

Session #9

**MAJOR INVESTMENT STUDY FOR A SMALL URBANIZED AREA CORRIDOR:  
CABARRUS/SOUTH ROWAN, NORTH CAROLINA**

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**ABSTRACT**

The Cabarrus/South Rowan Urban Area, which has approximately 155,000 population, decided to combine their effort on a major investment study with their effort on a long-range transportation plan update. A major investment study and a long-range transportation plan both require an urban area to fulfill similar requirements, but on different scales to meet the requirements of ISTEA, the CAAA, and NEPA. The long-range transportation planning study must consider alternative modal solutions and financial resources for the area as a whole, while a major investment study focuses on these issues for a corridor or subarea.

This paper describes the purpose and need for a major investment study in the Cabarrus/South Rowan Urban Area in North Carolina; how the long-range transportation planning study was adapted to meet the major investment study requirements; six alternate strategies considered for the major investment study; environmental considerations; what conclusion was determined, and why it was chosen; and the coordination effort which took place.

## **Major Investment Study for a Small Urbanized Area Corridor: Cabarrus-South Rowan, North Carolina**

### **Introduction and Background**

In 1993 the Cabarrus-South Rowan Urban Area MPO began work on updating their long-range transportation plan. As part of the development of the long range transportation plan, it is necessary to fulfill the requirements of the Intermodal Surface Transportation Efficiency Act (ISTEA), the Clean Air Act Amendments (CAAA), and the National Environmental Policy Act (NEPA).

In the 1991 ISTEA legislation, (23CFR 450 Subpart C), MPOs were required to also conduct Major Investment Studies (MIS). An (MIS) is a planning tool that fuses the principles of ISTEA and NEPA. Under the metropolitan planning regulations the MIS focuses on corridor or subarea transportation demand and other problems that may lead to a high type transit or highway investment with a substantial capital investment or impact on the metropolitan transportation system.

The purpose of an MIS is to develop information about the likely impacts and consequences of alternate transportation investment strategies at the corridor or subarea level. The study should include all reasonable alternatives for addressing the identified transportation purpose and need. Only those alternatives that have a reasonable likelihood of being an effective solution or component should be carried forward in the study.

An MIS is a cooperative effort. This one was between the Cabarrus-South Rowan Metropolitan Planning Organization (MPO), the North Carolina Department of Transportation's Divisions of Highways and Public Transportation, the Federal Highway Administration, local transit operators and the public.

### **Purpose and Need**

At the onset of the long-range planning study it became apparent that Interstate 85 fit the qualifications for an MIS. Interstate 85 is of primary importance to the area because it runs through North Carolina connecting seven of its urbanized areas including the Cabarrus-South Rowan Urban Area. Traffic on this facility makes both intrastate trips and local trips inside the urban areas. Present truck percentages, historic traffic growth rates, future traffic projections, and scheduled and recommended construction projects in the planning area all point to high levels of congestion for I-85 in the future. See Figure 1.

The traffic volumes along I-85 just north of the planning area increased 5.5% per year to 53,000 vehicles per day (VPD) from 1990 to 1995. The data from the 1996 long-range transportation planning study model showed that I-85 will experience congestion by the design year 2020 and carry approximately 97,200 VPD near that point. It is anticipated that approximately 70-80% of that traffic will be through traffic or traffic with neither end of the trip stopping inside the urban area. According to the 1994 NCDOT Highway Traffic Statistics Report, I-85 in Salisbury, just

north of the study area, presently carries 20% trucks.

The identified need for this project was derived from the above information. The present volume of traffic on this stretch of I-85 was approaching the highway's effective capacity. It will be nearly double that volume by the design year. The high through trip rate gives rise to transit concerns. Finally, I-85 has one of the highest truck rates in the country. Each of the alternates considered in this document will be examined according to how well it will resolve these problems.

### **Long -range Transportation Plan**

The MIS for I-85 was conducted as part of the Transportation Plan update rather than as a separate document. The Thoroughfare Plan is shown in Figure 2. Both must meet the requirements of ISTEA, the CAA, and NEPA. Alternative mode solutions and financial resources must be considered in both. Also, doing both studies together would save on costs, manpower, and other resources. The long-range plan update included some environmental screening, accident history and safety investigation, air quality analysis, freight movement analysis, and extensive public involvement.

These investigations were also used for the MIS. The public involvement included a Goals and Objectives Survey, many public meetings, and presentations to local policy boards. The G&O survey was designed to focus on several areas. The five-page survey included questions on transit, congestion areas, financing, and where their money should be spent. Also included was a list of 41 social and environmental questions to find out the respondents' opinions on light rail, parking, air pollution, greenways, signal timing, greenways, and industrial access. A more detailed description can be found in Appendix E of the 1997 Cabarrus-South Rowan Thoroughfare Plan Report.

### **Alternate Strategies Considered in the MIS**

Each of the following six strategies were examined, either in the planning study or in the MIS document, to see if they met the purpose and need of the project.

1. Do Nothing--This approach would prevent destruction of the surrounding environment due to construction of any new facilities and the outlay of funds for vans or buses. The traffic volumes on I-85 near the planning area, though, have been growing at a rate of 5.5% per year. If no improvements, other than what was already scheduled in the 1995 State Transportation Improvement Program, are made traffic volumes on I-85 could reach as high as 107,400 VPD by the year 2020.
2. Transportation Demand Management--In the past there have been few attempts in the region at Transportation Demand Management oriented toward reducing the number of trips or number of vehicles on the roadways by encouraging other types of transportation service. There is no existing general public transportation system in the Cabarrus-South Rowan urban area, therefore, major transit alternatives within the area were not considered as a reasonable strategy to the present transportation problems of I-85. A travel market analysis for the whole

I-85 corridor indicated that initiating alternate modes of transportation would not be a viable option due to the high level of through travel, but that the Cabarrus-South Rowan MPO should consider carpool/vanpool commuter programs in the transit study scheduled to begin in FY 1997. Although there are several paratransit programs centered in the City of Charlotte and Mecklenburg County, southwest of the Cabarrus-South Rowan area, as of late 1996 only a few vanpools were making regular trips as far away as the Cabarrus-South Rowan urban area. Cabarrus County does have a local van service for the elderly and handicapped and others without access to transportation, but that does not reduce the number of vehicles on I-85. The major employers in the planning area like Philip-Morris and Fieldcrest Cannon Mills already have their employees on shift time. *(In 1998 a transit study for the Cabarrus-South Rowan Area was begun in conjunction with one in Mecklenburg County).*

3. High Occupancy Vehicle Lanes--An investigation into the viability of HOV lanes for I-85 through the planning area shows that an insufficient number of vehicles will be removed from the traffic stream to warrant separate travel lanes. For example:

- If the above-mentioned 97,200 future vehicles per day and a 10 percent peak hour percentage factor were used to determine the viability of HOV lanes there would be a possible 9,720 vehicles on the highway during each peak hour. The majority of the HOV users would be on the highway during the peak hour. In Appendix D of the 1996 Cabarrus- South Rowan Transportation Plan Report the average AM Peak Hour VOR for the area is 1.17 and the average PM Peak VOR is 1.66 persons per vehicle. This would make 11372 persons during the AM Peak and 16135 persons during the PM Peak hour. Adding these gives 27507 persons making trips during the peak hours of the day. An October 1987 HOV lane study by the Metropolitan Transit Authority of Harris County, Texas stated that two successful HOV programs, the Shirley Highway Expressway in Washington D.C. and the El Monte Busway in Los Angeles, move at least 30 percent of the total person-trip movement on the freeway from the mainline freeway lanes to the HOV lane. Therefore, there would be a possible 3412 and 4841 persons, respectively, transferred to the HOV lanes during the peak hours in this analysis. To determine the number of vehicles removed, each peak hour should be divided by the respective VOR. These two numbers can be added together to give the total number of vehicles, 5833, moved from the total ADT into the HOV lanes. If that number were subtracted from the ADT there would still be 91,367 vehicles in the original four freeway travel lanes.

4. New Facilities - The Cabarrus-South Rowan Area is developing rapidly. Both residential and commercial development are consuming available land. There is floodplain both east and west of the present I-85 location and the surrounding urban area. The Westside Bypass, Transportation Improvement Projects R-2246 and U-2009, and its extension northward already appear on the adopted Transportation Plan.

5. Supplementary facilities--There are several smaller projects currently in the North Carolina

Transportation Improvement Program and on the 1996 mutually adopted Cabarrus-South Rowan Transportation Plan. Project I-2511 widens I-85 to an eight-lane cross section from Exit 68 to Exit 81 through Rowan County north of the Cabarrus-South Rowan Area with construction to begin in FY1997. The project I-301 widened I-85 to eight lanes through Charlotte as far north as the NC 49 Connector with construction completed in FY1996. Project R-2315 is a new facility just north of the Mecklenburg County line called Kings Grant/Speedway Boulevard with a new interchange on I-85 to be completed in FY1997. Projects R-2246 and U-2009, the Westside Bypass, have an interchange on I-85 with construction to begin in FY2002. Also on the Transportation Plan, an interchange is proposed between I-85 and Old Beattys Ford Road. There are potentially nine interchanges in the eighteen mile (30 kilometer) stretch of I-85 through the area. I-85 through the Cabarrus-South Rowan Area is currently only a four-lane freeway cross section. Even with these existing and proposed projects, though, the congestion problems on I-85 will not be completely solved.

6. Widening--The data from the 1996 long-range transportation planning study model showed that I-85 will experience congestion by the design year 2020 and carry approximately 97,200 VPD. This is much higher than the 60,000 VPD capacity recommended for the design of a four-lane freeway facility from the 1994 Highway Capacity Manual. It is also higher than the suggested 80,000 VPD for a six-lane freeway facility.

## **Environmental Considerations**

To minimize any environmental effects of this project on the surrounding land it is suggested that any work on I-85 take place within the existing 300 feet (91.5 m) of right-of-way. The general environmental consequences of these alternate strategies were considered during the transportation planning study, but more precise environmental effects of the project will be evaluated during the completion of the planning document once the project is programmed in the local and State Transportation Improvement Programs.

## **Conclusions**

After considering all the above alternatives it was determined that widening the facility to eight lanes would be the best course of action because:

1. If nothing is done, the anticipated traffic will overburden the existing facility and increase congestion and reduce safety on the facility.
2. The majority of the present travel on this facility is through traffic. A high percentage is also truck traffic. Neither of these travel types are conducive to travel management within the planning area. There is no existing bus system, no previous need for one and according to the comments from the goals and objectives survey there is little interest for one at this time.
3. From the cursory analysis for high occupancy lanes there would not be enough vehicles or riders transferred out of the main traffic stream to warrant the addition of the designated extra

lanes.

4. As part of the alternatives analysis of the long-range study it was determined that no new highway-type facilities can be accommodated along the existing I-85 corridor through the urbanized area. There would be extensive environmental and socio-economic damage to the area if a major new facility with a wide right-of-way is introduced.
5. The existing Interstate projects on either end of the subject section will cause a bottle-neck effect through the area decreasing travel safety and increasing congestion. The new interchanges will increase the number of weaving sections through the area also reducing safety along the four-lane section. The other projects will not significantly decrease the volume of traffic on the interstate through the area.
6. The approximate 97,200 VPD is higher than both the four- lane and six-lane recommended capacities in the Highway Capacity Manual.

This document will serve as the Major Investment Study (MIS) for I-85 through the Cabarrus-South Rowan Area and identifies the reasonable alternatives and strategies studied for the I-85 corridor and reports on the alternative selected for the corridor. The selected alternative will be carried forward into the project development stage where a NEPA document will be prepared.

### **Coordination**

This document may be incorporated into the planning document for this project by the Planning and Environmental Branch of NCDOT. This MIS has been a cooperative effort between the Cabarrus-South Rowan Metropolitan Planning Organization (MPO), the North Carolina Department of Transportation's Divisions of Highways and Public Transportation and the Federal Highway Administration. The correspondence from the Cabarrus-South Rowan MPO and the NCDOT Public Transportation Division (Figure 3) are included.

What follows is an excerpt from the minutes of the January 15, 1997 meeting of the Cabarrus-South Rowan Metropolitan Planning Organization Transportation Advisory Committee at which the Major Investment Study for I-85 was approved:

*Dosse briefly defined the MIS and that one is conducted on all high-cost projects that are identified in the Thoroughfare Plan. She explained that the only project in the Cabarrus-South Rowan Urban Area is the improvement and widening of I-85. Her presentation was summarized in a handout that provided the definition, purpose and need, how it relates to the long-range transportation plan, and environmental considerations. Additionally, her materials included a discussion about alternative strategies for improvement that were considered as well as the final recommendations. In short, it was determined that widening the current facility from four to eight lanes, through the urban area, was the best course of action. This document will be included in the area transportation plan update technical report due this summer. Dosse explained that she is asking the TAC for*

*formal approval of the MIS and its findings. Geathers asked for clarification about what exactly, does the MIS satisfy? For example, compliance with CAAA, the Thoroughfare Plan, etc. Dosse responded that this study was a recent requirement and part of the Thoroughfare Plan. Discussion continued about the justification for the recommended widening of I-85 from four to eight lanes rather than to six. The primary reasons are that this would be consistent with the improvements to I-85 in Mecklenburg and Rowan Counties. Additionally, traffic volume forecasts justify the eight-lane expansion. Geathers asked for a motion to approve the MIS and its findings. Sloop moved with a second by Brown. The motion passed unanimously. Brown and Geathers asked for more information. Geathers was curious whether the I-85 project would proceed regardless of local support. Brown asked when we were going to get the funds to begin. Dosse said that this was up to the action of the BOT. Sloop discussed some of the plans for improvements to I-85 in Rowan County. Dosse further explained that the MIS will be reviewed by the Planning and Environmental Department but this first effort, hopefully, will save time in the required Environmental Review process all projects must pass through prior to design and construction. Rankin asked for clarification of the funding obligation for the Interstate project. Dosse agreed to confirm this information when she returned to Raleigh.*

# **GEOGRAPHIC LOCATION FOR THE CABARRUS /SOUTH ROWAN URBAN AREA OF NORTH CAROLINA**

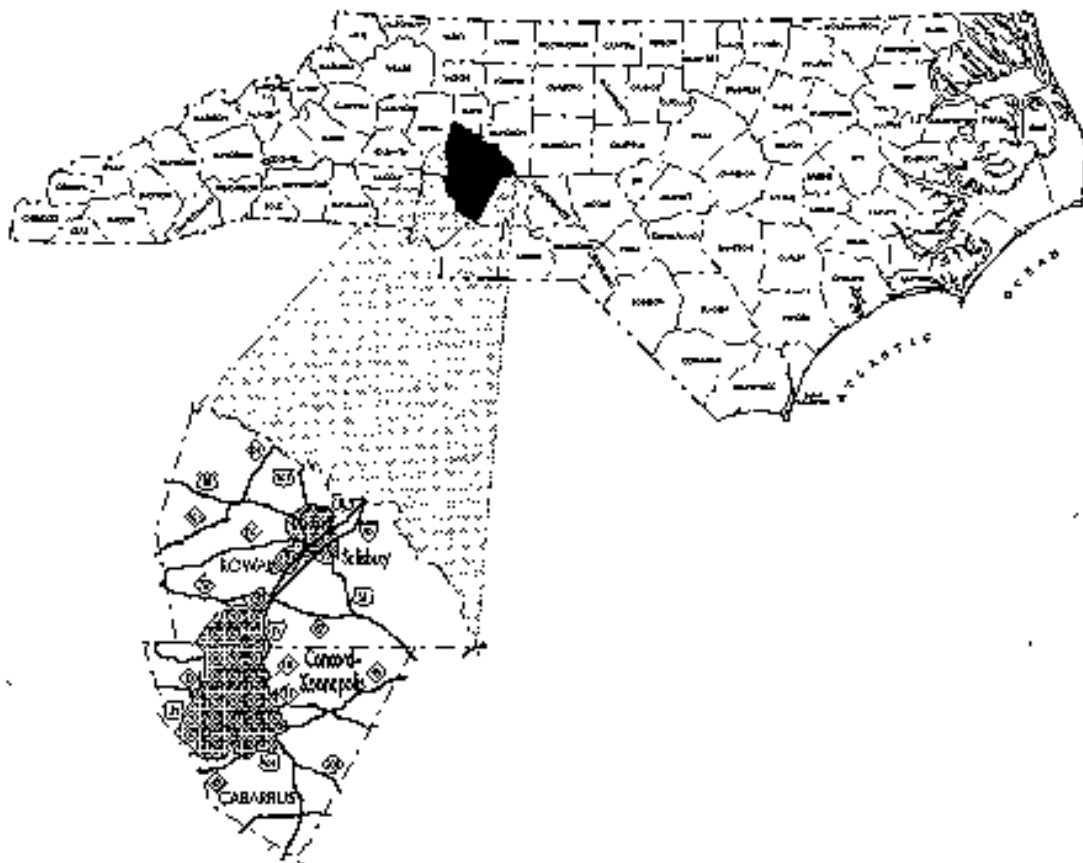


FIGURE 1



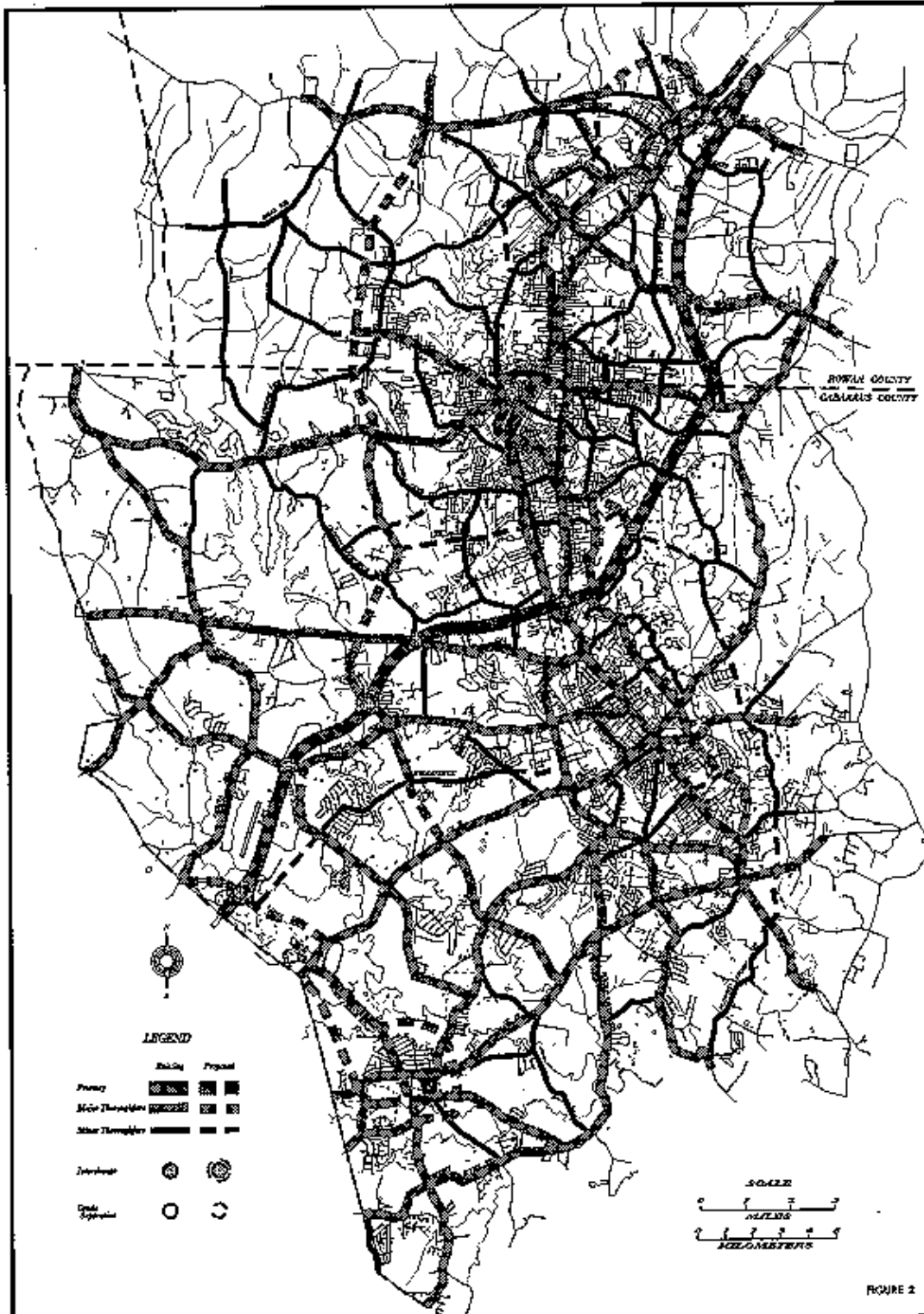


FIGURE 2

ADOPTED BY:  
 APOPKALEX \_\_\_\_\_ March 25, 1998  
 CROWFORD \_\_\_\_\_ March 25, 1998  
 CROWFORD \_\_\_\_\_ March 25, 1998  
 LAYTON \_\_\_\_\_ March 25, 1998  
 KANAWAY \_\_\_\_\_ March 25, 1998  
 CABARRUS COUNTY \_\_\_\_\_ March 19, 1998  
 ROWAN COUNTY \_\_\_\_\_ March 2, 1998

PREPARED BY:  
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Map No.  
 700-100

**THOROUGHFARE PLAN**

**CABARRUS - SOUTH ROWAN**

CABARRUS COUNTY  
 ROWAN COUNTY  
 NORTH CAROLINA

tplan.m(75.swp4) bob@swp4. Wed Jul 1 16:20:57 EDT 1998



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

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PUBLIC TRANSPORTATION DIVISION  
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GARLAND B. GARRETT JR.  
SECRETARY

October 14, 1996

MEMORANDUM

To: Ron Poole, Ph.D., P.E., Manager, Statewide Planning Branch

From: Sanford Cross, Director, Public Transportation Division *Sanford Cross*

Subject: Major Investment Study for I-85 Widening Project in the Kannapolis-Concord Urban Area

The Public Transportation Division has reviewed the above referenced study and has the following comments:

1) We recognize that this study is being conducted in the early stages of planning for facility improvements (in conjunction with the Thoroughfare Plan Update), therefore it is difficult to make final decisions on modal opportunities in the corridor. We will monitor the progress of the proposed project, and once it is scheduled in the North Carolina Transportation Improvement Program for a final environmental planning document, re-evaluate the need for alternative improvements.

2) We concur that the Kannapolis-Concord area needs to look at Transportation Demand Management measures on a regional basis, as well as in an effort to relieve congestion on the I-85 corridor. We also concur that, given the projected traffic volumes, TDM programs alone will not remove the need for improvements to the corridor.

3) We would like to address the High Occupancy Vehicle issue again once the final environmental documentation is programmed. The methodology presented in the major investment study is somewhat simplistic in its effort to determine the future effectiveness of HOV on the I-85 corridor. The Division recognizes that we need to work with the Statewide Planning Branch in determining an appropriate methodology in evaluating the effectiveness of HOV facilities. The Urban Section will undertake this activity so that we can have an agreement on a better methodology for future studies.

Given these findings, the Public Transportation Division believes that the subject study has sufficiently investigated alternative transportation modes for the future I-85 widening



1-85 MIS  
10/14/96

project as proposed in the Kannapolis-Concord Urban Area Thoroughfare Plan. We will retain the opportunity to re-evaluate the High Occupancy Vehicle (HOV) alternative once the final environmental planning document is prepared for the project. There is the potential for changes in travel behavior, traffic projections, and project restrictions that may require such an effort at that time.

Thank you for the opportunity to work with your staff and to comment on this study. We look forward to working on all of the major investment studies listed in your program of work in the future.

If you have any questions, please contact Carol Carter, Urban Section Manager, at 731-4713, extension 226.

CC: Linda Dosse, SWP  
Sarah LaBelle, Kanlacon