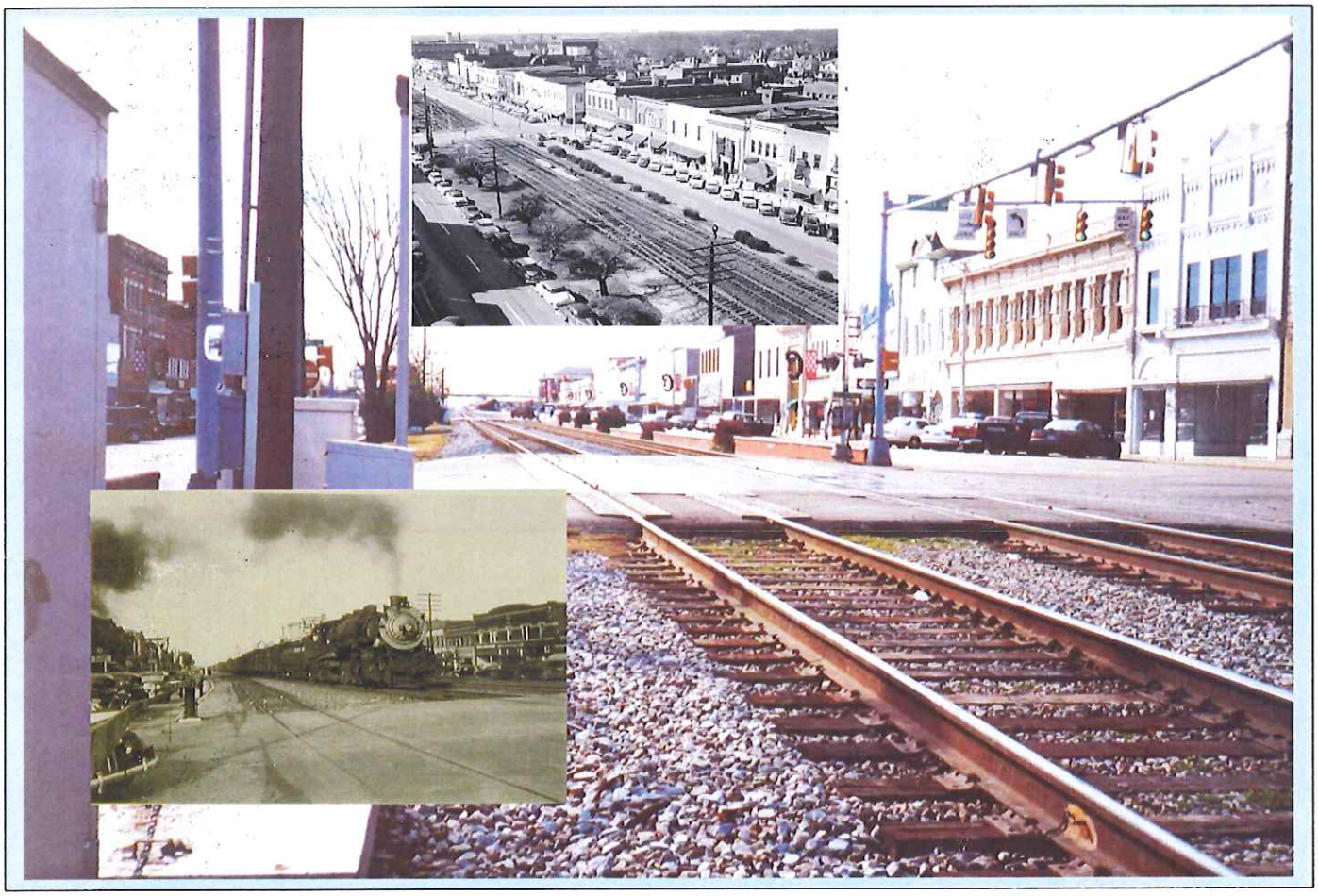
TRAFFIC SEPARATION STUDY

FOR THE

CITY OF ROCKY MOUNT



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PARSONS TRANSPORTATION GROUP, INC.

Prepared for the

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
ENGINEERING AND SAFETY BRANCH

May 2002

TRAFFIC SEPARATION STUDY
FOR THE
CITY OF ROCKY MOUNT

Prepared by

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In joint cooperation with the City of Rocky Mount, CSX Transportation, and the G&O Railroad, The North Carolina Department of Transportation has completed a series of meetings to gather information and receive public comments on proposed recommendations for safety improvements and closings at existing highway-rail crossings in the City of Rocky Mount.

Stakeholders Meeting #1
On September 14, 2001, Representatives from the NCDOT Rail Division and Parsons Transportation Group presented the initial findings and recommendations to City of Rocky Mount Engineering and Planning staff, City of Rocky Mount Police, Fire and EMS representatives, and CSX Transportation and Nash County Railroad representatives.

Based on recommendations from the meeting, two changes to the initial recommendations were incorporated into the study. First, the emergency services representatives noted that Bassett Street was needed for emergency services circulation and requested that Bassett Street not be closed. Second, for the purpose of soliciting input from the public, the City of Rocky Mount requested a proposed new crossing at Mayfair Drive.

Public Involvement Meetings (4)
In order to inform the public on the preliminary recommendations and receive comments on the impacts to neighborhoods, schools, businesses and individuals, four Public Information meetings have been completed. These meetings were held on:

1. October 11, 2001 at the City Hall
2. October 18, 2001 at the Community Center in Battleboro
3. October 23, 2001 at the D. S. Johnson Elementary School.
4. October 25, 2001 at the Winstead Avenue School.

All of the meetings were from 4:00 PM to 7:00 PM.

Based on the sign-in sheets, a total of approximately sixty-eight (68) people attended the four meetings with one hundred and fifty-eight (158) comment sheets returned during and after the Public Information Meetings.

Stakeholders Meeting #2
On Friday December 7, 2001, the City, railroads, and NCDOT representatives met to review the comments received from the public at the meetings, from petitions and comment sheets.

Based on public comment five changes were implemented into the study.

a. Nottingham Road will remain open "as-is" without improvements.
b. Mansfield Drive will remain open "as-is" without improvements.
c. Mayfair Drive crossing will remain closed.
d. Sheffield Drive will not be extended as a part of this study.
e. Gates will be provided at Nottingham Road and Mansfield Drive when listed on the Department's priority list.

The following page describes the recommendations, near-term costs, and long-term costs for this study.

Rocky Mount Traffic Separation Study
Summary of Improvements

Nash County Railroad

Street Name	Crossing No.	Recommendations	Est. Near-Term Cost	Est. Long-Term Cost
S. Halifax Road	626218B	Add gates/replace cabinet	$ 35,000.00	
Mansfield Drive	626217U	Upgrade crossing when on signal upgrade priority list.		
Nottingham Drive	626216M	Upgrade crossing when on signal upgrade priority list.		
Avondale Avenue	626213S	Close crossing, provide pedestrian crossing.	$ 40,000.00	
Wesleyan Boulevard	626211D	Feasibility Study in long-term.		To be determined
Mayo/Pinecrest Street	626208V	Install signals/gates.	$ 125,000.00	
Hammond Street	626207N	Add gates. Roadway improvements.	$ 60,000.00	
Pine Street	626206G	Close crossing, provide pedestrian crossing.	$ 40,000.00	
Tillery Street	626205A	Close crossing. Provide alternative access to business.	$ 50,000.00	
Howell Street	626204T	Add gates, improve hump. Pavement markings.	$ 175,000.00	
Pearl Street	626202E	Close crossing. Add Fire Hydrant	$ 15,000.00	
			$ 540,000.00	

CSX ABA Line

Street Name	Crossing No.	Recommendations	Est. Near-Term Cost	Est. Long-Term Cost
Washington Street	629772C	Close crossing. Provide alternative access to business. Add Fire Hydrant.	$ 40,000.00	
Clark Street	629774R	Close crossing. Roadway improvements. Add Fire Hydrant	$ 285,000.00	
Branch Street	629775X	Add gates, geometric improvements.	$ 100,000.00	
Cokey Road	629776E	Replace gates/cantilevers. Geometric and drainage improvements.	$ 175,000.00	
Pitt Street	629778T	Close. Provide additional Fire hydrant.	$ 15,000.00	
Fairview Road	629779A	Add gates.	$ 25,000.00	
Glendale Avenue	629780U	Enhance pavement markings.	$ 600.00	
			$ 640,600.00	

CSX A Line

Street Name	Crossing No.	Recommendations	Est. Near-Term Cost	Est. Long-Term Cost
Bridges Street	629685Y	Close after TIP Proj. U-3329 is complete.	$ 10,000.00	
Battleboro Road	629686F	Replace signal lens. Trim trees. Add guardrail. Add pre-empt signing.	$ 85,000.00	$ 150,000.00
College Road	629687M	Upgrade lenses and circuitry. Replace cabinet.	$ 40,000.00	
Fountain School Road	629688U	Replace circuitry, cabinet. Add concrete median.	$ 100,000.00	$ 150,000.00
Grand Avenue	630082X	Install 4-quad gates.	$ 150,000.00	
Gold Leaf Street	630083E	Close in conjunction with signal modifications between Grand Ave. and Bassett St. and the sidewalk improvements at Thomas St.	$ 10,000.00	To be determined
Thomas Street	630084L	Replace lenses, upgrade circuitry and cabinet. Add sidewalk.	$ 40,000.00	
Sunset Avenue	630085T	Replace lenses, upgrade circuitry and cabinet.	$ 40,000.00	
Western Avenue	630086A	Replace lenses, upgrade circuitry and cabinet. Add traffic signal pre-emption.	$ 40,000.00	
Nash Street	630087G	Pavement Markings. Add traffic signal pre-emption.	$ 25,000.00	
Bassett Street	629767F	Install 4-quad gates.	$ 150,000.00	
Kinston/Sutton Tunnel		Feasibility Study for grade separation.	$ 60,000.00	To be determined
Old Tarboro Road	629771V	Install 4-quad gates.	$ 150,000.00	
			$ 900,000.00	
		Total project cost	$ 2,080,600.00	

*Does not include the value of donated property.

SECTION 1. INTRODUCTION

PREAMBLE

Every 90 minutes, a vehicle and a train collide at one of the United States' 290,000 highway-rail grade crossings. Collisions between trains and highway vehicles are the principal cause of death in the railroad industry. North Carolina ranked 10th in the nation in 2000 for such collisions with 112 highway-rail crossing collisions, resulting in 14 deaths and 25 injuries.

STUDY OBJECTIVES

To improve safety at highway-rail crossings in the City of Rocky Mount, the City and the North Carolina Department of Transportation (NCDOT) agreed to evaluate the existing public highway-rail crossings, the potential for a new crossing at Mayfair Drive, and the recommended revisions to the existing one-way tunnel on Sutton Road. The purpose of the *Rocky Mount Traffic Separation Study* is to evaluate existing crossings to determine if any of the crossings should be closed, enhanced with additional warning devices or grade separated to improve safety. The study will examine the effects of the redistribution of traffic patterns based on opening a new crossing and/or closing existing crossings. The study will examine other possible safety enhancements to local streets and crossings that would further improve public safety, while accommodating current and projected highway, school bus and emergency response traffic. Recommendations and costs will be made for near-term (0 to 5 years) and long-term (5-10 years).

EXISTING CONDITIONS AND ASSUMPTIONS

The proposed study area within the City of Rocky Mount consists of three rail corridors:

- The NCYR "ABA" line is an east-west line located between Spring Hope and the north-south CSX line in downtown Rocky Mount. It is operated by the Nash County Railroad. The railroad operates two trains a day five days a week. The train normally consists of fifteen (15) to thirty (30) freight cars at a speed of ten (10) miles per hour. Approximately every eight (8) days a grain train consisting of four (4) trains per day with sixty-five (65) hopper cars travels the route at ten (10) miles per hour.
- The CSX "A" line is a north-south line shared by the Amtrak passenger service and the CSX Railroad freight service. Amtrak has four (4) trains in the AM period and four (4) trains in the PM period. The Silver Service Route consists of six (6) trips between New York, N.Y. and Miami, Florida and the Carolinian consisting of two (2) trips between New York, N.Y. and Charlotte, N.C. The passenger train speed is as high as 79 miles per hour in the Rocky Mount vicinity. CSX Railroad operates freight service with 30 to 34 trains per day with an average speed of 40 miles per hour and a maximum speed of 50 miles per hour.
- The CSX "AB" line is an east-west line located between the north-south CSX line in downtown Rocky Mount and Plymouth. Four (4) trains per day operate on a six (6) days a week schedule. The train speed is 10 to 40 miles per hour.

For analysis purposes, assumptions for train speeds and lengths, and number of trains will be as follows:

NCY Railroad 'ABA' line:	Speed	Maximum 10 miles per hour.
	Number of trains	2 per day.
	Length	15 to 30 freight cars (1500 feet).
Amtrak on the 'A' line:	Speed	Maximum 79 miles per hour.
	Number of trains	8 per day.
	Length	7 passenger cars (700 feet).
CSX on the 'A' line	Speed	40 to 50 miles per hour.
	Number of trains	34 per day
	Length	150 to 200 freight cars (7500 feet).
CSX on the 'AB' line	Speed	25 to 40 miles per hour.
	Number of trains	4 per day
	Length	30 to 70 freight cars (3500 feet).

For the 2015 design year, the number of trains and length remain the same, but vehicle traffic increases by 37.5 percent on the "AB" and ABA" Line. The train length is increased to 200 in the design year for the "A" Line.

Traffic Volumes and Conditions

Traffic Volumes were provided by the NCDOT Statewide Planning Branch. Average Daily Traffic volumes for the year 2000 were determined from the Rocky Mount Traffic Model prepared by the Statewide Planning Branch. An annual growth rate of 2.5% was used to determine future traffic volumes. These volumes are shown in Table 1.

To determine the impacts of a change in traffic patterns if individual crossings were closed, the Traffic Model was adjusted by the Statewide Planning Branch to show the new volumes on other local roads and streets. These revised volumes are shown in Tables 1A.

Nine (9) crossings have experienced accidents in the last ten years. Accidents at Grace Street and Grand Avenue resulted in two (2) injuries; accidents at Bridges Street, Fountain School Road, and Thomas Street resulted in three (3) deaths; and accidents at Lee Street, Gold Leaf Street, Bassett Street, and Old Tarboro Road resulted in property damage only. A more detail accident report and history is shown in Section 2.

Crossing Locations

This study evaluates thirty eight (38) existing public at-grade crossing, one potential at-grade crossing and one grade separation.

DESCRIPTION	MILE POST	AAR NUMBER	NAME OF ROAD	COUNTY	RR CODE	2000 VOLUME (ADT)	2025 VOLUME (ADT)
NASH COUNTY RAILROAD	ABA 120.10	626 199Y	CHURCH ST.	NASH	NCYR	3400	5600
	ABA 120.19	626 201X	FRANKLIN ST.	NASH	NCYR	3300	5500
	ABA 120.25	626 202E	PEARL	NASH	NCYR	500	800
	ABA 120.31	626 203L	GRACE ST.	NASH	NCYR	6900	11300
	ABA 120.61	626 204T	HOWELL ST.	NASH	NCYR	2000	2900
	ABA 120.67	626 205A	TILLERY ST.	NASH	NCYR	800	1200
	ABA 120.71	626 206G	PINE ST.	NASH	NCYR	900	1300
	ABA 120.72	626 207N	HAMMOND ST.	NASH	NCYR	4000	6600
	ABA 121.20	626 208V	MAYO ST.	NASH	NCYR	1100	1600
	ABA 121.25	626 209C	LEE ST.	NASH	NCYR	2000	3000
	ABA 121.48	626 210W	PIEDMONT ST.	NASH	NCYR	3600	5900
	ABA 122.10	626 211D	WESLEYAN BLVD.	NASH	NCYR	25000	41000
	ABA 122.27	626 212K	OLD MILL RD.	NASH	NCYR	4900	8100
	ABA 122.45	626 213S	AVONDALE AVE.	NASH	NCYR	500	800
	ABA 122.50	626 214Y	ENGLEWOOD DR.	NASH	NCYR	1400	2100
	ABA 123.16	626 215F	WINSTEAD AVE.	NASH	NCYR	10100	21200
	ABA 123.45	626 216M	NOTTINGHAM RD.	NASH	NCYR	2200	3200
	ABA 123.81	626 217U	MANSFIELD DR.	NASH	NCYR	2300	3400
	POTENTIAL CROSSING @ MAYFAIR DRIVE			NASH	NCYR	200	300
	ABA 124.50	626 218B	HALIFAX RD.	NASH	NCYR	7800	16400
CSX "A" LINE North East Sub							
	A 111.38	629 685Y	BRIDGES ST.	NASH	CSX	1700	2800
	A 111.51	629 686F	BATTLEBORO AVE.	NASH	CSX	4000	6600
	A 114.09	629 687M	COLLEGE RD.	NASH	CSX	700	1500
	A 115.24	629 688U	FOUNTAIN RD.	NASH	CSX	2200	4700
	A 118.67	630 082X	E. GRAND AVE.	NASH	CSX	11800	19400
	A 118.99	630 083E	GOLDLEAF ST.	NASH	CSX	2500	3700
	A 119.15	630 084L	THOMAS ST.	NASH	CSX	4700	7800
	A 119.29	630 085T	SUNSET AVE.	NASH	CSX	5100	8400
	A 119.39	630 086A	WESTERN AVE.	NASH	CSX	4400	6400
	A 119.48	630 087G	NASH ST.	NASH	CSX	2300	3400
	A 119.92	629 767F	BASSETT ST.	NASH	CSX	4600	6700
	EXISTING GRADE SEPARATION @ KINGSTON AVE.			NASH	CSX	4600	7600
	A 123.33	629 771V	OLD TARBORO ROAD	NASH	CSX	3000	5250

Table 1. Average Daily Traffic

MILE POST	AAR NUMBER	NAME OF ROAD	COUNTY	RR CODE	2000 VOLUME	2025 VOLUME
AB 121.31	629 772C	WASHINGTON ST.	EDGECOMBE	CSX	400	600
AB 121.47	629 773J	SOUTH ST.	EDGECOMBE	CSX	1600	2400
AB 121.54	629 774R	CLARK ST.	EDGECOMBE	CSX	700	1100
AB 121.60	629 775X	BRANCH ST.	EDGECOMBE	CSX	2200	3200
AB 121.80	629 776E	COKEY RD.	EDGECOMBE	CSX	8000	13200
AB 121.99	629 778T	PITT ST.	EDGECOMBE	CSX	700	1200
AB 122.54	629 779A	NC 43/FAIRVIEW RD.	EDGECOMBE	CSX	5500	11600
AB 122.86	629 780U	GLENDALE DR.	EDGECOMBE	CSX	1600	2700

DESCRIPTION

CSX "AB" LINE
TARBORO SUB

Table 1. Average Daily Traffic

DESCRIPTION	MILE POST	AAR NUMBER	NAME OF ROAD	COUNTY	RR CODE	2000 VOLUME (ADT)	2025 VOLUME (ADT)
NASH COUNTY RAILROAD	ABA 120.10	626 199Y	CHURCH ST.	NASH	NCYR	3500	5800
	ABA 120.19	626 201X	FRANKLIN ST.	NASH	NCYR	3400	5600
	ABA 120.25	626 202E	PEARL	NASH	NCYR	Closed	Closed
	ABA 120.31	626 203L	GRACE ST.	NASH	NCYR	7200	11900
	ABA 120.61	626 204T	HOWELL ST.	NASH	NCYR	3200	4700
	ABA 120.67	626 205A	TILLERY ST.	NASH	NCYR	Closed	Closed
	ABA 120.71	626 206G	PINE ST.	NASH	NCYR	Closed	Closed
	ABA 120.72	626 207N	HAMMOND ST.	NASH	NCYR	4500	7400
	ABA 121.20	626 208V	MAYO ST.	NASH	NCYR	1100	1600
	ABA 121.25	626 209C	LEE ST.	NASH	NCYR	2000	3000
	ABA 121.48	626 210W	PIEDMONT ST.	NASH	NCYR	3700	5900
	ABA 122.10	626 211D	WESLEYAN BLVD.	NASH	NCYR	25000	41000
	ABA 122.27	626 212K	OLD MILL RD.	NASH	NCYR	5000	8200
	ABA 122.45	626 213S	AVONDALE AVE.	NASH	NCYR	Closed	Closed
	ABA 122.50	626 214Y	ENGLEWOOD DR.	NASH	NCYR	1800	2600
	ABA 123.16	626 215F	WINSTEAD AVE.	NASH	NCYR	10100	21200
	ABA 123.45	626 216M	NOTTINGHAM RD.	NASH	NCYR	2200	3200
	ABA 123.81	626 217U	MANSFIELD DR.	NASH	NCYR	2300	3400
			MAYFAIR DR.	NASH	NCYR		
	ABA 124.50	626 218B	HALIFAX RD.	NASH	NCYR	7800	16400
CSX "A" LINE North East Sub	A 111.38	629 685Y	BRIDGES ST.	NASH	CSX	Closed	Closed
	A 111.51	629 686F	BATTLEBORO AVE.	NASH	CSX	5700	9400
	A 114.09	629 687M	COLLEGE RD.	NASH	CSX	700	1500
	A 115.24	629 688U	FOUNTAIN RD.	NASH	CSX	2200	4700
	A 118.67	630 082X	E. GRAND AVE.	NASH	CSX	13600	22300
	A 118.99	630 083E	GOLDLEAF ST.	NASH	CSX	Closed	Closed
	A 119.15	630 084L	THOMAS ST.	NASH	CSX	5300	8700
	A 119.29	630 085T	SUNSET AVE.	NASH	CSX	5200	8600
	A 119.39	630 086A	WESTERN AVE.	NASH	CSX	4600	6700
	A 119.48	630 087G	NASH ST.	NASH	CSX	2300	3400
	A 119.92	629 767F	BASSETT ST.	NASH	CSX	4600	6700
	EXISTING GRADE SEPARATION @ KINGSTON AVE.			NASH	CSX	4600	7600
	A 123.33	629 771V	OLD TARBORO ROAD	NASH	CSX	3000	5250

Table 1A. Average Daily Traffic Based on Study Recommendations

DESCRIPTION	MILE POST	AAR NUMBER	NAME OF ROAD	COUNTY	RR CODE	2000 VOLUME	2025 VOLUME
CSX "AB" LINE TARBORO SUB	AB 121.31	629 772C	WASHINGTON ST.	EDGECOMBE	CSX	Closed	Closed
	AB 121.47	629 773J	SOUTH ST.	EDGECOMBE	CSX	2200	3200
	AB 121.54	629 774R	CLARK ST.	EDGECOMBE	CSX	Closed	Closed
	AB 121.60	629 775X	BRANCH ST.	EDGECOMBE	CSX	2700	3900
	AB 121.80	629 776E	COKEY RD.	EDGECOMBE	CSX	8500	14000
	AB 121.99	629 778T	PITT ST.	EDGECOMBE	CSX	Closed	Closed
	AB 122.54	629 779A	NC 43/FAIRVIEW RD.	EDGECOMBE	CSX	5700	12000
	AB 122.86	629 780U	GLENDALE DR.	EDGECOMBE	CSX	1600	2700

Table 1A. Average Daily Traffic Based on Study Recommendations

Nash County Railroad 'ABA' Line

1. **South Halifax Road** (SR 1544) is a two-lane minor thoroughfare serving multi-family homes, mobile home parks, and commercial properties in a rural setting. The current average daily traffic (ADT) is 7800 vehicles with recent development likely increasing this figure quickly. The warning devices consist of flashing cantilevers over and not over. This road is a major school bus route with 60 crossings per day.
   NCY RR Mile Post 124.50, Crossing #626 218B

2. **Mayfair Drive** is a residential street with new development on both sides of the railroad but not connected with a crossing. Access to major thoroughfares from the development on the south side of the track is limited to a circuitous neighborhood route. The estimated average daily traffic (ADT) is 200 vehicles per day.
   Approx NCY RR Mile Post 124.25

3. **Mansfield Drive** is a two lane residential street serving low to median density single family homes. The current average daily traffic (ADT) is 2300 vehicles per day. The warning devices consist of advance warning signs and crossbucks. The crossing provides interconnectivity for school bus routes with 4 crossings per day.
   NCY RR Mile Post 123.81, Crossing # 626 217U

4. **Nottingham Road** is a two lane residential street providing interconnectivity between neighborhoods, but no direct route to a thoroughfare. The current average daily traffic (ADT) is 2200 vehicles per day. The warning devices consist of crossbucks and advanced warning signs. It is a school bus route with 4 crossings per day.
   NCY RR Mile Post 123.45, Crossing # 626 216M

5. **Winstead Avenue** (SR 1613) is a two lane minor thoroughfare providing direct access to US 64. The street serves as a collector of neighborhood traffic and has a large elementary school located south of the crossing. The average daily traffic (ADT) is 10,100 vehicles per day. The warning devices consist of gates and cantilevers. It is a major school bus route with 64 crossings per day.
   NCY RR Mile Post 123.16, Crossing # 626 215F

6. **Englewood Drive** is a two lane residential street providing neighborhood connectivity. The average daily traffic (ADT) is 1400 vehicles per day. The warning devices consist of gates. The neighborhood school bus route uses this street and has 14 grade crossings per day.
   NCY RR Mile Post 122.50, Crossing #626 214Y

7. **Avondale Avenue** is a two lane local residential street providing neighborhood connectivity. The average daily traffic (ADT) is 500 vehicles per day. The

warning devices consist of advanced warning signs and crossbucks. It is not a school bus route.
NCY RR Mile Post 122.45, Crossing #626 213S

8. **Old Mill Road** (SR 1836) is a two lane rural road serving residential and industrial properties. Old Mill Road is a connector to US 301. The average daily traffic (ADT) is 4900 vehicles per day. The warning devices consist of gates. It is a school bus route with 9 crossings per day.
NCY RR Mile Post 122.27, Crossing #626 212K

9. **Wesleyan Blvd.** (US 301 BYP) is a four lane divided median major arterial serving as a north south bypass of Rocky Mount. The average daily traffic (ADT) is 25,000 vehicles per day. The warning devices consist of gates and cantilevers. It is not a school bus route.
NCY RR Mile Post 122.10, Crossing #626 211D

10. **Piedmont Avenue** is a two lane residential street connecting residential neighborhoods with the City Park and City Park Lake. The average daily traffic (ADT) is 3600 vehicles per day. The warning devices consist of gates and cantilevers. It is a school bus route with 9 crossings per day.
NCY RR Mile Post 121.48, Crossing # 626 210W

11. **Lee St./Glenn Ave.** is a two lane residential collector providing a direct route to US 64 E and US 64 W. The average daily traffic (ADT) is 2000 vehicles per day. The warning devices consist of gates. It is a school bus route with 4 grade crossings per day.
NCY RR Mile Post 121.25, Crossing #626 209C

12. **Mayo St./Pinecrest Street** is a two lane residential street providing neighborhood connectivity and an additional route to US 64. The average daily traffic (ADT) is 1100 vehicles per day. The warning devices consist of advance warning signs and cross-bucks. It is a school bus route with 8 grade crossings per day.
NCY RR Mile Post 121.20, Crossing #626 208V.

13. **Hammond Street** is a two lane urban residential collector with an average daily traffic (ADT) of 4000 vehicles per day. Rocky Mount High School is located along this section of the railroad. The warning devices consist of advance warning signs and flashing masts. It is a school bus route with 29 grade crossings per day.
NCY RR Mile Post 120.72, Crossing #626 207N

14. **Pine Street** is a residential street four blocks long. The street begins at Walnut Street and ends at Hammond Street. The average daily traffic (ADT) is 900 vehicles per day. The warning devices consist of one advance warning sign and cross-bucks. One school bus a day crosses the railroad.

NCY RR Mile Post 120.71, Crossing #626 206G

15. **Tillery Street** is a two lane local residential street with an average daily traffic (ADT) of 800 vehicles per day. The warning devices consist of advance warning signs and cross-bucks. One school bus a day crosses the railroad.
NCY RR Mile Post 120.67, Crossing #626 205A

16. **Howell Street** is a two-lane local residential/commercial street with a baseball field which is part of the Buck Leonard Park located just south of the crossing. The average daily traffic (ADT) is 2000 vehicles per day. The warning devices consist of advance warning signs and cross-bucks It is a school bus route with 6 grade crossings per day.
NCY RR Mile Post 120.61, Crossing #626 204T

17. **Grace Street** is a four lane minor arterial serving as a transition area from urban residential to commercial. The average daily traffic (ADT) is 6900 vehicles per day. The warning devices consist of gates and cantilevers. It is a school bus route with 13 grade crossings per day.
NCY RR Mile Post 120.31, Crossing #626 203L

18. **Pearl Street** is a two lane street serving local traffic. Development is a mixture of older urban residential and commercial properties. The average daily traffic (ADT) is 500 vehicles per day. The warning devices consist of advance warning signs and cross-bucks. It is a school bus route with 4 grade crossings per day.
NCY RR Mile Post 120.25, Crossing #626 202E

19. **Franklin Street** (US 301 S) is a two lane, one way arterial through the business district of Rocky Mount. The average daily traffic (ADT) is 3300 vehicles per day. The warning devices consist of gates. It is not a school bus route.
NCY RR Mile Post 120.19, Crossing # 626 201X

20. **Church Street** (US 301 N) is a two lane, two way arterial with a center turn lane through the business district of Rocky Mount. The average daily traffic (ADT) is 3400 vehicles per day. The warning devices consist of gates and cantilevers. It is not a school bus route.
NCY RR Mile Post 120.10, Crossing #626 199Y

CSX Railroad 'AB' Line

21. **Washington Street** is a two lane urban local street with the grade crossing providing access to CSX property and Engine Solutions Inc. The crossing serves as access to private industrial property. The average daily traffic (ADT) is 400 vehicles per day. The warning devices consist of cross-bucks and 'STOP, LOOK, & LISTEN' signs. It is not a school bus route.
CSX RR Mile Post 121.31, Crossing #629 772C

22. **Vance Street/Pender Street** is a two lane urban collector providing a north-south route on the east side of the main CSX/Amtrak Railroad. The average daily traffic (ADT) is 1600 vehicles per day. The warning devices consist of advance warning signs and gates. It is a school bus route with 12 grade crossings per day.
CSX RR Mile Post 121.47, Crossing # 629 773J

23. **Clark Street** is a two lane urban local street providing neighborhood connectivity. The average daily traffic (ADT) is 700 vehicles per day. The warning devices consist of advance warning signs and gates. It is a school bus route with 17 grade crossings per day.
CSX RR Mile Post 121.54, Crossing #629 774R

24. **Branch Street** is a two lane urban local street providing neighborhood connectivity and access to US 64. The average daily traffic (ADT) is 2200 vehicles per day. The warning devices consist of advanced warning signs and flashing masts. It is a school bus route with 18 grade crossings per day.
CSX RR Mile Post 121.60, Crossing #629 775X

25. **Cokey Road** (SR 1164) is a two lane minor arterial providing access into Rocky Mount from the southeast. The average daily traffic (ADT) is 8,000 vehicles per day. The warning devices consist of gates. It is a school bus route with 10 grade crossings per day.
CSX RR Mile Post 121.80, Crossing #629 776E

26. **Pitt Street** is a two lane connector from a residential subdivision to Cokey Road. The average daily traffic (ADT) is 700 vehicles per day. The warning devices consist of advance warning signs and flashing masts. It is not a school bus route.
CSX RR Mile Post 121.99, Crossing #629 778T

27. **Fairview Road** (NC 43) is a two lane minor arterial with shopping centers, commercial, and some residential use. NC 43 changes to Cokey Road at the southern end of Fairview Road. The average daily traffic is 5,500 vehicles per day. The warning devices consist of advance warning signs and flashing masts. It is not a school bus route.
CSX RR Mile Post 122.54, Crossing #629 779A

28. **Glendale Avenue** (SR 1234) is a two lane secondary road providing additional neighborhood access to NC 43. The average daily traffic (ADT) is 1600 vehicles per day. The warning devices consist of gates. It is not a school bus route.
CSX RR Mile Post 122.86, Crossing #629 780U

CSX Railroad 'A' Line & Amtrak Passenger Line

29. **Bridges Street** is a two lane local street providing access from the residential neighborhood through the commercial district to US 301. The average daily

traffic (ADT) is 1700 vehicles per day. The warning devices consist of gates. It is not a school bus route.
CSX RR Mile Post 111.38, Crossing #629 685Y

30. **Battleboro Road** (SR 1560/SR 1407) is a two lane collector providing access to US 301, NC 4, and I-95. The average daily traffic (ADT) is 4,000 vehicles per day. The warning devices consist of gates and cantilevers. It is not a school bus route.
CSX RR Mile Post 111.51, Crossing # 629 686F

31. **College Road** (SR 1540/SR 1403) is a two lane rural secondary road providing access to farm land and light industrial. The average daily traffic is 700 vehicles per day. The warning devices consist of gates. It is not a school bus route.
CSX RR Mile Post 114.09, Crossing #629 687M

32. **Fountain School Road** (SR 1539/SR 1402)) is a two lane secondary road serving commercial and institutional properties, and farm land. The average daily traffic is 2200 vehicles per day. The warning devices consist of gates. It is not a school bus route.
CSX RR Mile Post 115.24, Crossing #629 688U

33. **Grand Avenue** (NC 43) is a four lane undivided urban arterial serving commercial and residential properties. The average daily traffic is 11,800 vehicles per day. The warning devices consist of gates and cantilevers. It is a major school bus crossing with 73 crossings per day.
CSX RR Mile Post 118.67, Crossing #630 082X

34. **Gold Leaf Street** is a two lane urban local collector providing light commercial access across tracks. The average daily traffic is 2500 vehicles per day. The warning devices consist of gates. One school bus crosses the track with the driver and no passengers each day.
CSX RR Mile Post 118.99, Crossing #630 083E

35. **Thomas Street** (US 64W) is a three lane one-way arterial. The average daily traffic is 4700 vehicles per day. The warning devices consist of gates. It is a school bus route with 11 crossings per day.
CSX RR Mile Post 119.15, Crossing #630 084L

36. **Sunset Avenue** (US 64E) is a two lane one-way arterial. The average daily traffic is 5100 vehicles per day. The warning devices consist of gates. It is a school bus route with 17 crossings per day.
CSX RR Mile Post 119.29, Crossing #630 085T

37. **Western Avenue** is a two lane one-way westbound urban collector. The average daily traffic is 4400 vehicles per day. The warning devices consist of gates. It is a school bus route with 13 crossings per day.

CSX RR Mile Post 119.39, Crossing # 630 086A

38. **Nash Street** is a two-lane one-way eastbound collector. The average daily traffic is 2300 vehicle per day. The warning devices consist of gates. It is a school bus crossing with16 crossings per day.
CSX RR Mile Post 119.48, Crossing #630 087G

39. **Bassett Street** is a two-lane collector. The average daily traffic is 4600 vehicles per day. The warning devices consist of gates. It is a major school bus crossing with 34 crossings per day.
CSX RR Mile Post 119.92, Crossing#629 767F

40. **Kingston** (SR 1727/SR 1157) consists of two one-way tunnels under the railroad with an at-grade crossing between the tunnels. The average daily traffic is 4600 vehicles per day. It is not a school bus route.

41. **Old Tarboro Road** (SR 1006) is a two lane rural/suburban secondary road. The average daily traffic is 3000 vehicles per day. The warning devices consist of gates. It was not listed as a school bus route.
CSX RR Mile Post 123.33, Crossing #629 771V

OTHER CONSIDERATIONS

Future Highway Projects

Several projects are identified in the *Draft 2002-2008 Transportation Improvement Program* that are relevant to this study.

U-2218 (NC 43 Bypass) is a two lane roadway beginning at the intersection of Cokey Road (NC 43) and Brake Road, continues northerly on new location across the CSX 'AB' line, bridges over and ends at the intersection of North Raleigh Street and Springfield Road

Construction	Project Completed During Traffic Separation Study

U-4019 is a proposed project to widen North Winstead Avenue (SR 1316) from Sunset Avenue (SR 1770) to Hunter Hill Road (SR 1604). The TIP schedule is:

Planning	FY 2001
Design	FY 2003
Right of Way	FFY 2005
Construction	FFY 2007

R-2823 (Rocky Mount Northern Outer Loop) is a proposed five lane curb and gutter roadway that begins at the intersection of North Winstead Avenue (SR 1316) and Hunter Hill Road (SR 1604), continues on new location in a northerly and northeasterly direction, then follows the existing corridor along Crusenberry Road and Instrument Drive to North Wesleyan Boulevard (US 301). The TIP schedule is for:

Planning	In Progress
Design	FY 2003
Right of Way	FFY 2005
Construction	FFY 2007 – 2008

U-3329 is a new route from the intersection of North Wesleyan Boulevard (US 301) and Red Oak-Battleboro Road easterly on new location across the CSX 'A' line to the intersection of Battleboro-Leggett Road and Morning Star Church Road. The project will be constructed as two lanes on four lanes of Right of Way. The TIP schedule is:

Planning	Complete
Design	In Progress
Right of Way	In Acquisition
Construction	FFY 2003

U-3820 is an upgrade of Tanner Road (SR 1401) beginning at the intersection of Atlantic Avenue (NC 97) and Airport Road (NC 97), bypasses the Women's Prison on new location and ends at Fountain School Road and College Road. The TIP schedule is:

Planning	In Progress
Design	FY 2006
Right of Way	FFY 2007
Construction	FFY 2008

B-3681 is a bridge replacement project to replace the bridge over the CSX railroad on Airport Road (SR 1555). The TIP schedule is:

Right of Way	FFY 2002
Construction	FFY 2004

The completion of the Rocky Mount Outer Loop along with the improvements proposed with TIP Project U-4019 will add significant traffic to Winstead Avenue and increase the exposure index at the crossing of the NCY RR and Winstead Avenue. The improvements to Tanner Road will provide an improved alternative to US 301 Business from the east side of Rocky Mount down town area to either CSX Rail crossings at Fountain School Road or College Road. Fountain School Road will also tie into the Northern Outer Loop.

The completion of the TIP Projects U-2218 and U-3329 will provide opportunities to eliminate existing redundant crossings along the CSX 'AB'line and along the CSX 'A' line. Crossings are considered to be redundant if they connect to the same street network and are closely spaced.

SECTION 2. EVALUATION CRITERIA/METHODOLOGY

DATA COLLECTION

In order to evaluate the crossing conditions in terms of safety and traffic delay, a variety of techniques were used to collect existing data for each crossing. This section describes the evaluation criteria and method of data collection for the criteria. Table 2 summarizes the evaluation criteria and source(s) or methods for data collection for the Rocky Mount grade crossing study.

Table 2
Summary of Data Collected for Grade Crossing Evaluations

Data Item	Source
Crossing number	NCDOT
Street or Route	City and County maps
County	State map
Railroad company	Railroad inventory sheets
Existing warning devices	Field visits
Vehicle traffic	Statewide Planning
24 hour train volumes	Railroad inventory sheets
Accident history	Accident reports
School bus Route (yes, no)	Rocky Mount School District
Crossing surface	Field visits
Classification of rail traffic	CSX, NCYR, Inventory sheets
100 year flood (above,below)	Field visits, FEMA maps
Development type	Field visits
Redundant crossing (yes,no)	Field visits
Potential for grade separation (high,medium,low)	Capacity analysis
Feasibility of implementing roadway improvements (high,medium,low)	Field visits and engineering judgment
Maintenance responsibility	City and County Maps
Crossing Geometry	Field visit, engineering judgment
Need for enhanced warning devices	Field visit and accident reports

The findings for each crossing relative to each of these criteria are summarized in Table 3 for the North / South CSX line and Table 3A for the NCYR and CSX East / West line.

Crossing #	Street Name	Nash County	Edgecombe County	Railroad	Warning Devices (Type)[1]	2000 ADT	2020 ADT	Percent Trucks	24 -Hour Train Volume	Accident History[2] 1990 - 2000	No. School Bus Crossing / Day	No. School Bus Passengers / Day	Crossing Surface[3]
629685Y	Bridges St.			CSX	4	1700	2800	6	34	1 (1/0)			3
629686F	Battleboro Rd.	SR 1560	SR 1407	CSX	5	4000	6600	7	34	1 (0/0)			4
629687M	College Rd.	SR 1540	SR 1403	CSX	4	700	1500	7	34				3
629688U	Fountain School Rd.	SR 1539	SR 1402	CSX	4	2200	4700	7	34	1 (1/0)			3
630082X	Grace St./Grand Av.	NC 43	NC 43	CSX	5	11800	19400	7	34	1 (0/1)	73	1181	3
630083E	Gold Leaf St.			CSX	4	2500	3700	6	34	1 (0/0)*	1	1	3
630084L	Thomas St.	US64W	US64W	CSX	4	4700	7800	14	34	1 (1/0)	11	143	6
630085T	Sunset Ave.	US64E	US64E	CSX	4	5100	8400	14	34		17	158	6
630086A	Western Ave.			CSX	4	4400	6400	6	34		13	293	6
630087G	Nash St.			CSX	4	2300	3400	6	34		16	177	6
629767F	Bassett St.			CSX	4	4600	6700	6	32	1 (0/0)	34	603	3
	Kingston/Sutton Rd.	SR 1727	SR 1157	CSX	Tunnel	4600	7600	7	32				
629771V	Old Tarboro Road	SR 1006	SR 1006	CSX	4			7	32	2 (0/0)			3

1. Warning Device Types Defined as: 0 = None; 1 = Crossbucks; 2 = Flashers; 3 = Cantilevers; 4 = Gates; 5 = Gates & Cantilevers; 6 = Traffic signal Preemption; 7 = Traffic Signals
2. Accident History [N (k/I)]: N = number of accidents; k = number of fatal accidents; I = number of injury accidents.
   * Accidents occurred prior to installation of existing warning devices
3. Crossing Surface: 1.Sec. Timber; 2. Full Wd. Plank; 3. Asphalt; 4. Concrete slab; 5. Concrete Pave.; 6. Rubber; 7. Metal Sections; 8. Other Metal; 9. Unconsolidated; O. Other.

Table 3. List of Data for At-Grade Street/Railroad Crossings on North/South Line in Rocky Mount

Crossing #	Street Name		Classification of Rail Traffic[4]	100 Year Flood Elevations[5] (Closed/Open)	Development Type[6]		Redundant Crossing (Yes/No)	Feasibility of Roadway Improvements (H,M,L)	Maintenance Responsibility (City/NCDOT)	Crossing Geometry (G,F,P)	Need for Enhanced Warning Devices (H,M,L)
629685Y	Bridges St.		1	Open	3		Y	L	CITY	G	L
629686F	Battleboro Rd.		1	Open	3		N	L	NCDOT	G	L
629687M	College Rd.		1	Open	3		N	H	NCDOT	G	L
629688U	Fountain School Rd.		1	Open	2		N	H	NCDOT	F	M
630082X	Grand Ave.		1	Closed	3		N	L	NCDOT	G	M
630083E	Gold Leaf St.		1	Closed	3		Y	L	CITY	G	L
630084L	Thomas St.		1	Open	3		N	L	NCDOT	G	M
630085T	Sunset Ave.		1	Open	3		N	L	NCDOT	F	M
630086A	Western Ave.		1	Open	3		N	L	CITY	F	M
630087G	Nash St.		1	Open	3		N	L	CITY	F	M
629767F	Bassett St.		1	Open	3		Y	L	CITY	G	M
	Kingston/Sutton Rd.			Closed				M			H
629771V	Old Tarboro Road		1	Open	2		N	M	NCDOT	G	M

4. Classification of Rail Traffic: 1. Passenger; 2. Mixed freight; 3. Unit coal trains; 4. other

5. 100 Year Flood Elavations: * Street Closings based on map showing ' Flooding Associated with Hurricane Floyd in the Rocky Mount Area'

6. Development Type: 0. Unknown; 1. Open space; 2. Residental; 3. Commercial; 4. Ind; 5. Institutional

Table 3. List of Data for At-Grade Street/Railroad Crossings on North/South Line in Rocky Mount

Crossing #	Street Name	Nash County	Edgecombe County	Railroad	Warning Devices (Type)[1]	2000 ADT	2020 ADT	Percent Trucks	24 -Hour Train Volume	Accident History[2] 1990 - 2000	No. School Bus Crossing / Day	No. School Bus Passengers / Day	Crossing Surface[3]
626218B	S. Halifax Rd.	SR 1544	N/A	NCYR	3	7800	16400	7	2		60	1548	3
	Mayfair Dr.		N/A	NCYR		200	300	6					
626217U	Mansfield Dr.		N/A	NCYR	1	2300	3400	6	2		4	70	3
626216M	Nottingham Rd.		N/A	NCYR	1	2200	3200	6	2		4	85	3
626215F	Winstead Ave.	SR 1613	N/A	NCYR	5	10100	21200	7	2		64	1517	3
626214Y	Englewood Drive		N/A	NCYR	4	1400	2100	6	2		14	97	3
626213S	Avondale Ave.		N/A	NCYR	1	500	800	6	2				3
626212K	Old Mill Rd.	SR 1836	N/A	NCYR	4	4900	8100	7	2	1 (0/0)*	9	99	3
626211D	Wesleyan Blvd.	301 BYP	N/A	NCYR	5	25000	41000	14	2				3
626210W	Piedmont Ave.		N/A	NCYR	3	3600	5900	6	2		9	176	3
626209C	Lee St./Glenn Ave.		N/A	NCYR	4	2000	3000	6	2	1 (0/0)*	4	44	3
626208V	Mayo/Pinecrest St.		N/A	NCYR	1	1100	1600	6	2		8	146	3
626207N	Hammond St.		N/A	NCYR	2	4000	6600	6	2		29	603	3
626206G	S. Pine St.		N/A	NCYR	1	900	1300	6	2		1	29	3
626205A	Tillery St.		N/A	NCYR	1	800	1200	6	2		1	26	3
626204T	Howell St.		N/A	NCYR	1	2000	2900	6	2		6	103	3
626203L	Grace St.		N/A	NCYR	5	6900	11300	6	2	1 (0/1)*	13	80	3
626202E	Pearl St.		N/A	NCYR	1	500	800	6	2		4	81	3
626201X	Franklin St.	301 BUS	N/A	NCYR	4	3300	5500	14	2				3
626199Y	Church St.	301 BUS	N/A	NCYR	5	3400	5600	14	2				3
629772C	Washington St.		N/A	CSX	1	400	600	6	4				3
629773J	Vance/Pender St.		N/A	CSX	4	1600	2400	6	4		12	170	3
629774R	Clark St.		N/A	CSX	4	700	1100	6	4		17	340	3
629775X	Branch St.		N/A	CSX	2	2200	3200	6	4		18	276	3
629776E	Cokey Rd.	SR 1164	N/A	CSX	4	8000	13200	7	4		10	140	3
629778T	Pitt St.		N/A	CSX	2	700	1200	6	4				3
629779A	Fairview Rd.	NC 43	N/A	CSX	2	5500	11600	7	4				3
629780U	Glendale Ave.	SR 1234	N/A	CSX	4	1600	2700	7	4				3

1. Warning Device Types Defined as: 0 = None; 1 = Crossbucks; 2 = Flashers; 3 = Cantilevers; 4 = Gates; 5 = Gates & Cantilevers; 6 = Traffic signal Preemption; 7 = Traffic Signals
2. Accident History [N (k/I)]: N = number of accidents; k = number of fatal accidents; I = number of injury accidents.
   * Accidents occurred prior to installation of existing warning devices
3. Crossing Surface: 1.Sec. Timber; 2. Full Wd. Plank; 3. Asphalt; 4. Concrete slab; 5. Concrete Pave.; 6. Rubber; 7. Metal Sections; 8. Other Metal; 9. Unconsolidated; O. Other.

Table3A. List of Data for At-Grade Street/Railroad Crossings on East/West Line in Rocky Mount, N.C.

Crossing #	Street Name		Classification of Rail Traffic[4]	100 Year Flood Elevations[5] (Closed/Open)	Development Type[6]		Redundant Crossing (Yes/No)	Feasibility of Roadway Improvements (Y/N)	Maintenance Responsibility (City/NCDOT)	Crossing Geometry (G,F,P)	Need for Enhanced Warning Devices (H,M,L)
626218B	S. Halifax Rd.		2	Open	2		No	Y	NCDOT	G	L
	Mayfair Dr.		2		2		Yes	N			
626217U	Mansfield Dr.		2	Open	2		No	N	CITY	G	L
626216M	Nottingham Rd.		2	Open	2		No	N	CITY	G	L
626215F	Winstead Ave.		2	Open	2		No	N	NCDOT	G	L
626214Y	Englewood Drive		2	Open	2		No	N	CITY	G	L
626213S	Avondale Ave.		2	Open	2		Yes	N	CITY	G	L
626212K	Old Mill Rd.		2	Open	4		No	Y	NCDOT	F	M
626211D	Wesleyan Blvd.		2	Closed	3		No	Y	NCDOT	G	L
626210W	Piedmont Ave.		2	Closed	2		No	N	CITY	G	L
626209C	Lee St./Glenn Ave.		2	Open	2		No	N	CITY	G	L
626208V	Mayo/Pinecrest St.		2	Open	2		Yes	N	CITY	G	L
626207N	Hammond St.		2	Open	5		No	N	CITY	G	L
626206G	S. Pine St.		2	Open	5		Yes	N	CITY	P	L
626205A	Tillery St.		2	Open	2		Yes	N	CITY	F	L
626204T	Howell St.		2	Open	2		No	Y	CITY	F	L
626203L	Grace St.		2	Open	4		No	N	CITY	G	L
626202E	Pearl St.		2	Open	2		Yes	N	CITY	F	L
626201X	Franklin St.		2	Open	4		No	Y	NCDOT	G	L
626199Y	Church St.		2	Open	4		No	Y	NCDOT	G	M
629772C	Washington St.		2	Open	4		No	Y	CITY	G	L
629773J	Vance/Pender St.		2	Open	2		No	N	CITY	G	L
629774R	Clark St.		2	Open	2		No	N	CITY	G	L
629775X	Branch St.		2	Open	2		No	Y	CITY	G	L
629776E	Cokey Rd.		2	Open	4		No	Y	NCDOT	F	L
629778T	Pitt St.		2	Open	2		No	N	CITY	G	L
629779A	Fairview Rd.		2	Open	3		No	Y	NCDOT	G	M
629780U	Glendale Ave.		2	Open	3		No	Y	NCDOT	G	L

4. Classification of Rail Traffic: 1. Passenger; 2. Mixed freight; 3. Unit coal trains; 4. other

5. 100 Year Flood Elavations: * Street Closings based on map showing ' Flooding Associated with Hurricane Floyd in the Rocky Mount Area'

6. Development Type: 0. Unknown; 1. Open space; 2. Residental; 3. Commercial; 4. Ind; 5. Institutional

Table3A. List of Data for At-Grade Street/Railroad Crossings on East/West Line in Rocky Mount, N.C.

SAFETY

Accident History

East / West Line -Vehicle / Train

- Old Mill Road – One accident occurred in 1991 with 0 injuries.
  No accidents have occurred since crossbucks were replaced with gates.

- Lee St. / Glenn Ave. – One accident occurred in mid 1996 with 0 injuries. No accidents have occurred since crossbucks were replaced with gates.

- Grace Street – One accident occurred in 1996 with 1 railroad employee injured. No accidents have occurred since crossbucks were replaced with gates and cantilever flashing-light signals.

North / South Line – Vehicle / Train

- Bridges Street – One accident occurred in 1993 with 1 person killed. The existing gates were in place.

- Battleboro Road – One accident occurred in 1994 with 0 injuries. Cantilever flashing-light signals and gates were in place.

- Fountain School Road – One accident occurred in 1998 with 1 person killed. The existing gates were in place.

- Grand Ave. / Grace Street – One accident occurred in 1994 with 1 injury. The injury accident occurred with cantilever flashing-light signals and gates in place.

- Gold Leaf Street – One accident occurred in 1990 with no injuries. The accident occurred with gates and standard flashing light signals in place.

- Bassett Street – One accident occurred in 1994 with 0 injuries. The accident occurred with gates and standard flashing light signals in place.

- Old Tarboro Road – Two accidents occurred between 1990 and 1997 with no injuries. The existing gates were in place.

North / South Line – Vehicle / Pedestrian

- Thomas Street – One accidents occurred in 1996 with 1 pedestrian killed. The existing gates were in place.

The compiled list of accident data from 1990 through 2000 is summarized in Table 4.

Crossing #	Street Name	Accident Number	Time of Day	Date of Accident	Weather	# Injuries in Vehicle	# Injuries Rail Personnel	Vehicle Speed	Train Speed	Type of Warning Device	REMARKS:
626218B	S. Halifax Rd.										
	Mayfair Dr.										
626217U	Mansfield Dr.										
626216M	Nottingham Rd.										
626215F	Winstead Ave.										
626214Y	Englewood Drive										
626213S	Avondale Ave.										
626212K	Old Mill Rd.	1	5:00 PM	1/30/91	Rain	0	0	5	5	7	Car Did Not Stop
626211D	Wesleyan Blvd.										
626210W	Piedmont Ave.										
626209C	Lee St./Glenn Ave.	1	10:48 AM	6/20/96	Clear	0	0	40	10	7	Car Did Not Stop
626208V	Mayo/Pinecrest St.										
626207N	Hammond St.										
626206G	S. Pine St.										
626205A	Tillery St.										
626204T	Howell St.										
626203L	Grace St.	1	2:31 PM	12/28/95	Clear	0	1	35	10	7	Car Did Not Stop
626202E	Pearl St.										
626201X	Franklin St.										
626199Y	Church St.										
629772C	Washington St.										
629773J	Vance/Pender St.										
629774R	Clark St.										
629775X	Branch St.										
629776E	Cokey Rd.										
629778T	Pitt St.										
629779A	Fairview Rd.										
629780U	Glendale Ave.										

Note: 1. Gates; 2. Cantilever FLS; 3. Standard FLS; 4. Wig Wags; 5. Hwy. Traffic Signals; 6. Audible; 7. Crossbucks; 8. Stop signs; 9. Watchman; 10. Flagged By Crew; 11. Other; 12. None

Table 4. Compiled List of Accidents From 1990 Thru 2000

Crossing #	Street Name	Accident Number	Time of Day	Date of Accident	Weather	# Injuries in Vehicle	# Injuries Rail Personnel	Vehicle Speed	Train Speed	Type of Warning Device	REMARKS:
629685Y	Bridges St.	1	4:30 PM	10/17/92	Rain	1 Killed	0	1	40	1, 3	Drove Around Gate
629686F	Battleboro Rd.	1	6:30 AM	2/8/94	Cloudy	0	0	0	45	1, 2	Truck Stopped on Crossing
629687M	College Rd.										
629688U	Fountain School Rd.	1	4:43 PM	10/23/98	Clear	1 Killed	0	20	77	1	Driver Drove Around Gate
630082X	Grand Ave.	1	11:10 AM	11/23/93	Clear	1	0	5	35	1, 2	Car Drove Around Gate
630083E	Gold Leaf St.	1	6:55 PM	2/9/90	Rain	0	0	15	25	1, 3	
630084L	Thomas St.	1	1:49 PM	8/8/96	Cloudy	1 Killed	0		25	1, 3	Pedestrian
630085T	Sunset Ave.										
630086A	Western Ave.										
630087G	Nash St.										
629767F	Bassett St.	1	11:15 AM	5/2/94	Clear	0	0	15	20	1, 3, 6	Car Drove Around Gate
	Kingston/Sutton Rd.										
629771V	Old Tarboro Road	1	11:30 AM	12/24/90	Cloudy	0	0	0	74	1	Car Stopped on Crossing
		2	1:22 PM	6/3/97	Cloudy	0	0	15	79	1	Car Drove Around Gate

Note: 1. Gates; 2. Cantilever FLS; 3. Standard FLS; 4. Wig Wags; 5. Hwy. Traffic Signals; 6. Audible; 7. Crossbucks; 8. Stop signs; 9. Watchman; 10. Flagged By Crew; 11. Other; 12. None

Table 4. Compiled List of Accidents From 1990 Thru 2000

Exposure Index

One key element in the safety assessment is the *exposure index,* the basis of NCDOT Rail Division's Rail Grade Separation Guidelines. The guidelines state the following:

- Separations should be used in RURAL areas when the exposure index is 15,000 or more.
- Separations should be used in URBAN areas when the exposure index is 30,000 or more.

The exposure index is defined as the "product of the number of trains per day and the projected daily highway traffic at the end of the design period." The formula is shown below:

$EI = N \times ADT$

Where:

E	=	NCDOT Rail Division's Exposure Index.
N	=	Number of trains per day.
ADT	=	Average Daily Traffic at highway/rail crossing.

Results calculated using this formula are one criteria in the determination of recommendations for grade separations. The number of trains for the design year will be assumed to be the same as present unless information to the contrary, such as pending abandonment of the railroad, is available. These exposure indices are summarized in Table 5.

CROSSING NO.	STREET NAME	TRAINS/24 HOUR YEAR 2000	2000 ADT	EXPOSURE INDEX YEAR 2000	TRAINS/24 HOUR 2010 ADT	2010 ADT	EXPOSURE INDEX 2010 ADT
629685Y	Bridges St.	34	1,700	**57,800**	34	2,250	**76,500**
629686F	Battleboro Rd.	34	4,000	**136,000**	34	5,300	**180,200**
629687M	College Rd.	34	700	23,800	34	1,100	**37,400**
629688U	Fountain School	34	2,200	**74,800**	34	3,450	**117,300**
630082X	Grand Ave.	34	11,800	**401,200**	34	15,600	**530,400**
630083E	Gold Leaf St.	34	2,500	**85,000**	34	3,100	**105,400**
630084L	Thomas St.	34	4,700	**159,800**	34	6,250	**212,500**
630085T	Sunset Ave.	34	5,100	**173,400**	34	6,750	**229,500**
630086A	Western Ave.	34	4,400	**149,600**	34	5,400	**183,600**
630087G	Nash Ave.	34	2,300	**78,200**	34	2,850	**96,900**
629767F	Bassett St.	34	4,600	**156,400**	34	5,650	**192,100**
	Sutton Rd.		4,600			6,100	
629771V	Old Tarboro Rd.	34	3,000	**102,000**	34	3,900	**132,600**
626218B	Halifax Rd.	4	7,800	**31,200**	4	12,100	**48,400**
	Mayfair Rd.		200			250	
626217U	Mansfield Dr.	4	2,300	9,200	4	2,850	11,400
626216M	Nottingham Rd.	4	2,200	8,800	4	2,700	10,800
626215F	Winstead Ave.	4	10,100	**40,400**	4	15,650	**62,600**
626214Y	Englewood Drive	4	1,400	5,600	4	1,750	7,000
626213S	Avondale Ave.	4	500	2,000	4	650	2,600
626212K	Old Mill Rd.	4	4,900	19,600	4	6,500	26,000
626211D	Wesleyan Ave.	4	25,000	**100,000**	4	33,000	**132,000**
626210W	Piedmont Ave.	4	3,600	14,400	4	4,750	19,000
626209C	Lee St./Glenn Ave.	4	2,000	8,000	4	2,500	10,000
626208V	Mayo/Pinecrest St.	4	1,100	4,400	4	1,350	5,400
626207N	Hammond St.	4	4,000	16,000	4	5,300	21,200
626206G	S. Pine St.	4	900	3,600	4	1,100	4,400
626205A	Tillery St.	4	800	3,200	4	1,000	4,000
626204T	Howell St.	4	2,000	8,000	4	2,450	9,800
626203L	Grace St.	4	6,900	27,600	4	9,100	**36,400**
626202E	Pearl St.	4	500	2,000	4	650	2,600
626201X	Franklin St.	4	3,300	13,200	4	4,400	17,600
626199Y	Church St.	4	3,400	13,600	4	4,500	18,000
629772C	Washington St.	9	400	3,600	9	500	4,500
629773J	Vance/Pender St.	9	1,600	14,400	9	2,000	18,000
629774R	Clark St.	9	700	6,300	9	900	8,100
629775X	Branch St.	9	2,200	19,800	9	2,700	24,300
629776E	Cokey Rd.	8	8,000	**64,000**	8	10,600	**84,800**
629778T	Pitt St.	6	700	4,200	6	950	5,700
629779A	Fairview Rd.	8	5,500	**44,000**	8	8,550	**68,400**
629780U	Glendale Ave.	6	1,600	9,600	6	2,150	12,900

NOTE: Numbers in BOLD indicate values exceeding relevent thresholds.

Table 5. Exposure Indices

DELAY ANALYSIS

Level of Service is a measure of the operational efficiency of the at-grade crossing. It is determined using procedures from the *Highway Capacity Manual* procedures. Level of service is expressed as a letter ranging from A (free flowing) to F (severely congested) and is determined using the average delay for all vehicles. Table 6 summarizes the relationships between average delay and level of service.

Table 6. Highway Capacity Manual LOS Thresholds for Average Delay

Level of Service	Average Delay/Vehicle (seconds)
A	5.0
B	>5.0 to 15.0
C	>15.0 to 25.0
D	>25.0 to 40.0
E	>40.0 to 60.0
F	>60.0

To quantify changes in traffic delays, several values were calculated for each of the at-grade crossings. The calculations are based on methodology developed for the Proposed Conrail Acquisition Draft Environmental Impact Statement (DEIS)[1]. This methodology was developed by the Surface Transportation Board's Section of Environmental Analysis (SEA). These formulas were modified as needed for this project.

The following values were calculated for existing and future conditions:

- Blocked crossing time per train.
- Event time.
- Average delay per stopped vehicle.
- Number of vehicles delayed per day.
- Maximum vehicle queue.
- Total stopped vehicle delay per day.
- Average delay for all vehicles.
- Traffic level of service (LOS).

Traffic Level of Service

The level of service (LOS) for each crossing was determined based on these values and the *Highway Capacity Manual*[2] procedures. Table 7 thru 7C summarize the results of the traffic delay analysis.

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[1] Surface Transportation Board Section of Environmental Analysis. *Proposed Conrail Acquisition Draft Environmental Impact Statement*. December 1997, Volume 1, Chapter 3, pp. 3-16 to 3-18 and Volume 5A, Appendix C, pp. C-10 to C-16.

[2] Transportation Research Board. *Highway Capacity Manual: Special Report 209, Third Edition (Updated 1994)*.

Crossing #	Street Name	No. Lanes (one-way direction)	ADT	Arrival Rate (Veh/Min) 2x uniform	Departure Rate	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Crossing Blockage Time (min) T_c	Event (Queue) Time (min) T_e	Total Stopped Vehicle Delay Per Day (min/day) D_T	Number Vehicles Delayed/Day V_D	Max. Peak Hr. Queue (veh/lane) Q	Average Delay /Stopped Veh. (mins) D_{avg}	Avg. Delay/Veh. In Secs. (All Vehicles) D_V	LOS
626218B	S. Halifax Rd.	1.00	7,800	10.83	30.00	2	10.00	1,500	1.70	2.67	38.56	29	13	1.33	0.59	A
	Mayfair Dr.	1.00	200	0.28	30.00	2	10.00	1,500	1.70	1.72	0.41	0	0	0.86	0.25	A
626217U	Mansfield Dr.	1.00	2,300	3.19	30.00	2	10.00	1,500	1.70	1.91	5.81	6	4	0.95	0.30	A
626216M	Nottingham Rd.	1.00	2,200	3.06	30.00	2	10.00	1,500	1.70	1.90	5.50	6	4	0.95	0.30	A
626215F	Winstead Ave.	1.00	10,100	14.03	30.00	2	10.00	1,500	2.20	4.14	120.26	58	22	2.07	1.43	A
626214Y	Englewood Drive	1.00	1,400	1.94	30.00	2	10.00	1,500	2.20	2.36	5.40	5	3	1.18	0.46	A
626213S	Avondale Ave.	1.00	500	0.69	30.00	2	10.00	1,500	1.70	1.74	1.06	1	1	0.87	0.25	A
626212K	Old Mill Rd.	1.00	4,900	6.81	30.00	2	10.00	1,500	2.20	2.85	27.67	19	11	1.43	0.68	A
626211D	Wesleyan Blvd.	2.00	25,000	34.72	60.00	2	10.00	1,500	2.20	5.23	475.38	182	28	2.62	2.28	A
626210W	Piedmont Ave.	1.00	3,600	5.00	30.00	2	10.00	1,500	1.70	2.05	10.46	10	6	1.02	0.35	A
626209C	Lee St./Glenn Ave.	1.00	2,000	2.78	30.00	2	10.00	1,500	2.20	2.43	8.20	7	4	1.21	0.49	A
626208V	Mayo/Pinecrest St.	1.00	1,100	1.53	30.00	2	10.00	1,500	1.70	1.80	2.46	3	2	0.90	0.27	A
626207N	Hammond St.	1.00	4,000	5.56	30.00	2	10.00	1,500	1.70	2.09	12.16	12	7	1.05	0.36	A
626206G	S. Pine St.	1.00	900	1.25	30.00	2	10.00	1,500	1.70	1.78	1.98	2	2	0.89	0.26	A
626205A	Tillery St.	1.00	800	1.11	30.00	2	10.00	1,500	1.70	1.77	1.74	2	1	0.89	0.26	A
626204T	Howell St.	1.00	2,000	2.78	30.00	2	10.00	1,500	1.70	1.88	4.90	5	3	0.94	0.29	A
626203L	Grace St.	2.00	6,900	9.58	60.00	2	10.00	1,500	2.20	2.62	32.98	25	8	1.31	0.57	A
626202E	Pearl St.	1.00	500	0.69	30.00	2	10.00	1,500	1.70	1.74	1.06	1	1	0.87	0.25	A
626201X	Franklin St.	2.00	3,300	4.58	60.00	2	10.00	1,500	2.20	2.39	13.06	11	4	1.19	0.47	A
626199Y	Church St.	1.00	3,400	4.72	30.00	2	10.00	1,500	2.20	2.62	16.16	12	7	1.31	0.57	A
629772C	Washington St.	1.00	400	0.56	30.00	4	25.00	3,500	2.09	2.13	2.52	2	1	1.07	0.76	A
629773J	Vance/Pender St.	1.00	1,600	2.22	30.00	4	25.00	3,500	2.09	2.26	11.33	10	3	1.13	0.85	A
629774R	Clark St.	1.00	700	0.97	30.00	4	25.00	3,500	2.09	2.16	4.54	4	1	1.08	0.78	A
629775X	Branch St.	1.00	2,200	3.06	30.00	4	25.00	3,500	2.09	2.33	16.56	14	5	1.16	0.90	A
629776E	Cokey Rd.	1.00	8,000	11.11	30.00	4	25.00	3,500	2.09	3.32	122.53	74	17	1.66	1.84	A
629778T	Pitt St.	1.00	700	0.97	30.00	4	25.00	3,500	2.09	2.16	4.54	4	1	1.08	0.78	A
629779A	Fairview Rd.	1.00	5,500	7.64	30.00	4	25.00	3,500	2.09	2.81	60.11	43	12	1.40	1.31	A
629780U	Glendale Ave.	1.00	1,600	2.22	30.00	4	25.00	3,500	2.09	2.26	11.33	10	3	1.13	0.85	A

Table 7. Year 2000 Vehicle-Delay due to Train Crossing on East West Line

Crossing #	Street Name	No. Lanes (one-way direction)	ADT	Arrival Rate (Veh/Min) 2x uniform	Departure Rate	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Crossing Blockage Time (min) T_c	Event (Queue) Time (min) T_c	Total Stopped Vehicle Delay Per Day (min/day) D_T	Number Vehicles Delayed/Day V_D	Max. Peak Hr. Queue (veh/lane) Q	Average Delay /Stopped Veh. (mins)	Avg. Delay/Veh. In Secs. (All Vehicles) D_V	LOS
626218B	S. Halifax Rd.	1.00	12,100	16.81	30.00	2	10.00	1,500	1.70	3.88	126.21	65	21	1.94	1.25	A
	Mayfair Dr.	1.00	250	0.35	30.00	2	10.00	1,500	1.70	1.72	0.52	1	0	0.86	0.25	A
626217U	Mansfield Dr.	1.00	2,850	3.96	30.00	2	10.00	1,500	1.70	1.96	7.63	8	5	0.98	0.32	A
626216M	Nottingham Rd.	1.00	2,700	3.75	30.00	2	10.00	1,500	1.70	1.95	7.12	7	5	0.97	0.32	A
626215F	Winstead Ave.	1.00	15,650	21.74	30.00	2	10.00	1,500	2.20	8.00	696.09	174	35	4.00	5.34	A
626214Y	Englewood Drive	1.00	1,750	2.43	30.00	2	10.00	1,500	2.20	2.40	6.99	6	4	1.20	0.48	A
626213S	Avondale Ave.	1.00	650	0.90	30.00	2	10.00	1,500	1.70	1.76	1.39	2	1	0.88	0.26	A
626212K	Old Mill Rd.	1.00	6,500	9.03	30.00	2	10.00	1,500	2.20	3.15	44.89	28	14	1.58	0.83	A
626211D	Wesleyan Blvd.	2.00	33,000	45.83	60.00	2	10.00	1,500	2.20	9.34	1997.82	428	36	4.67	7.26	B
626210W	Piedmont Ave.	1.00	4,750	6.60	30.00	2	10.00	1,500	1.70	2.19	15.75	14	8	1.09	0.40	A
626209C	Lee St./Glenn Ave.	1.00	2,500	3.47	30.00	2	10.00	1,500	2.20	2.49	10.79	9	6	1.25	0.52	A
626208V	Mayo/Pinecrest St.	1.00	1,350	1.88	30.00	2	10.00	1,500	1.70	1.82	3.10	3	2	0.91	0.28	A
626207N	Hammond St.	1.00	5,300	7.36	30.00	2	10.00	1,500	1.70	2.26	18.78	17	9	1.13	0.43	A
626206G	S. Pine St.	1.00	1,100	1.53	30.00	2	10.00	1,500	1.70	1.80	2.46	3	2	0.90	0.27	A
626205A	Tillery St.	1.00	1,000	1.39	30.00	2	10.00	1,500	1.70	1.79	2.22	2	2	0.89	0.27	A
626204T	Howell St.	1.00	2,450	3.40	30.00	2	10.00	1,500	1.70	1.92	6.29	7	4	0.96	0.31	A
626203L	Grace St.	2.00	9,100	12.64	60.00	2	10.00	1,500	2.20	2.79	49.29	35	10	1.40	0.65	A
626202E	Pearl St.	1.00	650	0.90	30.00	2	10.00	1,500	1.70	1.76	1.39	2	1	0.88	0.26	A
626201X	Franklin St.	2.00	4,400	6.11	60.00	2	10.00	1,500	2.20	2.45	18.41	15	5	1.23	0.50	A
626199Y	Church St.	1.00	4,500	6.25	30.00	2	10.00	1,500	2.20	2.78	24.23	17	10	1.39	0.65	A
629772C	Washington St.	1.00	500	0.69	30.00	4	25.00	3,500	2.09	2.14	3.18	3	1	1.07	0.76	A
629773J	Vance/Pender St.	1.00	2,000	2.78	30.00	4	25.00	3,500	2.09	2.30	14.75	13	4	1.15	0.88	A
629774R	Clark St.	1.00	900	1.25	30.00	4	25.00	3,500	2.09	2.18	5.95	5	2	1.09	0.79	A
629775X	Branch St.	1.00	2,700	3.75	30.00	4	25.00	3,500	2.09	2.39	21.41	18	6	1.19	0.95	A
629776E	Cokey Rd.	1.00	10,600	14.72	30.00	4	25.00	3,500	2.09	4.11	248.18	121	22	2.05	2.81	A
629778T	Pitt St.	1.00	950	1.32	30.00	4	25.00	3,500	2.09	2.19	6.31	6	2	1.09	0.80	A
629779A	Fairview Rd.	1.00	8,550	11.88	30.00	4	25.00	3,500	2.09	3.46	142.23	82	18	1.73	2.00	A
629780U	Glendale Ave.	1.00	2,150	2.99	30.00	4	25.00	3,500	2.09	2.32	16.10	14	4	1.16	0.90	A

Table 7A. Year 2010 Vehicle-Delay due to Train Crossing on East West Line

Crossing #	Street Name	No. Lanes (one-way direction)	ADT	Arrival Rate (Veh/Min) 2x uniform	Departure Rate	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Crossing Blockage Time (min) with Gates T_c	Event (Queue) Time (min) T_e	Total Stopped Vehicle Delay Per Day (min/day) D_T	Number Vehicles Delayed/Day V_D	Max. Peak Hr. Queue (veh/lane) Q	Average Delay /Stopped Veh. (mins) D_{avg}	Avg. Delay/Veh. In Secs. (All Vehicles) D_V
CSX FREIGHT LINE															
629685Y	Bridges St.	1.00	1,700	2.36	30.00	30	40.00	7,500	2.63	2.86	144.38	101	4	1.43	10.19
629686F	Battleboro Rd.	1.00	4,000	5.56	30.00	30	40.00	7,500	2.63	3.23	434.32	269	11	1.61	13.03
629687M	College Rd.	1.00	700	0.97	30.00	30	40.00	7,500	2.63	2.72	53.90	40	2	1.36	9.24
629688U	Fountain School Rd.	1.00	2,200	3.06	30.00	30	40.00	7,500	2.63	2.93	196.60	134	6	1.46	10.72
630082X	Grand Av.	2.00	11,800	16.39	60.00	30	40.00	7,500	2.63	2.64	858.44	650	16	1.32	8.73
630083E	Gold Leaf St.	1.00	2,500	3.47	30.00	30	40.00	7,500	2.63	2.98	230.49	155	7	1.49	11.06
630084L	Thomas St.	2.00	4,700	6.53	60.00	30	40.00	7,500	2.63	2.64	340.05	258	6	1.32	8.68
630085T	Sunset Ave.	2.00	5,100	7.08	60.00	30	40.00	7,500	2.63	2.64	369.10	280	7	1.32	8.68
630086A	Western Ave.	2.00	4,400	6.11	60.00	30	40.00	7,500	2.63	2.64	318.27	242	6	1.32	8.68
630087G	Nash St.	2.00	2,300	3.19	60.00	30	40.00	7,500	2.63	2.63	166.10	126	3	1.32	8.67
629767F	Bassett St.	1.00	4,600	6.39	30.00	30	40.00	7,500	2.63	3.34	535.34	320	12	1.67	13.97
	Kinston/Sutton Rd.	1.00	4,600	6.39	30.00	30	40.00	7,500	2.63	3.34	535.34	320	12	1.67	13.97
629771V	Old Tarboro Road	1.00	3,000	4.17	30.00	30	40.00	7,500	2.63	3.05	291.65	191	8	1.53	11.67
AMTRAK PASSENGER															
629685Y	Bridges St.	1.00	1,700	2.36	30.00	8	79.00	700	0.60	0.65	2.01	6	1	0.33	0.14
629686F	Battleboro Rd.	1.00	4,000	5.56	30.00	8	79.00	700	0.60	0.74	6.04	16	2	0.37	0.18
629687M	College Rd.	1.00	700	0.97	30.00	8	79.00	700	0.60	0.62	0.75	2	0	0.31	0.13
629688U	Fountain School Rd.	1.00	2,200	3.06	30.00	8	79.00	700	0.60	0.67	2.73	8	1	0.33	0.15
630082X	Grand Av.	2.00	11,800	16.39	60.00	8	40.00	700	0.70	0.70	16.16	46	4	0.35	0.16
630083E	Gold Leaf St.	1.00	2,500	3.47	30.00	8	40.00	700	0.70	0.79	4.34	11	2	0.40	0.21
630084L	Thomas St.	2.00	4,700	6.53	60.00	8	40.00	700	0.70	0.70	6.40	18	2	0.35	0.16
630085T	Sunset Ave.	2.00	5,100	7.08	60.00	8	40.00	700	0.70	0.70	6.95	20	2	0.35	0.16
630086A	Western Ave.	2.00	4,400	6.11	60.00	8	40.00	700	0.70	0.70	5.99	17	2	0.35	0.16
630087G	Nash St.	2.00	2,300	3.19	60.00	8	40.00	700	0.70	0.70	3.13	9	1	0.35	0.16
629767F	Bassett St.	1.00	4,600	6.39	30.00	8	40.00	700	0.70	0.89	10.08	23	3	0.44	0.26
	Kinston/Sutton Rd.	1.00	4,600	6.39	30.00	8	79.00	700	0.60	0.76	7.44	20	3	0.38	0.19
629771V	Old Tarboro Road	1.00	3,000	4.17	30.00	8	79.00	700	0.60	0.70	4.06	12	2	0.35	0.16

Table 7B. Year 2000 Vehicle-Delay due to Train Crossing on North South Line

Crossing #	Street Name	No. Lanes (one-way direction)	ADT	Arrival Rate (Veh/Min) 2x uniform	Departure Rate	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Crossing Blockage Time (min) with Gates T_c	Event (Queue) Time (min) T_e	Total Stopped Vehicle Delay Per Day (min/day) D_T	Number Vehicles Delayed/Day V_D	Max. Peak Hr. Queue (veh/lane) Q	Average Delay /Stopped Veh. (mins) D_{avg}	Avg. Delay/Veh. In Secs. (All Vehicles) D_V
CSX FREIGHT LINE															
629685Y	Bridges St.	1.00	2,250	3.13	30.00	30	40.00	10,000	3.34	3.73	325.98	175	8	1.86	17.39
629686F	Battleboro Rd.	1.00	5,300	7.36	30.00	30	40.00	10,000	3.34	4.43	1082.10	489	18	2.21	24.50
629687M	College Rd.	1.00	1,100	1.53	30.00	30	40.00	10,000	3.34	3.52	141.99	81	4	1.76	15.49
629688U	Fountain School Rd.	1.00	3,450	4.79	30.00	30	40.00	10,000	3.34	3.98	568.11	286	12	1.99	19.76
630082X	Grand Ave.	2.00	15,600	21.67	60.00	30	40.00	10,000	3.34	5.23	4443.57	1700	26	2.61	34.18
630083E	Gold Leaf St.	1.00	3,100	4.31	30.00	30	40.00	10,000	3.34	3.90	491.34	252	10	1.95	19.02
630084L	Thomas St.	2.00	6,250	8.68	60.00	30	40.00	10,000	3.34	3.91	993.29	509	10	1.95	19.07
630085T	Sunset Ave.	2.00	6,750	9.38	60.00	30	40.00	10,000	3.34	3.96	1102.39	557	11	1.98	19.60
630086A	Western Ave.	2.00	5,400	7.50	60.00	30	40.00	10,000	3.34	3.82	820.04	430	9	1.91	18.22
630087G	Nash St.	2.00	2,850	3.96	60.00	30	40.00	10,000	3.34	3.58	379.82	212	5	1.79	15.99
629767F	Bassett St.	1.00	5,650	7.85	30.00	30	40.00	10,000	3.34	4.52	1204.74	533	19	2.26	25.59
	Kingston/Sutton Rd.	1.00	6,100	8.47	30.00	30	40.00	10,000	3.34	4.66	1377.31	592	20	2.33	27.09
629771V	Old Tarboro road	1.00	3,900	5.42	30.00	30	40.00	10,000	3.34	4.08	675.28	331	13	2.04	20.78
AMTRAK PASSENGER															
629685Y	Bridges St.	1.00	2,250	3.13	30.00	8	79.00	700	0.60	0.67	2.81	8	1	0.34	0.15
629686F	Battleboro Rd.	1.00	5,300	7.36	30.00	8	79.00	700	0.60	0.80	9.33	23	3	0.40	0.21
629687M	College Rd.	1.00	1,100	1.53	30.00	8	79.00	700	0.60	0.63	1.22	4	1	0.32	0.13
629688U	Fountain School Rd.	1.00	3,450	4.79	30.00	8	79.00	700	0.60	0.71	4.90	14	2	0.36	0.17
630082X	Grand Ave.	2.00	15,600	21.67	60.00	8	40.00	700	0.70	1.09	51.85	95	5	0.55	0.40
630083E	Gold Leaf St.	1.00	3,100	4.31	30.00	8	40.00	700	0.70	0.82	5.73	14	2	0.41	0.22
630084L	Thomas St.	2.00	6,250	8.68	60.00	8	40.00	700	0.70	0.82	11.59	28	2	0.41	0.22
630085T	Sunset Ave.	2.00	6,750	9.38	60.00	8	40.00	700	0.70	0.83	12.86	31	2	0.41	0.23
630086A	Western Ave.	2.00	5,400	7.50	60.00	8	40.00	700	0.70	0.80	9.57	24	2	0.40	0.21
630087G	Nash St.	2.00	2,850	3.96	60.00	8	40.00	700	0.70	0.75	4.43	12	1	0.37	0.19
629767F	Bassett St.	1.00	5,650	7.85	30.00	8	40.00	700	0.70	0.95	14.06	30	4	0.47	0.30
	Kingston/Sutton Rd.	1.00	6,100	8.47	30.00	8	79.00	700	0.60	0.84	11.87	28	4	0.42	0.23
629771V	Old Tarboro road	1.00	3,900	5.42	30.00	8	79.00	700	0.60	0.73	5.82	16	2	0.37	0.18

Table 7C. Year 2010 Vehicle-Delay due to Train Crossing on North South Line

SECTION 3. SAFETY AND MOBILITY ISSUES

VEHICLES QUEUEING ACROSS RAILROAD TRACKS

The presence of nearby traffic signals, intersections, or parallel roadways can result in queues of stopped vehicles extending onto or across a railroad crossing. Parallel streets occur along the tracks in several locations in the Rocky Mount area. These locations are:

"ABA" Line –

Andrews Street on the north side of the NCYRR between Church Street and Franklin Street.

Franklin Street is one-way southbound and is gate controlled. Queues formed for traffic turning left from Andrews Street to Franklin Street would remain on Andrews Street

Northbound traffic on Church Street is gate controlled with left turn volumes onto Andrews a minor move for u-turn movements down Franklin Street No accidents have been reported at this crossing since gates were installed.

"AB" Line

South Street on the north side of the CSX track between Washington Street and Pender Street.

Washington Street is an industrial access with low traffic volumes. Vehicles turning left would queue on South Street

Pender Street is gate controlled and left turns to South Street are very minor movements.

Traffic volumes are low in this area and no accidents have been reported.

"A" Line

Railroad Street and Pearsall Street parallel the railroad between Battleboro Road and Bridges Street

Railroad Street and Pearsall Street have low traffic volumes.

Bridges Street is a redundant crossing and is recommended to be closed.

Battleboro Road is gate controlled and the only available left turn movement is from eastbound Battleboro Road to Pearsall Street

No known accidents have occurred due to vehicles stopped for left turns onto Pearsall Street

S.W. Main Street is a parallel street located on the west side of the tracks between Hammond Street and Thomas Street

N.E. Main Street is a parallel street located on the east side of the tracks between Edgecombe Street and Grand Ave.

Main Street is in very close proximity to the railroad tracks on both east and west sides. The streets with the higher volumes of traffic are one-way which eliminates the possibilities of left turn queues across the tracks. No accidents have been reported for vehicles stopped on the tracks in this location.

TRAFFIC SIGNAL PREEMPTION

Standard practice (based of *The Manual on Uniform Traffic Control Devices*) requires that traffic signals located within 200 feet of a railroad crossing be coordinated with the crossings train detection and warning system to preempt normal operations of the traffic signal. There are traffic signals within 200 feet of the crossings at the following locations:

Thomas Street & Main Street (Existing preemption)
Sunset Avenue & Main Street (Existing preemption)
Western Avenue & Main Street
Nash Street & Main Street

Traffic signal preemption is warranted at these locations.

HUMPED CROSSINGS

A "humped" crossing exists where the elevation of the railroad is significantly higher than the crossing roadway, causing vehicles to ascend on one side of the tracks and descend on the other. The severity of this condition can range from discomfort at normal speeds, to "bottoming out" of vehicles with long wheelbases or low clearances. This dragging can damage vehicles, or cause them to become stuck on the crossing, creating a serious hazard. Routine track maintenance tends to exacerbate the problem over time, as track ballast work typically adds about 3" per occurrence. Over a ten-year period, the railroad will rise about one foot as a result of this routine maintenance.

Crest vertical curves across the tracks that do not create a need for the driver to reduce speed are not considered to be a humped profile. The combination of short crest and sag vertical curves caused by a buildup of the ballast and raising of the track create a need to reduce speed across the crossing. The following crossings have humped profiles:

Tillery Street
Howell Street
Fountain School
Thomas Street
Sunset Avenue
Western Avenue
Nash Street

GRADE CROSSING CONDITION

A poor grade crossing surface can result in a rough, uneven ride. This can increase wear and tear on vehicles, create a traffic safety hazard, and cause congestion by reducing travel speeds. The crossing materials used on these grade crossings include asphalt, concrete slab, and rubber. Even though some materials provide a slightly improved ride and longer term maintenance, the main safety issue is the condition of the crossing. All of the crossings have been maintained and are in good to excellent condition.

VEHICLES DRIVING AROUND AUTOMATED GATES

Several situations can lead to the circumvention of automated gates by motorists:

- Gates are lowered, but no train is visible
- Gates fail, and remain in the lowered position
- Gates are lowered and train is visible, but motorist is too impatient to wait

Accidents have occurred at the following locations due to vehicles driving around automated gates:

Bridges Street	*one death occurred in 1992.*
Fountain School Road	*one death occurred in 1998 (bicycle).*
Grand Avenue	*one injury occurred in 1993.*
Goldleaf Street	*no injuries or deaths in 1990 accident.*
Thomas Street	*one pedestrian was killed 1996.*
Old Tarboro Road	*one accident resulted in no injuries or deaths in 1997.*
Bassett Street	*one accident resulted in no injuries or deaths in 1994.*

IMPROVED SIGNS AND MARKINGS

The effectiveness of required warning signs, markings, signals, and other devices depends heavily on proper installation and maintenance by state and municipal transportation departments and the railroads. W-10-1 Signs and pavement markings should be improved at the following locations:

Cokey Road has recently been milled and resurfaced.
Needs W-10 1 signs,
Enhance pavement markings,
Replacement of 8" lens with 12" lens.
Washington Street.
Needs W-10- 1 sign and pavement marking on south approach.
Enhance pavement marking on north approach.
Glendale Avenue
Needs bush trimmed from sign on south approach.
Nash Avenue
Replace 2-8" lens with 12" lens,
Needs traffic signal preemption.
Western Avenue
Replace 8-8" lens with 12" lens,
Enhance pavement markings.
Needs traffic signal preemption.
Sunset Avenue
Replace 4-8" lens with 12" lens.
Thomas Street
Replace 8-8" lens with 12" lens.
Nash Avenue
Enhance pavement markings.
Howell Street
Enhance pavement markings.

ROADWAY GRADE SEPARATION

To fully eliminate the potential for train/vehicle collisions while still maintaining access across the tracks, construction of grade separations should be evaluated. However, modifications to mainline railway grades or profiles are severely constrained by strict design standards. Highway overpasses of railroads require a vertical clearance of 23 feet, while railroad overpasses of highways typically require 16 to 17 feet. Due to sight distance requirements for safe stopping, a "crest" curve on a roadway overpass is longer than a "sag" curve at a comparable underpass, thereby involving a longer approach distance. This can have important implications with respect to property access and street network connectivity. Other considerations include visual and noise impacts of roadway overpasses, especially in neighborhoods, downtowns, or historic areas.

Using the NCDOT *Exposure Index* formula, the following crossings in Table 8 exceed the relevant threshold for number of vehicles multiplied by the number of trains (See Table 5 in Section 2).

Table 8

Year 2000	**Year 2010**
Bridges Street	Bridges Street
Battleboro Road	Battleboro Road
College Road	College Road
Fountain School Road	Fountain School Road
Grand Avenue	Grand Avenue
Gold Leaf Street	Gold Leaf Street
Thomas Street	Thomas Street
Sunset Avenue	Sunset Avenue
Western Avenue	Western Avenue
Nash Avenue	Nash Avenue
Bassett Street	Bassett Street
Old Tarboro Road	Old Tarboro Road
Halifax Road	Halifax Road
Winstead Avenue	Winstead Avenue
Wesleyan Avenue	Wesleyan Avenue
	Grace Street
	Cokey Road
	Fairview Road

It is not feasible to grade separate the at-grade crossing based on the exposure index alone. Based on all factors including closures, the most reasonable possibilities for grade separations would be:

LOCATION	COMMENT
College Road	Rural Area, Low Impacts
Fountain School Road	Rural Area, Low Impacts
Bassett Street	Urban Area, Medium Impacts.
Old Tarboro Road	Suburban Area, some impacts to existing
Halifax Road	Suburban Area, some impacts to existing
Winstead Avenue	Urban, Medium Impacts, Possible Loop Extension
Wesleyan Avenue	US 301 with 55 mph speed limit
Grace Street	Urban Business Area, High Impacts.
Fairview Road	Suburban Area, Low Impacts

COMMUNITY SERVICES

Emergency medical services (EMS), hospitals, schools, fire and rescue stations, and churches have been located as part of this study to determine the potential impacts on Rocky Mount residents who would be affected by changes in the crossing status of the 38 existing rail crossings. The studies included a field survey in the vicinity of the identified rail crossings and an investigation of all adjacent neighborhoods on foot and photography to establish general demographic patterns in the neighborhoods. Community facilities and/or other features that may have a focal role in the neighborhood or add to the sense of community are identified.

This study is intended only to provide basic data, to assist in deciding the need for additional studies; it will not include any statistical analysis of demographic data, or attempt to analyze the ramifications of proposed rail crossing modifications on the communities identified.

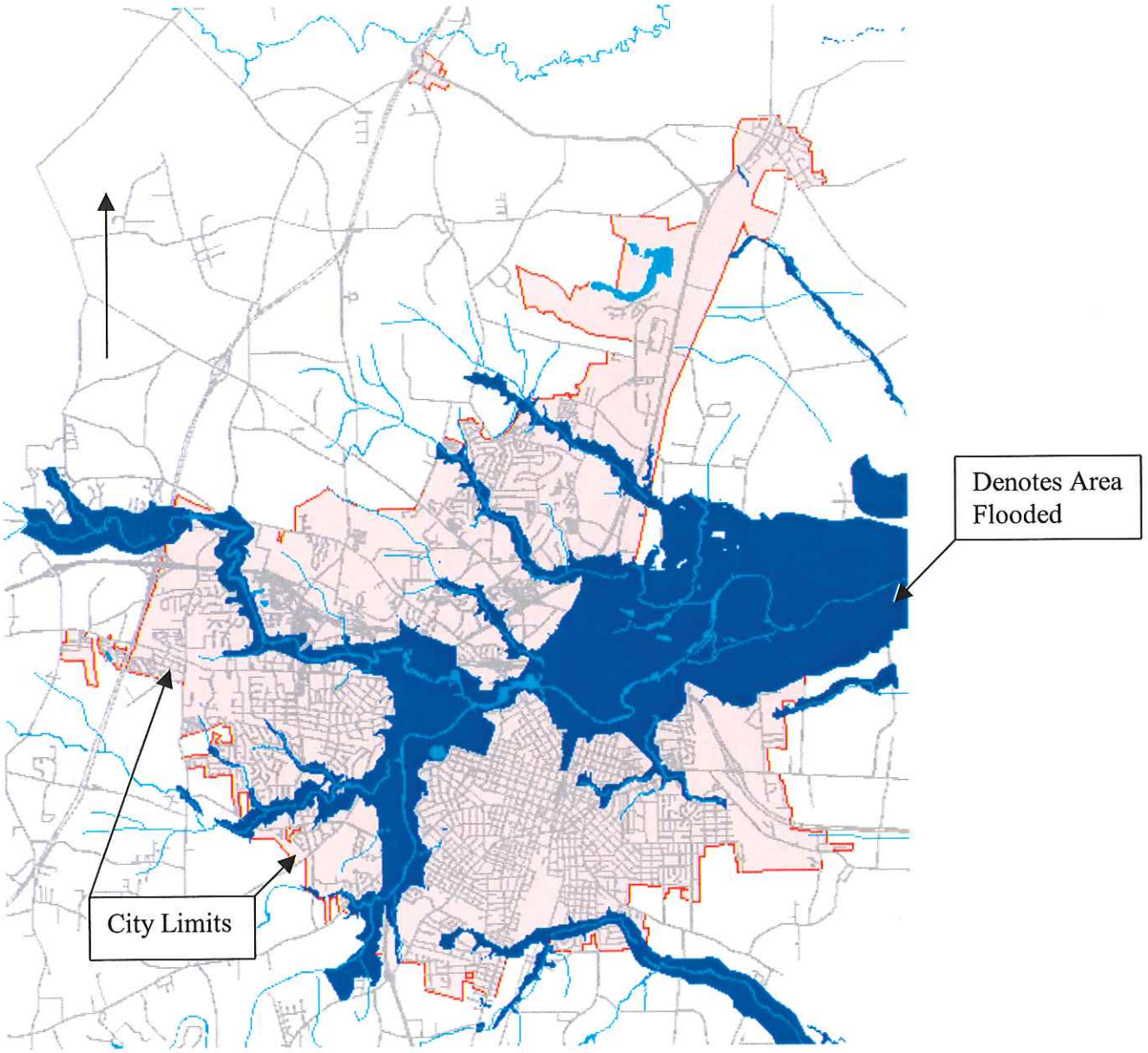
FLOODING CONDITIONS

The worst flooding conditions in the Rocky Mount area occurred with Hurricane Floyd in 1999. The flooding from the Tar River and its tributaries was greater than the 100 year flood forecast by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). In the Rocky Mount Grade Study report, several highway/rail crossings are recommended to be closed. With the potential for future flooding events with the same magnitude as with Hurricane Floyd, some crossings that did not flood are recommended to remain open to provide as much accessibility as possible during disaster

related events. During Hurricane Floyd, the following highway/rail crossings were closed by flooding:

- US 301 Bypass (Wesleyan Blvd.) at the NCY RR.
- Sutton Road Tunnel under the CSX 'A' Line.
- Grand Avenue at the CSX 'A' Line.
- Fountain School Road closed just west of the CSX 'A' Line crossing.

Flooding Associated With Hurricane Floyd in the Rocky Mount Area



Note: Used with permission from City of Rocky Mount

SECTION 4. SYSTEM ENHANCEMENT OPTIONS

The Census 2000 reports the total population for the City of Rocky Mount at 55,893 people. In the Rocky Mount area population growth rates between 1990 and 2000 averaged a total increase of 7.3% or approximately 0.73% per year. This varied from 14% in Nash County to a minus 1.7% in Edgecombe County. For comparison North Carolina has increased 21.4% overall or approximately 2.14% per year. Assuming that most of the City is located in Nash County, the population would be growing at a yearly average rate of 1.4% which is below the average for North Carolina but very typical of the United States average of 1.3% per year. These percentages may be lower reflecting the severe loss of jobs, people and productivity from Hurricane Floyd. The capacity analysis for this study, based on increased traffic volumes of 2.5%, should represent a worst-case scenario and a realistic increase of future population increases. The overall growth rate in Rocky Mount should begin to recover and increase as Hurricane Floyd disaster funds are incorporated into the economy. With the increased traffic, accident potential and traffic delays at existing grade crossings will increase.

Long-term changes in train operations could exacerbate the situation. Increases in freight activity and passenger-rail service are very likely. Clearly, both the need and the opportunity exist for enhancing rail crossings in the study area. A number of options available for consideration are discussed below.

GRADE SEPARATION STRUCTURES

Many factors must be considered before suggesting grade separation, including:

- Traffic volumes (both vehicle and train),
- Accident history,
- Topography,
- Adjacent land use,
- Construction impacts,
- Costs.

Traffic Volumes

An ***exposure index*** is employed by NCDOT as one factor in determining whether or not grade separation is justified at proposed highway/rail crossings. This index is calculated by multiplying the number of trains per day by the number of crossing vehicles per day, in the design year. Current policy identifies an exposure index of 15,000 as the threshold for considering grade separation in rural areas. In urban areas, an exposure index of 30,000 or greater identifies a potential grade separation. Using this formula in Rocky Mount, fifteen locations currently exceed the exposure index and eighteen locations exceed the index in 2010. (See Table 5 in Section 2).

Accident History

In some cases, the accident history of a low-volume crossing may contribute to justification of a grade separation, even with a low exposure index. If the crossing cannot

be closed, or other safety provisions made, a physical separation between the road and tracks may be the only feasible solution.

Topography

The relationship between elevations and slopes in the vicinity of the crossing greatly influence the viability of constructing a grade-separation. Where existing topography facilitates a highway overpass, minimizing earthwork and ROW requirements, the cost of grade separation can be significantly reduced. When topography is relatively flat, costs (and other impacts) can escalate significantly.

Adjacent land use

In heavily developed areas, such as a central business district (CBD) impacts to the existing land use may be severe enough that it results in grade separations being considered not feasible. Costs for right of way acquisition and socio-economic impacts associated with loss of business and jobs can result in less than a favorable project benefit-cost ratio.

Construction Impacts

While the impacts of constructing a new grade separation can be significant, retrofitting a grade separation to comply with current design criteria is typically more disruptive during and after construction. Visual, noise, and access degradation can be severe, and the separation may require the relocation of businesses or dwellings. Other potential impacts can involve wetlands/woodlands, historic/archaeological sites, and hazardous materials.

Costs

Grade separation structures represent substantial, long-term infrastructure investments, often exceeding several million dollars. Careful analysis and planning is required to insure that this alternative is the most cost-effective and beneficial solution.

CROSSING PROTECTION DEVICE UPGRADES

The most common, and cost-effective, way to increase the safety at a railway crossing is to upgrade existing warning devices at the crossing. Typical warning devices include signs, gate arms, flashing lights and bells. *Passive* devices, such as advanced warning signs and crossbucks, merely warn the motorist of the existence of a railroad crossing. These devices are most suitable where train and traffic volumes and speeds are low, and where sight distance is adequate. *Active* devices that warn motorists of approaching trains include flashing lights, bells, and automated gates. Such devices are usually employed at locations exhibiting higher volumes or speeds, or greater potential for accidents. The hierarchy of standard warning treatments, from least to most protected is:

1. Unmarked;
2. Railroad crossbucks;
3. Standard STOP signs (limited sight distance) and crossbucks;
4. Flashing signals and bells;
5. Flashing signals, bells and gates.

ADVANCED CROSSING PROTECTION DEVICES

The NCDOT Rail Division and Norfolk Southern Railway have been testing advanced crossing protection devices on the main line from Raleigh to Charlotte since 1995. These devices are most appropriate where high-volume multilane roadways cross railroad main lines, and where significant numbers of motorists are ignoring or circumventing existing warning devices. The advanced warning devices being considered are described below, along with some initial NCDOT Rail Division test results from Charlotte, NC.

Median Barriers

Median barriers consist of markers mounted on raised islands along the roadway centerline to discourage motorists from driving in opposing travel lanes to "go around" lowered gate arms. Median treatments typically extend 70' to 100' back from the gates, but may be precluded by driveways or intersecting roads within this distance. Typical costs are about $15,000 per location. Installation of median barriers at Sugar Creek Road in Charlotte reduced crossing violations by 77%.

Four-Quadrant Gates

This crossing treatment requires an additional gate on each approach, completely "sealing" the crossing. Several measures are employed to prevent vehicles from becoming "trapped" inside the gates, including careful timing of the gates to allow traffic to clear; providing 16 feet of clearance between track center and gates; leaving adequate space between gate tips for a vehicle to "squeeze" out; and use of breakaway arms. In tests at the Sugar Creek Rd. crossing in Charlotte, four-quadrant gates alone reduced violations by 86%; in combination with median barriers, the reduction in violations rose to 98%. The cost of four-quadrant gates is site specific, but $140,000 is typical.

Long Gate Arms

Extra-long arms cover at least ¾ of the crossing width. When tested at the Orr Road crossing in Charlotte, the installation of long gate arms reduced crossing violations by 67%. A cost of $20,000 is typical.

Articulated Gates

Articulated gates are hinged arms that unfold to cover at least ¾ of crossing width. They are typically warranted where overhead obstructions prevent the use of long gate arms. Articulated gates installed at Orr Road in Charlotte reduced crossing violations by 78%.

Remote Video Detection

The Crossing Law Enforcement and Research of (CLEAR) Violations program employs video cameras to monitor selected crossings. The recordings provide information on crossing operations, violations, and accidents for both enforcement and research purposes.

CROSSING CONSOLIDATION & ELIMINATION

Many low-volume crossings are unnecessary due to the availability of alternative access across the tracks. These alternative crossings can often be made safer, since many low-volume crossings lack adequate warning devices. Resources are not available to upgrade

warning devices on all existing crossings, and grade separation would be even less feasible. Therefore, consolidation and closure of these minor crossings is an effective strategy in terms of both costs and safety benefits. Typically, a crossing is considered redundant (and therefore a candidate for elimination) if it is within ¼-mile of another crossing connected to the same street network.

Crossing consolidations eliminate the potential for train/vehicle collisions. Crossing-related installation and maintenance costs are reduced, and by concentrating traffic at fewer, higher-volume crossings, more expensive active warning treatments and roadway improvements can be justified.

Crossings with high potential for elimination include:

- Redundant crossings near parallel crossings or grade separations, or where traffic can be safely and efficiently diverted to another crossing;
- Skewed crossings, or those where sight distance is limited by horizontal/vertical curvature, vegetation, or permanent obstructions;
- Crossings with a history of frequent accidents;
- Crossings adjacent to a newly constructed crossing or grade separation;
- Private crossings with no identifiable owner, or where the owner is unwilling or unable to fund crossing upgrades (and where alternative access is reasonably available); Since NCDOT does not currently have jurisdiction over private crossings, closing of these crossings is determined by the railroad and property owner if identified.
- Complex crossings that cannot be effectively served by warning devices due to multiple tracks, extensive switching operations, etc.

ROADWAY IMPROVEMENTS

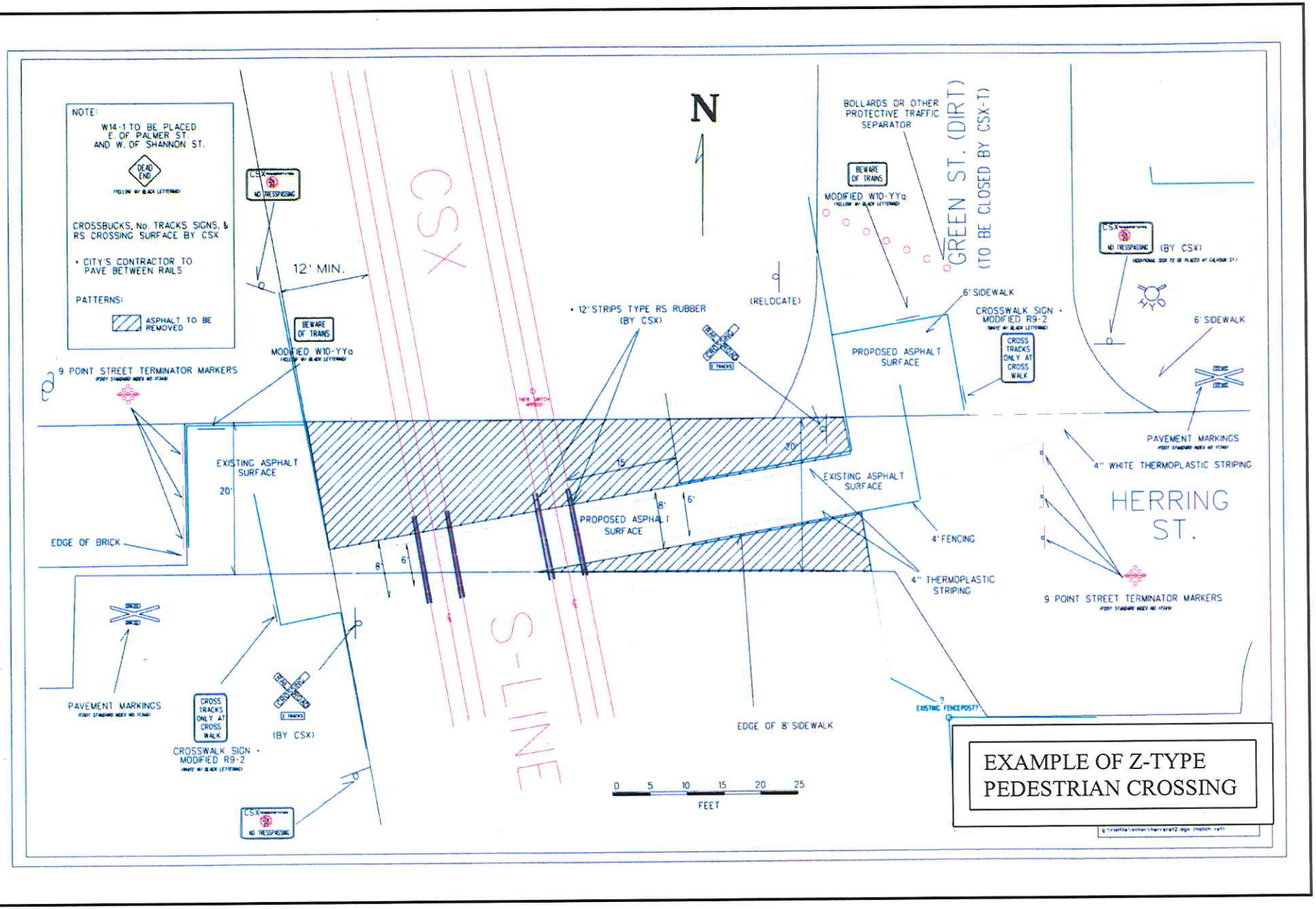
Roadway improvements can reduce both accident potential and traffic delay at railroad crossings. Realignment and re-grading can improve visibility and reduce the time required to traverse a crossing. Additional lanes significantly increase capacity, reducing the residual delay following a crossing event. New roadways can provide alternative routes, allowing crossings to occur at more desirable locations, and potentially eliminating some crossing trips.

TRAFFIC SIGNALS

Traffic signals are not specifically intended as warning devices at railroad crossings. However, when an at-grade railroad crossing is located near a signalized intersection (typically within 200'), special steps should be taken to insure that vehicles do not get trapped on the tracks due to queues resulting from a red signal. The normal sequence of traffic signal indications should be preempted by the approach of a train, eliminating the possibility of entrapment due to conflicting traffic and railroad crossing signals. Ideally, the preempted signal phasing should be designed to allow non-conflicting movements to proceed during a train crossing, thereby minimizing overall traffic delay.

PEDESTRIAN CROSSINGS

The closing of existing highway/rail grade crossings reduce the accident frequency and severity and improve rail and motor vehicle operating efficiency. The closings can also fragment and separate existing neighborhoods, affect existing pedestrians routes, and reduce access to schools, libraries, and shopping areas. An access has been developed that provides enhanced pedestrian access across the grade crossing to be closed to vehicular traffic. The crossing designated as the 'Z type' is configured to provide views of the tracks in both directions before crossing the tracks at 90 degrees. While the plan does not provide for an active barricade such as a gate, it is very well signed and provides a safe alternative for pedestrians and bicyclists. Materials used for construction of the 'Z-type' crossing may vary to correspond with the surrounding land uses.One addition recommendation would be signing for bicyclists to walk their bicycles across the grade crossing. The following is an example of the Z-Type Pedestrian crossing.



EXAMPLE OF Z-TYPE PEDESTRIAN CROSSING

EXAMPLE OF Z TYPE PEDESTRIAN CROSSING

SECTION 5. FINDINGS AND RECOMMENDATIONS

KEY FINDINGS

In the course of this study, several critical issues emerged. The findings and recommendations of this study are highly dependent on these factors, and on related assumptions. Four of the most critical factors are discussed below.

Growth Rates

While Rocky Mount is at the intersection of a two major routes, I-95 and US 64, and provides both freight and passenger rail service, the flooding experienced from Hurricane Floyd will influence major population generators for the next few years. Indications are that Rocky Mount will experience a normal growth rate of 2.5% to 3% over the next 10-25 years as documented in Table 7. As would be expected, most of the observed new construction is along the corridor between I-95 and US 301.

Transportation Improvement Program (TIP) & Long-Range Plans

Most of the recommendations resulting from this study are relatively low-cost, near-term solutions. They depend more on existing conditions than on long-range expectations of traffic volumes and highway improvements. However, several pending roadway improvement projects will significantly alter traffic patterns in Rocky Mount, reducing traffic volumes at several crossings, and providing opportunities for crossing consolidation and elimination. Additional development triggered by improved accessibility may add traffic at some locations, but careful planning should allow new facilities to offset this increase by diverting traffic to more desirable routes.

Key projects include:

Roadway Projects

- TIP Project Number U-3329 (New Route) will provide a new grade-separated railroad crossing and road from US 301 and NC 4 to Battleboro-Leggett Road and will affect traffic volumes at the existing at-grade crossing on Battleboro-Leggett Road. (Crossing #629 686F)

  Construction is scheduled for FFY 2003

- TIP Project Number R-2823 (Rocky Mount Northern Outer Loop) is a new connector from Benvenue Road to Fountain School Road at US 301. Traffic volumes on the at-grade crossing on Fountain School Road and CSX RR will be increased with this improvement. (Crossing#629 688U)

  Construction is scheduled for FFY 2007 and 2008

- TIP Project Number U-4019 (North Winstead Avenue) is a proposed extension of the Rocky Mount Northern Outer Loop connector from Benvenue Road to Sunset Avenue. Traffic volumes on the at-grade crossing on Winstead Avenue and the NCY RR will be increased with this improvement. (Crossing #626 215F)

  Construction is scheduled for FFY 2007

- TIP Project Number U-2218 (NC 43 Bypass) is a new connector recently completed from NC 43 to Springfield Road. Traffic volumes should decrease for the at-grade crossings at S. Fairview Road (Crossing #629 779A) and S. Glendale Avenue (Crossing #629 780U).

  Completed

- TIP Project Number B-3681 is a bridge replacement project on Airport Road over the CSX RR. Construction will cause temporary delays and some detouring of traffic.

  Construction FFY 2004

- TIP Project Number U-3820 (Tanner Road) is an upgrade of the existing roadway with realignment to connect to Atlantic Avenue (NC 47) and College Road. Traffic studies will determine the effects on existing College Road and the at-grade crossing at the CSX RR and College Road (Crossing #629 687M).

  Construction FFY 2008

Rail / Highway Crossing Improvements

Two projects are shown in the *2002-2008 Draft Transportation Improvement Program* for rail/highway crossing improvement in Rocky Mount.

Z-4004G	Howell Street at Nash County Railroad Crossing 626 204T Safety Improvements including installation of cantilever signals and crossing gates.
Z-4004H	Tillery Street at Nash County Railroad Crossing 626 205A Safety Improvements including installation of cantilever signals and crossing gates.

These projects all have some degree of commitment behind them, though not necessarily funded at this time, these projects are a part of the Rocky Mount Thoroughfare Plan and are included in the state TIP (Transportation Improvement Program).

Future Passenger Rail Service

Possible changes in rail service could have major impacts on grade crossing conditions in the study area. Although not directly analyzed in this study, potential implications were considered in developing the study's overall recommendations.

BENEFIT / COST RATIOS

Benefit / Cost Ratios were determined using the Federal Railroad Administration's "GradeDec 2000 *System for Grade Crossing Investment Analysis".* GradeDec determines the effects rail corridor investments will have on safety, and highway delay and queuing. Improvements will result in the following economic benefits:

- Improvements in safety and reduced accident cost;
- Reduced travel time costs;
- Improved air quality;
- Reduced vehicle operating costs; and
- Network benefits.

The program was used to evaluate each of the three lines separately and with all three combined as a regional model. The benefit / cost ratio is based on a factor of 1.00 with a benefit of $1.00 for every $1.00 spent. The following results are based on our recommendations outlined in Section 5, Specific Recommendations.

Table 9 - Nash County Railroad from South Halifax Road to Church Street.
Average Benefit / Cost Ratio = 0.28

Table 9A – CSX Transportation 'AB' Line from Washington Street to Glendale Avenue.
Average Benefit / Cost Ratio = 1.03

Table 9B – CSX Transportation 'A' Line from Bridges Street to Old Tarboro Road.
Average Benefit / Cost Ratio = 2.77

Table 9C – Regional Model combining Nash County Railroad, CSX "AB' Line & CSX "A' Line.
Average Benefit / Cost Ratio = 1.39

See pages 44 through 54 for Tables 9 –9C.

SPECIFIC RECOMMENDATIONS

The following section of the report describes the recommendations on a crossing-by-crossing basis. Relevant findings, forecasts, and supporting data are included for every crossing, along with photographs of each approach and a plan view of the crossing indicating existing conditions and proposed improvements.

For the purposes of this report, recommendations are classified as follows:

- Near-term (0-5 years)
- Long-term (5-10 years)

Costs are estimated for individual improvement recommendations, and for the crossing as a whole.

Recommendations are shown on Table 10, which is included as pages 55 through 58.

Nash County Railroad
South Halifax Road to Church Street

Name	Description	Average	StDev	Min	Max	Skewness	Kurtosis
corsaf	Safety benefits, thous $ PV	703.7289	129.3116	513.3855	1110.206	1.229295	2.042445
cortts	Travel time savings, thous $ PV	3.64E-07	5.93E-06	-1.26E-05	2.14E-05	0.868749	2.672801
corenv	Environmental benefits, thous $ PV	-2.11E-09	3.11E-08	-7.25E-08	9.38E-08	0.727916	1.86331
corvoc	Veh operating cost benefit, thous $ PV	1.67E-08	3.32E-07	-1.05E-06	7.78E-07	-0.359361	1.634701
cornwk	Network benefits, thous $ PV	0	0	0	0	0	-3
cortot	Total benefits, thous $ PV	177.0297	262.3212	-533.2651	668.7614	-0.399152	-0.190568
BenInduced	of this, benefits from induced trips, thous $ PV	4.7964	2.743363	1.684572	15.01894	1.696926	3.926318
DisBenefit	of this, disbenefits from induced trips, thous $ PV	-531.4956	231.3563	-1194.083	-157.3445	-0.737957	1.39E-02
corcst	Total costs, thous $ PV	629.7938	0	629.7938	629.7938	0	-3
cornet	Net benefits, thous $ PV	-452.764	262.3212	-1163.059	38.96759	-0.399152	-0.190568
corbcr	**Benefit-cost ratio**	**0.281092**	0.416519	-0.84673	1.061874	-0.399152	-0.190567
corror	Rate of return (constant dollars), %	-47.90147	48.75055	-99	5.873291	-0.109336	-2.053427
LocBen	Local benefits (not included in summary), thous $ PV	8.536286	13.52656	-23.93639	40.57236	1.91E-02	-4.94E-02
SafetyBen(1)	Safety Benefit, GCX 1, thous $ PV, MP 120.1	0	0	0	0	0	-3
SafetyBen(2)	Safety Benefit, GCX 2, thous $ PV, MP 120.19	-1.558739	0.287825	-2.47523	-1.126581	-1.231651	2.035031
SafetyBen(3)	Safety Benefit, GCX 3, thous $ PV, MP 120.25	114.7775	21.19835	83.72344	182.4383	1.246412	2.126918
SafetyBen(4)	Safety Benefit, GCX 4, thous $ PV, MP 120.31	-1.588338	0.293286	-2.521685	-1.14609	-1.228508	2.016452
SafetyBen(5)	Safety Benefit, GCX 5, thous $ PV, MP 120.61	97.48906	18.00198	70.97733	154.8995	1.242092	2.101176
SafetyBen(6)	Safety Benefit, GCX 6, thous $ PV, MP 120.67	132.8142	24.52832	96.78888	211.0841	1.244869	2.117175
SafetyBen(7)	Safety Benefit, GCX 7, thous $ PV, MP 120.71	137.6717	25.42509	100.3035	218.7977	1.244452	2.114552
SafetyBen(8)	Safety Benefit, GCX 8, thous $ PV, MP 120.72	28.01476	5.160041	20.57285	44.28264	1.209436	1.937884
SafetyBen(9)	Safety Benefit, GCX 9, thous $ PV, MP 121.2	29.25322	5.402338	21.30355	46.48885	1.243714	2.109923
SafetyBen(10)	Safety Benefit, GCX 10, thous $ PV, MP 121.25	0	0	0	0	0	-3
SafetyBen(11)	Safety Benefit, GCX 11, thous $ PV, MP 121.48	0	0	0	0	0	-3
SafetyBen(12)	Safety Benefit, GCX 12, thous $ PV, MP 122.1	0	0	0	0	0	-3
SafetyBen(13)	Safety Benefit, GCX 13, thous $ PV, MP 122.27	-0.65063	0.112322	-1.000811	-0.479502	-1.13444	1.637139
SafetyBen(14)	Safety Benefit, GCX 14, thous $ PV, MP 122.45	114.7775	21.19835	83.72344	182.4383	1.246412	2.126918
SafetyBen(15)	Safety Benefit, GCX 15, thous $ PV, MP 122.5	-4.430148	0.81806	-7.036377	-3.206778	-1.234522	2.052115
SafetyBen(16)	Safety Benefit, GCX 16, thous $ PV, MP 123.16	0	0	0	0	0	-3
SafetyBen(17)	Safety Benefit, GCX 17, thous $ PV, MP 123.45	0	0	0	0	0	-3
SafetyBen(18)	Safety Benefit, GCX 18, thous $ PV, MP 123.81	0	0	0	0	0	-3
SafetyBen(19)	Safety Benefit, GCX 19, thous $ PV, MP 124.5	57.15876	9.99123	41.95138	89.36589	1.113925	1.571453
BenTTS(1)	Travel Time Savings, GCX 1, thous $ PV, MP 120.1	0	0	0	0	0	-3
BenTTS(2)	Travel Time Savings, GCX 2, thous $ PV, MP 120.19	-9.416496	3.697855	-19.27185	-2.638659	-0.428435	-5.54E-02
BenTTS(3)	Travel Time Savings, GCX 3, thous $ PV, MP 120.25	18.83299	7.395712	5.277318	38.5437	0.428434	-5.54E-02
BenTTS(4)	Travel Time Savings, GCX 4, thous $ PV, MP 120.31	-9.416497	3.697856	-19.27185	-2.638658	-0.428435	-5.54E-02

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Nash County Railroad
South Halifax Road to Church Street

BenTTS(5)	Travel Time Savings, GCX 5, thous $ PV, MP 120.61	-16.77988	6.589457	-34.3418	-4.702001	-0.428435	-5.54E-02
BenTTS(6)	Travel Time Savings, GCX 6, thous $ PV, MP 120.67	30.13279	11.83314	8.443708	61.66993	0.428435	-5.54E-02
BenTTS(7)	Travel Time Savings, GCX 7, thous $ PV, MP 120.71	33.89939	13.31228	9.499171	69.37867	0.428435	-5.54E-02
BenTTS(8)	Travel Time Savings, GCX 8, thous $ PV, MP 120.72	-47.2523	18.55596	-96.70679	-13.24088	-0.428434	-5.54E-02
BenTTS(9)	Travel Time Savings, GCX 9, thous $ PV, MP 121.2	0	0	0	0	0	-3
BenTTS(10)	Travel Time Savings, GCX 10, thous $ PV, MP 121.25	0	0	0	0	0	-3
BenTTS(11)	Travel Time Savings, GCX 11, thous $ PV, MP 121.48	0	0	0	0	0	-3
BenTTS(12)	Travel Time Savings, GCX 12, thous $ PV, MP 122.1	0	0	0	0	0	-3
BenTTS(13)	Travel Time Savings, GCX 13, thous $ PV, MP 122.27	-4.094319	1.607838	-8.379456	-1.147298	-0.428435	-5.54E-02
BenTTS(14)	Travel Time Savings, GCX 14, thous $ PV, MP 122.45	18.83299	7.395712	5.277318	38.5437	0.428434	-5.54E-02
BenTTS(15)	Travel Time Savings, GCX 15, thous $ PV, MP 122.5	-14.73868	5.787874	-30.16426	-4.130022	-0.428435	-5.54E-02
BenTTS(16)	Travel Time Savings, GCX 16, thous $ PV, MP 123.16	0	0	0	0	0	-3
BenTTS(17)	Travel Time Savings, GCX 17, thous $ PV, MP 123.45	0	0	0	0	0	-3
BenTTS(18)	Travel Time Savings, GCX 18, thous $ PV, MP 123.81	0	0	0	0	0	-3
BenTTS(19)	Travel Time Savings, GCX 19, thous $ PV, MP 124.5	0	0	0	0	0	-3
BenEnv(1)	Environmental Benefit, GCX 1, thous $ PV, MP 120.1	0	0	0	0	0	-3
BenEnv(2)	Environmental Benefit, GCX 2, thous $ PV, MP 120.19	-4.18E-02	1.81E-02	-9.36E-02	-1.23E-02	-0.732999	7.07E-03
BenEnv(3)	Environmental Benefit, GCX 3, thous $ PV, MP 120.25	8.37E-02	3.63E-02	2.46E-02	0.187232	0.732999	7.07E-03
BenEnv(4)	Environmental Benefit, GCX 4, thous $ PV, MP 120.31	-4.18E-02	0.018136	-9.36E-02	-1.23E-02	-0.733	7.07E-03
BenEnv(5)	Environmental Benefit, GCX 5, thous $ PV, MP 120.61	-0.074568	3.23E-02	-0.166821	-2.19E-02	-0.732999	7.07E-03
BenEnv(6)	Environmental Benefit, GCX 6, thous $ PV, MP 120.67	0.133907	5.80E-02	3.94E-02	0.299571	0.732999	7.07E-03
BenEnv(7)	Environmental Benefit, GCX 7, thous $ PV, MP 120.71	0.150645	6.53E-02	4.43E-02	0.337018	0.733	7.07E-03
BenEnv(8)	Environmental Benefit, GCX 8, thous $ PV, MP 120.72	-0.209984	9.10E-02	-0.469768	-6.18E-02	-0.732999	7.07E-03
BenEnv(9)	Environmental Benefit, GCX 9, thous $ PV, MP 121.2	0	0	0	0	0	-3
BenEnv(10)	Environmental Benefit, GCX 10, thous $ PV, MP 121.25	0	0	0	0	0	-3
BenEnv(11)	Environmental Benefit, GCX 11, thous $ PV, MP 121.48	0	0	0	0	0	-3
BenEnv(12)	Environmental Benefit, GCX 12, thous $ PV, MP 122.1	0	0	0	0	0	-3
BenEnv(13)	Environmental Benefit, GCX 13, thous $ PV, MP 122.27	-1.82E-02	7.89E-03	-4.07E-02	-5.35E-03	-0.733001	7.08E-03
BenEnv(14)	Environmental Benefit, GCX 14, thous $ PV, MP 122.45	8.37E-02	3.63E-02	2.46E-02	0.187232	0.732999	7.07E-03
BenEnv(15)	Environmental Benefit, GCX 15, thous $ PV, MP 122.5	-6.55E-02	2.84E-02	-0.146528	-1.93E-02	-0.733	7.07E-03
BenEnv(16)	Environmental Benefit, GCX 16, thous $ PV, MP 123.16	0	0	0	0	0	-3
BenEnv(17)	Environmental Benefit, GCX 17, thous $ PV, MP 123.45	0	0	0	0	0	-3
BenEnv(18)	Environmental Benefit, GCX 18, thous $ PV, MP 123.81	0	0	0	0	0	-3
BenEnv(19)	Environmental Benefit, GCX 19, thous $ PV, MP 124.5	0	0	0	0	0	-3
BenVOC(1)	Benefit Veh Op Cost, GCX 1, thous $ PV, MP 120.1	0	0	0	0	0	-3
BenVOC(2)	Benefit Veh Op Cost, GCX 2, thous $ PV, MP 120.19	-0.481293	0.188287	-0.940515	-0.1271	-0.579016	-0.25654
BenVOC(3)	Benefit Veh Op Cost, GCX 3, thous $ PV, MP 120.25	0.962585	0.376575	0.2542	1.88103	0.579016	-0.25654

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South Halifax Road to Church Street

BenVOC(4)	Benefit Veh Op Cost, GCX 4, thous $ PV, MP 120.31	-0.481293	0.188287	-0.940515	-0.1271	-0.579016	-0.256538
BenVOC(5)	Benefit Veh Op Cost, GCX 5, thous $ PV, MP 120.61	-0.857648	0.335522	-1.675967	-0.226488	-0.579016	-0.256539
BenVOC(6)	Benefit Veh Op Cost, GCX 6, thous $ PV, MP 120.67	1.540137	0.602519	0.40672	3.009649	0.579016	-0.25654
BenVOC(7)	Benefit Veh Op Cost, GCX 7, thous $ PV, MP 120.71	1.732654	0.677834	0.45756	3.385854	0.579016	-0.25654
BenVOC(8)	Benefit Veh Op Cost, GCX 8, thous $ PV, MP 120.72	-2.415143	0.944832	-4.719536	-0.637791	-0.579016	-0.25654
BenVOC(9)	Benefit Veh Op Cost, GCX 9, thous $ PV, MP 121.2	0	0	0	0	0	-3
BenVOC(10)	Benefit Veh Op Cost, GCX 10, thous $ PV, MP 121.25	0	0	0	0	0	-3
BenVOC(11)	Benefit Veh Op Cost, GCX 11, thous $ PV, MP 121.48	0	0	0	0	0	-3
BenVOC(12)	Benefit Veh Op Cost, GCX 12, thous $ PV, MP 122.1	0	0	0	0	0	-3
BenVOC(13)	Benefit Veh Op Cost, GCX 13, thous $ PV, MP 122.27	-0.209267	8.19E-02	-0.408939	-5.53E-02	-0.579016	-0.256539
BenVOC(14)	Benefit Veh Op Cost, GCX 14, thous $ PV, MP 122.45	0.962585	0.376575	0.2542	1.88103	0.579016	-0.25654
BenVOC(15)	Benefit Veh Op Cost, GCX 15, thous $ PV, MP 122.5	-0.753318	0.294707	-1.472092	-0.198936	-0.579016	-0.25654
BenVOC(16)	Benefit Veh Op Cost, GCX 16, thous $ PV, MP 123.16	0	0	0	0	0	-3
BenVOC(17)	Benefit Veh Op Cost, GCX 17, thous $ PV, MP 123.45	0	0	0	0	0	-3
BenVOC(18)	Benefit Veh Op Cost, GCX 18, thous $ PV, MP 123.81	0	0	0	0	0	-3
BenVOC(19)	Benefit Veh Op Cost, GCX 19, thous $ PV, MP 124.5	0	0	0	0	0	-3
BenNetwork(1)	Network Benefits, GCX 1, thous $ PV, MP 120.1	0	0	0	0	0	-3
BenNetwork(2)	Network Benefits, GCX 2, thous $ PV, MP 120.19	0	0	0	0	0	-3
BenNetwork(3)	Network Benefits, GCX 3, thous $ PV, MP 120.25	0	0	0	0	0	-3
BenNetwork(4)	Network Benefits, GCX 4, thous $ PV, MP 120.31	0	0	0	0	0	-3
BenNetwork(5)	Network Benefits, GCX 5, thous $ PV, MP 120.61	0	0	0	0	0	-3
BenNetwork(6)	Network Benefits, GCX 6, thous $ PV, MP 120.67	0	0	0	0	0	-3
BenNetwork(7)	Network Benefits, GCX 7, thous $ PV, MP 120.71	0	0	0	0	0	-3
BenNetwork(8)	Network Benefits, GCX 8, thous $ PV, MP 120.72	0	0	0	0	0	-3
BenNetwork(9)	Network Benefits, GCX 9, thous $ PV, MP 121.2	0	0	0	0	0	-3
BenNetwork(10)	Network Benefits, GCX 10, thous $ PV, MP 121.25	0	0	0	0	0	-3
BenNetwork(11)	Network Benefits, GCX 11, thous $ PV, MP 121.48	0	0	0	0	0	-3
BenNetwork(12)	Network Benefits, GCX 12, thous $ PV, MP 122.1	0	0	0	0	0	-3
BenNetwork(13)	Network Benefits, GCX 13, thous $ PV, MP 122.27	0	0	0	0	0	-3
BenNetwork(14)	Network Benefits, GCX 14, thous $ PV, MP 122.45	0	0	0	0	0	-3
BenNetwork(15)	Network Benefits, GCX 15, thous $ PV, MP 122.5	0	0	0	0	0	-3
BenNetwork(16)	Network Benefits, GCX 16, thous $ PV, MP 123.16	0	0	0	0	0	-3
BenNetwork(17)	Network Benefits, GCX 17, thous $ PV, MP 123.45	0	0	0	0	0	-3
BenNetwork(18)	Network Benefits, GCX 18, thous $ PV, MP 123.81	0	0	0	0	0	-3
BenNetwork(19)	Network Benefits, GCX 19, thous $ PV, MP 124.5	0	0	0	0	0	-3
BenTotal(1)	Total Benefits, GCX 1, thous $ PV, MP 120.1	0	0	0	0	0	-3
BenTotal(2)	Total Benefits, GCX 2, thous $ PV, MP 120.19	-11.49837	3.897603	-22.02478	-4.356585	-0.474104	-4.49E-03

Table 9 Benefit / Cost Ratio

Nash County Railroad
South Halifax Road to Church Street

BenTotal(3)	Total Benefits, GCX 3, thous $ PV, MP 120.25	134.6568	22.43761	97.72276	209.4108	1.390499	3.125089
BenTotal(4)	Total Benefits, GCX 4, thous $ PV, MP 120.31	-11.52797	3.897785	-22.0578	-4.382515	-0.474709	-2.83E-03
BenTotal(5)	Total Benefits, GCX 5, thous $ PV, MP 120.61	79.77695	19.42649	48.72453	131.7764	0.768131	0.304861
BenTotal(6)	Total Benefits, GCX 6, thous $ PV, MP 120.67	164.621	27.28741	117.3296	255.6791	1.353878	3.05531
BenTotal(7)	Total Benefits, GCX 7, thous $ PV, MP 120.71	173.4544	28.78465	122.9763	269.3027	1.336462	2.998218
BenTotal(8)	Total Benefits, GCX 8, thous $ PV, MP 120.72	-21.86266	20.39843	-71.16785	20.35711	-0.295277	-0.231137
BenTotal(9)	Total Benefits, GCX 9, thous $ PV, MP 121.2	29.25322	5.402338	21.30355	46.48885	1.243714	2.109923
BenTotal(10)	Total Benefits, GCX 10, thous $ PV, MP 121.25	0	0	0	0	0	-3
BenTotal(11)	Total Benefits, GCX 11, thous $ PV, MP 121.48	0	0	0	0	0	-3
BenTotal(12)	Total Benefits, GCX 12, thous $ PV, MP 122.1	0	0	0	0	0	-3
BenTotal(13)	Total Benefits, GCX 13, thous $ PV, MP 122.27	-4.972412	1.691921	-9.528135	-1.868957	-0.467923	-1.40E-02
BenTotal(14)	Total Benefits, GCX 14, thous $ PV, MP 122.45	134.6568	22.43761	97.72276	209.4108	1.390499	3.125089
BenTotal(15)	Total Benefits, GCX 15, thous $ PV, MP 122.5	-19.98764	6.131229	-36.6875	-8.845037	-0.509425	5.55E-02
BenTotal(16)	Total Benefits, GCX 16, thous $ PV, MP 123.16	0	0	0	0	0	-3
BenTotal(17)	Total Benefits, GCX 17, thous $ PV, MP 123.45	0	0	0	0	0	-3
BenTotal(18)	Total Benefits, GCX 18, thous $ PV, MP 123.81	0	0	0	0	0	-3
BenTotal(19)	Total Benefits, GCX 19, thous $ PV, MP 124.5	57.15876	9.99123	41.95138	89.36589	1.113925	1.571453
CostTotal(1)	Total Costs, GCX 1, thous $ PV, MP 120.1	0	0	0	0	0	-3
CostTotal(2)	Total Costs, GCX 2, thous $ PV, MP 120.19	0	0	0	0	0	-3
CostTotal(3)	Total Costs, GCX 3, thous $ PV, MP 120.25	7.882936	0	7.882936	7.882936	0	-3
CostTotal(4)	Total Costs, GCX 4, thous $ PV, MP 120.31	0	0	0	0	0	-3
CostTotal(5)	Total Costs, GCX 5, thous $ PV, MP 120.61	213.8462	0	213.8462	213.8462	0	-3
CostTotal(6)	Total Costs, GCX 6, thous $ PV, MP 120.67	49.88294	0	49.88294	49.88294	0	-3
CostTotal(7)	Total Costs, GCX 7, thous $ PV, MP 120.71	39.38294	0	39.38294	39.38294	0	-3
CostTotal(8)	Total Costs, GCX 8, thous $ PV, MP 120.72	72.15972	0	72.15972	72.15972	0	-3
CostTotal(9)	Total Costs, GCX 9, thous $ PV, MP 121.2	161.3462	0	161.3462	161.3462	0	-3
CostTotal(10)	Total Costs, GCX 10, thous $ PV, MP 121.25	0	0	0	0	0	-3
CostTotal(11)	Total Costs, GCX 11, thous $ PV, MP 121.48	0	0	0	0	0	-3
CostTotal(12)	Total Costs, GCX 12, thous $ PV, MP 122.1	0	0	0	0	0	-3
CostTotal(13)	Total Costs, GCX 13, thous $ PV, MP 122.27	0	0	0	0	0	-3
CostTotal(14)	Total Costs, GCX 14, thous $ PV, MP 122.45	39.38294	0	39.38294	39.38294	0	-3
CostTotal(15)	Total Costs, GCX 15, thous $ PV, MP 122.5	0	0	0	0	0	-3
CostTotal(16)	Total Costs, GCX 16, thous $ PV, MP 123.16	0	0	0	0	0	-3
CostTotal(17)	Total Costs, GCX 17, thous $ PV, MP 123.45	0	0	0	0	0	-3
CostTotal(18)	Total Costs, GCX 18, thous $ PV, MP 123.81	0	0	0	0	0	-3
CostTotal(19)	Total Costs, GCX 19, thous $ PV, MP 124.5	45.90973	0	45.90973	45.90973	0	-3

Table 9 Benefit / Cost Ratio

CSX Transportation 'AB' Line
Washington Street to Glendale Avenue

Name	Description	Average	StDev	Min	Max	Skewness	Kurtosis
corsaf	Safety benefits, thous $ PV	648.262	98.47695	504.4076	896.9976	0.935616	7.37E-02
cortts	Travel time savings, thous $ PV	-0.18541	4.42E-02	-0.29892	-9.57E-02	-0.39427	3.31E-02
corenv	Environmental benefits, thous $ PV	-2.41E-05	3.23E-05	-1.17E-04	3.46E-05	-0.77827	0.48653
corvoc	Veh operating cost benefit, thous $ PV	-1.69E-03	3.57E-04	-2.52E-03	-8.18E-04	-0.11664	-0.19114
cornwk	Network benefits, thous $ PV	0	0	0	0	0	-3
cortot	Total benefits, thous $ PV	651.926	106.406	499.7944	912.9017	0.954285	0.102215
BenInduced	of this, benefits from induced trips, thous $ PV	36.7669	9.105563	21.63361	65.83731	0.994028	1.089687
DisBenefit	of this, disbenefits from induced trips, thous $ PV	-32.9158	9.536242	-59.181	-14.4082	-0.77146	0.765226
corcst	Total costs, thous $ PV	630.8972	0	630.8972	630.8972	0	-3
cornet	Net benefits, thous $ PV	21.02883	106.406	-131.103	282.0045	0.954284	0.102214
corbcr	**Benefit-cost ratio**	1.033332	0.168658	0.792196	1.44699	0.954284	0.102214
corror	Rate of return (constant dollars), %	5.325439	1.87625	2.489502	9.837158	0.862439	-6.02E-02
LocBen	Local benefits (not included in summary), thous $ PV	32.93599	12.43486	5.170625	61.08371	0.36688	-0.24898
SafetyBen(1)	Safety Benefit, GCX 1, thous $ PV, MP 121.31	275.093	41.20441	216.0009	377.0601	0.951651	5.84E-02
SafetyBen(2)	Safety Benefit, GCX 2, thous $ PV, MP 121.47	-14.5563	2.222047	-20.3197	-11.2912	-0.93541	9.76E-02
SafetyBen(3)	Safety Benefit, GCX 3, thous $ PV, MP 121.54	120.0153	18.26275	93.15759	167.2339	0.940304	0.107038
SafetyBen(4)	Safety Benefit, GCX 4, thous $ PV, MP 121.6	45.5224	7.115973	34.9156	63.38993	0.892401	5.24E-02
SafetyBen(5)	Safety Benefit, GCX 5, thous $ PV, MP 121.8	-3.24382	0.496274	-4.5335	-2.51507	-0.93167	9.09E-02
SafetyBen(6)	Safety Benefit, GCX 6, thous $ PV, MP 121.99	143.426	21.93567	111.0326	199.7597	0.931671	9.90E-02
SafetyBen(7)	Safety Benefit, GCX 7, thous $ PV, MP 122.54	82.00547	12.73482	63.10716	114.4072	0.906226	6.75E-02
SafetyBen(8)	Safety Benefit, GCX 8, thous $ PV, MP 122.86	0	0	0	0	0	-3
BenTotal(1)	Total Benefits, GCX 1, thous $ PV, MP 121.31	278.756	41.42328	218.9942	382.2704	0.951055	7.71E-02
BenTotal(2)	Total Benefits, GCX 2, thous $ PV, MP 121.47	-21.516	3.051895	-30.2485	-15.9372	-0.65187	0.642887
BenTotal(3)	Total Benefits, GCX 3, thous $ PV, MP 121.54	126.753	18.71757	98.6418	176.8459	0.937753	0.227633
BenTotal(4)	Total Benefits, GCX 4, thous $ PV, MP 121.6	41.89437	6.931088	31.96251	58.21416	0.874936	-4.23E-02
BenTotal(5)	Total Benefits, GCX 5, thous $ PV, MP 121.8	-8.25158	1.368468	-11.6776	-5.35362	-0.34879	5.57E-02
BenTotal(6)	Total Benefits, GCX 6, thous $ PV, MP 121.99	150.1636	22.39042	116.5168	209.3716	0.928472	0.191573
BenTotal(7)	Total Benefits, GCX 7, thous $ PV, MP 122.54	80.27557	12.63436	61.69909	111.9393	0.903526	0.032614
BenTotal(8)	Total Benefits, GCX 8, thous $ PV, MP 122.86	0	0	0	0	0	-3
CostTotal(1)	Total Costs, GCX 1, thous $ PV, MP 121.31	39.30756	0	39.30756	39.30756	0	-3
CostTotal(2)	Total Costs, GCX 2, thous $ PV, MP 121.47	0	0	0	0	0	-3
CostTotal(3)	Total Costs, GCX 3, thous $ PV, MP 121.54	265.5945	0	265.5945	265.5945	0	-3
CostTotal(4)	Total Costs, GCX 4, thous $ PV, MP 121.6	114.4235	0	114.4235	114.4235	0	-3
CostTotal(5)	Total Costs, GCX 5, thous $ PV, MP 121.8	183.75	0	183.75	183.75	0	-3
CostTotal(6)	Total Costs, GCX 6, thous $ PV, MP 121.99	-8.48198	0	-8.48198	-8.48198	0	-3
CostTotal(7)	Total Costs, GCX 7, thous $ PV, MP 122.54	35.67355	0	35.67355	35.67355	0	-3
CostTotal(8)	Total Costs, GCX 8, thous $ PV, MP 122.86	0.63	0	0.63	0.63	0	-3

Table 9A Benefit / Cost Ratio

CSX Transportation 'A' Line
Amtrak Passenger Line
Bridges Street to Old Tarboro Road

Name	Description	Average	StDev	Min	Max	Skewness	Kurtosis
corsaf	Safety benefits, thous $ PV	2828.865	361.6358	2410.141	4079.453	1.343309	1.846307
cortts	Travel time savings, thous $ PV	266.5154	63.14382	136.623	407.2184	0.337527	-0.37846
corenv	Environmental benefits, thous $ PV	1.224073	0.354366	0.526877	2.194383	0.765604	0.752021
corvoc	Veh operating cost benefit, thous $ PV	14.0039	2.994793	6.63953	20.92028	0.113913	-0.18784
cornwk	Network benefits, thous $ PV	0	0	0	0	0	-3
cortot	Total benefits, thous $ PV	2974.531	405.4021	2433.695	4317.478	1.289995	1.575887
BenInduced	of this, benefits from induced trips, thous $ PV	310.2276	34.48042	258.7993	411.1011	0.822569	0.378485
DisBenefit	of this, disbenefits from induced trips, thous $ PV	-446.304	137.1269	-820.104	-176.323	-0.80714	0.8053
corcst	Total costs, thous $ PV	1074.455	0	1074.455	1074.455	0	-3
cornet	Net benefits, thous $ PV	1900.077	405.4021	1359.24	3243.023	1.289994	1.575886
corbcr	**Benefit-cost ratio**	2.76841	0.37731	2.265051	4.018296	1.289993	1.575883
corror	Rate of return (constant dollars), %	23.65761	4.113357	18.44165	37.87427	1.41276	2.068627
LocBen	Local benefits (not included in summary), thous $ PV	150.6432	57.02551	23.78341	294.2987	0.503033	0.125882
SafetyBen(1)	Safety Benefit, GCX 1, thous $ PV, MP 111.38	406.871	52.39257	344.3068	584.0189	1.29645	1.626888
SafetyBen(2)	Safety Benefit, GCX 2, thous $ PV, MP 111.51	-34.024	4.40536	-48.632	-28.7515	-1.25522	1.432473
SafetyBen(3)	Safety Benefit, GCX 3, thous $ PV, MP 114.09	0	0	0	0	0	-3
SafetyBen(4)	Safety Benefit, GCX 4, thous $ PV, MP 115.24	268.7607	33.67316	230.5285	394.4289	1.526553	2.905195
SafetyBen(5)	Safety Benefit, GCX 5, thous $ PV, MP 118.67	345.9702	44.65479	292.5753	495.6064	1.277523	1.535169
SafetyBen(6)	Safety Benefit, GCX 6, thous $ PV, MP 119.15	0	0	0	0	0	-3
SafetyBen(7)	Safety Benefit, GCX 7, thous $ PV, MP 119.29	0	0	0	0	0	-3
SafetyBen(8)	Safety Benefit, GCX 8, thous $ PV, MP 119.39	0	0	0	0	0	-3
SafetyBen(9)	Safety Benefit, GCX 9, thous $ PV, MP 119.48	0	0	0	0	0	-3
SafetyBen(10)	Safety Benefit, GCX 10, thous $ PV, MP 119.92	258.4483	32.97061	221.0645	373.439	1.369267	1.937514
SafetyBen(11)	Safety Benefit, GCX 11, thous $ PV, MP 121	0	0	0	0	0	-3
SafetyBen(12)	Safety Benefit, GCX 12, thous $ PV, MP 123.33	1142.063	145.9013	976.4763	1648.061	1.356601	1.873684
SafetyBen(13)	Safety Benefit, GCX 13, thous $ PV, MP 188.99	440.7749	56.77348	372.9669	632.5316	1.294243	1.615896
BenTotal(1)	Total Benefits, GCX 1, thous $ PV, MP 111.38	483.232	58.9669	395.4841	642.5275	0.922303	0.495182
BenTotal(2)	Total Benefits, GCX 2, thous $ PV, MP 111.51	-114.306	19.24006	-154.98	-73.5299	-0.27276	-0.28962
BenTotal(3)	Total Benefits, GCX 3, thous $ PV, MP 114.09	0	0	0	0	0	-3
BenTotal(4)	Total Benefits, GCX 4, thous $ PV, MP 115.24	268.7607	33.67316	230.5285	394.4289	1.526553	2.905195
BenTotal(5)	Total Benefits, GCX 5, thous $ PV, MP 118.67	345.9702	44.65479	292.5753	495.6064	1.277523	1.535169
BenTotal(6)	Total Benefits, GCX 6, thous $ PV, MP 119.15	0	0	0	0	0	-3
BenTotal(7)	Total Benefits, GCX 7, thous $ PV, MP 119.29	0	0	0	0	0	-3
BenTotal(8)	Total Benefits, GCX 8, thous $ PV, MP 119.39	0	0	0	0	0	-3
BenTotal(9)	Total Benefits, GCX 9, thous $ PV, MP 119.48	0	0	0	0	0	-3
BenTotal(10)	Total Benefits, GCX 10, thous $ PV, MP 119.92	258.4483	32.97061	221.0645	373.439	1.369267	1.937514
BenTotal(11)	Total Benefits, GCX 11, thous $ PV, MP 121	0	0	0	0	0	-3
BenTotal(12)	Total Benefits, GCX 12, thous $ PV, MP 123.33	1269.644	155.2067	1063.658	1745.656	1.118535	0.955518
BenTotal(13)	Total Benefits, GCX 13, thous $ PV, MP 188.99	598.8587	76.45792	461.1964	788.5864	0.575363	-4.90E-02

Table 9B Benefit / Cost Ratio

CSX Transportation 'A' Line
Amtrak Passenger Line
Bridges Street to Old Tarboro Road

CostTotal(1)	Total Costs, GCX 1, thous $ PV, MP 111.38	45.09449	0	45.09449	45.09449	0	-3
CostTotal(2)	Total Costs, GCX 2, thous $ PV, MP 111.51	21	0	21	21	0	-3
CostTotal(3)	Total Costs, GCX 3, thous $ PV, MP 114.09	42	0	42	42	0	-3
CostTotal(4)	Total Costs, GCX 4, thous $ PV, MP 115.24	107.6924	0	107.6924	107.6924	0	-3
CostTotal(5)	Total Costs, GCX 5, thous $ PV, MP 118.67	164.2311	0	164.2311	164.2311	0	-3
CostTotal(6)	Total Costs, GCX 6, thous $ PV, MP 119.15	42	0	42	42	0	-3
CostTotal(7)	Total Costs, GCX 7, thous $ PV, MP 119.29	42	0	42	42	0	-3
CostTotal(8)	Total Costs, GCX 8, thous $ PV, MP 119.39	42	0	42	42	0	-3
CostTotal(9)	Total Costs, GCX 9, thous $ PV, MP 119.48	0.63	0	0.63	0.63	0	-3
CostTotal(10)	Total Costs, GCX 10, thous $ PV, MP 119.92	164.2311	0	164.2311	164.2311	0	-3
CostTotal(11)	Total Costs, GCX 11, thous $ PV, MP 121	63	0	63	63	0	-3
CostTotal(12)	Total Costs, GCX 12, thous $ PV, MP 123.33	164.2311	0	164.2311	164.2311	0	-3
CostTotal(13)	Total Costs, GCX 13, thous $ PV, MP 188.99	176.3445	0	176.3445	176.3445	0	-3

Table 9B Benefit / Cost Ratio

Regional Model
Nash County Railroad, CSX Transportation 'AB' Line CSX Transportation 'A' Line

Name	Description	Average	StDev	Min	Max	Skewness	Kurtosis
corsaf	Safety benefits, thous $ PV	2791.667	320.3932	2293.576	3840.761	0.934306	1.320907
cortts	Travel time savings, thous $ PV	0	0	0	0	0	-3
corenv	Environmental benefits, thous $ PV	0	0	0	0	0	-3
corvoc	Veh operating cost benefit, thous $ PV	0	0	0	0	0	-3
cortot	Total benefits, thous $ PV	3244.812	398.1423	2627.185	4557.934	0.956644	1.422759
beninduced	of this, benefits from induced trips, thous $ PV	509.99	76.36426	392.2897	764.8307	1.009339	1.621744
disbenefit	of this, disbenefit from induced trips, thous $ PV	-56.8441	15.42703	-86.595	-14.5548	0.221917	8.99E-02
corcst	Total costs, thous $ PV	2330.646	0	2330.646	2330.646	0	-3
cornet	Net benefits, thous $ PV	914.1659	398.1423	296.5388	2227.288	0.956643	1.422757
corbcr	**Benefit-cost ratio**	1.392237	0.170829	1.127235	1.955652	0.956643	1.422757
corror	Rate of return (constant dollars), %	7.402157	1.627839	4.809814	12.64087	0.85703	1.138458
LocBen	Local benefits (not included in summary), thous $ PV	161.776	56.12667	5.776379	301.8737	8.55E-02	0.731665
SafetyBen(1)	Safety Benefit, GCX 1, thous $ PV, ID 629685Y	0	0	0	0	0	-3
SafetyBen(2)	Safety Benefit, GCX 2, thous $ PV, ID 629686F	0	0	0	0	0	-3
SafetyBen(3)	Safety Benefit, GCX 3, thous $ PV, ID 629687M	26.39558	4.807376	19.62086	41.35192	1.212661	1.418519
SafetyBen(4)	Safety Benefit, GCX 4, thous $ PV, ID 629688U	0	0	0	0	0	-3
SafetyBen(5)	Safety Benefit, GCX 5, thous $ PV, ID 626218B	74.56828	13.5896	55.54418	117.0846	1.214563	1.438459
SafetyBen(6)	Safety Benefit, GCX 6, thous $ PV, ID 626217U	29.86421	5.440158	22.21408	46.82007	1.213298	1.424949
SafetyBen(7)	Safety Benefit, GCX 7, thous $ PV, ID 626216M	30.77223	5.605858	22.89348	48.25278	1.21346	1.426621
SafetyBen(8)	Safety Benefit, GCX 8, thous $ PV, ID 626215F	52.78896	9.619109	39.23882	82.64267	1.204975	1.397384
SafetyBen(9)	Safety Benefit, GCX 9, thous $ PV, ID 626214Y	64.70534	11.78862	48.153	101.4953	1.213737	1.429517
SafetyBen(10)	Safety Benefit, GCX 10, thous $ PV, ID 626213S	0	0	0	0	0	-3
SafetyBen(11)	Safety Benefit, GCX 11, thous $ PV, ID 626212K	0	0	0	0	0	-3
SafetyBen(12)	Safety Benefit, GCX 12, thous $ PV, ID 626211D	0	0	0	0	0	-3
SafetyBen(13)	Safety Benefit, GCX 13, thous $ PV, ID 626199Y	0	0	0	0	0	-3
SafetyBen(14)	Safety Benefit, GCX 14, thous $ PV, ID 626201X	26.39558	4.807376	19.62086	41.35192	1.212661	1.418519
SafetyBen(15)	Safety Benefit, GCX 15, thous $ PV, ID 626202E	0	0	0	0	0	-3
SafetyBen(16)	Safety Benefit, GCX 16, thous $ PV, ID 626203L	0	0	0	0	0	-3
SafetyBen(17)	Safety Benefit, GCX 17, thous $ PV, ID 626204T	0	0	0	0	0	-3
SafetyBen(18)	Safety Benefit, GCX 18, thous $ PV, ID 626205A	0	0	0	0	0	-3
SafetyBen(19)	Safety Benefit, GCX 19, thous $ PV, ID 626206G	71.9683	13.57816	52.12546	114.2225	1.198302	1.439915
SafetyBen(20)	Safety Benefit, GCX 20, thous $ PV, ID 626207N	51.96597	5.454709	43.36863	68.61497	0.856323	0.734971
SafetyBen(21)	Safety Benefit, GCX 21, thous $ PV, ID 626208V	0	0	0	0	0	-3
SafetyBen(22)	Safety Benefit, GCX 22, thous $ PV, ID 626209C	0	0	0	0	0	-3
SafetyBen(23)	Safety Benefit, GCX 23, thous $ PV, ID 626210W	673.5235	70.70109	562.0343	892.0347	0.86504	0.817992
SafetyBen(24)	Safety Benefit, GCX 24, thous $ PV, ID 629767F	319.4706	33.20522	267.1985	419.5515	0.858256	0.695937
SafetyBen(25)	Safety Benefit, GCX 25, thous $ PV, ID 629771V	0	0	0	0	0	-3
SafetyBen(26)	Safety Benefit, GCX 26, thous $ PV, ID 629772C	712.623	74.0671	595.9714	937.9052	0.864305	0.75469
SafetyBen(27)	Safety Benefit, GCX 27, thous $ PV, ID 629773J	58.86189	7.843505	46.93277	85.18249	1.113139	1.845532

Table 9C Benefit / Cost Ratio

Regional Model
Nash County Railroad, CSX Transportation 'AB' Line CSX Transportation 'A' Line

SafetyBen(28)	Safety Benefit, GCX 28, thous $ PV, ID 629774R	0	0	0	0	0	-3
SafetyBen(29)	Safety Benefit, GCX 29, thous $ PV, ID 629775X	15.9994	2.130481	12.73086	23.10665	1.108709	1.799412
SafetyBen(30)	Safety Benefit, GCX 30, thous $ PV, ID 629776E	105.7891	13.92979	84.28166	153.0109	1.072241	1.933672
SafetyBen(31)	Safety Benefit, GCX 31, thous $ PV, ID 629778T	0	0	0	0	0	-3
SafetyBen(32)	Safety Benefit, GCX 32, thous $ PV, ID 629779A	19.78384	2.606185	15.75993	28.42669	1.082826	1.737951
SafetyBen(33)	Safety Benefit, GCX 33, thous $ PV, ID 629780U	86.58517	13.27092	64.53057	125.8904	0.608997	0.167444
SafetyBen(34)	Safety Benefit, GCX 34, thous $ PV, ID 630082X	0	0	0	0	0	-3
SafetyBen(35)	Safety Benefit, GCX 35, thous $ PV, ID 630083E	328.9555	38.74016	269.8104	456.3981	0.977108	1.39627
SafetyBen(36)	Safety Benefit, GCX 36, thous $ PV, ID 630084L	40.64999	5.063433	32.88067	57.41684	1.037397	1.585401
SafetyBen(37)	Safety Benefit, GCX 37, thous $ PV, ID 630085T	0	0	0	0	0	-3
SafetyBen(38)	Safety Benefit, GCX 38, thous $ PV, ID 630086A	0	0	0	0	0	-3
SafetyBen(39)	Safety Benefit, GCX 39, thous $ PV, ID 630087G	0	0	0	0	0	-3
SafetyBen(40)	Safety Benefit, GCX 40, thous $ PV, ID 629770a	0	0	0	0	0	-3
BenTotal(1)	Total Benefit, GCX 1, thous $ PV, ID 629685Y	0	0	0	0	0	-3
BenTotal(2)	Total Benefit, GCX 2, thous $ PV, ID 629686F	0	0	0	0	0	-3
BenTotal(3)	Total Benefit, GCX 3, thous $ PV, ID 629687M	26.39558	4.807376	19.62086	41.35192	1.212661	1.418519
BenTotal(4)	Total Benefit, GCX 4, thous $ PV, ID 629688U	0	0	0	0	0	-3
BenTotal(5)	Total Benefit, GCX 5, thous $ PV, ID 626218B	74.56828	13.5896	55.54418	117.0846	1.214563	1.438459
BenTotal(6)	Total Benefit, GCX 6, thous $ PV, ID 626217U	29.86421	5.440158	22.21408	46.82007	1.213298	1.424949
BenTotal(7)	Total Benefit, GCX 7, thous $ PV, ID 626216M	30.77223	5.605858	22.89348	48.25278	1.21346	1.426621
BenTotal(8)	Total Benefit, GCX 8, thous $ PV, ID 626215F	52.78896	9.619109	39.23882	82.64267	1.204975	1.397384
BenTotal(9)	Total Benefit, GCX 9, thous $ PV, ID 626214Y	64.70534	11.78862	48.153	101.4953	1.213737	1.429517
BenTotal(10)	Total Benefit, GCX 10, thous $ PV, ID 626213S	0	0	0	0	0	-3
BenTotal(11)	Total Benefit, GCX 11, thous $ PV, ID 626212K	0	0	0	0	0	-3
BenTotal(12)	Total Benefit, GCX 12, thous $ PV, ID 626211D	0	0	0	0	0	-3
BenTotal(13)	Total Benefit, GCX 13, thous $ PV, ID 626199Y	0	0	0	0	0	-3
BenTotal(14)	Total Benefit, GCX 14, thous $ PV, ID 626201X	26.39558	4.807376	19.62086	41.35192	1.212661	1.418519
BenTotal(15)	Total Benefit, GCX 15, thous $ PV, ID 626202E	0	0	0	0	0	-3
BenTotal(16)	Total Benefit, GCX 16, thous $ PV, ID 626203L	0	0	0	0	0	-3
BenTotal(17)	Total Benefit, GCX 17, thous $ PV, ID 626204T	0	0	0	0	0	-3
BenTotal(18)	Total Benefit, GCX 18, thous $ PV, ID 626205A	0	0	0	0	0	-3
BenTotal(19)	Total Benefit, GCX 19, thous $ PV, ID 626206G	71.9683	13.57816	52.12546	114.2225	1.198302	1.439915
BenTotal(20)	Total Benefit, GCX 20, thous $ PV, ID 626207N	51.96597	5.454709	43.36863	68.61497	0.856323	0.734971
BenTotal(21)	Total Benefit, GCX 21, thous $ PV, ID 626208V	0	0	0	0	0	-3
BenTotal(22)	Total Benefit, GCX 22, thous $ PV, ID 626209C	0	0	0	0	0	-3
BenTotal(23)	Total Benefit, GCX 23, thous $ PV, ID 626210W	673.5235	70.70109	562.0343	892.0347	0.86504	0.817992
BenTotal(24)	Total Benefit, GCX 24, thous $ PV, ID 629767F	319.4706	33.20522	267.1985	419.5515	0.858256	0.695937
BenTotal(25)	Total Benefit, GCX 25, thous $ PV, ID 629771V	0	0	0	0	0	-3
BenTotal(26)	Total Benefit, GCX 26, thous $ PV, ID 629772C	712.623	74.0671	595.9714	937.9052	0.864305	0.75469
BenTotal(27)	Total Benefit, GCX 27, thous $ PV, ID 629773J	58.86189	7.843505	46.93277	85.18249	1.113139	1.845532

Table 9C Benefit / Cost Ratio

Regional Model
Nash County Railroad, CSX Transportation 'AB' Line CSX Transportation 'A' Line

BenTotal(28)	Total Benefit, GCX 28, thous $ PV, ID 629774R	0	0	0	0	0	-3
BenTotal(29)	Total Benefit, GCX 29, thous $ PV, ID 629775X	15.9994	2.130481	12.73086	23.10665	1.108709	1.799412
BenTotal(30)	Total Benefit, GCX 30, thous $ PV, ID 629776E	105.7891	13.92979	84.28166	153.0109	1.072241	1.933672
BenTotal(31)	Total Benefit, GCX 31, thous $ PV, ID 629778T	0	0	0	0	0	-3
BenTotal(32)	Total Benefit, GCX 32, thous $ PV, ID 629779A	19.78384	2.606185	15.75993	28.42669	1.082826	1.737951
BenTotal(33)	Total Benefit, GCX 33, thous $ PV, ID 629780U	86.58517	13.27092	64.53057	125.8904	0.608997	0.167444
BenTotal(34)	Total Benefit, GCX 34, thous $ PV, ID 630082X	0	0	0	0	0	-3
BenTotal(35)	Total Benefit, GCX 35, thous $ PV, ID 630083E	328.9555	38.74016	269.8104	456.3981	0.977108	1.39627
BenTotal(36)	Total Benefit, GCX 36, thous $ PV, ID 630084L	40.64999	5.063433	32.88067	57.41684	1.037397	1.585401
BenTotal(37)	Total Benefit, GCX 37, thous $ PV, ID 630085T	0	0	0	0	0	-3
BenTotal(38)	Total Benefit, GCX 38, thous $ PV, ID 630086A	0	0	0	0	0	-3
BenTotal(39)	Total Benefit, GCX 39, thous $ PV, ID 630087G	0	0	0	0	0	-3
BenTotal(40)	Total Benefit, GCX 40, thous $ PV, ID 629770a	0	0	0	0	0	-3
CostTotal(1)	Total Costs, GCX 1, thous $ PV, ID 629685Y	0	0	0	0	0	-3
CostTotal(2)	Total Costs, GCX 2, thous $ PV, ID 629686F	0	0	0	0	0	-3
CostTotal(3)	Total Costs, GCX 3, thous $ PV, ID 629687M	7.807558	0	7.807558	7.807558	0	-3
CostTotal(4)	Total Costs, GCX 4, thous $ PV, ID 629688U	0	0	0	0	0	-3
CostTotal(5)	Total Costs, GCX 5, thous $ PV, ID 626218B	214.7131	0	214.7131	214.7131	0	-3
CostTotal(6)	Total Costs, GCX 6, thous $ PV, ID 626217U	49.80756	0	49.80756	49.80756	0	-3
CostTotal(7)	Total Costs, GCX 7, thous $ PV, ID 626216M	39.30756	0	39.30756	39.30756	0	-3
CostTotal(8)	Total Costs, GCX 8, thous $ PV, ID 626215F	72.42355	0	72.42355	72.42355	0	-3
CostTotal(9)	Total Costs, GCX 9, thous $ PV, ID 626214Y	162.2131	0	162.2131	162.2131	0	-3
CostTotal(10)	Total Costs, GCX 10, thous $ PV, ID 626213S	0	0	0	0	0	-3
CostTotal(11)	Total Costs, GCX 11, thous $ PV, ID 626212K	0	0	0	0	0	-3
CostTotal(12)	Total Costs, GCX 12, thous $ PV, ID 626211D	0	0	0	0	0	-3
CostTotal(13)	Total Costs, GCX 13, thous $ PV, ID 626199Y	0	0	0	0	0	-3
CostTotal(14)	Total Costs, GCX 14, thous $ PV, ID 626201X	39.30756	0	39.30756	39.30756	0	-3
CostTotal(15)	Total Costs, GCX 15, thous $ PV, ID 626202E	0	0	0	0	0	-3
CostTotal(16)	Total Costs, GCX 16, thous $ PV, ID 626203L	0	0	0	0	0	-3
CostTotal(17)	Total Costs, GCX 17, thous $ PV, ID 626204T	0	0	0	0	0	-3
CostTotal(18)	Total Costs, GCX 18, thous $ PV, ID 626205A	0	0	0	0	0	-3
CostTotal(19)	Total Costs, GCX 19, thous $ PV, ID 626206G	46.17356	0	46.17356	46.17356	0	-3
CostTotal(20)	Total Costs, GCX 20, thous $ PV, ID 626207N	45.09449	0	45.09449	45.09449	0	-3
CostTotal(21)	Total Costs, GCX 21, thous $ PV, ID 626208V	21	0	21	21	0	-3
CostTotal(22)	Total Costs, GCX 22, thous $ PV, ID 626209C	42	0	42	42	0	-3
CostTotal(23)	Total Costs, GCX 23, thous $ PV, ID 626210W	109.0387	0	109.0387	109.0387	0	-3
CostTotal(24)	Total Costs, GCX 24, thous $ PV, ID 629767F	164.2311	0	164.2311	164.2311	0	-3
CostTotal(25)	Total Costs, GCX 25, thous $ PV, ID 629771V	0	0	0	0	0	-3
CostTotal(26)	Total Costs, GCX 26, thous $ PV, ID 629772C	164.2311	0	164.2311	164.2311	0	-3
CostTotal(27)	Total Costs, GCX 27, thous $ PV, ID 629773J	39.30756	0	39.30756	39.30756	0	-3

Table 9C Benefit / Cost Ratio

Regional Model
Nash County Railroad, CSX Transportation 'AB' Line CSX Transportation 'A' Line

CostTotal(28)	Total Costs, GCX 28, thous $ PV, ID 629774R	0	0	0	0	0	-3
CostTotal(29)	Total Costs, GCX 29, thous $ PV, ID 629775X	265.5945	0	265.5945	265.5945	0	-3
CostTotal(30)	Total Costs, GCX 30, thous $ PV, ID 629776E	135.9631	0	135.9631	135.9631	0	-3
CostTotal(31)	Total Costs, GCX 31, thous $ PV, ID 629778T	183.75	0	183.75	183.75	0	-3
CostTotal(32)	Total Costs, GCX 32, thous $ PV, ID 629779A	-8.48198	0	-8.48198	-8.48198	0	-3
CostTotal(33)	Total Costs, GCX 33, thous $ PV, ID 629780U	35.67355	0	35.67355	35.67355	0	-3
CostTotal(34)	Total Costs, GCX 34, thous $ PV, ID 630082X	0.63	0	0.63	0.63	0	-3
CostTotal(35)	Total Costs, GCX 35, thous $ PV, ID 630083E	164.2311	0	164.2311	164.2311	0	-3
CostTotal(36)	Total Costs, GCX 36, thous $ PV, ID 630084L	210	0	210	210	0	-3
CostTotal(37)	Total Costs, GCX 37, thous $ PV, ID 630085T	42	0	42	42	0	-3
CostTotal(38)	Total Costs, GCX 38, thous $ PV, ID 630086A	42	0	42	42	0	-3
CostTotal(39)	Total Costs, GCX 39, thous $ PV, ID 630087G	42	0	42	42	0	-3
CostTotal(40)	Total Costs, GCX 40, thous $ PV, ID 629770a	0.63	0	0.63	0.63	0	-3

Table 9C Benefit / Cost Ratio

CROSSING NUMBER	STREET NAME	EXISTING WARNING DEVICES[1]	ACCIDENT HISTORY[2]	NEAR TERM 0 - 5 YEARS	LONG TERM 5 - 10 YEARS
626218B	S. Halifax Rd.	3		Retain cantilever. Add gates. Replace cabinet.	None.
	Mayfair Dr.			None.	None.
626217U	Mansfield Dr.	1		Crossing will be upgraded when it appears on the NCDOT priority list.	None.
626216M	Nottingham Rd.	1		Crossing will be upgraded when it appears on the NCDOT priority list.	None.
626215F	Winstead Ave.	5		None.	None.
626214Y	Englewood Drive.	4		None.	None.
626213S	Avondale Ave.	1		Close. Provide pedestrian / bicycle crossing.	None.
626212K	Old Mill Rd.	4	1 (0/0)*	None.	None.
626211D	Wesleyan Blvd.	5		None.	Feasibility Study for grade separation of US 301 over railroad and river.
626210W	Piedmont Ave.	3		None.	None.
626209C	Lee St./Glenn Ave.	4	1(0/0)*	None.	None.
626208V	Mayo/Pinecrest St.	1		Install signals and gates.	None.

1. Warning Device Types Defined as: 0 = None; 1 = Crossbucks; 2 = Flashers; 3 = Cantilevers; 4 = Gates; 5 = Gates & Cantilevers; 6 = Traffic signal Preemption; 7 = Traffic Signals
2. Accident History [N (k/I)]: N = number of accidents; k = number of fatal accidents; I = number of injury accidents.
   * Accidents occurred prior to installation of existing warning devices

Table 10 Recommendations

CROSSING NUMBER	STREET NAME	EXISTING WARNING DEVICES[1]	ACCIDENT HISTORY[2]	NEAR TERM 0 - 5 YEARS	LONG TERM 5 - 10 YEARS
626207N	Hammond Street	2		Add gates. Make Talbot Drive one-way eastbound. Add curb & gutter along school property.	None.
626206G	Pine Street	1		Close. Provide pedestrian / bicycle crossing.	None.
626205A	Tillery Street	1		Close. Provide alternative access to business.	None.
626204T	Howell St.	1		Enhance pavement markings. Improve hump. Safety improvements to be proposed under TIP Project Z-4004G. (cantilever signals and crossing gates).	None.
626203L	Grace St.	5	1 (0/1)*	None.	None.
626202E	Pearl St.	1		Close.	None.
626201X	Franklin St.	4		None.	None.
626199Y	Church St.	5		None.	None.
629772C	Washington St.	1		Close - Property can be accessed with a new driveway from the vicinity of Vance St./Rex St. intersection. Provide additional fire hydrant by boring under tracks.	None.

1. Warning Device Types Defined as: 0 = None; 1 = Crossbucks; 2 = Flashers; 3 = Cantilevers; 4 = Gates; 5 = Gates & Cantilevers; 6 = Traffic signal Preemption; 7 = Traffic Signals
2. Accident History [N (k/I)]: N = number of accidents; k = number of fatal accidents; I = number of injury accidents.
   * Accidents occurred prior to installation of existing warning devices

Table 10 Recommendations

CROSSING NUMBER	STREET NAME	EXISTING WARNING DEVICES[1]	ACCIDENT HISTORY[2]	NEAR TERM 0 - 5 YEARS	LONG TERM 5 - 10 YEARS
629773J	Vance/Pender St.	4		None.	None
629774R	Clark St.	4		Close. Pave South St. between Washington St. and Pender St. Extend South St. from Pender St. to Branch St. Pave Norfolk St. between Clark St. and Branch St. Extend Norfolk St. from Clark St. to Vance St. Provide additional Fire Hydrant by boring under tracks.	None
629775X	Branch St.	2		Roadway and geometric improvements. Add gates.	None
629776E	Cokey Rd.	4		Replace gates and add cantilevers. Add median island with markers. Extend culvert and widen pavement at crossing. Enhance pavement markings & replace W10-1 Signs.	None
629778T	Pitt St.	2		Close. Provide additional fire hydrant by boring under tracks.	None
629779A	Fairview Rd.	2		Add gates.	None
629780U	Glendale Ave.	4		Enhance pavement markings.	None
629685Y	Bridges St.	4	1 (1/0)	Close after TIP Project U-3329 is completed.	None
629686F	Battleboro Rd.	5	1 (0/0)	Replace 6-8" lens with 12" lens. Trim trees in southwest quadrant. Place guardrail in northeast quadrant around gate. Install preempt system to alert emergency services when crossing is blocked.	Four quadrant gates.
629687M	College Rd.	4		Upgrade lenses and circuitry. Replace cabinet.	None

1. Warning Device Types Defined as: 0 = None; 1 = Crossbucks; 2 = Flashers; 3 = Cantilevers; 4 = Gates; 5 = Gates & Cantilevers; 6 = Traffic signal Preemption; 7 = Traffic Signals

Table 10 Recommendations

CROSSING NUMBER	STREET NAME	EXISTING WARNING DEVICES[1]	ACCIDENT HISTORY[2]	NEAR TERM 0 - 5 YEARS	LONG TERM 5 - 10 YEARS
629688U	Fountain School Rd.	4	1 (1/0)	Replace circuitry and cabinet. Add median island with markers.	Study for further safety enhancements.
630082X	Grand Ave.	5	1 (0/1)	Install four-quadrant automated gates. Adjust overhead utilities for gates.	None
630083E	Gold Leaf St.	4	1 (0/0)*	Close in conjunction with signal modifications between Grand Ave. and Bassett St. and the sidewalk improvements at Thomas St.	None
630084L	Thomas St.	4	1 (1/0)	Replace 8-8"lens with 12" lens. Upgrade circuitry and cabinet. Revise intersection to include right turn and change signal phasing.	None
630085T	Sunset Ave.	4		Replace 4-8" lens with 12" lens. Upgrade circuitry and cabinet.	None
630086A	Western Ave.	4		Enhance pavement markings. Replace 8-8" lens with 12" lens. Upgrade circuitry and cabinet. Add traffic signal preemption	None
630087G	Nash St.	4		Enhance pavement markings. Add traffic signal preemption.	None
629767F	Bassett St.	4	1 (0/0)	Install four-quadrant automated gates.	None
	Kingston/Sutton Rd.	Tunnel		Feasibility Study	Construct grade separation pending results from Feasibility Study.
629771V	Old Tarboro Road	4	2 (0/0)	Install four-quadrant automated gates.	None

1. Warning Device Types Defined as: 0 = None; 1 = Crossbucks; 2 = Flashers; 3 = Cantilevers; 4 = Gates; 5 = Gates & Cantilevers; 6 = Traffic signal Preemption; 7 = Traffic Signals
2. Accident History [N (k/I)]: N = number of accidents; k = number of fatal accidents; I = number of injury accidents.
   * Accidents occurred prior to installation of existing warning devices

Table 10 Recommendations

RECOMMENDATIONS

Nash County Railroad 'ABA' Line (2 trains per day. 5 days a week; 8 trains per day once every 8 days)

South Halifax Road (SR 1544) *NCY RR Mile Post 124.50, Crossing #626 218B*

- South Halifax Road is a two-lane minor thoroughfare serving multi-family homes, mobile home parks, and commercial properties in a rural setting. The current average daily traffic (ADT) is 7800 vehicles with recent development likely increasing this figure quickly. The warning devices consist of cantilevers. This road is a major school bus route with 60 crossings per day. No accidents have occurred at the location during the previous 10 year period.

Near-term Recommendations:

Retain the existing cantilever, add gates and replace the signal cabinet.

Estimated Cost:

Signal Modifications $35,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	31,200	48,400	48,400
Maximum Queue	13	21	21
Vehicles Delayed / Day	29	65	65
Minutes Delay / Stopped Vehicle	1.33	1.94	1.94
LOS	A	A	A

Mayfair Drive Approx NCY RR Mile Post 124.25

Mayfair Drive is a residential street with new development on both sides of the railroad but not connected with a crossing. Access to major thoroughfares from the development on the south side of the track is limited to a circuitous neighborhood route. The current average daily traffic (ADT) is 200 vehicles per day.

Near-term Recommendations:

Leave closed for vehicular traffic. The crossing location as proposed is within ¼ mile of crossing at South Halifax Road and would classify as a redundant crossing. Traffic projections for this location are relatively low. Residential development on either side of tracks is new and since crossing has never been connected, neighborhood cohesiveness has not been established. During meetings with the residents in this area they indicated that emergency response times were adequate and that provision of a crossing at this location would negatively impact their community.

Estimated Cost:

Near-Term.....$0.00

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	N/A	N/A	N/A
Maximum Queue	N/A	N/A	N/A
Vehicles Delayed / Day	N/A	N/A	N/A
Minutes Delay / Stopped Vehicle	N/A	N/A	N/A
LOS	N/A	N/A	N/A

Mansfield Drive *NCY RR Mile Post 123.81, Crossing # 626 217U*

Mansfield Drive is a two lane residential street serving low to median density single family homes. The current average daily traffic (ADT) is 2300 vehicles per day. The warning devices consist of advance warning signs and crossbucks. The crossing provides interconnectivity for school bus routes with 4 crossings per day. No accidents have been recorded at this location during the last 10 years.

Recommendations:

Crossing will be upgraded when it appears on the NCDOT crossing safety priority list. Timing of these improvements is based on a number of factors which determine signalization priorities statewide. Therefore it cannot be determined at this time when (near or long-term) these improvements will be made.

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	9,200	11,400	N/A
Maximum Queue	4	5	N/A
Vehicles Delayed / Day	6	8	N/A
Minutes Delay / Stopped Vehicle	0.95	0.98	N/A
LOS	A	A	N/A

Nottingham Road *NCY RR Mile Post 123.45, Crossing # 626 216M*

Nottingham Road is a two lane residential street providing interconnectivity between neighborhoods, but no direct route to a thoroughfare. The current average daily traffic (ADT) is 2200 vehicles per day. The warning devices consist of crossbucks and advanced warning signs. It is a school bus route with 4 crossings per day. No accidents have been recorded at this location during the previous 10 years.

Recommendations:

Crossing will be upgraded when it appears on the NCDOT crossing safety priority list. Timing of these improvements is based on a number of factors which determine signalization priorities statewide. Therefore it cannot be determined at this time when (near or long-term) these improvements will be made.

Crossing Characteristics

MEASURE	EXISTING	2010	IMPROVED 2010
Exposure Index	8,800	10,800	N/A
Maximum Queue	4	5	N/A
Vehicles Delayed / Day	6	7	N/A
Minutes Delay / Stopped Vehicle	0.95	0.97	N/A
LOS	A	A	N/A

Winstead Avenue (SR 1613) *NCY RR Mile Post 123.16, Crossing # 626 215F*

Winstead Avenue is a two lane minor thoroughfare providing direct access to US 64. The street serves as a collector of neighborhood traffic and has a large elementary school located south of the crossing. The average daily traffic (ADT) is 10,100 vehicles per day. The warning devices consist of gates and cantilevers. It is a major school bus route with 64 crossings per day. There have been no accidents recorded at the location during the last 10 years.

Recommendations:

None

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	40,400	62,600	N/A
Maximum Queue	22	35	N/A
Vehicles Delayed / Day	58	174	N/A
Minutes Delay / Stopped Vehicle	2.07	4.00	N/A
LOS	A	A	N/A

Englewood Drive *NCY RR Mile Post 122.50, Crossing #626 214Y*

Englewood Road is a two lane residential street providing neighborhood connectivity. The average daily traffic (ADT) is 1400 vehicles per day. The warning devices consist of gates. The neighborhood school bus route uses this street and has 14 grade crossings per day. There have been no reported accidents at this location during the last 10 years.

Recommendations:

None

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	5,600	7,000	N/A
Maximum Queue	3	4	N/A
Vehicles Delayed / Day	5	6	N/A
Minutes Delay / Stopped Vehicle	1.18	1.20	N/A
LOS	A	A	N/A

Avondale Avenue *NCY RR Mile Post 122.45, Crossing #626 213S*

Avondale Avenue is a two lane local residential street providing neighborhood connectivity. The average daily traffic (ADT) is 500 vehicles per day. The warning devices consist of advanced warning signs and crossbucks. It is not a school bus route. There have been no reported accidents at this location during the last 10 years.

Near-term Recommendations:

This crossing meets several criteria for candidates for closure. Adequate alternative access is provided from Englewood Drive which can easily handle the additional traffic volumes which will result from the closure of Avondale Avenue. Traffic volumes are relatively low on Avondale Drive and it is currently a passively protected (crossbucks) crossing. Recommendations are therefore to close this crossing to vehicular traffic.

Recognizing the need to maintain some level of neighborhood connectivity and the slow rate of speed of the train traffic, it is further recommended that a pedestrian/bicycle crossing be constructed at this location.

Estimated Cost:

Close crossing, construct pedestrian /bike crossing.....$40,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	2,000	2,600	0
Maximum Queue	1	1	0
Vehicles Delayed / Day	1	2	0
Minutes Delay / Stopped Vehicle	0.87	0.88	0
LOS	A	A	N/A

Old Mill Road (SR 1713) *NCY RR Mile Post 122.27, Crossing #626 212K*

Old Mill Road is a two lane rural road serving residential and industrial properties. Old Mill Road is a connector to US 301. The average daily traffic (ADT) is 4900 vehicles per day. The warning devices consist of gates, which were placed at this location in December of 1999. It is a school bus route with 9 crossings per day. One accident in 1991 with no injuries.

Recommendations:

None

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	19,600	26,000	N/A
Maximum Queue	11	14	N/A
Vehicles Delayed / Day	19	28	N/A
Minutes Delay / Stopped Vehicle	1.43	1.58	N/A
LOS	A	A	N/A

Wesleyan Blvd. (US 301 BYP) *NCY RR Mile Post 122.10, Crossing #626 211D*

Wesleyan Blvd. is a four lane divided median major arterial serving as a north south bypass of Rocky Mount. The average daily traffic (ADT) is 25,000 vehicles per day. The warning devices consist of gates and cantilevers. It is not a school bus route.

Long-term Recommendations:

Based on the relatively high volume of traffic, topography and low density of development, this location is recommended for a Feasibility Study to determine if a grade separation is warranted.

Estimated Cost:

Feasibility Study.....To Be Determined

Crossing Characteristics

MEASURE	EXISTING	2010	Improved Long-term
Exposure Index	100,000	132,000	0
Maximum Queue	28	36	0
Vehicles Delayed / Day	182	428	0
Minutes Delay / Stopped Vehicle	2.62	4.67	0
LOS	A	B	B

Piedmont Avenue *NCY RR Mile Post 121.48, Crossing # 626 210W*

Piedmont Avenue is a two lane residential street connecting residential neighborhoods with the City Park and City Park Lake. The average daily traffic (ADT) is 3600 vehicles per day. The warning devices consist of 1 cantilever flashing light signal and 1 standard flashing light signal. It is a school bus route with 9 crossings per day. No accidents have been reported at this crossing during the latest 10 year period.

Recommendations:

None

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	14,400	19,000	N/A
Maximum Queue	6	8	N/A
Vehicles Delayed / Day	10	14	N/A
Minutes Delay / Stopped Vehicle	1.02	1.09	N/A
LOS	A	A	N/A

Lee St./Glenn Ave. *NCY RR Mile Post 121.25, Crossing #626 209C*

Lee Street / Glenn Avenue is a two lane residential collector providing a direct route to US 64 E and US 64 W. The average daily traffic (ADT) is 2000 vehicle per day. The warning devices consist of gates which were installed in December of 1999. It is a school bus route with 4 grade crossings per day. One accident occurred in 1996 with 0 injuries.

Recommendations:

None.

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	8,000	10,000	N/A
Maximum Queue	4	6	N/A
Vehicles Delayed / Day	7	9	N/A
Minutes Delay / Stopped Vehicle	1.21	1.25	N/A
LOS	A	A	N/A

Mayo St./Pinecrest Street *NCY RR Mile Post 121.20, Crossing #626 208V*

Mayo Street/Pinecrest Street is a two lane residential street providing neighborhood connectivity and an additional route to US 64. The average daily traffic (ADT) is 1100 vehicles per day. The warning devices consist of advance warning signs and cross-bucks. It is a school bus route with 8 grade crossings per day. No accidents have been reported at this crossing during the last 10 years.

Recommendations:

Crossing signal and gates will be installed at this location when it appears on the NCDOT Crossing Safety Priority List. Timing of these improvements is based on a number of factors which determine signalization priorities statewide. Therefore it cannot be determined at this time when (near or long-term) these improvements will be made.

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	4,400	5,400	N/A
Maximum Queue	2	2	N/A
Vehicles Delayed / Day	3	3	N/A
Minutes Delay / Stopped Vehicle	0.90	0.91	N/A
LOS	A	A	A

Hammond Street *NCY RR Mile Post 120.72, Crossing #626 207N*

Hammond Street is a two lane urban residential collector with an average daily traffic (ADT) of 4000 vehicles per day. The Rocky Mount High School is located along this section of the railroad. The warning devices consist of advance warning signs and flashing masts. It is a school bus route with 29 grade crossings per day. No accidents have been reported at this location during the last 10 years.

Near Term Recommendations:

Crossing gates will be added to the existing railroad signal at this location. The roadway geometrics in this area are complicated by the lack of positive driveway delineation. To improve this condition, it is recommended that Talbot Drive be converted to allow one-way eastbound traffic and that curb and gutter be constructed along the school property to restrict access to Hammond Road between the crossing gate and the railroad from the school's parking lot. These improvements coupled with recommendations at Pine Street and Tillery Street should enhance safety through this area.

Estimated Cost:

Signal Modification (add gate).....	$15,000
Geometric Enhancements.....	$45,000
Total	$60,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	16,000	21,200	21,200
Maximum Queue	7	9	9
Vehicles Delayed / Day	12	17	17
Minutes Delay / Stopped Vehicle	1.05	1.13	1.13
LOS	A	A	A

Pine Street *NCY RR Mile Post 120.71, Crossing #626 206G*

Pine Street is a residential street four blocks long. The street begins at Walnut Street and ends at Hammond Street. The average daily traffic (ADT) is 900 vehicles per day. The warning devices consist of one advance warning sign and cross-bucks. One school bus a day crosses the railroad. No accidents have been recorded at this crossing within the past 10 years.

Near-Term Recommendations:

This crossing meets several criteria for candidates for closure. Several closely spaced crossings exist in this area of Rocky Mount. Good, east-west circulation is provided to access these crossings. The relatively low traffic volumes currently utilizing this crossing can be easily accommodated by the adjacent street network. The protection at this crossing is crossbucks.

Meetings with school representatives from the High School resulted in the additional recommendation to include a pedestrian/bicycle crossing at this location rather than Tillery Street. This was based on internal circulation on the High School property as well as the proximity to the protected crossing at Hammond Street.

Therefore the recommendation is to close the crossing at Pine Street to vehicular traffic and construct a pedestrian/bicycle access.

Estimated Cost:

Close crossing, construct pedestrian/bike crossing.....$40,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	3,600	4,400	N/A
Maximum Queue	2	2	N/A
Vehicles Delayed / Day	2	3	N/A
Minutes Delay / Stopped Vehicle	0.89	0.90	N/A
LOS	A	A	N/A

Tillery Street NCY RR Mile Post 120.67, Crossing #626 205A

Tillery Street is a two lane local residential street with an average daily traffic (ADT) of 800 vehicles per day. The warning devices consist of advance warning signs and cross-bucks. One school bus a day crosses the railroad. No accidents have occurred at this crossing in the last 10 years.

Near-term Recommendations:

Similar to Pine Street, Tillery Street meets several of the criteria for crossing closure. There are several closely spaced crossings located in this area of Rocky Mount. Good east-west circulation exists to allow access to adjacent grade crossings. The relatively low traffic volumes currently using this crossing can easily be accommodated by the adjacent street network. The protection at this humped crossing is crossbucks. Based on these criteria it is recommended that this crossing be closed.

Impacts to the closure of Tillery Street and Pine Street include the redistribution of traffic from a business located south of the track in between Pine Street and Tillery Street. To minimize truck traffic into the adjacent neighborhood and mitigate impacts to the businesses, it is recommended that alternative access be provided to the business from Tillery Street and modifications be made to the loading dock at the rear of the building.

Estimated cost:

Close crossing	$10,000
Access/Loading Dock Modifications	$40,000
Total	$50,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	3,200	4,000	N/A
Maximum Queue	1	2	N/A
Vehicles Delayed / Day	2	2	N/A
Minutes Delay / Stopped Vehicle	0.89	0.89	N/A
LOS	A	A	N/A

Howell Street *NCY RR Mile Post 120.61, Crossing #626 204T*

Howell Street is a two-lane local residential/commercial street with a baseball field and the Buck Leonard Park located just south of the crossing. The average daily traffic (ADT) is 2000 vehicles per day. The warning devices consist advance warning signs and cross-bucks. It is a school bus route with 6 grade crossings per day. Safety Improvements to be proposed under TIP Project Z-4004G include the modification of the existing crossing signal to include cantilever signals and gate.

Near-term Recommendations:

The crossing protection devices at Howell Street have a recommendation under TIP Project Z-4004G to be upgraded to include cantilever signals and gates. This TSS concurs with that recommendation. In addition, based on the average daily traffic and current humped condition of the crossing, it is recommended that geometric improvements be constructed at this location to improve the vertical alignment and remove the hump.

Estimated cost:

Signal Improvements.....TIP Project Z-4004G
Geometric Improvements (remove hump)..... .$175,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	8,000	9,800	9,800
Maximum Queue	3	4	4
Vehicles Delayed / Day	5	7	7
Minutes Delay / Stopped Vehicle	0.94	0.96	0.96
LOS	A	A	A

Grace Street *NCY RR Mile Post 120.31, Crossing #626 203L*

Grace Street is a four lane minor arterial serving as a transition area from urban residential to commercial. The average daily traffic (ADT) is 6900 vehicles per day. The warning devices consist of gates and cantilevers which were installed in February of 1999. It is a school bus route with 13 grade crossings per day. One accident occurred in 1996 with 1 railroad employee injured.

Recommendations:

None

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	27,600	36,400	N/A
Maximum Queue	8	10	N/A
Vehicles Delayed / Day	25	35	N/A
Minutes Delay / Stopped Vehicle	1.31	1.40	N/A
LOS	A	A	N/A

Pearl Street *NCY RR Mile Post 120.25, Crossing #626 202E*

Pearl Street is a two-lane street serving local traffic. Development is a mixture of older urban residential and commercial properties. The average daily traffic (ADT) is 500 vehicles per day. The warning devices consist of advance warning signs and cross-bucks. It is a school bus route with 4 grade crossings per day. No accidents have occurred at the crossing in the last 10 years.

Near-term Recommendations:

This crossing meets several criteria for closure. Adequate alternative access exists at the nearby adjacent crossings. Traffic volumes on Pearl Street are relatively low and can easily be accommodated by the adjacent street network. The protection at the crossing currently consists of crossbucks. Recommendations are to close this crossing. An additional fire hydrant has been requested by the city.

Estimated cost:

Close crossing.....	.....$10,000
New Fire Hydrant	$ 5,000
Total	$15,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	2,000	2,600	N/A
Maximum Queue	1	1	N/A
Vehicles Delayed / Day	1	2	N/A
Minutes Delay / Stopped Vehicle	0.87	0.88	N/A
LOS	A	A	N/A

Franklin Street (US 301 S) *NCY RR Mile Post 120.19, Crossing # 626 201X*

Franklin Street is a two lane, one way arterial through the business district of Rocky Mount. The average daily traffic (ADT) is 3300 vehicles per day. The warning devices consist of gates. It is not a school bus route. No accidents have occurred at this crossing within the last 10 years.

Recommendations:

None

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	13,200	17,600	N/A
Maximum Queue	4	5	N/A
Vehicles Delayed / Day	11	15	N/A
Minutes Delay / Stopped Vehicle	1.19	1.23	N/A
LOS	A	A	N/A

Church Street (US 301 N) *NCY RR Mile Post 120.10, Crossing #626 199Y*

Church Street is a two lane, two way arterial with a center turn lane through the business district of Rocky Mount. The average daily traffic (ADT) is 3400 vehicles per day. The warning devices consist of gates and cantilevers. It is not a school bus route. No accidents have occurred at this crossing within the last 10 years.

Recommendations:

None.

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	13,600	18,000	N/A
Maximum Queue	7	10	N/A
Vehicles Delayed / Day	12	17	N/A
Minutes Delay / Stopped Vehicle	1.31	1.39	N/A
LOS	A	A	N/A

CSX Railroad 'AB' Line (4 trains per day, 6 days per week)

Washington Street *CSX RR Mile Post 121.31, Crossing #629 772C*

Washington Street is a two lane urban local street with the grade crossing providing access to CSX property and Engine Solutions Inc. The average daily traffic (ADT) is 400 vehicles per day. The warning devices consist of cross-bucks and 'Stop, LOOK, & LISTEN' signs. It is not a school bus route. There were no accidents recorded at this location within the last 10 years.

Near-term Recommendations:

Since this is a low volume crossing with adequate adjacent access at Vance Street/Pender Street located approximately 0.16 miles to the east and is currently protected with crossbucks only, the recommendation is to close the existing crossing at Washington Street. To mitigate impact to the adjacent property it is further recommended that a new drive to the CSX property be constructed to Vance Street/Pender Street. In addition the fire department has requested that another fire hydrant be provided at this location. This should be provided in conjunction with the crossing closure.

Estimated cost:

Close crossing.....	$10,000
Fire Hydrant.....	$ 5,000
Construct new driveway.....	$25,000
Total	$40,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	3,600	4,500	0
Maximum Queue	1	1	0
Vehicles Delayed / Day	2	3	0
Minutes Delay / Stopped Vehicle	1.07	1.07	0
LOS	A	A	N/A

Vance Street/Pender Street *CSX RR Mile Post 121.47, Crossing # 629 773J*

Vance Street / Pender Street is a two lane urban collector providing a north-south route on the east side of the main CSX/Amtrak Railroad. The average daily traffic (ADT) is 1600 vehicles per day. The warning devices consist of advance warning signs and gates. It is a school bus route with 12 grade crossings per day. No accidents have been recorded at this location in the last 10 years.

Recommendations:

None.

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	14,400	18,000	N/A
Maximum Queue	3	4	N/A
Vehicles Delayed / Day	10	13	N/A
Minutes Delay / Stopped Vehicle	1.13	1.15	N/A
LOS	A	A	N/A

Clark Street *CSX RR Mile Post 121.54, Crossing #629 774R*

Clark Street is a two lane urban local street providing neighborhood connectivity. The average daily traffic (ADT) is 700 vehicles per day. The warning devices consist of advance warning signs and gates. It is a school bus route with 17 grade crossings per day.

Near-term Recommendations:

Clark Street meets several criteria for crossing closure and consolidation. It is located 0.06 miles west of Branch Street and 0.07 miles east of Vance Street. Traffic volumes utilizing the crossing are relatively low and can easily be accommodated using the adjacent street network. Based on these and other criteria it is recommended that Clark Street be closed.

To improve east-west circulation in conjunction with the closure the following improvements are recommended:

- *Pave South Street between Washington Street and Pender Street*
- *Extend South street from Pender Street to Branch Street*
- *Pave Norfolk Street between Clark Street and Branch Street*
- *Extend Norfolk Street from Clark Street to Branch Street*
- *Provide an additional fire hydrant*

Estimated cost:

Close Crossing	$ 10,000
Fire Hydrant	$ 5,000
Roadway Improvements	$270,000
Total	$285,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	6,300	8,100	N/A
Maximum Queue	1	2	N/A
Vehicles Delayed / Day	4	5	N/A
Minutes Delay / Stopped Vehicle	1.08	1.09	N/A
LOS	A	A	N/A

Branch Street *CSX RR Mile Post 121.60, Crossing #629 775X*

Branch Street is a two lane urban local street providing neighborhood connectivity and access to US 64. The average daily traffic (ADT) is 2200 vehicles per day. The warning devices consist of advanced warning signs and flashing masts. It is a school bus route with 18 grade crossings per day.

Near-term Recommendations:

In order to more positively provide roadway delineation through the crossing and added protection of safety devices, it is recommended that curb and gutter be constructed and guardrail be added. It is further recommended that gates be added to the crossing signals.

Estimated Cost:

Signal Modification.....	$ 25,000
Roadway Improvements.....	$ 75,000
Total	$100,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	19,800	24,300	24,300
Maximum Queue	5	6	6
Vehicles Delayed / Day	14	18	18
Minutes Delay / Stopped Vehicle	1.16	1.19	1.19
LOS	A	A	A

Cokey Road (SR 1164) *CSX RR Mile Post 121.80, Crossing #629 776E*

Cokey Road is a two lane minor arterial providing access into Rocky Mount from the southeast. The average daily traffic (ADT) is 8,000 vehicles per day. The warning devices consist of gates. It is a school bus route with 10 grade crossings per day.

Near-term Recommendations:

Existing geometrics at the railroad crossing includes an intersection of Cokey Road and Norfolk Street. With the volume of traffic utilizing these roads complications in terms or crossing signalization and geographic movements/conflicts arise. In order to better delineate and control traffic through this area it is recommended that:

- *Cokey Road be widened and the existing culvert extended through the crossing to accommodate a media island with markers*
- *Signal modifications be constructed to include cantilever and gates on both approaches to the crossing*

Estimated Cost:

Signal Modifications.....	$125,000
Roadway Improvements.....	$ 50,000
Total	$175,000

Crossing Characteristics

MEASURE	EXISTING	2010	IMPROVED 2010
Exposure Index	64,000	84,800	84,800
Maximum Queue	17	22	22
Vehicles Delayed / Day	74	121	121
Minutes Delay / Stopped Vehicle	1.66	2.05	2.05
LOS	A	A	A

Pitt Street *CSX RR Mile Post 121.99, Crossing #629 778T*

Pitt Street is a two lane connector from a residential subdivision to Cokey Road. The average daily traffic (ADT) is 700 vehicles per day. The warning devices consist of advance warning signs and flashing masts. It is not a school bus route. There were no accidents recorded at the crossing within the last 10 years.

Near-term Recommendations:

Since this is a relatively low volume crossing with adequate access at Cokey Street located approximately 0.19 miles to the west, the recommendation is to close the existing crossing at Pitt Street. The existing street network can easily accommodate the redistributed traffic volumes. In addition the fire department has requested that a fire hydrant be provided at this location. This hydrant should be constructed in conjunction with the crossing closure.

Estimated Cost:

Close Crossing	$10,000
Fire Hydrant	$ 5,000
Total	$15,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	4,200	5,700	N/A
Maximum Queue	1	2	N/A
Vehicles Delayed / Day	4	6	N/A
Minutes Delay / Stopped Vehicle	1.08	1.09	N/A
LOS	A	A	N/A

Fairview Road (NC 43) *CSX RR Mile Post 122.54, Crossing #629 779A*

Fairview Road is a two lane minor arterial with shopping centers, commercial, and some residential use. NC 43 changes to Cokey Road at the southern end of Fairview Road. The average daily traffic is 5,500 vehicles per day. The warning devices consist of advance warning signs and flashing masts. It is not a school bus route. No accidents have been recorded at this location during the last 10 years.

Near-term Recommendations:

Recommendations for improvements at this location involve the installation of crossing gates to provide more positive protection and discourage drivers from crossing the railroad tracks in front of advancing train traffic.

Estimated cost of Recommendations

Signal Modifications.....$25,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	44,000	68,400	68,400
Maximum Queue	12	18	18
Vehicles Delayed / Day	43	82	82
Minutes Delay / Stopped Vehicle	1.40	1.73	1.73
LOS	A	A	A

Glendale Avenue (SR 1234) *CSX RR Mile Post 122.86, Crossing #629 780U*

Glendale Avenue is a two lane secondary road providing additional neighborhood access to NC 43. The average daily traffic (ADT) is 1600 vehicles per day. The warning devices consist of gates. It is not a school bus route. There have been no accidents reported at this crossing during the last 10 years.

Near-term Recommendations:

Pavement markings including railroad crossing symbols should be installed at this location.

Estimated Cost:

Pavement Markings.....$600.00

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	9,600	12,900	0
Maximum Queue	3	4	0
Vehicles Delayed / Day	10	14	0
Minutes Delay / Stopped Vehicle	1.13	1.16	0
LOS	A	A	A

CSX Railroad 'A' Line & Amtrak Passenger Line
(Amtrak: 8 trains per day; CSX : 34 trains per day)

Bridges Street *CSX RR Mile Post 111.38, Crossing #629 685Y*

Bridges Street is a two lane local street providing access from the residential neighborhood through the commercial district to US 301. The average daily traffic (ADT) is 1700 vehicles per day. The warning devices consist of gates. It is not a school bus route. One accident in 1993 with 1 person killed.

Near-term Recommendations:

This crossing is one of two existing crossings located within the Battleboro area of Rocky Mount. The other crossing is located at Battleboro Road, approximately 0.13 miles south of Bridges Street. Both Battleboro Road and Bridges Street serve the same area.

TIP Project U-3329 will provide a new grade-separation crossing south of Battleboro Road. It is currently scheduled for construction in 2003. When this new grade separation is completed it is recommended that Bridges Street be closed.

Estimated cost of Recommendations

Close Crossing..... $10,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	57,800	76,500	N/A
Maximum Queue	4	8	N/A
Vehicles Delayed / Day	101	175	N/A
Minutes Delay / Stopped Vehicle	1.43	1.86	N/A
LOS	B	C	N/A

Battleboro Road (SR 1560/SR 1407) *CSX RR Mile Post 111.51, Crossing # 629 686F*

Battleboro Road is a two lane collector providing access to US 301, NC 4, and I-95. The average daily traffic (ADT) is 4,000 vehicles per day. The warning devices consist of gates and cantilevers. It is not a school bus route. One accident occurred in 1994 with 0 injuries.

Near-term Recommendations:

The existing lenses at this crossing are 8" and trees currently need to be trimmed in the southwest quadrant. Recommendations at Battleboro Road are to replace the signal lenses with 12" lenses and to trim the trees to improve sight distance. In addition, it is recommended that guardrail be installed to protect the signal gate in the northeast quadrant.

Once TIP Project U-3329 is completed and in conjunction with the closure of Bridges Street, it is recommended that a pre-empt system be installed to alert emergency services when the Battleboro Road crossing is blocked.

Estimated Cost:

Signal Modifications.....	$ 5,000
Trim Trees.....	$ 5,000
Signal Pre-empt.....	$75,000
Total	$85,000

Long-Term Recommendations:

Increase in traffic volumes can lead to driver frustration when the crossing signals are activated. Recognizing this and also that this crossing involves a mainline track with both freight and passenger service, long term recommendations include the installation of four quad signals.

Estimated Cost:

Install 4 quad signals.....	$150,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	136,000	180,200	180,200
Maximum Queue	11	18	18
Vehicles Delayed / Day	269	489	489
Minutes Delay / Stopped Vehicle	1.61	2.21	2.21
LOS	B	C	C

College Road (SR 1540/SR 1403) *CSX RR Mile Post 114.09, Crossing #629 687M*

College Road is a two lane rural secondary road providing access to farm land and light industrial. The average daily traffic is 700 vehicles per day. The warning devices consist of gates. It is not a school bus route. Provides access to Prison and Industrial Park. Served as parking area for recreational vehicles for flood victims.

Near-term Recommendations:

Field investigations revealed that lenses, circuitry and the signal cabinet should be upgraded. These improvements are recommended in the near-term.

Estimated Cost:

Signal Modifications.....$40,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	23,800	37,400	37,400
Maximum Queue	2	4	4
Vehicles Delayed / Day	40	81	81
Minutes Delay / Stopped Vehicle	1.36	1.76	1.76
LOS	B	C	C

Fountain School Road (SR 1539/SR 1402)) *CSX RR Mile Post 115.24, Crossing #629 688U*

Fountain School Road is a two lane secondary road serving commercial and institutional properties, and farm land. The average daily traffic is 2200 vehicles per day. The warning devices consist of gates. It is not a school bus route. One accident occurred in 1998 with 1 person killed.

Near-term Recommendations:

Field investigations revealed that the circuitry and cabinet should be replaced at this location. In addition, existing pavement width is wide enough that construction of a raised media with markers is recommended to discourage drivers from running around the crossing gates.

Estimated Cost:

Signal Modifications including Median.....$100,000

Long-term Recommendations:

TIP Project R-2823 (Rocky Mount Northern Outer Loop) is currently scheduled for construction in FFY 2007 and 2008. Traffic volumes at this crossing are expected to increase with this project. At such time as more detailed information is available with regard to project impacts, it is recommended that the crossing be evaluated to determine the need for further safety enhancements.

Estimate Cost:

Study and further improvements.....To Be Determined

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	74,800	117,300	117,300
Maximum Queue	6	12	12
Vehicles Delayed / Day	134	286	286
Minutes Delay / Stopped Vehicle	1.46	1.99	1.99
LOS	B	C	C

Grand Avenue (NC 43) *CSX RR Mile Post 118.67, Crossing #630 082X*

Grand Avenue is a four lane undivided urban arterial serving commercial and residential properties. The average daily traffic is 11,800 vehicles per day. The warning devices consist of gates and cantilevers. It is a major school bus crossing. One accident occurred in 1993 with 1 injury.

Near-term Recommendations:

Information provided by the Police Department revealed that this crossing experiences a noticeable level of drivers going around the gates when they are activated. Due to the existing traffic volumes using this crossing the NCDOT determined that recommendations for installation of four-quadrant automated gates at this location would be accelerated as a demonstration project for the Rocky Mount Traffic Separation Study.

The installation should be completed in Spring of 2002.

Estimated Cost:

Four Quadrant Automated Gate..... .....$150,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	401,200	530,400	530,400
Maximum Queue	16	26	26
Vehicles Delayed / Day	650	1700	1700
Minutes Delay / Stopped Vehicle	1.32	2.61	2.61
LOS	B	D	D

Gold Leaf Street *CSX RR Mile Post 118.99, Crossing #630 083E*

Gold Leaf Street is a two lane urban local collector providing light commercial access across tracks. The average daily traffic is 2500 vehicles per day. The warning devices consist of gates. One school bus with driver and no passengers cross the track each day. One accident occurred in 1990 with no injuries.

Near-term Recommendations:

Gold Leaf Street is located 0.32 miles south of Grand Avenue and 0.16 miles north of Thomas Street.

It is therefore recommended that Gold Leaf Street be closed in conjunction with the signal modifications completed in the downtown area (between Grand Avenue and Bassett Street) and the sidewalk improvements at Thomas Street. With these improvements the adjacent street network can accommodate the redistribution of existing traffic volumes.

Estimated Cost:

Close crossing..... $10,000

Long-term Recommendations:

At such time that the City can obtain the required right of way it is recommended that N. E. Main Street be realigned between Gold Leaf Street and Sunset Avenue to improve circulation in the downtown area.

Estimated Cost:

Geometric Improvements..... To be determined

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	85,000	105,400	105,400
Maximum Queue	7	10	10
Vehicles Delayed / Day	155	252	252
Minutes Delay / Stopped Vehicle	1.49	1.95	1.95
LOS	B	C	C

Thomas Street (US 64W) *CSX RR Mile Post 119.15, Crossing #630 084L*

Thomas Street is a three lane one-way arterial. The average daily traffic is 4700 vehicles per day. The warnings devices consist of gates. It is a school bus route. One accident occurred in 1996 with 1 pedestrian killed.

Near-term Recommendations:

Field investigations revealed that the lenses, circuitry and signal cabinet should be replaced at this location. In conjunction with the closure of Gold Leaf Street sidewalk should be provided at the crossing and the crossing signal and gate will be revised to accommodate the new sidewalk.

Estimated cost of Recommendations

Signal Modification.....	$30,000
Sidewalk Improvements	$10,000
Total	$40,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	159,800	212,500	212,500
Maximum Queue	6	10	10
Vehicles Delayed / Day	258	509	509
Minutes Delay / Stopped Vehicle	1.32	1.95	1.95
LOS	B	C	C

Sunset Avenue (US 64E) *CSX RR Mile Post 119.29, Crossing #630 085T*

Sunset Avenue is a two lane one-way arterial. The average daily traffic is 5100 vehicles per day. The warning devices consist of gates. It is a school bus route. No accidents have been recorded at this location during the last 10 years.

Near-term Recommendations:

Field investigations revealed that the lenses, circuitry and signal cabinet associated with this crossing should be replaced. It is therefore recommended that these improvements be made in conjunction with the closure of Gold Leaf Street and other signal improvements in the downtown area.

Estimated cost of Recommendations

Signal Modifications.....$40,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	173,400	229,500	229,500
Maximum Queue	7	11	11
Vehicles Delayed / Day	280	557	557
Minutes Delay / Stopped Vehicle	1.32	1.98	1.98
LOS	B	C	C

Western Avenue *CSX RR Mile Post 119.39, Crossing # 630 086A*

Western Avenue is a two lane one-way westbound urban collector. The average daily traffic is 4400 vehicles per day. The warning devices consist of gates. It is a school bus route. No accidents have been reported at this location during the last 10 years.

Near-term Recommendations:

Field investigations revealed that the lenses, circuitry and signal cabinet associated with this crossing should be replaced. It is therefore recommended that these improvements be made in conjunction with the closure of Gold Leaf Street and other signal improvements in the downtown area.

Estimated cost of Recommendations

Signal Modifications.....$40,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	149,600	183,600	183,600
Maximum Queue	6	9	9
Vehicles Delayed / Day	242	430	430
Minutes Delay / Stopped Vehicle	1.32	1.91	1.91
LOS	B	C	C

Nash Street *CSX RR Mile Post 119.48, Crossing #630 087G*

Nash Street is a two lane one-way eastbound collector. The average daily traffic is 2300 vehicles per day. The warning devices consist of gates. It is a school bus crossing. No accidents have been recorded at this crossing during the last 10 years.

Near-term Recommendations:

Pavement markings including railroad crossing symbols should be installed at this location. Add traffic signal pre-emption.

Estimated cost of Recommendations

Pavement Markings.....$25,000

Crossing Characteristics

MEASURE	EXISTING	2010	IMPROVED 2010
Exposure Index	78,200	96,900	96,900
Maximum Queue	3	5	5
Vehicles Delayed / Day	126	212	212
Minutes Delay / Stopped Vehicle	1.32	1.79	1.79
LOS	B	C	C

Bassett Street *CSX RR Mile Post 119.92, Crossing#629 767F*

Bassett Street is a two lane collector. The average daily traffic is 4600 vehicles per day. The warning devices consist of gates. Bassett Street is a major school bus crossing. One accident occurred in 1994 with 0 injuries.

Near-term Recommendations:

Information provided by the Police Department revealed that this crossing experiences a noticeable level of drivers going around the gates when they are activated. This crossing is located near the railroad's yard and experiences many instances when the crossing is blocked adding to driver frustration. Recommendations for this crossing involves the installation of four-quadrant automated gates.

Estimated Cost:

Four Quadrant Automated Gate.....$150,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	156,400	192,100	192,100
Maximum Queue	12	19	19
Vehicles Delayed / Day	320	533	533
Minutes Delay / Stopped Vehicle	1.67	2.26	2.26
LOS	B	D	D

Sutton Road (SR 1727/SR 1157)

Sutton Road consists of two one way tunnels under the railroad with an at grade crossing between the tunnels. A signal is in place to operate the one-way pattern. The average daily traffic is 4600 vehicles per day. It is not a school bus route. The existing vertical clearance of 8'-0" is below the minimum required 15'-0"for local roads and streets.

Near-term Recommendations:

Based on the high volume of through and switching rail movements and limitations of the existing one way tunnel, it is recommended that a feasibility study be conducted to determine the need for a new grade separation at or near this location.

Estimated Cost:

Feasibility study..... $60,000

Long-term Recommendations:

The NCDOT will work with the City to secure funding for improvements (if any) recommended by the Feasibility Study.

Estimated Cost:

Improvements Recommended.....To Be Determined

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	N/A	N/A	N/A
Maximum Queue	N/A	N/A	N/A
Vehicles Delayed / Day	N/A	N/A	N/A
Minutes Delay / Stopped Vehicle	N/A	N/A	N/A
LOS	F	F	A

Old Tarboro Road (SR 1006) *CSX RR Mile Post 123.33, Crossing #629 771V*

Old Tarboro Road is a two-lane rural/suburban secondary road. The average daily traffic is 3000 vehicles per day. The warning devices consist of gates. It was not listed as a school bus route. One accident occurred in 1997 with no injuries.

Near-term Recommendations:

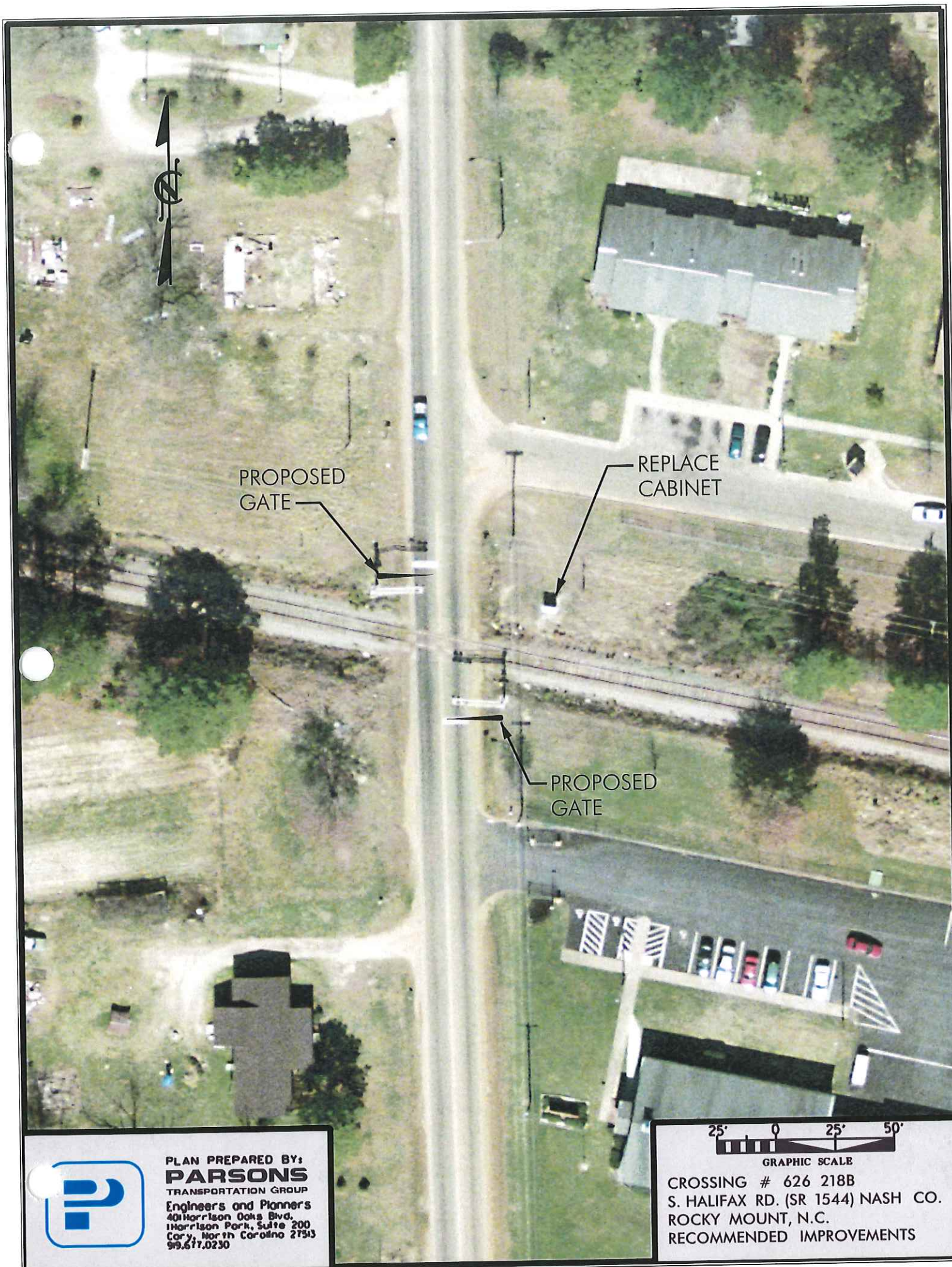
This crossing is located at the south end of the CSX rail yard. Land use in the area is relatively rural when compared to most of the other crossings in the study. The close proximity of industrial drives to the crossing precludes the construction of a median at this crossing. To discourage drivers from running around the gate it is recommended that four quadrant automated gates be installed at this location.

Estimated Cost:

Four Quadrant Automated Gates.....$150,000

Crossing Characteristics

Measure	Existing	2010	Improved 2010
Exposure Index	102,000	132,600	132,600
Maximum Queue	8	13	13
Vehicles Delayed / Day	191	331	331
Minutes Delay / Stopped Vehicle	1.53	2.04	2.04
LOS	B	C	C



PLAN PREPARED BY:
PARSONS
TRANSPORTATION GROUP
Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

CROSSING # 626 218B
S. HALIFAX RD. (SR 1544) NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\s.halifax.dgn 04/29/02 11:12:45 AM

North

S. Halifax Road
South

East

S. Halifax Road
West

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Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING #
MAYFAIR DRIVE – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\mayfair.dgn 04/29/02 11:14:43 AM

No Photographs
For
Mayfair Drive

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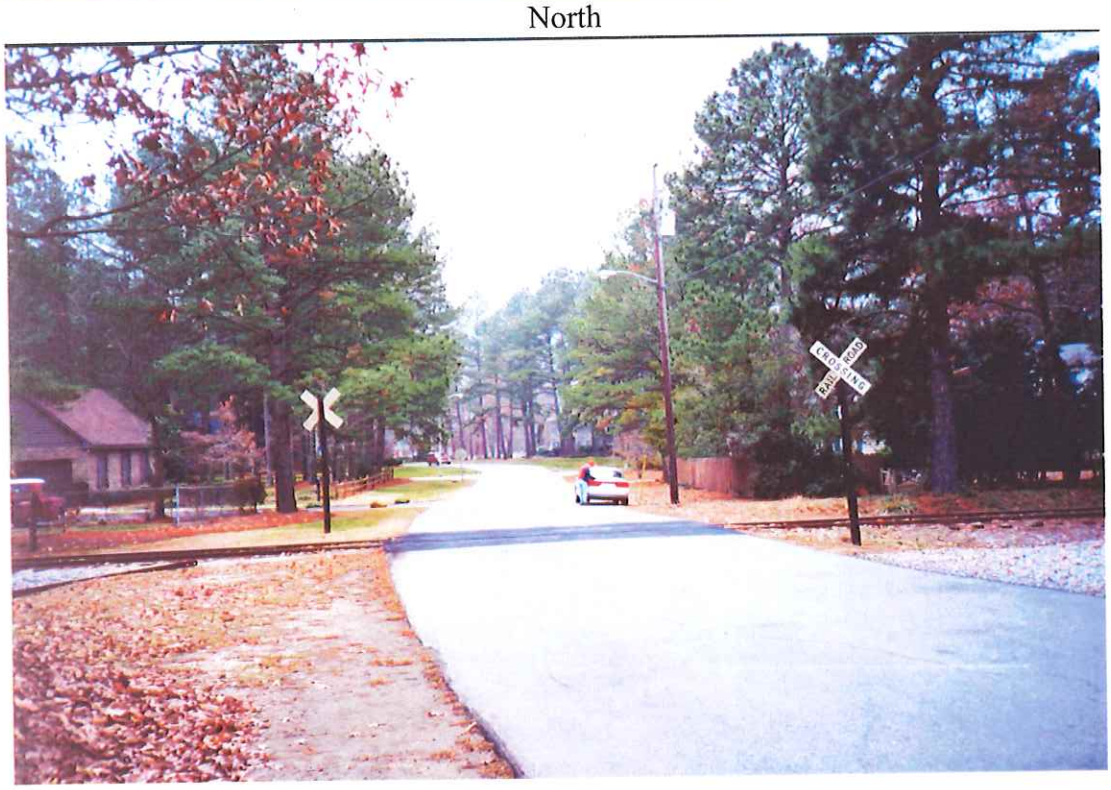
Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 217U
MANSFIELD DRIVE – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\mansfield.dgn 04/29/02 11:20:17 AM

North



Mansfield Drive
South

East

Mansfield Drive
West

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Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 216M
NOTTINGHAM ROAD – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

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North

Nottingham Road
South

East

Nottingham Road
West

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PARSONS
TRANSPORTATION GROUP
Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 215F
WINSTEAD AVE. (SR 1613) NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\winstead.dgn 04/29/02 11:25:03 AM

North

Winstead Avenue
South

East

Winstead Avenue
West

PLAN PREPARED BY:
PARSONS
TRANSPORTATION GROUP
Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 214Y
ENGLEWOOD ROAD – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

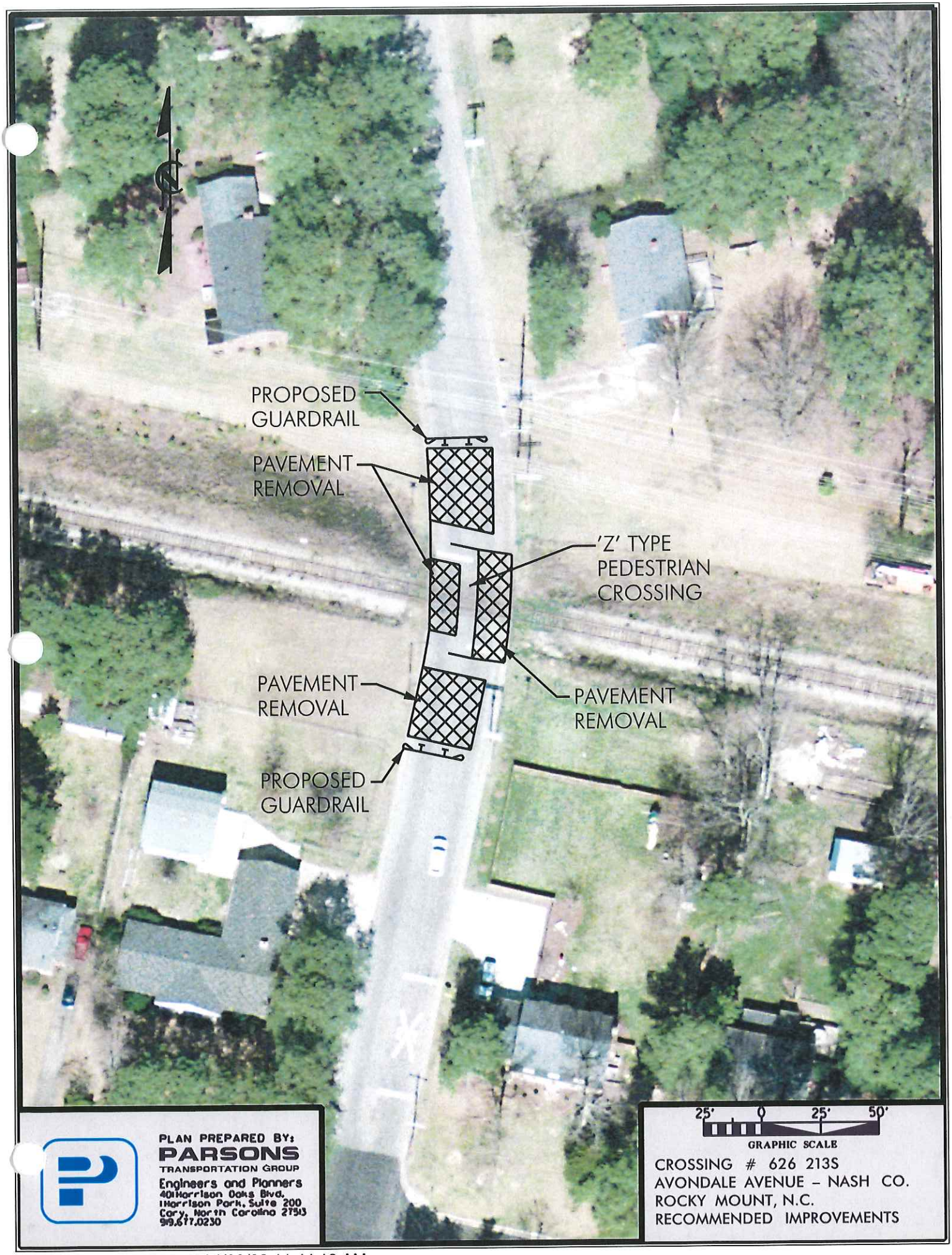
J:\644255\englewood.dgn 04/29/02 11:27:31 AM

North

Englewood Road
South

East

Englewood Road
West



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PARSONS
TRANSPORTATION GROUP
Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 213S
AVONDALE AVENUE – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

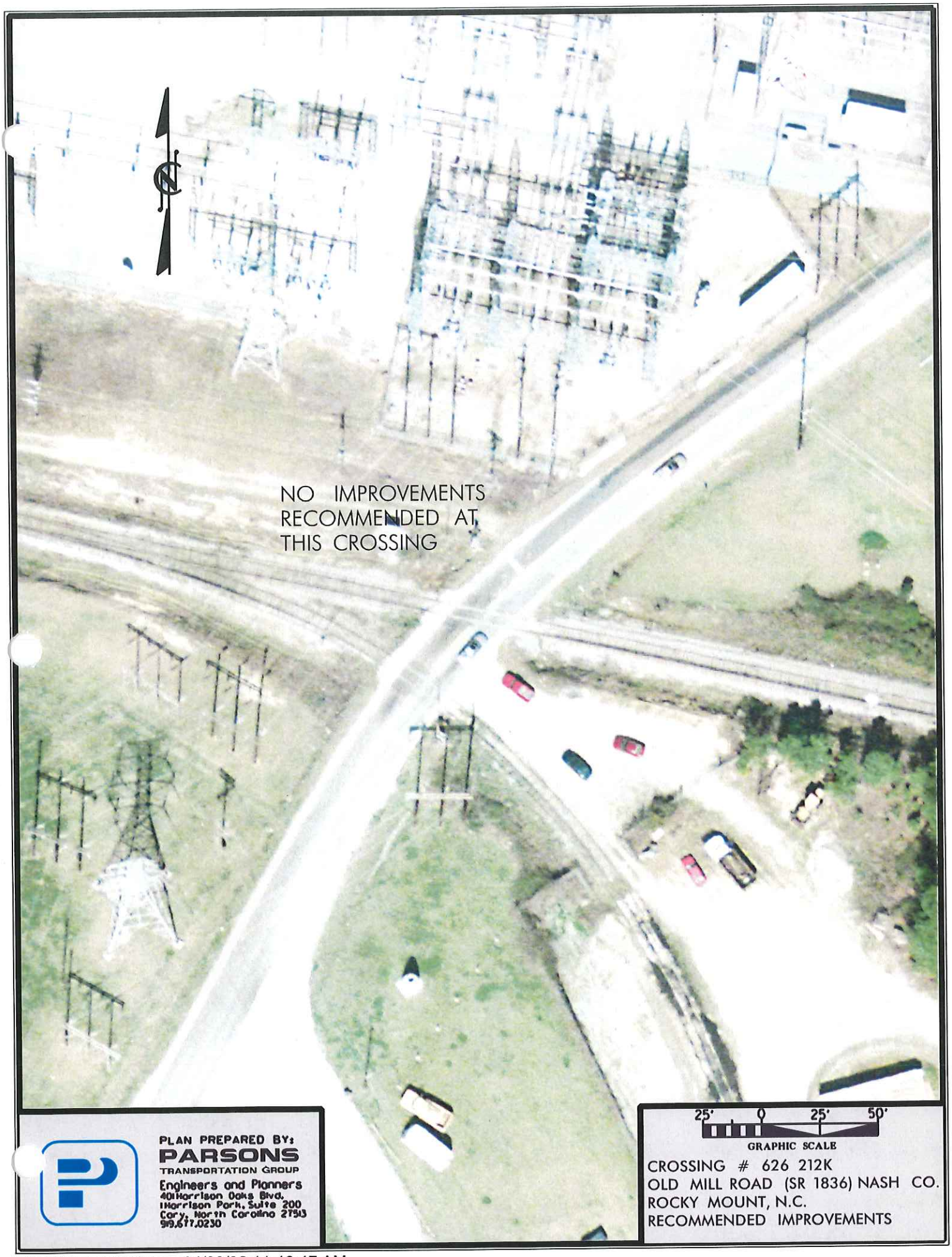
J:\644255\avondale.dgn 04/29/02 11:44:19 AM

North

Avondale Avenue
South

East

Avondale Avenue
West



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25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 212K
OLD MILL ROAD (SR 1836) NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

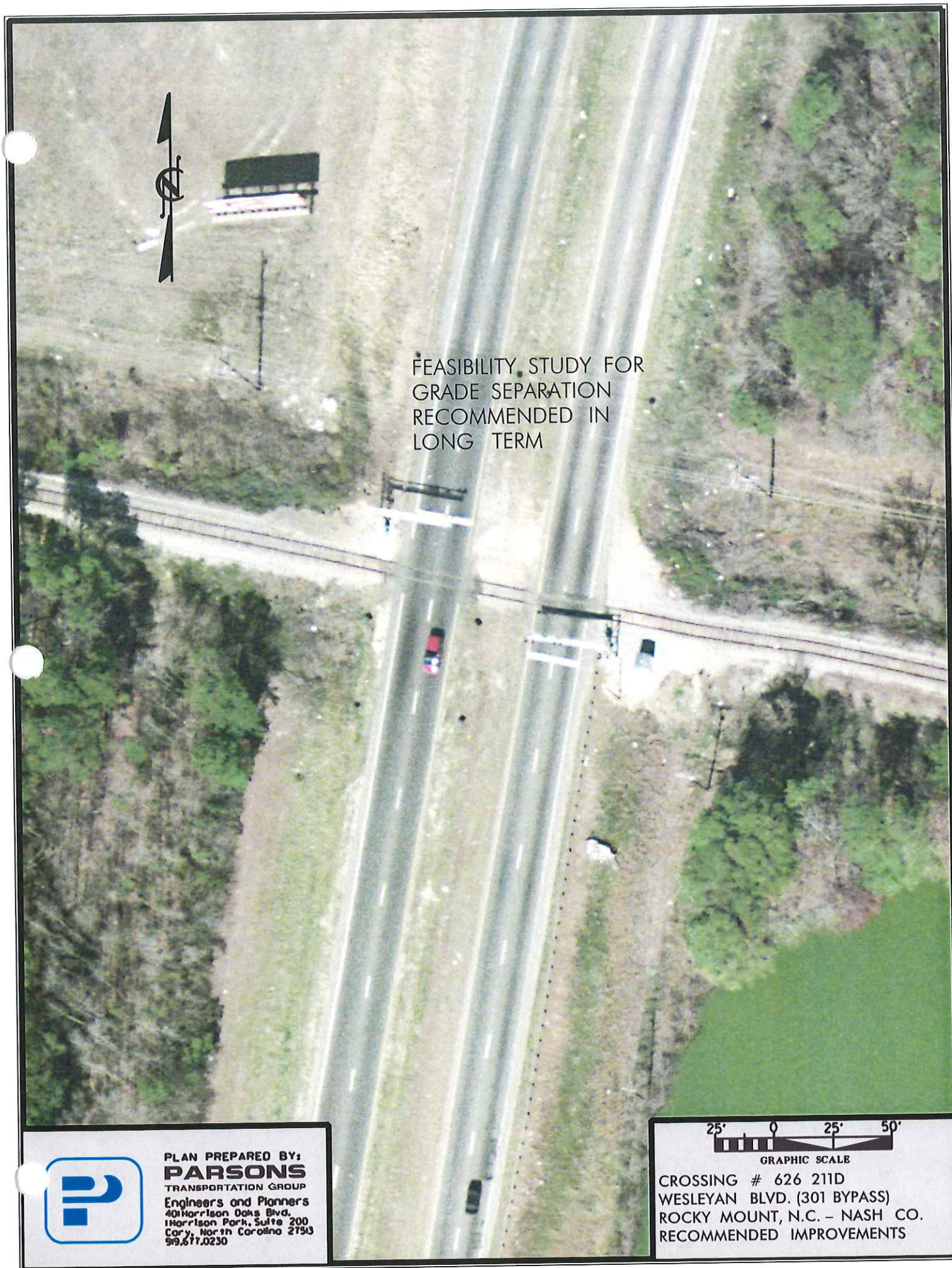
J:\644255\oldmill.dgn 04/29/02 11:46:47 AM

North

Old Mill Road
South

East

Old Mill Road
West



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Harrison Park, Suite 200
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919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 211D
WESLEYAN BLVD. (301 BYPASS)
ROCKY MOUNT, N.C. – NASH CO.
RECOMMENDED IMPROVEMENTS

J:\644255\wesleyan.dgn 04/29/02 11:53:02 AM

North

Wesleyan Boulevard
South

East

Wesleyan Boulevard
West

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919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 210W
PIEDMONT AVENUE – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

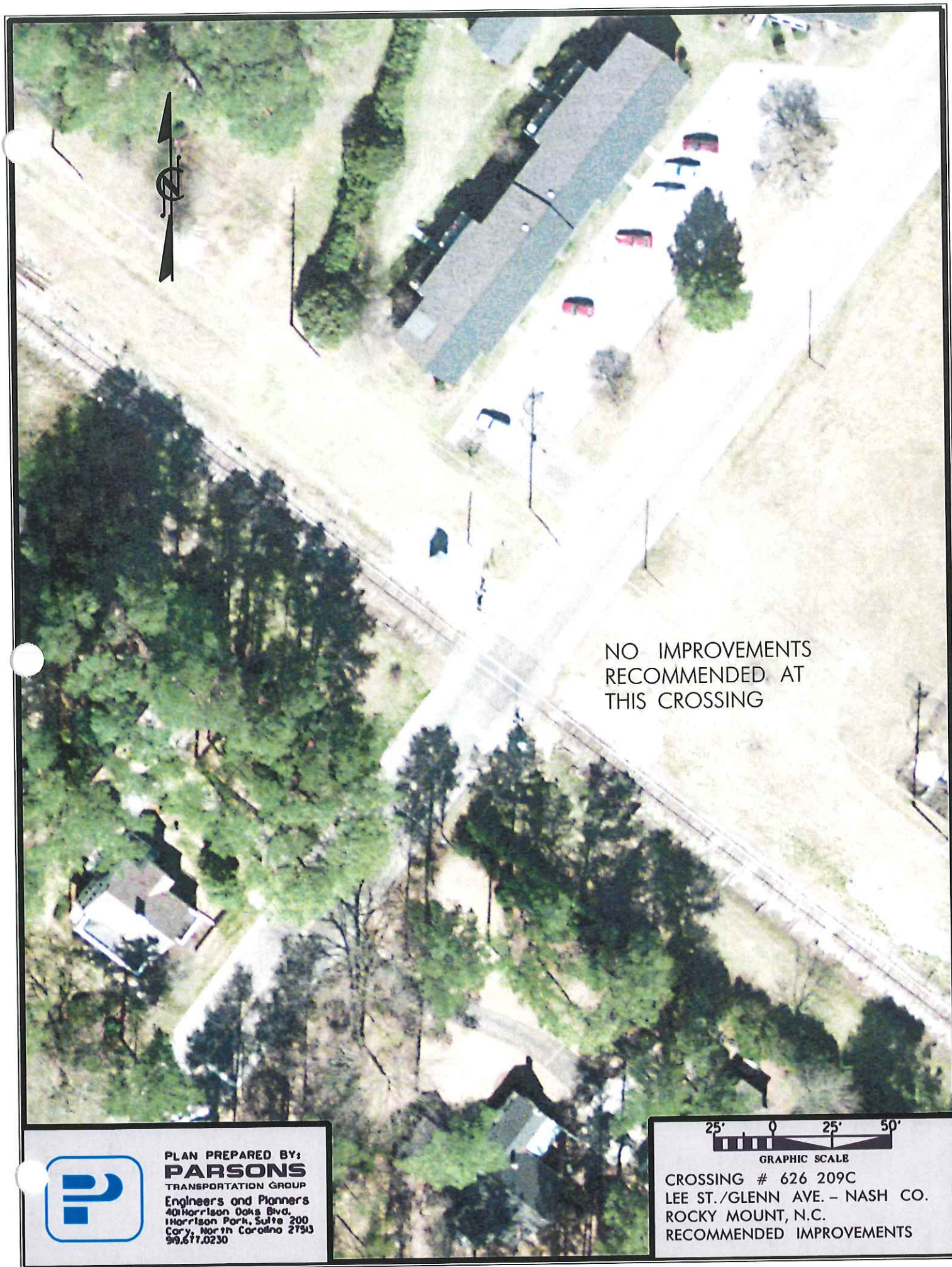
J:\644255\piedmont.dgn 04/29/02 11:55:55 AM

West

Piedmont Avenue
East

North

Piedmont Avenue
South



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919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 209C
LEE ST./GLENN AVE. – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\glenn.dgn 04/29/02 12:05:03 PM

North

Lee Street-Glenn Avenue
South

East

Lee Street-Glenn Avenue
West

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401 Harrison Oaks Blvd.
1 Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 208V
MAYO / PINECREST ST. - NE
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

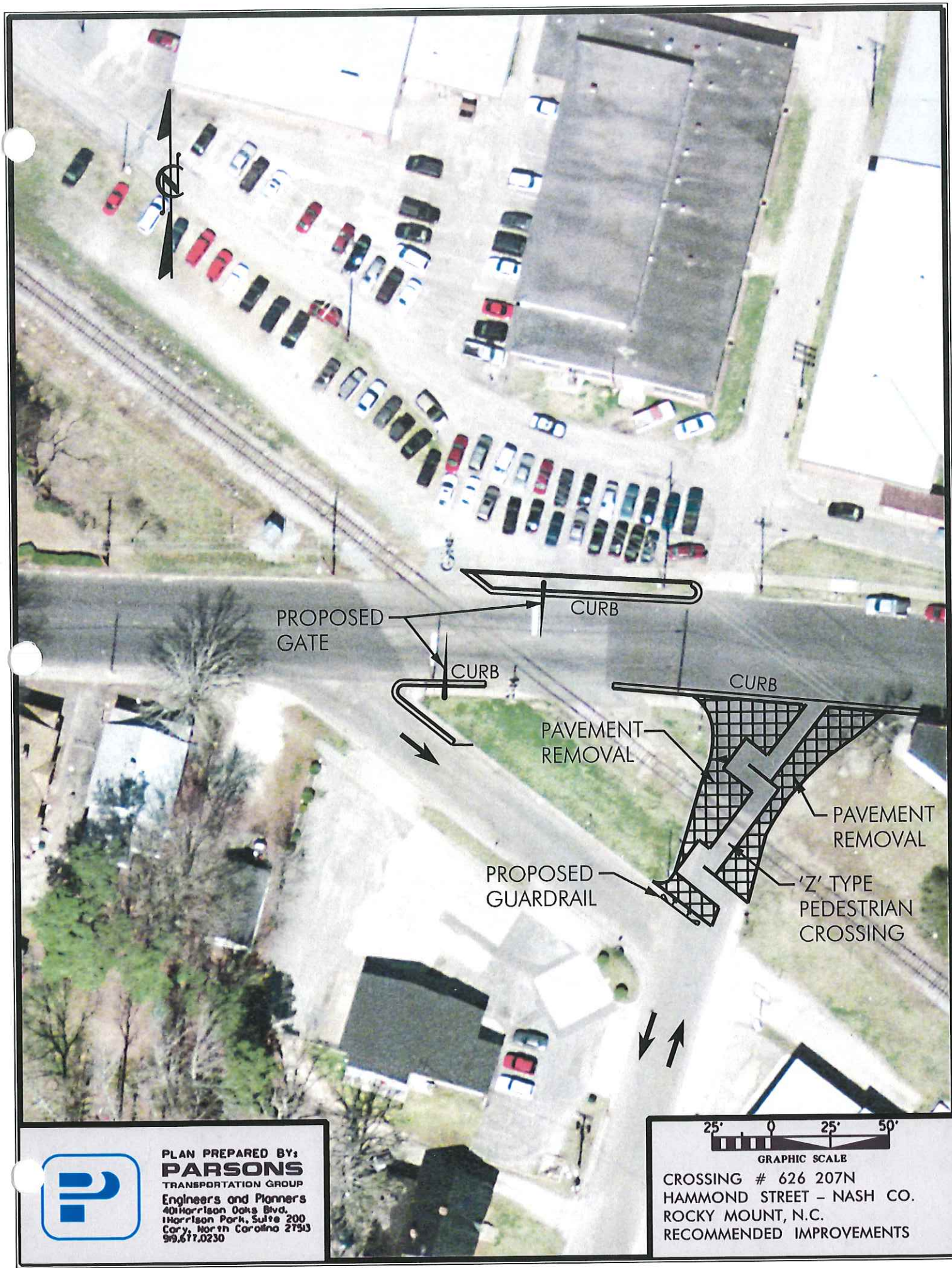
J:\644255\mayo.dgn 05/16/02 04:06:14 PM

North

Mayo-Pinecrest
South

East

Mayo-Pinecrest
West



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CROSSING # 626 207N
HAMMOND STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

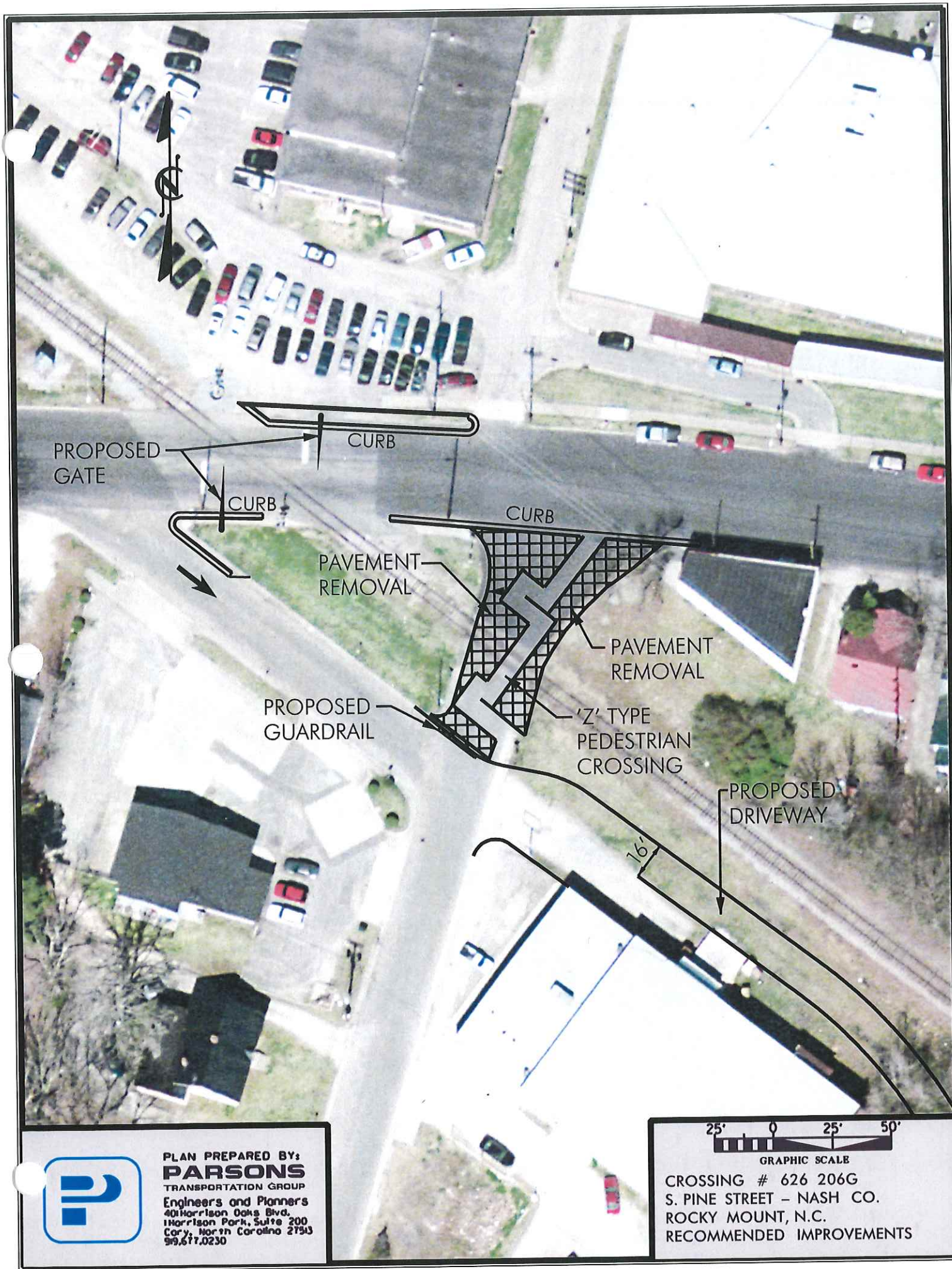
J:\644255\hammond.dgn 04/29/02 12:11:52 PM

North to Rocky Mount

Hammond Street
South

West

Hammond Street
East



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25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 206G
S. PINE STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

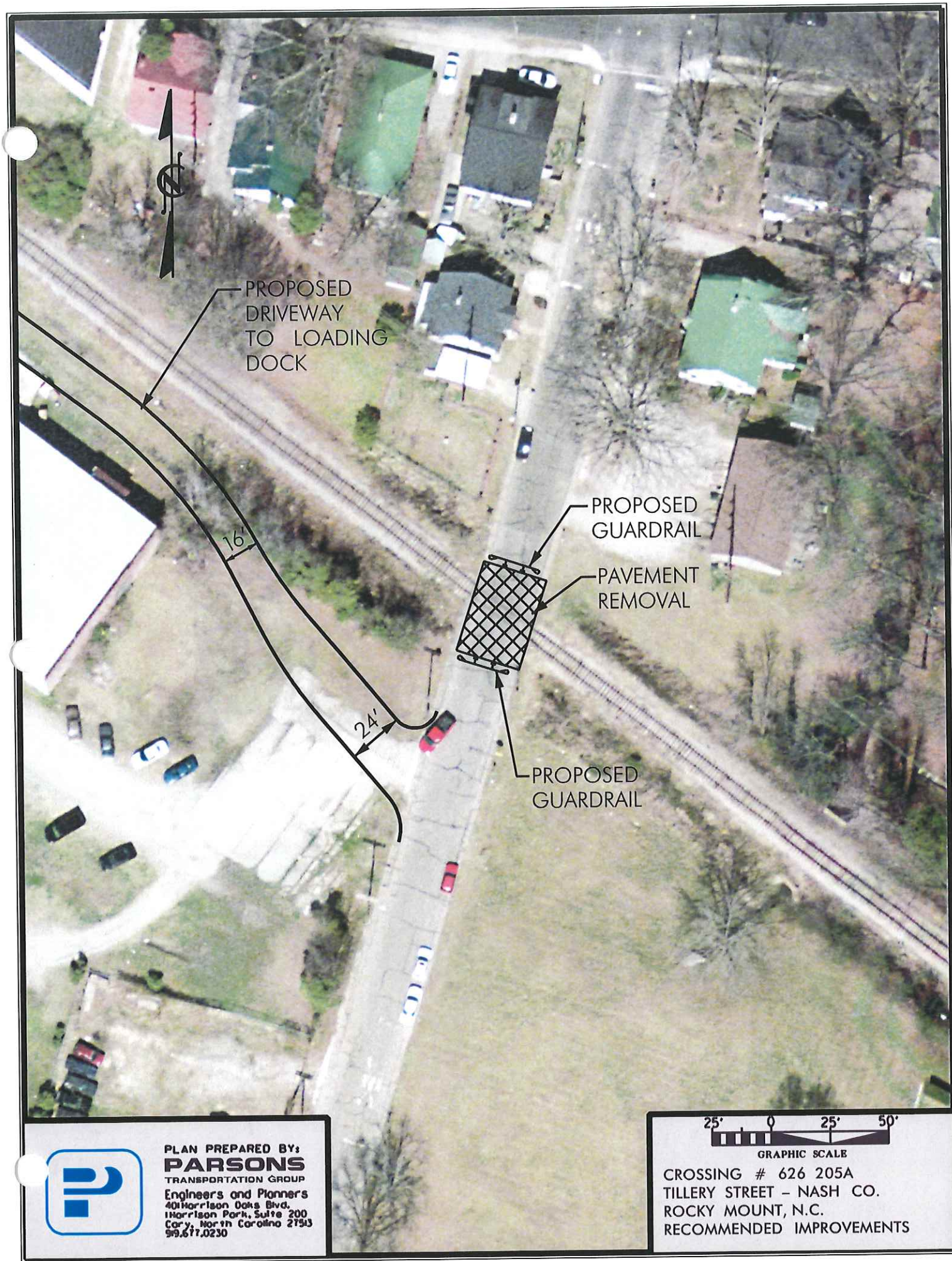
J:\644255\s.pine.dgn 04/29/02 12:17:59 PM

N. Pine Street

S. Pine Street
South

East

S. Pine Street
West



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401 Harrison Oaks Blvd.
Harrison Park, Suite 200
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919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 205A
TILLERY STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\tillery.dgn 04/29/02 12:39:50 PM

North

Tillery Street
South

West

Tillery Street
East

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25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 204T
HOWELL STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\howell.dgn 04/29/02 12:55:41 PM

North

Howell Street
South

East

Howell Street
West

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25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 203L
GRACE STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

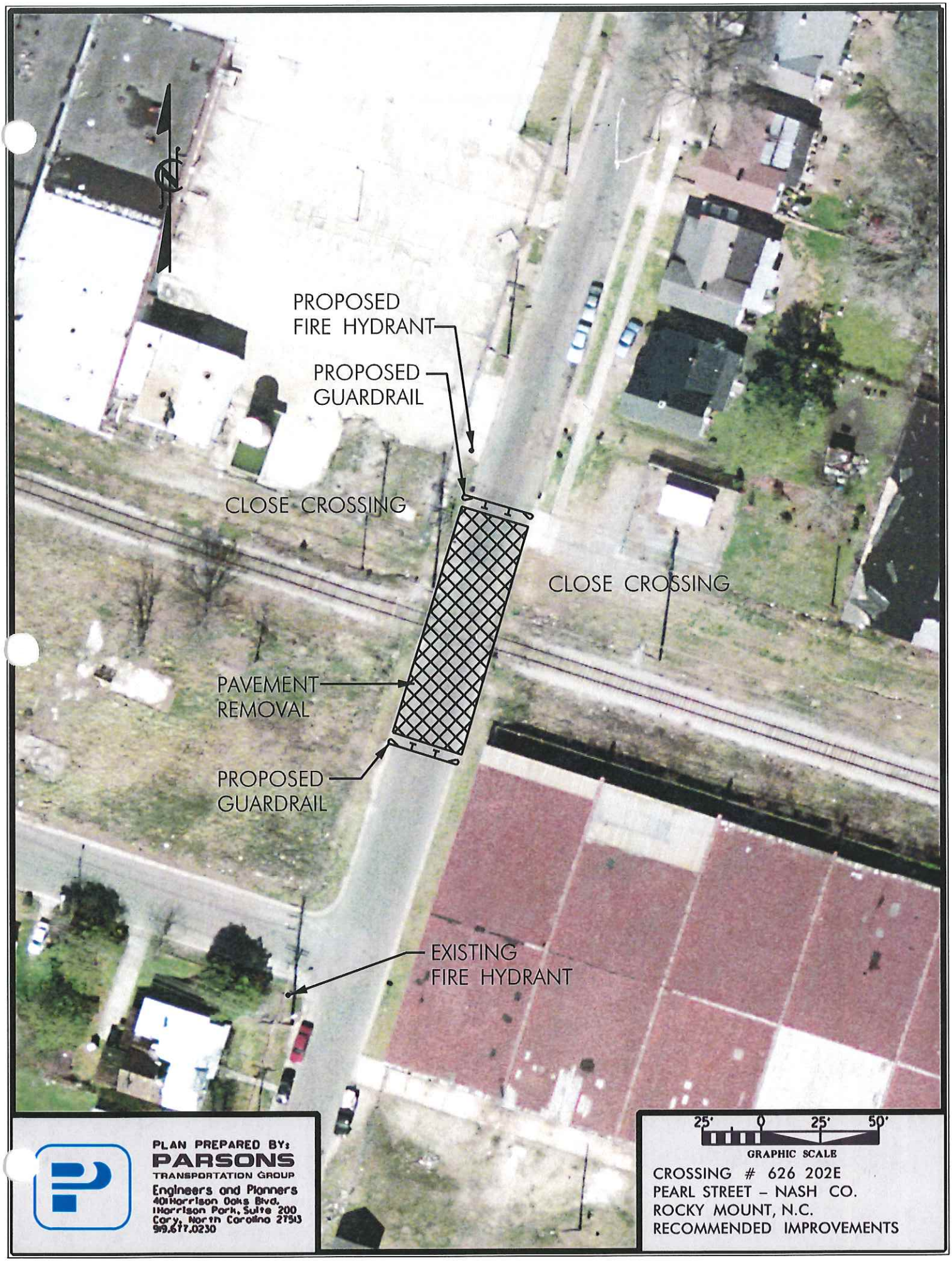
J:\644255\grace.dgn 04/29/02 12:58:23 PM

North

Grace Street
South

East

West



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919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 202E
PEARL STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

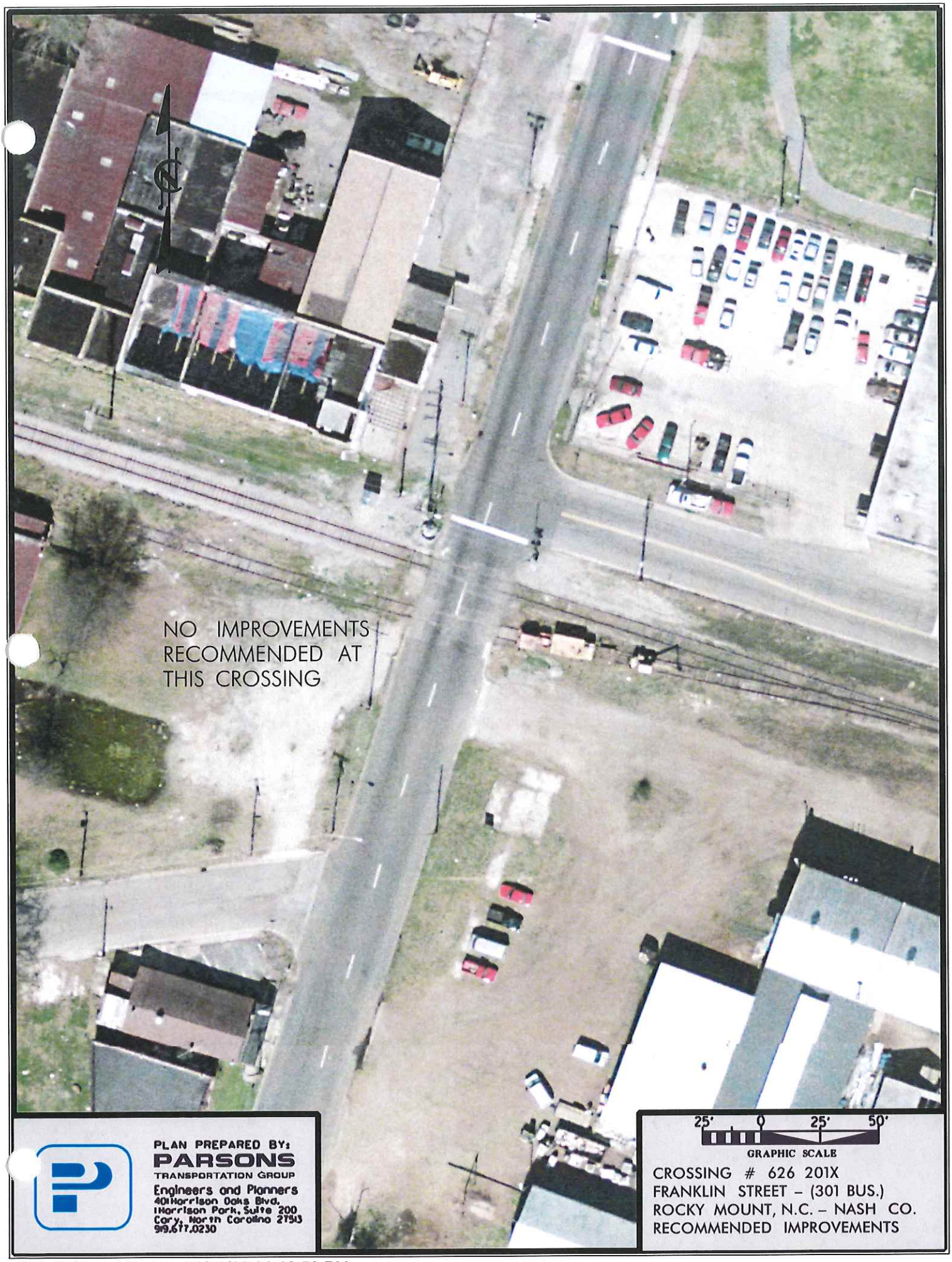
J:\644255\pearl.dgn 04/29/02 01:17:06 PM

North

Pearl Street
South

East

Pearl Street
West



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25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 201X
FRANKLIN STREET – (301 BUS.)
ROCKY MOUNT, N.C. – NASH CO.
RECOMMENDED IMPROVEMENTS

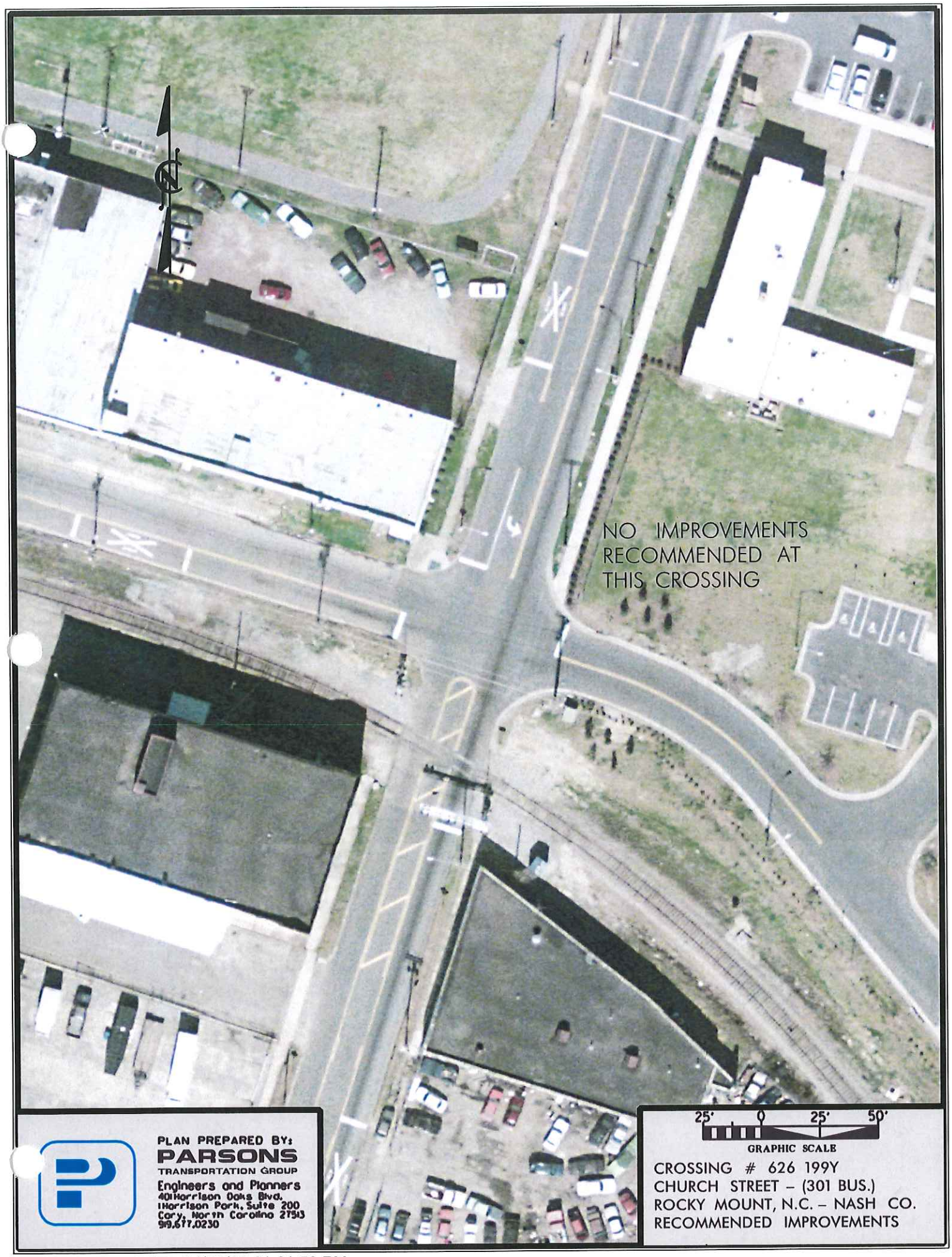
J:\644255\franklin.dgn 04/29/02 01:19:59 PM

North

Franklin Street
South

East

Franklin Street
West



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Cary, North Carolina 27513
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25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 626 199Y
CHURCH STREET – (301 BUS.)
ROCKY MOUNT, N.C. – NASH CO.
RECOMMENDED IMPROVEMENTS

J:\644255\church.dgn 04/29/02 01:21:53 PM

North

Church Street
South

East

Church Street
West

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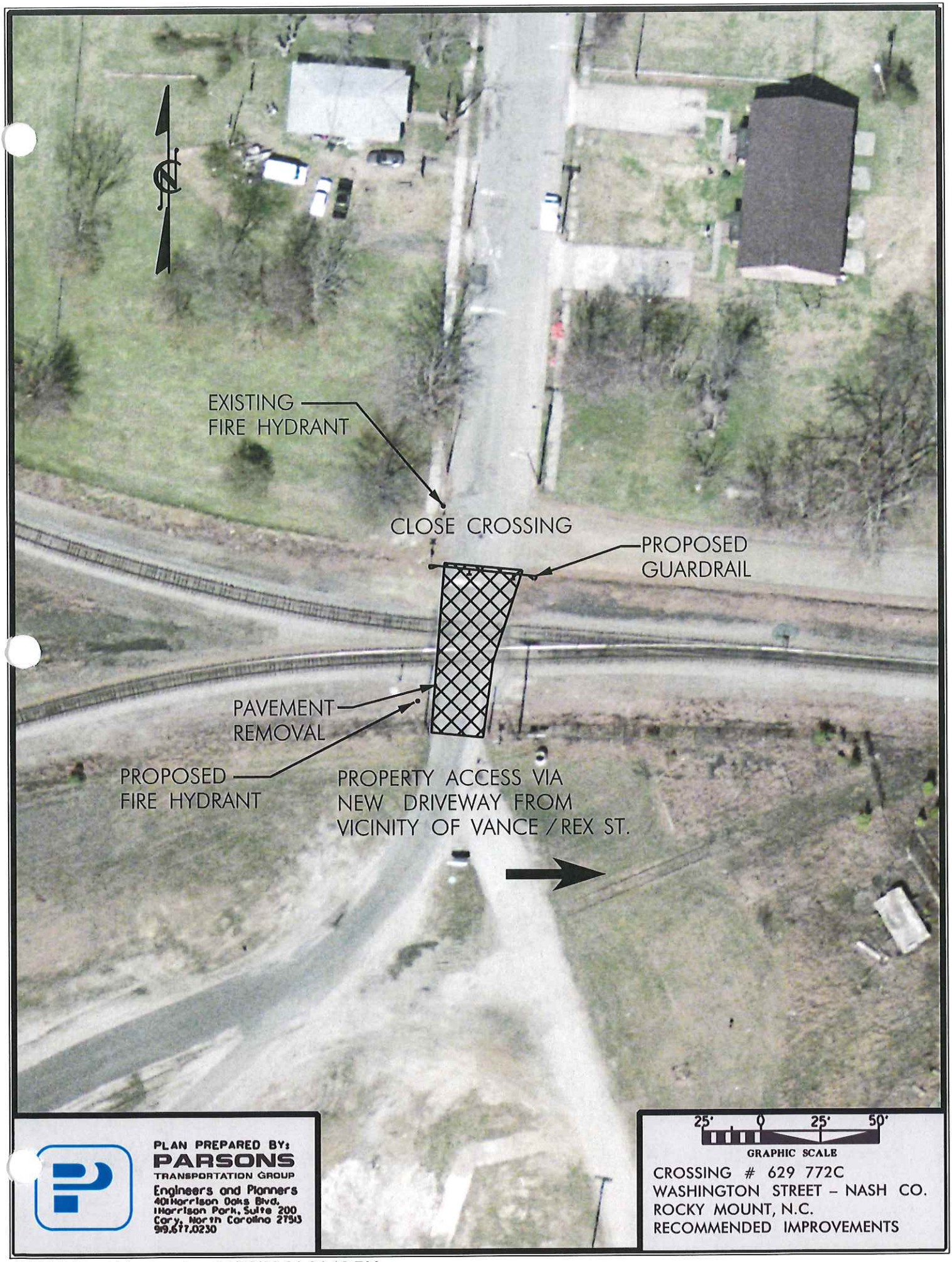
ROCKY MOUNT, N.C.– NASH COUNTY
RECOMMENDED IMPROVEMENTS TO
NORFOLK STREET, SOUTH STREET
AND REX STREET

J:\644255\multistudy.dgn 04/29/02 06:41:08 PM



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919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 629 772C
WASHINGTON STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

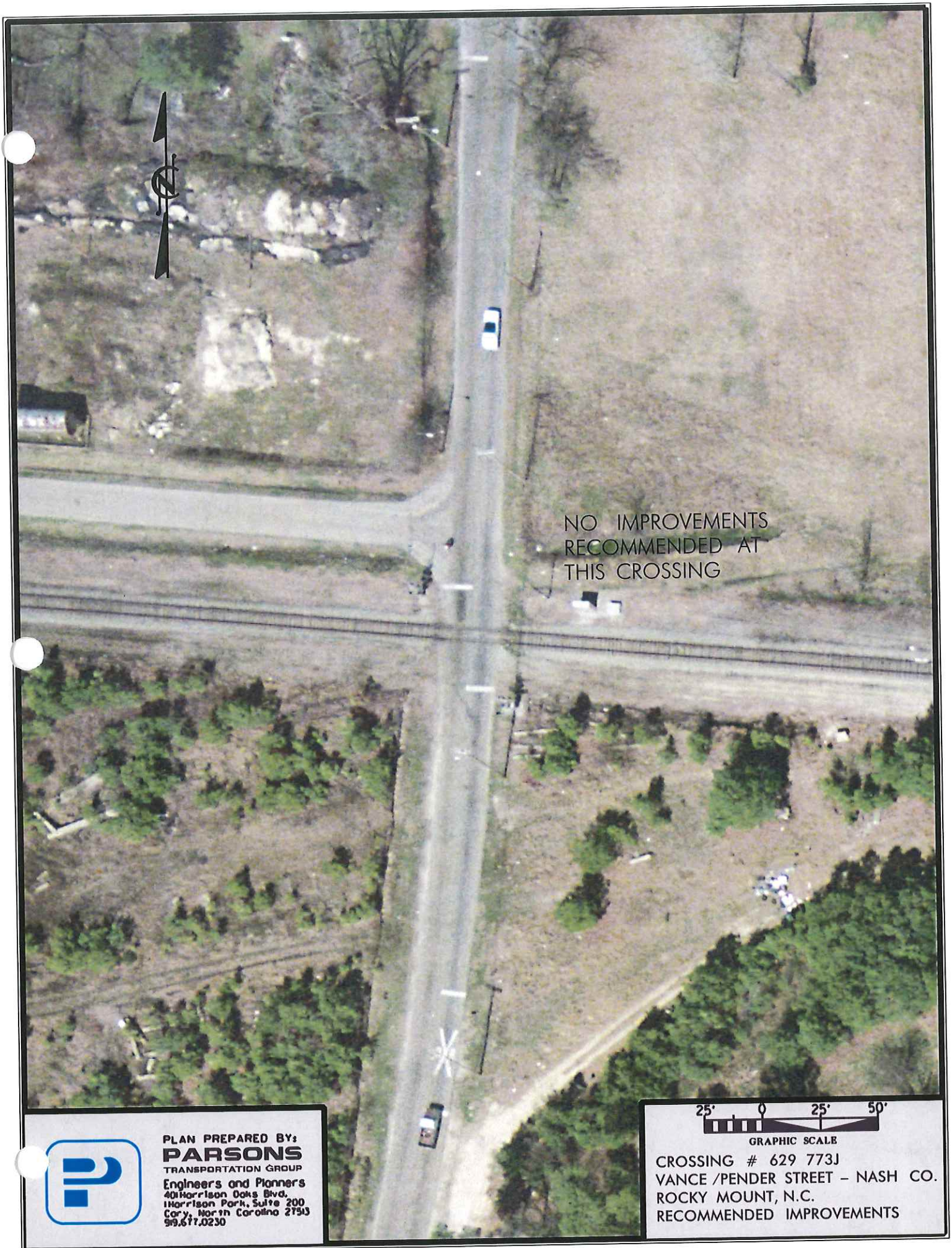
J:\644255\washington.dgn 04/29/02 01:24:10 PM

North

Washington Street
South

East

Washington Street
West



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Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 629 773J
VANCE /PENDER STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

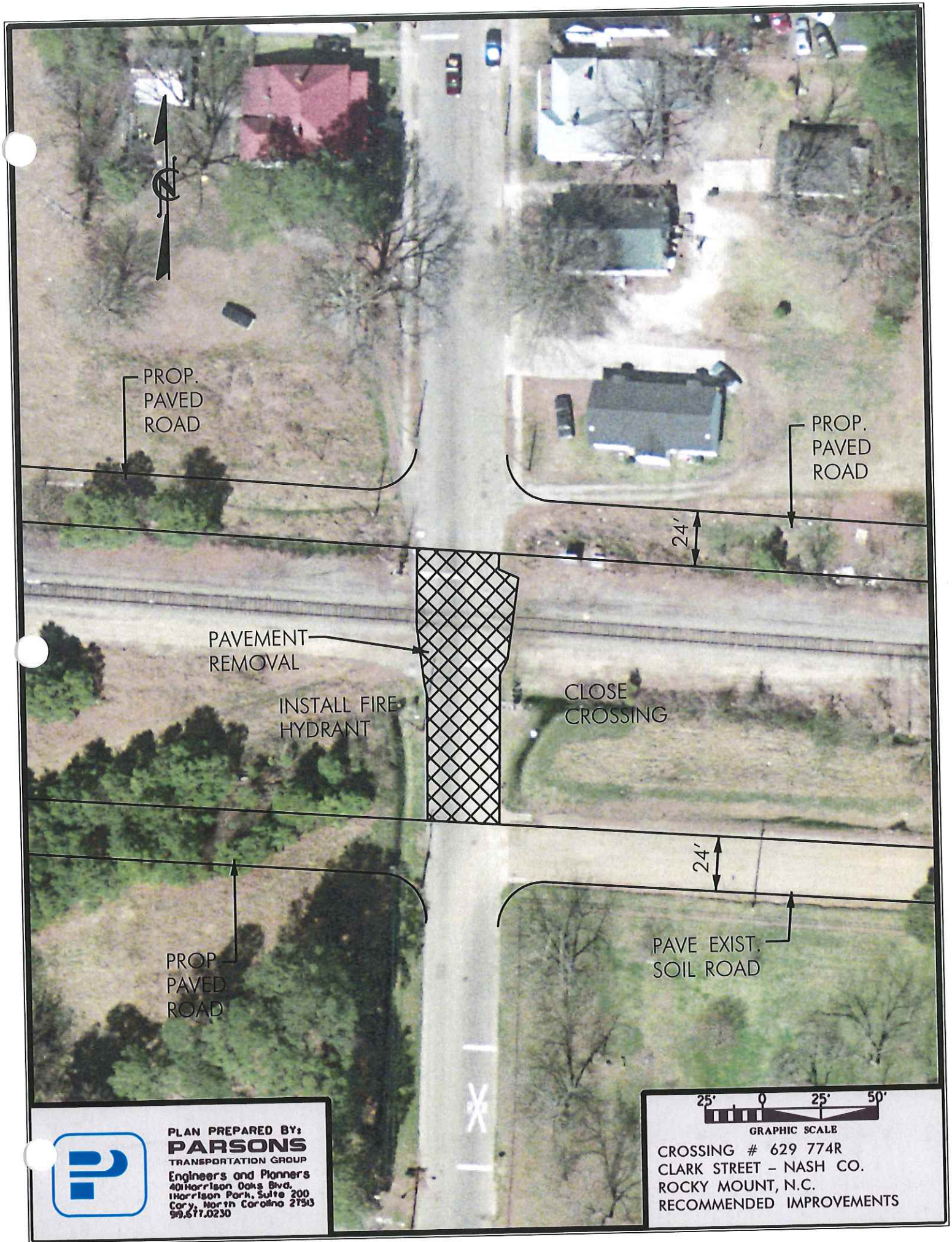
J:\644255\pender.dgn 04/29/02 02:16:24 PM

North

Vance Pender Street
South

East

Vance Pender Street
West



J:\644255\clark.dgn 04/29/02 02:18:38 PM

North

Clark Street
South

Clark Street

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PARSONS
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Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 629 775X
BRANCH STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

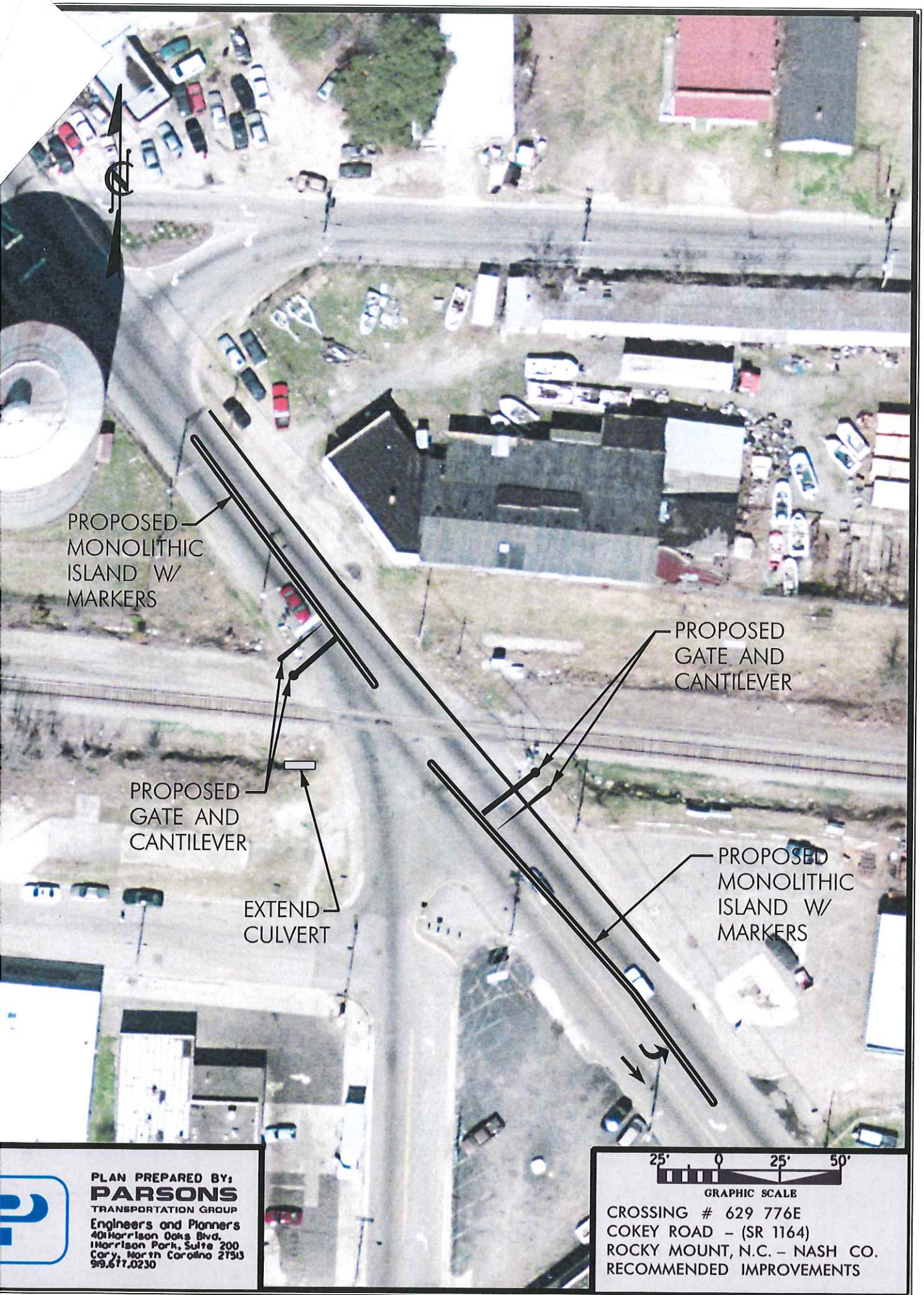
J:\644255\branch.dgn 04/29/02 02:20:41 PM

North

Branch Street
South

East

Branch Street
West



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Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

CROSSING # 629 776E
COKEY ROAD – (SR 1164)
ROCKY MOUNT, N.C. – NASH CO.
RECOMMENDED IMPROVEMENTS

55\cokey.dgn 04/29/02 02:22:34 PM

North

Cokey Road
South

North

Cokey Road
East

Cokey Road
West

PLAN PREPARED BY:
PARSONS
TRANSPORTATION GROUP
Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

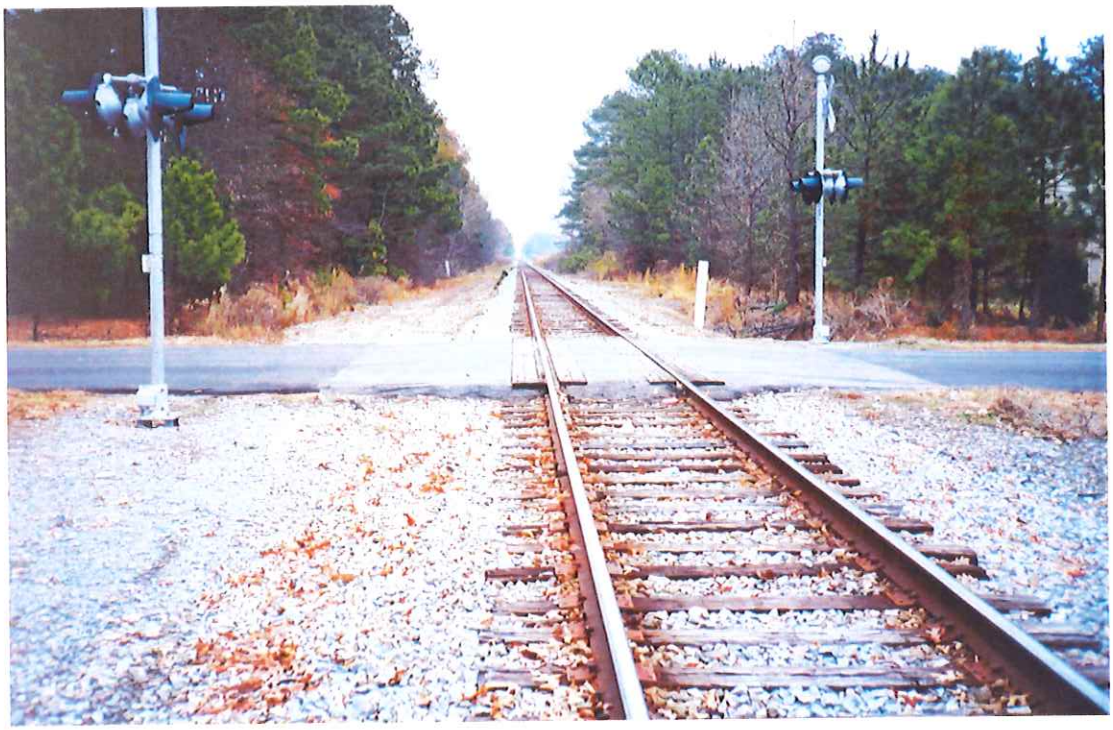
CROSSING # 629 778T
PITT STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\pitt.dgn 04/29/02 02:24:35 PM

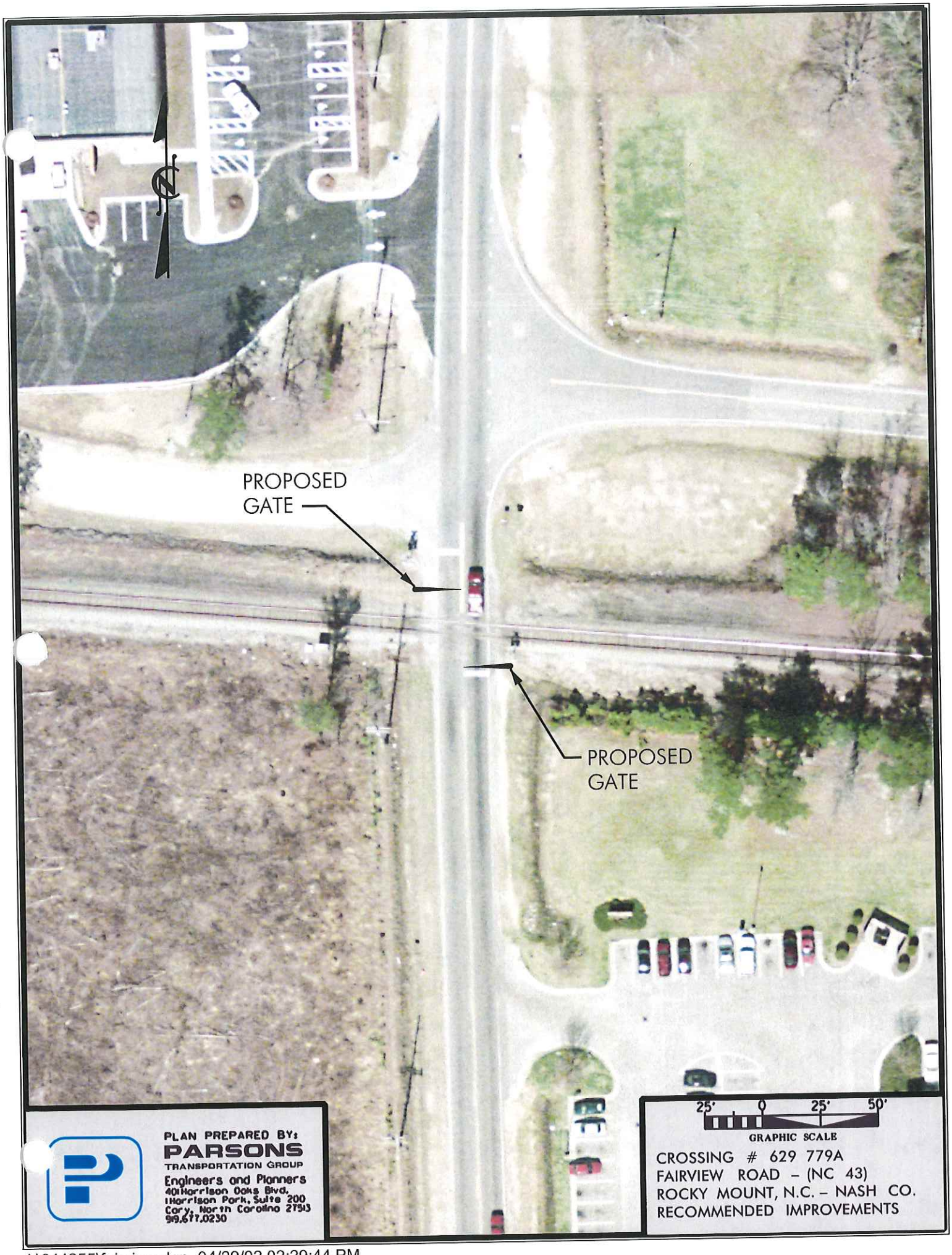
North

Pitt Street
West

South



Pitt Street
East



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Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

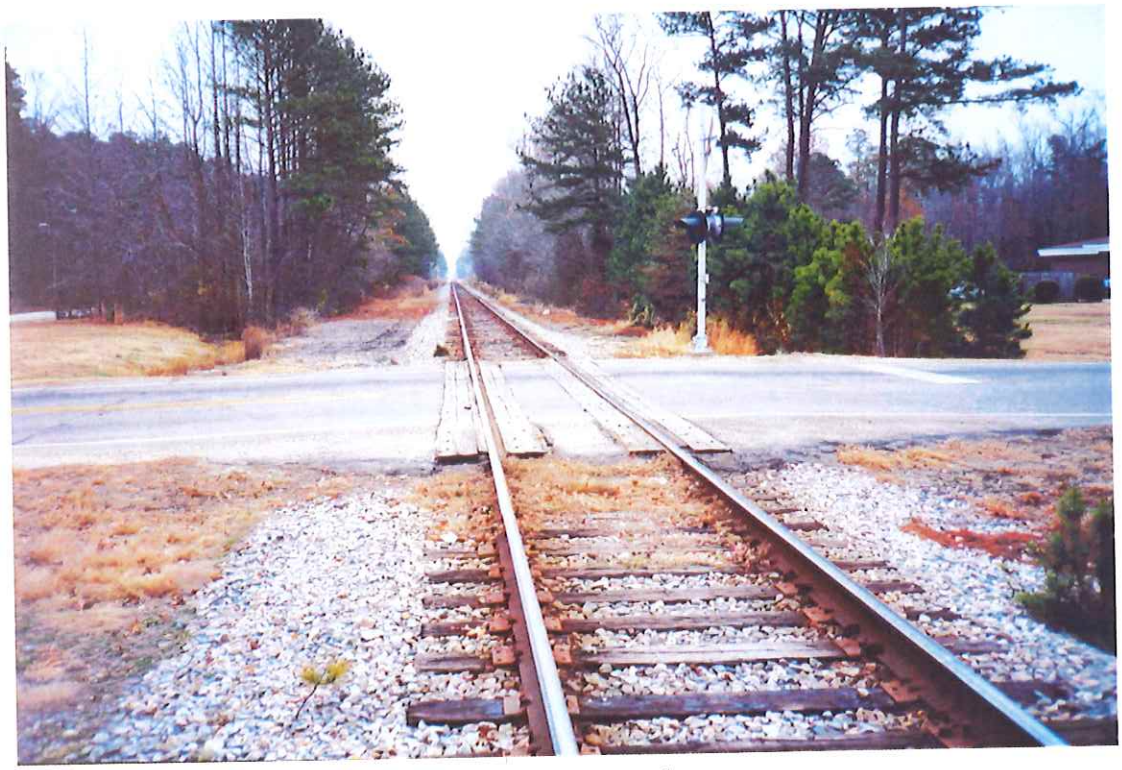
CROSSING # 629 779A
FAIRVIEW ROAD – (NC 43)
ROCKY MOUNT, N.C. – NASH CO.
RECOMMENDED IMPROVEMENTS

J:\644255\fairview.dgn 04/29/02 02:29:44 PM

West

Fairview Road
North

South



Fairview Road
East

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Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 629 780U
GLENDALE AVE. – (SR 1234)
ROCKY MOUNT, N.C. – NASH CO.
RECOMMENDED IMPROVEMENTS

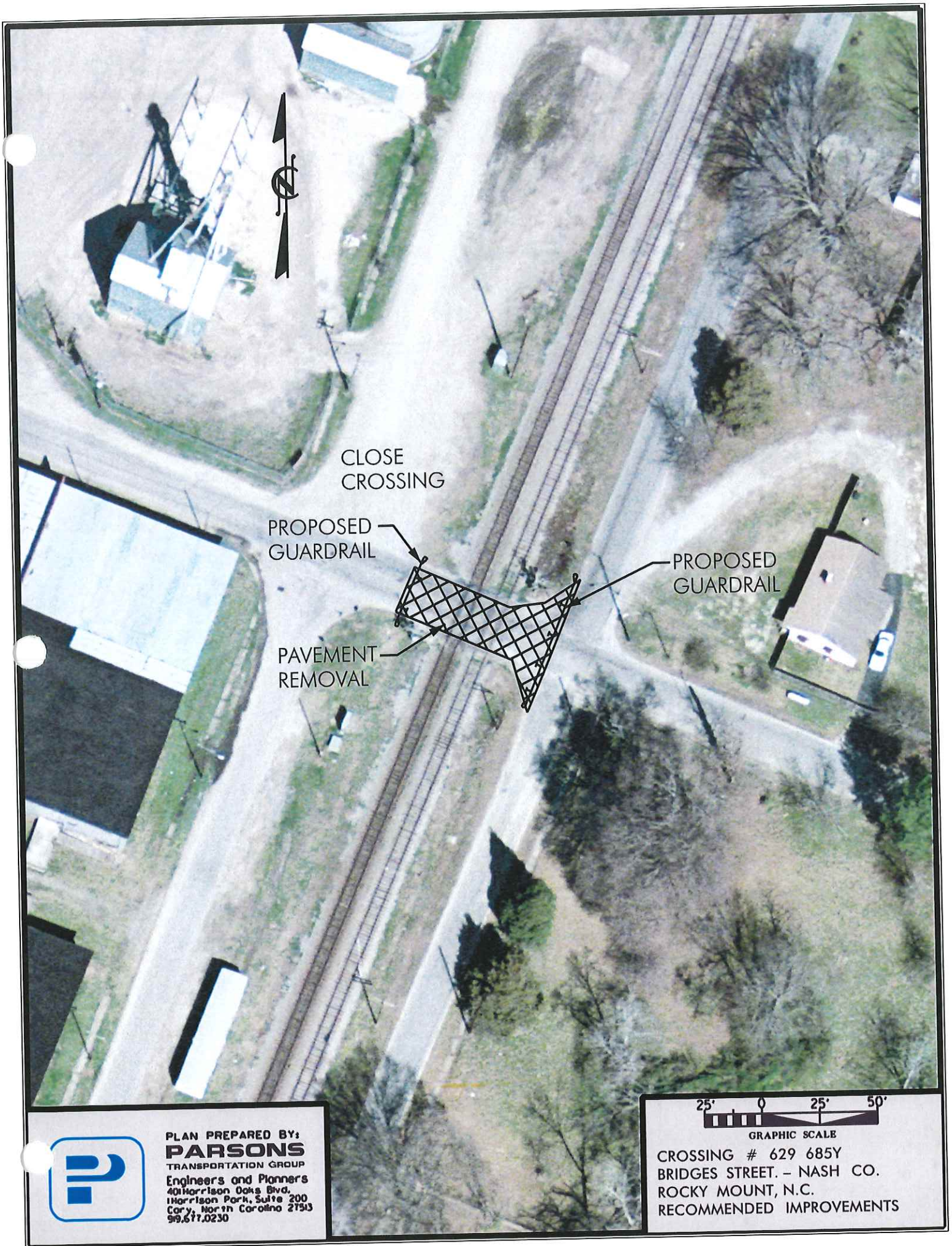
J:\644255\glendale.dgn 04/29/02 03:17:01 PM

South

Glendale Avenue
East

North

Glendale Avenue
West



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Harrison Park, Suite 200
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919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 629 685Y
BRIDGES STREET. – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

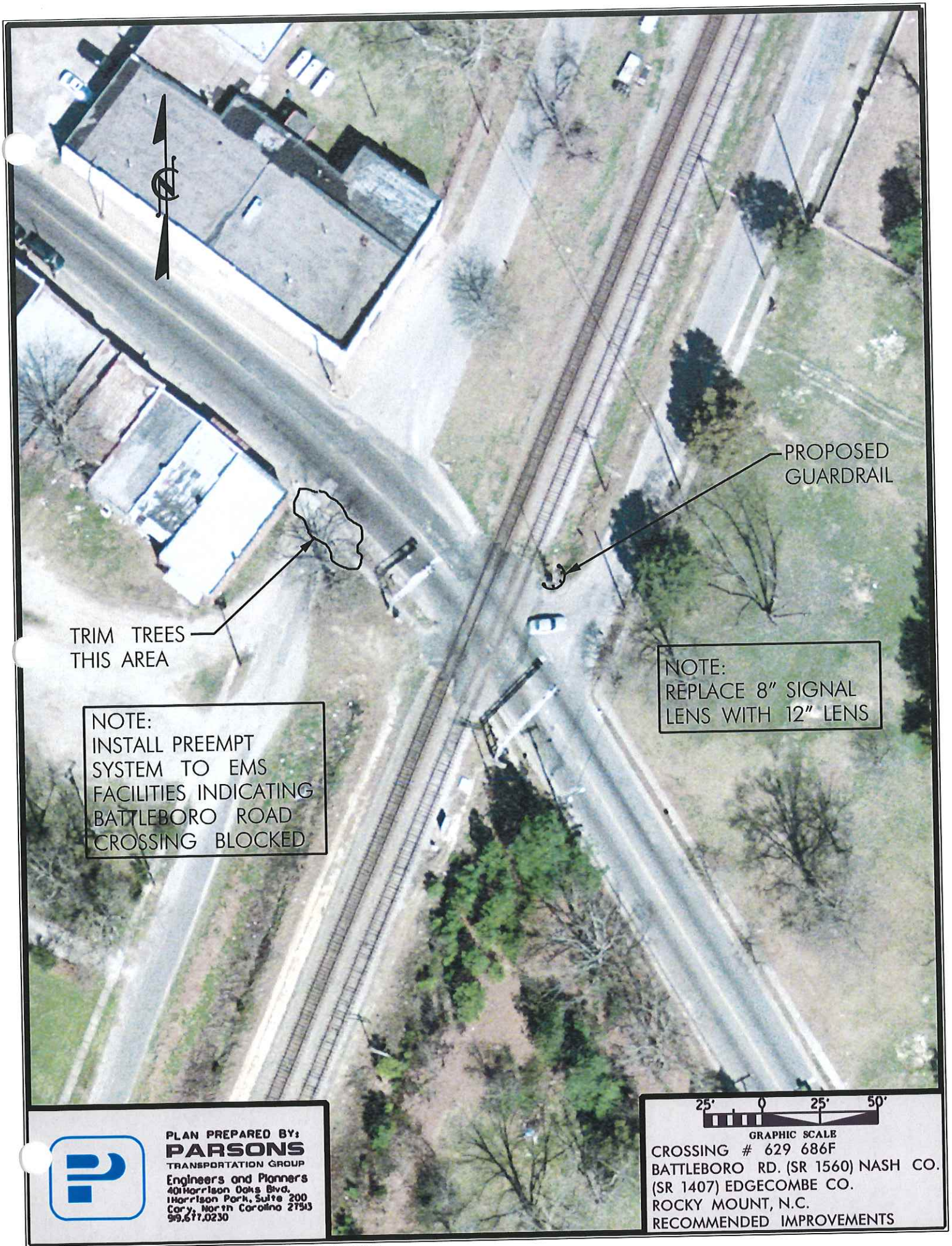
J:\644255\bridges.dgn 04/29/02 03:46:26 PM

North

Bridges Street
South

West

Bridges Street
East



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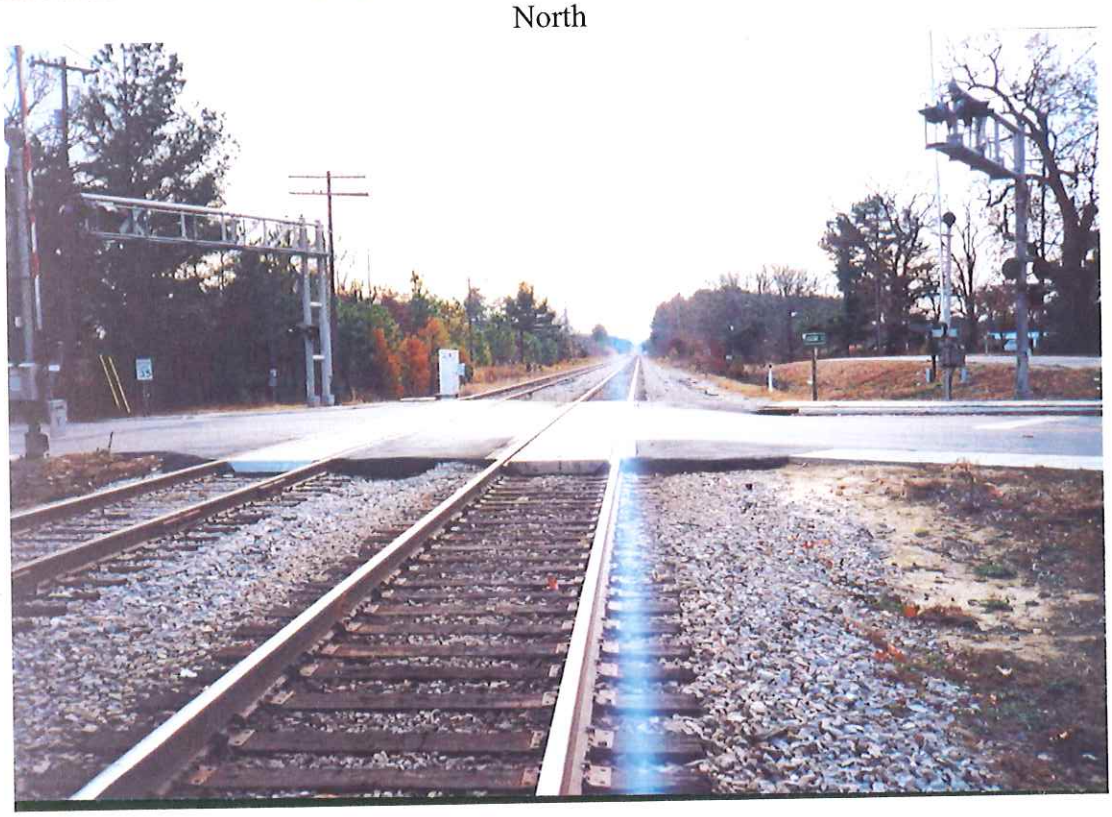
CROSSING # 629 686F
BATTLEBORO RD. (SR 1560) NASH CO.
(SR 1407) EDGECOMBE CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

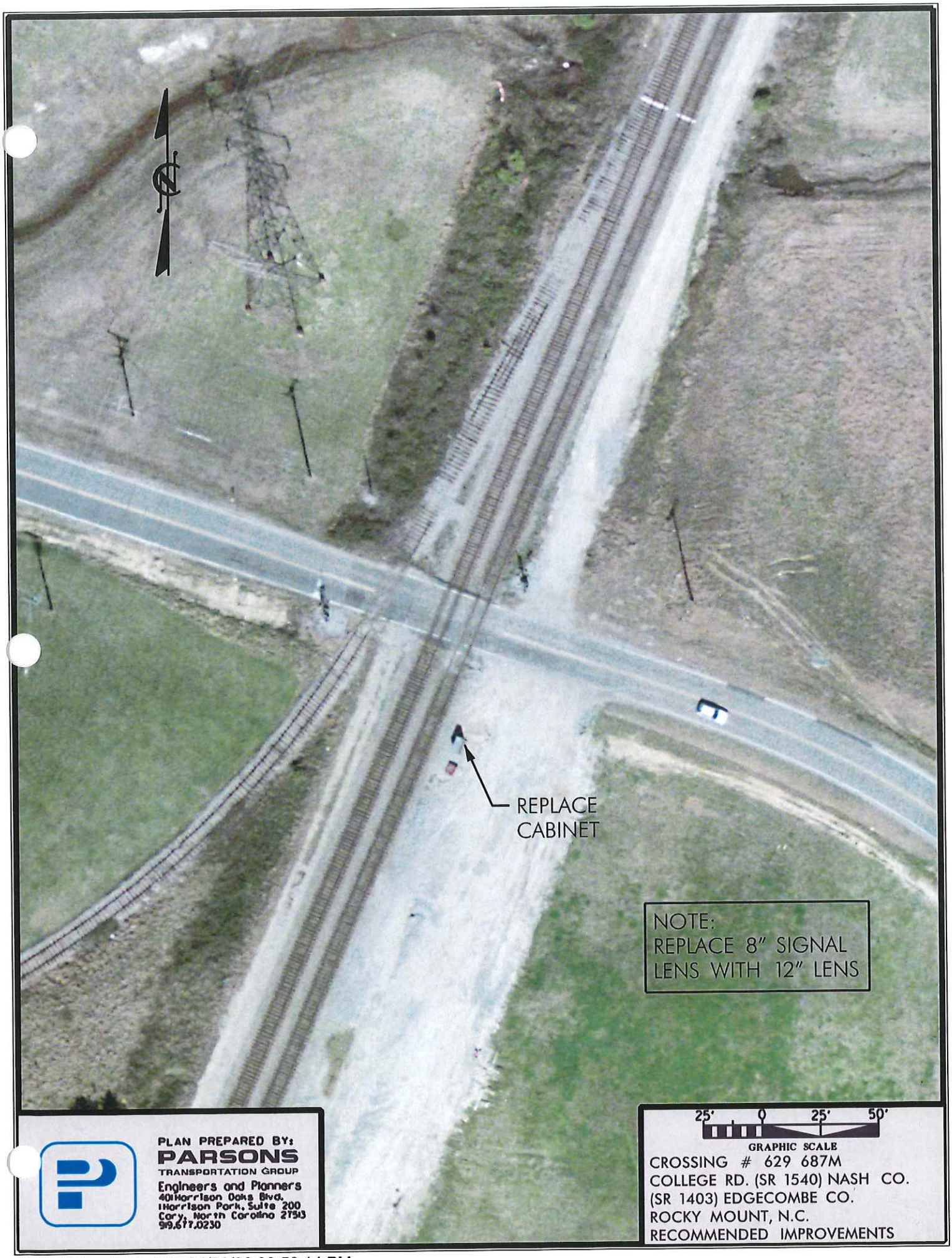
J:\644255\battleboro.dgn 04/29/02 03:51:35 PM

North



Battleboro
South

Battleboro Road 2



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401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 629 687M
COLLEGE RD. (SR 1540) NASH CO.
(SR 1403) EDGECOMBE CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\college.dgn 04/29/02 03:53:14 PM

North

College Road
South

West

College Road
East

PLAN PREPARED BY:
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401 Harrison Oaks Blvd.
Harrison Park, Suite 200
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919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

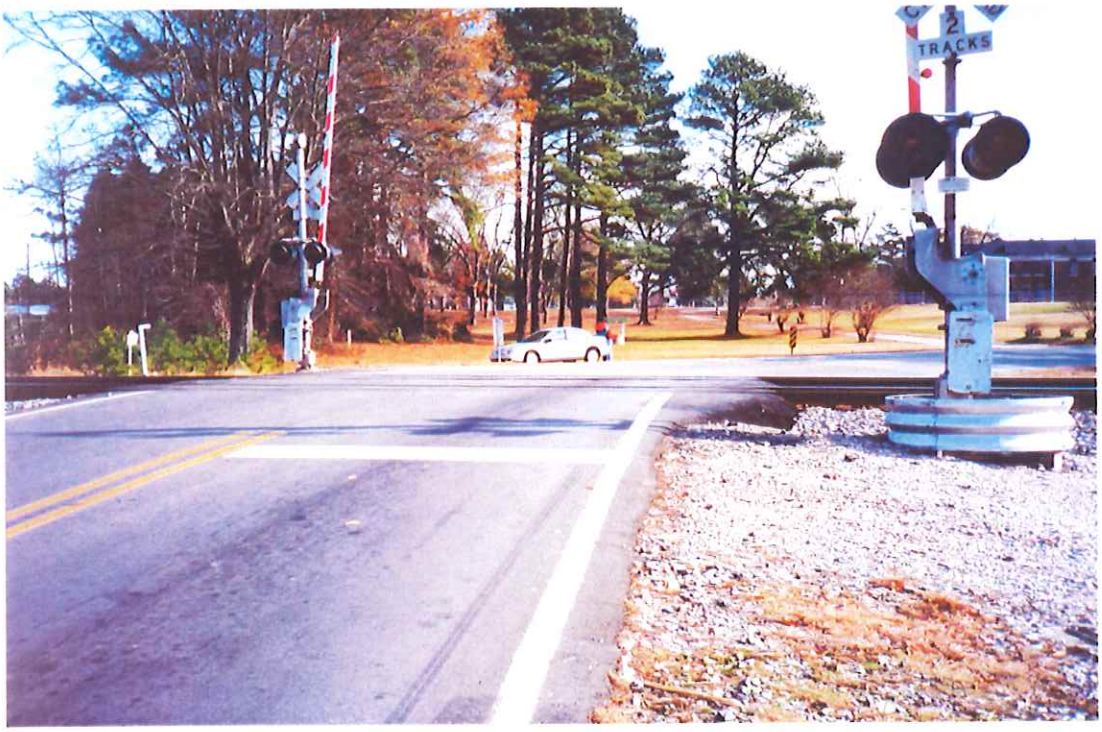
CROSSING # 629 688U
FOUNTAIN SCH. RD. (SR 1539) NASH CO.
(SR 1402) EDGECOMBE CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\fountain.dgn 04/29/02 03:55:20 PM

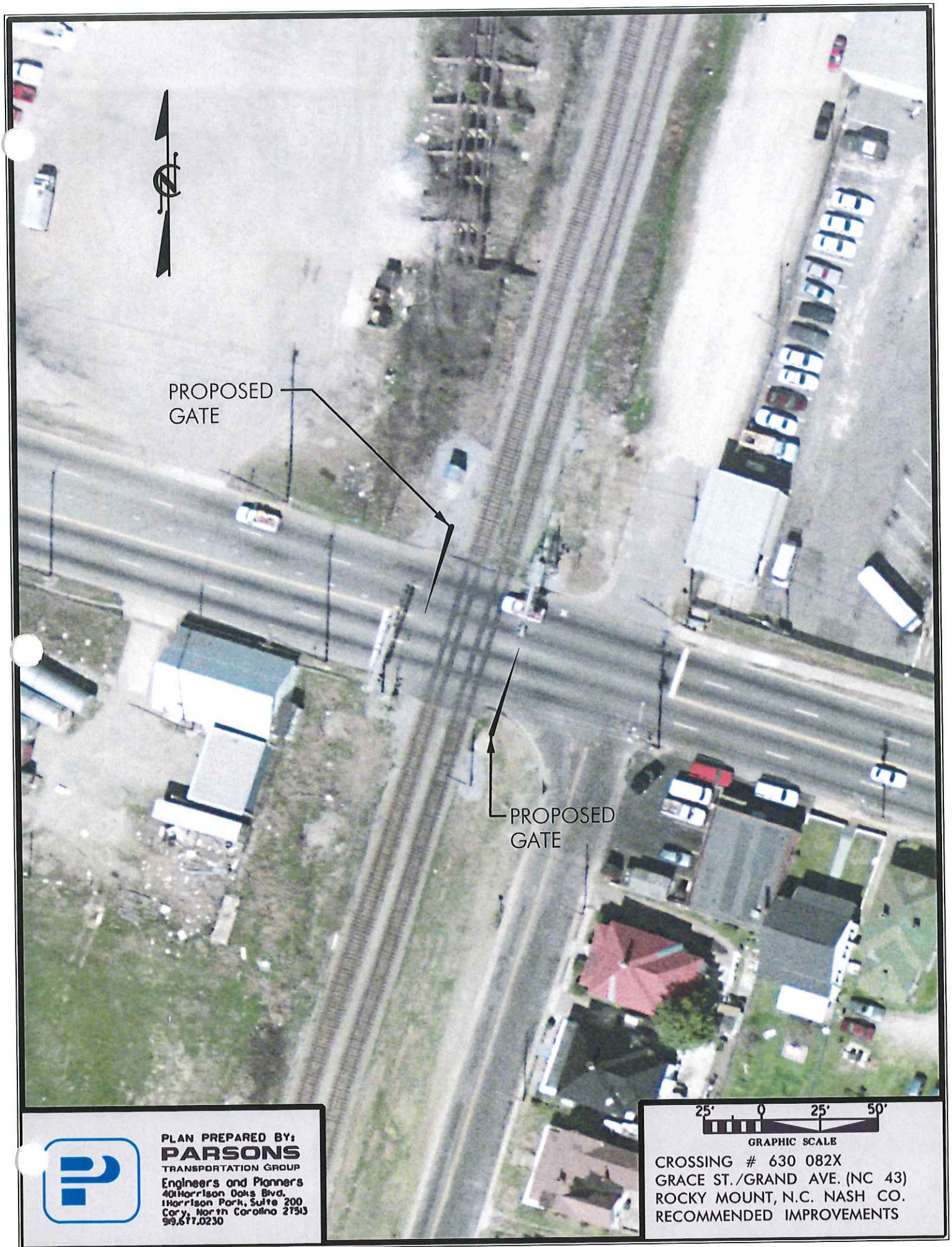
North

Fountain School Road
South

West



Fountain School Road
East



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Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 630 082X
GRACE ST./GRAND AVE. (NC 43)
ROCKY MOUNT, N.C. NASH CO.
RECOMMENDED IMPROVEMENTS

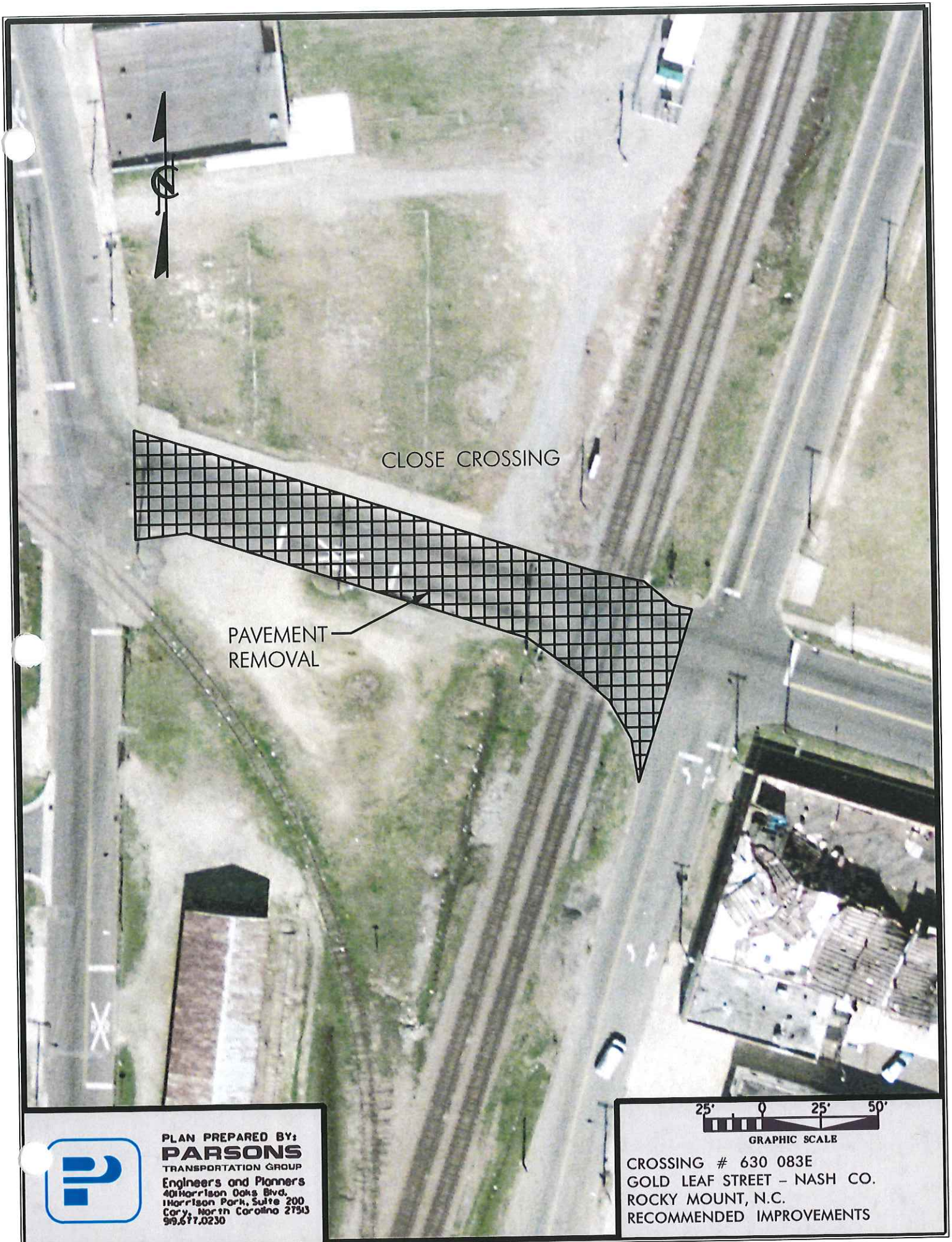
J:\644255\grand.dgn 04/29/02 03:58:37 PM

North

South

East

West



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CROSSING # 630 083E
GOLD LEAF STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\goldleaf.dgn 04/29/02 04:05:19 PM

North

Gold Leaf Street
South

East

Gold Leaf Street
West

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PARSONS
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401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

NOT TO SCALE

ROCKY MOUNT, N.C.– NASH COUNTY
RECOMMENDED IMPROVEMENTS TO
GOLDLEAF STREET AND
THOMAS STREET

J:\644255\trafstdy.dgn 04/29/02 06:30:33 PM

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Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 630 084L
THOMAS STREET – (US 64W) NASH CO.
(US 64W) EDGECOMBE CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

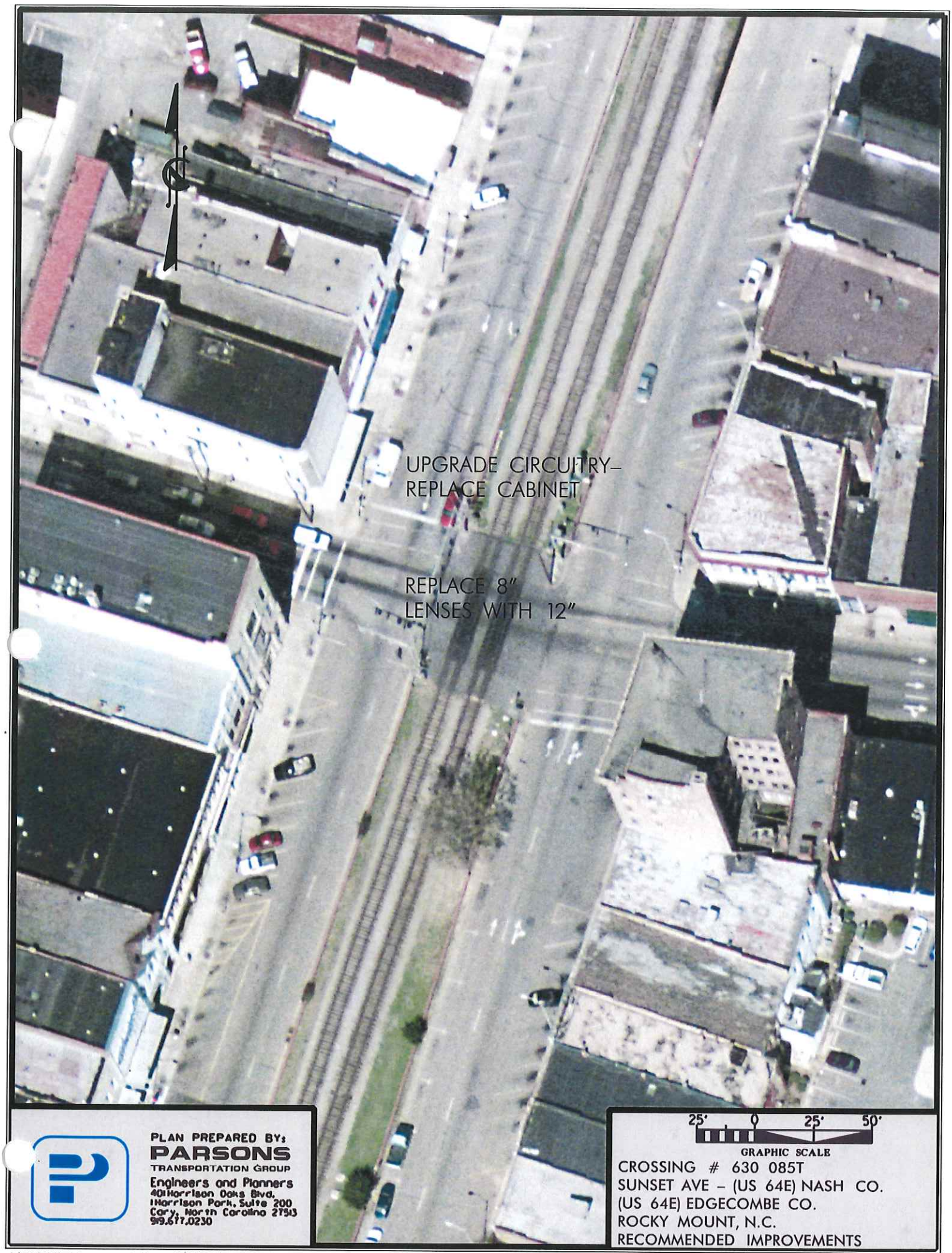
J:\644255\thomas.dgn 04/29/02 04:39:31 PM

North

Thomas Street
South

West

Thomas Street
East



PLAN PREPARED BY:
PARSONS
TRANSPORTATION GROUP
Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 630 085T
SUNSET AVE – (US 64E) NASH CO.
(US 64E) EDGECOMBE CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\sunset.dgn 04/29/02 05:11:27 PM

North

Sunset Ave.
South

West

Sunset Ave.
East

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TRANSPORTATION GROUP
Engineers and Planners
401 Harrison Oaks Blvd.
Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 630 086A
WESTERN AVENUE – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\western.dgn 04/29/02 05:13:05 PM

North

Western Avenue
South

West

Western Ave.
East

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PARSONS
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Engineers and Planners
401 Harrison Oaks Blvd.
1 Harrison Park, Suite 200
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 630 087G
NASH STREET - NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

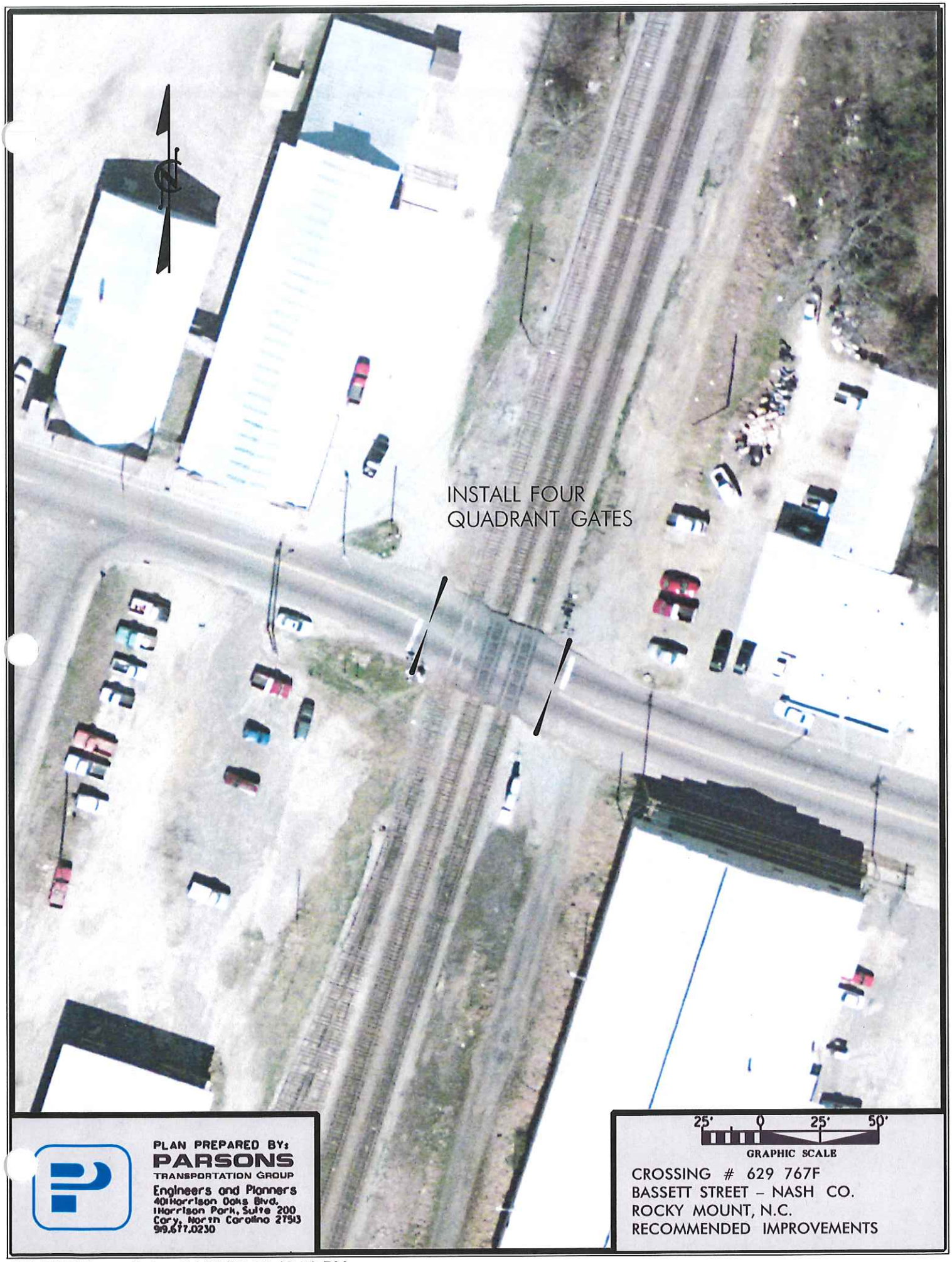
J:\644255\nash.dgn 05/16/02 04:11:39 PM

North

Nash Street
South

West

Nash Street
East



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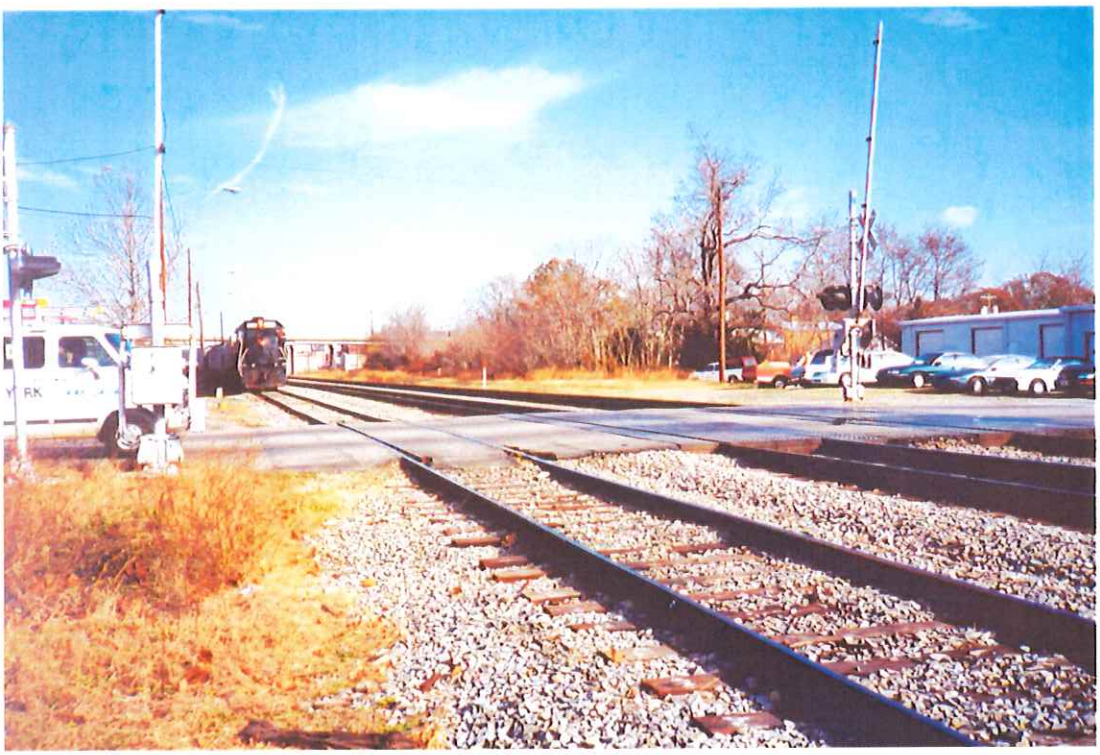
Cary, North Carolina 27513
919.677.0230

25' 0 25' 50'
GRAPHIC SCALE

CROSSING # 629 767F
BASSETT STREET – NASH CO.
ROCKY MOUNT, N.C.
RECOMMENDED IMPROVEMENTS

J:\644255\bassett.dgn 04/29/02 05:42:59 PM

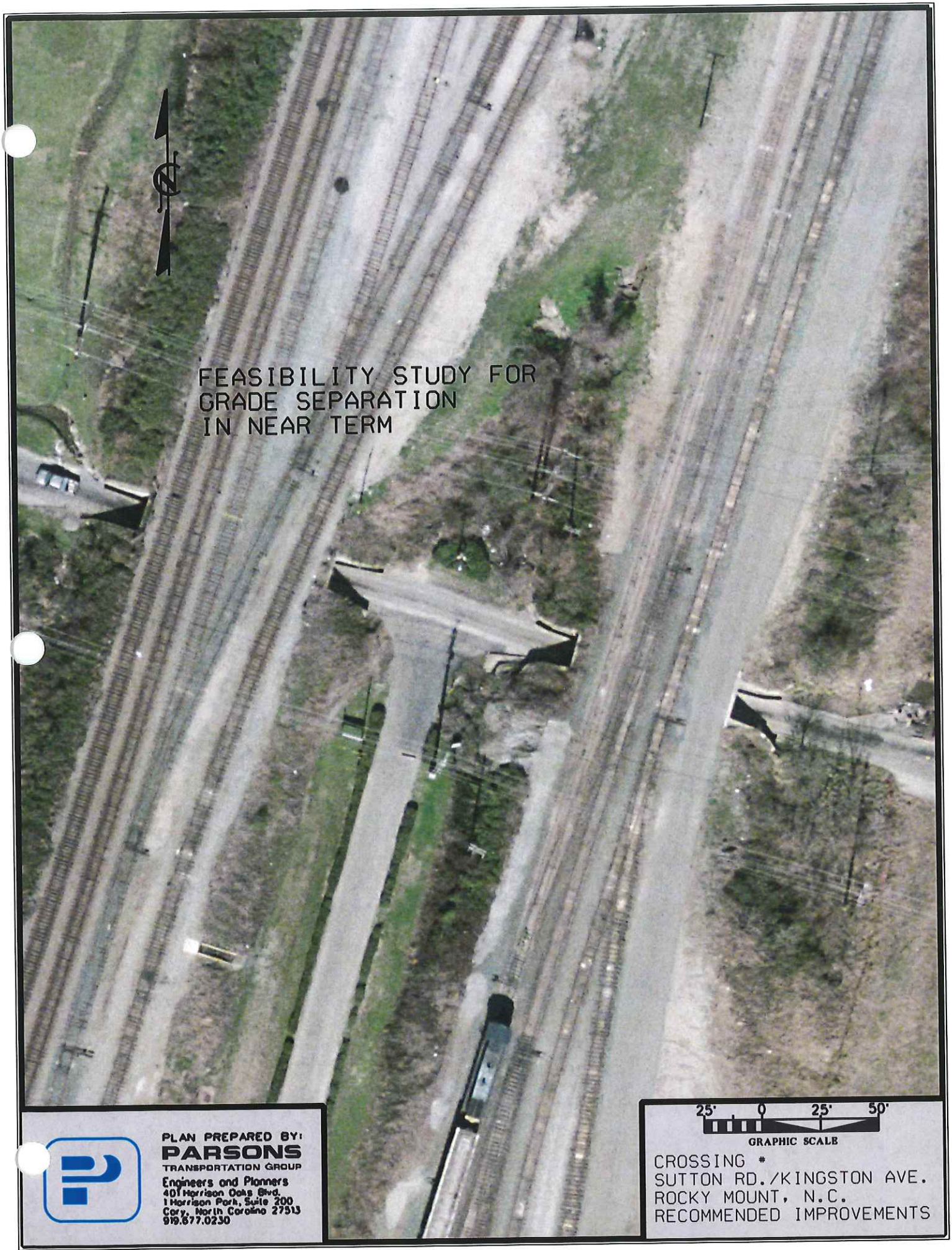


North

Bassett Street
South

West

Bassett Street
East



J:\644255\sutton.dgn 05/16/02 04:14:13 PM

Sutton Road

Sutton Road

No Aerial Photography
For
Tarboro Road

East

E. Tarboro Road
South

West

E. Tarboro Road
North