



PRIVATE CROSSING SAFETY INITIATIVE

OCTOBER 2003

Crossing Evaluations and Recommendations

**Next Generation High Speed Rail Program
Federal Railroad Administration**

**North Carolina Railroad/Norfolk Southern
Charlotte to Raleigh**

STATE PROJECT NO. WBS 32198



Prepared by



Gannett Fleming

Prepared for



RAIL DIVISION

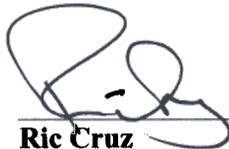
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EXECUTIVE SUMMARY

PRIVATE CROSSING SAFETY INITIATIVE NORTH CAROLINA RAILROAD RALEIGH TO CHARLOTTE

OCTOBER 2003

I. OBJECTIVE

The North Carolina Department of Transportation proposes to proceed with crossing safety improvements along the Raleigh to Charlotte “Sealed Corridor” by closing private crossings where feasible and protecting the private crossings that will remain open with crossbucks, automatic flashers and gates, signals and locking gates. These improvements will be identified through a systematic analysis conducted on private crossings within the North Carolina Railroad Company corridor operated by the Norfolk Southern and CSX Transportation railroad companies.

These projects will be funded through grants from the Federal Railroad Administration’s Next Generation High Speed Rail and Section 1103c programs. This is in addition to other ongoing projects on the corridor to close/consolidate public crossings or treat with enhanced devices.

II. FINDINGS

In the preparation of this Traffic Separation Study, 46 Private Vehicular Access (PVA) points (grade crossings) on the North Carolina Railroad (NCRR)/Norfolk Southern (NS) Railroad mainline between Charlotte and Greensboro and the ‘H’ line between Greensboro and Raleigh were evaluated for conformity to grade crossing safety standards, physical attributes, feasible alternative access improvements and the possibility of either crossing closure or consolidation. The 46 PVA’s were evaluated using the North Carolina Department of Transportation (NCDOT) approved Evaluation Criteria. The evaluation of the crossings resulted in the following findings:

1. Twenty seven (27) of the crossings serve one or more occupied residential structures or commercial/industrial operations.
2. Many of the crossings are very poorly marked and would be hard to locate by uninformed emergency responders.
3. Seven of the crossings are either controlled by NS or accessed by NS personnel for maintenance/operation purposes.
4. A search of the public records in all nine counties as well as a review of the NCRR and NS archives produced 13 written agreements for private crossings on the NCRR/NS. No written agreements were found for the three (3) crossings on

the NCR/CSXT 'S' Line. None of the written agreements were found to be recorded in county land records.

5. Traffic volumes are low on most of the crossings with the Byrdsville Road crossing in Orange County having the highest estimated volume.
6. A significant accident problem exists or has existed at only two crossings.
7. Sight obstructions are an issue at many of the crossings. These sight obstructions take the form of foliage, buildings and/or abandoned vehicles. The obstructions are within railroad right-of-way and should be cleared by the NCR/NS.
8. Most of the crossings with measurable traffic volume have been upgraded with automatic warning devices (gates, flashers and bells).
9. All of the crossings in Wake County and 4 of 5 in Durham County will be impacted by the Regional Rail Project proposed by the Triangle Transit Authority.
10. It appears feasible to close 10 crossings in the near-term through various public initiatives. Some of these initiatives are already underway and others are proposed as a result of this study.
11. Long-term, an additional 11 crossings can be closed by providing alternative access and 7 can be closed by purchasing the property served by the crossing.
12. No improvements or modifications were recommended for six (6) crossings as a result of this study.
13. Automatic warning devices (gates and flashers) are recommended for one crossing.
14. If all recommendations contained in this report are implemented along with other planned public or possibly private projects, 28 of the 46 crossings studied could eventually be closed. Of the remaining 18 crossings, seven are controlled by Norfolk Southern and one by the City of High Point.

III. ESTIMATED COSTS

1. Near-Term upgrades or modification to crossing protection devices - \$310,000 (This includes new gate/lock assemblies and near-term costs pending near-term closures).
2. Construct Near-Term alternative access - \$332,000 (includes TTA costs of \$272,000 in Wake County).
3. Construct Long-Term alternative access - \$825,000
4. Purchase property and close crossings - \$995,000
5. **Total Estimated Costs - \$2,462,000. SAY \$2,500,000.**

**PRIVATE CROSSING SAFETY INITIATIVE
NORTH CAROLINA RAILROAD
RALEIGH TO CHARLOTTE**

Prepared for

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
ENGINEERING & SAFETY BRANCH**

October 2003

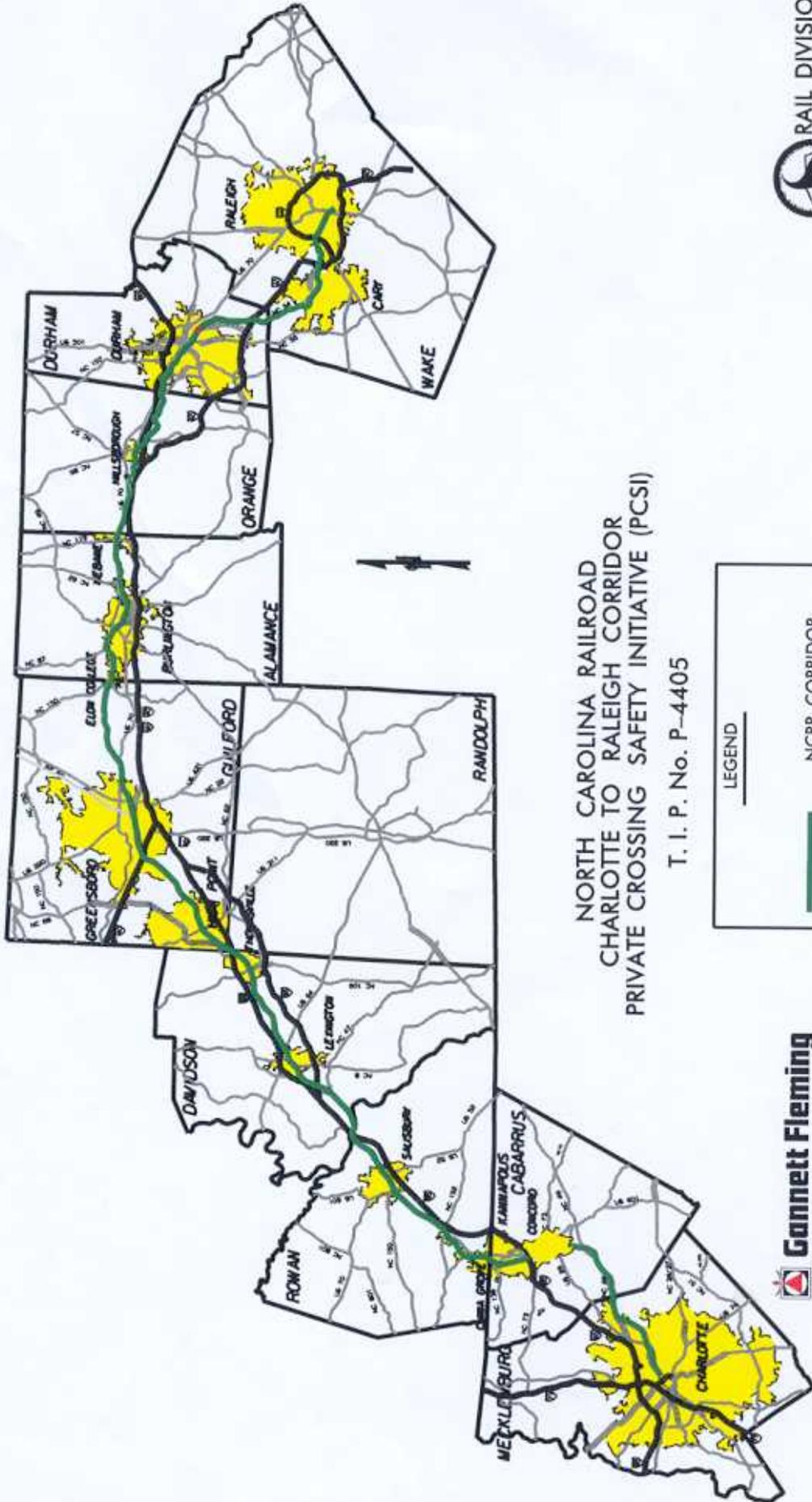
I. PURPOSE OF THE STUDY

As part of its continuing effort to improve grade crossing safety on the **High-Speed Rail Corridor** that extends from Raleigh to Charlotte along the North Carolina Railroad (NCRR), the Rail Division of the North Carolina Department of Transportation (NCDOT) has contracted with Gannett Fleming, Inc. (GF) to locate, inventory and evaluate all existing private grade crossings of the railroad. The project is identified as the **Private Crossing Safety Initiative (PCSI)** under the **Sealed Corridor Project** and is funded by the Federal Railroad Administration's (FRA) **Next Generation High-Speed Rail Program**. The project covers approximately 171 miles of track from Milepost 375 in Charlotte to Milepost 285 in Greensboro along the mainline and from Milepost 0 in Greensboro to Milepost 81 in Raleigh along the 'H' Line. Forty-six (46) private crossings have been located within the project limits (See **Figure 1**).

Partners in the study, in addition to the NCDOT, include the NCRR as owner and manager of the railroad right-of-way and the Norfolk Southern Corp. (NS), the railroad operating company.

II. CORRIDOR CHARACTERISTICS

The study corridor passes through nine (9) counties and 12 significant municipalities and numerous smaller communities, both incorporated and unincorporated. Norfolk Southern operates approximately 30 freight trains a day on the mainline from Charlotte to Greensboro and approximately 20 on the line from Greensboro to Raleigh. In addition, AMTRAK operates six (6) passenger trains a day over the entire line segment.



NORTH CAROLINA RAILROAD
 CHARLOTTE TO RALEIGH CORRIDOR
 PRIVATE CROSSING SAFETY INITIATIVE (PCSI)
 T. I. P. No. P-4405

LEGEND

— NCRR CORRIDOR

— PCSI

FIGURE 1 - VICINITY MAP



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The private crossings serve all types of land uses including residential, farming, municipal and private water and sewer treatment facilities, power company substations, a wildlife refuge, a sand and gravel mine, large business parks, distribution facilities and railroad related facilities and activities. In many cases, the crossing serves only one type of land use or property owner. In others, it may serve several different properties with a variety of uses. Where appropriate, local planning agencies were consulted for proposed changes in land use that might impact the crossings.

This study includes a comprehensive effort to address grade crossing safety and access issues at private crossings. In an effort to improve safety throughout the corridor, alternative access for each private crossing will be identified where such access is feasible. Where no alternative to the private crossing exists, enhanced safety measures may be recommended.

Private crossings typically exist as a result of an agreement between the railroad company and usually, the property owner of record at the crossing. In some cases, written and recorded agreements exist between the two parties. In other cases, however, the crossing may have been installed under the terms of a non-recorded agreement or installed by the owner/user without railroad permission. Some private crossings may precede construction of the railroad or have been constructed by the railroad to serve industrial clients. (The correct term for a private crossing is Private Vehicular Access or PVA, however; for simplicity, they will be referred to in this report as “private crossings”).

A review of land records in all nine counties encompassing the study corridor revealed no recorded agreements between a property owner and either the NCR or the NS. Written maintenance agreements between NS and property owners as well as NS and the NCDOT exist for 13 crossings.

The crossings are summarized by county in the following table.

Table 1 – Crossing Summary by County

LOCATION	NUMBER OF CROSSINGS
Wake	5
Durham	5
Orange	6
Alamance	2
Guilford	7
Davidson	4
Rowan	7
Cabarrus	3
Mecklenburg	7
TOTAL	46

III. EVALUATION CRITERIA

All of the private crossings were evaluated using the NCDOT Rail Division approved criteria (as applicable) which consists of the following:

- Crossing Inventory – All crossings were inventoried using the USDOT approved standard form for railroad grade crossings.
- Accident History – Train/vehicle crashes are the single most important factor in evaluating grade crossings. This report utilizes the accident classification system developed and adopted by the Federal Highway Administration and in general use around the country. Under this system, accidents are classified as follows:
 1. K – Killed
 2. Class A – Injured and transported to hospital
 3. Class B – Injured and treated on-scene
 4. Class C – Complains of injury or pain but not treated
 5. PDO - Property Damage Only (damage to vehicle or personal property)
- Automobile traffic – existing and projected (if applicable).
- Train traffic – existing and projected (where available).
- Truck traffic or designated truck route (if applicable) – do large trucks routinely use the crossing?
- Sight obstructions – do buildings, foliage or other obstructions restrict either the motorist’s or the train crew’s ability to observe approaching traffic at the crossing?
- Humped crossing – is the crossing roadway humped to the point of causing vehicles to either drag or become hung on the crossing?
- Queue distance – is there sufficient distance between the track and a paralleling roadway to allow vehicles to safely queue between the track and the road?
- Hazardous materials crossing – do vehicles delivering hazardous materials to nearby industries use the crossing?
- Roadway classification – federal or state route, thoroughfare, collector, local access, etc. (Not Applicable for this report).
- Adjacent land use – industrial, commercial, residential, etc.
- School bus route – is the crossing routinely used by school buses?
- Emergency responder’s route – do fire and medic crews routinely use the crossing?
- Crossing protection safety devices – gates and flashers, etc.
- Redundant crossing – does another nearby crossing serve the same function?
- Feasibility of grade separation – does the surrounding topography and land uses lend themselves to grade separating the roadway from the railroad?
- Roadway improvements – will roadway improvements at or near the crossing improve grade crossing safety? Is it feasible to implement roadway improvements?
- Economic impact if crossing is closed – will closing the crossing have a measurable economic impact on nearby land uses?

A spreadsheet, which follows at the end of this report on page 76 lists each crossing by AAR number and railroad milepost as well as other pertinent information.

A. Accident History

Over the last 10 years, 17 accidents have been reported involving 11 of the 46 crossings contained in this study. The accidents are summarized by type as follows:

- Killed – 3
- Class A – 2
- Class B – 3
- Class C – 1
- PDO – 8

There are only two crossings, however, that have more than two reported accidents. They are:

- #735 189T/Byrdsville Road with four, including one fatality. (There are no reported accidents since the installation of the automatic warning devices described beginning on page 32).
- #715 344R/8400 Old Concord Road with three, including a fatality in 1999.

The accident data summarized above was provided by the NCDOT Rail Division, Engineering & Safety Branch. It was supplemented by accident data from the Federal Railroad Administration data base.

B. Truck Traffic

For the most part, truck traffic is not an issue at private crossings. Several crossings in this study, however, are used more or less on a daily basis by tractor/trailers and single-unit trucks (See **Figure 2**). The most notable of these are:

- 904 415G/MP H 74.15/Public Service Co. of NC in Wake County (propane gas supply)
- 734 754R/MP H 71.11/CP & L in Wake County (substation access)
- 734 751V/MP H 67.75/Long Beverage in Wake County (beverage warehouse and building supply company)
- 736 137A/MP H 63.98/Northern Telecom in Durham County (manufacturing operations)
- 736 223B/MP H 61.80/IBM #2 in Durham County (warehousing)
- 735 206G/MP H 52.56/W. Durham Lumber in Durham County (building supplies receiving and distribution)
- 722 972N/MP H 6.77/Rankin Fryar in Guilford County (sand and gravel mining; land clearing and inert debris landfill)
- 715 335S/MP 366.29/Duke Power in Mecklenburg County (substation access)



FIGURE 2 - TRUCK ROUTE

C. Sight Obstructions

There are many locations up and down the line where the ability of a train crew to observe a vehicle approaching a crossing or for the motorist to see an approaching train, is obscured (See **Figure 3**). This is especially true at some of the crossings where foliage has been planted in many cases to purposely block the view of the railroad. There are also locations where buildings constructed inside the railroad right-of-way obscure the view (See **Figure 4**) and in other locations, vehicles are parked very near the crossing creating a sight obstruction.



**FIGURE 3 - SIGHT OBSTRUCTION/
FOLIAGE**



**FIGURE 4 - SIGHT OBSTRUCTION
/BUILDING**

D. Summary of Crossing Protection Devices

The majority of the private crossings evaluated as part of this study have some type of warning devices present. In the table below, AWD stands for automatic warning devices and indicates that gates and flashing signals (See **Figure 5**) are present at the crossing. Automatic warning devices (AWD) have been installed, for the most part, at those crossings with a significant volume of crossing traffic. The majority of the crossing protection devices are crossbucks and some have gate and lock assemblies (See **Figure 6**). In the recommendations that follow, such devices are recommended for other crossings.

Table 2 - Summary of Crossing Protection Devices

NONE	XBUCKS	GATE/LOCK	AWD	XBUCKS/STOP
9	23	2	8	4



FIGURE 5 - CROSSING WITH GATES, FLASHING SIGNALS & BELL



FIGURE 6 - GATED CROSSING WITH MULTIPLE ACCESS LOCKS

E. Crossings with the Highest Traffic Volume

None of the crossings evaluated as part of this study had sufficient volume to warrant an automatic traffic count. Estimated crossing volumes are provided in some of the recommendations described below where the crossing serves several tracts of land or residential parcels. Most of these estimates were developed from the *Trip Generation Tables* of the Institute of Transportation Engineers while others were provided by property owners.

F. Humped Crossings

Many of the crossings evaluated are humped to some degree. Most of them, however, are providing access to residential properties or farm lands where the humped condition may hinder the use of farm equipment, especially tractors with implements attached. (See **Figure 7**). Where the crossings serve tractor/trailers or other long vehicles, the hump can cause a problem. All of the private crossings in this study that provide truck access are relatively flat and no evidence of hanging or scraping vehicles was observed.



FIGURE 7 - HUMPED CROSSING

G. Queue Distance

Queue distance is defined as the storage distance between the crossing protection safety devices (where they exist), or the end of tie and the edge of pavement (or stop bar, as the case may be) of any paralleling roadway. In other words, if there is a roadway that parallels the railroad track, is there enough distance between the track and the road to safely store the number of vehicles that typically queue at the crossing while waiting to enter the flow of traffic on the parallel road?

The only crossing studied as part of this report that has a queuing problem is # **715 344R/MP 369.92** in Mecklenburg County. This crossing is impacted by the adjacent parallel roadway (Old Concord Road. See **Figure 31 on page 69**). However, the crossing is scheduled for removal and the queue problem will be eliminated.

H. Land Use

The 46 private crossings are summarized in the table below by primary land use served:

Table 3 – Crossing Summary by Land Use

INDUSTRIAL	COMMERCIAL	RESIDENTIAL	FARM	OTHER
17	5	13	10	1

IV. MENU OF AVAILABLE TRANSPORTATION SYSTEM ENHANCEMENTS

Over the years, Traffic, Roadway and Railway engineers have developed more sophisticated methods for treating safety issues at grade crossings over and above those traditionally used for most of the 20th Century. A listing and description of these methods follows:

A. Crossing Protection Devices Upgrade

One way to deal with safety issues at an at-grade railroad crossing, whether public or private is to upgrade the crossing protection devices.

Crossing protection devices include signs, signals, bells and flashing signals used to warn motorists of the pending crossing and, in the case of bells, signals and gates, alert the motorist to the train approaching the crossing. Passive devices, which include advance-warning signs, railroad crossbucks and standard stop signs, are generally used on low volume crossings with good site distance. Active devices, which include flashers, bells and gates, are used on higher volume crossings with greater accident potential or where existing conditions warrant more positive control. Crossings are protected as follows:

- Unmarked
- Retro-reflective railroad crossbucks
- Standard stop signs (limited sight distance) & crossbucks
- Flashing signals and bells
- Flashing signals, bells & gates
- 4-quadrant signals, bells & gates
- 4-quadrant signals, bells, gates and median separator

The use of 4-quadrant gates/flashers and median separators are reserved for higher speed mainline rail corridors where train and roadway traffic volume are high and more positive control of the grade crossing is warranted, therefore sealing the corridor. The use of this type system is very effective where significant numbers of motorists are ignoring the existing devices. The installation consists of dual gates across the entire approach width, and a median separator on each approach to prevent motorists from crossing the roadway centerline in an attempt to get around the gates.

Other advanced crossing protection devices available for installation include:

- Longer gate arms (covers 2/3 of the approach roadway versus 1/2 for standard gates)
- Warning device revisions (upgrade from 8” to 12” lenses, add gates) Pavement marking revisions (supplemental RxR)
- Special signage (“Low Vehicles May Drag”, “Stop Here when Flashing”)

In the recommendations that follow beginning on page 16, many of the crossings studied in this report are to initially receive upgraded warning devices.

B. Crossing Closure/Crossing Consolidation

The most effective way to deal with railroad/highway crossing safety issues is to close low-volume redundant crossings. Crossings that connect to the same street network and are within a quarter mile (+/- 1300 feet) of each other are considered to be redundant. Crossing consolidation is another way to treat crossings that may be relatively close to each other. Consolidation of two or more crossings into one can be accomplished by:

- Utilizing or building roads that parallel the tracks;
- Building new access roadways/driveways that do not need to cross the railroad;
- Replacing several crossings with a grade separation structure; or by,
- Constructing a new at-grade public crossing with automatic warning devices.

Consolidation is particularly effective method where several crossings, either public or private, are relatively close together.

In the recommendations contained below, several alternative access roads or driveways are recommended that, if constructed, will allow for the closure of the private crossing(s) affected.

C. Street Improvements

Street improvements are an effective way to treat capacity and safety problems associated with a particular section of roadway, an intersection or a railroad crossing. These improvements can range from simply remarking the existing pavement to obtain a turn lane to total reconstruction of the roadway. In many cases, the more minor the improvement, the greater the benefits.

There are no recommended improvements to existing public streets associated with any of the private crossings contained in this report. However, there are proposed, planned or programmed public projects that will affect some of the crossings.

V. SAFETY AND MOBILITY ISSUES

A. Vehicles Queuing Across Railroad Tracks

Queuing of vehicles across the tracks usually occurs due to the nearby presence of traffic signals, intersections or paralleling roadways.

Queuing is not a problem associated with any of the private crossings evaluated in this study with the exception of crossing #715 344R located in Mecklenburg County. However, this crossing is recommended for closure.

B. Traffic Signal Preemption

Traffic signal preemption is a technique used by Traffic Engineers to prevent automobile traffic from turning onto a crossing when a train is approaching. Under this technique, the approaching train activates signs and signals. These activated signs/signals warn motorists of the approach and prohibit turns until the train has cleared the crossing.

The Manual on Uniform Traffic Control Devices requires that preemption of traffic signals occur when the signal is within 200 feet or less of the crossing. The only crossing

impacted by a nearby traffic signal evaluated in this study is the one at Northern Telecom in Durham County (#736 173A/MP H 63.98) and the signal is preempted by railroad operations.

C. Humped Crossings

A “humped” crossing is one at which the elevation of the railroad is generally higher than that of the approaching roadway. This humped affect may cause cars and trucks to ascend on one approach to cross the track and descend on the other side. When the humping is severe enough, vehicles, especially low-hanging or long wheelbase trucks, tend to drag over the crossing and can become hung such that the vehicle can go neither forward nor backward. Maintenance of the railroad tends to exacerbate the hump over time in that work on the track ballast generally raises the roadbed. In cases where a vehicle becomes hung on the crossing, significant disruption can occur to railroad operations while the hung vehicle is cleared from the crossing.

No corrective action as a result of humped crossings is recommended in this report.

D. Grade Crossing Condition

The condition of the grade crossing surface can affect both safety and mobility. A poorly maintained crossing surface can contribute to accidents that may or may not involve a train. Also, a crossing in poor condition may cause operating speeds over the crossing to be lowered, thereby, impacting roadway capacity.

For the most part, the private crossings of the NS mainline and the ‘H’ Line are in good condition for the volume of traffic served.

E. Vehicles Driving Around Automatic Gates

This occurs when motorists perceive that the automatic gates have lowered but a train is not approaching the crossing; when the motorist perceives that the train is far enough away from the crossing to allow for a safe crossing; when the gates fail in the lowered position (Fail Safe); or when impatience causes a driver or pedestrian to maneuver around the gates even when an approaching train is in sight.

Field tests have determined that one of the hardest things for a motorist to judge while stopped at a crossing is the speed of an approaching train. Because of its size and the motorist’s perspective, an approaching train may appear to be moving relatively slow when it is, in fact, approaching at a high rate of speed.

Installation of enhance devices including 4-quadrant gates, longer gate arms and median separators has proved to be very effective in treating this safety issue. Occurrences of this type have been virtually eliminated along the NS mainline from Charlotte to Raleigh where such gate/signal/barrier systems have been installed as part of the Sealed Corridor initiative.

During field observations for this report, there were no observed instances where a motorist drove around a lowered gate. For the most part, this is directly attributable to the low volume of crossing traffic on the private crossings.

F. Improved Signs and Markings

Installation and maintenance of required traffic control signs and markings is consistently an issue with state and municipal street and highway departments. And, to some extent, maintenance of the railroad signs, signals, and gates at crossings can be an issue with the railroad company.

In that all of the crossings studied in this report are private, most do not have any kind of advance warning signs or railroad pavement markings. Where the crossings have automatic warning devices and signs and markings are in place, such as the Northern Telecom crossing and the IBM crossings, the signs and markings present are in good condition as are the automatic warning devices.

In the **Recommendations and Estimated Costs** section of this report that follows beginning on page 16, the installation of railroad crossbucks or the replacement of the existing crossbucks is recommended. In all cases, “Look” signs should also be installed. These signs direct a motorist to look in both directions before proceeding to cross the track(s).

G. Roadway Improvements

In order to make grade crossings safer, roadway improvements are frequently recommended. In many cases, not only does the crossing roadway require improvement, but a nearby paralleling roadway or intersection can be involved as well as the relocation of overhead wire lines.

There are no recommended improvements to existing public streets that provide access to the private crossings except for the installation of median separators on two crossings in Durham County. There are several recommendations contained below for new private or public streets to allow grade crossings to be closed.

H. Roadway Grade Separation

Providing a roadway/railroad grade separation can eliminate safety, queuing and delay problems at a railroad grade crossing. Highway grade separations can either be on a bridge over the railway or the roadway can cross beneath the rail line.

Highway overpasses require greater length for the same design speed. The total elevation difference is greater because the standard rail vertical clearance of 23 feet exceeds the typical highway clearance of 16 or 16-1/2 feet (even though the structure depth is usually greater for the rail bridge typically provided at an underpass). More importantly, the vertical curve in the middle of the facility, the “crest” curve on an overpass, is longer for a given design speed than the “sag” curve at an underpass, due to stopping sight distance requirements.

The visual and noise impacts associated with overpasses can make them undesirable for use in residential zones, downtown zones, or near historic structures.

The design, and ultimately the feasibility, of a highway grade separation is heavily influenced by property access considerations and the location and connectivity of roadways which parallel the tracks and connect to the cross street. Where an existing frontage road is immediately adjacent to the railroad, this facility must be bridged as well as the railroad. If necessary, a connection to the frontage road can be provided by

directional ramps similar to freeway on-and-off ramps that provide access to the frontage road for traffic to-and-from points on the same side of the railway line as the frontage roadway.

In the recommendations that follow, the Rankin Fryar crossing (# 722 972F/MP H 6.77) in Guilford County is proposed (by the private sector) to be replaced with an overpass of the railroad as part of the conversion of the existing mining and land clearing and inert debris landfill operations into a construction and demolition landfill.

I. Other Mobility Factors

Many of the crossings studied in this report are very poorly marked and difficult to locate. Of the total of 46 crossings studied, 27 provide access to one or more occupied structures or business/commercial operations. None of the crossings that provide access to residences are used by public school buses; even the Byrdsville crossing that provides access to many residential structures. Most, it is assumed, have been or will be used by emergency responders at one time or another.

J. Thoroughfare Plan Considerations

The only crossing evaluated in this report that may be impacted by a future street project is the Long Beverage crossing (# 734 751V/MP H 67.75) in Wake County. This matter is discussed more fully in the recommendations pertaining to the crossing. Several of the crossings, however, will be impacted by the proposed regional rail project by Triangle Transit Authority. The impacts to these crossings are more fully described in the sections on Wake and Durham counties.

VI. RECOMMENDATIONS AND ESTIMATED COSTS

The following recommendations for the private grade crossings of the NCR/NS are based upon extensive field evaluations and the potential for implementation of the recommendations. The recommendations are broken down into two categories:

1. **Near-term** recommendations/actions are those that can easily be implemented, generally within 0-5 years.
2. **Long-term** recommendations/actions are those that are more complex, possibly requiring the preparation of plans and acquisition of right-of-way. Long-term recommendations are those that will require more than 5 years for implementation.

Some crossings may receive a recommendation in both categories or two recommendations in the same category.

The Triangle Transit Authority (TTA) also proposes to utilize a portion of the NCR right-of-way in Wake and Durham counties for its Regional Rail Service. Should such service be implemented, it will impact all the crossings in Wake County and all but one of the crossings in Durham County included in this study. The TTA proposal

for modifications to the crossings, if different than the recommendations contained in this report, are also listed below for the impacted crossings.

The current TTA plans call for the addition of two passenger rail tracks north of the existing NS/CSXT tracks within the NCRR right-of-way. The plans also anticipate the possibility of two additional passenger tracks south of the mainline freight tracks.

TTA staff (John Roberson, PE, Chief Civil Engineer) estimates that construction on their project will begin in late 2003 and be completed by December of 2007. Using this schedule, all recommendations based upon the TTA project are considered to be near-term.

The first three (3) crossings described below in Wake County are under the operational control of CSXT. All other crossings evaluated in this study are on that segment of the railroad operated by Norfolk Southern.

A. Wake County

There are five private crossings located in Wake County. The crossings are further described below.

1. **Crossing #630 652H/S 162.25/Recreational Ventures Incorporated** – This crossing provides access to a construction firm that builds tennis courts. The crossing connects to Hillsborough Street which serves both Raleigh and Cary. The site appears to have parking for about eight passenger vehicles and several construction vehicles. The crossing is located in an area where both the NS and CSXT railroads operate on separate tracks within the NCRR right-of-way. The crossing is protected by crossbucks and is slightly humped, but there is no evidence of vehicles dragging or hanging at the crossing.

An accident resulting in property damage was reported at this crossing in January 1994.



Crossing #734751V
 MP # H 67.75
 10401 SR 54/Chapel Hill Rd

NCRR/Norfolk Southern
 Crabtree Creek W/S Structure No. 2

Crossing #630660A
 MP # S 164.02
 830 E Chatham St

Crossing #630659F
 MP # S 163.82
 900 E Chatham St

Crossing #630652H
 MP # S 162.25
 5810 Hillsborough St

Crossing #734754R
 MP # H 71.11
 9417 SR 54/Chapel Hill Rd

Crabtree Creek W/S No. 18 Dam

Mag 13:00
 Tue Nov 18 14:29 2003
 Scale 1:62,500 (at center)

1 Miles
 2 km

↑

PRIVATE CROSSING SAFETY INITIATIVE - WAKE CO. CROSSINGS

Wake County GIS mapping shows an alleyway or easement approximately 15 feet in width that extends from the NCRR right-of-way line northerly to the right-of-way line of NC 54 which is to the rear of the property in question. This alleyway also serves several landlocked parcels of property between Hillsborough Street and NC 54. It is recommended that the crossing be closed and that a new driveway to serve all parcels be constructed and connected to NC 54/Chapel Hill Road. The total length of driveway required would be approximately 850 feet. The estimate below assumes the construction of a paved driveway 15 feet wide by 850 feet long. Construction easements would be required from all involved property owners. It is assumed, for purposes of this estimate, that no cost would be incurred in acquiring the easements due to the existence of the alleyway and the benefits to accrue to the landlocked property. While this is considered to be a near-term recommendation, it will take longer to implement due to the number of properties involved. In the meantime, new crossbucks should be installed and a stop sign study should be conducted.

Independent of this report, the TTA has determined that the appropriate treatment for this crossing is to provide alternative access to NC 54.

Near-term recommendation: Install new crossbucks and conduct stop sign study.
Estimated Cost: \$900

Near-term recommendation TTA project: Build connector driveway to NC 54 as part of TTA project.

Estimated Cost: \$40,000 (GF estimate)

2. **Crossing #630 659F/S 163.82/Public Service Co. of NC** – This crossing provides access to a gas storage and distribution facility for both Liquefied Natural Gas (LNG) and Liquefied Propane Gas (LPG) operated by Public Service Co. of North Carolina. The crossing provides direct access to Hillsborough Street. Access to the facility is controlled by an electronically operated gate. The crossing itself is protected by crossbucks and is in the area where both NS and CSXT are utilizing the NCRR right-of-way. There is parking on the site for both automobiles and larger vehicles. Officials of the gas company stated that 17-18 employees typically work at the site but could not give an estimate of the number of truck trips in and out of the site each day. They stated that the LNG comes in and is distributed by pipeline only. The LPG is distributed by truck with the heavy demand being in the winter months.

An accident resulting in a class ‘A’ injury was reported at this crossing in April 1996.

Wake County land records indicate that the gas company owns all of the land between Hillsborough Street and NC 54. It is recommended that the grade crossing

be closed and a new access road be constructed from the existing parking facilities to connect to NC 54 opposite an entrance to a subdivision fronting NC 54 (See **Figure 9**). The length of the proposed access road would be approximately 1500 feet. Due to the truck activity at the site, the access road needs to be designed to accommodate heavier loadings and would be approximately 24 feet wide. In the meantime, new crossbucks should be installed and a stop sign study should be conducted at the crossing.



FIGURE 9 - PROPOSED DRIVEWAY LOCATION @ NC 54

Independent of this report, the TTA has determined that the appropriate treatment for this crossing is to provide alternative access to NC 54.

Near-term recommendation: Install new crossbucks and conduct stop sign study.
Estimated Cost: \$900

Near-term recommendation TTA project: Build connector driveway to NC 54 as part of the TTA project.

Estimated Cost: \$150,000 (GF estimate)

3. **Crossing #630 660A/S 164.02/First State Communications Inc. (WPTF)** – This crossing provides access to the WPTF radio transmission towers located between Hillsborough Street and NC 54. The crossing is located in the area where both the NS and the CSXT occupy NCRR right-of-way. The crossing itself is slightly humped and while the area over the tracks is paved with asphalt, the roadway on both sides of the crossing is gravel. It does not appear that the crossing receives frequent use. The crossing is protected by crossbucks.

Wake County land records indicate that the parcel which the crossing serves does not extend all the way to NC 54. However, there are several options that could be pursued to allow the crossing to be closed. They would all involve the acquisition of an easement or access agreement with an adjoining property owner. To the rear and north of the site, a vacant parcel of land has frontage along NC 54. To the west, an adjacent commercial property is developed with a paved parking area that abuts the site in question. And to the east, an agreement might be feasible with the Public Service Co. of NC that would allow the station driveway to be connected to the proposed access road to NC 54 for the gas facility. The most expensive option, not including the cost of an access easement, would be to build a new gravel driveway across the property to the north, now owned by Great Western Properties, LLC. The driveway would need to be approximately 1200 feet long by 12 feet wide. The estimated cost for this option is shown below and includes a cost of \$0.50/square foot for easement acquisition from Great Western.

The most feasible option, however, given the low volume of traffic to the station site, appears to be a connection through the commercial property that abuts the site on the west side. It is recommended that the grade crossing be closed and that alternative access be acquired from one of the three adjacent properties discussed above. Even though the implementation of this recommendation requires negotiations with an adjacent property owner, it can still be accomplished near-term. In the meantime, it is recommended that a gate with lock be installed on the Hillsborough Street side of the track. The lock mechanism would have to be such that it could be accessed by both railroad and station personnel. (See **Figure 6 on page 10**).

Independent of this report, the TTA has determined that the appropriate treatment for this crossing is to provide alternative access to NC 54.

Near-term recommendation: Install gate and lock on south side of crossing.
Estimated Cost: \$750

Near-term recommendation TTA project: Secure alternative access through an adjacent parcel as part of the TTA project.

Estimated Cost: \$55,000 (GF estimate)

4. **Crossing 734 754R/MP H 71.11/Carolina Power & Light Co. (now Progress Energy)** – This crossing provides access from NC 54 to a Carolina Power & Light substation. The westbound approach also serves several parcels between the railroad right-of-way and NC 54. The crossing is relatively flat with the approach from NC 54 being gravel and the approach from the substation asphalt. The crossing is protected on the westbound approach only with a crossbuck and a stop sign. The crossing is located in Cary in a segment of the NCRW right-of-way used only by the NS.

On the west side of the crossing, the roadway splits with a segment of gravel roadway extending southwest across what appears to be a large platted but

undeveloped industrial subdivision. The subdivision layout seems to indicate that this access would be eliminated as the subdivision develops.

To the immediate rear of the substation, there is a large industrial subdivision with access to James Jackson Avenue. The mapping shows an industrial-width paved roadway that extends almost to the CP & L property line. It is recommended that the crossing be closed, that an access agreement with the industrial parcel to the rear (south) be acquired and that a new driveway to the substation be constructed. The driveway would be approximately 200 feet long by 15 feet wide. The estimated cost for this option is shown below and includes a cost of \$1.80/square foot for easement acquisition from the industrial park. However, access through the building supply facility to the east or through the undeveloped property to the west may also be feasible. Even though negotiations with an adjacent property owner are required, this recommendation is still considered near-term. In the meantime, it is recommended that a gate with lock be installed on the north side of the crossing. The lock mechanism would have to be such that it could be accessed by both railroad and CP & L personnel.

Independent of this report, the TTA has determined that the appropriate treatment for this crossing is to provide alternative access to James Jackson Avenue.

Near-term recommendation: Install gate and lock on north side of crossing.

Estimated cost: \$750

Near-term recommendation TTA project: Secure alternative access through an adjacent parcel.

Estimated Cost: \$27,000 (GF estimate)

5. **Crossing #734 751V/MP H 67.75/Long Beverage, Inc.** – This crossing provides access to NC 54 for a beverage distribution warehouse as well as a building supply facility (Truss Builders, Inc.). The crossing is flat and is paved on both approaches with concrete approximately 24 feet wide. The crossing is protected by longer gate arms and flashers (installed 4/30/2002) as well as supplemental stop signs on both approaches. The stop signs carry the message “STOP High Speed RR Crossing”. These stop signs do not conform to the requirements of the Manual on Uniform Traffic Control Devices (MUTCD) and should be removed by the property owner (NCDOT Rail Division staff has already discussed this matter with the owner).

Field observations at the site indicate significant truck crossings of the railroad each day (200 trips per day from *ITE Trip Generation Tables*).

An accident resulting in a class ‘C’ injury was reported at this crossing on April 11, 2002 just 19 days prior to the installation of the automatic warning devices.

Available mapping does not indicate any other feasible alternative access to the facilities described above. Given the fact that the crossing is protected by gates and

flashers and there have been no reported accidents since the installation of the automatic warning devices, there is only one recommended change or modification to this crossing.

Long-term, the Wake County Thoroughfare Plan proposes to extend Airport Boulevard from its current terminus at NC 54 southwesterly to connect to Davis Drive. Such an extension would cross the railroad in the vicinity of this crossing. The TTA has prepared a concept drawing for this extension that assumes a grade-separation with the railroad. TTA has not included this project in their plans for the Regional Rail Project, however. Should Airport Boulevard be extended, NC Board of Transportation policy will require that it be grade-separated from the railroad. Such a separation will require alternative access to both the Long Beverage facilities as well as Truss Builders, should they remain in their current locations.

The gates and flashers installed at this crossing were part of a pilot installation of automatic warning devices at a private crossing. The NCDOT Rail Division secured federal funding from the **Federal-Aid Next Generation High Speed Rail Program** to cover all costs associated with the installation of re-cycled equipment at this crossing and at the Byrdsville Road private crossing in Orange County. The Rail Division contracted with NS to prepare the plans and install the automatic warning devices including all related control and communication equipment.

There is a written agreement dated August 4, 1989 between NS (Southern Railway Co.) and the property owner for the maintenance of this crossing.

The Rail Division paid NS \$62,300 to install and activate the equipment. In addition, another \$26,780 was paid to NS as a capitalized maintenance cost for perpetual maintenance of the equipment. The capital costs compare to the cost of \$115,000 to \$125,000 for a new gate and flasher installation. Annual maintenance costs for such equipment at public crossings are jointly shared by the operating railroad and the road maintenance agency. Typically, state and local governments pay from \$1400 to \$1500 per year to the railroad for each public crossing equipped with similar devices. Under the terms of the agreement between the NCDOT and NS, the railroad is responsible for all costs relating to operation and maintenance of the devices.

Under the terms of that same agreement, should a new public crossing of the railroad be constructed nearby that would allow the closing of this crossing, NS will make a “best faith” effort to close the private crossing.

In discussing matters surrounding the decision to signalize a private crossing with members of the Rail Division staff responsible for implementation, the only major issue to arise was funding. The NCDOT is prohibited by law from spending state funds on private streets including private crossings of railroads. In order to move forward with this project, the Rail Division had to apply for and receive the federal funding as described above. The federal grant paid all costs associated with the

installation of the automatic warning devices including staff costs for both the Rail Division and NS. Staff could not recall any other significant impediments to the project.

When compared to the other private crossings evaluated as part of this report, the Long Beverage crossing had a significant potential for crossing collisions due to the volume of traffic, especially truck traffic, using the crossing. The decision to install automatic warning devices appears to be a wise and proper use of both funds and equipment.

Independent of this report, the TTA has determined that the appropriate treatment for this crossing is to install 4-quadrant gates and flashers.

Near-term recommendation: Remove non-MUTCD standard signs.
Estimated Cost: To be borne by owner.

Near-term recommendation TTA Project: Install 4-quadrant gates and flashers.
Estimated Cost: \$170,000 (GF estimate)

Long-term recommendation: Close the crossing as part of the Airport Boulevard Extension project. Provide alternative access to Long Beverage and Truss Builders as required per the agreement between the NCDOT and NS.
Cost Estimate: To be determined.

B. Durham County

There are five private crossings located in Durham County. The crossings are further described below.

1. **Crossing #736 173A/MP H 63.98/Northern Telecom, Inc.** – This crossing provides access to S. Miami Boulevard for Northern Telecom’s (Nortel) operations in the Research Triangle Park. Approximately $\frac{3}{4}$ miles south of the crossing, S. Miami Boulevard intersects with NC 54, which turns west at that point and parallels the Nortel complex on the south side. Three additional access points to the complex are provided along NC 54. The crossing is relatively flat and is protected by gates and flashers (installed 02/01/1988). The nearby (+/- 150’) intersection at S. Miami Boulevard and the Nortel driveway is signalized.

There is a written agreement between NS (Southern Railway Co.) and Northern Telecom, Inc. dated 10/9/1981 for the maintenance of this crossing.

The NCRP currently has a project underway to replace the obsolete railroad overpass at NC 54. The overpass occurs approximately 450 feet west of the intersection of NC 54 and S. Miami Boulevard (See **Figure 10**). The new overpass will be constructed west of the existing overpass resulting in a horizontal shift in track alignment to the west. This shift will move the mainline track to the west

approximately 70 feet at the Nortel crossing. In order to meet current railroad/highway design standards, the new overpass will be significantly higher as it crosses NC 54 resulting in a rise in track elevation throughout the project limits. At the Nortel crossing, the track elevation will rise approximately 4 feet. Such a rise would create a “humped” condition at the crossing requiring that the roadway be reconstructed on both approaches for a significant distance. Even with a shift in the horizontal alignment of the track to the west, an acceptable grade between the track and the intersection at S. Miami Boulevard may not be feasible.

Due to the impact of the proposed roadway/railway project and given that Nortel has alternative access to NC 54, the following is recommended:

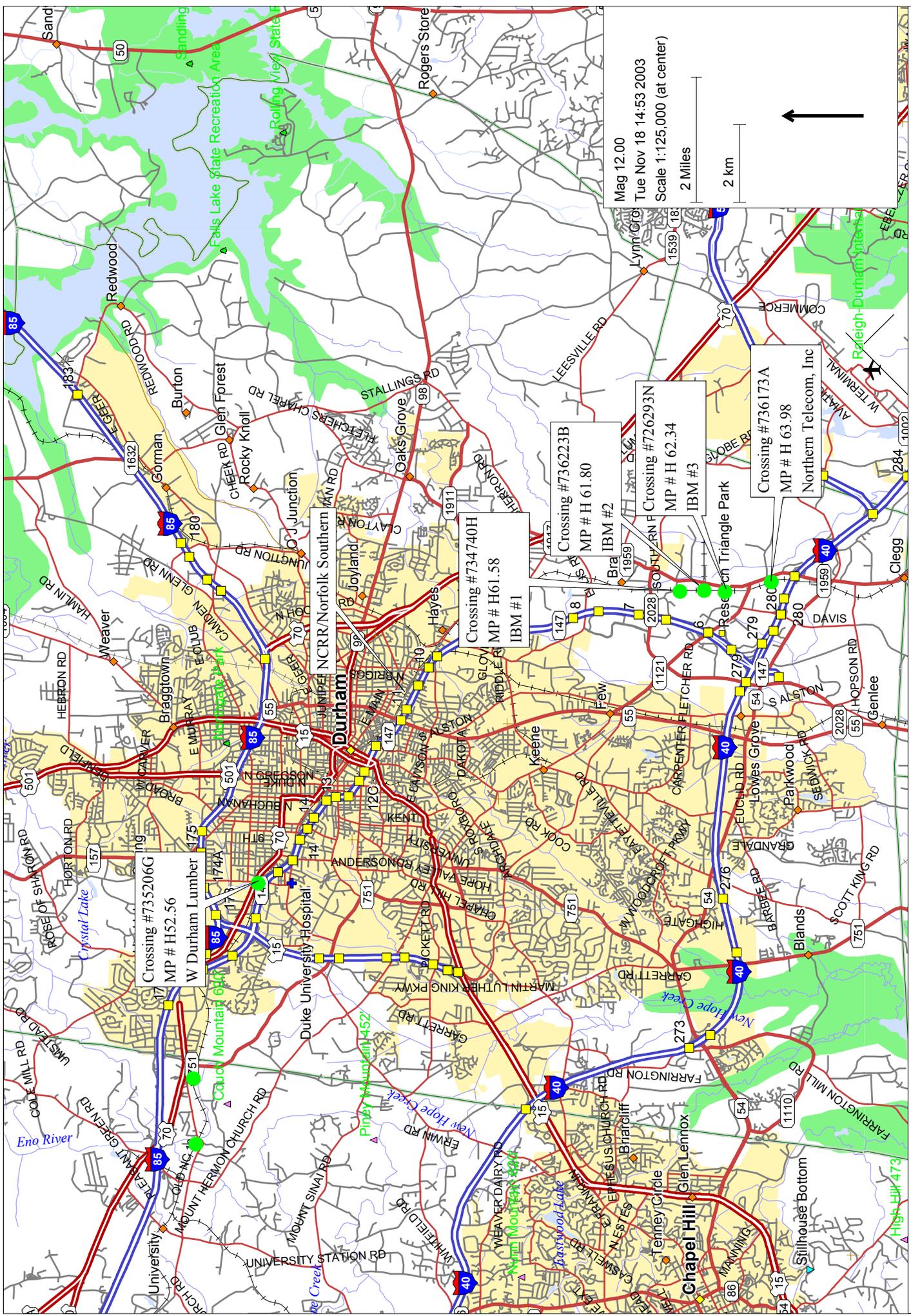
- Close the crossing;
- Salvage the automatic warning devices;
- Remove the roadway on both sides of the crossing; and,
- Incorporate the above recommendations into the NCRR bridge project.



FIGURE 10 - EXISTING NCRR/NS OVERPASS AT NC-54

The track in the area of this crossing is programmed to receive improvements in the form of signal circuit modifications as part of the North Carolina Railroad Improvement Program (NCRRIIP). The estimated cost for these improvements is \$31,400 and is to be included in the PCSI project.

Near-term recommendation: Implement the NCRRIIP project. Close and remove crossing as part of the NCRRIIP NC 54 bridge project.
Estimated Cost: \$31,400 (NCRRIIP project only)



PRIVATE CROSSING SAFETY INITIATIVE - DURHAM CO. CROSSINGS

2. **Crossing #726 293N/MP H 62.34/IBM #3** – This is one of three crossings of the NCRR that serves the IBM complex in Research Triangle Park. The crossing is relatively flat and is protected by automatic warning devices (gates and flashers installed 11/18/99) as well as advance warning signs and pavement markings. The approach roadway is paved and approximately 36-40 feet wide on both sides of the crossing. The crossing is currently used only for morning and afternoon peak-hour traffic needs.

There is a written agreement between NS (Southern Railway Co.) and IBM dated 4/8/1985 for the maintenance of this crossing.

Independent of this report, the TTA has determined that the appropriate treatment for this crossing is to install 4-quadrant gates/ flashers and a median separator.

The track in the area of this crossing has been programmed to receive upgraded signals, circuitry and controllers as part of the NCRRIIP project. The project budget for these improvements is \$102,900 and is to be funded as part of the PCSI project.

Near-term recommendation: Implement the NCRRIIP project and install a median separator.

Estimated Cost: \$102,900 (NCRRIIP), \$4,500 (median separator)

Near-term recommendation TTA Project: Upgrade to 4-quadrant gates and flashers.

Estimated Cost: \$170,000 (GF estimate)

3. **Crossing #736 223B/MP H 61.80/Sanmina Scientific Corp. & Duke Energy Corp. (IBM #2)** - This crossing provides internal access between the IBM operations and a large warehouse facility that accesses S. Miami Boulevard. The crossing is flat and is protected by automatic warning devices (gates and flashers). The roadway is paved and is approximately 24 feet wide. The crossing appears to be used by tractor/trailer trucks to shuttle material between the two operations on each side of the track with access to the warehouse facility restricted by an automatic gate system. Access to the IBM complex is gated as well.

There is a written agreement between NS (Southern Railway Co.) and IBM dated 12/16/ 1976 for the maintenance of this crossing. Said agreement was amended 8/26/1999 for the addition of gates and flashers at the crossing.

Through negotiations with IBM and Sanmina Scientific Corp., it has been determined that this crossing will be closed and that separate access will be provided to the Sanmina facilities.

Near-term recommendation: Close crossing and salvage the automatic warning devices.

4. **Crossing #734 740H/MP H 61.58/IBM #1** – This is the third crossing to serve the IBM complex. It provides access to S. Miami Boulevard. The crossing is flat and protected by automatic warning devices (gates and flashers) as well as advance warning signs and pavement markings. The approach roadway is wide with a marked centerline and paved shoulders.

There is a written agreement between NS (Southern Railway Co.) and IBM dated 7/14/1982 for the maintenance of this crossing. Said agreement was amended 8/26/1999 for the addition of gates and flashers.

The crossing is currently in use to provide peak-hour traffic service, both morning and evening, to IBM.

Independent of this report, the TTA has determined that the appropriate treatment for this crossing is to install 4-quadrant gates and flashers and a median separator.

Through the NCRRIIP project, this crossing is to receive longer gate arms estimated to cost \$3,500. The cost for these improvements is to be included in the PCSI project.

Near-term recommendation: Implement the NCRRIIP project and install a median separator.

Estimated Cost: \$3,500 (NCRRIIP), \$4,500 (median separator)

Near-term recommendation TTA Project: Install 4-quadrant gates and flashers and a median separator.

Estimated Cost: \$180,000 (GF estimate)

5. **Crossing #735 206G/MP H 52.56/West Durham Lumber Co.** – This crossing serves the W. Durham Lumber Co. which is a large building materials distributor in Durham. The facility is surrounded on three sides by major highways-the Durham Freeway, Hillsborough Road and Hillandale Road. The NCRR crosses in front of the facility between the Durham Freeway and Hillsborough Road.

The southbound roadway approach to the crossing is very steep which limits sight distance. The northbound approach is in a curve with drivers being unable to see vehicles on the southbound approach until they are almost on the crossing. The track is in a curve at this location and immediately to the east of the crossing, the railroad overpasses Hillandale Road. Buildings, foliage and parked vehicles, including tractor/trailers, obstruct the sight of train crews on the eastbound rail approach. (See **Figure 2 on page 8.**)

The crossing is protected by automatic warning devices (gates and flashers); however, there are no advance warning signs or railroad markings. The approach roadway is wide with a marked centerline. There have been no accidents reported at this crossing in the last 10 years.

There is a written agreement between NS (Southern Railway Company) and the NCDOT dated 3/23/1987 for the maintenance of this crossing.

Given the steep approach grade to the crossing, the curved track and the limited sight distance, it would be desirable to relocate the driveway to a straight section of track where the elevation of Hillsborough Road, the track and the site are relatively equal. Such relocation does not appear feasible at this time. If new development or redevelopment of property north of the track and fronting on Hillsborough Road takes place, this alternative should be considered.

Through the NCRRIIP project this crossing is to receive longer gate arms and an upgrade of the railroad control system. The proposed improvements are estimated to cost \$31,400. In that there are no feasible alternatives to this crossing remaining in-place, it is recommended that the proposed improvements proceed as planned. The improvements will be installed as part of the PCSI project.

Near-term recommendation: Implement NCRRIIP proposal.
Estimated Cost: \$31,400

C. Orange County

There are six private crossings located in Orange County. They are further described below.

1. **Crossing #735 199Y/MP H 48.49/5300 Old Hillsborough Road/Couch et.al.** – This crossing provides access to Old NC 10, now SR 1710, for six properties located south of the NCR. The crossing occurs in an area where NS operates one mainline track and what appears to be a passing siding. While the track section is straight at this location, it quickly enters a curved section both east and west of the crossing. The sight distance for train crews on either approach to the crossing is limited by heavy foliage on both sides of the track. The crossing is humped and is protected by crossbucks. **Figure 7 on page 11** shows a humped private crossing in Mecklenburg County similar to this crossing.

The parcels served by the crossing are large and each is occupied by a single residential structure. All of the parcels are in different ownership according to Orange County land records. Much of the property surrounding the six parcels is owned by Duke University and is part of their School of Forestry. However, to the immediate west, a subdivision has developed that may allow alternative access to the properties in the future. At this time, a private road, which is well outside of NCCR right-of-way, serves the subdivision and could be extended to the vicinity of the properties served by the crossing. Should that happen, it may be possible to access these properties from the west and close the crossing. In the meantime, it is recommended that new crossbucks be installed and a stop sign study conducted.

Near-term recommendation: Install new crossbucks and conduct a stop sign study.

Estimated Cost: \$900

Long-term recommendation: Seek alternative access as property to the west of the crossing develops.

2. **Crossing #726 305F/MP H 47.62/Greenbrier Drive** – This crossing serves eight residential parcels located north of the railroad and provides access to old NC 10, now SR 1710. The crossing is located along a straight section of track. There is heavy foliage on all four approaches to the crossing. The roadway approaches are gravel and the southbound approach is slightly humped. The crossing is protected by crossbucks. The railroad overpasses SR 1710 approximately 550 feet east of the crossing.

The Greenbrier subdivision abuts the Whispering Pines subdivision immediately to the east which has direct access to SR 1710 without crossing the railroad. According to Orange County land records, a 50-foot easement exists between the two subdivisions that would allow them to be connected together via a public street and thereby, close the railroad crossing (See **Figure 13**). The available aerial mapping indicates that a portion of an adjacent residential structure may encroach into this easement. There does appear to be enough available and vacant land in both subdivisions to shift the easement to miss the structure if necessary. It is recommended that a new public street be constructed parallel to the track, but outside of railroad right-of-way, to connect Greenbrier Drive to the adjacent Whispering Pines subdivision and close the crossing. The public street would be approximately 700 feet long and 24 feet wide. An alternative would be to install automatic warning devices (gates and flashers) at the crossing. These devices are estimated at approximately \$110,000. In the meantime, it is recommended that new crossbucks be installed at the crossing and a stop sign study be conducted.

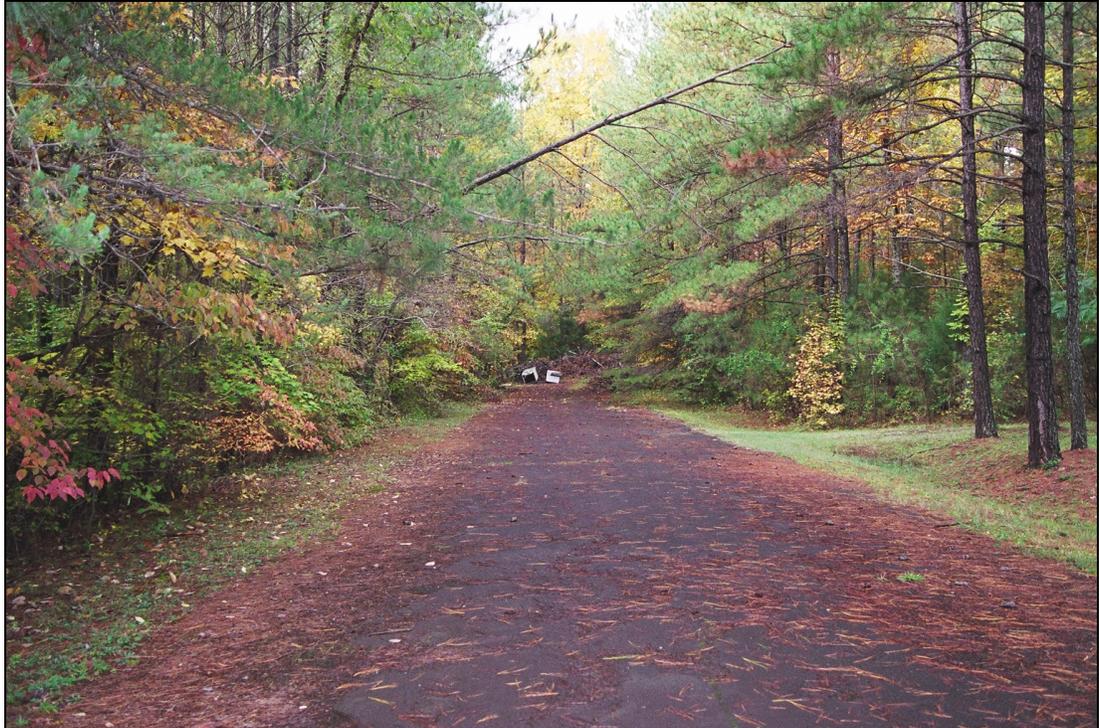


FIGURE 13 - LOCATION OF PROPOSED PUBLIC STREET CONNECTION

Near-term recommendation: Install new crossbucks and conduct a stop sign study.

Estimated cost: \$900

Long-term recommendation: Build a new public street that connects Greenbrier subdivision with the Whispering Pines subdivision and close the crossing.

Estimated Cost: \$125,000

Long-term alternative recommendation: If it is not be feasible to implement the above long-term recommendation, the crossing should receive automatic warning devices (gates and flashers).

Estimated Cost: \$110,000

3. **Crossing #735 189T/MP H 43.89/Byrdsville Road** – This crossing is unique in all of the private crossings along the NCRR in that it serves a large subdivision of permanent and mobile homes. The crossing is protected by automatic warning devices. Longer gate arms and flashers were installed September 11, 2002. The crossing also has a sign mounted on the signal mast identifying it as a “Private Vehicular Crossing” (See **Figure 14**). The approach roadway is paved and is approximately 16 feet wide. The westbound approach is curved. The crossing is slightly humped and there is heavy foliage on three of the four approaches.

Four (4) accidents have been reported at this crossing as follows:

- Killed – March 1994
- PDO – July 1995
- PDO – January 1997
- Class ‘B’ – February 1999

According to Orange County mapping, a mixture of 67 permanent and mobile homes are served by this crossing. Assigning 16 trips per day (eight in/eight out) to each residential structure yields almost 1100 crossings of the track each day. There appears to be ample vacant land allowing for the addition of many more homes. A mailbox facility located at the intersection of Byrdsville Road and US 70A has boxes for over 100 addresses. This property is surrounded on three sides by Duke University property (Duke Forest) which will most likely remain undeveloped, thereby limiting future alternative access possibilities.

There are no additional recommendations pertaining to this crossing at this time.

There is a written agreement between the NCDOT and Norfolk Southern for the installation of gates and flashers at this crossing as detailed below. However, no written agreement between NS (Southern Railway Co.) and the property owner(s) for maintenance of the crossing has been found.

The gates and flashers installed at this crossing were part of a pilot installation of automatic warning devices at a private crossing. The NCDOT Rail Division secured federal funding from the **Federal-Aid Next Generation High Speed Rail Program** to cover all costs associated with the installation of re-cycled equipment at this crossing and at the Long Beverage/Truss Builders private crossing in Wake County. The Rail Division contracted with NS to prepare the plans and install the automatic warning devices including all related control and communication equipment.

The Rail Division paid NS \$59,300 to install and activate the equipment. In addition, another \$26,780 was paid to NS as a capitalized maintenance cost for perpetual maintenance of the equipment. The capital costs compare to the cost of \$115,000 to \$125,000 for a new gate and flasher installation. Annual maintenance costs for such equipment at public crossings are jointly shared by the operating railroad and the road maintenance agency. Typically, state and local governments pay from \$1400 to \$1500 per year to the railroad for each public crossing equipped with similar devices. Under the terms of the agreement between the NCDOT and



FIGURE 14 - SIGNAL MAST WITH “PRIVATE VEHICULAR ACCESS” SIGN

NS, the railroad is responsible for all costs relating to operation and maintenance of the devices in perpetuity.

Should a new public crossing ever be constructed nearby that would allow this crossing to be closed, the agreement between the NCDOT and the NS requires the railroad or its successors to make a “best faith” effort to close the private crossing.

In discussing matters surrounding the decision to signalize a private crossing with members of the Rail Division staff responsible for implementation, the only major issue to arise was funding. The NCDOT is prohibited by law from spending state funds on private streets including private crossings of railroads. In order to move forward with this project, the Rail Division had to apply for and receive the federal funding as described above. Staff could not recall any other significant impediments to the project.

When compared to the other private crossings evaluated as part of this report, the Byrdsville crossing had a significant accident history and the potential for more train/vehicle collisions due to the volume of traffic. During field observations conducted as part of the data gathering process for this report, this crossing was utilized by more vehicles than any other crossing observed. The decision to install automatic warning devices appears to be a wise and proper use of both funds and equipment.

Near-term recommendation: None.

Long-term recommendation: None.

4. **Crossing #735 160V/MP H 41.82/Terrell's Trailer Park** – This crossing serves a +/- 10 acre tract surrounded by the NCRR right-of-way and the Duke Forest. The crossing connects to US 70A just east of Hillsborough. The crossing is protected by crossbucks. The approach roadway is gravel, approximately 10 feet wide and is steep on the southbound approach from US 70A.

There is a written agreement between NS (Southern Railway Co.) and the Orange Co. Board of Commissioners dated 11/6/1899 for the construction of a public road on railroad right-of-way at this location. This agreement is apparently still in effect for the private crossing now in place.

An accident resulting in a class 'A' injury was reported at this crossing in December 1992. Another accident resulting in property damage only occurred at this crossing in February 2002.

The trailer park is a mixture of permanent and mobile structures. Orange County mapping shows approximately four permanent structures and 12 mobile homes located on the site. Assigning 16 trips per day (8 in/8 out) to each residential structure yields an average daily crossing of the track of about 260 vehicles per day. Given that there does not appear to be any opportunities to provide alternative access to the site and that the Duke Forest property will most likely remain as is, it is recommended that the crossing be upgraded with automatic warning devices (gates and flashers).

Near-term recommendation: Install automatic warning devices with longer gate arms.

Estimated Cost: \$110,000

5. **Crossing # 735 148N/MP H 38.85/Frank E. Freeman** – This crossing provides access to a single residential structure located north of the railroad off Ben Johnson Road/SR 1144. The crossing is protected by crossbucks. The crossing roadway is gravel with the crossing itself being slightly humped. The southbound roadway approach is in a curve and all four approaches are obstructed by heavy foliage. The foliage is made up of large evergreen and deciduous trees. The railroad track is in a curved section for a considerable distance on either side of the crossing.

The parcel on which the house is located is surrounded by large undeveloped parcels of dense woodlands with no indication of pending development activities.

In that there does not appear to be a feasible alternative to access this structure, the only viable option to close the crossing is to purchase the land and structure. The Orange County tax records value the 3.93 acres of land and the structure at \$94,500. To purchase the property and relocate the owners would probably cost in the neighborhood of \$150,000. Should the crossing remain in service, it is recommended that the railroads (NCRR/NS) clear the right-of-way of sight obstructions. Also, new crossbucks should be installed and a stop sign study conducted.

Near-term recommendation: Install new crossbucks and conduct a stop sign study.

Estimated Cost: \$900

Long-term recommendation: Acquire the property and close the crossing.

Estimated Cost: \$150,000

6. **Crossing 735 147G/MP H 38.23/Andrew B. Lloyd Property** – This crossing provides access to farm land that may also double as game lands. The crossing provides access to Ben Johnson Road/SR 1144 which provides access to the I-85/US 70 Connector. The approach roadway is gravel and the crossing is slightly humped and protected by crossbucks. The railroad is in a curved section for a considerable distance both east and west of the crossing. Sight distance is obscured to some extent in all four quadrants.

The gravel driveway extends north from the crossing almost all the way to the right-of-way line of the I-85/US 70 Connector. According to information provided by the Division 7 Right-of-Way office's Senior Agent, Mr. Ritchie Tuttle, the control of access along the Connector ends south of the railroad right-of-way. Since this portion of the Connector is not under access control, Mr. Tuttle saw no impediment to the issuance of a driveway permit. Pending further review into the recorded agreement by Mr. Tuttle, it is recommended that the crossing be closed and that a new driveway be constructed to provide access to the fields from the Connector (See **Figure 15**). The new driveway connection would be well outside railroad right-of-way.



FIGURE 15 - LOCATION OF PROPOSED DRIVEWAY TO 85/70 CONNECTOR

Near-term recommendation: Build a new driveway connection to the I-85/US 70 Connector and close the crossing.

Estimated Cost: \$20,000

Near-term alternative recommendation: Railroads clear sight obstructions.

D. Alamance County

There are two crossings in Alamance County. They are further described below.

1. **Crossing #736 180K/MP H 28.58/Richard C. Roberts** – This crossing provides access to an eight acre tract of land extending from US 70 across the NCRR to McAdams Creek. The property is owned by Richard C. Roberts and wife, Linda Faye. A single mobile home is located south of the railroad on the extreme rear of the property. Access to the mobile home is via a gravel driveway approximately 10 feet wide by 1200 feet long (See **Figure 16**). There are no warning devices of any type at the crossing. However, a metal gate is mounted on the approach from US 70, but from all appearances, has not been used in some time.

There is a written agreement between NS (Southern Railway Co.) and the property owner dated 11/2/1982 for the maintenance of this crossing.

The railroad is in a curved section both east and west of the crossing and all approaches have sight obstructions caused by dense foliage including large evergreen and deciduous trees.

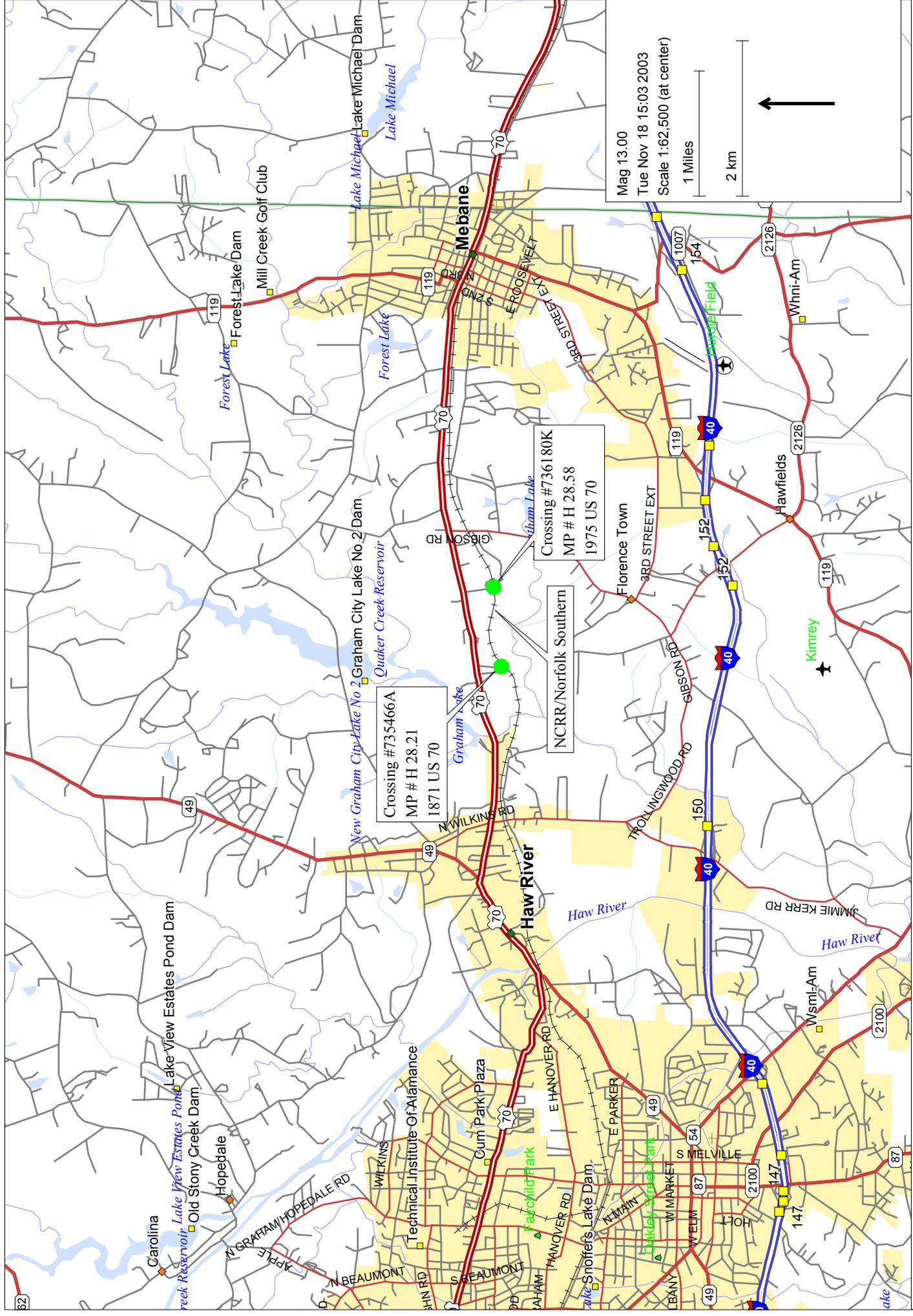


FIGURE 16 - ACCESS TO ROBERTS PROPERTY

The properties surrounding the tract in question are similar in shape and size, are mostly undeveloped and have a dense tree covering. There does not appear to be any type of development activity in the area. There does not appear to be any other feasible means to provide access to the residence. Accordingly, the only reasonable option that would allow the closure and removal of the crossing would be to purchase the property and relocate the residents. The Alamance County tax records value the land and structure at \$37,000. To purchase the property and relocate the mobile home would cost in the neighborhood of \$65,000. Should the crossing remain in service, it is recommended that the railroads clear the sight obstruction in all four quadrants at the crossing, install crossbucks and a stop sign study be conducted.

Near-term recommendation: Install crossbucks and conduct a stop sign study.
Estimated Cost: \$900

Long-term recommendation: Purchase the property and close the crossing.
Estimated cost: \$65,000



PRIVATE CROSSING SAFETY INITIATIVE - ALAMANCE CO. CROSSINGS

2. **Crossing # 735 466A/MP H 28.21/James D. Norris** – This crossing provides access to a large landlocked parcel of property south of the railroad behind a trailer park (Norris Trailer Park) that fronts on US 70. Both the trailer park and the parcel served by the crossing are owned by James D. Norris, Jr. Access to the crossing is through the trailer park property and it appears that building material from the park has been stored on the property in times past. The crossing itself is paved but the approach roadway is mostly dirt and gravel and appears to have not been used in some time. There are no crossing protection/warning devices of any kind present at this location.

The track is in a curved section both east and west of the crossing and there are sight obstructions in all four quadrants. The northbound roadway approach is on a steep grade and is heavily overgrown with weeds which further exacerbate the sight distance problem.

The tract of land which the crossing serves is surrounded on all sides except the railroad side with large, mostly undeveloped tracts of land with dense tree coverings. There does not appear to be any development activity in the area on any of the property. There do not appear to be any reasonable alternative means to access this parcel. The tract is 29.45 acres and is valued at \$98,600 according to the Alamance County tax records.

In light of the fact that the crossing is not in use at this time, it is recommended that it be removed. Should removal not be feasible, standard crossbucks should be installed and a stop sign study conducted. Long-term, it is recommended that the property be purchased and the crossing closed.

Near-term recommendation: Install crossbucks and conduct a stop sign study.
Estimated Cost: \$900

Long-term recommendation: Purchase property and close crossing.
Estimated Cost: \$125,000

E. Guilford County

There are seven crossings in Guilford County. Six of the crossings are on the NS ‘H’ Line which runs east and west from Greensboro to Raleigh and one is one the NS mainline which runs north and south from Greensboro to Charlotte. The crossings are further described below.

1. **Crossing # 904 413T/MP H 9.50/Carl C. Barber** – This crossing provides access to two residential structures, one permanent and one mobile, at 5915 Carmon Road in Gibsonville. The structures are located one behind the other and are served by a

common driveway. The crossing is paved and relatively flat. However, the approach roadway is gravel. There are no crossing protection/warning devices of any kind present.

There is a written agreement between NS (Southern Railway Co.) and the property owner dated 8/18/1981 for the maintenance of this crossing.

There are two mainline tracks at this location with the southern most track recently receiving tie and ballast replacement. The track section is straight and there is good sight distance in all four quadrants.

The property in question is surrounded by large tracts of land containing dense forests and cultivated fields. There are no signs of development activity and there do not appear to be any alternative means to access the property.

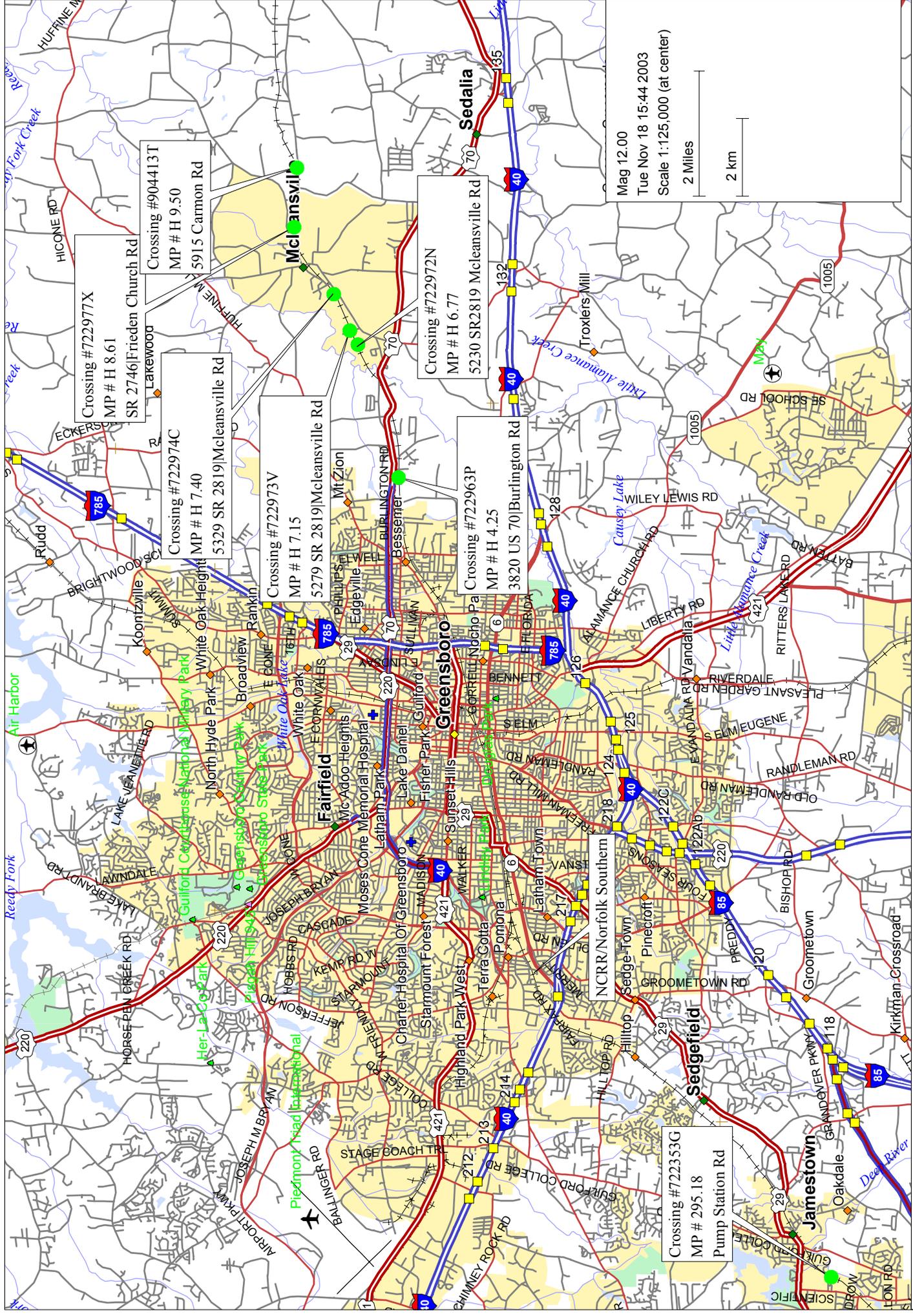
The Guilford County tax records value the two properties served by the crossing at \$106,600. The parcel with the permanent structure is valued at \$78,000 and the one with the mobile home at \$28,600. To acquire both properties and relocate the residents would cost about \$180,000.

It is recommended that crossbucks be installed at the crossing near-term. Long-term, it is recommended that the property be purchased and the crossing closed.

Near-term recommendation: Install crossbucks.
Estimated Cost: \$400

Long-term recommendation: Purchase the property and close the crossing.
Estimated Cost: \$180,000

2. **Crossing # 722 977X/MP H 8.61/Bullard & Black Farms** – This crossing provides access to two farms located south of the NCRP off Frieden Church Road/SR 2746. One farm, a 52.4 acre tract, is owned by Thomas J. and Diane C. Black. The other, a 39.84 acre tract, is owned by Eugene V. and Louise B. Bullard. Access to the crossing is provided via a recorded agreement with the owners of the property north of the railroad with frontage on SR 2746. The agreement between the property owners was recorded in 1971 and acknowledges that the “cartway” had been in existence in excess of 50 years.



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 Tue Nov 18 15:44 2003
 Scale 1:125,000 (at center)
 2 Miles
 2 km

PRIVATE CROSSING SAFETY INITIATIVE - GUILFORD CO. CROSSINGS

The crossing is paved. However, the roadway approach on both sides is gravel and both approaches are curved (See **Figure 19**). The railroad is operating two main line tracks in this location with the southern most track recently receiving tie and ballast replacement. The track is curved on both sides of the crossing and the sight distance is obscured on the northbound roadway approach in both quadrants. There are no crossing protection/warning devices of any kind in-place.

Guilford County land records show that the tracts in question are surrounded on all sides by other large farms as well as forest land with no evidence of any land development activities. There does not appear to be any reasonable means to provide alternative access. It is recommended that crossbucks be installed at the crossing and a stop sign study be conducted. In addition, it is recommended the railroads clear the right-of-way of obstructions to provide adequate sight distance.



FIGURE 19 - BULLARD & BLACK FARMS IN GUILFORD COUNTY

Long-term, consideration should be given to acquiring the property and closing the crossing. Guilford County values the Black tract at \$92,500 but it is only assessed at \$14,400 as a result of a farm deferment. The Bullard tract is valued at \$70,000 with no farm deferment.

Near-term recommendation: Install crossbucks and conduct a stop sign study.
Estimated Cost: \$900

Long-term recommendation: Purchase the property and close the crossing.
Estimated Cost: \$225,000

3. **Crossing # 722 974C/MP H 7.40/Long & Patterson** – This crossing provides access via a common driveway to two residences located north of the NCRR. The houses are located side by side on separate parcels of land and belong to a Betty Sue Long and a Judy B. Patterson. The crossing is paved, is relatively flat and protected by crossbucks. However, the approach roadway is gravel. The NS operates a single track in this area which is curved on both sides of the crossing. There is good sight distance on all four quadrant approaches.

In the discussion of crossing **722 973V** below, a frontage road is proposed to connect Northwest Tree & Stone Co. to Frieden Church Road. Building this road would place it in close proximity to the two houses served by this crossing. Long-term and if the frontage road is built, these two properties should be purchased and the crossing closed. The Guilford County tax records value the Long parcel at \$54,200 and the Patterson Parcel at \$59,600. To purchase both properties and relocate the owners would cost in the neighborhood of \$200,000.

Near-term, new crossbucks should be installed at the crossing and a stop sign study conducted.

Near-term recommendation: Install new crossbucks and conduct a stop sign study.

Estimated Cost: \$900

Long-term recommendation: Purchase properties and close crossing.

Estimated Cost: \$200,000

4. **Crossing # 722 973V/MP H 7.15/Northwest Tree & Stone Co.** – This crossing provides access to a landscaping company located north of the NCRR off McLeansville Road. The property served is in excess of 50 acres. The northbound approach to the crossing is paved while the southbound is gravel. The crossing itself is relatively flat and is protected by crossbucks. The railroad track in this segment is straight with the eastbound approach to the crossing being obscured by heavy foliage.

An accident resulting in a fatality was reported at this crossing in January 1993.

It may be feasible to construct a frontage road parallel to but outside of railroad right-of-way on the north side that would connect to Frieden Church Road at Randhurst Road to the east of the crossing herein described. Given this scenario, the crossing could be closed. The frontage road would extend approximately 2400 feet and would require the acquisition of the two properties described above served by crossing **#722 973C**.

Near-term, the railroads should clear sight obstructions at the crossing to provide adequate sight distance and a stop sign study should be conducted.

Near-term recommendation: Conduct stop sign study.

Estimated Cost: \$500

Long-term recommendation: Construct frontage road and close crossing.

Estimated Cost:

1. **Roadway Construction - \$400,000**
2. **Right-of-Way Acquisition - \$100,000 (R/W at +/- \$0.50/sq. ft.)**
3. **Total Estimated Cost - \$500,000**

5. **Crossing # 722 972N/MP H 6.77/Rankin Fryar Sand & Gravel** – This crossing serves several tracts of land totaling in excess of 120 acres +/- owned by Robert Rankin Fryar and currently operated as a sand and gravel mine and a land clearing and inert debris (LCID) landfill. Mr. Fryar and Star Environmental Services petitioned Guilford County to rezone the property and for a Special Use Permit to allow the property to be operated as a construction and demolition landfill. The Guilford County Community Development Dept. recommended approval of the request; however, the Board of County Commissioners denied the rezoning petition. Once the rezoning petition was denied, there was no longer any need to hear the request for a special use permit.

In a telephone discussion with Mr. Robert Fryar on April 15, 2003, he reports that he will cease the mining operations at the site later this year as it will no longer be economically feasible. He estimates that there is 50-60 years of capacity at the site if it continues to be operated as an LCID landfill. Mr. Fryar estimates that due to the decreased mining operations, the number of truck trips per day is averaging about 40 as compared to the 65 or so reported in the September 2002 traffic report prepared by Wilbur Smith and Assoc. Mr. Fryar also reported that he is stationing a person at the crossing at such times as the *Piedmont* and *Carolinian* passengers trains are passing to assure that proper crossing techniques are observed by the various truck drivers that access the site.

In a conversation with Mr. Roger Davis of Star Environmental Services, Inc. also on April 15, 2003, Mr. Davis stated that they anticipate again petitioning the Guilford Board of County Commissioners within 30-90 days for the required rezoning and Special Use Permit to allow for the operation of a Construction and Demolition Debris (C & DD) landfill. Mr. Davis stated that Star will meet the additional conditions described by the Board in the denial of the previous petition. He also stated that Star is committed to building an overpass of the railroad in accordance with the agreement with NCRP once the proper permits are received and prior to beginning the C & DD landfill operations.

In the meantime, Mr. Fryar will continue to operate the site as a mine and LCID landfill.

In a follow-up conversation with the Guilford County Planning Director on October 2, 2003, he indicated that the rezoning petition had not been refilled as of that date.

The roadway approaching the crossing is paved and is approximately 30 feet wide. The crossing is flat and is protected by crossbucks and standard stop signs mounted on the left-hand (wrong) side of the road at each approach. The track in this segment is straight with sight obstructions in both the southwest and northeast quadrants caused by embankments and heavy foliage. The mining/land filling operation in the northwest quadrant is creating a future sight obstruction.

Given that the current conditions at the site are expected to remain essentially the same until such time as the overpass is constructed and no train/vehicle crashes have been reported, it is recommended that the existing crossbucks be replaced with the new standard crossbucks and that the stop signs be mounted in accordance with the MUTCD.

Near-term Recommendation: Install new crossbucks and reinstall stop signs in accordance with MUTCD standards.

Estimated Cost: \$475

Long-Term Recommendation: Monitor site for changes in land use and the commitments associated therewith.



FIGURE 20 - ACCESS TO RANKIN FRYAR LCID LANDFILL IN GUILFORD CO.

6. **Crossing 722 963P/MP H 4.25/Thomas & Howard, Inc.** – This crossing serves a former food distribution company and another warehouse operation located south of the track. The Thomas & Howard warehouse, which is on the east side of the road, also has a driveway directly connecting to Maxfield Road to the east (see **Figure 21 on page 48**). Maxfield Road (crossing #722 964W) is a public street protected by gates and flashers at the railroad crossing.

There is a written agreement between NS (Southern Railway Co.) and the property owner dated 4/16/1974 for the maintenance of this crossing.

An accident resulting in property damage only was reported at this crossing in June 1993.

The approach roadway is paved on both sides of the crossing and the crossing itself is relatively flat. The crossing is protected with crossbucks and non-standard stop signs (red lettering on a white background). There is a supplemental sign below the stop sign that warns of high-speed trains. Sight distance is obscured in the southwest quadrant by heavy foliage and in the northeast quadrant by parked vehicles.

The Thomas & Howard operation has a rail siding and a loading dock for approximately 12 tractor/trailers. Additional on-site parking can accommodate another +/- 20 tractor/trailers. The warehouse on the west side of the road, while large, does not appear to be served by tractor/trailer operations.

Based on Guilford County mapping, it appears feasible to construct another driveway to the rear of the Thomas & Howard property to connect the warehouse and non-tractor/trailer access to Maxfield Road. The driveway would be approximately 12 feet wide and 800 feet long and would be well outside of railroad right-of-way. Truck access to Thomas & Howard would continue to use the existing driveway to Maxfield Road (see **Figure 21**).

A Traffic Separation Study currently underway for the public grade crossings in eastern Guilford Count has identified the Maxfield Road crossing for possible future closure when a connecting roadway to the south is constructed.

Near-term, it is recommended that an additional driveway be constructed to allow all traffic to utilize Maxfield Road. This would allow the crossing to be closed. If the additional driveway cannot be constructed, the alternative recommendation is to install automatic warning devices at the crossing. Should the Maxfield Road grade crossing ultimately be closed, this recommendation is still valid in that the Thomas & Howard property will still be able to access US 70 via the new connecting road.



FIGURE 21 - THOMAS & HOWARD ACCESS TO MAXFIELD ROAD

Near-term recommendation: Construct additional driveway and close the crossing.

Estimated Cost: \$40,000

Near-term alternative recommendation: Install automatic warning devices.
Estimated Cost: \$110,000

NOTE: All crossings evaluated from this point on are located along the NS mainline from Greensboro to Charlotte. The railroad is considered to run north and south and all directional references will be made accordingly.

7. **Crossing 722 353G/MP 295.18/City of High Point** – This crossing provides access to a City of High Point water pumping station adjacent Deep River. Access to the pump station and the railroad crossing is controlled by a 6-foot chain link fence with a locked gate. The crossing itself is located along a straight section of track, is relatively flat and is protected by crossbucks. Sight distance is obscured on all four approaches by heavy foliage. The City of High Point reports that the pump station is unmanned, but Utility Department employees visit the site 10-12 times per week for preventative maintenance purposes. The City also reports that there has never been an accident at the crossing and that all of their employees are keenly aware of the railroad and the dangers therein.

There is a written agreement between NS (Southern Railway Co.) and the City of High Point dated 3/30/1987 for the maintenance of this crossing.

Given the controlled situation that exists at the crossing as well as the fact that all vehicles allowed to cross the track belong to the City of High Point and are operated by employees familiar with the crossing, the only recommended safety enhancements at the crossing is that the railroads should clear the right-of-way of obstructions to provide adequate sight distance on all approaches.

Near-term recommendation: The City of High Point should coordinate with the NCR/NS to clear sight obstructions.

F. Davidson County

There are four crossings located in Davidson County. The crossings are further described below.

1. **Crossing # 904 230A/MP 303.95/206 Albertson Road/NS Maintenance Access** – This crossing is gated and locked and is used by Norfolk Southern to access a signal bridge for maintenance purposes. The signal bridge is located about ½ miles south of the access point. The gate is provided on the eastbound approach only. On the east side of the crossing, a residential subdivision is separated from the track by a fence.

Given the fact that this crossing is used exclusively by NS personnel and access is restricted, no improvements or modifications are recommended.

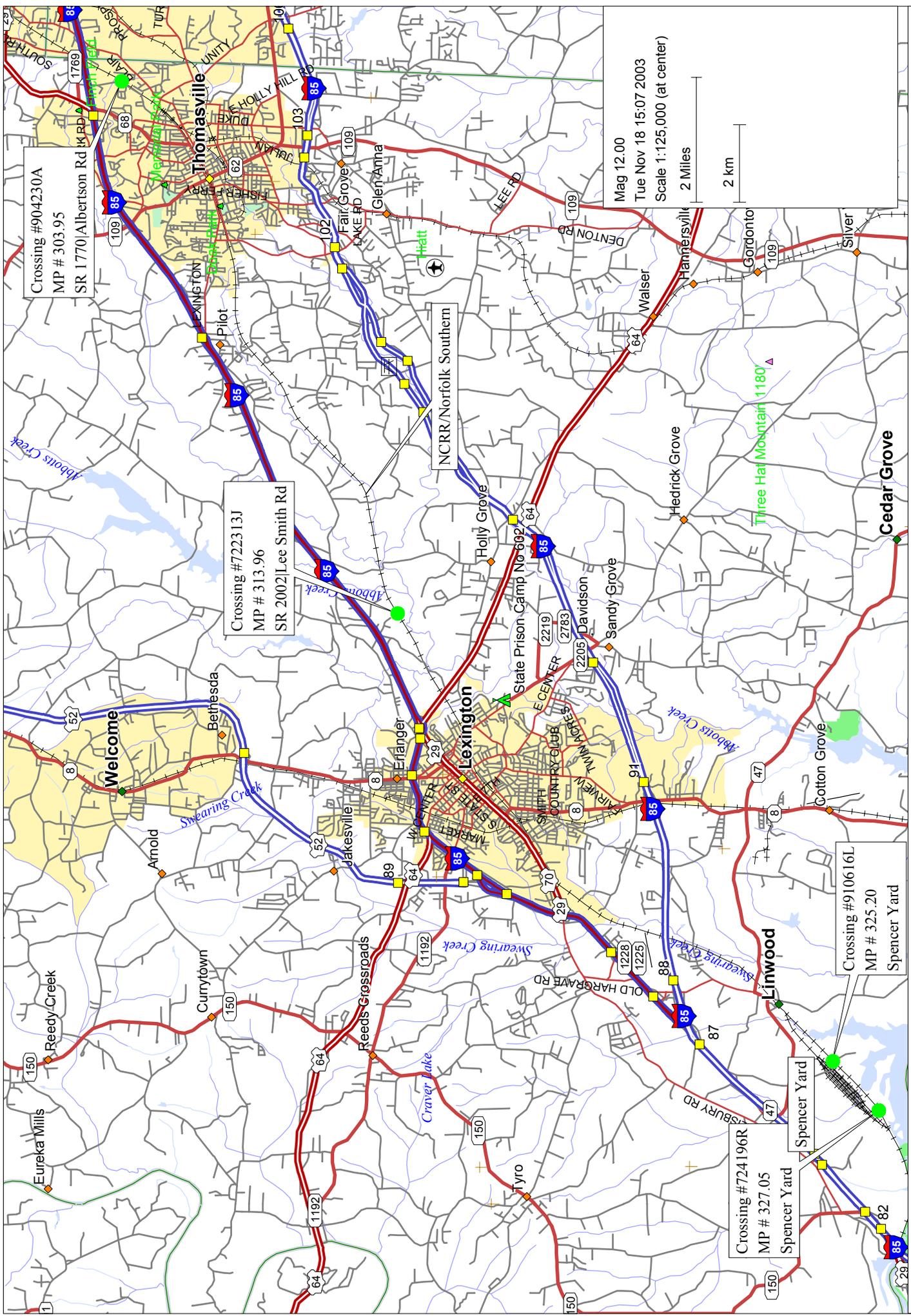
Near-term recommendation: None.

2. **Crossing # 722 313J/MP 313.96/Randall T. Byerly/NS Maintenance Access –**
This crossing provides access to a 75 acre +/- tract of land located east of the NCRR and accessed from the west via SR 2002. It also appears that the crossing is used by NS to maintain railroad signal equipment. Access to the crossing is locked and gated at the end of maintenance on SR 2002 on the west side of the track.

The crossing is paved and flat while the approach roadway is gravel and approximately 10 feet wide. The crossing is protected by crossbucks on both approaches with a standard stop sign also posted on the westbound approach. The roadway appears to be well-used. However, there are no structures visible on Davidson County aerial mapping that could be served by the road. That same mapping shows that the tract of land in question is surrounded by large tracts of heavily wooded land. No structures or farm lands are visible.

Given the restricted access to this crossing, no improvements or modifications are recommended.

Near-term recommendation: None.



Crossing #904230A
MP # 303.95
SR 1770/Albertson Rd

Crossing #722313J
MP # 313.96
SR 2002/Lee Smith Rd

Crossing #910616L
MP # 325.20
Spencer Yard

Crossing #724196R
MP # 327.05
Spencer Yard

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Tue Nov 18 15:07 2003
Scale 1:125,000 (at center)
2 Miles
2 km

PRIVATE CROSSING SAFETY INITIATIVE - DAVIDSON CO. CROSSINGS

3. **Crossing # 910 616L/MP 325.20/NC Wildlife Commission** – This crossing provides access to a gameland preserve located east of the NCR and accessed through NS’s Spencer Yard. The gamelands are surrounded by the waters of High Rock Lake and are also accessible by boat under normal rainfall conditions. A sign located at the crossing prohibits vehicle access and encourages foot traffic (See **Figure 23**). The crossing is paved. However, a gravel road approximately 10 feet wide is used by a local farmer to access crops planted on the gameland property. That farmer, Mr. Ed Begley, reports that the gamelands are used primarily in the fall for dove and deer hunting.



FIGURE 23 - GAMELANDS ACCESS IN DAVIDSON COUNTY

There are two mainline tracks along this segment with fair sight distance, especially for train crews. Other than the gameland signing described above, there are no crossing protection devices of any kind in place.

Given the restricted use and access to this crossing, it is recommended that standard crossbucks be installed on both roadway approaches.

Near-term recommendation: Install crossbucks and advise NCR and regarding wording on the sign pertaining to foot traffic.

Estimated Cost: \$400

4. **Crossing # 722 196R/MP 327.05/Yadkin, Inc., Pittsburg, PA** – this crossing provides access to several tracts of undeveloped and landlocked property east of NS’s Spencer Yard and abutting the Yadkin River. It also provides access to several Duke Power transmission towers. The only access to the crossing is through Spencer Yard.

There are two mainline tracks in operation at this location with the track in a curve both north and south of the crossing. Sight distance is poor on the roadway approaches due to the fact that the railroad is in a cut and there is heavy foliage on the east side of the tracks. The crossing is paved while the approach roadway is gravel and approximately 10 feet wide. The approach roadway, east of the crossing, appears not to have been used in some time. There are no crossing protection devices of any kind located at the crossing.

Given the apparent limited use of this crossing and the fact that access is controlled through Spencer Yard, it is recommended that standard crossbucks be installed on both roadway approaches.

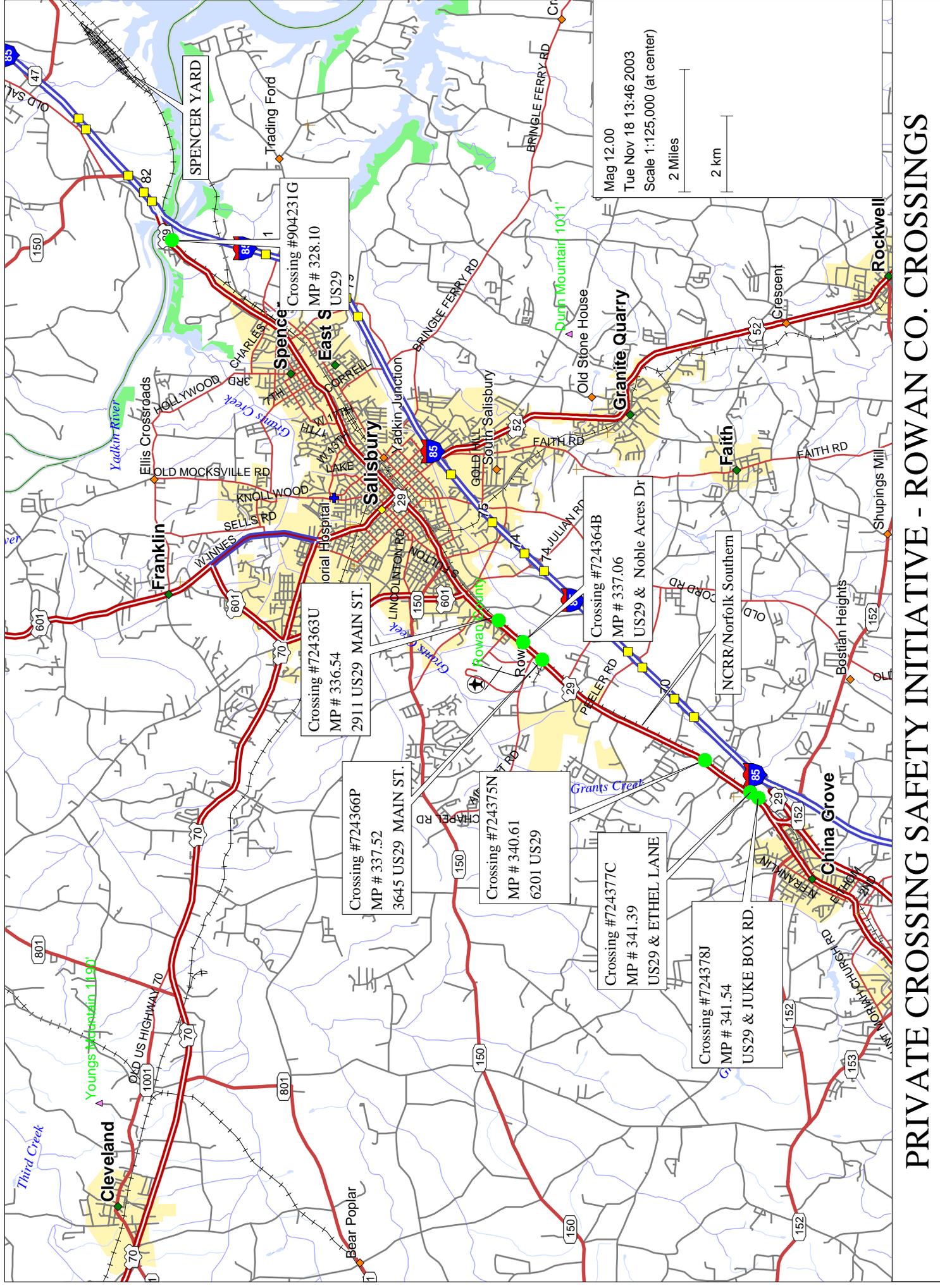
Near-term recommendation: Install crossbucks.
Estimated Cost: \$400

G. Rowan County

There are seven crossings in Rowan County. The crossings are further described below.

1. **Crossing # 904 231G/MP 328.10/NC Finishing Plant** – This crossing provides access to an abandoned sewage treatment plant that formerly served the now closed North Carolina Finishing Plant located on the west side of US 29 just south of the Yadkin River. There are four tracks at this crossing including two mainline tracks and two sidings. The crossing is paved. However, the approach roadway is a combination of gravel and deteriorating asphalt approximately 10 feet wide. The crossing is protected by crossbucks. The mainline tracks are in a curved section both north and south of the crossing. There is fair sight distance on all four approaches.

Given the fact that the sewage treatment plant is no longer in operation, it is recommended that the crossing be gated and locked. Should the finishing plant reopen at some future date, and should it be necessary to re-activate the treatment plant, then an appropriate treatment of the crossing would be determined at that time.



PRIVATE CROSSING SAFETY INITIATIVE - ROWAN CO. CROSSINGS

Near-term recommendation: Install gate and lock.

Estimated Cost: \$750

Long-term recommendation: The crossing should be re-evaluated for appropriate safety devices should operations resume at the industrial plant.

2. **Crossing # 724 363U/MP 336.54/Ms. W. Pat Sloop** – This crossing provides access to a single-family residence and farm of about 50 acres located at 2011 US 29 in Salisbury and east of the NCCR. The property is owned by Mrs. W. Pat Sloop. The crossing is flat and is located along a straight segment of track with two mainlines. The roadway is paved on the eastbound approach but is gravel on the westbound side, is approximately eight feet wide and protected by crossbucks. Sight distance is fair on the south and westbound approaches but is obscured by foliage on the east and northbound approaches.

A review of Rowan County land records indicates that it may be feasible to construct alternative access to the property via Henderson Grove Church Road. This would require the construction of a new driveway across adjacent farm land to the east of the property in question. A new driveway approximately 1400 feet long would be required and a 20-foot driveway easement across about 500 feet of adjacent property would be required. Near-term, it is recommended that the crossing receive new crossbucks, a stop sign study be conducted and that the railroads clear the right-of-way of all obstructions that create sight distance problems.

Long-term, alternative access to Henderson Grove Church Road should be constructed.

Near-term recommendation: Install new crossbucks and conduct a stop sign study.

Estimated Cost: \$900

Long-term recommendation: Acquire driveway easement and construct new driveway into Henderson Grove Church Road.

Estimated Cost: \$40,000 (including easement)

3. **Crossing # 724 364B/MP 337.06/A. & Q. Chunn** – This crossing serves what appears to be a platted but relatively undeveloped subdivision off US 29 south of Salisbury. Land records indicate the property is owned by Angeline and Quezryth Chunn. The total acreage is 5.76 and the assessed value is approximately \$40,000.

The crossing is located along a straight segment of track where NS operates two mainlines. The crossing itself is relatively flat. However, the eastbound approach roadway is steep. The roadway is a mixture of asphalt and gravel, is approximately

8 feet wide and poorly maintained. Sight distance on the railroad approaches is good but poor on the roadway approaches. The crossing is protected by crossbucks.

An abandoned house is located on the east side of the crossing to which access is prevented by a locked gate across the road. The gate is located on the east side of the tracks and does not prevent access to the crossing from US 29.

A review of county land records does not indicate that feasible alternative access to the property is available. There are no public streets nearby and access to the rear to/from Henderson Grove Church Road is restricted by Town Creek.

Given the apparent lack of use of the crossing it should be removed; however, it may not be feasible to do so. It is recommended, therefore, that a gate and lock be installed on the west side (US 29 side) of the crossing.

Long-term, consideration should be given to purchasing the property and closing the crossing.

Near-term recommendation: Install new gate/lock assembly to the west side of the track.

Estimated Cost: \$750

Long-term recommendation: Purchase the property and close the crossing.

Estimated Cost: \$50,000

4. **Crossing # 724 366P/MP 337.52/Reid Farm Road** – This crossing provides access to five tracts of land (Orbison Family) located at 3629 S. Main Street/US 29 in Salisbury. One of the parcels has a mobile home on it and one (the larger of the five at approximately four acres) has a barn and other outbuildings. The other three parcels are vacant.

The crossing is flat and is located along a straight section of track with only one mainline. The roadway is gravel, about 10 feet in width, and appears to be well maintained. Sight distance is obscured in all four quadrants by weeds and bushes. The crossing is protected by a single crossbuck on the eastbound approach. On the westbound side, the crossbuck post is in place; however, the crossbuck is missing.

A review of county land records does not indicate that feasible alternative access to the property served is available. On the north and south sides of the land in question are large tracts of undeveloped land and to the rear of the property, Martin Marietta operates an aggregate facility. It is recommended that the railroads clear the right-of-way of obstructions to provide adequate sight distance, that new crossbucks be installed and that a stop sign study be conducted.

Near-term recommendation: Install new crossbucks and conduct a stop sign study.

Estimated Cost: \$900

5. **Crossing # 724 375N/MP 340.61/Kluttz Property** – This crossing serves a 69 acre tract of land located at 6250 S. Main Street/US 29 in Salisbury. The property is owned by Robert R. Kluttz and Wife. A portion of the property appears to have been in cultivation at some time in the past while the remainder is in woodlands. The crossing is relatively flat and occurs along a straight segment of track where NS operates only one mainline. Just to the north of the crossing, a siding turns out to a large brick yard and kiln.

The approach roadway is gravel approximately 10 feet wide, is poorly maintained and does not appear to be in use. On the east side of the track, a cable is stretched across the road. The crossing is protected by crossbucks. Sight distance is obscured by large trees in all quadrants except the northeast.

County land records show a residential subdivision abutting the property in question on the south side. This subdivision connects to Mt. Hope Church Road, a public street which crosses the railroad (crossing #724 376V) and is protected by gates and flashers. Should the Kluttz property develop as residential, it appears feasible to connect it to Mt. Hope Church Road via Moon Circle which serves the existing subdivision. The lots where Moon Circle is the closest to the Kluttz property are vacant and a connecting roadway could be constructed.

Given the crossing is not in use at this time and there is no apparent activity on the property served, it is recommended that the crossing be gated and locked on the US 29 side (west side) of the railroad. Should a proposal to develop the land be presented at some future date, all efforts should be made to connect the property to an existing public street(s).

Near-term recommendation: Install gate and lock.

Estimated Cost: \$750

Long-term recommendation: Connect property to existing or proposed public streets east of the railroad and close the crossing.

6. **Crossing # 724 377C/MP 341.39/Ethel Lane** – This crossing provides access to US 29/N. Main Street in China Grove for several residential parcels located east of the NCR. County aerial mapping shows there are currently seven residential structures served by the crossing and a frontage road that extends north and south along the track from the crossing. This frontage road is inside railroad right-of-way. The crossing is humped with a gravel roadway on the US 29 side but is paved on the east side (See **Figure 25**). The roadway is approximately eight feet wide and is protected by crossbucks.

An accident resulting in a class 'B' injury was reported at this crossing in June 1994.

County land records show that there are 17 parcels of land that potentially could be served by this crossing. Several of the parcels are landlocked at this time and additional roadway or driveways will have to be constructed to provide the necessary access. To the rear of the 17 parcels, several other properties have access to the service road along I-85. The service road then connects to Mt. Hope Church Road, the nearest public crossing (# 724 376V) of the railroad, which is approximately 0.4 miles north of the Ethel Lane crossing. To the south of the Ethel Lane crossing, Juke Box Road, another private crossing, is located at MP 341.54, or 0.15 miles away.

Given the potential for the undeveloped parcels to develop over time, the situation at the Ethel Lane crossing will only exacerbate as more daily vehicle crossings occur. It appears from the County mapping, that it is possible to construct a new roadway that would connect from the frontage road parallel to the railroad to the I-85 service road. The new access roadway could be constructed down the property line that separates one large undeveloped parcel from six other parcels, two of which are developed. It could then be extended across the corner of another undeveloped parcel to connect to the I-85 service road. The total length of roadway/driveway required would be about 2000 linear feet. In addition, the frontage road that parallels the railroad could be extended southerly to access the two properties served by the Juke Box Road crossing (# 723 378J). This extension would require approximately 400 feet of roadway construction. Construction of these new roadways would allow for the closure of both the Ethel Lane and Juke Box Road crossings.



FIGURE 25 - ETHEL LANE IN ROWAN COUNTY

Long-term, it is recommended that a new roadway/driveway be constructed from Ethel Lane to the I-85 service road and that the existing railroad frontage road be

extended southerly to serve the two properties now accessed by Juke Box Road. There is adequate open land available to allow for the frontage road to be extended outside of the 200-foot NCRR right-of-way.

Near-term, it is recommended that a stop sign study be conducted.

The long-term cost estimate provided below assumes no cost for right-of-way to construct the new roadway or the frontage road. This assumption is based upon the fact that all property values will be enhanced by the construction of the public access. The width of the proposed public right-of-way is assumed to be 50 feet.

Near-term recommendation: Conduct stop sign study.
Estimated Cost: \$500

Long-term recommendation: Build a new public street connection to the I-85 frontage road and extend the existing frontage road south to serve the properties now accessed by the Juke Box Road crossing (# 724 378J).

Estimated Cost:

1. New roadway/driveway - \$100,000
2. Frontage road extension - \$20,000

7. **Crossing # 724 378J/MP 341.54/Juke Box Road** – This crossing provides access to US 29 for two properties lying east of the NCRR. One parcel of about 3 acres located at 1726 N. Main Street in China Grove and belonging to Ruth S. and John M. Shoe, has a residential structure located on it. The other parcel, which is approximately 10 acres, is located at 1722 N. Main Street, belongs to Leigh B. Poteat and is vacant.

The crossing is located along a straight section of single track. The crossing itself is flat and is protected by crossbucks. The approach roadway is gravel approximately eight feet wide. Sight distance is obscured in all four quadrants by either foliage or buildings.

The parcels in question are surrounded by large tracts of undeveloped or underdeveloped land. Some of these tracts abut the I-85 right-of-way. As discussed immediately above under crossing # 724 377C, the most feasible alternative to this private crossing is to build a new roadway/driveway connecting to the I-85 frontage road and extend the existing frontage road parallel to the track to connect to the Shoe and Poteat properties. The cost to extend the frontage road is shown above under crossing # 724 377C. It is recommended that the frontage road be extended and crossing # 724 378J be closed. In the meantime, it is recommended that a stop sign study be conducted. It is also recommended that the railroads clear the right-of-way of sight distance obstructions.

*Note: there is a garage in the northwest quadrant of the crossing (see **Figure 4 on page 8**) that encroaches into the railroad right-of-way and contributes to the sight*

obstruction problem. This garage will need to be removed in order to clear the obstruction.

Near-term recommendation: Conduct stop sign study.

Estimated Cost: \$500

Long-term recommendation: Extend frontage road as discussed above under crossing # 724 377C and close crossing.

Estimated Cost: see Ethel Lane long-term cost estimate immediately above.

H. Cabarrus County

There are three crossings in Cabarrus County. The crossings are further described below.

1. **Crossing # 715 322R/MP 358.08/NS Maintenance Access** – This crossing provides access to a signal bridge located just north of the crossing. Access to the crossing is at the end of Barbee Road in Concord (See **Figure 26 below**). The right-of-way for Barbee Road, which serves several residential structures, intersects with the NCRR right-of-way. To access the crossing, maintenance vehicles continue down a gravel driveway at the end of the paved section of Barbee Road. This driveway passes two occupied structures.

There are no warning devices of any kind in place at the crossing and there is nothing to prevent private vehicles from driving onto the crossing. Given that the crossing is required by NS for maintenance purposes, it is recommended that a gate with lock (key to NS only) be installed on the west side of the crossing to restrict non railroad-owned vehicles from the crossing.



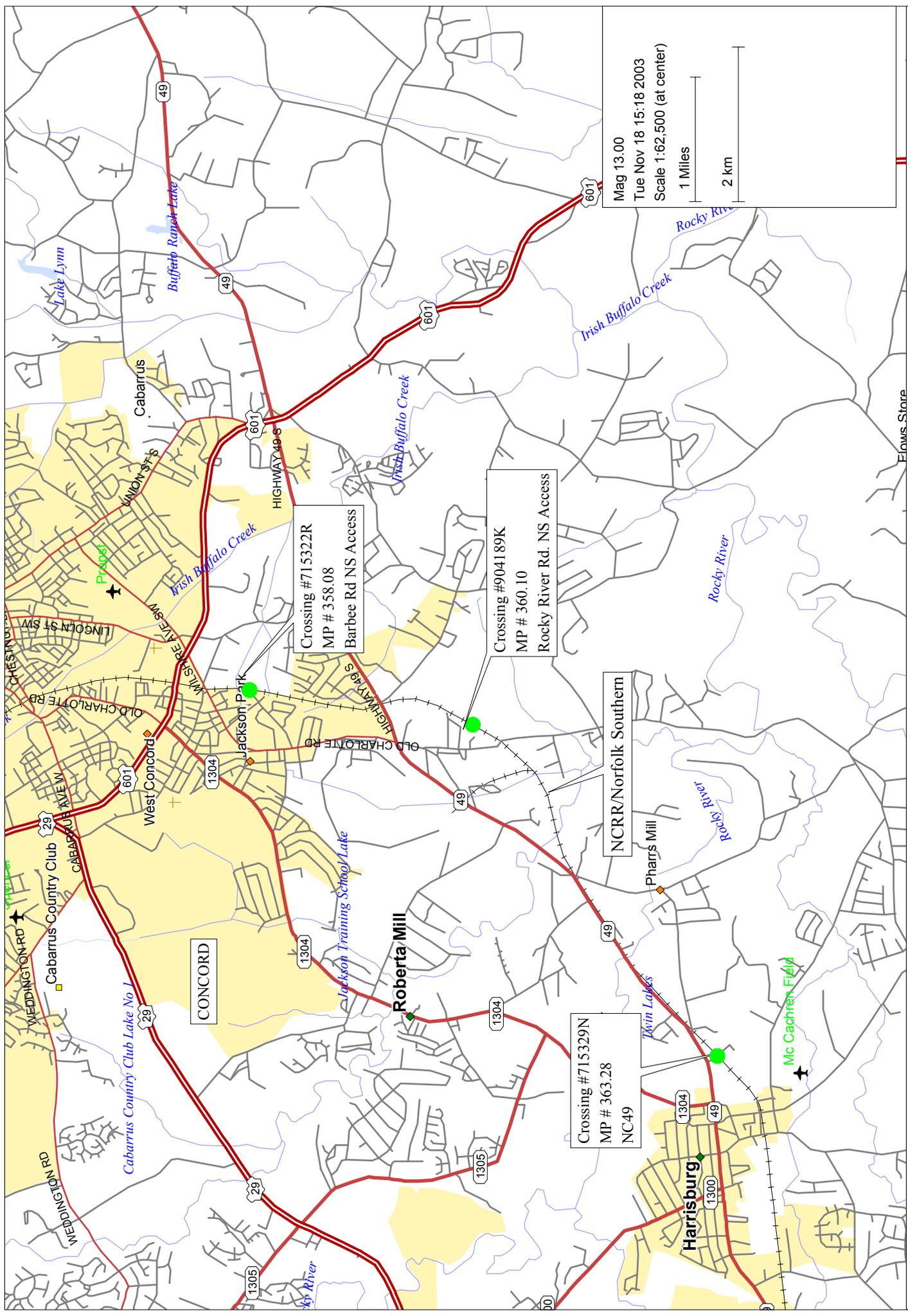
FIGURE 26 - NS ACCESS AT END OF BARBEE ROAD IN CABARRUS CO.

Near-term recommendation: Install gate and lock (key to RR personnel only)
Estimated Cost: \$750

2. **Crossing # 904 189K/MP 360.10/NS Maintenance Access** – This crossing is used by NS to access a wheel flange lubricator, a signal bridge and other signal equipment just north of the Rocky River Road overpass. Access to the crossing is via an obscured gravel driveway beside an abandoned farm house. The driveway approaches the crossing from the east. Access to the crossing from the west is blocked by a farm fence. There are no crossing protection devices of any kind in place.

Although the driveway to the crossing is hard to find, there is nothing in place to prevent vehicles from driving onto the crossing. It is recommended that a gate with lock be installed at the right-of-way on the east side to prevent access to the crossing for all but NS personnel.

Near-term recommendation: Install gate and lock (key to RR personnel only)
Estimated cost: \$750



Mag 13.00
 Tue Nov 18 15:18 2003
 Scale 1:62,500 (at center)

1 Miles
 2 km

Crossing #715322R
 MP # 358.08
 Barbee Rd NS Access

Crossing #904189K
 MP # 360.10
 Rocky River Rd. NS Access

Crossing #715329N
 MP # 363.28
 NC49

PRIVATE CROSSING SAFETY INITIATIVE - CABARRUS CO. CROSSINGS

3. **Crossing # 715 329N/MP 363.28/Gladys H. Doster** – This crossing provides access to/from NC 49 for a 14 acre +/- tract of land that has been subdivided into one large tract of 12+ acres and two smaller tracts of less than one acre each. There are four residential structures located on the three tracts. The property is surrounded by the NCRR on the west, a large residential/farm tract to the north and the Harrisburg elementary school on the south and east. The closest public street is Stallings Road, which is to the rear of the property in front of the school.

The crossing is relatively flat and is protected by crossbucks. There is a single track along this segment which is straight for a considerable distance on both sides of the crossing. Sight distance is obscured on all approaches by either embankment or foliage or both.

An ideal time to have provided alternative access to this property was during the planning for the new school. However, the option of providing a driveway to Stallings Road serving all three tracts of land is still open. The property to the immediate north of the properties in question is undeveloped. A driveway of approximately 1000 feet in length would be required plus a permanent access easement. It is recommended that a driveway approximately 12 feet wide by 1000 feet long be constructed from the Doster property to Stallings Road along the property line of the parcel to the immediate north adjacent to the school. This new driveway would be outside of NCRR right-of-way. In the meantime, new crossbucks should be installed on both roadway approaches to the crossing and a stop sign study conducted.

Near-term recommendation: Install crossbucks and conduct a stop sign study
Estimated Cost: \$900

Long-term recommendation: Construct new driveway to Stallings Road.
Estimated Cost: \$40,000 (including right-of-way)

I. Mecklenburg County

There are seven crossings in Mecklenburg County. The crossings are further described below.

1. **Crossing # 917 037B/MP 365.90/City of Charlotte** – This crossing provides access to the Charlotte Mecklenburg Utilities Back Creek Lift Station located off NC 49 near the Cabarrus County line. Access to the crossing from NC 49, which parallels the NCRR to the west, is restricted by a 6-foot chain-link fence with a locked gate. The crossing is relatively flat and is protected by crossbucks and standard stop signs on both roadway approaches. NS operates a single track in this location which is curved on both sides of the crossing. Sight distance is obscured on all approaches by heavy foliage.

There is a written agreement between NS (Southern Railway Co.) and the City of Charlotte dated 8/20/1991 for the maintenance of this crossing.

A representative of the Utility Department reports that maintenance staff visits the lift station on the average once a week to assure proper operation. No other activities occur at the station such as storage of construction materials.

In light of the limited usage of the crossing and the restricted access, there are no recommended improvements or modifications.

An option that could allow for the closure of this crossing is discussed following the discussion pertaining to crossing # **715 338M** below.

Near-term recommendation: None.

Long-term recommendation: See crossing #**715 338M** below.

2. **Crossing # 715 335S/MP 366.29/Duke Power Co.** – This crossing provides access to/from NC 49 to a Duke Power Co. substation and storage yard located on a 100 acre tract. Access to the site and the crossing is restricted by a locked gate on the west side of the crossing just off NC 49. The crossing itself is relatively flat, occurs along a straight section of single track and is protected by crossbucks. Just north of the crossing, a siding turns out to the Duke site for railcar delivery. Sight distance is obscured on all four approaches by foliage.

In light of the limited usage of the crossing and the restricted access, there are no recommended improvements or modifications.

An option that could allow for the closure of this crossing is discussed following the discussion pertaining to crossing # **715 338M** below.

Near-term recommendation: None.

Long-term recommendation: See crossing # **715 338M** below.

3. **Crossing # 715 336Y/MP 366.61/Mozingo Farm** – This crossing provides access to approximately 34 acres owned by Hugh L. Mozingo, Jr. doing business as Char-Meck Enterprises. The property is currently in use as farm land. The crossing provides access to NC 49 for the farm which is located east of the track. The crossing is slightly humped; is located along a curved segment of single track and protected by crossbucks. Sight distance is obscured by foliage on the eastbound road approach. This property abuts the Duke Power tract to the north, another large farm to the south and I-485 to the rear.

An accident involving property damage only occurred at this crossing in July 2002.

It is recommended that the crossing receive new crossbucks and that a stop sign study be conducted. Long-term, a future option that could allow for closure of this crossing is discussed following the discussion pertaining to crossing # 715 338M.

Near-term recommendation: Install crossbucks and conduct a stop sign study.
Estimated Cost: \$900

Long-term recommendation: See crossing # 715 338M below.

4. **Crossing # 715 338M/MP 367.00/Stroup Farm** – This crossing serves a 57 acre tract of land belonging to John B. Stroup and wife and a 2 acre tract belonging to John B. Stroup, Jr. and wife. The crossing was moved to its present location as part of the construction of I-485 by the NCDOT. Automatic warning devices (longer gate arms and flashers, see **Figure 5 on page 9**), were installed (07/18/1996) as part of the project. The crossing is maintained by the NCDOT as a result of negotiations with the landowner for the required I-485 right-of-way, and although the crossing is considered to be a public access road, it is not part of the State Highway System.

There is a written agreement between Norfolk Southern and the NCDOT dated 11/18/1994 for the maintenance of this crossing.

The crossing is located along a straight section of single track, is relatively flat and is paved approximately 20 feet wide. Railroad pavement markings are in place on the eastbound approach. Sight distance is good on all four approaches.

There are no recommended improvements or modifications to the crossing.

Near-term recommendation: None.

Future Option

There has been a considerable amount of discussion between land owners and developers in the area from the Stroup Farm crossing all the way to the Back Creek Pump Station crossing. Several months ago Gannett Fleming developed concept plans to provide a grade separation of the NCR/NS in the vicinity of the new

crossing which serves the Back Creek Pump Station near the Cabarrus County line at approximately **MP 366**. The new roadway would intersect NC 49 opposite the entrance to Carolina Memorial Park. It was determined that a grade separation project was feasible in this area due to the fact that the railroad begins to curve away from NC 49 near the Duke Power substation (See **Figure 29**). When it reaches the area of the proposed overpass, it is about 850 feet east of NC 49. The estimated cost for the project, including about 3500 feet of new roadway, is \$4.8 million in today's dollars.



FIGURE 29 - LOCATION OF PROPOSED FRONTAGE ROAD

Long-term recommendation:

1. Construct a new railroad overpass in the vicinity of the Charlotte-Mecklenburg Utilities crossing;
2. Build a frontage road outside of NCRR right-of-way south to crossing **715 338M at MP 367.00**; and,
3. Close four affected private crossings:
 - The Charlotte-Mecklenburg Utilities crossing at **MP 365.90**;
 - The Duke Power crossing at **MP 366.29**;
 - The Mozingo Farm crossing at **MP 366.61**; and,
 - The Stoup Farm crossing at **MP 367.00**.

Estimated Cost: \$5,000,000 + depending on private participation.

5. **Crossing # 715 340N/MP 368.08/Merryhue Farms** – This crossing provides access to 109 acre +/- tract of land currently being farmed. The farm is known as

Merryhue Farms and is operated by Hugh C. Harris and wife. The crossing provides access to the farm from Old Concord Road and is located along a curved section of track with a siding located on the west side of the mainline. The crossing is relatively flat and is protected by crossbucks. The approach roadway is gravel and there is a significant sight obstruction in the northeast quadrant caused by heavy foliage and large trees.



FIGURE 30 - FUTURE ACCESS TO MERRYHUE FARM PROPERTY

The site is bordered on both the north and south sides by large residential subdivisions. The Charlotte-Mecklenburg Land Use Plan calls for the Merryhue Farms property to be connected to these two subdivisions (See **Figure 30**) as part of the land development process and for the crossing to be closed. The property has been sold to Portrait Homes which has petitioned the Charlotte City Council for the rezoning necessary to convert the farm land into a residential neighborhood. The rezoning petition was approved by the Council on March 18, 2003.

Pending the future redevelopment of the property, it is recommended that the crossing receive new crossbucks and a stop sign study conducted.

Near-term recommendation: Install crossbucks and conduct a stop sign study.
Estimated Cost: \$900

Long-term recommendation: Close the crossing following the construction of alternative access by the private sector.

6. **Crossing # 715 344R/MP 369.92/8400 Old Concord Road** – This crossing provides access to seven residential properties and a nursery/landscaping operation fronting the NCCR/NS in the Newell community. All of the properties are further

accessed by a dirt/gravel frontage road that parallels the track inside the NCRR right-of-way. One of the properties, a residence owned by Ann S. Taylor, is designated as historic. Previously there were two private crossings serving these properties, however the NCRR/NS removed one of them several years ago.

Accidents were reported at this crossing as follows:

- Class B – September 1993
- Killed – June 1999
- PDO – November 2001

It should be noted that the crossing is frequently used by other than the property owners due to the nursery/landscaping business and the US Postal Service delivers mail to boxes located along the frontage road. Also, City of Charlotte sanitation crews pick up garbage and trash on the east side of the track requiring large trucks to use the crossing.

The crossing provides access to the properties from Old Concord Road. It is humped and has queue distance for only one vehicle at a time on either side of the track. The crossing is protected by crossbucks. Sight distance is good on both railroad approaches. The westbound roadway approach has large trees which obscure sight distance, especially in the summer. On the eastbound approach, sight distance is generally obscured by rental trucks parked in the railroad right-of-way (See **Figure 31**). Also note the presence of the parallel roadway (Old Concord Road) on the left in the photograph.



FIGURE 31 - CROSSING # 715 344R IN MECKLENBURG COUNTY

Approximately two years ago, the NCR, the NS and the NCDOT Rail Division met with the property owners and advised them that alternative access (rear access) to the property would have to be obtained. The reason is that this particular crossing has a significant accident history as outlined above and the NCR/NS intend to remove it. Also present at the meeting was a representative of Crosland Commercial Properties. Crosland is developing a business park to the immediate rear of the properties in question. The Crosland representative advised that a commercial type public street would be extended parallel to the track that would allow for rear access to the properties. That road has now been extended and a driveway connecting to the nursery and the historic property has been constructed. This same driveway connects to the frontage road that serves all of the parcels. In that the properties have now been provided rear access, it is recommended that the crossing be closed.

Near-term recommendation: Remove the crossing.

7. **Crossing # 715 388R/MP 375.64/NS Maintenance Access** – This crossing provides internal access to NS’s Charlotte Yard. While the crossing can be accessed from N. Tryon Street, it is very obscure and difficult to find unless one is very familiar with the area and railroad operations. Access to the crossing is prohibited to all except NS employees by large “No Trespassing” signs on the west side. This sign is posted in both English and Spanish. There is also a sign advising of five “live” tracks.

An accident resulting in property damage only was reported at this crossing in September 1996.

In that this crossing is on NS property and is for railroad use only, there are no recommended improvements or modifications.

Near-term recommendation: None.

VII. IMPLEMENTATION PRIORITY

The application of sound engineering practices was used in the determination of priority for implementing crossing upgrades. The forty-six (46) crossings are placed into four (4) categories below based on the following principles:

1. Estimated cost of improvement;
2. Time required to complete project; and,
3. Relationship with other existing/proposed projects.

Below each crossing is placed into a table of **Near-Term Actions (0-5 years), Long-Term Actions (more than 5 years) or No Action**. In several cases, crossings will have

recommended Near-Term and Long-Term Actions. And, finally, those crossings that are being closed as part of the Triangle Transit Authority’s Regional Rail project and those other crossings being closed independent of this report, are listed in a table (**Closings by Others**). The following factors were then applied to further prioritize the needed improvements within each table:

1. NCDOT Rail Division, Engineering & Safety Branch’s Investigative Index;
2. Experience of previous Traffic Separation Studies;
3. Field observations;
4. Current conditions in and around the crossing including maintenance of railroad/roadway right-of-way especially in the area of sight obstructions caused by foliage;
5. Mix of vehicles using the crossing such as automobiles, trucks including tractor/trailers, construction and farm equipment, etc.;
6. Types of property uses in and around the crossing such as warehousing, manufacturing, gas/gasoline storage facilities, etc.;
7. Current condition of the grade crossing and any crossing protection devices;
8. Presence of other control measures at the crossing such as locked gates or other barriers to prohibit access to the crossing; and,
9. Options to enhance crossing protection devices.

NEAR-TERM ACTIONS – the crossings listed in this table are placed in descending priority based upon the factors described above.

Table 4 – Near-Term Actions

RANK	NUMBER	MILEPOST	COUNTY	ACTION
1	735160V	H 41.82	Orange	Install Gates/Flashers by PCSI
2	735147G	H 38.23	Orange	Close/Alt. Access by PCSI
3	722963P	H 4.25	Guilford	Close/Alt. Access by PCSI
4	724375N	340.61	Rowan	Gate & Lock by PCSI
5	724364B	337.06	Rowan	Gate & Lock by PCSI
6	904189K	360.10	Cabarrus	Gate & Lock by NS
7	904231G	328.10	Rowan	Gate & Lock by PCSI
8	715322R	358.08	Cabarrus	Gate & Lock by NS
9	734740H	H 61.58	Durham	Median Separator by TTA
10	726293N	H 62.34	Durham	Median Separator by TTA
11	722973V	H 7.15	Guilford	Stop Sign Study by PCSI
12	722972N	H 6.77	Guilford	Xbucks/Stop Sign Study by PCSI
13	724377C	341.39	Rowan	Stop Sign Study by PCSI
14	735199Y	H 48.49	Orange	Xbucks/Stop Sign Study by PCSI
15	715329N	363.28	Cabarrus	Xbucks/Stop Sign Study by PCSI

RANK	NUMBER	MILEPOST	COUNTY	ACTION
16	726305F	H 47.62	Orange	Xbucks/Stop Sign Study by PCSI
17	724366P	337.52	Rowan	Xbucks/Stop Sign Study by PCSI
18	734363U	336.54	Rowan	Xbucks/Stop Sign Study by PCSI
19	735148N	H 38.85	Orange	Xbucks/Stop Sign Study by PCSI
20	715366Y	366.61	Mecklenburg	Xbucks/Stop Sign Study by PCSI
21	735466A	H 28.21	Alamance	Xbucks/Stop Sign Study by PCSI
22	736180K	H 28.58	Alamance	Xbucks/Stop Sign Study by PCSI
23	722977X	H 8.61	Guilford	Xbucks/Stop Sign Study by PCSI
24	724348J	341.54	Rowan	Stop Sign Study by PCSI
25	904413T	H 9.50	Guilford	Crossbucks by PCSI
26	724364B	337.06	Rowan	Gate & Lock by PCSI
27	722974C	H 7.4	Guilford	Xbucks/Stop Sign Study by PCSI
28	722196R	327.05	Davidson	Crossbucks by PCSI
29	910616L	325.20	Davidson	Crossbucks by PCSI
30	722353G	295.18	Guilford	Clear Sight Lines by NCRR/NS

ESTIMATED COST – to implement the above listed **NEAR-TERM ACTIONS** is estimated as follows:

- PCSI - \$186,075 plus \$169,200 as part of the NCRRIP funded by PCSI
- TTA - \$9,000
- NCRR/NS - \$1,500

LONG-TERM ACTIONS – the crossings listed in this table are placed in descending priority based upon estimated cost, recommended action and responsibility. It is anticipated that providing alternative access will be more acceptable to the crossing owner than a buyout of the property. Also, it is anticipated that those projects with public agency/railroad responsibility will be implemented before those dependent upon the private sector.

Table 5 – Long-Term Actions

RANK	NUMBER	MILEPOST	COUNTY	ACTION
1	715329N	363.28	Cabarrus	Alternate Access by PCSI
2	734363U	336.54	Rowan	Alternate Access by PCSI
3*	724377C	341.39	Rowan	Alternate Access by PCSI
3*	724348J	341.54	Rowan	Alternate Access by PCSI
4	726305F	H 47.62	Orange	Alternate Access by PCSI
5	722973V	H 7.15	Guilford	Alternate Access by PCSI
1	724364B	337.06	Rowan	Acquire Property by PCSI/NCRR
2	736180K	H 28.58	Alamance	Acquire Property by PCSI/NCRR
3	735466A	H 28.21	Alamance	Acquire Property by PCSI/NCRR
4	735148N	H 38.85	Orange	Acquire Property by PCSI/NCRR
5	904413T	H 9.50	Guilford	Acquire Property by PCSI/NCRR

RANK	NUMBER	MILEPOST	COUNTY	ACTION
6	722974C	H 7.40	Guilford	Acquire Property by PCSI/NCRR
7	722977X	H 8.61	Guilford	Acquire Property by PCSI/NCRR
TBD	722972N	H 6.77	Guilford	Grade Separate by Pvt. Sector
TBD	917037B	365.90	Mecklenburg	Grade Separate by Pvt. Sector
TBD	715335S	366.29	Mecklenburg	Grade Separate by Pvt. Sector
TBD	715366Y	366.61	Mecklenburg	Grade Separate by Pvt. Sector
TBD	715338M	367.00	Mecklenburg	Grade Separate by Pvt. Sector

*The Ethel Lane and Juke Box Road projects should be implemented as a single project.

ESTIMATED COST – to implement the above listed **LONG-TERM ACTIONS** is estimated as follows:

- PCSI (Alternate Access) - \$825,000
- PCSI and/or NCRR (Acquire Property) - \$995,000
- Private Sector (Grade Separations) – Not Available

NO ACTION – based upon the factors described above, the crossings listed in this table require no corrective action at this time.

Table 6 – No Action

COUNT	NUMBER	MILEPOST	COUNTY	NAME
1	734751V	H 67.75	Wake	Long Beverage/Truss Builders
2	735206G	H 52.56	Durham	West Durham Lumber Co.
3	735189T	H 43.89	Orange	Byrdsville Road
4	904230A	303.95	Davidson	NS Access/206 Albertson Rd.
5	722313J	313.96	Davidson	NS Access/Randall Byerly
6	715388R	375.64	Mecklenburg	NS Maint. Access/CLT Yard

CLOSINGS BY OTHERS – the crossings listed in this table are to be closed by either other public agencies, the railroads or the private sector.

Table 7 – Closings by Others

COUNT	NUMBER	MILEPOST	COUNTY	ACTION
1	630652H	S 162.25	Wake	Close by TTA
2	630659F	S 163.82	Wake	Close by TTA
3	630660A	S 164.02	Wake	Close by TTA
4	734754R	H 71.11	Wake	Close by TTA
5	736173A	H 63.98	Durham	Close by NCRR
6	736223B	H 61.80	Durham	Close by Private Sector
7	715340N	368.08	Mecklenburg	Close by Private Sector
8	715344R	369.92	Mecklenburg	Close by NCRR/NS

ESTIMATED COST – to implement the above listed **CLOSINGS BY OTHERS** is estimated as follows:

- TTA - \$272,000
- NCRR/NS – Not Available
- Private Sector – Not Available

TOTAL ESTIMATED COSTS – the cost to implement all recommendations listed above is \$2,457,775 (**SAY \$2,500,000**) and is broken down as follows:

- PCSI - \$1,180,275
- PCSI and/or NCRR - \$995,000
- TTA - \$281,000
- NCRR/NS - \$1,500
- PRIVATE SECTOR – Not Available

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**PRIVATE CROSSING SAFETY INITIATIVE (PCSI)
FINAL RECOMMENDATIONS**

COUNT	XING NO.	WARNING DEVICES	BRANCH	OWNER OR STREET NAME	LAND USE	COUNTY	STATUS	TRACKS	MILEPOST	OPERATING RR	NEAR TERM REC.	EST. COST	LONG TERM REC.	EST. COST
1	630652H	CROSSBUCKS	H	Recreational Ventures, Inc.	INDUSTRIAL	WAKE	OPEN	2	S 162.25	NS/CXST	Close/Alt. Access*	\$ 40,000.00		
2	630659F	CROSSBUCKS	H	Public Service Co. of NC	INDUSTRIAL	WAKE	OPEN	2	S 163.82	NS/CXST	Close/Alt. Access*	\$ 150,000.00		
3	630660A	CROSSBUCKS	H	First State Comm., Inc./WPTF	COMMERCIAL	WAKE	OPEN	2	S 164.02	NS/CXST	Close/Alt. Access*	\$ 55,000.00		
4	734754R	XBUCKS/STOP	H	CP & L Inc. (Substation)	INDUSTRIAL	WAKE	OPEN	1	H 71.11	NS	Close/Alt. Access*	\$ 27,000.00		
5	734751V	Gates/Flashers	H	Long Beverage, Inc.	COMMERCIAL	WAKE	OPEN	1	H 67.75	NS	Remove Nonstd. Signs	Private Sector	Possible Closure	TBD
6	736173A	Gates/Flashers	H	Northern Telecom Inc.	INDUSTRIAL	DURHAM	OPEN	1	H 63.98	NS	Close/NCRRIP	\$ 31,400.00		
7	726293N	Gates/Flashers	H	IBM, Inc. (#3)	INDUSTRIAL	DURHAM	OPEN	1	H 62.34	NS	Med. Sep./NCRRIP	\$ 107,400.00	None	
8	736223B	Gates/Flashers	H	Sanmina/Duke (IBM #2)	INDUSTRIAL	DURHAM	OPEN	1	H 61.80	NS	Close/Alt. Access	\$ -		
9	734740H	Gates/Flashers	H	IBM, Inc. (#1)	INDUSTRIAL	DURHAM	OPEN	1	H 61.58	NS	Med. Sep./NCRRIP	\$ 8,000.00	None	
10	735206G	Gates/Flashers	H	W. Durham Lumber Co.	COMMERCIAL	DURHAM	OPEN	1	H 52.56	NS	NCRRIP Proposal	\$ 31,400.00	Seek Alt. Access	TBD
11	735199Y	CROSSBUCKS	H	5300 Old Hillsborough Road	RESIDENTIAL	ORANGE	OPEN	1	H 48.49	NS	New Xbucks/Stop	\$ 900.00	Seek Alt. Access	TBD
12	726305F	CROSSBUCKS	H	Greenbrier Drive	RESIDENTIAL	ORANGE	OPEN	1	H 47.62	NS	New Xbucks/Stop	\$ 900.00	Close/ Alt. Access	\$ 125,000.00
13	735189T	Gates/Flashers	H	Byrdsville Road	RESIDENTIAL	ORANGE	OPEN	1	H 43.89	NS	None	\$ -	None	
14	735160V	CROSSBUCKS	H	Terrell's Trailer Park	RESIDENTIAL	ORANGE	OPEN	1	H 41.82	NS	Gates/Flashers	\$ 110,000.00	None	
15	735148N	CROSSBUCKS	H	Frank E. Freeman & Wife	RESIDENTIAL	ORANGE	OPEN	1	H 38.85	NS	New Xbucks/Stop	\$ 900.00	Acquire Prop./Close	\$ 150,000.00
16	735147G	CROSSBUCKS	H	Andrew B. Lloyd & Wife	FARM	ORANGE	OPEN	1	H 38.23	NS	Close/Alt. Access	\$ 20,000.00		
17	736180K	NONE	H	Richard C. Roberts & Wife	RESIDENTIAL	ALAMANCE	OPEN	1	H 28.58	NS	New Xbucks/Stop	\$ 900.00	Acquire Prop./Close	\$ 65,000.00
18	735466A	NONE	H	James D. Norris & Wife	FARM	ALAMANCE	OPEN	1	H 28.21	NS	New Xbucks/Stop	\$ 900.00	Acquire Prop./Close	\$ 125,000.00
19	904413T	NONE	H	Carl C. Barber & Wife	RESIDENTIAL	GUILFORD	OPEN	2	H 9.50	NS	Crossbucks	\$ 400.00	Acquire Prop./Close	\$ 180,000.00
20	722977X	NONE	H	Bullard & Black	FARM	GUILFORD	OPEN	2	H 8.61	NS	New Xbucks/Stop	\$ 900.00	Acquire Prop./Close	\$ 225,000.00
21	722974C	CROSSBUCKS	H	Long & Patterson	RESIDENTIAL	GUILFORD	OPEN	1	H 7.40	NS	New Xbucks/Stop	\$ 900.00	Acquire Prop./Close	\$ 200,000.00
22	722973V	CROSSBUCKS	H	Northwest Tree & Stone, Co.	COMMERCIAL	GUILFORD	OPEN	1	H 7.15	NS	Stop Sign Study	\$ 500.00	Close/ Alt. Access	\$ 500,000.00
23	722972N	XBUCKS/STOP	H	Robert Rankin Fryar	INDUSTRIAL	GUILFORD	OPEN	1	H 6.77	NS	New Xbucks/Stop	\$ 475.00	Grade Separate	Private Sector
24	722963P	XBUCKS/STOP	H	Thomas & Howard Inc.	COMMERCIAL	GUILFORD	OPEN	1	H 4.25	NS	Close/Alt. Access	\$ 40,000.00		
25	722353G	CROSSBUCKS	MAIN	City of High Point (Pump Station)	INDUSTRIAL	GUILFORD	OPEN	1	295.18	NS	Clear Sight Lines	\$ -	None	
26	904230A	GATE & LOCK	MAIN	206 Albertson Road	INDUSTRIAL	DAVIDSON	OPEN	2	303.95	NS	None	\$ -	None	
27	722313J	GATE & LOCK	MAIN	Randall T. Byerly	INDUSTRIAL	DAVIDSON	OPEN	1	313.96	NS	None	\$ -	None	
28	910616L	NONE	MAIN	N. C. Wildlife Commission	GAMELANDS	DAVIDSON	OPEN	2	325.20	NS	Crossbucks	\$ 400.00	None	
29	722196R	NONE	MAIN	Yadkin, Inc./Pittsburg, PA	FARM	DAVIDSON	OPEN	2	327.05	NS	Crossbucks	\$ 400.00	None	
30	904231G	CROSSBUCKS	MAIN	NC Finishing Plant	INDUSTRIAL	ROWAN	OPEN	2	328.10	NS	Gate & Lock	\$ 750.00	Monitor	TBD
31	724363U	CROSSBUCKS	MAIN	Ms. W. Pat Sloop	FARM	ROWAN	OPEN	2	336.54	NS	New Xbucks/Stop	\$ 900.00	Close/ Alt. Access	\$ 40,000.00
32	724364B	CROSSBUCKS	MAIN	A. & Q. Chunn	RESIDENTIAL	ROWAN	OPEN	2	337.06	NS	Gate & Lock	\$ 750.00	Acquire Prop./Close	\$ 50,000.00
33	724366P	CROSSBUCKS	MAIN	Reid Farm Road/Orbison Prop.	FARM	ROWAN	OPEN	1	337.52	NS	New Xbucks/Stop	\$ 900.00	None	
34	724375N	CROSSBUCKS	MAIN	Robert R. Kluttz & Wife	FARM	ROWAN	OPEN	1	340.61	NS	Gate & Lock	\$ 750.00	Seek Alt. Access	TBD
35	724377C	CROSSBUCKS	MAIN	Ethel Lane	RESIDENTIAL	ROWAN	OPEN	1	341.39	NS	Stop Sign Study	\$ 500.00	Close/ Alt. Access	\$ 100,000.00
36	724378J	CROSSBUCKS	MAIN	Juke Box Road	RESIDENTIAL	ROWAN	OPEN	1	341.54	NS	Stop Sign Study	\$ 500.00	Close/ Alt. Access	\$ 20,000.00
37	715322R	NONE	MAIN	NS Maint. Access (Barbee Rd.)	INDUSTRIAL	CABARRUS	OPEN	1	358.08	NS	Gate & Lock	\$ 750.00	None	
38	904189K	NONE	MAIN	NS Maintenance Access	INDUSTRIAL	CABARRUS	OPEN	2	360.10	NS	Gate & Lock	\$ 750.00	None	
39	715329N	CROSSBUCKS	MAIN	Ms. Gladys H. Doster	RESIDENTIAL	CABARRUS	OPEN	1	363.28	NS	New Xbucks/Stop	\$ 900.00	Close/ Alt. Access	\$ 40,000.00
40	917037B	XBUCKS/STOP	MAIN	City of Charlotte (Pump Station)	INDUSTRIAL	MECK.	OPEN	1	365.90	NS	None	\$ -	Close/ Alt. Access	See Page 65
41	715335S	CROSSBUCKS	MAIN	Duke Power Co. (Substation)	INDUSTRIAL	MECK.	OPEN	1	366.29	NS	None	\$ -	Close/ Alt. Access	See Page 65
42	715336Y	CROSSBUCKS	MAIN	H. L. Mozingo & Wife	FARM	MECK.	OPEN	1	366.61	NS	New Xbucks/Stop	\$ 900.00	Close/ Alt. Access	See Page 65
43	715338M	Gates/Flashers	MAIN	J. B. Stroup, Jr. & Wife	FARM	MECK.	OPEN	1	367.00	NS	None	\$ -	Close/ Alt. Access	See Page 65
44	715340N	CROSSBUCKS	MAIN	IP Merryhue Farms, LLC	FARM	MECK.	OPEN	1	368.08	NS	New Xbucks/Stop	\$ 900.00	Close/ Alt. Access	Private Sector
45	715344R	CROSSBUCKS	MAIN	8400 Old Concord Road	RESIDENTIAL	MECK.	OPEN	1	369.92	NS	Close/Alt. Access	\$ -		
46	715388R	NONE	MAIN	NS Maintenance Access	INDUSTRIAL	MECK.	OPEN	5	375.64	NS	None	\$ -	None	
												\$ 637,925.00		\$ 1,820,000.00

NS ACCESS/CONTROL
NEAR TERM CLOSURE
LONG TERM CLOSURE
*TTA FUNDING
**NCRR FUNDING