(105)

Biological Conclusion: **No Effect**

Suitable habitat for the dwarf wedge mussel may exist in the project study area. On June 30, 200, NCDOT biologists Susan Brady and Lynn Smith performed a survey for mussel fauna in the streams affected by the proposed project. No mussels were found during this survey. These streams appear to be heavily impacted by development, showing evidence of siltation, channelization, and erosion, and do not contain habitat suitable for mussels. A review of NHP database of rare species and unique habitats revealed no known populations of dwarf wedge mussels within 1.0 mile (1.6 kilometers) of the project study area.

Echinacea laevigata (smooth coneflower)
Plant Family: Asteraceae
Federally Listed: December 9, 1991 PE
Flowers Present: June - early July

Smooth coneflower is a perennial herb that grows from simple or branched rhizomes. This herb has a smooth stem and few leaves. The basal leaves are the largest, and these leaves are smooth to slightly rough, tapered to the base and elliptical to broadly lanceolate. Mid-stem leaves have short or no petioles and are smaller than the basal leaves. Flowers are light pink to purplish in color and solitary. The petal-like rays usually droop. Fruits are gray-brown, oblong-prismatic and four-angled.

Habitat for the smooth coneflower is found in areas of meadows, open woodlands, glades, cedar barrens, roadsides, power line rights-of-way, clearcuts, and dry limestone bluffs. Plants usually grow in soil derived from calcareous parent material. North Carolina populations are found in soils derived from Diabase, a circumneutral igneous rock. Optimal sites are in areas with abundant sunlight and little competition from other herbaceous plants.

Biological Conclusion: **No Effect**

Suitable habitat for smooth coneflower does exist in the project area (i.e. roadside shoulder and power line easement). A plant-by-plant survey for smooth coneflower was conducted during the site visits on June 29 and June 30, 1999. A known population was visited before the survey was conducted. A review of the NHP rare and unique habitat database did not reveal the presence of this plant within 1.0 mile (1.6 kilometers) of the project study area. Impacts to this species will not occur from project construction.

Isotria medeoloides (small whorled pogonia)
Plant Family: Orchidaceae
Federally Listed: 10 September, 1982
Flowers Present: mid May-mid June

Small whorled pogonia is a perennial orchid having long pubescent roots and a hollow stem. Stems terminate in a whorl of five or six light green, elliptical leaves that are somewhat pointed. One or two light green flowers are produced at the end of the stem. Flowers of small-whorled pogonia have short sepals.

The small whorled pogonia grows in "second growth deciduous" or deciduous-coniferous forests, with an open canopy, open shrub layer, and sparse herb layer. It prefers acidic soils. Flowering is inhibited in areas where there is relatively high shrub coverage or high sapling density.

Biological Conclusion: **No Effect**

Habitat for small-whorled pogonia does exist in the project study area, specifically within the successional mixed hardwood forest. A plant-by-plant survey for this species was conducted on June 29 and June 30, 1999. No populations of this species were observed during the site visit. A review of the NHP rare species and unique habitat database did not reveal any populations of small-whorled pogonia within 1.0 mile (1.6 kilometers) of the project study area. Impacts to this species will not occur from project construction.

Rhus michauxii (Michaux's sumac)
Plant Family: Anacardiaceae
Federally Listed: 28 September 1989
Flowers Present: June

Michaux's sumac is a densely pubescent rhizomatous shrub. The bases of the leaflets are rounded and their edges are simply or doubly serrate. The flowers of Michaux's sumac are greenish to white in color. Fruits, which develop from August to September on female plants, are a red densely short-pubescent drupe.

This plant occurs in rocky or sandy open woods as well as areas that are artificially disturbed including highway and railroad right-of-ways, edges of cultivated fields, and other cleared land. Michaux's sumac is dependent on some sort of disturbance to maintain the openness of its habitat. It usually grows in association with basic soils and occurs on sand or sandy loams. Michaux's sumac grows only in open habitat where it can get full sunlight. Michaux's sumac does not compete well with other species, such as Japanese honeysuckle, with which it is often associated.

Biological Conclusion: **No Effect**

Suitable habitat for Michaux's sumac is present along the irregularly maintained roadside shoulder, powerline corridor and forest/maintained ecotone. A known population was visited before the site visit. A plant-by-plant survey was conducted during the site visits on June 29 and June 30, 1999. No populations of Michaux's sumac were observed during the site visit. A review of the NHP rare species and unique habitat database did not reveal

the presence of Michaux's sumac within 1.0 mile (1.6 kilometers) of the project area. Impacts to Michaux's sumac will not occur from project construction.

2. Federal Species of Concern and State Listed Species

Federal Species of Concern (FSC) are those plant and animal species which may or may not be listed in the future. Eleven FSC are listed for Orange County (Table 14).

Threatened (T) are native or once-native species of wild plant or animal which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. An Endangered (E) species is any native species or once-native species of fauna or flora whose continued existence as a viable component of the State's flora or fauna is determined to be in jeopardy. Significantly rare (SR) species are very rare in North Carolina, generally with 1-20 populations in the state. Special Concern (SC) species require monitoring but which may be collected and sold under regulations adopted under provisions of the Plant Protection and Conservation Act. (P_) are species that have been proposed by a Scientific Council as a status that is different from the current status, but the status has not yet been adopted by the WRC and the General Assembly as law. Candidate (C) species are very rare in North Carolina, with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction. Watch Category 2 (W2) includes species with questionable taxonomy, including taxa of dubious validity and taxa under study and potentially to be named. Watch Category 5 (W5) includes species includes species which have declined sharply in North Carolina, but which do not appear yet to warrant site-specific monitoring.

TABLE 14. Federal Species of Concern for Orange County

Common Name	Scientific Name	NC Status	Habitat
Carolina darter	*Etheostoma collis lepidinion*	SC	Yes
Carolina redhorse	*Moxostoma* sp.	SR	Yes
brook floater	*Alsmidonta varicosa*	T (PE)	Yes
Carolina well diacyclops	*Diacyclops jeanneli putei*	SR (PSC)	No
Atlantic pigtoe	*Fusconaia masoni*	T (PE)	Yes
yellow lampmussel	*Lampsilis cariosa*	T (PE)	Yes
green floater	*Lasmigona subvirdis*	E	Yes
Savanna lilliput	*Toxolasma pullus*	T (PE)	Yes
Butternut	*Juglans cinerea*	W5	No
sweet pinesap	*Monotropsis odorata*	C	Yes
a liverwort	*Plagiochila columbiana*	W2	Yes

FSC species are not afforded federal protection under the ESA and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. Organisms which are listed as Endangered (E), Threatened (T) or Special Concern (SC) by the NHP list of Rare Plant and Animal species are afforded state protection under the State ESA and the North Carolina Plant Protection and Conservation Act of 1979; however, the level of protection given to state listed species does not apply to NCDOT activities.

A review of the NHP database of rare species and unique habitats did not reveal the presence of these species or unique habitats in or near the project study area. Surveys for the above-mentioned species were not conducted during the site visit, nor were these species observed during the site visit.

6. Flood Hazard Evaluation

There are no major stream crossings involved in this project. The terrain in the vicinity of the project is rolling with natural draws located such that the project can be drained without difficulty. The project is not within a water supply watershed area or a high quality water zone, therefore, erosion and sedimentation will be controlled throughout the appropriate specification, installation, and maintenance of standard erosion and sedimentation control measures. The project will not impact any wetlands. Existing drainage patterns will be maintained to the extent practicable and groundwater resources should not be affected by the proposed widening. Both Chapel Hill and Orange County currently participant in the National Flood Insurance Regular Program. This project does not cross any identified flood hazard areas. The proposed roadway widening will not have any significant adverse effect on existing floodplains or floodways.

7. Air Quality Analysis

Air pollution originates from various sources. Emissions from industry and internal combustion engines are the most prevalent sources. The impact resulting from highway construction ranges from intensifying existing air pollution problems to improving the ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility.

Federal standards, known as National Ambient Air Quality Standards (NAAQS), are required to set levels that protect human health. There are currently NAAQS for six pollutants and they are carbon monoxide (CO), nitrogen oxide (NO_2), ozone (O_3), lead (Pb), particulate matter (PM), and sulfur dioxide (SO_2). The main pollutants that are significant from transportation sources are carbon monoxide, ozone, and particulate matter.

Automobiles are considered to be the major source of CO in the project area and can be analyzed with a project level analysis. For these reasons, most of the analysis presented herein is concerned with determining expected carbon monoxide levels in the vicinity of the project due to traffic flow.

In order to determine the ambient CO concentration at a receptor near a highway, two concentration components must be used: local and background. The local concentration is defined as the CO emissions from cars operating on highways in the near vicinity (i.e., distances within 325 feet (100 meters)) of the receptor location. The background concentration is defined as "the concentration of a pollutant at a point that is the result of emissions outside the local vicinity; that is, the concentration at the upwind edge of the local sources."

In this study, the local concentration was determined by the NCDOT Traffic Noise/Air Quality Staff using line source computer modeling and the background component was obtained from the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Air Quality. Once the two concentration components were ascertained, they were added together to determine the ambient CO concentration for the area in question and to compare to the National Ambient Air Quality Standards (NAAQS).

Automobiles are regarded as sources of hydrocarbons (HC) and nitrogen oxides (NO_2). Hydrocarbons and nitrogen oxides emitted from cars are carried into the atmosphere where they react with sunlight to form ozone and nitrogen dioxide. Automotive emissions of HC and NO_2 are expected to decrease in the future due to the continued installation and maintenance of pollution control devices on new cars. However, regarding area-wide emissions, these technological improvements maybe offset by the increasing number of cars on the transportation facilities of the area.

The photochemical reactions that form ozone and nitrogen dioxide require several hours to occur. For this reason, the peak levels of ozone generally take place 6 to 12 miles (10 to 20 kilometers) downwind of the source of hydrocarbon emissions. Urban areas as a whole, not individual streets and highways, are regarded as sources of hydrocarbons and are analyzed using an area-wide analysis. The emissions of all sources in an urban area mix together in the atmosphere, and in the presence of sunlight, the mixture reacts to form ozone, nitrogen dioxide, and other photochemical oxidants. The best example of this type of air pollution is the smog that forms in Los Angeles, California.

Particulate matter (PM) is the general term used for a mixture of solid particles and liquid droplets found in air. Some particles are large or dark enough to be seen as soot or smoke, while others are so small that they can be detected only with an electron microscope. Fine particulate matter (PM-2.5 define particles that are less than 2.5 micrometers in diameter) result from fuel combustion from motor vehicles, power generation, and industrial facilities, as well as from residential fireplaces and wood stoves. Coarse particulate matter (PM-10 define particles that are less than 10 micrometers in diameter) based on estimates of

anthropogenic emissions includes fuel combustion, industrial processes, and transportation sources. Transportation sources account for only 6 percent of the total PM-10 emissions nationwide. The PM standard is under review and may be changed in the future to account for fine particular matter and the effects on human health. The NCDOT Standard Specification for Roads and Structures requires contractors to control dust and other particulate matter at all areas utilized during construction, including unpaved roads, haul roads, and borrow and disposal sites.

Lead (Pb) and sulfur dioxide (SO_2) emissions are predominantly the result of non-highway sources (e.g., industrial, commercial, and agricultural). Because emissions of lead and sulfur dioxide from automobiles are very low, there is no reason to suspect that traffic on the project will cause air quality standards for lead and sulfur dioxide to exceed the NAAQS.

A microscale air quality analysis was performed to determine future CO concentrations resulting from the proposed highway improvements. "CAL3QHC - A Modeling Methodology For Predicting Pollutant Concentrations Near Roadway Intersections" was used to predict the CO concentration near sensitive receptors.

Inputs into the mathematical model used to estimate hourly CO concentrations consisted of a level roadway under normal conditions with predicted traffic volumes, vehicle emission factors, and worst-case meteorological parameters. The traffic volumes are based on the annual average daily traffic projections. Carbon monoxide vehicle emission factors were calculated for the year of 2005 for the Design Year of 2025 using the EPA publication "Mobile Source Emission Factors" and the MOBILE5A mobile source emissions computer model.

The background CO concentration for the project area was estimated to be 1.8 parts per million (ppm). Consultation with the Air Quality Section, Division of Environmental Management (DEM), North Carolina Department of Environment, Health and Natural Resources indicated that an ambient CO concentration of 1.8 ppm is suitable for most suburban and rural areas.

The worst-case air quality scenario was determined to be located along the limits of the right-of-way at 50 feet (15 meters) from the centerline of the roadway. The predicted 1-hour average CO concentrations for the evaluation build years of 2005 and 2025 are 2.6 and 2.8 ppm, respectively.

Comparison of the predicted CO concentrations with the NAAQS (maximum permitted for 1-hour averaging period = 35 ppm; 8-hour averaging period = 9 ppm) indicates no violation of these standards. Since the results of the worst case 1-hour CO analysis for the build scenario is less than 9 ppm, it can be concluded that 8-hour CO level does not exceed the standard.

(III)

The project is located in Orange County, which has been determined to be in compliance with the National Ambient Air Quality Standards. 40 CFR part 51 and 93 is not applicable, because the proposed project is located in an attainment area. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

During construction of the proposed project, all materials resulting from clearing and grubbing, demolition or other operations will be removed from the project, burned or otherwise disposed of by the Contractor. Any burning done will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. Care will be taken to insure burning will be done at the greatest distance practical from dwellings and not when atmospheric conditions are such as to create a hazard to the public. Burning will be performed under constant surveillance. Also during construction, measures will be taken to reduce the dust generated by construction when the control of dust is necessary for the protection and comfort of motorists or area residents. This evaluation completes the assessment requirements for air quality of the 1990 Clean Air Act Amendments and the NEPA process, and no additional reports are necessary.

8. Highway Traffic Noise/Construction Noise Analysis

This analysis was performed to determine the effect of the proposed widening of Weaver Dairy Road (SR 1733) on noise levels in the immediate project area. The project begins at NC 86 and extends to Erwin Road (SR 1734) in Orange County (see Appendix A, Figure 1). This investigation includes an inventory of existing noise sensitive land uses and a field survey of ambient (existing) noise levels in the study area. It also includes a comparison of the predicted noise levels and the ambient noise levels to determine if traffic noise impacts can be expected resulting from the proposed project. Traffic noise impacts are determined from the current procedures for the abatement of highway traffic noise and construction noise, appearing as Part 772 of Title 23 of the Code of Federal Regulations. If traffic noise impacts are predicted, examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts must be considered.

a. Characteristics of Noise

Noise is basically defined as unwanted sound. It is emitted from many sources including airplanes, factories, railroads, power generation plants, and highway vehicles. Highway noise, or traffic noise, is usually a composite of noises from engine exhaust, drive train, and tire-roadway interaction.

The magnitude of noise is usually described by its sound pressure. Since the range of sound pressure varies greatly, a logarithmic scale is used to relate sound pressures some common reference level, usually the decibel (dB). Sound pressures described in decibels are called sound pressure levels and are often defined in terms of frequency weighted scales (A, B, C, or D).

The weighted-A decibel scale is used almost exclusively in vehicle noise measurements because it places more emphasis on the frequency range to which the human ear is most sensitive (1,000-6,000 Hertz). Sound levels measured using a weighted-A decibel scale are often expressed as dBA. Throughout this report, all noise levels will be expressed in dBA's. Several examples of noise pressure levels in dBA are listed in (see Appendix C. Table N1).

Review of Table N1 in Appendix C indicates that most individuals in urbanized areas are exposed to fairly high noise levels from many sources as they go about their daily activities. The degree of disturbance or annoyance of unwanted sound depends essentially on three things:

1) The amount and nature of the intruding noise.
2) The relationship between the background noise and the intruding noise.
3) The type of activity occurring when the noise is heard.

In considering the first of these three factors, it is important to note that individuals have different sensitivity to noise. Loud noises bother some more than others and some individuals become upset if an unwanted noise persists. The time patterns of noise also enter into an individual's judgement of whether or not a noise is offensive. For example, noises that occur during sleeping hours are usually considered to be more offensive than the same noises in the daytime.

With regard to the second factor, individuals tend to judge the annoyance of an unwanted noise in terms of its relationship to noise from other sources (background noise). The blowing of a car horn at night when background noise levels are approximately 45 dBA would generally be more objectionable than the blowing of a car horn in the afternoon when background noises might be 55 dBA.

The third factor is related to the interference of noise with activities of individuals. In a 60 dBA environment, normal conversation would be possible while sleep might be difficult. Work activities requiring high levels of concentration may be interrupted by loud noises while activities requiring manual effort may not be interrupted to the same degree over time, particularly if the noises occur at predicted intervals and are expected,

individuals tend to accept the noises that intrude into their lives. Attempts have been made to regulate many of these types of noises including airplane noise, factory noise, railroad noise, and highway traffic noise. In relation to highway traffic noise, methods of analysis and control have developed rapidly over the past few years.

b. Noise Abatement Criteria

In order to determine whether highway noise levels are or are not compatible with various land uses, the Federal Highway Administration (FHWA) has developed noise abatement criteria (NAC) and procedures to be used in the planning and design of highways. These abatement criteria and procedures are set forth in the aforementioned Federal reference (Title 23 CFR Part 772). A summary of the noise abatement criteria for various land uses is presented in (see Appendix C, Table N2). The Leq, or equivalent sound level, is the level of constant sound which in a given situation and time period has the same energy as does time varying sound. In other words, the fluctuating sound levels of traffic noise are represented in terms of a steady noise level with the same energy content.

c. Ambient Noise Levels

Ambient noise measurements were taken in the vicinity of the project to determine ambient (existing) noise levels for the identified land uses. The purpose of this noise level information was to quantify the existing acoustic environment and to provide a base for assessing the impact of noise level increases. The existing Leq noise level in the project area as measured at 50 feet (15 meters) from the nearest roadway range from 64.5 to 66.4 dBA. The ambient measurement location and measured exterior Leq noise levels are presented in Table N3 (see Appendix C) respectively.

The existing roadway and traffic conditions were used with the most current traffic noise prediction model in order to calculate the existing noise levels for comparison with the noise levels actually measured. The calculated existing noise levels were approximately 1 dBA higher than the measured noise levels for the locations where the noise measurements were obtained. Hence, the computer model is a reliable tool in the prediction of noise levels. The differences in the dBA level can be attributed to "bunching" of vehicles, low traffic volumes, and actual vehicle speeds versus the computer's "evenly-spaced" vehicles and single vehicular speed.

d. PROCEDURE FOR PREDICTING FUTURE NOISE LEVELS

In general, the traffic situation is composed of a large number of variables that describe different cars driving at different speeds through a continual changing highway configuration and surrounding terrain. Due to the complexity of the problem, certain assumptions and simplifications must be made to predict highway traffic noise.

The procedure used to predict future noise levels in this study was the Noise Barrier Cost Reduction Procedure, STAMINA 2.0 and OPTIMA (revised March, 1983). The BCR (Barrier Cost Reduction) procedure is based upon the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The BCR traffic noise prediction model uses the number and type of vehicles on the planned roadway, their speeds, the physical characteristics of the road (curves, hills, depressed, elevated, etc.), receptor location and height, and, if applicable, barrier type, barrier ground elevation, and barrier top elevation.

The project proposes widening of the existing 2-lane roadway to a multilane roadway. The cross-section recommended is a four-lane median divided curb and gutter facility along the project. Only those existing natural or man-made barriers were included in setting up the model. The roadway sections and proposed intersections were assumed to be flat and at-grade. Thus, this analysis represents the "worst-case" topographical conditions. The noise predictions made in this report are highway-related noise predictions for the traffic conditions during the year being analyzed.

Peak hour design and level-of-service (LOS) C volumes were compared, and the volumes resulting in the noisiest conditions were used with the proposed posted speed limits. Hence, during all other time periods, the noise levels will be no greater than those indicated in this report. The STAMINA 2.0 computer model was utilized in order to determine the number of land uses (by type) which would be impacted during the peak hour of the year 2025. A land use is considered to be impacted when exposed to noise levels approaching or exceeding the FHWA noise abatement criteria and/or predicted to sustain a substantial noise increase.

The Leq traffic noise exposures associated with this project are listed in Table N4 (see Appendix C). Information contained in these tables include all receptors located in the vicinity of the project, their ambient and predicted noise levels, and the estimated noise level increase for each.

e. Traffic Noise Impacts And Noise Contours

Traffic noise impacts occur when the predicted traffic noise levels either: [a] approach or exceed the FHWA noise abatement criteria (with "approach" meaning within 1 dBA of the Table N2 (see Appendix C) value), or [b] substantially exceed the existing noise levels. The NCDOT definition of substantial increase is shown in the lower portion of Table N2. Consideration for noise abatement measures must be given to receptors which fall in either category.

In accordance with NCDOT Traffic Noise Abatement Policy, the Federal/State governments are no longer responsible for providing noise abatement measures for new development which building permits are issued within the noise impact area of a proposed highway after the Date of Public Knowledge. The Date of Public Knowledge of the location of a proposed highway project will be the approval date of CEs, FONSIs, RODs, or the Design Public Hearing, whichever comes later. For development occurring after this public knowledge date, local governing bodies are responsible to insure that noise compatible designs are utilized along the proposed facility.

The maximum number of receptors in each activity category by section and alternative that are predicted to become impacted by future traffic noise is shown in Table N5 (see Appendix C). These are noted in terms if those receptors expected to experience traffic noise impacts either by approaching or exceeding the FHWA NAC or by a substantial increase in exterior noise levels. Under Title 23 CFR Part 772, there are 35 impacted residential receptors due to highway traffic noise in the project area. The maximum extent of the 72 and 67 dBA noise level contours are 50 and 100 feet (15 and 31 meters), from the center of the proposed roadway. This information should assist local authorities in exercising land use control over the remaining undeveloped lands adjacent to the roadway within local jurisdiction. For example, with the proper information on noise, the local authorities can prevent further development of incompatible activities and land uses with the predicted noise levels of an adjacent highway.

Table N6 (see Appendix C) indicates the exterior traffic noise level increases for the identified receptors in each roadway section. The predicted noise level increases for this project range from +3 to +16 dBA. When real-life noises are heard, it is barely possible to detect noise level changes of 2-3 dBA. A 5 dBA change is more readily noticeable. A 10 dBA change is judged by most people as a doubling or a halving of the loudness of the sound.

f. Traffic Noise Abatement Measures

If traffic noise impacts are predicted, examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts must be considered. Consideration for noise abatement measures must be given to all impacted receptors.

1. Highway Alignment

Highway alignment selection involves the horizontal or vertical orientation of the proposed improvements in such a way as to minimize impacts and costs. The selection of alternative alignments for noise abatement purposes must consider the balance between noise impacts and other engineering and environmental parameters. For noise abatement, horizontal alignment selection is primarily a matter of siting the roadway at a sufficient distance from noise sensitive areas. Changing the highway alignment is not a viable alternative for noise abatement.

2. Traffic System Management Measures

Traffic management measures which limit vehicle type, speed, volume, and time of operations are often effective noise abatement measures. For this project, traffic management measures are not considered appropriate for noise abatement due to their effect on the capacity and level-of-service on the proposed roadway.

3. Noise Barriers

Physical measures to abate anticipated traffic noise levels can often be applied with a measurable degree of success by the application of solid mass, attenuable measures to effectively diffract, absorb, and reflect highway traffic noise emissions. Solid mass, attenuable measures may include earth berms or artificial abatement walls.

For a noise barrier to provide sufficient noise reduction it must be high enough and long enough to shield the receptor from significant sections of the highway. Access openings in the barrier severely reduce the noise reduction provided by the barrier. It then becomes economically unreasonable to construct a barrier for a small noise reduction. Safety at access openings (driveways, crossing streets, etc.) due to restricted sight distance is also a concern. Furthermore, to provide a sufficient reduction, a barrier's length would normally be 8 times the distance from the barrier to the

receptor. For example, a receptor located 50 feet (15 meters) from the barrier would normally require a barrier 400 feet (120 meters) long. An access opening of 40 feet (12 meters) (10 percent of the area) would limit its noise reduction to approximately 4 dBA (FUNDAMENTAL AND ABATEMENT OF HIGHWAY TRAFFIC NOISE, Report No. FHWA-HHI-HEV-73-7976-1, USDOT, chapter 5, section 3.2, page 5-27).

In addition, businesses, churches, and other related establishments located along a particular highway normally require accessibility and high visibility. Solid mass, attenuable measures for traffic noise abatement would tend to disallow these two qualities, and thus, would not be acceptable abatement measures in this case.

g. "Do Nothing" Alternative

The traffic noise impacts for the "do nothing" or "No-Build" alternative were also considered. If the traffic currently using the network of roads in the project area should double, the future traffic noise levels would only increase approximately 2-3 dBA. This small increase to present noise levels would barely noticeable to the people working and living in the area.

h. Construction Noise

The major construction elements of this project are expected to be earth removal, hauling, grading, and paving. General construction noise impacts, such as temporary speech interference for passers-by and those individuals living or working near the project, can be expected particularly from paving operations and from the earth moving equipment during grading operations. However, considering the relatively short-term nature of construction noise and the limitation of construction to daytime hours, these impacts are not expected to be substantial. The transmission loss characteristics of nearby natural elements and man-made structures are believed to be sufficient to moderate the effects of intrusive construction noise.

i. Summary

Based on these preliminary studies, traffic noise abatement is not recommended, and no noise abatement measures are proposed. This evaluation completes the highway traffic noise requirements of Title 23 CFR Part 772, and unless a major project change develops, no additional noise reports will be submitted for this project.

9. Hazardous Materials

An investigation of the project area was conducted to determine if any hazards such as underground storage tanks (UST's), hazardous waste sites, regulated and unregulated dump sites that may impact construction of the project, cause delays, or create liabilities.

a. Underground Storage Tanks

As a result of this study, one facility with the potential for UST's was discovered in the project area. A description of the facility is as follows:

1. There are three UST's located at the Cedar Village Convenience Corner, 618 Weaver Dairy Road, Chapel Hill, NC 27514.

If acquisition of this property cannot be avoided, a preliminary site assessment will be performed prior to right-of-way acquisition.

b. Landfills

The Geographical Information Service (GIS) was consulted for the project corridor. The research shows that no regulated or unregulated landfills dumpsites or Superfund sites were identified within the project area.

10. Geodetic Markers

There are none located in the project area.

11. Construction Impacts

To minimize potential adverse effects caused by construction of the proposed project, the following measures, along with those already mentioned, will be enforced during the construction phase:

1. All possible measures will be taken to insure that the public's health and safety will not be compromised during the movement of any materials to and from construction sites along the project and that any inconveniences imposed on the public will be kept to a minimum.

2. Dust control will be exercised at all times to prevent endangering the safety and general welfare of the public and to prevent diminishing the value, utility, or appearance of any public or private properties.

3. The contractor shall be required to observe and comply with all laws, ordinances, regulations, orders and decrees, including those of the N.C.

State Board of Health, regarding the disposal of solid waste. All solid waste will be disposed of in accordance with the Standard Specifications of the Division of Highways. These specifications have been reviewed and approved by the Solid Waste Vector Control Section of the Division of Health Services, N.C. Department of Human Resources.

4. Waste and debris will be disposed of in areas outside of the right of way and provided by the contractor, unless otherwise required by the plans or special provisions or unless disposal within the right of way is permitted by the Engineer. Disposal of waste and debris in active public waste or disposal areas will not be permitted without prior approval by the Engineer. Such approval will not be permitted when, in the opinion of the Engineer, it will result in excessive siltation or pollution.

5. The construction of the project is not expected to cause any serious disruptions in service to any of the utilities serving the area. Before construction is started, a preconstruction conference involving the contractor, pertinent local officials and the Division of Highways will be held to discuss various construction procedures, including a discussion of precautionary steps to be taken during the time of construction that will minimize interruption of service.

6. Prior to construction, a determination will be made regarding the need to relocate or adjust any existing utilities in the project area. A determination of whether the NCDOT or the utility owner will be responsible for this work will be made at that time.

7. During construction of the proposed project, all materials resulting from clearing and grubbing, demolition, or other operations will be removed from the project, burned, or otherwise disposed of by the contractor. Any burning will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina State Implementation Plan for Air Quality. Care will be taken to insure burning will be done at the greatest distance practicable from dwellings and not when atmospheric conditions are such as to create a hazard to the public. Burning will be performed under constant surveillance.

8. The Contractor will be required to perform erosion control in accordance with the project erosion control plans, contract, standards, and/or Standard Specifications or as requested by the Resident Engineer. These contract documents are in accordance with the erosion control measures outlined in the Department of Transportation's FAPG 650 Subpart B. Temporary erosion control measures will be installed in accordance with the plans. Additional measures to control erosion throughout the project will be added as needed.

9. Prior to the approval of any borrow source developed for use on this project, the contractor shall obtain a certification from the state Department of Cultural Resources certifying that the removal of material from the borrow source will have no effect on any known district, site, building, structure, or object that is included or eligible for inclusion in the National Register of Historic Places. A copy of this certification shall be furnished to the Engineer prior to performing any work on the proposed borrow source.

10. Traffic service in the immediate project area may be subjected to brief disruption during construction of the project. Every effort will be made to insure that the transportation needs of the public will be met both during and after construction.

VI. COMMENTS AND COORDINATION

A. Comments Received

Input concerning the effects of the project on the environment was requested from appropriate federal, state, and local agencies. Listed below are the agencies that were contacted.

*U. S. Army Corps of Engineers
*U. S. Fish and Wildlife Service
*N. C. Department of Administration, N. C. State Clearinghouse
*N. C. Department of Cultural Resources
*N. C. Department of Environment, Health, and Natural Resources
Division of Water Quality
*N. C. DEHNR, Division of Forest Resources
*N. C. Wildlife Resources Commission
*Town of Chapel Hill
*Triangle J Council of Governments

*Denotes agencies from which input was received

B. Citizens Informational Workshop

A citizens informational workshop was held on April 28, 1999 in the Carol Woods Retirement Community Assembly Hall in Chapel Hill to inform citizens about the project and to receive comments and suggestions. Approximately ninety-one people attended the informal gathering in addition to representatives from NCDOT. There were many comments received on the different alignments presented. Many of the citizens favored the three-lane alternative, however there was also a significant number that favored the multi-

lane alternatives. NCDOT right of way and relocation agents addressed the concerns of several property owners regarding specific impacts to their properties. All of the comments from the workshop and subsequent meetings with the Town of Chapel Hill were considered when selecting the recommended alternative.

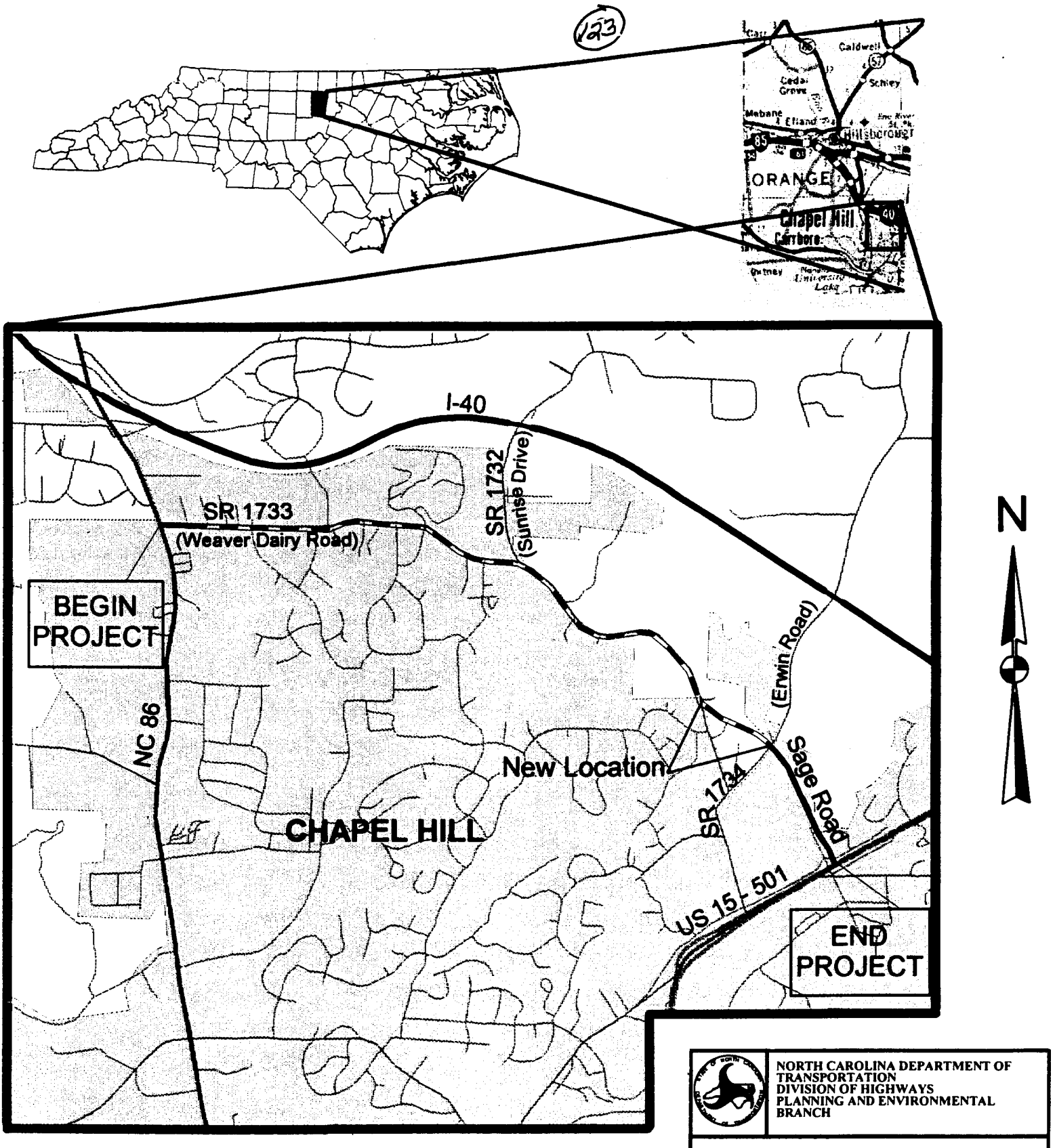
C. Public Hearing

A public hearing will be held for this project following the circulation of this document. The hearing will provide more detailed information to the public about the proposed improvements. The public will be invited to make additional comments or voice concerns regarding the proposed project.

(129)

APPENDIX A

FIGURES

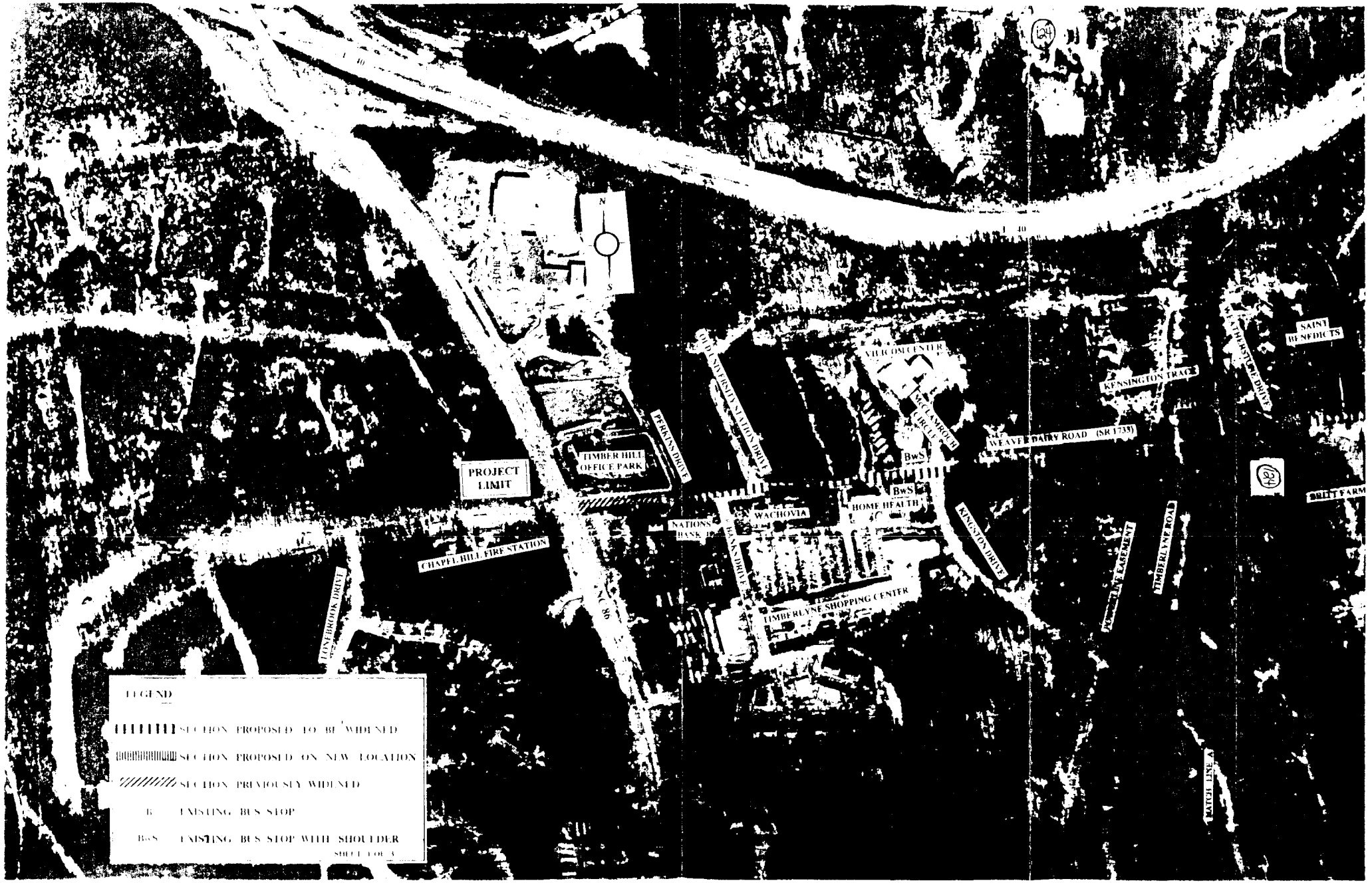


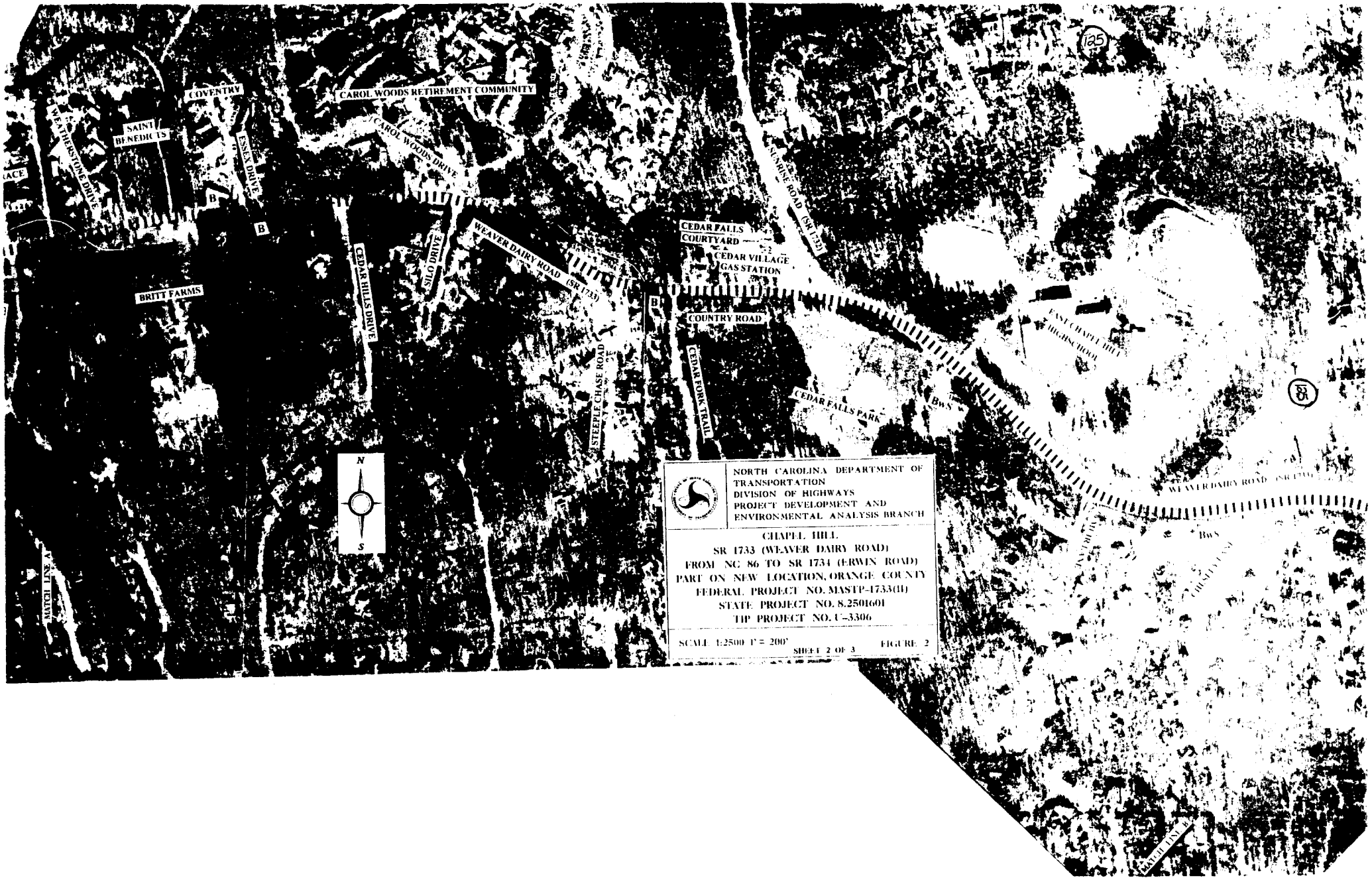
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND ENVIRONMENTAL BRANCH

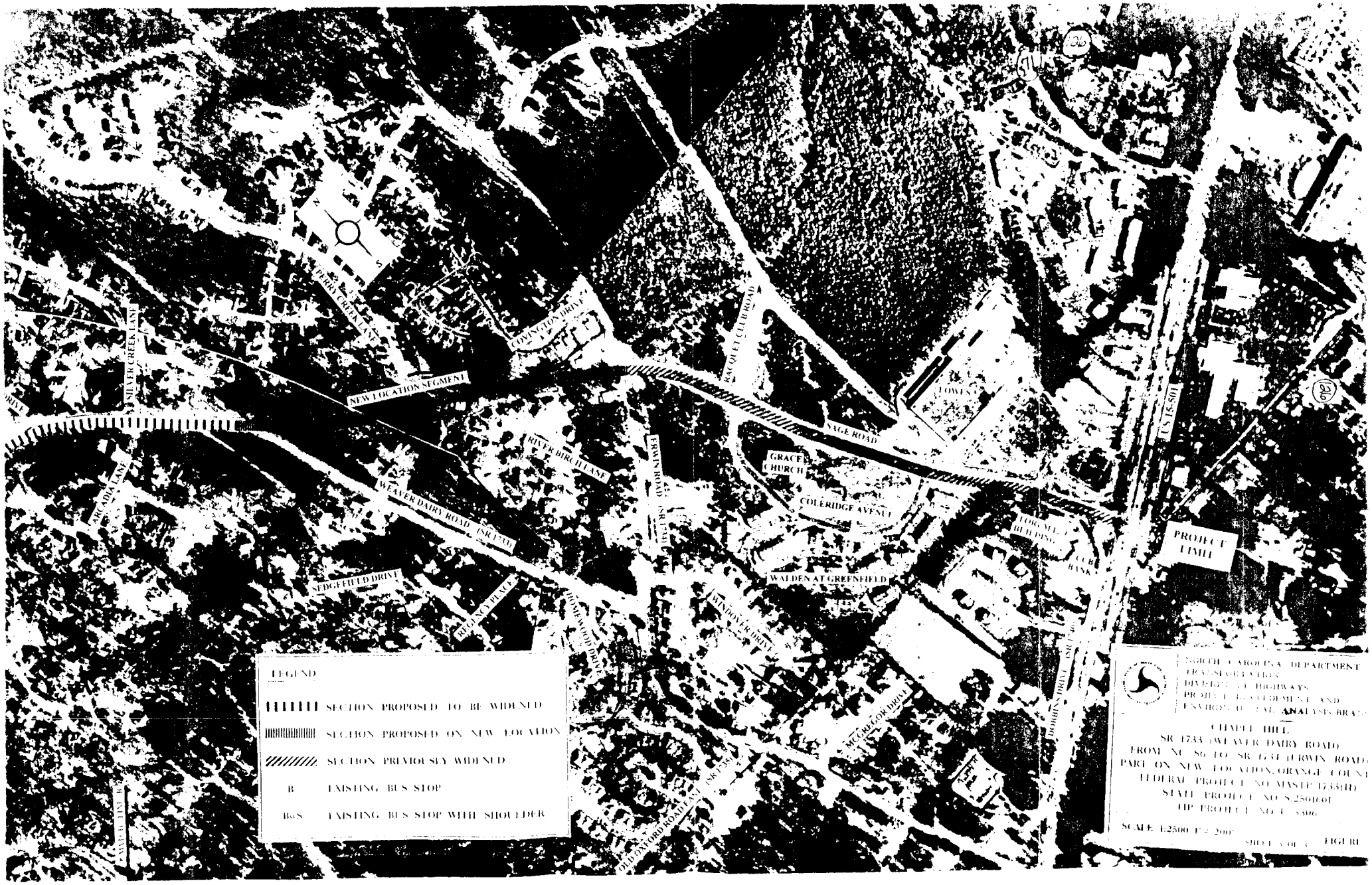
WIDEN SR 1733 (WEAVER DAIRY ROAD) FROM NC 86 TO SR 1734 (ERWIN ROAD). NEW LOCATION FROM SR 1734 TO SAGE ROAD AT SR 1734. WIDEN SAGE ROAD FROM SR 1734 TO US F15-501. QRANGE COUNTY, T.I.P. NO. U-3306

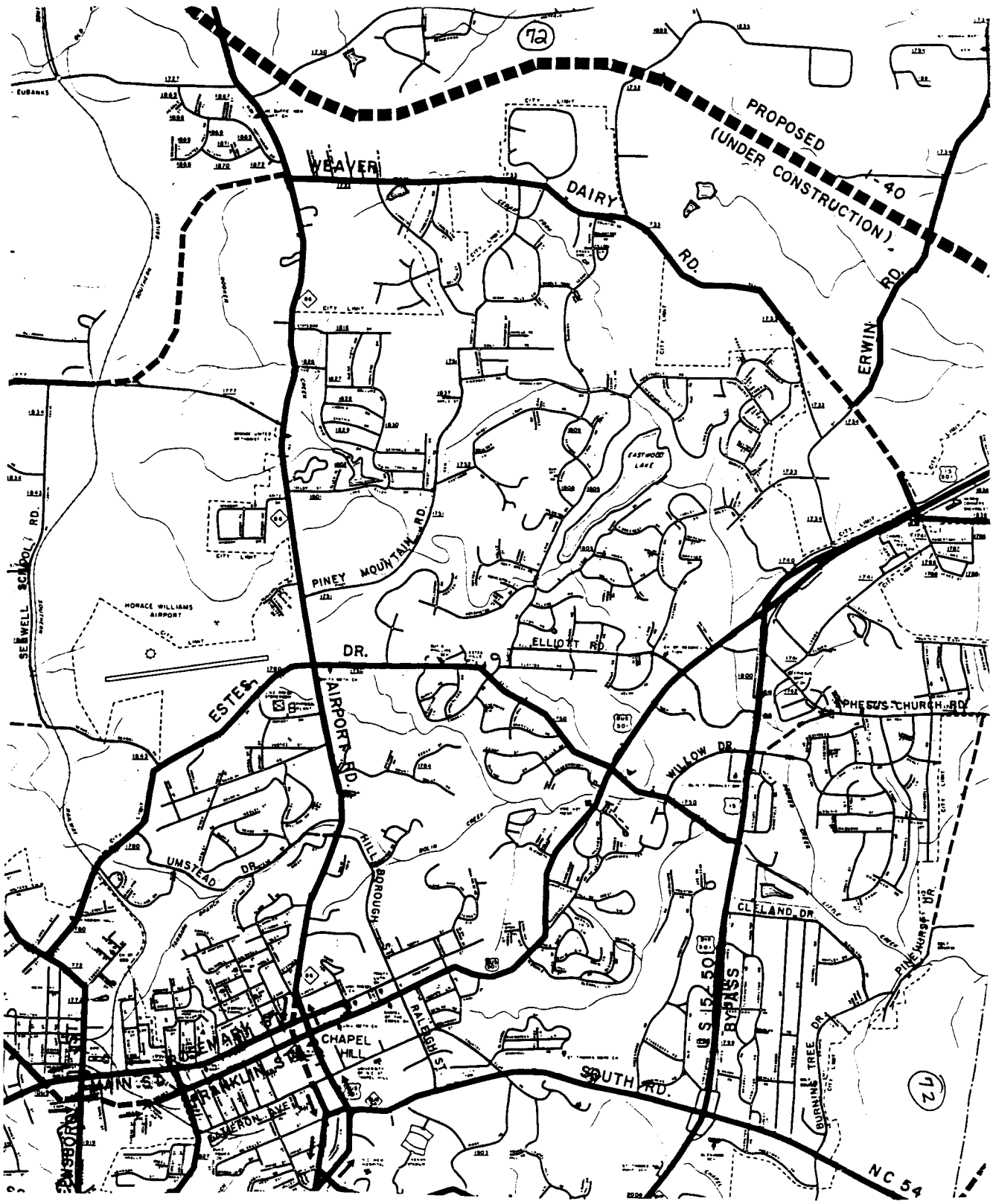
KILOMETERS 0 1
MILES 0 .5

FIGURE 1


PROJECT LIMIT
TIMBER HILL OFFICE PARK
FERRAN DRIVE
OLD NATIONAL FIRST NATIONS DRIVE
CHAPEL HILL FIRE STATION
LOVEBROOK DRIVE
NATIONS BANK
WACHOVIA
BANK DRIVE
HOME HEALTH
TIMBERLYNE SHOPPING CENTER
KINGSTON DRIVE
VILLAGE CENTER
MCCLAMROCH CIRCLE
WEAVER DAIRY ROAD (SR 1739)
KENSINGTON TRACE
WATERCRESS DRIVE
SAINT BENEDICTS
TIMBERLYNE ROAD
BRITT FARM
MATCH LINE A
BwS
N
S
LEGEND
SECTION PROPOSED TO BE WIDENED
SECTION PROPOSED ON NEW LOCATION
SECTION PREVIOUSLY WIDENED
B EXISTING BUS STOP
B=S EXISTING BUS STOP WITH SHOULDER
SHEET 1 OF 3


CAROL WOODS RETIREMENT COMMUNITY
COVENTRY
SAINT BENEDICTS
ESSEX DRIVE
CAROL WOODS DRIVE
CEDAR FALLS COURTYARD
CEDAR VILLAGE GAS STATION
SUNRISE ROAD (SR 1321)
BRITT FARMS
CEDAR HILLS DRIVE
SILO DRIVE
WEAVER DAIRY ROAD (SR 1733)
COUNTRY ROAD
STEEPLE CHASE ROAD
CEDAR FORK TRAIL
CEDAR FALLS PARK
EAST CHAPEL HILL HIGH SCHOOL
WEAVER DAIRY ROAD (SR 1733)
N
S
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH
CHAPEL HILL
SR 1733 (WEAVER DAIRY ROAD)
FROM NC 86 TO SR 1734 (ERWIN ROAD)
PART ON NEW LOCATION, ORANGE COUNTY
FEDERAL PROJECT NO. MASTP-1733(1)
STATE PROJECT NO. 8.2501601
TIP PROJECT NO. U-3306
SCALE 1:2500 1" = 200'
SHEET 2 OF 3
FIGURE 2


LEGEND
SECTION PROPOSED TO BE WIDENED
SECTION PROPOSED ON NEW LOCATION
SECTION PREVIOUSLY WIDENED
B EXISTING BUS STOP
B&S EXISTING BUS STOP WITH SHOULDER
NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS BRANCH
CHAPEL HILL
SR 1733 (WEAVER DAIRY ROAD)
FROM NC 86 TO SR 1734 (ERWIN ROAD)
PART ON NEW LOCATION, ORANGE COUNT
FEDERAL PROJECT NO. MASTP-1733(1)
STATE PROJECT NO. 9.2501601
TIP PROJECT NO. U-3306
SCALE: 1:2500 1" = 200'
SHEET 1 OF 1
FIGURE
NEW LOCATION SEGMENT
WEAVER DAIRY ROAD (SR 1733)
ERWIN ROAD (SR 1734)
NC 86
US 15-501
SAGE ROAD
COLERIDGE AVENUE
WALDEN AT GREENFIELD
PROJECT LIMIT
SILVER CREEK LANE
PERRY CREEK LANE
COVINGTON DRIVE
RACQUET CLUB ROAD
RIVER BIRCH LANE
ARCADIA LANE
EDGEFIELD DRIVE
REGENCY PLACE
HOMEWOOD DRIVE
WINDOVER DRIVE
OLD OXFORD ROAD
MCGREGOR DRIVE
DOBBS DRIVE



REVISIONS:

TOWN OF CHAPEL HILL	TOWN OF CARRBORO	STATEWIDE PLANNING BRANCH	N.C. DEPARTMENT OF TRANSPORTATION
8/11/83	4/5/83	7/21/84*	3/4/84

*NOTE: RECOMMENDED FOR DISAPPROVAL BY SWP. SEE LETTER DATED FEBRUARY 21, 1984

THOROUGHFARE PLAN

ADOPTED BY:	DATE:
TOWN OF CHAPEL HILL	- APRIL 24, 1984
TOWN OF CARRBORO	- JANUARY 31, 1984
N.C. BOARD OF TRANSPORTATION	- SEPTEMBER 10, 1984

TYPE OF FACILITY:

MAJOR THOROUGHFARE
- FREEWAY
- OTHER

MINOR THOROUGHFARE

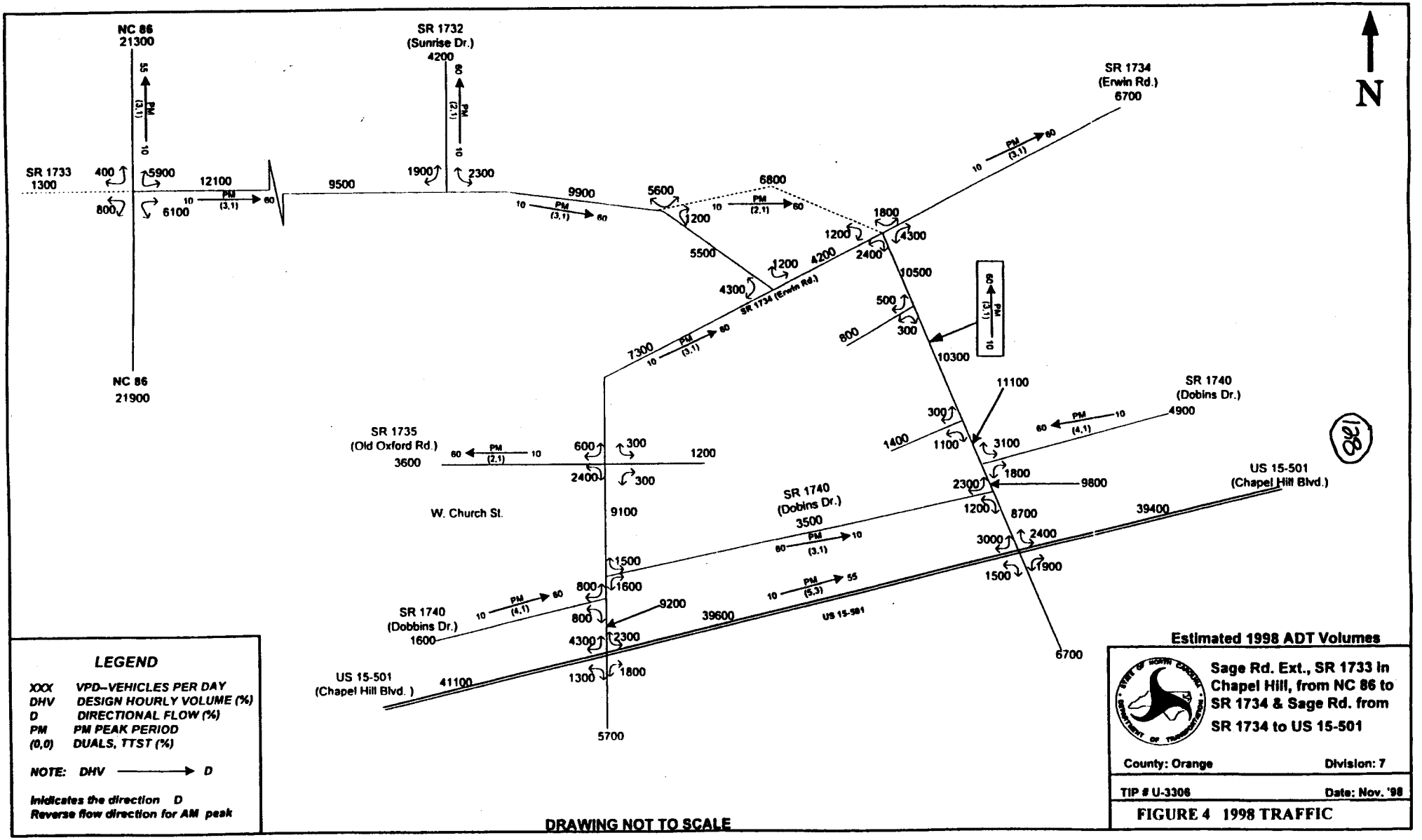
EXISTING PROPOSED

PROPOSED

CHAPEL HILL
CARRBORO
AND VICINITY
ORANGE, CHATHAM, & DURHAM COUNTIES
NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - PLANNING AND RESEARCH BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BASE MAP DATE - NOVEMBER, 1980

FIGURE 3 THOROUGHFARE PLAN



LEGEND

XXX	VPD--VEHICLES PER DAY
DHV	DESIGN HOURLY VOLUME (%)
D	DIRECTIONAL FLOW (%)
PM	PM PEAK PERIOD
(0,0)	DUALS, TTST (%)

NOTE: DHV ⟶ D

Indicates the direction D
Reverse flow direction for AM peak

DRAWING NOT TO SCALE

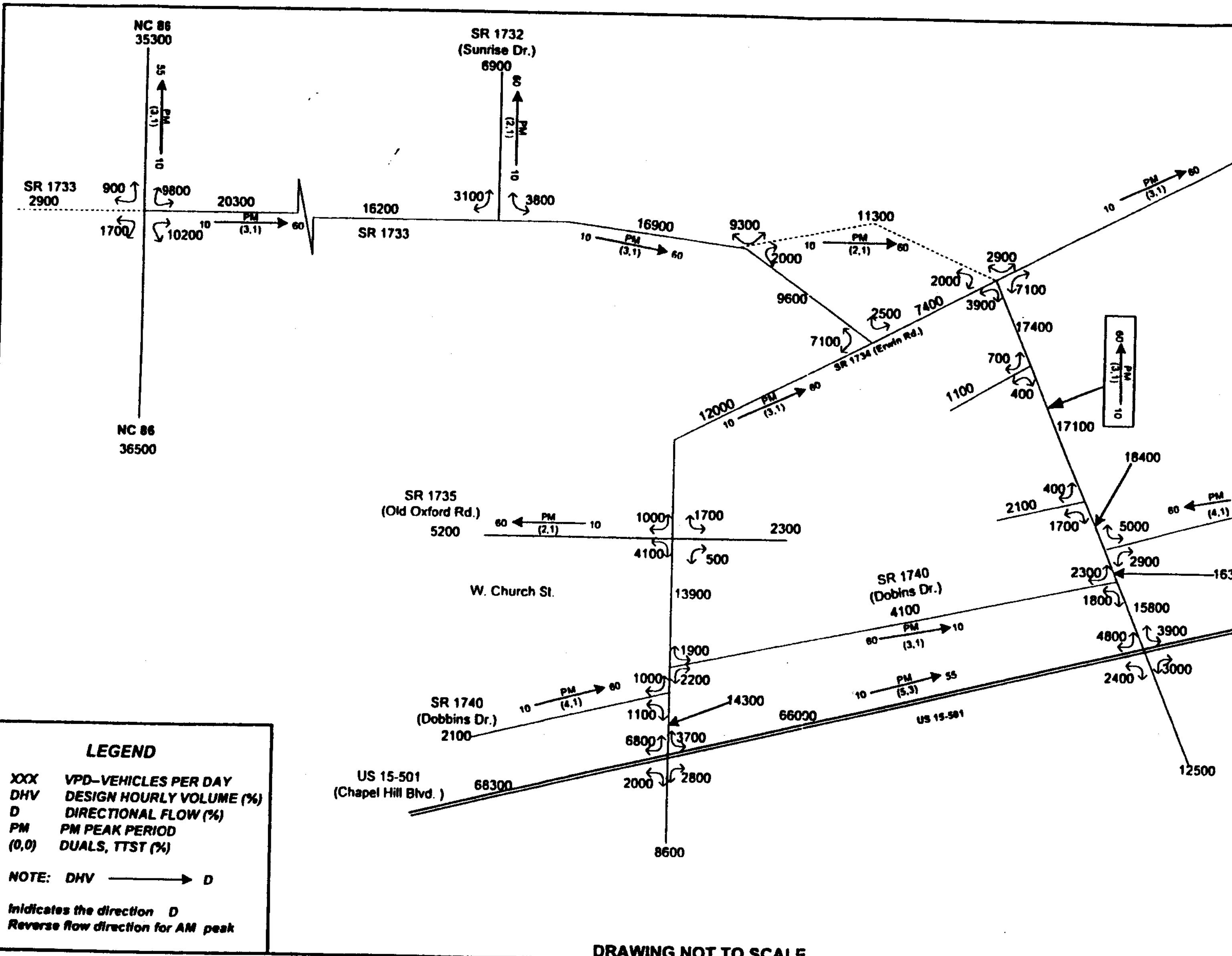
Estimated 1998 ADT Volumes

Sage Rd. Ext., SR 1733 in Chapel Hill, from NC 86 to SR 1734 & Sage Rd. from SR 1734 to US 15-501

County: Orange | Division: 7

TIP # U-3306 | Date: Nov. '98

FIGURE 4 1998 TRAFFIC



LEGEND

XXX *VPD–VEHICLES PER DAY*
DHV *DESIGN HOURLY VOLUME (%)*
D *DIRECTIONAL FLOW (%)*
PM *PM PEAK PERIOD*
(0,0) *DUALS, TTST (%)*

NOTE: DHV ——→ D

Indicates the direction D
Reverse flow direction for AM peak

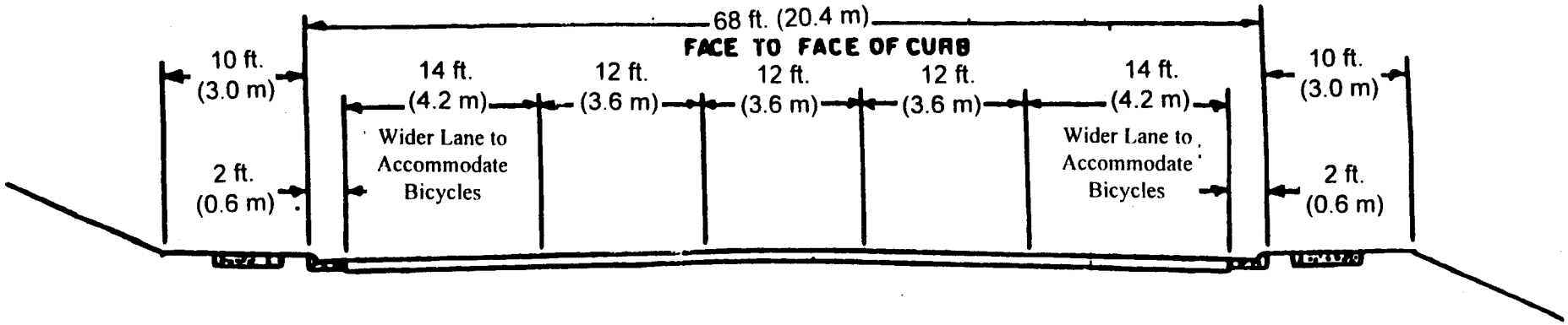
Estimated 2025 ADT Volumes

Sage Rd. Ext., SR 1733 in Chapel Hill, from NC 86 to SR 1734 & Sage Rd. from SR 1734 to US 15-501

County: Orange | Division: 7

TIP # U-3306 | Date: Nov. '98

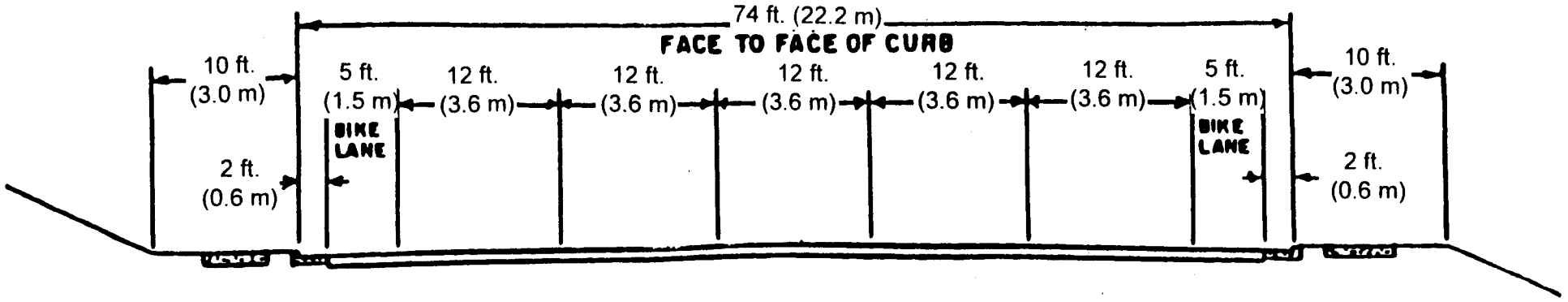
FIGURE 5 2025 TRAFFIC



FIVE LANES WITH CURB AND GUTTER

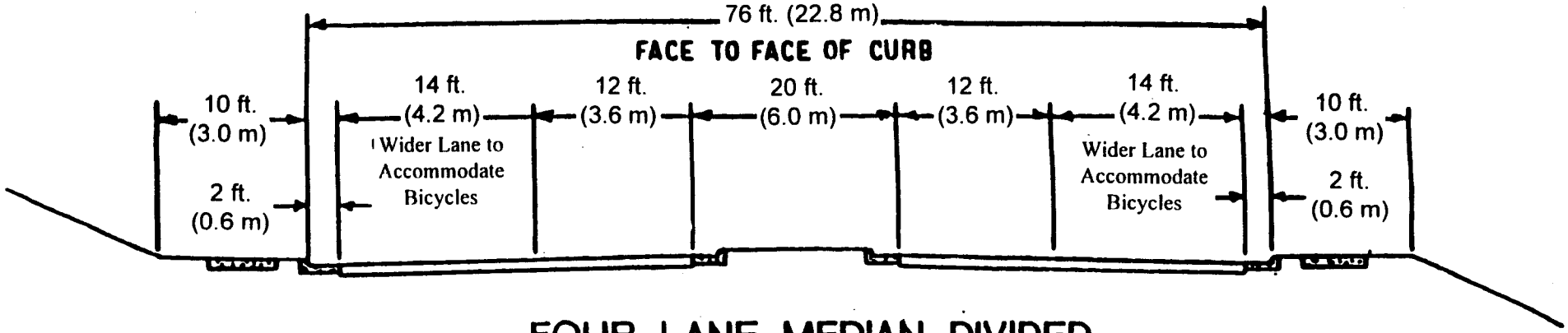
FIGURE 6 ALTERNATIVE 1

130



FIVE LANES WITH CURB AND GUTTER

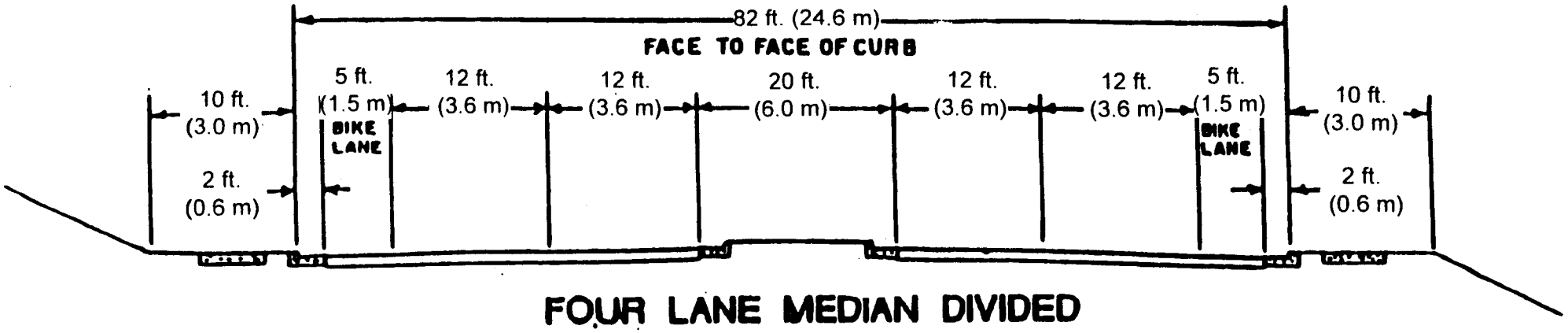
FIGURE 6-A ALTERNATIVE 1-A



FOUR LANE MEDIAN DIVIDED
WITH CURB AND GUTTER

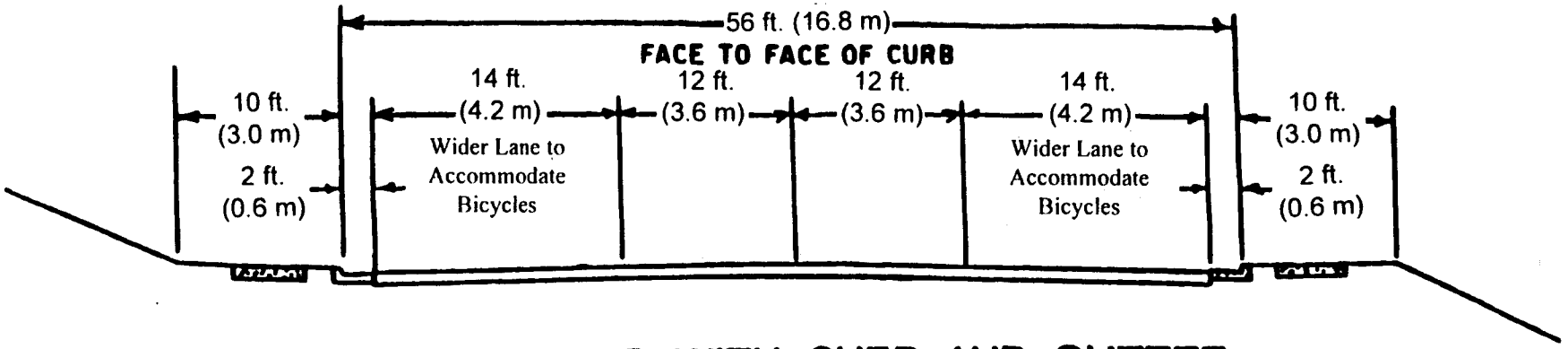
FIGURE 7 ALTERNATIVE 2

131



FOUR LANE MEDIAN DIVIDED
WITH CURB AND GUTTER

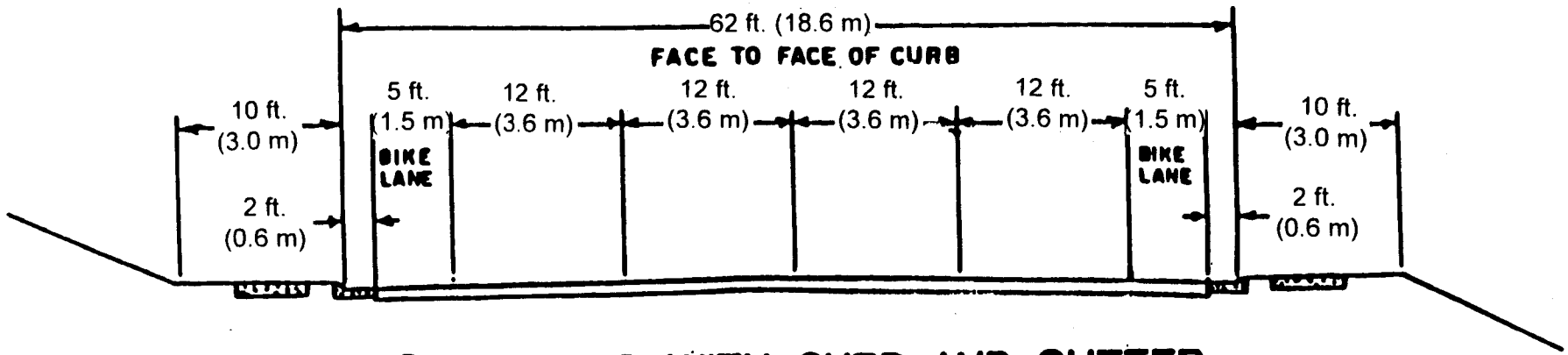
FIGURE 7-A ALTERNATIVE 2-A



FOUR LANES WITH CURB AND GUTTER

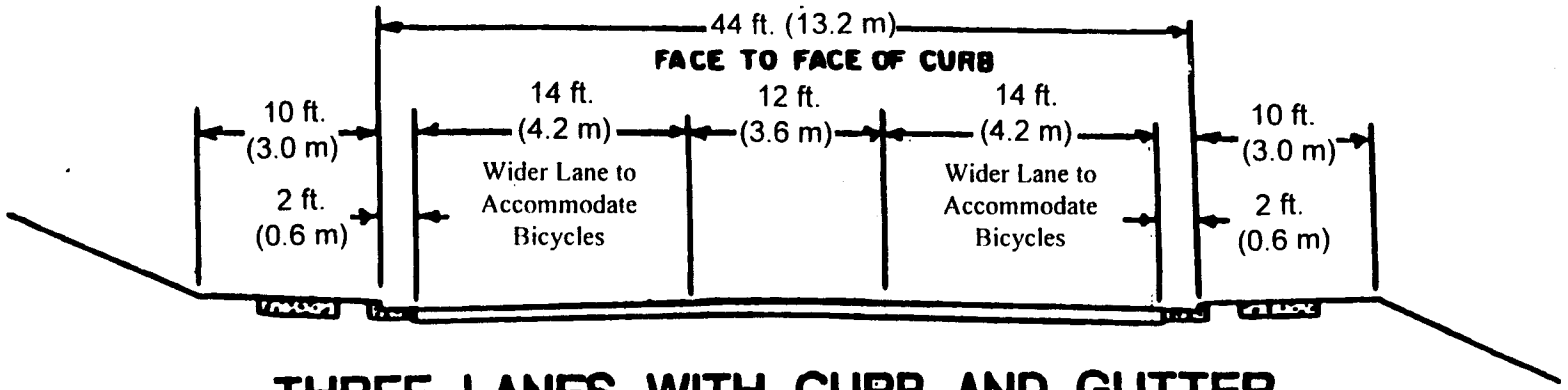
FIGURE 8 ALTERNATIVE 3

(132)



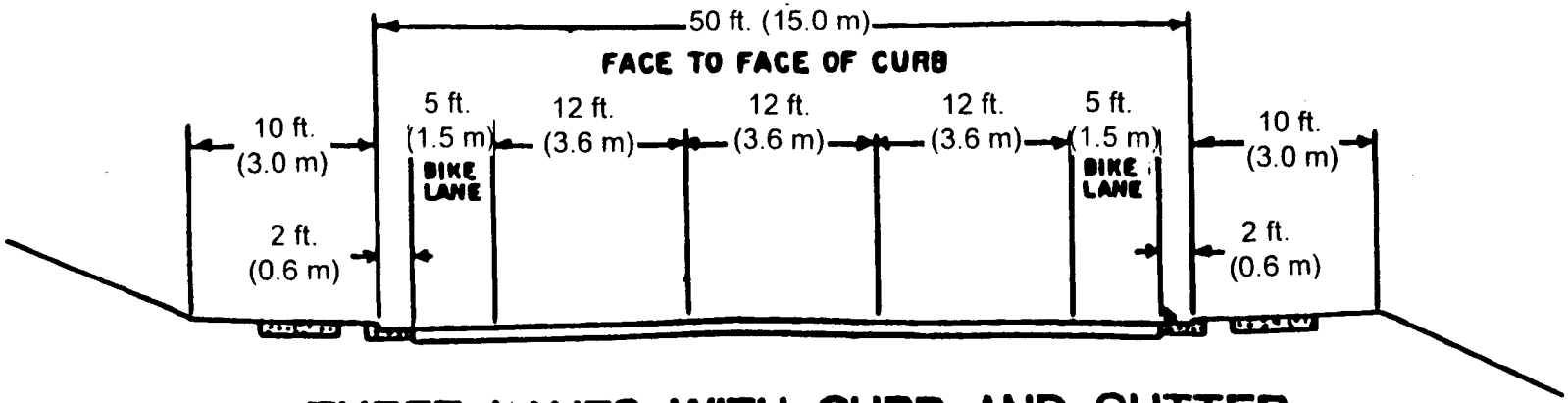
FOUR LANES WITH CURB AND GUTTER

FIGURE 8-A ALTERNATIVE 3-A



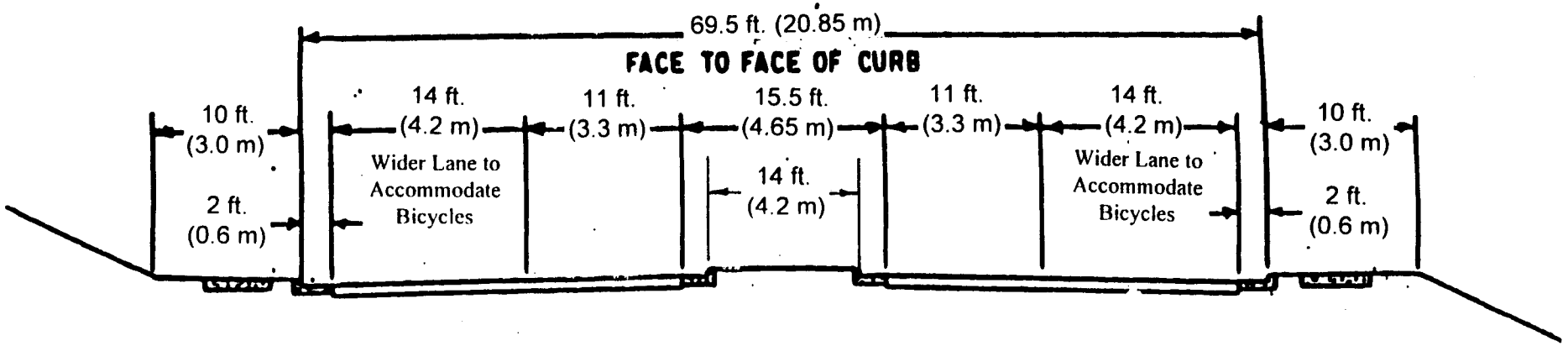
THREE LANES WITH CURB AND GUTTER

FIGURE 9 ALTERNATIVE 4



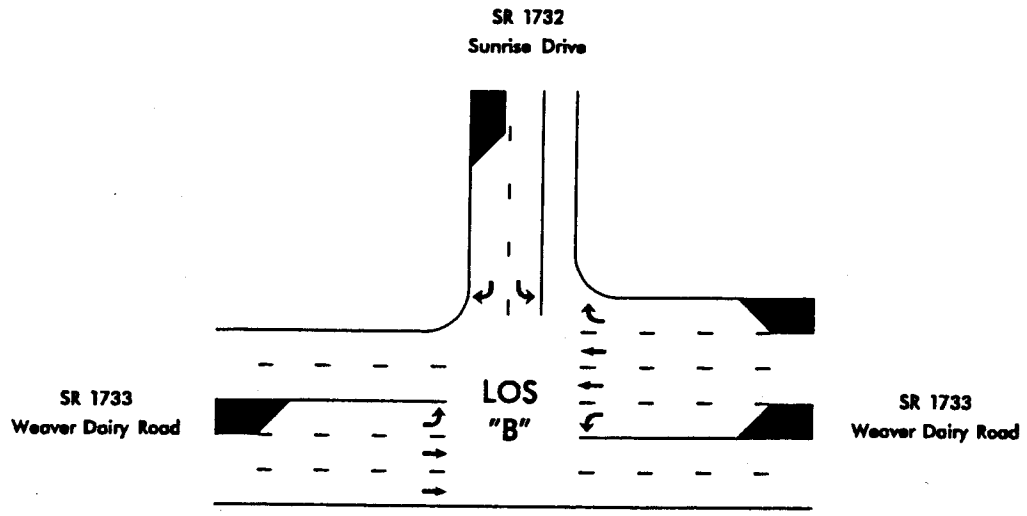
THREE LANES WITH CURB AND GUTTER

FIGURE 9-A ALTERNATIVE 4-A

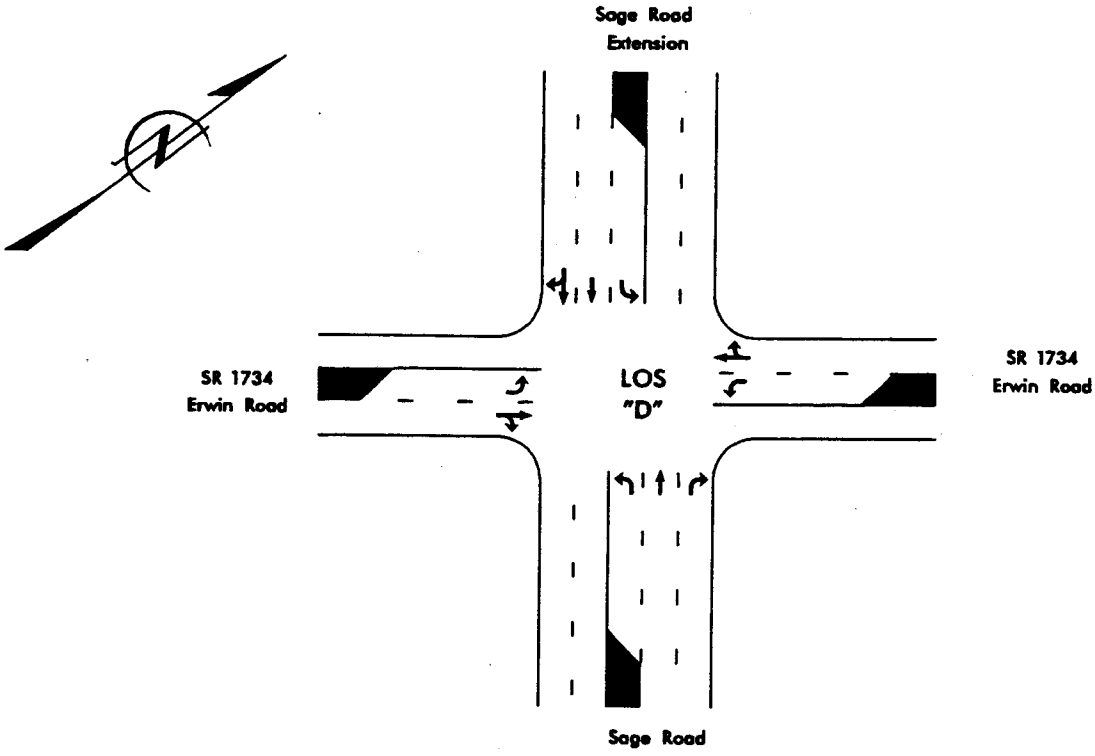


FOUR LANE DIVIDED MEDIAN
WITH CURB AND GUTTER

FIGURE 10 ALTERNATIVE 5



Weaver Dairy Road and Sunrise Lane
Intersection Geometry



Weaver Dairy Road/Sage Road Extension and Erwin Road
Intersection Geometry

Intersection Geometry
FIGURE 11

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APPENDIX B

COMMENTS AND COORDINATION LETTERS