AREA ENLARGED

I-77 FROM I-85, NORTH TO PROPOSED OUTER LOOP

CHARLOTTE

I-3311 DIV. 10 FIG. 3