GREENVILLE NORTH CAROLINA

TRAFFIC SEPARATION STUDY

JULY 2008

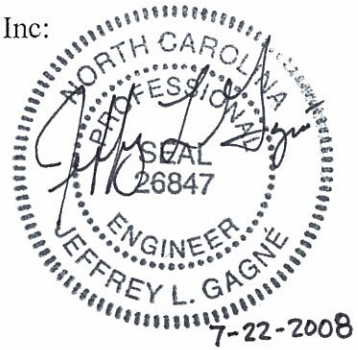
North Carolina Department of Transportation
RAIL DIVISION
ENGINEERING & SAFETY BRANCH

STV/RALPH WHITEHEAD ASSOCIATES

TRAFFIC SEPARATION STUDY
for the
CITY OF GREENVILLE, NC

July 2008

Documentation Prepared by STV/Ralph Whitehead Associates, Inc:



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APPENDICES – under separate cover

Appendix A – Public Workshop Summaries

Appendix B – Stakeholder Meeting Minutes

Appendix C – Newsletter

Appendix D – Newspaper Articles

Appendix E – Public Meeting Sign-In Sheets

Map Crossing Reference Number	Crossing Number	Street Name	Existing Conditions Figure #	Crossing Photos	Recommendations Figure #
1	465 482M	SR 1726/Portertown Rd	C-1a	C-1b	H1
2	465 483U	SR 1809/Windsor Rd	C-2a	C-2b	H2
3	465 485H	SR 1807/Oxford Rd	C-3a	C-3b	H3
4	465 488D	SR 1704/14th St	C-4a	C-4b	H4
5	465 489K	US 264/Greenville Blvd	C-5a	C-5b	H5
6	465 490E	Brownlea Dr	C-6a	C-6b	H6
7	465 491L	Elm St	C-7a	C-7b	H7
8	465 492T	W. Berkley Rd	C-8a	C-8b	H8
9	465 495N	SR 1702/Evans St	C-9a	C-9b	H9
10	465 496V	S. Pitt St	C-10a	C-10b	H10
11	465 506Y	Beatty St	C-11a	C-11b	H11
12	465 509U	Skinner St	C-12a	C-12b	H12
13	465 512C	US 13/Memorial Dr	C-13a	C-13b	H13
14	465 514R	SR 1324/W.H. Smith Blvd	C-14a	C-14b	H14
15	465 515X	Arlington Blvd	C-15a	C-15b	H15
16	465 516E	Spring Forest Rd	C-16a	C-16b	H16
17	465 517L	SR 1203/Allen Rd	C-17a	C-17b	H17
18	465 709D	W. 9th St	C-18a	C-18b	H18
19		Ficklen St	C-19a	C-19b	H19
20	465 708W	W. 10th St	C-20a	C-20b	H20
21	465 707P	W. 11th St	C-21a	C-21b	H21
22	465 706H	W. 12th St	C-22a	C-22b	H22
23	465 705B	W. 13th St	C-23a	C-23b	H23
24	465 704U	W. 14th St	C-24a	C-24b	H24
25	641 847B	NC 903	C-25a	C-25b	H25
26	641 850J	SR 1579/Staton Rd	C-26a	C-26b	H26
27	641 851R	SR 1527/N. Greene St	C-27a	C-27b	H27
28	641 852X	NC 33/N. Greene St	C-28a	C-28b	H28
29	641 853E	SR 1591/Industrial Blvd	C-29a	C-29b	H29
30	641 857G	SR 1528/W. Belvoir Rd	C-30a	C-30b	H30
31	641 859V	Gum Rd	C-31a	C-31b	H31
32	641 860P	SR 1530/Airport Rd	C-32a	C-32b	H32
33	641 553R	Dudley St	C-33a	C-33b	H33
34	641 557T	W. 3rd St	C-34a	C-34b	H34
35	641 558A	W. 4th St	C-35a	C-35b	H35
36	641 609H	5th St	C-36a	C-36b	H36
37	641 610C	Alley St	C-37a	C-37b	H37
38	641 854L	10th St Connector: SR 1598/W. 10th St	C-38a	C-38b	H38
39	641 855T	10th St Connector: SR 1531/Dickinson Ave	C-39a	C-39b	H39
40	641 614E	14th St	C-40a	C-40b	H40
41	641 615L	Howell St	C-41a	C-41b	H41
42	904 748H	Moye Hooker Connection/Line Ave	C-42a	C-42b	H42
43	642 719W	Arlington Blvd	C-43a	C-43b	H43
44	641 618G	US 264 Alt./Greenville Blvd	C-44a	C-44b	H44
45	641 620H	SR 1708/Fire Tower Rd	C-45a	C-45b	H45

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EXECUTIVE SUMMARY

In a joint cooperative effort with the City of Greenville, CSX Transportation, and the Carolina Coastal Railway, 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 closures at existing highway/rail grade crossings within the City of Greenville, North Carolina.

Stakeholders Meeting #1

A stakeholders committee was established so key agencies could participate and provide critical input on reaching consensus on grade crossing recommendations. The following agencies participated on the Stakeholder Committee:

- City of Greenville Planning
- City of Greenville Police
- City of Greenville Fire
- City of Greenville Public Works
- City of Greenville Engineering
- Pitt County Schools
- Pitt County
- Pitt County Sherriff Department
- NCDOT Division 2
- CSX Transportation
- Norfolk Southern Railroad
- Carolina Coastal Railway

The first stakeholder meeting was held on February 23, 2006. The purpose of this meeting was to present to the committee an overview of the TSS Study process. An overview of the preliminary recommendations for the 45 crossings was provided. Discussions included the need for a new wye connection track to alleviate blockages at railroad crossings in the vicinity of 14th Street, Arlington Road, Pitt Street, and Howell Street, along with possibly relocating the existing CSX rail yard, and modifying the existing yard for CLNA use as part of the study.

Public Meetings (2)

Two public meetings were held throughout the City in February 2008. The meeting schedule was as follows

- February 12th and 13th (5:00-7:00 PM) – Sheppard Memorial Library

The objective of the public meetings was to present the recommendations and potential affect on traffic movements resulting from improvement scenarios under consideration for each of the 45 crossings and to receive public comment on the recommendations.

Stakeholders Meeting #2

The second meeting of the Stakeholder Committee was on April 3rd, 2008. The purpose of this meeting was to discuss the comments received from the public and the recommendations and to finalize the recommendations to be carried forward into the implementation phase.

The committee requested that the rail crossing improvements incorporate additional widening for pedestrian movements at the Evans Street, Greenville Boulevard and Airport Road rail

crossings. As future improvements occur at other rail crossing locations, the incorporation of widening for pedestrian movements will be evaluated on a crossing by crossing basis. In addition, any project that involves both TSS recommendations and rail improvement recommendations at the same location, all of the improvements should be done simultaneously.

The committee also asked NCDOT Rail, the City of Greenville and the consultants to evaluate a possible connector road between Crossing #641 553R (Dudley Street) & #641 860P (Airport Road). Additionally, they requested the Department to investigate possible safety measures at Gum Road in order to prevent truck trailers from driving along the western side of the tracks from Airport Road to Gum Road at Crossing #641 859V (Gum Road).

The following Figure ES1 and Table ES2 details the recommended improvements along with the estimated costs.

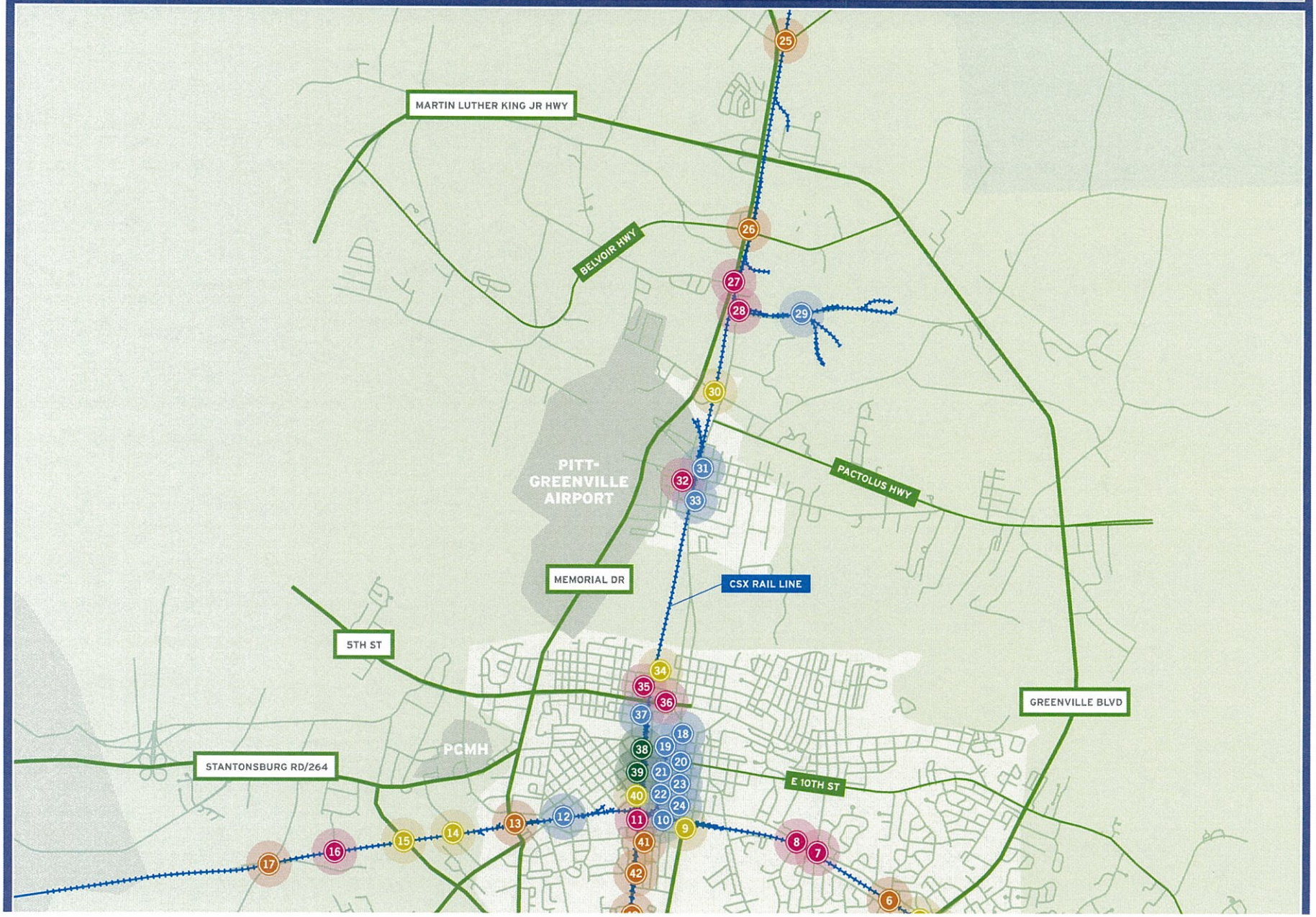
Greenville City Council Presentation

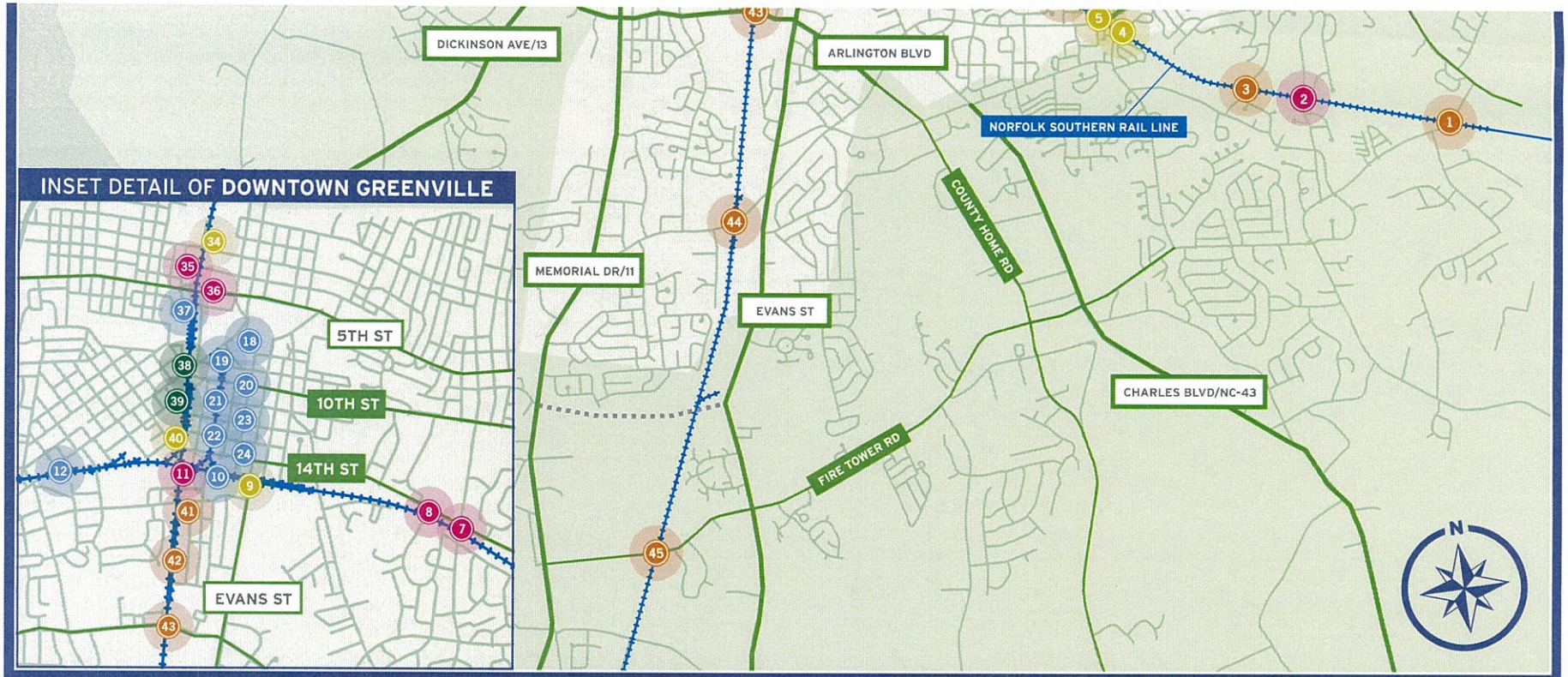
A presentation was conducted to the Greenville City Council on February 12, 2008. NCDOT and the consultant informed the City Council on the progress of the study and the recommendations presented in the report. City Council did not indicate any major concerns or issues.

Public Hearing

A public hearing was held on June 12, 2008 with the Greenville City Council. The only comments related to the existing W. 4th Street (Crossing # 641 558A) At-Grade Rail Crossing by the City Council and public, all in which preferred that the existing rail crossing not be recommended for closure but to improve the crossing's safety mechanisms. A motion was made and approved by the City Council to recommend not closing the 4th Street At-Grade Crossing.

GREENVILLE, NC: TRAFFIC SEPARATION STUDY GRADE CROSSING MAP





1 465 482M: SR 1726/Portertown Rd	16 465 516E: Spring Forest Rd	31 641 859V: Gum Rd
2 465 483U: SR 1809/Windsor Rd	17 465 517L: SR 1203/Allen Rd	32 641 860P: SR 1530/Airport Rd
3 465 485H: SR 1807/Oxford Rd	18 465 709D: W. 9th St*	33 641 553R: Dudley St
4 465 488D: SR 1704/14th St	19 Ficklen St*	34 641 557T: W. 3rd St
5 465 489K: US264/Greenville Blvd	20 465 708W: W. 10th St*	35 641 558A: W. 4th St
6 465 490E: Brownlea Dr	21 465 707P: W. 11th St*	36 641 609H: 5th St
7 465 491L: Elm St	22 465 706H: W. 12th St*	37 641 610C: Alley St
8 465 492T: W. Berkley Rd	23 465 705B: W. 13th St*	38 641 854L: SR 1598/W. 10th St
9 465 495N: SR 1702/Evans St	24 465 704U: W. 14th St*	39 641 855T: SR 1531/Dickinson Ave
10 465 496V: S. Pitt St	25 641 847B: NC 903	40 641 614E: 14th St
11 465 506Y: Beatty St	26 641 850J: SR 1579/Staton Rd	41 641 615L: Howell St
12 465 509U: Skinner St	27 641 851R: SR 1527/N Greene St	42 904 748H: Moye Hooker Connection/Line Ave
13 465 512C: US 13/Memorial Dr	28 641 852X: NC 33/N. Greene St	43 642 719W: Arlington Blvd
14 465 514R: SR 1324/W.H. Smith Blvd	29 641 853E: SR 1591/Industrial Blvd	44 641 618G: US 264 Alt./Greenville Blvd
15 465 515X: Arlington Blvd	30 641 857G: SR 1528/W. Belvoir Rd	45 641 620H: SR 1708/Fire Tower Rd

- **A** NO ACTION
- **B** REMOVALS/CLOSURES
- **C** ROADWAY IMPROVEMENTS
- **D** GRADE CROSSING IMPROVEMENTS
- **E** FUTURE PROJECTS

NCDOT

On the Web at **www.ncdot.org**

*The rail spur to UNX will only be removed if the business relocates out of its current location.

Table ES 2 - Summary of Recommendations and Costs

Crossing Reference Number	Crossing Number	Street Name	Near-Term Recommendation	Est. Near-Term Cost	Long-Term Recommendation	Est. Long-Term Cost
H1	465 482M	SR 1726/Portertown Rd	No Action			
H2	465 483U	SR 1809/Windsor Rd	Add Gates	$ 145,000.00		
H3	465 485H	SR 1807/Oxford Rd	No Action			
H4	465 488D	SR 1704/14th St	Add Median Barrier	$ 150,000.00		
H5	465 489K	US 264/Greenville Blvd	Add Concrete Median	$ 185,000.00		
H6	465 490E	Brownlea Dr	No Action			
H7	465 491L	Elm St	Add Gates & Signal Preemption	$ 185,000.00		
H8	465 492T	W. Berkley Rd	Add Gates	$ 145,000.00		
H9	465 495N	SR 1702/Evans St	Add Concrete Median	$ 185,000.00		
H10	465 496V	S. Pitt St	Closure	$ 12,000.00		
H11	465 506Y	Beatty St	Add Gates & Signal Preemption	$ 185,000.00		
H12	465 509U	Skinner St	Closure	$ 12,000.00		
H13	465 512C	US 13/Memorial Dr	No Action			
H14	465 514R	SR 1324/W.H. Smith Blvd	Add Concrete Median	$ 185,000.00		
H15	465 515X	Arlington Blvd	Add Concrete Median	$ 185,000.00		
H16	465 516E	Spring Forest Rd	Add Gates	$ 145,000.00		
H17	465 517L	SR 1203/Allen Rd	No Action			
H18	465 709D	W. 9th St			Remove Rail Spur	$ 12,000.00
H19		Ficklen St			Remove Rail Spur	$ 12,000.00
H20	465 708W	W. 10th St			Remove Rail Spur	$ 12,000.00
H21	465 707P	W. 11th St			Remove Rail Spur	$ 12,000.00
H22	465 706H	W. 12th St			Remove Rail Spur	$ 12,000.00
H23	465 705B	W. 13th St			Remove Rail Spur	$ 12,000.00
H24	465 704U	W. 14th St			Remove Rail Spur	$ 12,000.00
H25	641 847B	NC 903	No Action			
H26	641 850J	SR 1579/Staton Rd	No Action			
H27	641 851R	SR 1527/N. Greene St	Add Signal Preemption	$ 40,000.00		
H28	641 852X	NC 33/N. Greene St	Add Gates	$ 145,000.00		
H29	641 853E	SR 1591/Industrial Blvd	Remove Rail Spur	$ 12,000.00		
H30	641 857G	SR 1528/W. Belvoir Rd	Add Concrete Median	$ 185,000.00		
H31	641 859V	Gum Rd	Closure	$ 12,000.00		
H32	641 860P	SR 1530/Airport Rd	Add Median Barrier	$ 150,000.00		
H33	641 553R	Dudley St	Closure	$ 12,000.00		
H34	641 557T	W. 3rd St	Adjust Vertical Profile	$ 100,000.00		
H35	641 558A	W. 4th St	Add Gates	$ 145,000.00		
H36	641 609H	5th St	Add Gates	$ 145,000.00		
H37	641 610C	Alley St	Closure	$ 12,000.00		
H38	641 854L	10th St Connector: SR 1598/W. 10th St			TIP U-3315	
H39	641 855T	10th St Connector: SR 1531/Dickinson Ave			TIP U-3315	
H40	641 614E	14th St	Add Median Barrier	TIP U-3839		
H41	641 615L	Howell St	No Action			
H42	904 748H	Moye Hooker Connection/Line Ave	No Action			
H43	642 719W	Arlington Blvd	No Action			
H44	641 618G	US 264 Alt./Greenville Blvd	No Action			
H45	641 620H	SR 1708/Fire Tower Rd	No Action			

INTRODUCTION

A. INTRODUCTION

Every year more than 450 persons are killed and nearly 500 injured nationwide as a result of crashes between vehicles and trains.

During the year 2006, North Carolina recorded 75 rail-highway grade crossing collisions that resulted in 8 deaths and 21 injuries.

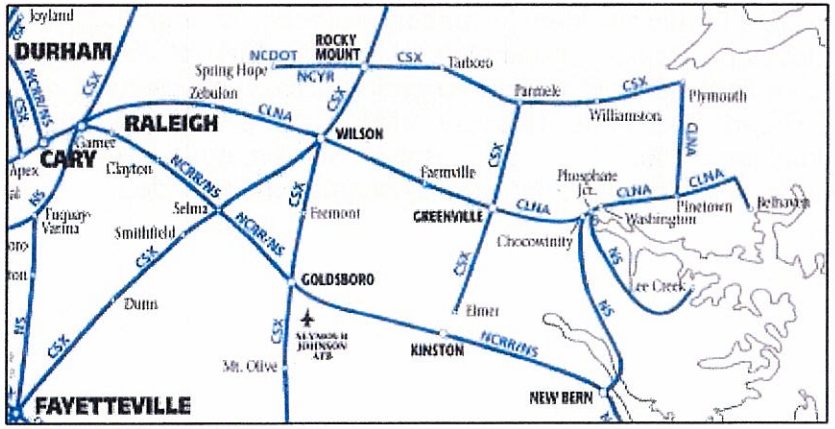
The North Carolina Department of Transportation (NCDOT) has developed the Traffic Separation Study (TSS) as an effort to pursue a more systematic approach to crossing safety. Traffic Separation Studies are a comprehensive evaluation of traffic patterns and road usage for an entire municipality or region that determines the need for improving and/or eliminating public grade crossings.

Once NCDOT entered into a municipal agreement with the City of Greenville to complete a TSS, the Consultants evaluated the rail lines in downtown Greenville; CSX and the Carolina Coastal that included a total of forty-five (45) grade crossings; 20 CSX crossings and 25 Carolina Coastal crossings.

The Traffic Separation Study process has three phases:

1. Preliminary Phase

The NCDOT and the City of Greenville have contractually agreed to make a "best faith" effort to approve and implement improvements that will be identified by the TSS. An engineering consultant is then selected by NCDOT.



2. Study Phase

The engineering consultant evaluates the existing crossing conditions, average daily traffic (both trains and vehicles) and socioeconomic impact of potential closings for all public crossings within the study area and prepares recommendations for NCDOT and local officials to review. Near-term recommendations (within two to five years) may include installation of flashing lights and gates, enhanced devices such as four-quadrant gates and longer gate arms, installation of concrete or rubber crossings, crossing closures, median barrier installation, pavement markings, roadway approach modifications and crossings realignments, connector roads, roadway realignments, crossing closures, relocations of existing crossings to safer locations and feasibility studies to evaluate potential grade separation locations. Long-term recommendations (more then 5 years) may include grade separation, connector roads and crossing closures. Recommendations are presented to the public for comment.

3. Implementation Process

NCDOT officials identify funding sources for improvements, develop project agreements with the City of Greenville, coordinate project design, coordinate crossing closures with railroad and state highway officials, and oversee project implementation. City staff assists with project development, utility relocation and right of way acquisition, if needed.

PREVIOUS STUDIES

B. PREVIOUS STUDIES

1. Railroad Operation

The operational analysis conducted by NCDOT Rail, STV/Ralph Whitehead Associates and Rail Safety Consultants resulted in the findings and recommendations found in the ***Greenville Rail Improvements Study - April 2008***.

The issue is the crossing blockages caused by the switching operation at the existing rail yard. This mainly occurs due to movements of southbound CSXT rail traffic to points east on the CLNA line, mainly to the PCS Phosphate facility in Aurora, NC, as per trackage rights agreement between NS and CSXT. There is no connector track to permit a direct south to east movement of rail traffic. CSXT breaks apart and rebuilds trains on sidings (one east and one west of their mainline track) between Arlington Road and Howell Street. This often blocks the at-grade crossings at 14th Street, Howell Street and Arlington Road. The switching operations occur mainly during peak roadway travel times.

Existing CSX Yard

Train times are dependent entirely on schedules at the phosphate plant in Aurora. Adjustments to these times to facilitate improved rail and highway operations have already been made to the extent possible.

The existing CSXT Greenville yard can not hold more than approximately 75 rail cars, and at times, PCS will send out trains with 100 to 150 loaded rail cars heading through Greenville at one time. When these longer trains are being switched within the sidings, blockages of vehicular traffic occur for longer periods of time at 14th Street, Howell Street and Arlington Road crossings.

Existing CSXT/NS Interlocking

2. Roadway Operation

Since the regional Pitt County Memorial Hospital, which includes the Brody School of Medicine at East Carolina University and other major employment areas are located in the northwest side of the City, East Carolina University is located east of the downtown and most of the residential areas and new growth are located in the southeast side of the City; commuters, school buses and emergency vehicles must travel through these rail corridors on a daily basis.

As growth continues to flourish, the likelihood for increased congestion occurs and the average daily traffic volumes increases. Within the vicinity of the downtown CSXT/CLNA interlocking, Arlington Boulevard is one of the busiest streets in Greenville. Traffic counts from NCDOT show that within a 24-hour period, approximately 30,000 vehicles cross over the existing Arlington Boulevard at-grade railroad/highway crossing. Over 5,000 vehicles per day cross over Howell Street, while approximately 1,000 cross over Pitt Street and

over 14,000 vehicles cross over the CSX at-grade crossing at 14th Street per day.

Over the past 10 years, Howell Street has had two (2) train/vehicle collisions and 14th Street has had one (1) accident. In each case, the train was conducting switching operations at the crossings and the vehicle failed to yield right of way.

Greenville has been pro-active in improving the local road network, safety issues and at-grade rail crossings. They have worked with NCDOT in identifying and planning for other road improvements in the Greenville area, including:

1. 10th Street Extension (NCDOT TIP Project U-3315) – this project will create a grade separation over the CSXT tracks at 10th Street.
2. Berkley Road will extend across 14th Street. This intersection has already been designed.

The North Carolina General Assembly has allocated $3.8 million to NCDOT Rail for the Greenville project. CSXT has also discussed contributions towards the overall project cost. Additional funding is currently being sought through a Federal grant, "Capital Grants for Rail Line Relocations" and other sources.

DATA COLLECTION

C. DATA COLLECTION

The information included in Table C-1 was gathered for each grade crossing in order to evaluate the crossing conditions in terms of traffic and safety.

The data summary sheets for each crossing are located in Figures C-1a to C-45a. Photographs for each crossing are found with its corresponding data summary sheet in Figures C-1b to C-45b.

TABLE C-1

Data Item	Source
Crossing Number	NCDOT Rail
Street or Route	NCDOT Rail
Railroad Company	NCDOT Rail
Railroad Milepost	NCDOT Rail
Existing Warning Devices	Site Inspection
Vehicle Traffic	NCDOT
24 hour train volumes	FRA Inventory Forms
Accident History	Accident Reports (NCDOT & FRA)
Street Classification	GUAMPO*
Truck Route	NA
Transit Route	GUAMPO
School Bus Route (Yes/No)	Pitt County School
Crossing Surface and Condition	Site Inspection
Land Use	Site Inspection
Redundant Crossing (Yes/No)	Site Inspection
Potential for Grade Separation	Exposure Index**
Humped Crossing	Site Inspection
Crossing Geometry	Site Inspection
Need for Enhanced Warning devices	Site Inspection and accident history
Feasibility of Roadway Improvements	Site Inspection and engineering judgment

*GUAMPO (Greenville Urban Area Metropolitan Planning Organization)

** Exposure Index = Number of trains per day x Average Daily Traffic at highway/rail crossing (See Section C)

Map Crossing Reference Number	Crossing Number	Street Name	Existing Conditions Figure #	Crossing Photos	Recommendations Figure #
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4	465 488D	SR 1704/14th St	C-4a	C-4b	H4
5	465 489K	US 264/Greenville Blvd	C-5a	C-5b	H5
6	465 490E	Brownlea Dr	C-6a	C-6b	H6
7	465 491L	Elm St	C-7a	C-7b	H7
8	465 492T	W. Berkley Rd	C-8a	C-8b	H8
9	465 495N	SR 1702/Evans St	C-9a	C-9b	H9
10	465 496V	S. Pitt St	C-10a	C-10b	H10
11	465 506Y	Beatty St	C-11a	C-11b	H11
12	465 509U	Skinner St	C-12a	C-12b	H12
13	465 512C	US 13/Memorial Dr	C-13a	C-13b	H13
14	465 514R	SR 1324/W.H. Smith Blvd	C-14a	C-14b	H14
15	465 515X	Arlington Blvd	C-15a	C-15b	H15
16	465 516E	Spring Forest Rd	C-16a	C-16b	H16
17	465 517L	SR 1203/Allen Rd	C-17a	C-17b	H17
18	465 709D	W. 9th St	C-18a	C-18b	H18
19		Ficklen St	C-19a	C-19b	H19
20	465 708W	W. 10th St	C-20a	C-20b	H20
21	465 707P	W. 11th St	C-21a	C-21b	H21
22	465 706H	W. 12th St	C-22a	C-22b	H22
23	465 705B	W. 13th St	C-23a	C-23b	H23
24	465 704U	W. 14th St	C-24a	C-24b	H24
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32	641 860P	SR 1530/Airport Rd	C-32a	C-32b	H32
33	641 553R	Dudley St	C-33a	C-33b	H33
34	641 557T	W. 3rd St	C-34a	C-34b	H34
35	641 558A	W. 4th St	C-35a	C-35b	H35
36	641 609H	5th St	C-36a	C-36b	H36
37	641 610C	Alley St	C-37a	C-37b	H37
38	641 854L	10th St Connector: SR 1598/W. 10th St	C-38a	C-38b	H38
39	641 855T	10th St Connector: SR 1531/Dickinson Ave	C-39a	C-39b	H39
40	641 614E	14th St	C-40a	C-40b	H40
41	641 615L	Howell St	C-41a	C-41b	H41
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43	642 719W	Arlington Blvd	C-43a	C-43b	H43
44	641 618G	US 264 Alt./Greenville Blvd	C-44a	C-44b	H44
45	641 620H	SR 1708/Fire Tower Rd	C-45a	C-45b	H45

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 847B	AA 145.2	CSX	NC 903	Major Thoroughfare	CB, Gates, CFL	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
7649	4	1-Injury, 1-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☑	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	No

Aerials

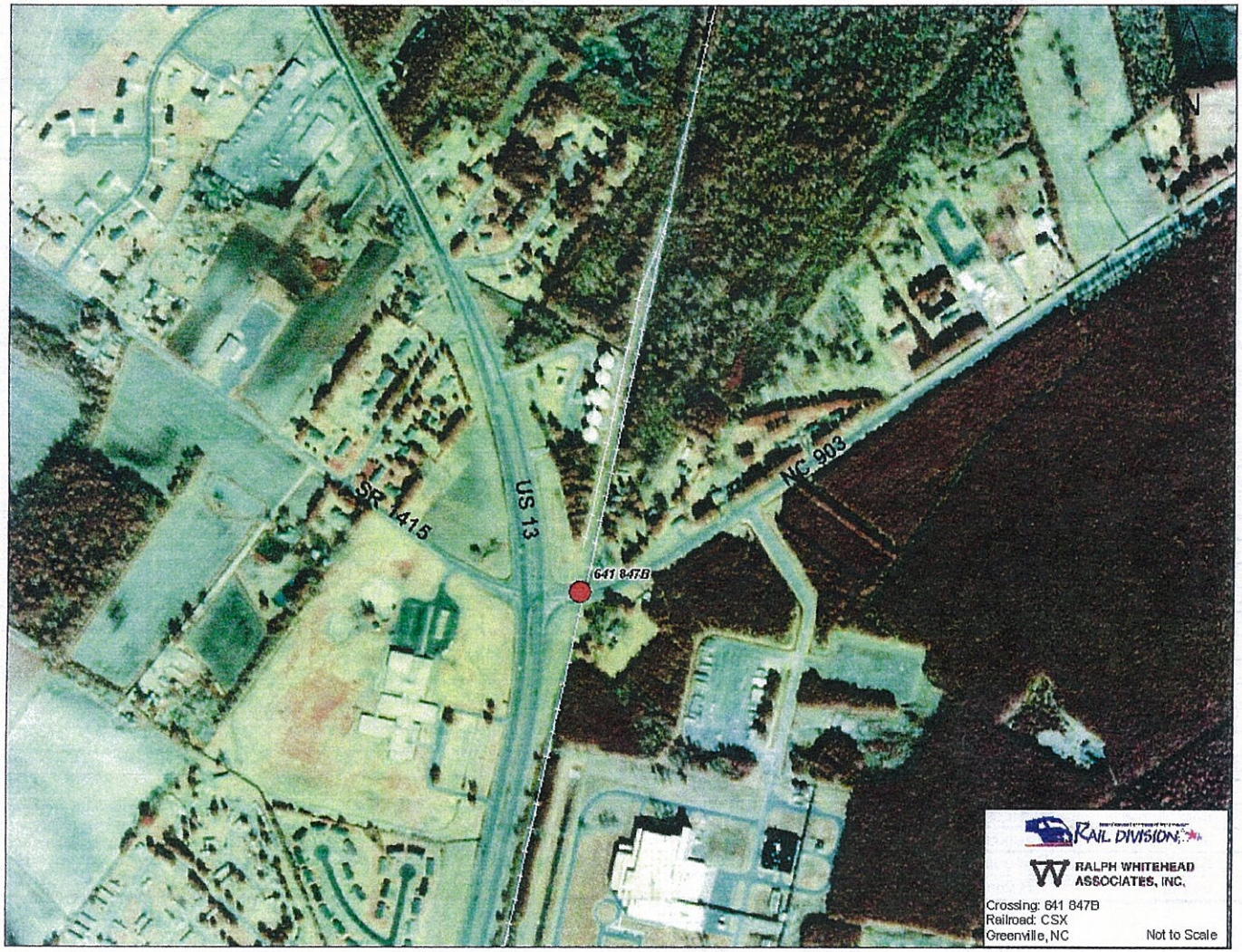


Figure C-1a

Crossing# 641 847B (NC 903)

Looking East

Looking North

Looking West

Looking South

Figure C-1b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 850J	AA 146.41	CSX	SR 1579/Staton Rd.	Major Thoroughfare	CB, Gates, CFL	Industrial/Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
7470	5	1-Injury, 1-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☑	☐	Good	Fair	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	No

Aerials

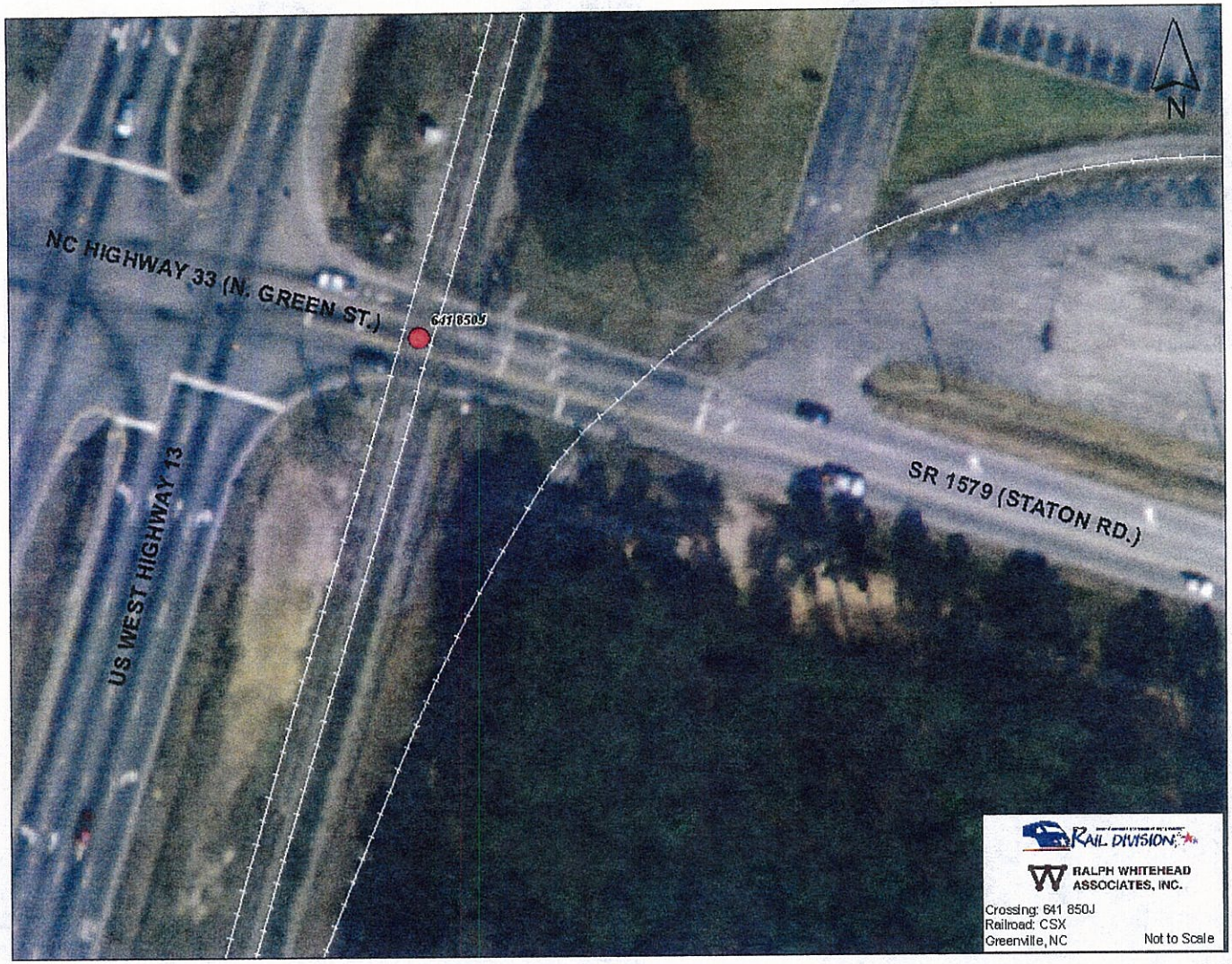


Figure C-2a

Crossing# 641 850J (SR 1579/Staton Rd.)

Looking East

Looking North

Looking West

Looking South

Figure C-2b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 512C	NS 149.1	NS	US 13/Memorial Dr.	Major Thoroughfare	CB, Gates	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
22000	6	1-PDO	Yes	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Poor	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	No

Aerials

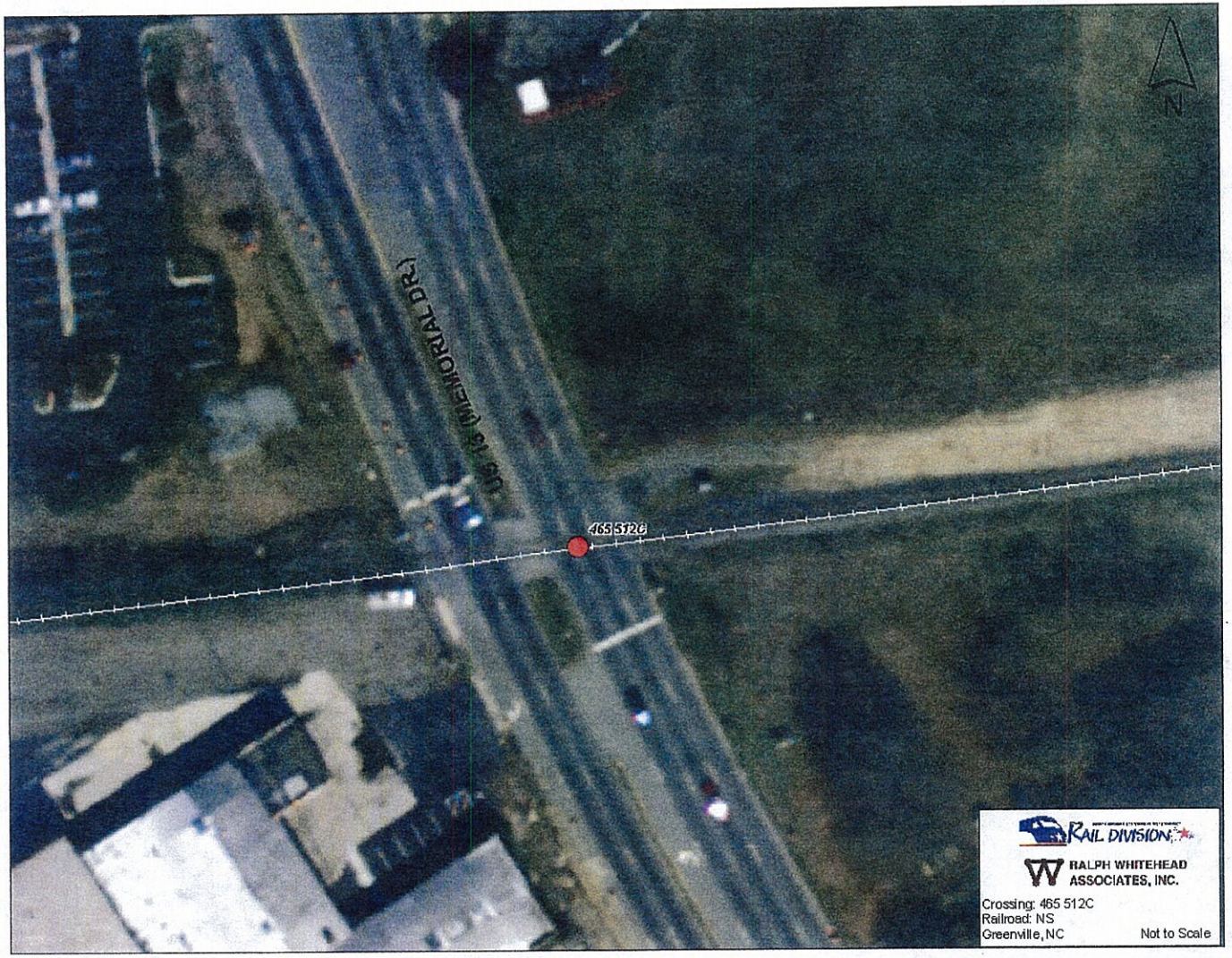


Figure C-3a

Crossing# 465 512C (US 13/Memorial Dr.)

Looking East

Looking North

Looking West

Looking South

Figure C-3b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 517L	NS 150.7	NS	SR 1203/Allen Rd.	Major Thoroughfare	CB, Gates, CFL	Industrial/Residential

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
9269	4	3-Injury, 2-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Poor	Poor	Poor	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	No

Aerials

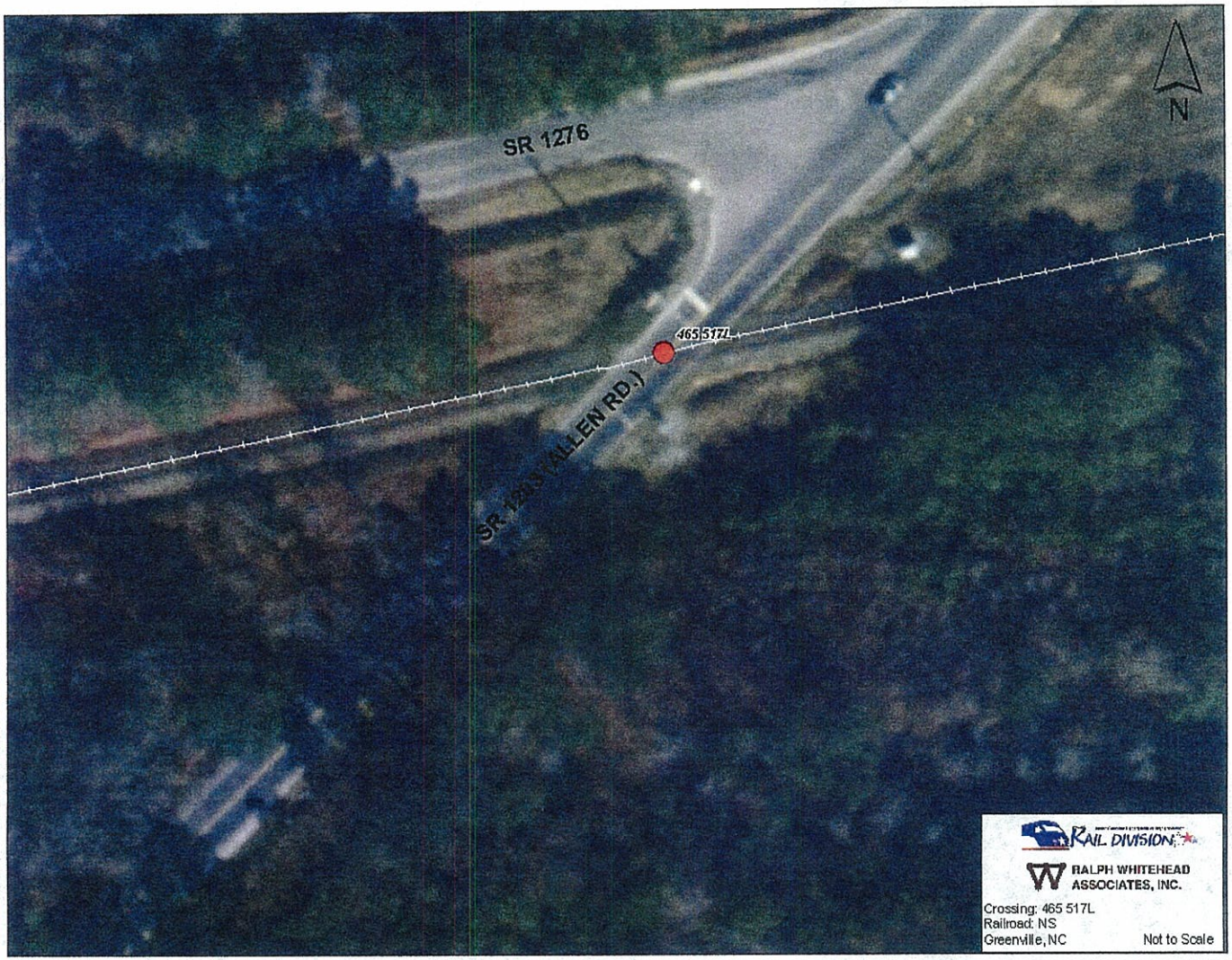
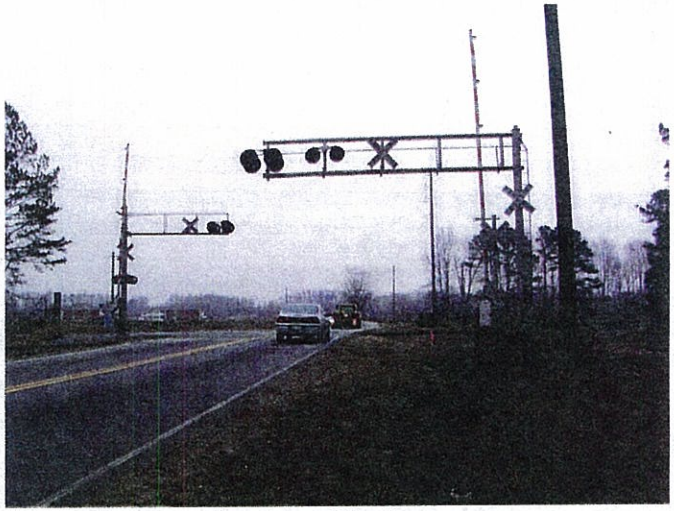


Figure C-4a

Crossing# 465 517L (SR 1203/Allen Rd.)

Looking East



Looking North

Looking West

Looking South

Figure C-4b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 615L	AA 150.2	CSX	Howell St.	Local	CB, Gates, CFL	Residential

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
5462	12	3-Injury, 3-PDO	Yes	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Poor	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	No

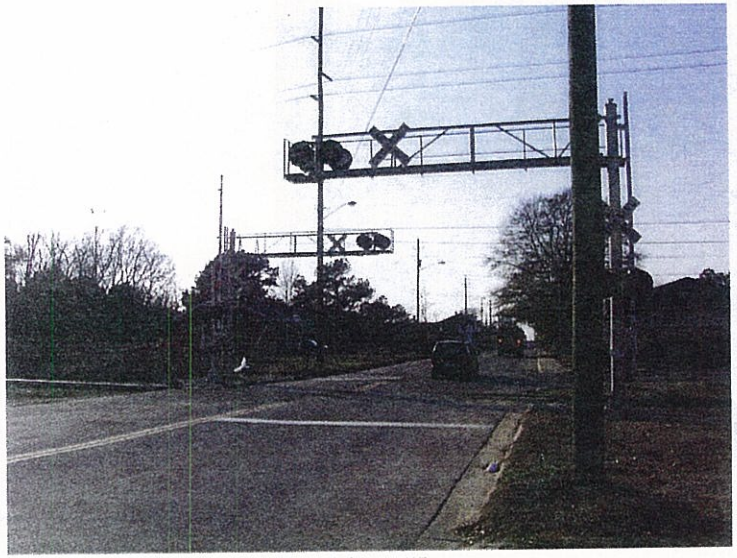
Aerials

Figure C-5a

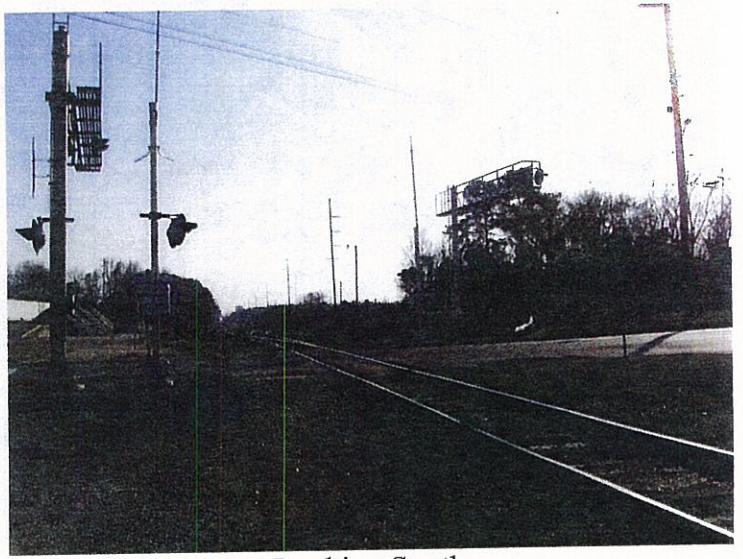
Crossing# 641 615L (Howell St.)

Looking East

Looking North



Looking West



Looking South

Figure C-5b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
904 748H	NS 148.85	NS	Moye Hooker Connection/Line Ave.	Minor Thoroughfare	CB, Gates, CFL	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
10546	6	1-Injury, 2-PDO	Yes	Yes	NA

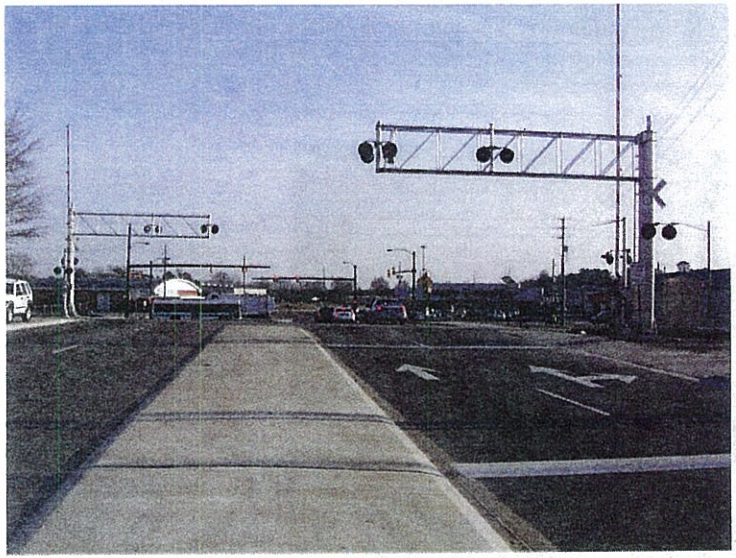
Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	No

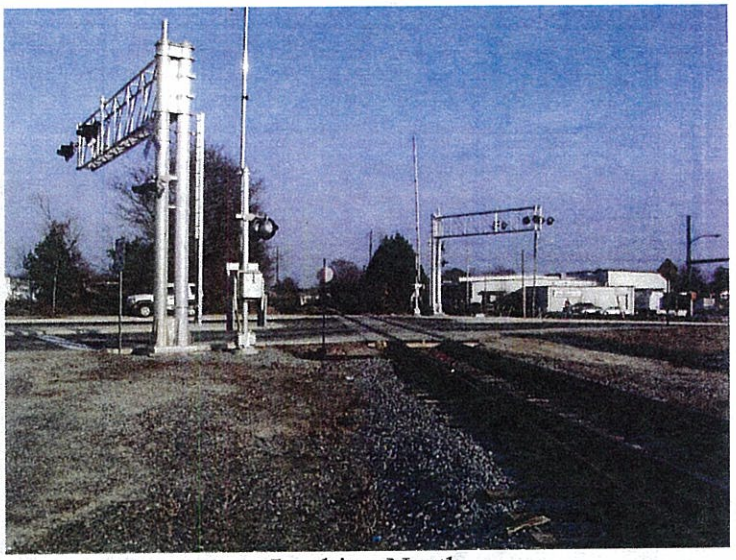
Aerials

Figure C-6a

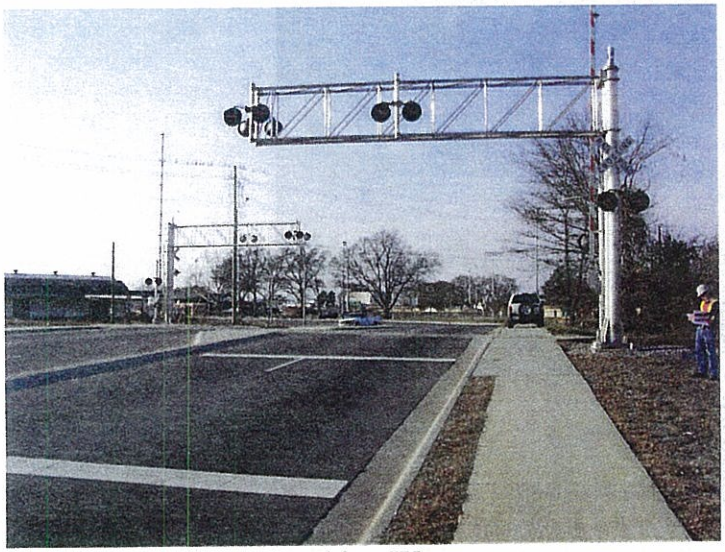
Crossing# 904 748H (Moye Hooker Connection/Line Ave.)



Looking East



Looking North



Looking West

Looking South

Figure C-6b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 490E	NS 145.3	NS	Brownlea Dr.	Local	CB, Gates, CFL	Residential

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
1339	4	4-Injury, 1-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Fair	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	No

Aerials

Figure C-7a

Crossing# 465 490E (Brownlea Dr.)

Looking East

Looking North

Looking West

Looking South

Figure C-7b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
642 719W	AA 150.7	CSX	Arlington Blvd.	Major Thoroughfare	Gates, CFL	Commercial/Residenti

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
30839	5		No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	Yes

Aerials

Figure C-8a

Crossing# 642 719W (Arlington Blvd.)

Looking East

Looking North

Looking West

Looking South

Figure C-8b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 620H	AA 153.8	CSX	SR 1708/Fire Tower Rd.	Major Thoroughfare	Gates	Industrial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
17795	5	1-Fatality, 3-Injury, 2-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Fair	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	No

Aerials

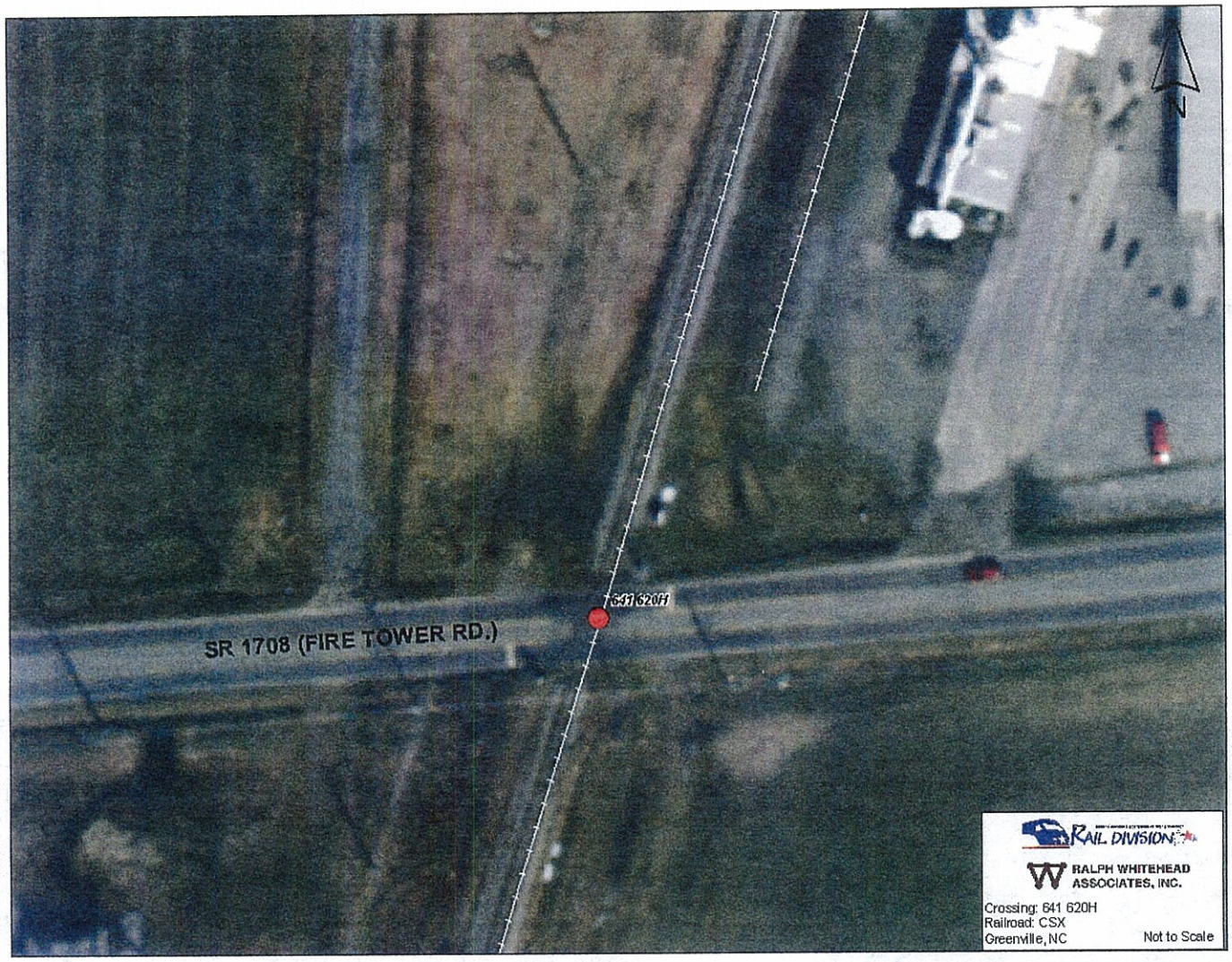


Figure C-9a

Crossing# 641 620H (SR 1708/Fire Tower Rd.)

Looking East

Looking North

Looking West

Looking South

Figure C-9b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 485H	NS 144.2	NS	SR 1807/Oxford Rd.	Local	CB, Gates	Residential

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
2039	4	1-Injury, 2-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	No

Aerials

Figure C-10a

Crossing# 465 485H (SR 1807/Oxford Rd.)

Looking East

Looking North

Looking West

Looking South

Figure C-10b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 482M	NS 143.0	NS	SR 1726/Portertown Rd.	Minor Thoroughfare	CB, Gates, CFL	Open Space

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
6483	4		No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	No

Aerials

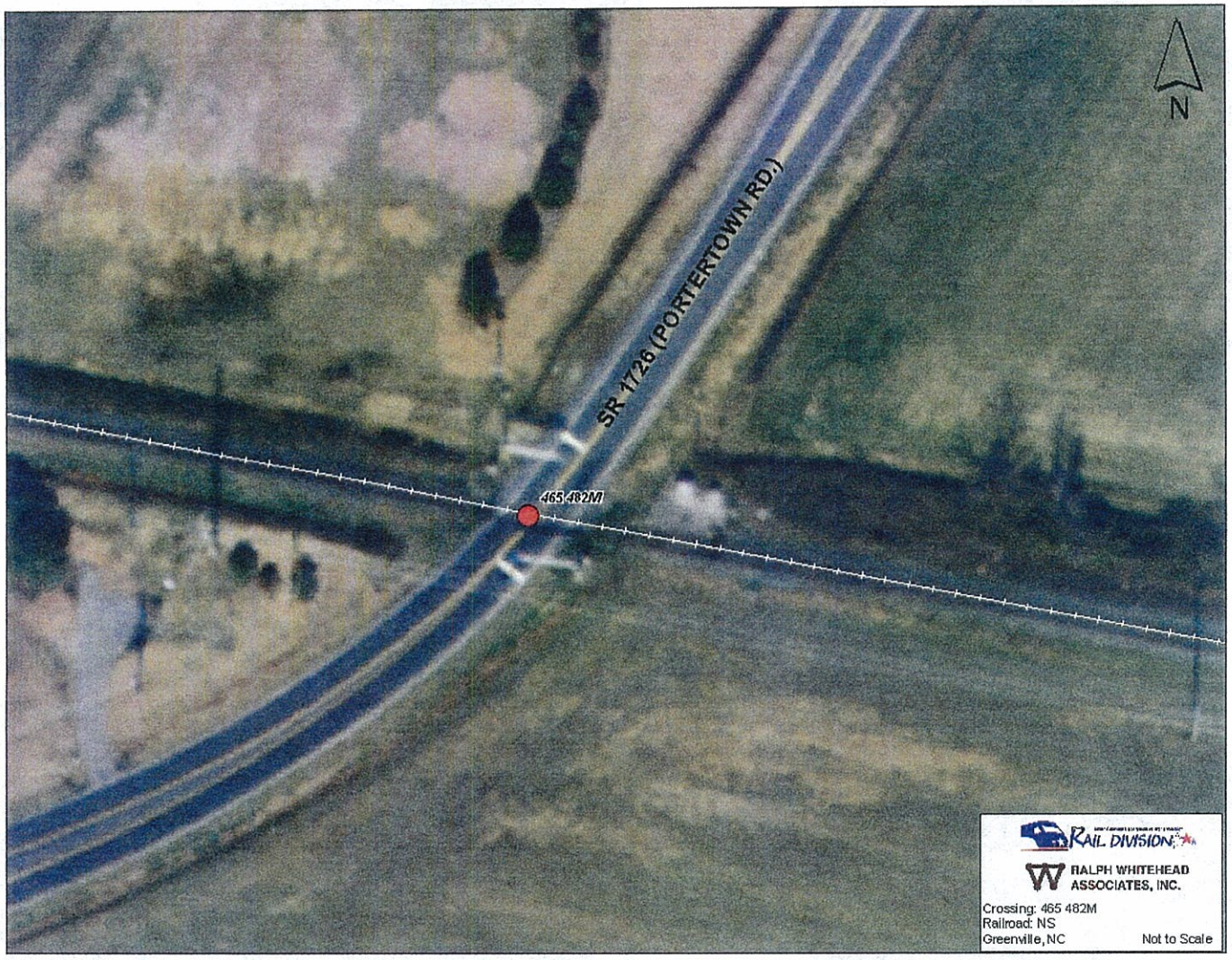


Figure C-11a

Crossing# 465 482M (SR 1726/Portertown Rd.)

Looking East

Looking North

Looking West

Looking South

Figure C-11b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 618G	AA 151.91	CSX	US 264 Alt./Greenville Blvd.	Major Thoroughfare	CB, Gates, CFL	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
37372	5	1-Injury	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Fair	Poor	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	No

Aerials

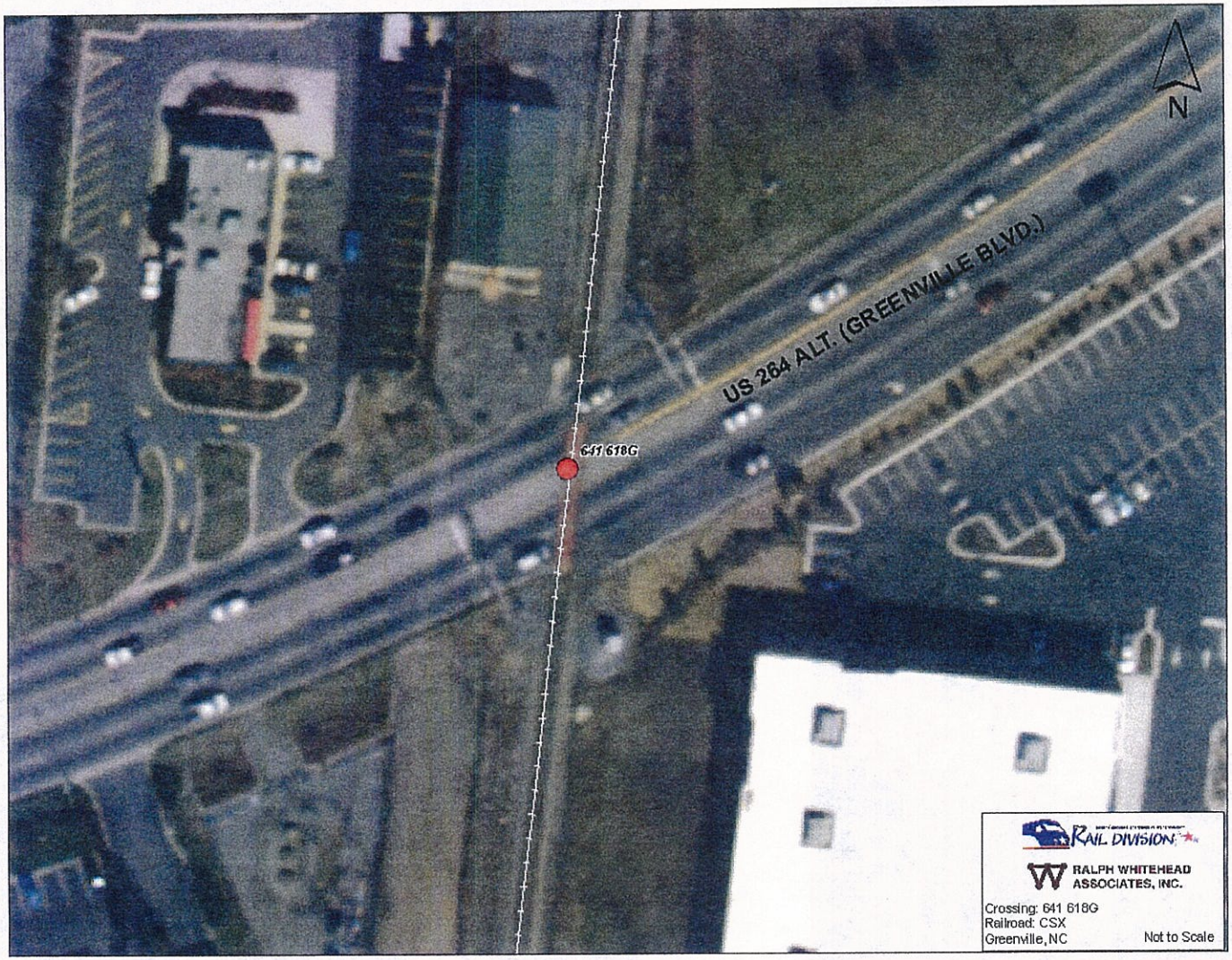
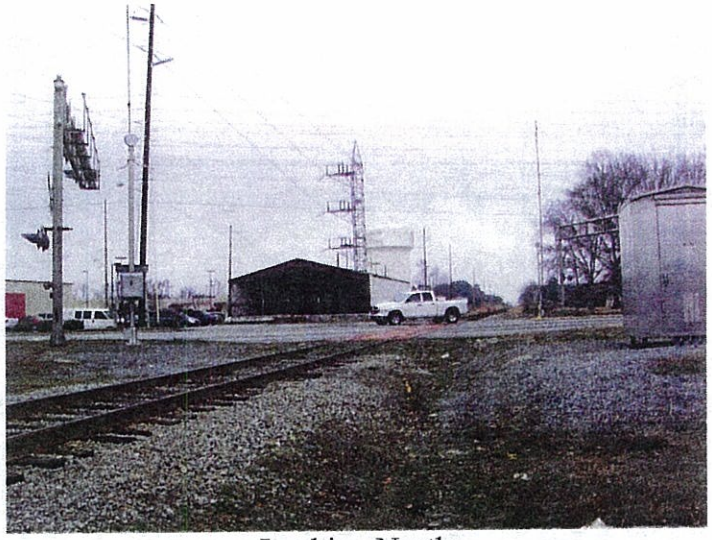


Figure C-12a

Crossing# 641 618G (US 264 Alt./Greenville Blvd.)

Looking East



Looking North

Looking West

Looking South

Figure C-12b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 853E	AA 146.69	CSX	SR 1591/Industrial Blvd.	Local	CB	Industrial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
2800	1	2-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Fair	Good	Poor	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	No

Aerials

Figure C-13a

Crossing# 641 853E (SR 1591/Industrial Blvd.)

Looking East

Looking North

Looking West

Looking South

Figure C-13b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
N/A	N/A	NS	Ficklen St.	Local	None	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
0	0		No	No	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	Yes

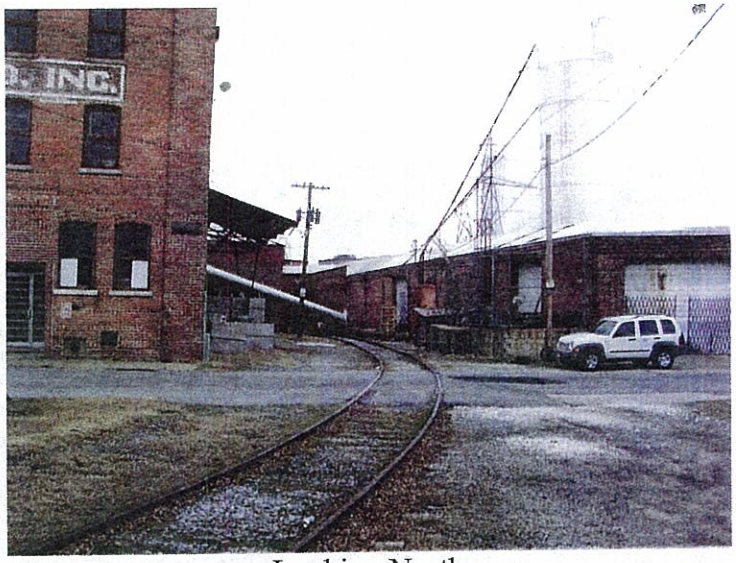
Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	No

Aerials

Figure C-14a

Crossing# XXX XXXX (Ficklen St.)

Looking East



Looking North

Looking West

Looking South

Figure C-14b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 709D	NS 146.9	NS	W. 9th St.	Local	CB	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
1041	3		No	No	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Poor	Good	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

Aerials

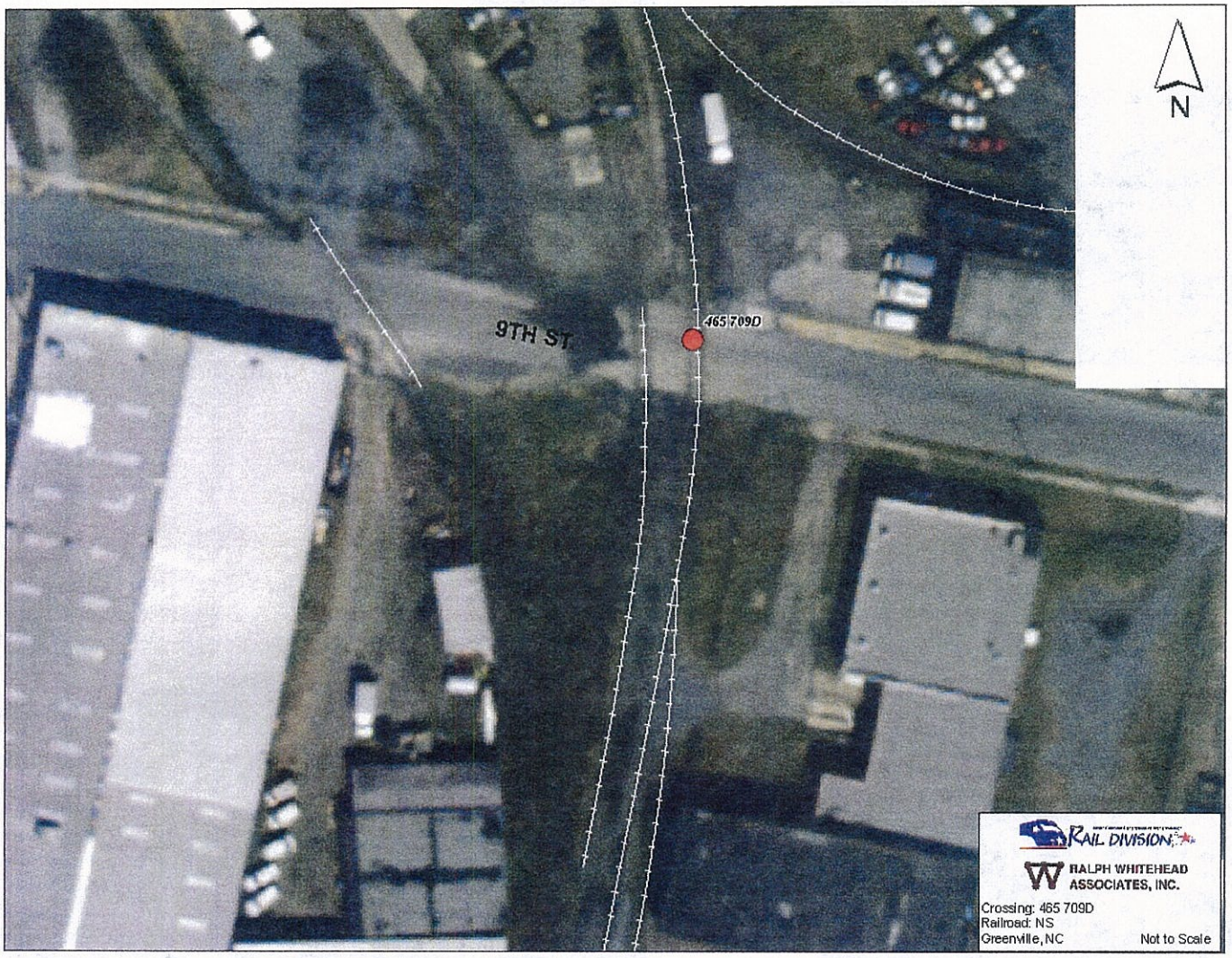
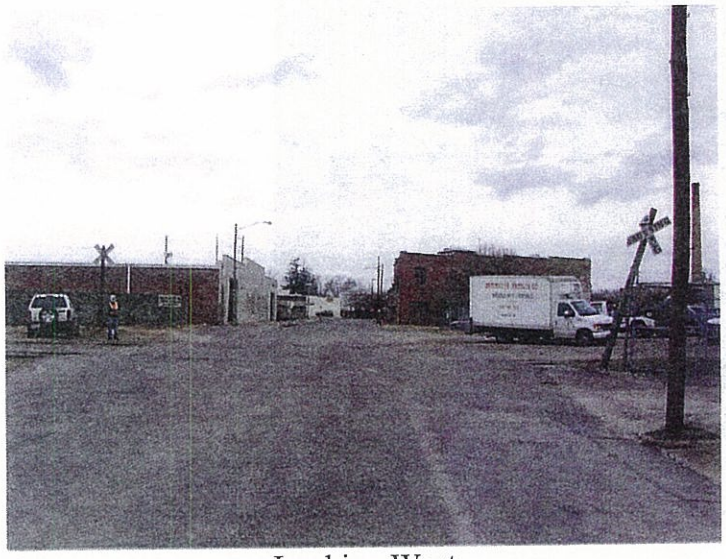


Figure C-15a

Crossing# 465 709D (W. 9th St.)

Looking East

Looking North



Looking West

Looking South

Figure C-15b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 708W	NS 146.9	NS	W. 10th St.	Major Thoroughfare	CB, Gates, CFL	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
11649	3	1-Injury	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Fair	Fair	Fair	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	No

Aerials

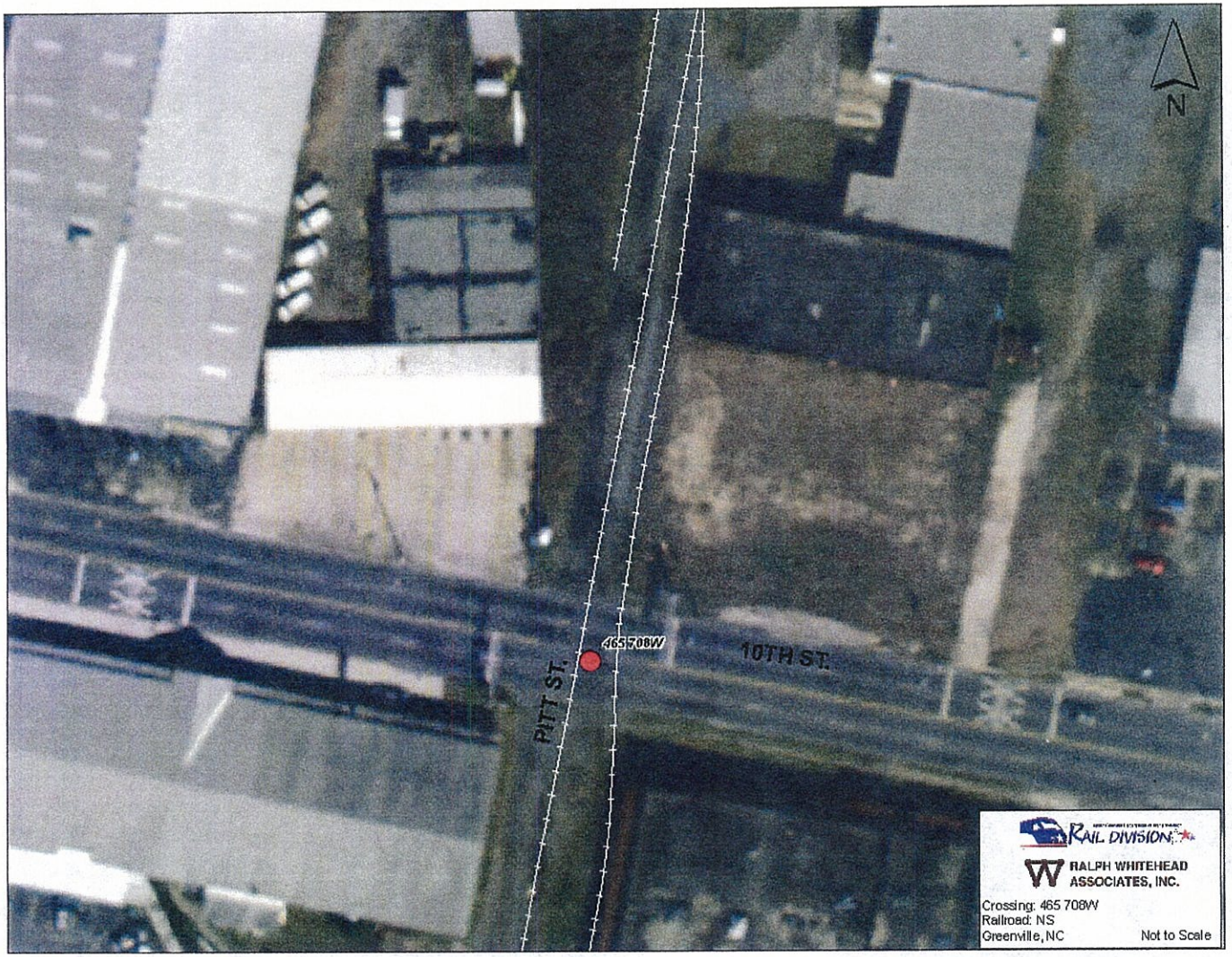
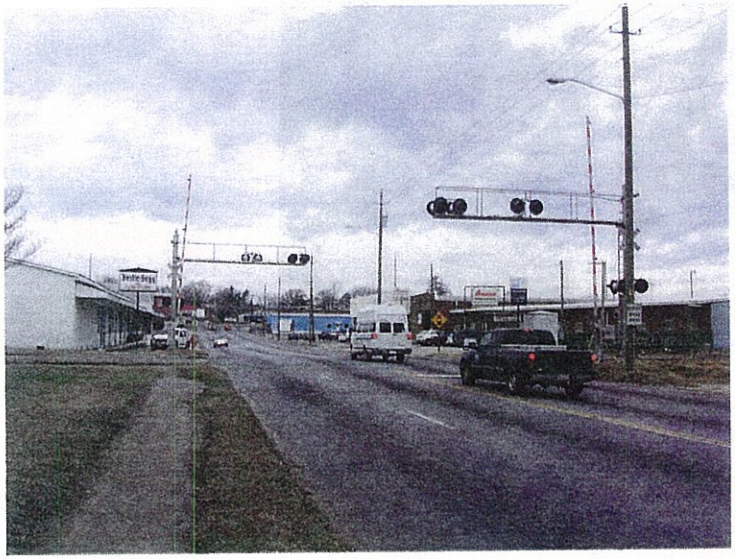


Figure C-16a

Crossing# 465 708W (W. 10th St.)

Looking East

Looking North



Looking West

Looking South

Figure C-16b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 707P	NS 146.9	NS	W. 11th St.	Local	None	Industrial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
162	3		No	No	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	No

Aerials

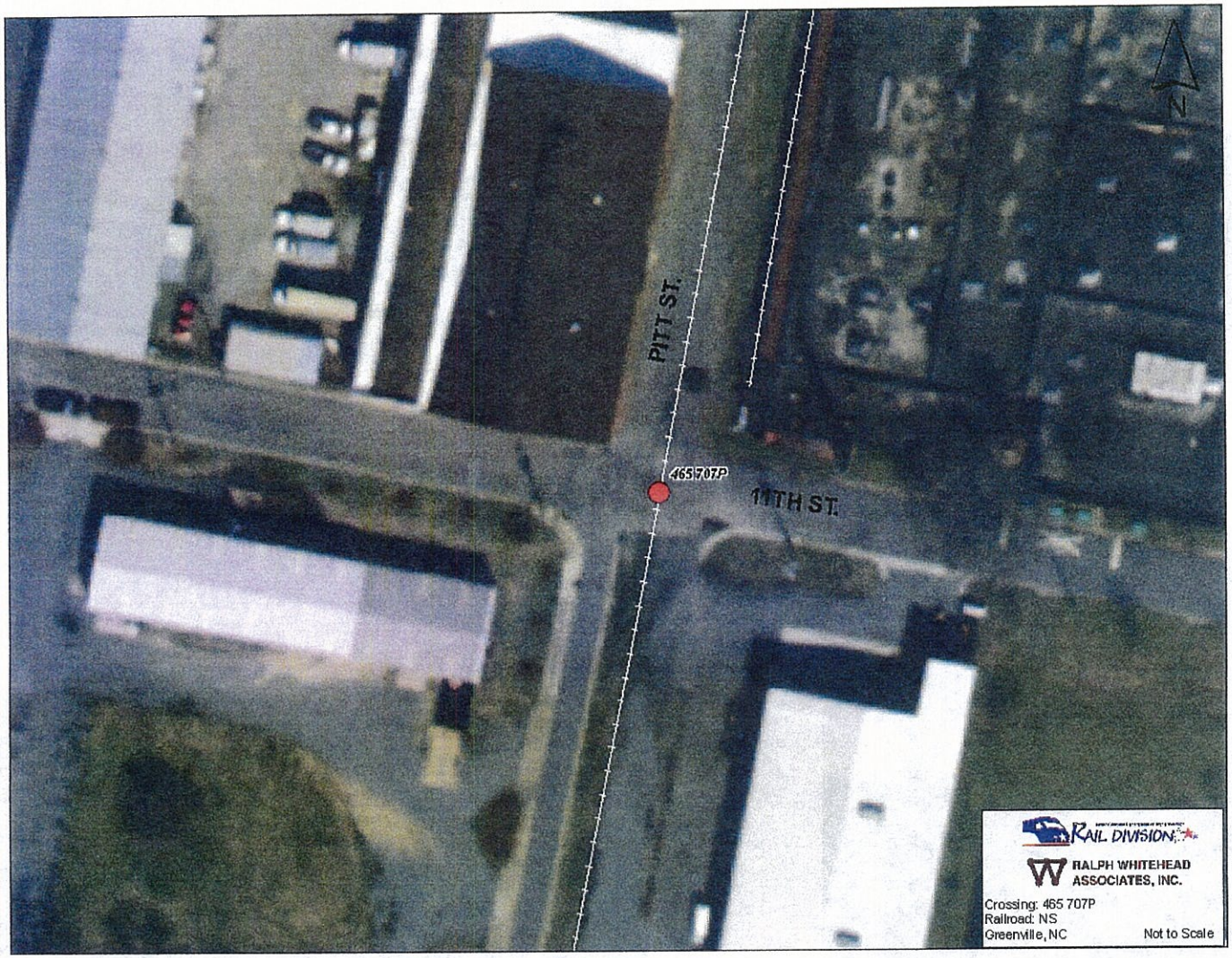


Figure C-17a

Crossing# 465 707P (W. 11th St.)

Looking East

Looking North

Looking West

Looking South

Figure C-17b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 706H	NS 146.9	NS	W. 12th St.	Local	CB	Commercial/Residenti

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
923	3		No	No	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Fair	Good	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	No

Aerials

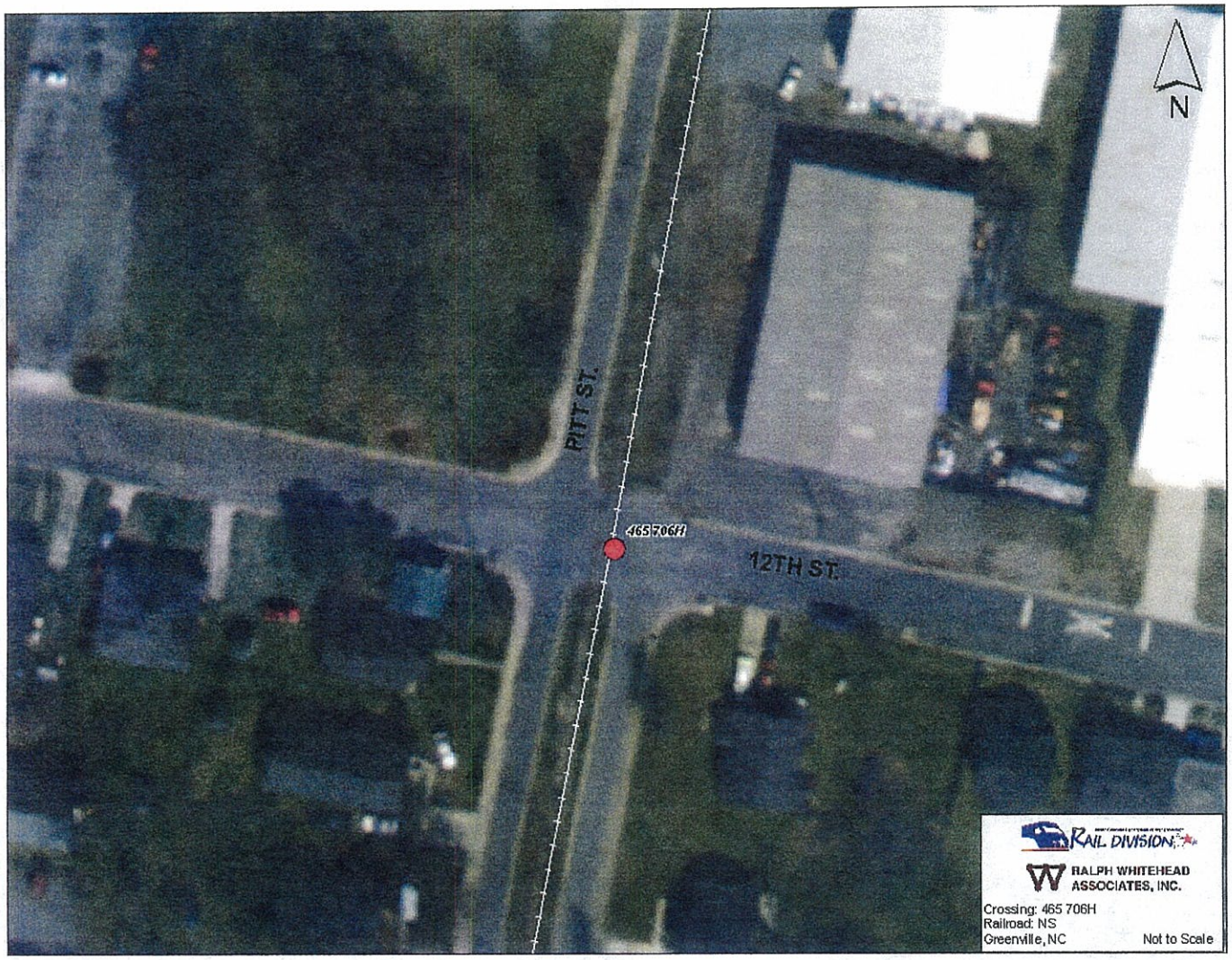


Figure C-18a

Crossing# 465 706H (W. 12th St.)

Looking East

Looking North

Looking West

Looking South

Figure C-18b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 705B	NS 146.9	NS	W. 13th St.	Local	CB	Residential

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
219	3		No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Poor	Good	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
Low	Low	Low	No

Aerials

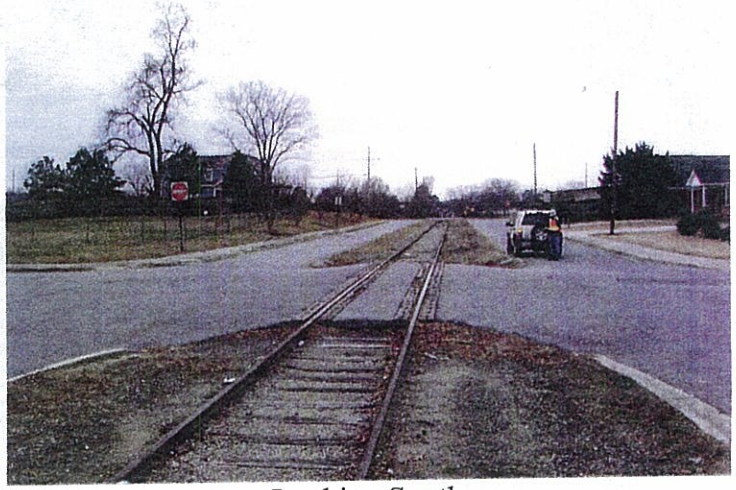
Figure C-19a

Crossing# 465 705B (W. 13th St.)

Looking East

Looking North

Looking West



Looking South

Figure C-19b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 704U	NS 146.9	NS	W. 14th St.	Major Thoroughfare	CB	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
12600	3	1-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	No

Aerials

Figure C-20a

Crossing# 465 704U (W. 14th St.)

Looking East

Looking North

Looking West

Looking South

Figure C-20b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 859V	AA 147.86	CSX	Gum Rd.	Local	CB	Industrial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
320	0		No	No	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Poor	Good	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
Low	High	Low	Yes

Aerials

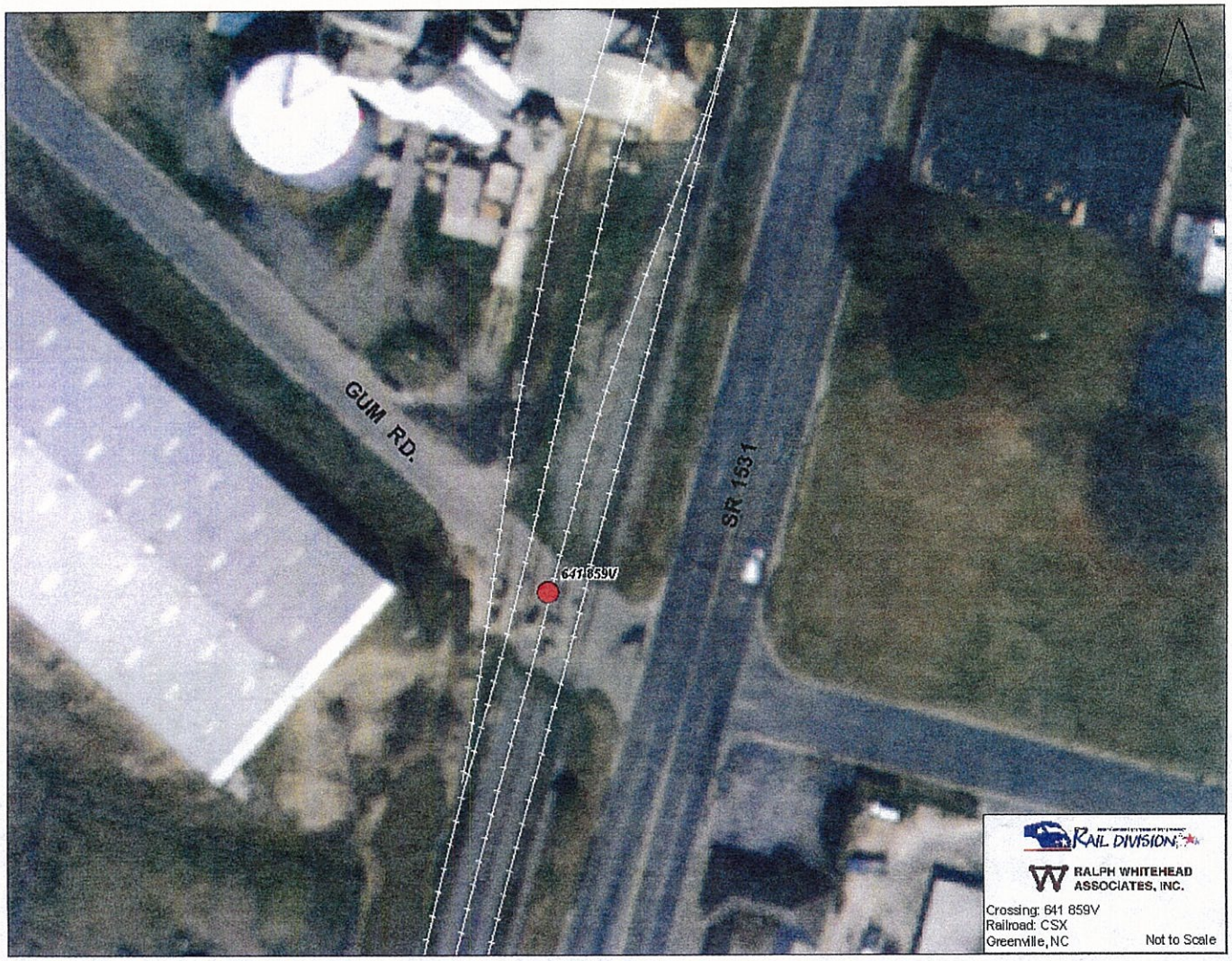
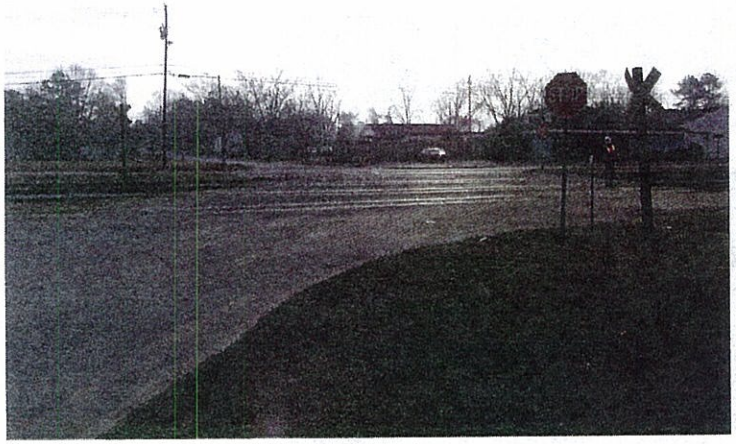


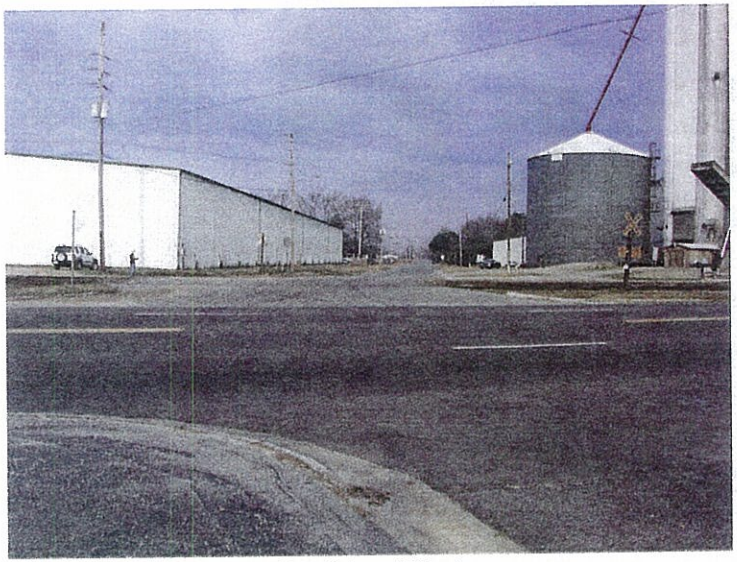
Figure C-21a

Crossing# 641 859V (Gum Rd.)



Looking East

Looking North



Looking West

Looking South

Figure C-21b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 553R	AA 148.02	CSX	Dudley St.	Local	CB, Gates	Commercial/Residenti

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
1075	2	2-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☑	Fair	Fair	Fair	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
Low	High	Low	No

Aerials

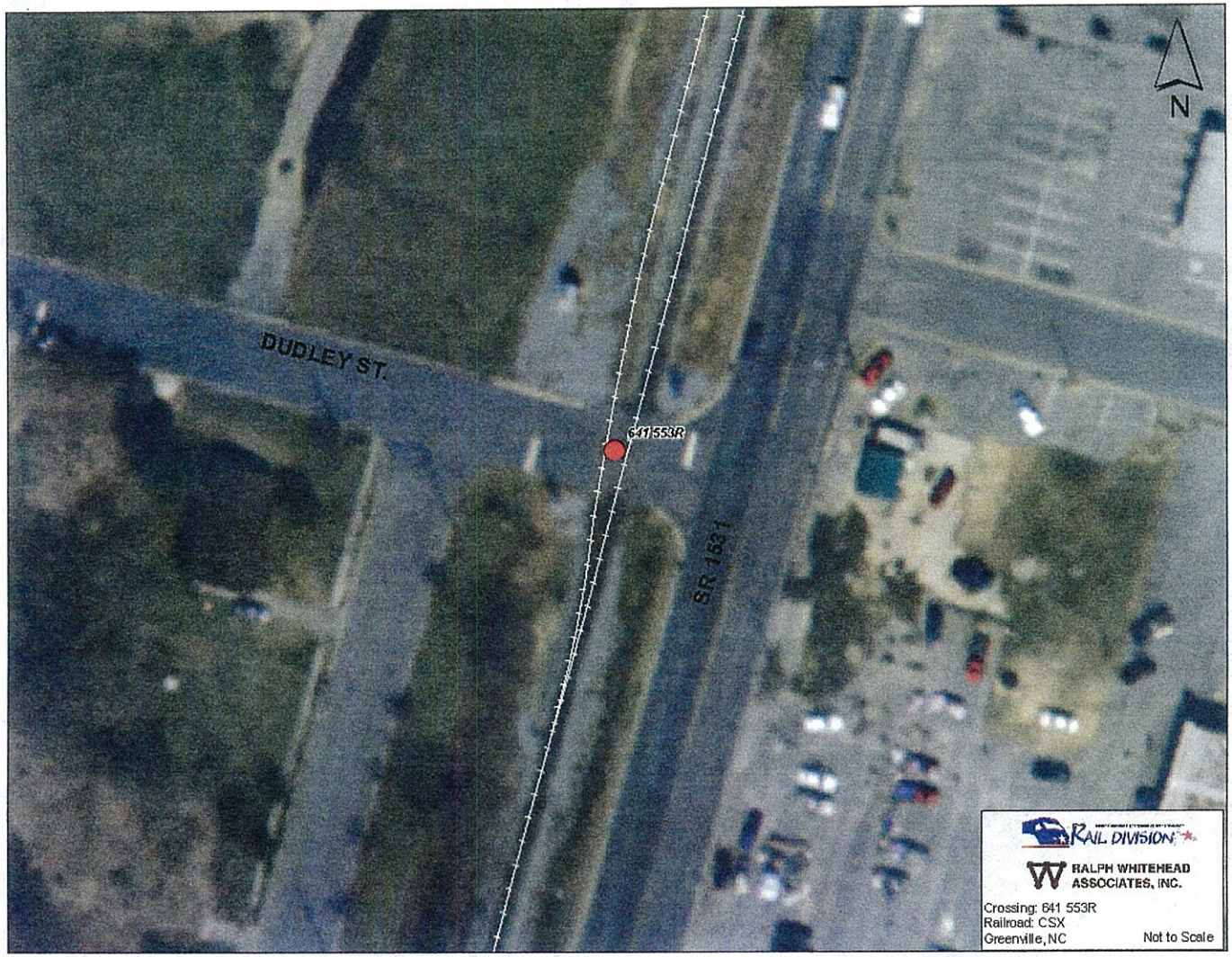
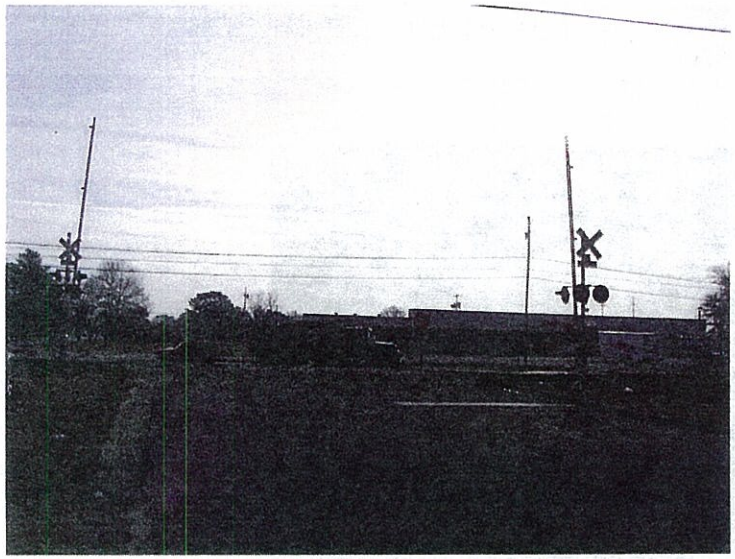


Figure C-22a

Crossing# 641 553R (Dudley St.)



Looking East

Looking North

Looking West

Looking South

Figure C-22b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 558A	AA 149.22	CSX	W. 4th St.	Local	CB	Residential

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
1176	5		Yes	No	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
Low	Low	Low	Yes

Aerials

Figure C-23a

Crossing# 641 558A (W. 4th St.)

Looking East

Looking North

Looking West

Looking South

Figure C-23b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 610C	AA 149.92	CSX	Alley St.	Local	Gates, CFL	Industrial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
321	10	2-Injury	No	No	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Fair	Good	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
Low	Low	Low	No

Aerials

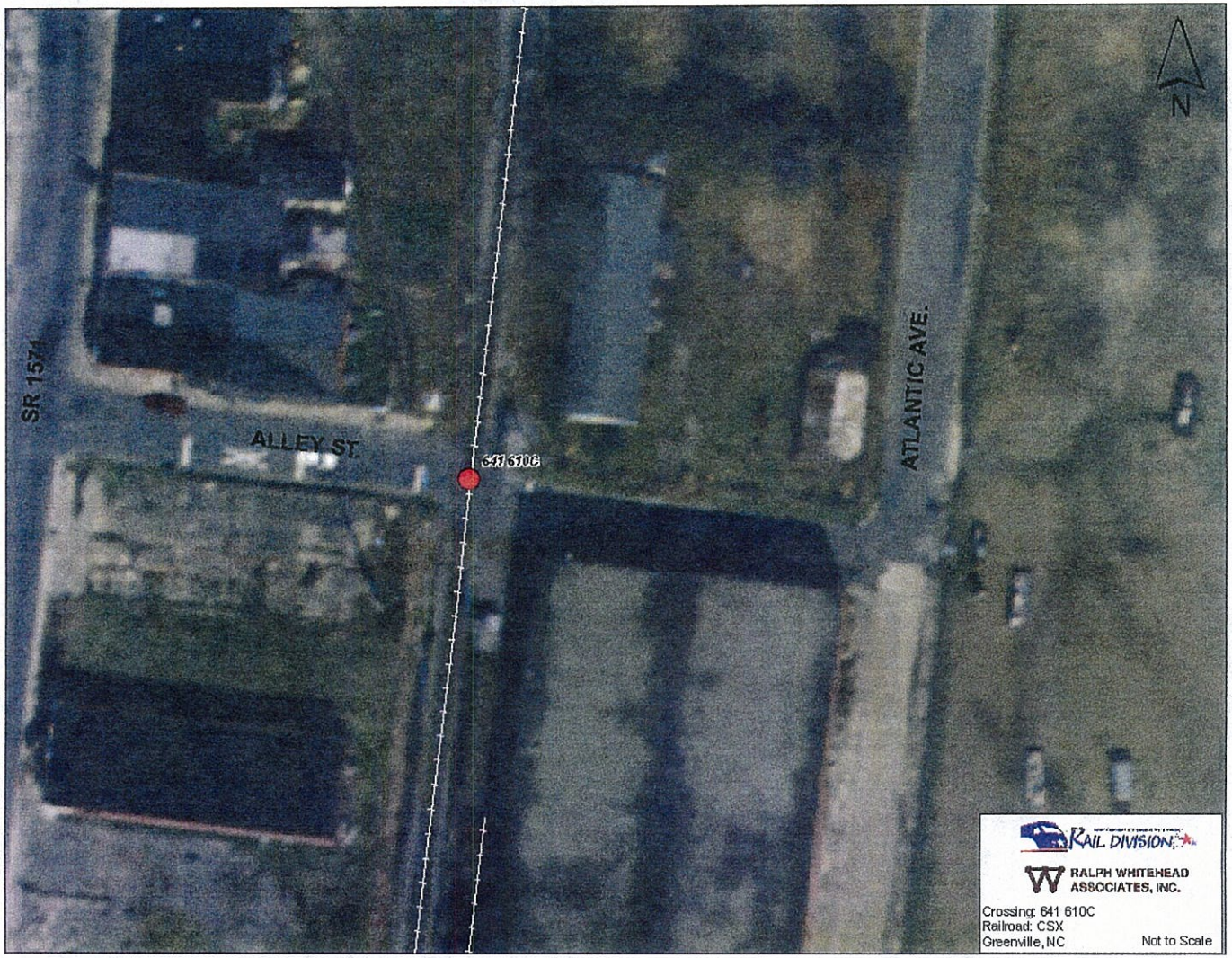


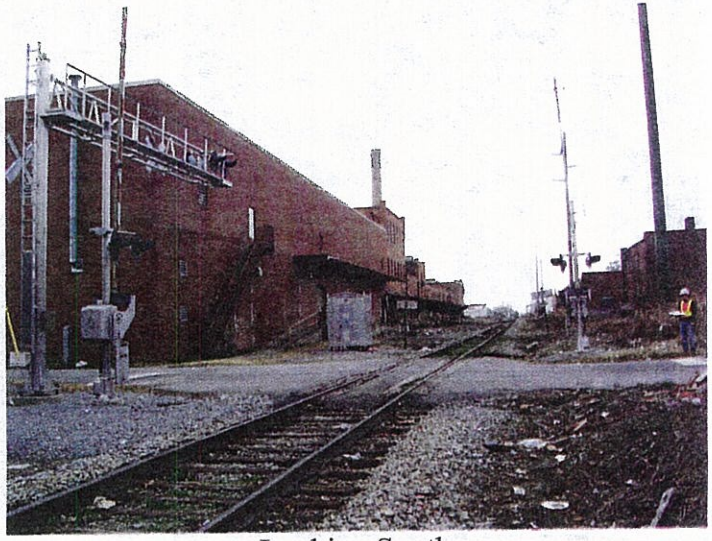
Figure C-24a

Crossing# 641 610C (Alley St.)

Looking East

Looking North

Looking West



Looking South

Figure C-24b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 509U	NS 148.7	NS	Skinner St.	Local	CB	Industrial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
1375	6	1-PDO	No	No	NA

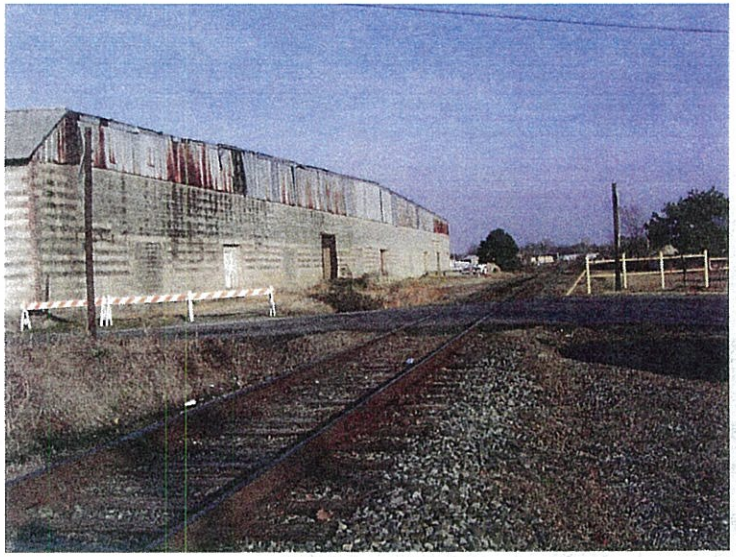
Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

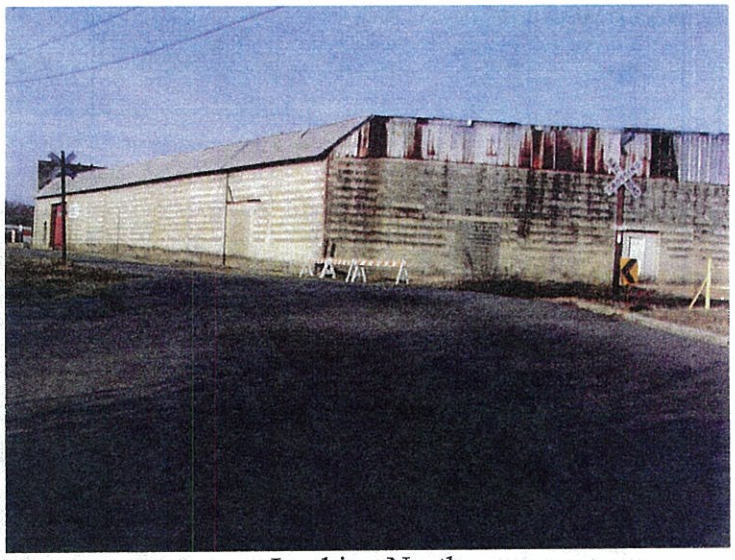
Aerials

Figure C-25a

Crossing# 465 509U (Skinner St.)



Looking East



Looking North

Looking West

Looking South

Figure C-25b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 496V	NS 148.1	NS	S. Pitt St.	Local	CB	Residential

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
950	8		Yes	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☑	Poor	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	High	Low	Yes

Aerials

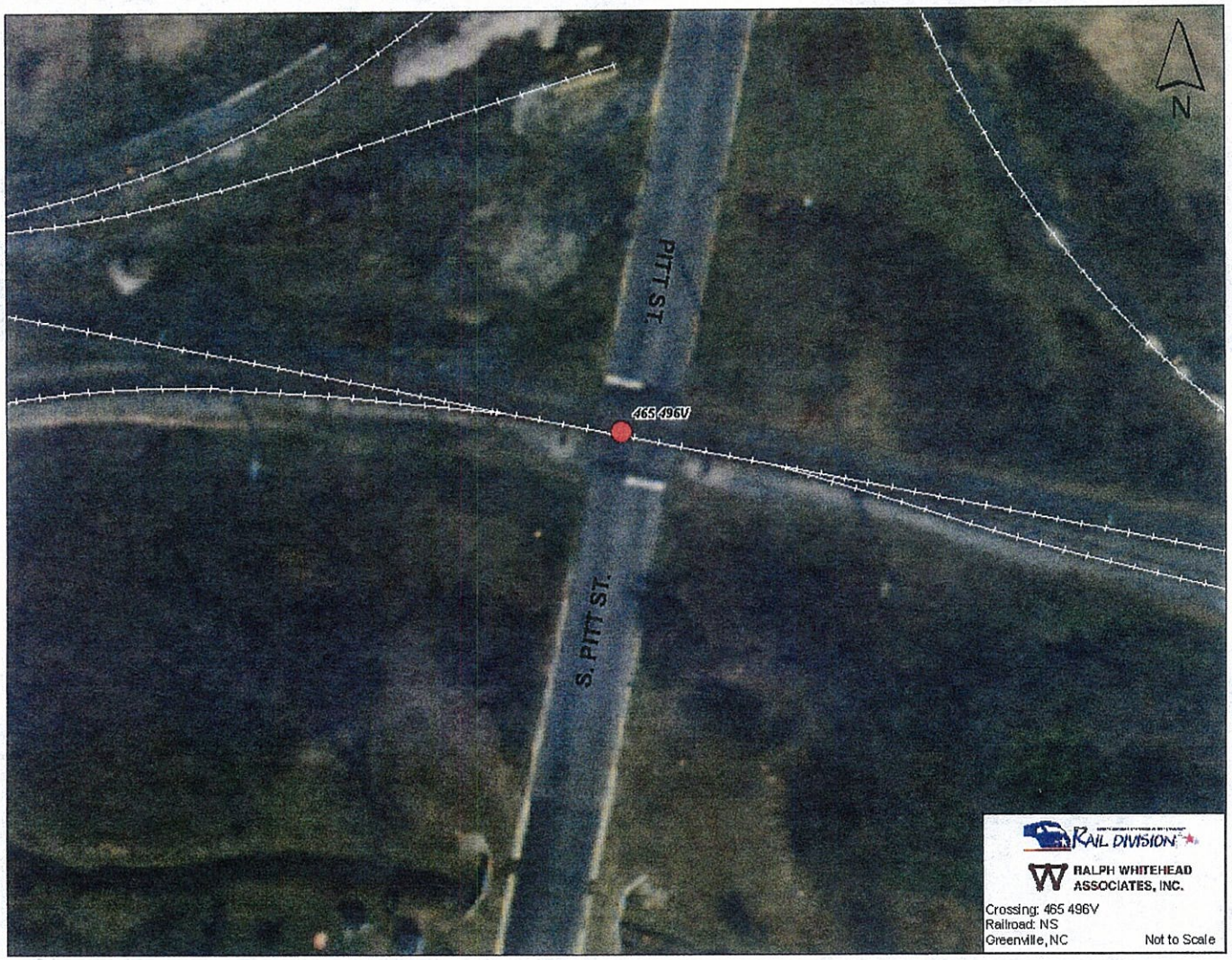


Figure C-26a

Crossing# 465 496V (S. Pitt St.)

Looking East

Looking North

Looking West

Looking South

Figure C-26b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 857G	AA 147.4	CSX	SR 1528/W. Belvoir Rd.	Local	Gates, CFL	Industrial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
7646	4	6-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Fair	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

Aerials

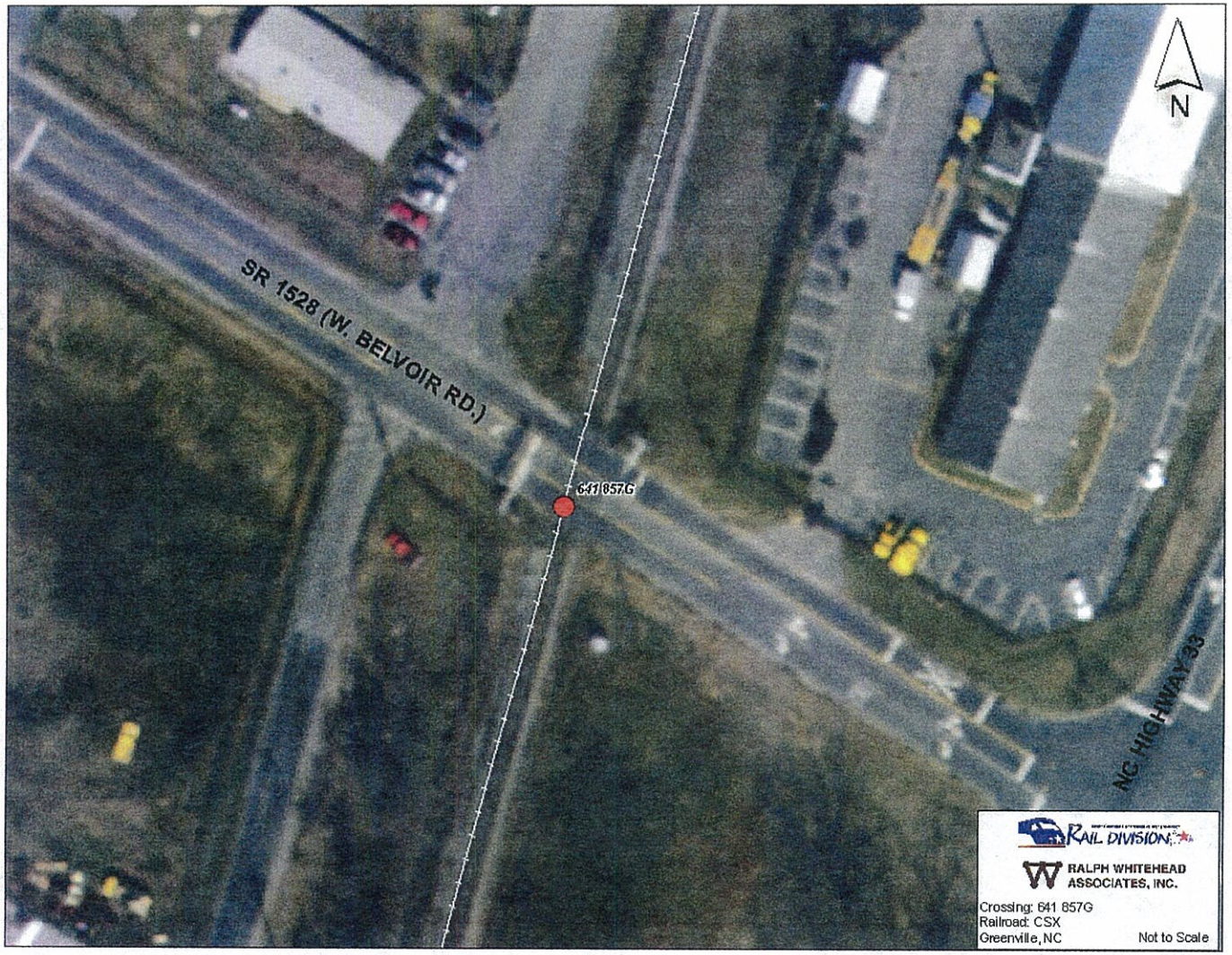


Figure C-27a

Crossing# 641 857G (SR 1528/Belvoir Rd.)

Looking East

Looking North

Looking West

Looking South

Figure C-27b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 515X	NS 149.8	NS	Arlington Blvd.	Major Thoroughfare	CB, Gates, CFL	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
22000	4	1-Fatality	Yes	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	Yes

Aerials

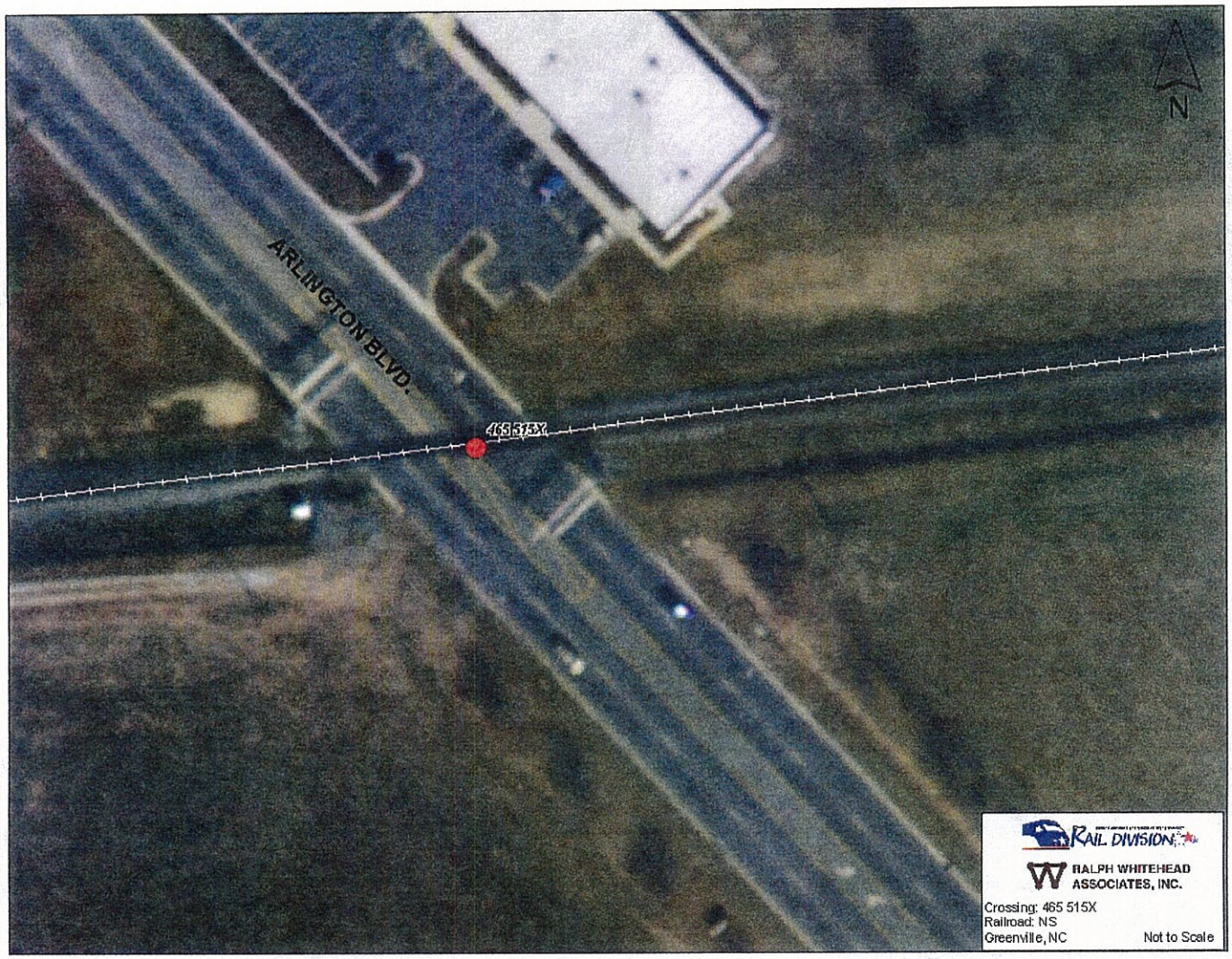
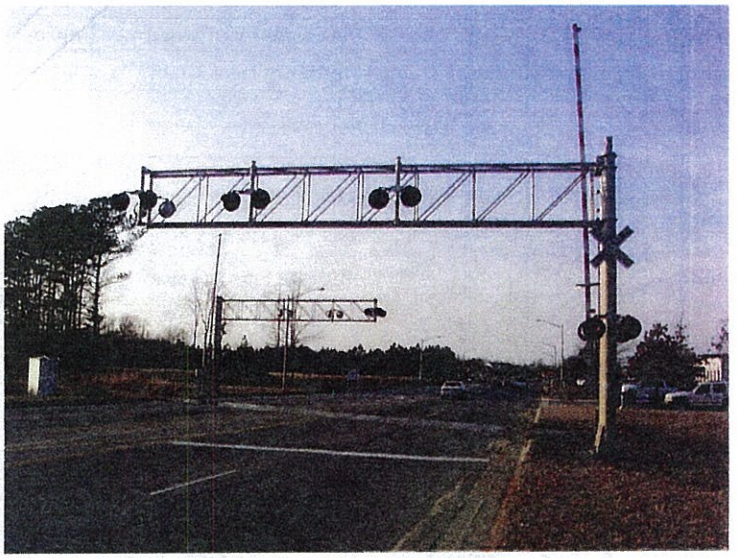


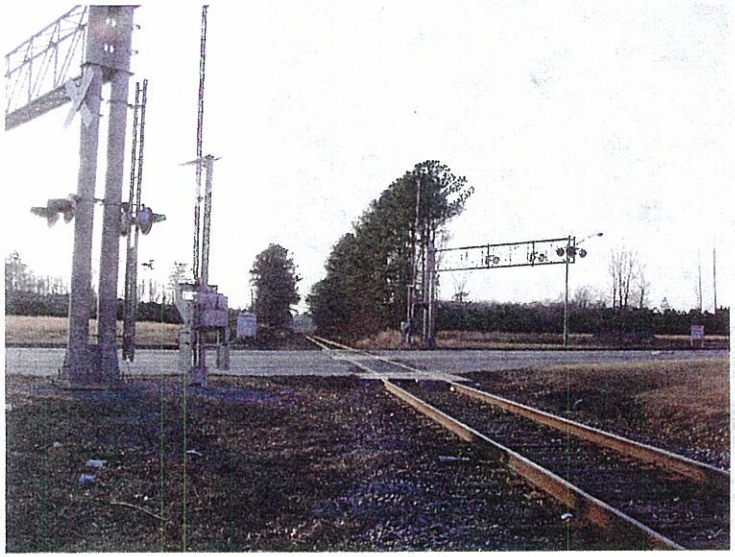
Figure C-28a

Crossing# 465 515X (Arlington Blvd.)

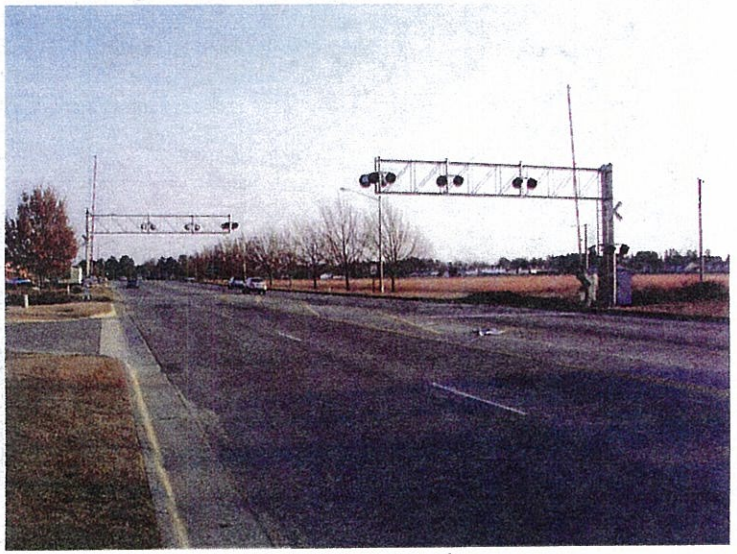
Looking East



Looking North



Looking West



Looking South

Figure C-28b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 514R	NS 149.4	NS	SR 1324/W. H. Smith Blvd.	Local	Gates, CFL	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
3057	4		Yes	No	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

Aerials

Figure C-29a

Crossing# 465 514R (SR1324/W. H. Smith Blvd.)

Looking East

Looking North

Looking West

Looking South

Figure C-29b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 495N	NS 146.8	NS	SR 1702/Evans St.	Major Thoroughfare	CB, Gates, CFL	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
18300	4		Yes	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	Yes

Aerials

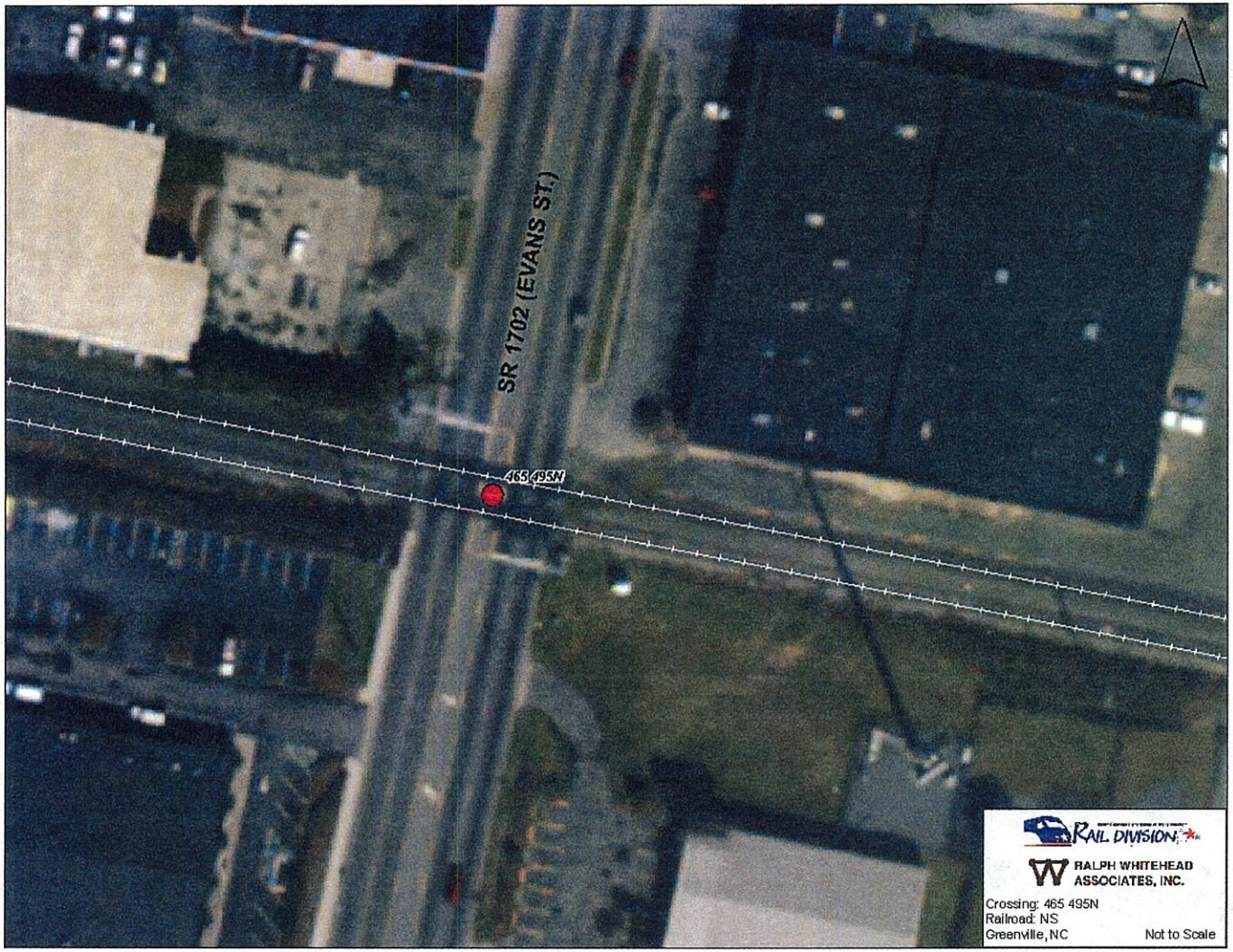
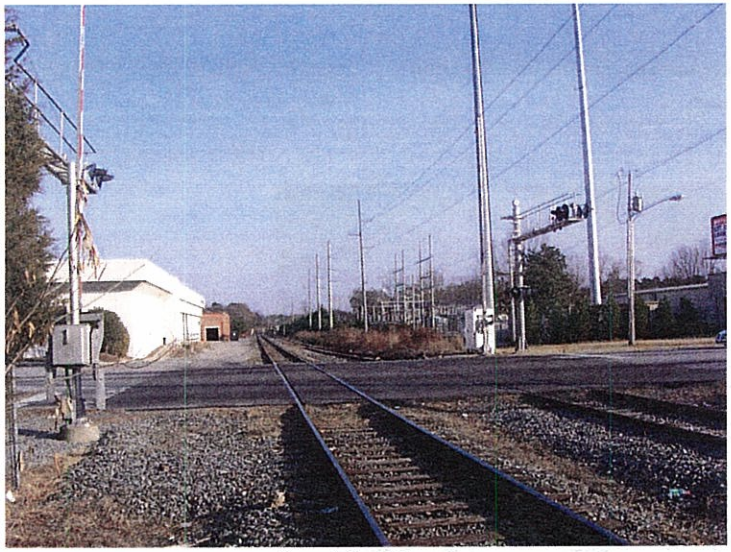


Figure C-30a

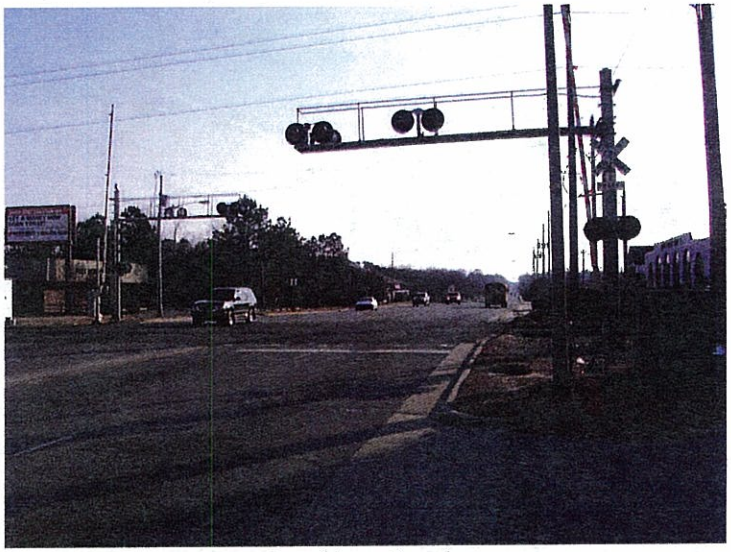
Crossing# 465 495N (SR 1702/Evans St.)



Looking East

Looking North

Looking West



Looking South

Figure C-30b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 489K	NS 145.1	NS	US 264/Greenville Blvd.	Major Thoroughfare	CB, Gates, CFL	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
21180	4		No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Fair	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	Yes

Aerials

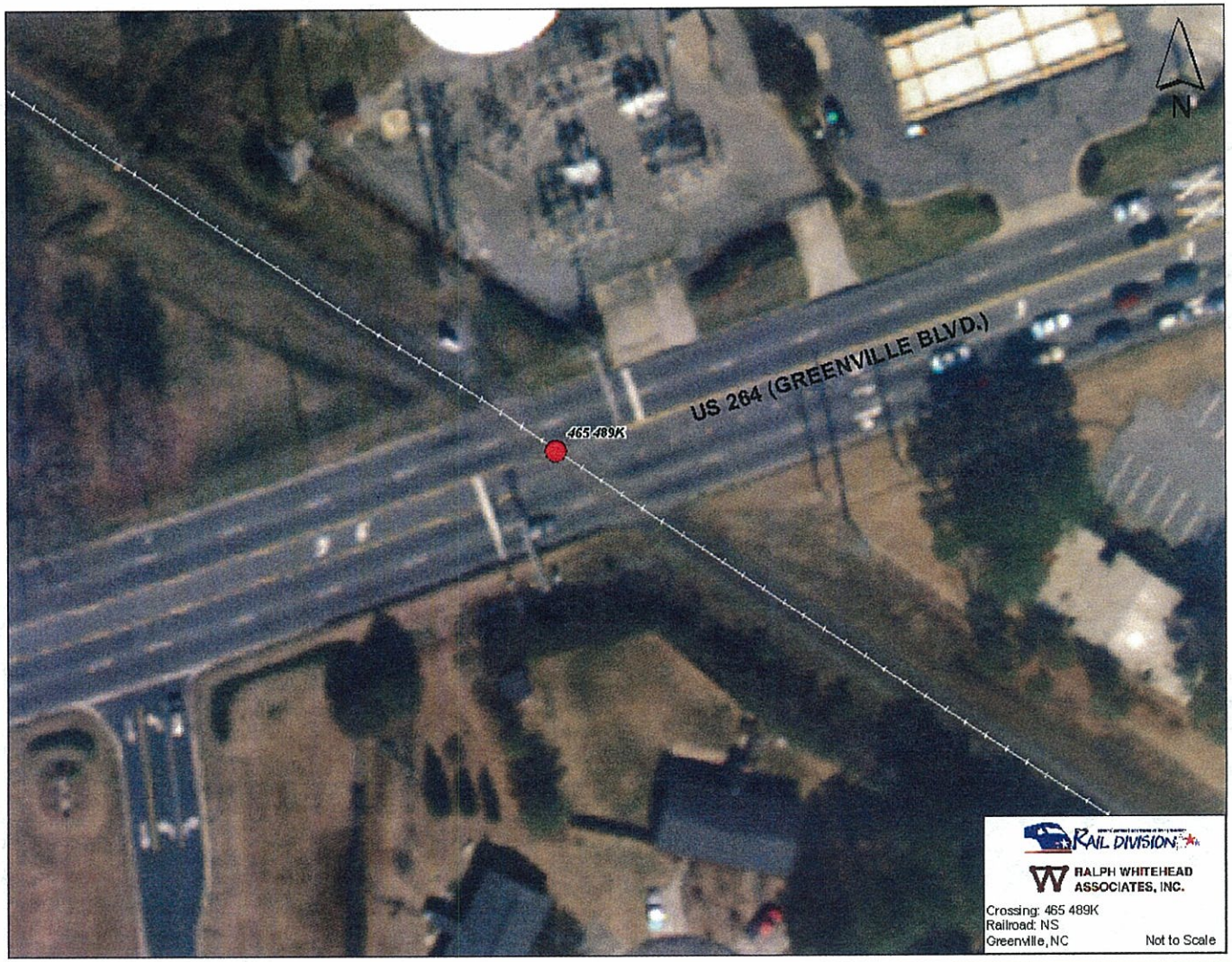
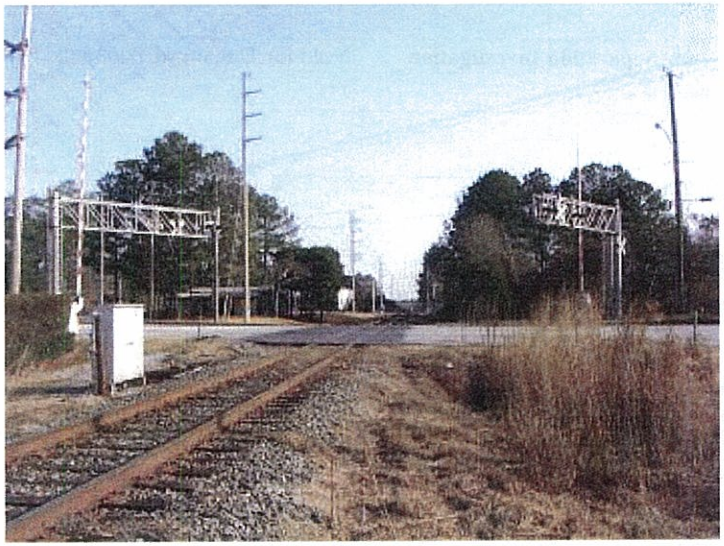


Figure C-31a

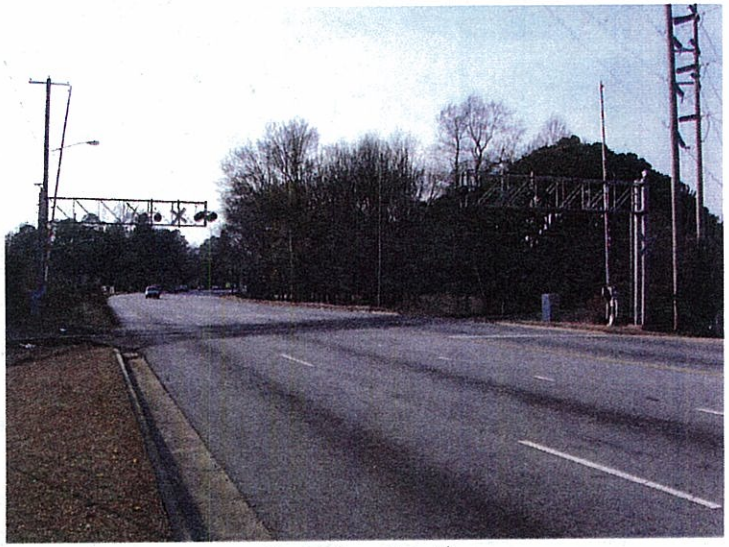
Crossing# 465 489K (US 264/Greenville Blvd.)



Looking East

Looking North

Looking West



Looking South

Figure C-31b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 557T	AA 149.16	CSX	W. 3rd St.	Local	Gates	Residential

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
2786	4	1-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☑	Poor	Fair	Poor	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

Aerials

Figure C-32a

Crossing# 641 557T (W. 3rd St.)

Looking East

Looking North

Looking West

Looking South

Figure C-32b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 488D	NS 145.0	NS	SR 1704/14th St.	Major Thoroughfare	CB, Gates, CFL	Commercial/Residenti

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
15595	4	1-Fatality, 3-Injury, 1-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	Yes

Aerials

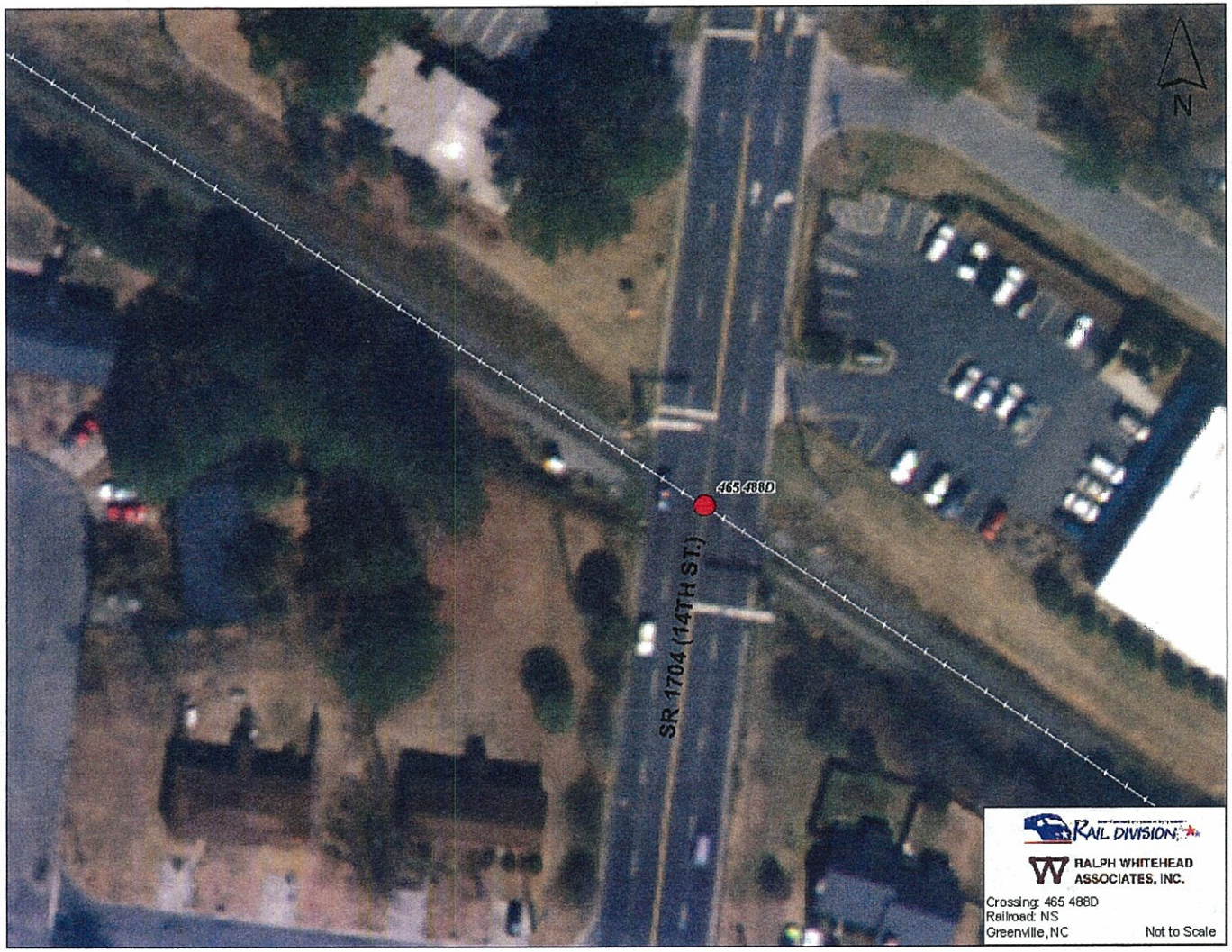


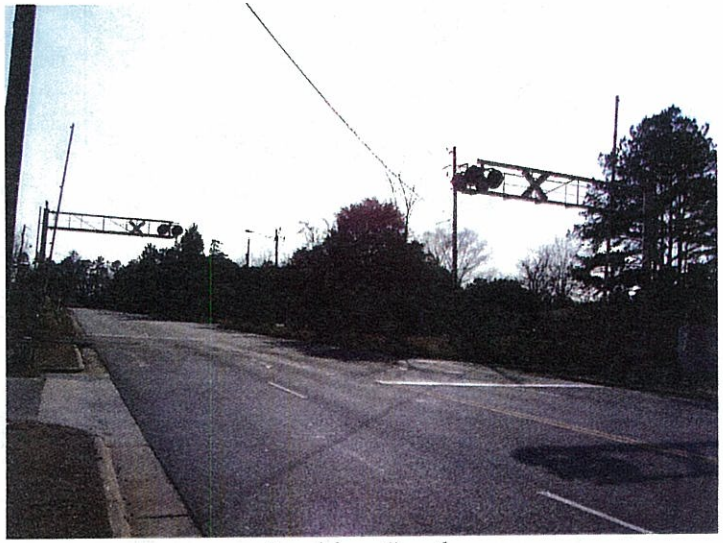
Figure C-33a

Crossing# 465 488D (SR 1704/14th St.)

Looking East

Looking North

Looking West



Looking South

Figure C-33b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 614E	AA 149.9	CSX	14th St.	Major Thoroughfare	CB, Gates, CFL	Residential/Commerci

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
14406	5	1-Injury, 4-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Fair	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	High	Yes

Aerials

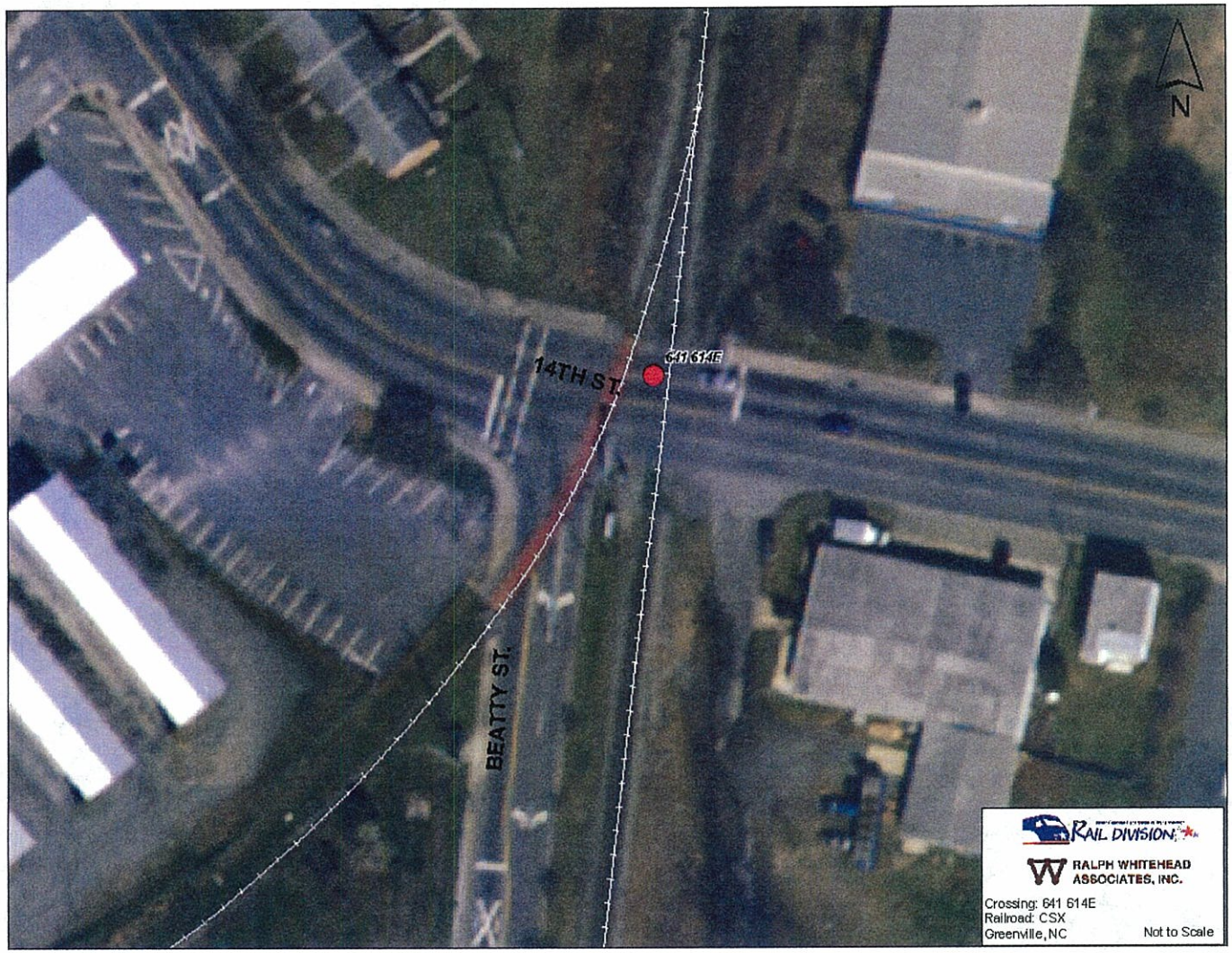


Figure C-34a

Crossing# 641 614E (14th St.)

Looking East

Looking North

Looking West

Looking South

Figure C-34b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 860P	AA 147.93	CSX	SR 1530/Airport Rd.	Major Thoroughfare	CB, CFL	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
7996	3	1-Injury, 8-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☑	☐	Good	Poor	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

Aerials

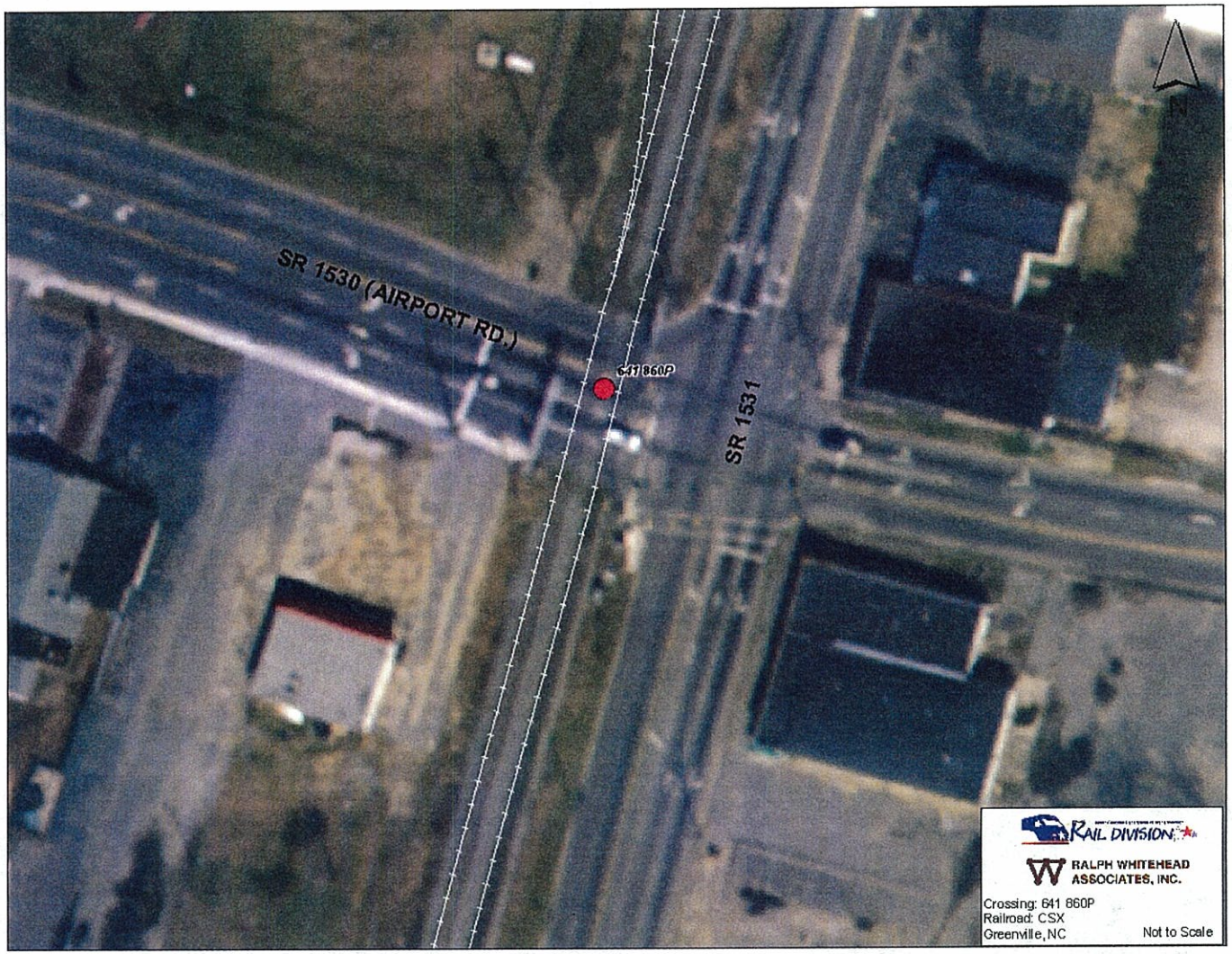


Figure C-35a

Crossing# 641 860P (SR 1530/Airport Rd.)

Looking East

Looking North

Looking West

Looking South

Figure C-35b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 516E	NS 150.3	NS	Spring Forest Rd.	Local	CB, MMFL, Bells	Commercial/Residenti

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
2503	4		Yes	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

Aerials

Figure C-36a

Crossing# 465 516E (Spring Forest Rd.)

Looking East

Looking North

Looking West

Looking South

Figure C-36b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 492T	NS 146.05	NS	W. Berkley Rd.	Local	CB, CFL, Bells	Institutional

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
4648	4	2-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

Aerials

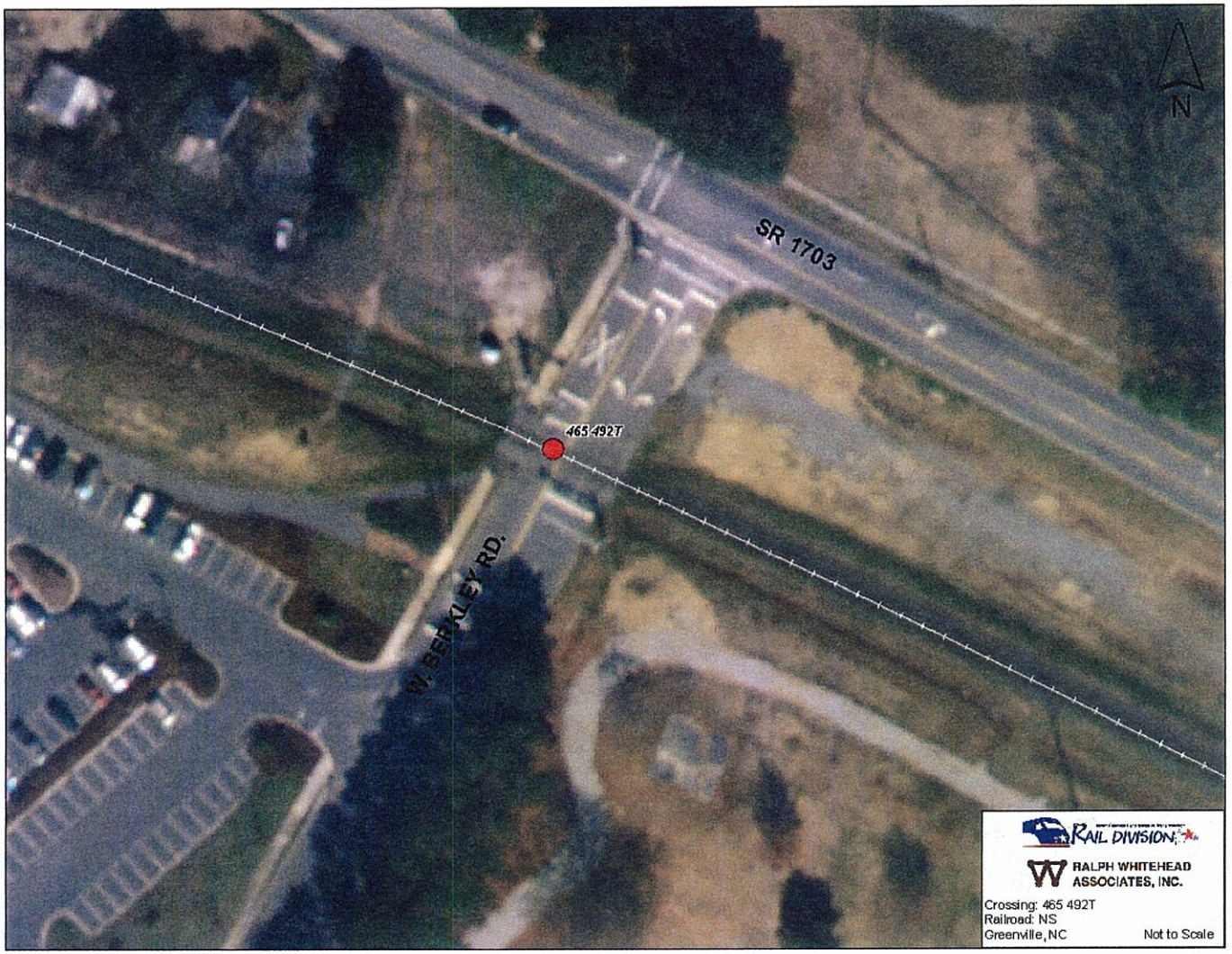


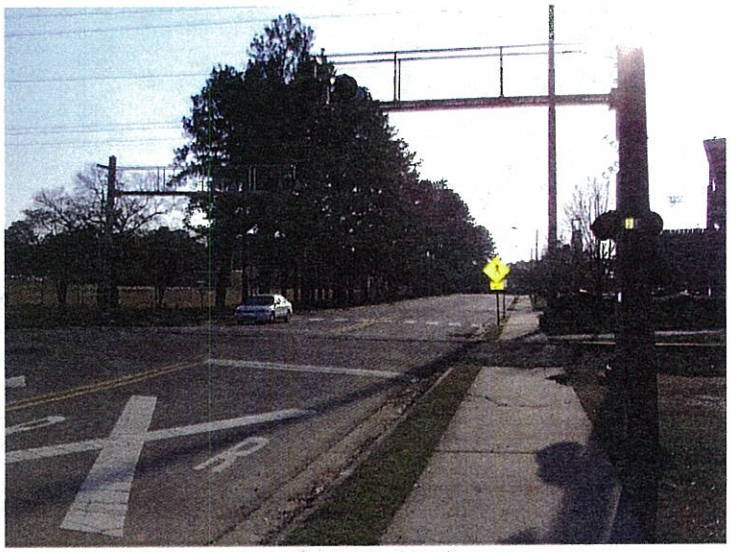
Figure C-37a

Crossing# 465 492T (W. Berkley Rd.)

Looking East

Looking North

Looking West



Looking South

Figure C-37b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 483U	NS 143.8	NS	SR 1809/Windsor Rd.	Local	CB, MMFL, Bells	Residential

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
584	4	1-Injury, 2-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

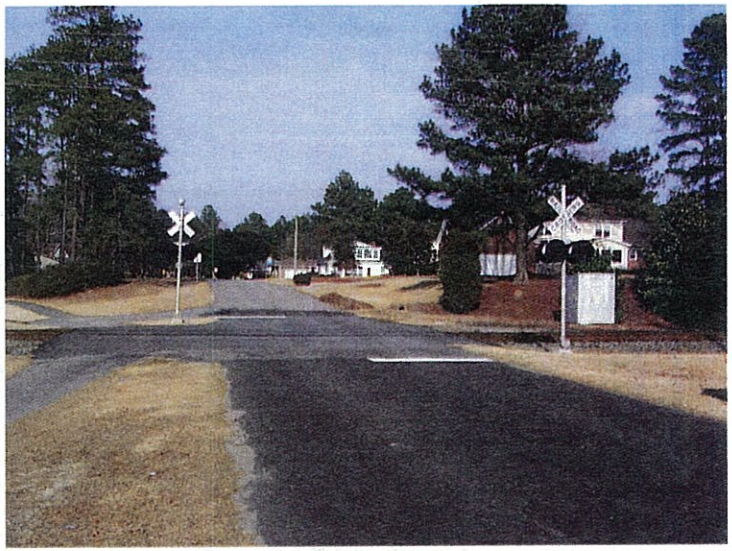
Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

Aerials

Figure C-38a

Crossing# 465 483U (SR 1809/Winsor Rd.)

Looking East



Looking North

Looking West

Looking South

Figure C-38b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 852X	AA 146.69	CSX	NC 33/N. Greene St.	Major Thoroughfare	CB, MMFL, Bells	Industrial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
11000	1	1-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Fair	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

Aerials

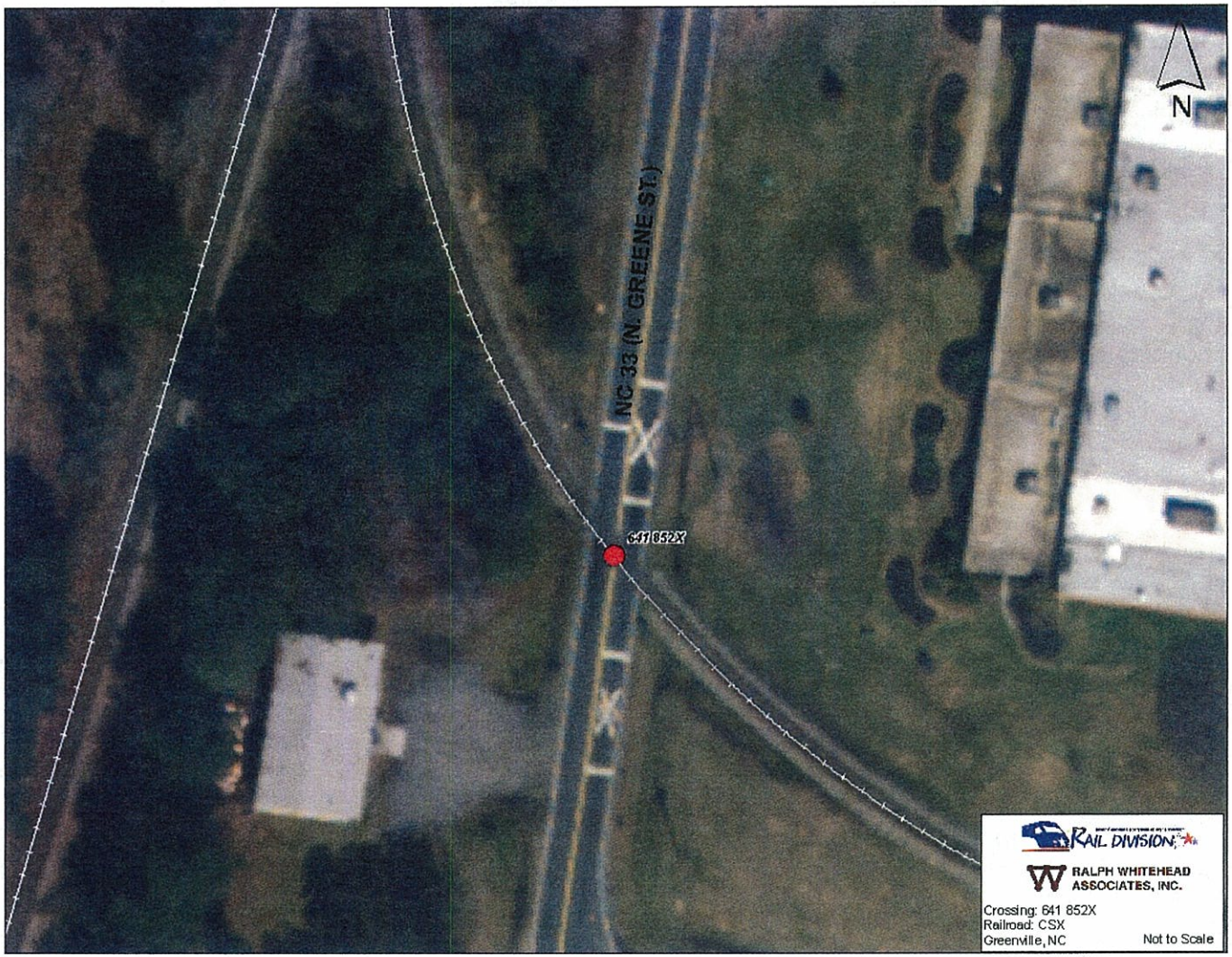


Figure C-39a

Crossing# 641 852X (NC 33/N. Greene St.)

Looking East

Looking North

Looking West

Looking South

Figure C-39b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 609H	AA 149.3	CSX	5th Street	Minor Thoroughfare	CB, MMFL	Residential

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
3998	5	1-Injury, 1-PDO	Yes	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Poor	Poor	Yes

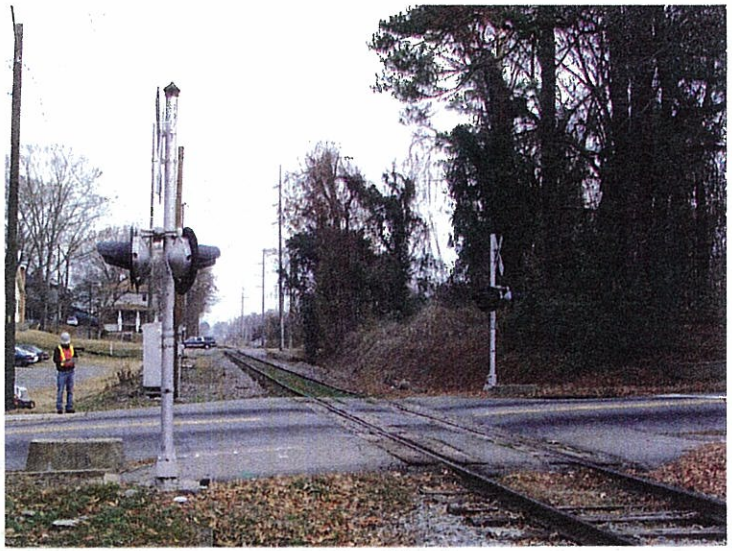
Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	No

Aerials

Figure C-40a

Crossing# 641 609H (5th Street)

Looking East



Looking North

Looking West

Looking South

Figure C-40b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 851R	AA 146.67	CSX	SR 1527/N. Greene St.	Major Thoroughfare	CB, Gates	Industrial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
5200	4	1-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Poor	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	No

Aerials

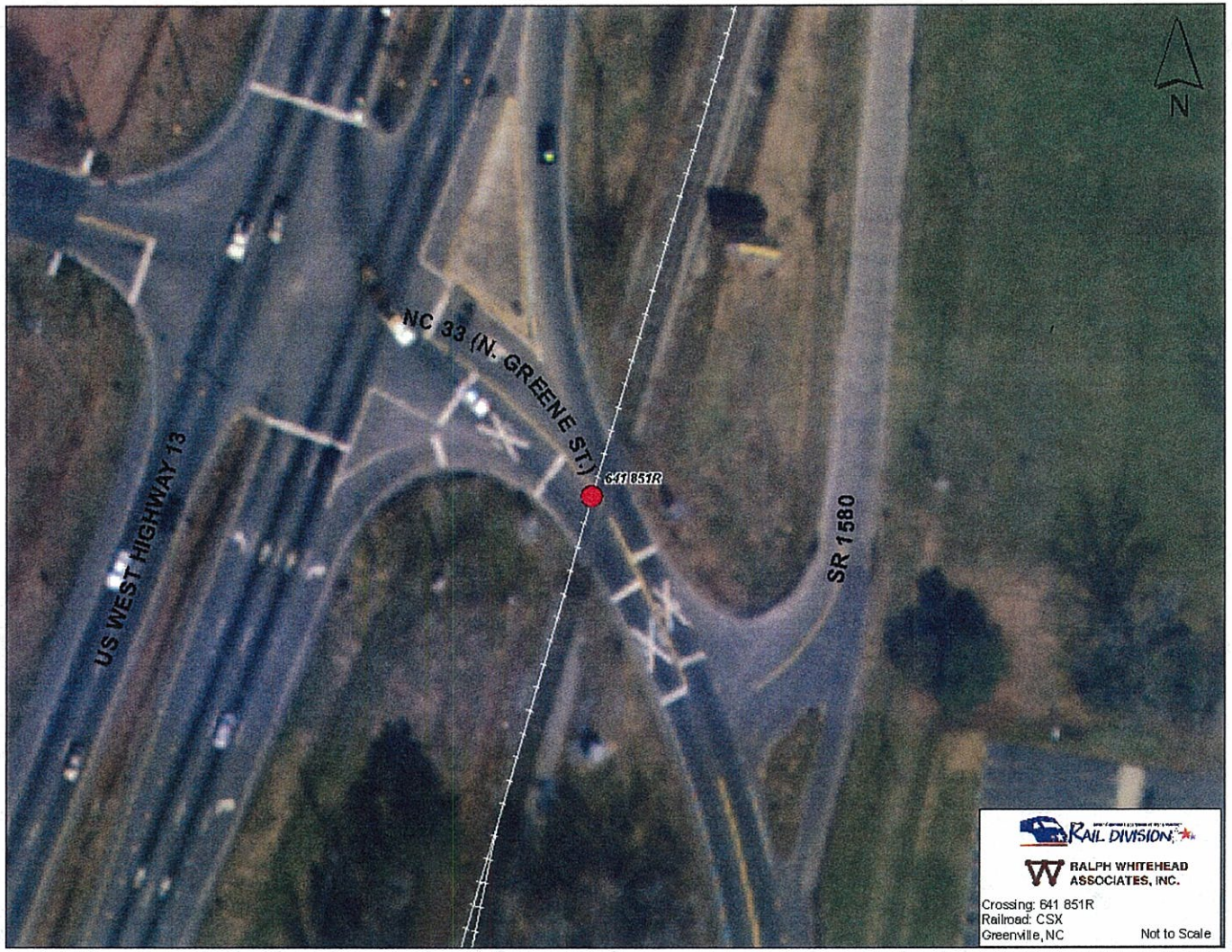


Figure C-41a

Crossing# 641 851R (SR 1527/ N. Greene St.)

Looking East

Looking North

Looking West

Looking South

Figure C-41b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 491L	NS 145.9	NS	Elm St.	Major Thoroughfare	CB, MMFL, Bells	Residential

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
9123	4	1-Injury	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

Aerials

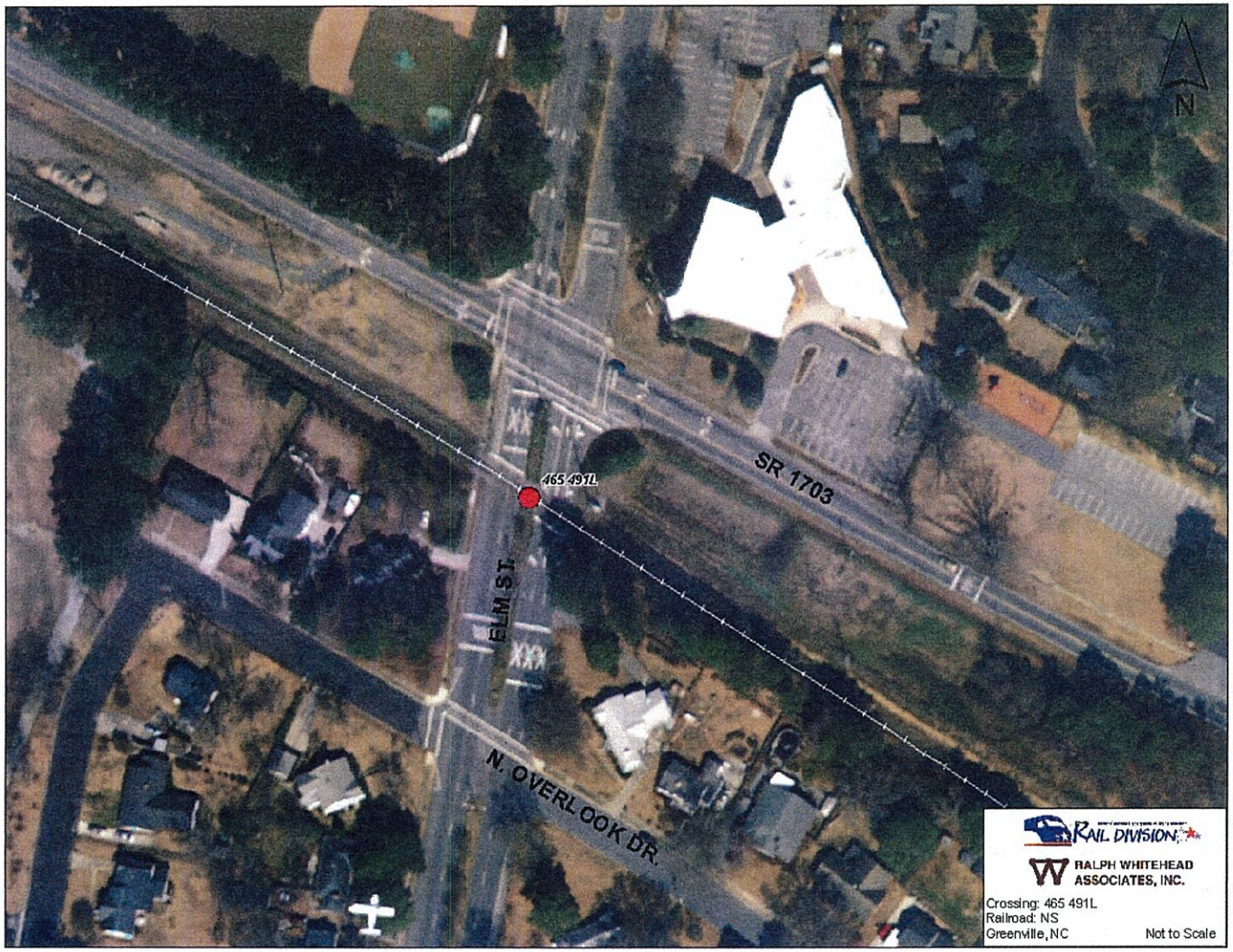


Figure C-42a

Crossing# 465 491L (Elm St.)

Looking East

Looking North

Looking West

Looking South

Figure C-42b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
465 506Y	NS 148.25	NS	Beatty St.	Local	CB	Industrial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
3481	4		No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Good	Good	No

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	Low	Low	Yes

Aerials

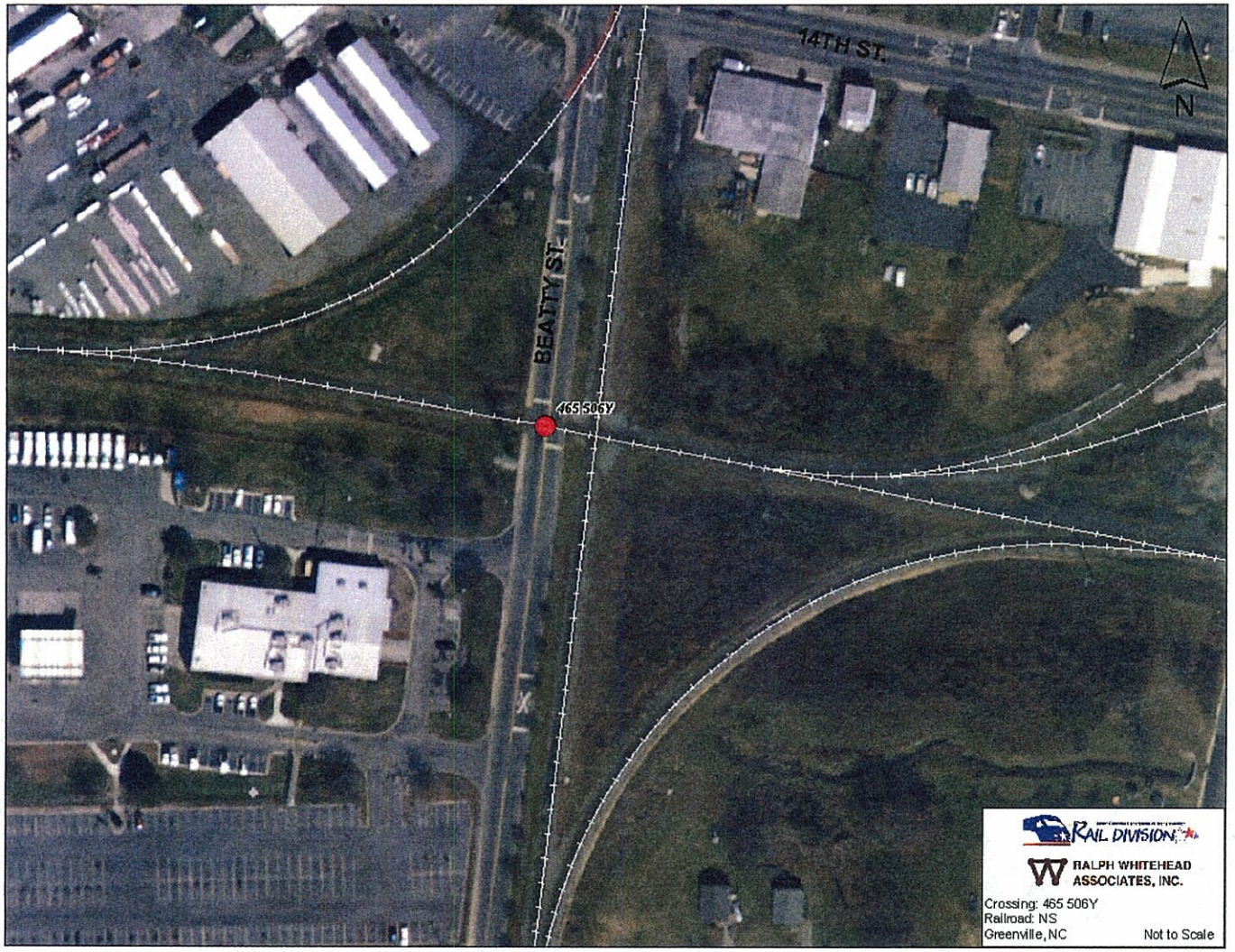
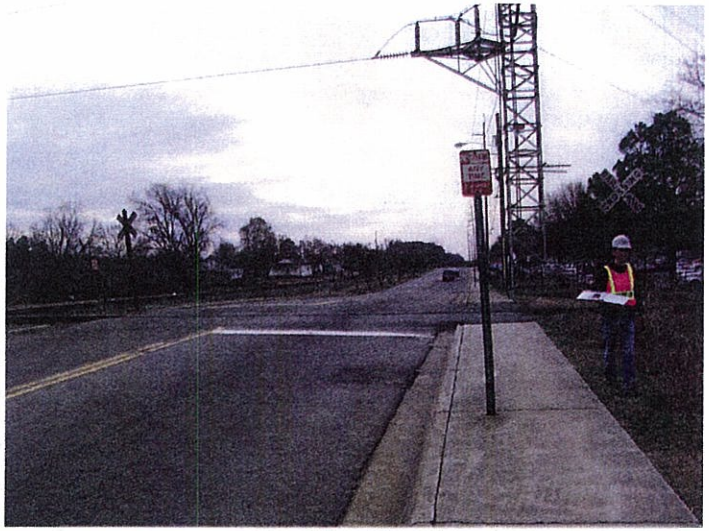


Figure C-43a

Crossing# 465 506Y (Beatty St.)

Looking East



Looking North

Looking West

Looking South

Figure C-43b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 854L	AA 149.66	CSX	SR 1598/W. 10th St.	Major Thoroughfare	CB, CFL, Bells	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
6068	5	1-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Poor	Good	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	High	High	No

Aerials

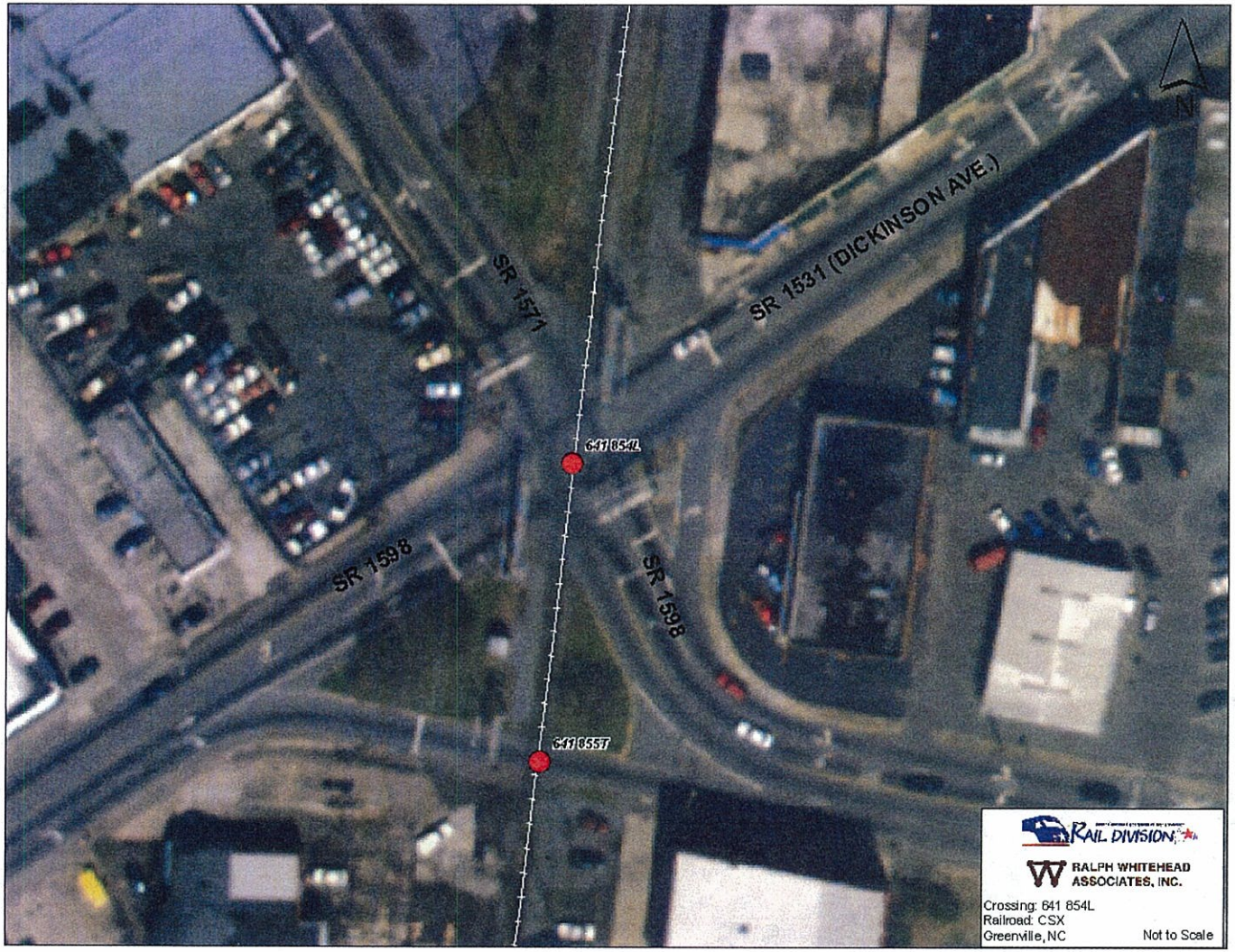


Figure C-44a

Crossing# 641 854L (SR 1598/W. 10th St.)

Looking East

Looking North

Looking West

Looking South

Figure C-44b

Crossing Number	Milepost	Railroad	Street Name	Street Classification	Warning Device	Land Use
641 855T	AA 149.64	CSX	SR 1531/Dickinson Ave.	Major Thoroughfare	CB, CFL, Bells	Commercial

24 Hour ADT	24 Hour Train Volume	Accident History	Transit Route	School Bus Route	Truck Route
11257	4	2-PDO	No	Yes	NA

Preemption	Humped Crossing	Crossing Condition_Geometry	Crossing Surface Condition	Crossing Condition_Sight	Redundant Crossing
☐	☐	Good	Fair	Good	Yes

Economic Impact if Closed	Feasibility of Roadway Improvements	Grade Separation Investigation	Need for Enhanced Warning Devices
High	High	High	No

Aerials

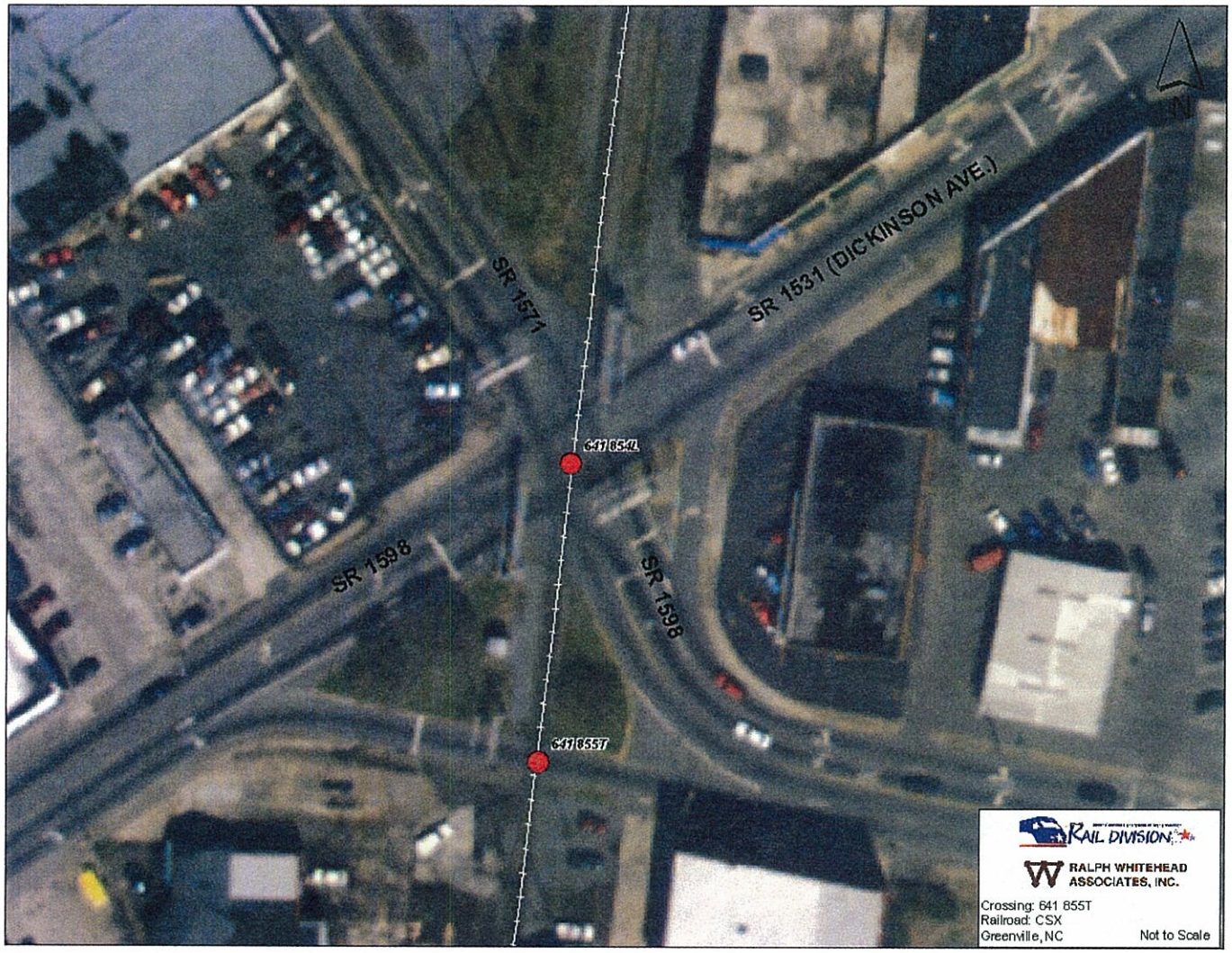


Figure C-45a

Crossing# 641 855T (SR 1531/Dickinson St.)

Looking East

Looking North

Looking West

Looking South

Figure C-45b

CROSSING ANALYSIS

D. CROSSING ANALYSIS

1. Exposure Index

NCDOT uses an exposure index as one indicator to determine if a grade separation structure is warranted at highway/rail grade crossings. The exposure index is calculated by multiplying the number of trains per day by the number of vehicles per day that use the crossing. As a general rule, grade separations should be considered in RURAL areas when the exposure index is 15,000 or more. In URBAN areas grade separations should be considered when the exposure index is 30,000 or more. Other factors that need to be considered in the feasibility of grade separations are:

- Accident history
- Topography
- Adjacent land use
- Construction impacts
- Costs

The exposure index was calculated for each of the 45 crossings.

Table D-1 contains the exposure index calculations for each of the 45 crossings. Nineteen (19) crossings exceeded the exposure index of 30,000.

2. Delay Analysis

Level of Service is a measure of the operational efficiency of the highway/rail 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 D-2 summarizes the average delay and corresponding level of service.

TABLE D-2 - LOS

Level of Service	Avg. Delay/Vehicle (seconds)
A	10.0
B	>10.0 to 15.0
C	>15.0 to 25.0
D	>25.0 to 35.0
E	>35.0 to 50.0
F	>50.0

The delay calculations are based on the methodology developed for the Proposed Conrail Acquisition Draft Environmental Impact Statement (DEIS) by the Surface Transportation Board's Sections of Environmental Analysis (SEA) and 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 day
- Maximum vehicle queue
- Total stopped vehicle delay per day
- Average delay for all vehicles
- Traffic level of service (LOS)

The level of service (LOS) for each of the 45 crossings was determined based on these computed values and the Highway Capacity Manual procedures. Table D-3 summarizes the delay and LOS results for the existing conditions.

The six following highway/rail grade crossings had a LOS F (> 50 seconds of avg. delay/vehicle):

- US 264-Greenville Boulevard (Crossing # 465 489K)
- SR 1702-Evans Street (Crossing # 465 495N)
- South Pitt Street (Crossing # 465 496V)
- US 13-Memorial Drive (Crossing # 465 512C)
- Arlington Boulevard (Crossing # 465 515X)
- West 10th Street (Crossing # 465 708W)

3. Accident Analysis

Ten accidents involving train/vehicle collisions have been reported at 30 of the 45 crossings within the past 10 years.

Accidents are summarized using the following classifications:

Fatality
Injury
PDO – property damage only

Table G-4 summarizes the accident data for the past 10 years.

4. Benefit/Cost Ratios

Benefit/cost ratios were determined using the Federal Railroad Administration's "GradeDec Version 2.0" 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 the rail lines separately and with all 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 this section:

The Near Term Recommended Improvements Benefit/Cost Analysis evaluated all of the projects listed under Section 1 of Chapter H, as well as the No Action Recommendations under Section 4 of Chapter H. The result is:

- Near Term: Benefit/Cost Ratio = 2.40

The Long Term Recommended Improvements Benefit/Cost Analysis evaluated all of the projects listed within every section of this Chapter. The result is:

- All Recommended Improvements (Near and Long Term)
  Average Benefit/Cost Ratio = 2.56

Table D-5 shows the near term and long term evaluation tables that are outputs of the GradeDec2000 program.

TABLE D-1 – Exposure Index

CSX Crossings

CROSSING NO.	STREET NAME	TRAINS PER DAY	ADT	EXPOSURE INDEX
641 553R	Dudley St	3	1,075	3,225
641 557T	W. 3rd St	3	2,786	8,358
641 558A	W. 4th St	3	1,176	3,528
641 609H	5th St	4	3,998	15,992
641 610C	Alley St	4	321	1,284
641 614E	14th St	4	14,406	57,624
641 615L	Howell St	4	5,462	21,848
641 618G	US 264 Alt./Greenville Blvd	4	37,372	149,488
641 620H	SR 1708/Fire Tower Rd	4	17,795	71,180
641 847B	NC 903	3	7,649	22,947
641 850J	SR 1579/Staton Rd	3	7,470	22,410
641 851R	SR 1527/N. Greene St	3	5,200	15,600
641 852X	NC 33/N. Greene St	1	11,000	11,000
641 853E	SR 1591/Industrial Blvd	1	2,800	2,800
641 854L	SR 1598/W. 10th St	4	6,068	24,272
641 855T	SR 1531/Dickinson Ave	4	11,257	45,028
641 857G	SR 1528/W. Belvoir Rd	3	7,646	22,938
641 860P	SR 1530/Airport Rd	3	1,732	5,196
642 719W	Arlington Blvd	4	30,839	123,356
641 859V	Gum Rd	1	320	320

CLNA/NS Crossings

CROSSING NO.	STREET NAME	TRAINS PER DAY	ADT	EXPOSURE INDEX
465 483U	SR 1809/Windsor Rd	4	584	2,336
465 485H	SR 1807/Oxford Rd	4	2,039	8,156
465 488D	SR 1704/14th St	4	15,595	62,380
465 489K	US 264/Greenville Blvd	4	21,180	84,720
465 490E	Brownlea Dr	4	1,339	5,356
465 491L	Elm St	4	9,123	36,492
465 492T	W. Berkley Rd	4	4,648	18,592
465 495N	SR 1702/Evans St	4	18,300	73,200
465 496V	S. Pitt St	8	950	7,600
465 506Y	Beatty St	8	3,481	27,848
465 509U	Skinner St	6	1,375	8,250
465 512C	US 13/Memorial Dr	6	22,000	132,000
465 514R	SR 1324/W. H. Smith Blvd	1	3,057	3,057
465 515X	Arlington Blvd	1	22,000	22,000
465 516E	Spring Forest Rd	1	2,503	2,503
465 517L	SR 1203/Allen Rd	4	9,269	37,076
465 704U	W. 14th St	2	12,600	25,200
465 705B	W. 13th St	2	219	438
465 706H	W. 12th St	2	923	1,846
465 707P	W. 11th St	2	162	324
465 708W	W.10th St	2	11,649	23,298
465 709D	W. 9th St	2	1,041	2,082
904 748H	Moye Hooker Connection/Line Ave	6	10,546	63,276
465 482M	SR 1726/Portertown Rd	4	6,483	25,932
	Ficklen St	0	-	-

TABLE D-3 – Delay and LOS

CSX Crossings

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_f	LOS
641 553R	Dudley St	1	1,075	1.49	30.00	2	40	9,000	2.56	2.69	5.40	4	3	1.35	0.60	A
641 557T	W. 3rd St	1	2,786	3.87	30.00	4	20	9,000	5.11	5.87	133.37	45	14	2.94	5.74	A
641 558A	W. 4th St	1	1,176	1.63	30.00	5	20	9,000	5.11	5.41	59.71	22	6	2.70	6.09	A
641 609H	5th St	1	3,998	5.55	30.00	5	20	9,000	5.11	6.28	273.31	87	20	3.14	8.20	A
641 610C	Alley St	1	321	0.45	30.00	10	20	9,000	5.11	5.19	30.03	12	2	2.60	11.23	B
641 614E	14th St	2	14,406	20.01	60.00	5	20	9,000	5.11	15.35	5895.86	768	37	7.68	49.11	E
641 615L	Howell St	1	5,462	7.59	30.00	12	40	9,000	2.56	3.42	266.53	156	14	1.71	5.86	A
641 618G	US 264 Alt./Greenville Blvd	2	37,372	51.91	60.00	5	35	9,000	2.92	-4.00	1039.06	-519	55	-2.00	3.34	A
641 620H	SR 1708/Fire Tower Rd	1	17,795	24.72	30.00	5	40	9,000	2.56	14.51	6508.39	897	45	7.26	43.89	E
641 847B	NC 903	1	7,649	10.62	30.00	4	40	9,000	2.56	3.96	166.48	84	20	1.98	2.61	A
641 850J	SR 1579/Staton Rd	1	7,470	10.38	30.00	5	40	9,000	2.56	3.91	198.12	101	19	1.95	3.18	A
641 851R	SR 1527/N. Greene St	1	5,200	7.22	30.00	4	20	9,000	5.11	6.74	327.60	97	27	3.37	7.56	A
641 852X	NC 33/N. Greene St	1	11,000	15.28	30.00	1	10	9,000	10.23	20.84	1658.88	159	113	10.42	18.10	C
641 853E	SR 1591/Industrial Blvd	1	2,800	3.89	30.00	1	35	9,000	2.92	3.36	10.96	7	8	1.68	0.47	A
641 854L	SR 1598/W. 10th St	1	6,068	8.43	30.00	5	20	9,000	5.11	7.11	532.76	150	31	3.56	10.54	B
641 855T	SR 1531/Dickinson Ave	1	11,257	15.63	30.00	4	20	9,000	5.11	10.68	1783.05	334	58	5.34	19.01	C
641 857G	SR 1528/W. Belvoir Rd	1	7,646	10.62	30.00	4	35	9,000	2.92	4.52	217.27	96	22	2.26	3.41	A
641 860P	SR 1530/Airport Rd	2	1,732	2.41	60.00	3	35	9,000	2.92	3.18	18.21	11	3	1.59	1.26	A
642 719W	Arlington Blvd	2	30,839	42.83	60.00	5	35	9,000	2.92	-6.83	2498.73	-732	45	-3.42	9.72	A
641 859V	Gum Rd	1	320	1.49	30.00	2	40	9,000	2.56	2.69	1.61	1	1	1.35	0.60	A

TABLE D-3 (Con't) – Delay and LOS

CLNA/NS Crossings

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_I	LOS
465 483U	SR 1809/Windsor Rd	1	584	0.81	30.00	4	49.00	9,000	2.09	2.15	3.73	3	1	1.07	0.77	A
465 485H	SR 1807/Oxford Rd	1	2,039	2.83	30.00	4	49.00	9,000	2.09	2.30	15.04	13	4	1.15	0.89	A
465 488D	SR 1704/14th St	2	15,595	21.66	60.00	4	35.00	9,000	2.92	10.51	2392.86	455	23	5.26	18.41	C
465 489K	US 264/Greenville Blvd	2	21,180	29.42	60.00	4	35.00	9,000	2.92	150.28	664333.22	8841	31	75.14	3763.93	F
465 490E	Brownlea Dr	1	1,339	1.86	30.00	4	10.00	9,000	10.23	10.90	221.08	41	14	5.45	19.81	C
465 491L	Elm St	2	9,123	12.67	60.00	4	35.00	9,000	2.92	5.06	324.25	128	13	2.53	4.27	A
465 492T	W. Berkley Rd	1	4,648	6.46	30.00	4	35.00	9,000	2.92	3.72	89.49	48	14	1.86	2.31	A
465 495N	SR 1702/Evans St	2	18,300	25.42	60.00	4	10.00	9,000	10.23	66.94	113898.47	3403	94	33.47	746.88	F
465 496V	S. Pitt St	1	12,680	17.61	30.00	8	10.00	9,000	10.23	24.77	21603.01	1745	130	12.38	204.44	F
465 506Y	Beatty St	1	3,481	4.83	30.00	4	25.00	9,000	4.09	4.88	114.99	47	14	2.44	3.96	A
465 509U	Skinner St	1	1,375	1.91	30.00	6	35.00	9,000	2.92	3.12	27.90	18	4	1.56	2.43	A
465 512C	US 13/Memorial Dr	3	7,955	11.05	90.00	6	10.00	9,000	10.23	16.19	4343.89	537	27	8.09	65.53	F
465 514R	SR 1324/W. H. Smith Blvd	2	3,057	4.25	60.00	4	49.00	9,000	2.09	2.43	25.10	21	3	1.22	0.99	A
465 515X	Arlington Blvd	2	22,000	30.56	60.00	4	49.00	9,000	2.09	-112.71	388155.03	-6888	23	-56.35	2117.21	F
465 516E	Spring Forest Rd	1	2,503	3.48	30.00	4	49.00	9,000	2.09	2.36	19.37	16	5	1.18	0.93	A
465 517L	SR 1203/Allen Rd	1	9,269	12.87	30.00	4	45.00	9,000	2.27	3.98	204.04	103	21	1.99	2.64	A
465 704U	W. 14th St	2	12,600	17.50	60.00	0	10.00	9,000	10.23	24.55	0.00	0	64	12.27	0.00	A
465 705B	W. 13th St	1	219	0.30	30.00	3	10.00	9,000	10.23	10.33	24.35	5	2	5.17	13.34	B
465 706H	W. 12th St	1	923	1.28	30.00	3	10.00	9,000	10.23	10.68	109.74	21	9	5.34	14.27	B
465 707P	W. 11th St	1	162	0.23	30.00	3	10.00	9,000	10.23	10.30	17.92	3	2	5.15	13.27	B
465 708W	W.10th St	2	11,649	16.18	60.00	3	10.00	9,000	10.23	22.20	5980.14	539	60	11.10	61.60	F
465 709D	W. 9th St	1	1,041	1.45	30.00	6	35.00	9,000	2.92	3.07	20.44	13	3	1.54	2.36	A
904 748H	Moye Hooker Connection/Line Ave	1	10,546	14.65	30.00	4	49.00	9,000	2.09	4.08	243.64	119	22	2.04	2.77	A
465 482M	SR 1726/Portertown Rd	1	6,483	9.00	30.00	4	49.00	9,000	2.09	2.98	80.08	54	14	1.49	1.48	A
	Ficklen St	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE D-4 – Accident Summary

CSX Crossings								
Crossing Number	Railroad	Street Name	Total # of Accidents	# with Fatalities	# with Injuries	# with PDO	Unknown	Remarks
641 553R	AA 148.02	Dudley St	0	0	0	0	0	
641 557T	AA 149.16	W. 3rd St	0	0	0	0	0	
641 558A	AA 149.22	W. 4th St	0	0	0	0	0	
641 609H	AA 149.3	5th St	2	0	1	1	0	stopped on crossing, unknown
641 610C	AA 149.42	Alley St	0	0	0	0	0	
641 614E	AA 149.9	14th St	1	0	0	0	0	drove around or thru the gate
641 615L	AA 150.2	Howell St	2	0	1	6	0	did not stop
641 618G	AA 151.91	US 264 Alt./Greenville Blvd	1	0	0	0	0	SUV ran into Hi-Rail vehicle
641 620H	AA 153.8	SR 1708/Fire Tower Rd	0	0	0	0	0	
641 847B	AA 145.2	NC 903	0	0	0	0	0	
641 850J	AA 146.41	SR 1579/Staton Rd	0	0	0	0	0	
641 851R	AA 146.67	SR 1527/N. Greene St	0	0	0	0	0	
641 852X	AA 146.69	NC 33/N. Greene St	0	0	0	0	0	
641 853E	AA 146.69	SR 1591/Industrial Blvd	0	0	0	0	0	
641 854L	AA 149.66	SR 1598/W. 10th St	0	0	0	0	0	
641 855T	AA 149.64	SR 1531/Dickinson Ave	0	0	0	0	0	
641 857G	AA 147.4	SR 1528/W. Belvoir Rd	0	0	0	0	0	
641 860P	AA 147.93	SR 1530/Airport Rd	2	0	0	0	0	drove around or thru the gate, stopped and then proceeded & did not stop
642 719W	AA 150.7	Arlington Blvd	0	0	0	0	0	
641 859V	AA 147.86	Gum Rd	0	0	0	0	0	

TABLE D-4 (Con't) – Accident Summary

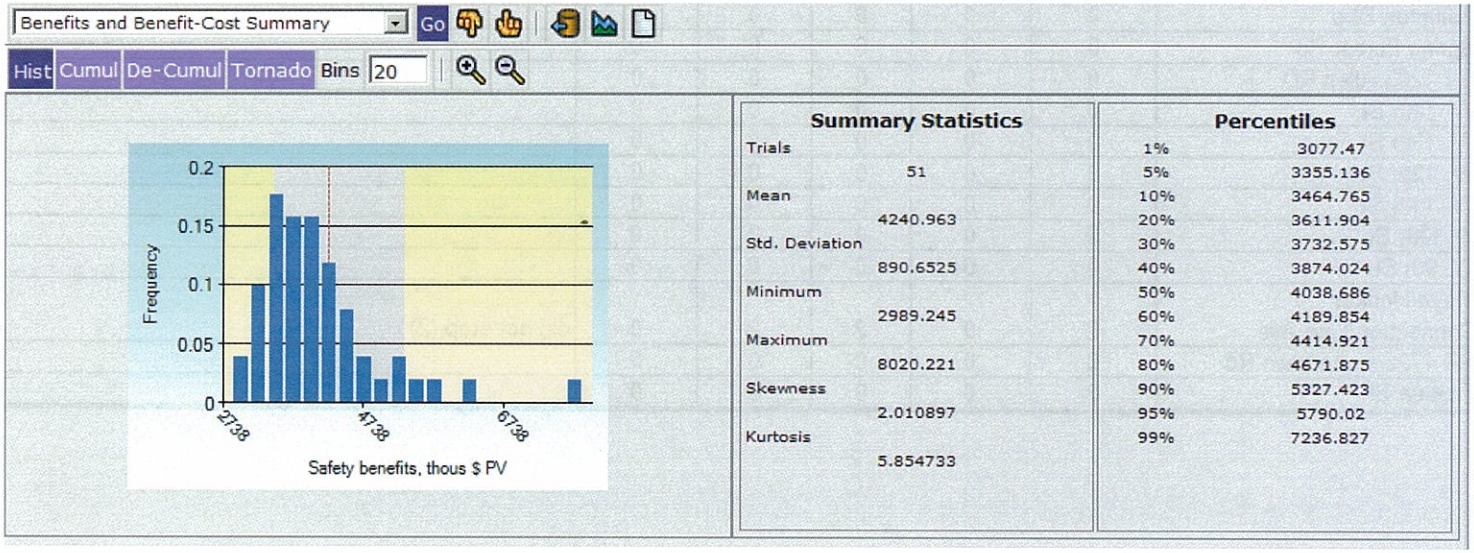
CLNA/NS Crossings

Crossing Number	Railroad	Street Name	Total # of Accidents	# with Fatalities	# with Injuries	# with PDO	Unknown	Remarks
465 483U	NS 143.8	SR 1089/Winsor Rd	0	0	0	0	0	
465 485H	NS 144.2	SR 1807/Oxford Rd	0	0	0	0	0	
465 488D	NS 145	SR 1704/14th St	0	0	0	0	0	
465 489K	NS 145.1	US 264/Greenville Blvd	0	0	0	0	0	
465 490E	NS 145.3	Brownlea Dr	0	0	0	0	0	
465 491L	NS 145.9	Elm St	0	0	0	0	0	
465 492T	NS 146.05	W. Berkley Rd	0	0	0	0	0	
465 495N	NS 146.8	SR 1702/Evans St	0	0	0	0	0	
465 496V	NS 148.1	S. Pitt St	0	0	0	0	0	
465 506Y	NS 148.25	Beatty St	0	0	0	0	0	
465 509U	NS 148.7	Skinner St	0	0	0	0	0	
465 512C	NS 149.1	US 13/Memorial Dr	0	0	0	0	0	
465 514R	NS 149.4	SR 1324/W. H. Smith Blvd	0	0	0	0	0	
465 515X	NS 149.8	Arlington Blvd	0	0	0	0	0	
465 516E	NS 150.3	Spring Forest Rd	0	0	0	0	0	
465 517L	NS 150.7	SR 1203/Allen RD	0	0	0	0	0	
465 704U	NS 146.9	W. 14th St	0	0	0	0	0	
465 705B	NS 146.9	W. 13th St	0	0	0	0	0	
465 706H	NS 146.9	W. 12th St	0	0	0	0	0	
465 707P	NS 146.9	W. 11th St	0	0	0	0	0	
465 708W	NS 146.9	W.10th St	0	0	0	0	0	
465 709D	NS 146.9	W. 9th St	0	0	0	0	0	
904 748H	NS 148.85	Moye Hooker Connection/Line Ave	2	0	2	2	0	did not stop (2)
465 482M	NS 143.0	SR 1726/Portertown Rd	0	0	0	0	0	
		Ficklen St	0	0	0	0	0	

TABLE D-5 Near Term Evaluation Tables

	Result Description	Mean Value
Select	**Safety benefits, thous $ PV**	**4240.963**
Select	Travel time savings, thous $ PV	-244.1649
Select	Environmental benefits, thous $ PV	-1.440082
Select	Veh operating cost benefit, thous $ PV	-17.84578
Select	Network benefits, thous $ PV	0
Select	Total benefits, thous $ PV	4109.604
Select	of this, benefits from induced trips, thous $ PV	0.9697493
Select	of this, disbenefits from induced trips, thous $ PV	-0.361654
Select	of this, investment salvage value, thous $ PV	131.4829
Select	Total costs, thous $ PV	1713.33
Select	Net benefits, thous $ PV	2396.273
Select	Benefit-cost ratio,	2.398605
Select	Rate of return (constant dollars), %	19.00844
Select	Local benefits (not included in summary), thous $ PV	216.1551

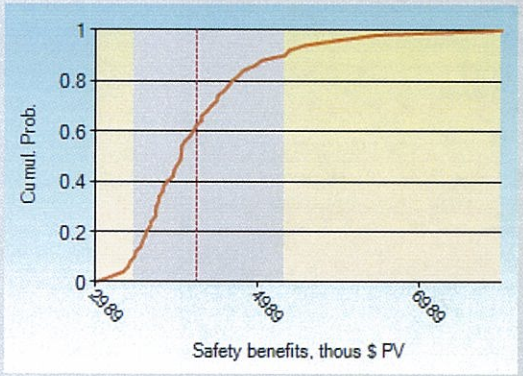
1



Results | Placeholder - Corridor Model | Result: Safety benefits, thous $ PV

Benefits and Benefit-Cost Summary | Go

Hist | Cumul | De-Cumul | Tornado | Bins 20



Summary Statistics	
Trials	51
Mean	4240.963
Std. Deviation	890.6525
Minimum	2989.245
Maximum	8020.221
Skewness	2.010897
Kurtosis	5.854733

Percentiles	
1%	3077.47
5%	3355.136
10%	3464.765
20%	3611.904
30%	3732.575
40%	3874.024
50%	4038.686
60%	4189.854
70%	4414.921
80%	4671.875
90%	5327.423
95%	5790.02
99%	7236.827

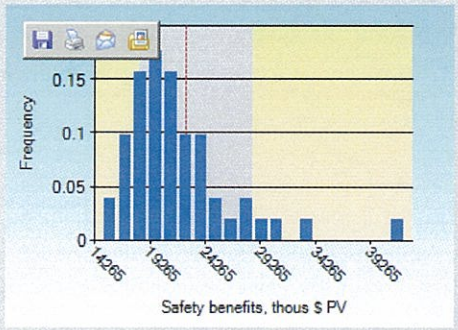
TABLE D-5 (Con't) Long Term Evaluation Tables

	Result Description	Mean Value
Select	**Safety benefits, thous $ PV**	**22514.38**
Select	Travel time savings, thous $ PV	-5.038277
Select	Environmental benefits, thous $ PV	-0.02534517
Select	Veh operating cost benefit, thous $ PV	-0.3865203
Select	Network benefits, thous $ PV	0
Select	Total benefits, thous $ PV	23396.98
Select	of this, benefits from induced trips, thous $ PV	10.00777
Select	of this, disbenefits from induced trips, thous $ PV	-1.915608
Select	of this, investment salvage value, thous $ PV	879.9529
Select	Total costs, thous $ PV	9130.143
Select	Net benefits, thous $ PV	14266.83
Select	Benefit-cost ratio,	2.562608
Select	Rate of return (constant dollars), %	24.58781
Select	Local benefits (not included in summary), thous $ PV	1238.897

1

Benefits and Benefit-Cost Summary | Go

Hist | Cumul | De-Cumul | Tornado | Bins 20

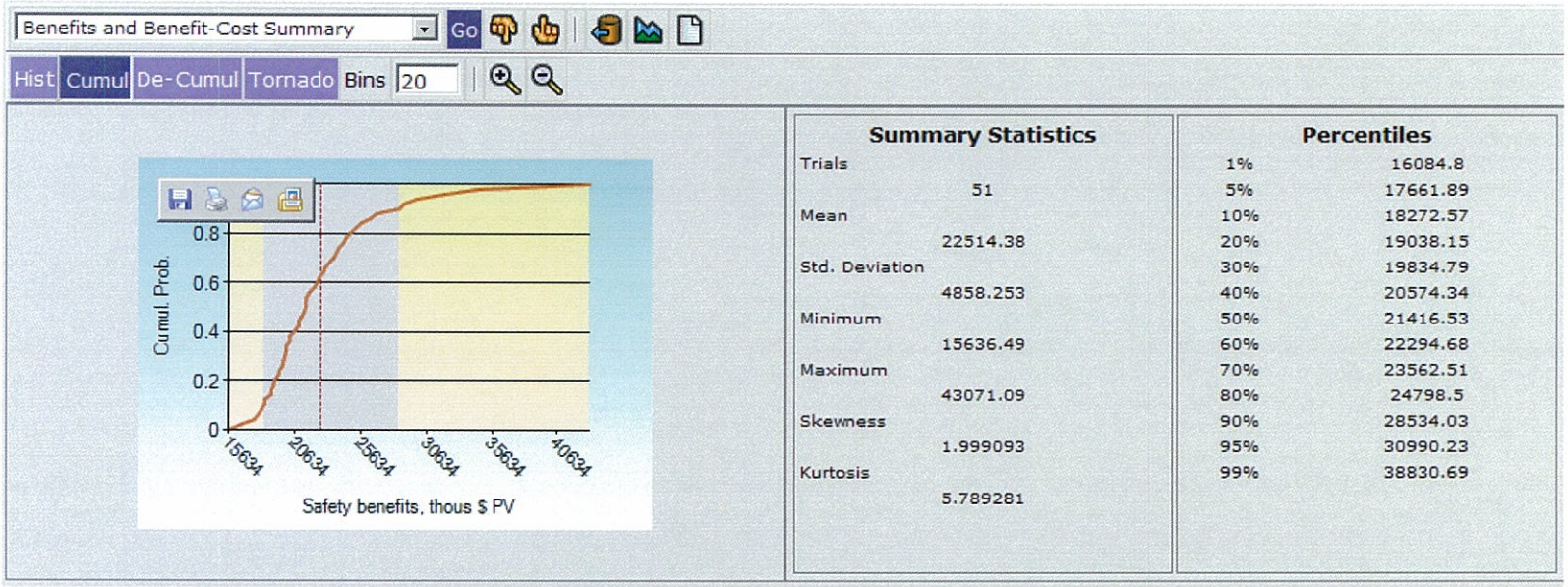


Summary Statistics

Trials	51
Mean	22514.38
Std. Deviation	4858.253
Minimum	15636.49
Maximum	43071.09
Skewness	1.999093
Kurtosis	5.789281

Percentiles

1%	16084.8
5%	17661.89
10%	18272.57
20%	19038.15
30%	19834.79
40%	20574.34
50%	21416.53
60%	22294.68
70%	23562.51
80%	24798.5
90%	28534.03
95%	30990.23
99%	38830.69



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95%	30990.23
99%	38830.69

SAFETY and MOBILITY ISSUES

E. SAFETY AND MOBILITY ISSUES

There are several methods available to enhance railroad-crossing safety. This chapter discusses some of these methods in more detail.

1. 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 highway/rail crossing. During the site inspections the following crossings had queueing of vehicles across the tracks when trains were present:

- Howell Street (Crossing # 641 615L)
- Arlington Boulevard (Crossing # 642 719W)

2. Traffic Signal Preemption

Standard practice (based on *The Manual on Uniform Traffic Control Devices*) requires that traffic signals located within 200 feet of a highway/rail at-grade crossing be coordinated with the crossing's train detection and warning system to preempt normal operations of the traffic signal.

3. 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 three inches per occurrence. Over a ten-year period, the railroad may rise as much as 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:

- South Pitt Street (Crossing # 465 496V)
- Dudley Street (Crossing # 641 553R)
- West 3rd Street (Crossing # 641 557T)

4. Grade Crossing Condition

A poor grade crossing surface can result in a rough, uneven ride. This can increase wear and tear on vehicles, potentially create a traffic safety hazard, and may add to 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. The following crossings have surfaces that are deemed to be in poor condition:

- US 13/Memorial Drive (Crossing # 465 512C)
- SR 1403/Allen Road (Crossing # 465 517L)
- West 13th Street (Crossing # 465 705B)
- West 9th Street (Crossing # 465 709D)

5. 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

It was noted in the NCDOT and FRA accident reports that a total of three accidents have occurred within the last 10 years at the following locations due to vehicles driving around automated gates:

- 14th Street (Crossing # 641 614E) – 1 accident
- SR 1530/Airport Road (Crossing # 641 860P) – 2 accidents

The remainder of the accidents in Greenville was attributed to either vehicles not stopping at highway/rail grade crossings or vehicles being stopped on the tracks.

6. 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. Sign and/or marking improvements are recommended at the following locations due to the faded markings:

- South Pitt Street (Crossing # 465 496V)
- Skinner Street (Crossing # 465 509U)
- SR 1403/Allen Road (Crossing # 465 517L)
- West 13th Street (Crossing # 465 705B)
- West 12th Street (Crossing # 465 706H)
- West 11th Street (Crossing # 465 707P)
- West 9th Street (Crossing # 465 709D)
- West 3rd Street (Crossing # 641 557T)
- West 4th Street (Crossing # 641 558A)
- Arlington Boulevard (Crossing # 642 719W)
- Gum Road (Crossing # 641 859V)

7. 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 (EI)* formula, the following 19 crossings exceed the relevant threshold for urban conditions (30,000) that result from multiplying the number of vehicles per day by the number of trains per day (See Table E-1):

TABLE E-1 – Exposure Index

Street	Crossing #	EI
SR 1704/14th St	465 488D	62,380
US 264/Greenville Blvd	465 489K	84,720
Elm St.	465 491L	36,492
SR 1702/Evans St	465 495N	73,200
US 13/Memorial Dr	465 512C	47,730
Arlington Blvd	465 515X	88,000
SR 1203/Allen Rd	465 517L	37,076
W. 10th St	465 708W	34,947
Moye Hooker Connection/Line Ave	904 748H	42,184
14th St	641 614E	72,030
Howell St	641 615L	65,544
US 264 Alt./Greenville Blvd	641 618G	186,860
SR 1708/Fire Tower Rd	641 620H	88,975
NC 903	641 847B	30,596
SR 1579/Staton Rd	641 850J	37,350
SR 1598/W. 10th St	641 854L	30,340
SR 1531/Dickinson Ave	641 855T	45,028
SR 1528/W. Belvoir Rd	641 857G	30,584
Arlington Blvd	642 719W	154,195

There are many factors that need to be considered along with the exposure index when looking at grade separations. These include accident history, topography, adjacent land uses, construction impacts, and costs. The following crossings are currently scheduled for roadway grade separations and are found in the NCDOT's 2008-2015 Transportation Improvement Program (TIP):

- U-3839: 14th Street (Crossing # 641 614E)
- U-3315: 10th Street Connector: SR 1598/ W.10th St (Crossing # 641 854L)

8. Community Services

Locations of hospitals, schools, fire and rescue stations, and parks have been identified as part of this study to determine the potential impacts on Greenville residents who would be affected by changes in the crossing status of the 45 existing highway/rail grade 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 highway/rail grade crossing modifications on the communities identified.

SYSTEM ENHANCEMENT OPTIONS

F. SYSTEM ENHANCEMENT OPTIONS

1. 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

a. Traffic Volumes

An ***exposure index*** is employed by NCDOT as one factor in determining whether or not grade separation should be considered in place of 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 Greenville, 20 locations currently exceed the exposure index. (See Table D-1 in Section D).

b. 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.

c. 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.

d. 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.

e. Construction Impacts

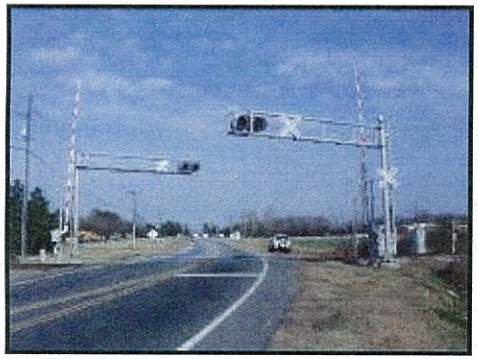
While the impacts of constructing a new grade separation can be significant, retrofitting a grade separation to comply with current design criteria is typically more disruptive during and after construction. Visual, noise, and access degradation can be severe, and the separation may require the relocation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

f. 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.

2. 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 are:



Example of gates, signs and flashing lights

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.

a. Advanced Crossing Protection Devices

NCDOT Rail 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 multi-lane 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 test results from Charlotte, NC.

b. 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 feet to 100 feet back from the gates, but may be precluded by driveways or intersecting roads within this distance.

Example of Median Barriers

c. Four-Quadrant Gates

Example of 4 Quadrant Gate

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 Road crossing in Charlotte, four-quadrant gates alone reduced violations by 86%; in combination with median barriers, the reduction in violations rose to 98%.

c. 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%.

d. 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%.

e. 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.

f. 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 a reasonable distance 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 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.

g. 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 eliminate the number of crossing trips.

h. Traffic Signals

Traffic signals are not specifically intended as warning devices at railroad crossings. However, when a highway/rail grade crossing is located near a signalized intersection (typically within 200 feet), special steps should be taken to insure that vehicles do not get trapped on the tracks due to queues resulting from an adjacent highway intersection's 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.

PUBLIC INVOLVEMENT

G. PUBLIC INVOLVEMENT

A Public Involvement program was established as part of this study. This program involved:

- Two Stakeholder Group Meetings
- Two Public Meetings
- Greenville City Council Presentation
- One Public Hearing

1. Stakeholders Meeting #1

A stakeholders committee was established so key agencies could participate and provide critical input on reaching consensus on grade crossing recommendations. The following agencies participated on the Stakeholder Committee:

- City of Greenville Planning
- City of Greenville Police
- City of Greenville Fire/Rescue
- City of Greenville Traffic
- City of Greenville Public Works Department
- Pitt County Emergency Management
- Pitt County Sherriff's Department
- Pitt County Schools
- Pitt County Communications
- NCDOT Division 2
- CSX Transportation
- Norfolk Southern Railroad
- Carolina Coastal Railway

The first stakeholder meeting was held on February 23, 2006. The purpose of this meeting was to present to the committee an overview of the TSS Study process. An overview of the preliminary recommendations for the 45 crossings that are part of the study was also provided.

2. Public Meetings

Two public meetings were held throughout the City in February 2008. The meeting schedule was as follows

- February 12th and 13th (5:00-7:00 PM) – Sheppard Memorial Library

The objective of the public meetings was to present the recommendations and potential affect on traffic movements resulting from improvement scenarios under consideration for each of the 45 crossings and to receive public comment on the recommendations. No major comments or concerns were raised during the public meetings.

3. Stakeholders Meeting #2

The second meeting of the Stakeholder Committee was on April 3rd, 2008. The purpose of this meeting was to discuss the comments received from the public and the recommendations and to finalize the recommendations to be carried forward into the implementation phase.

The committee requested that the rail crossing improvements incorporate additional widening for pedestrian movements at the Evans Street, Greenville Boulevard and Airport Road rail crossings. As future improvements occur at other rail crossing locations, the incorporation of widening for pedestrian movements will be evaluated on a crossing by crossing basis. In addition, any project that involve both TSS recommendations and rail improvement recommendations at

the same location, all of the improvements should be done simultaneously.

The committee also asked NCDOT Rail, the City of Greenville and the consultants to investigate a possible connector road between Crossing #641 553R (Dudley Street) & #641 860P (Airport Road). Due to ROW issues, a connector street paralleling the railroad would not be feasible. However, there is a vehicular connection to Airport Road, via Legion Street.

In addition, the committee asked the consultants to investigate possible safety measures at Gum Road in order to prevent truck trailers from driving along the western side of the tracks from Airport Road to Gum Road at Crossing #641 859V (Gum Road). Possible improvements could range from installing concrete barriers to curb and gutter; however, this would not be part of the recommended improvements.

4. Newsletters

A newsletter was created and distributed at the public meetings. This newsletter discussed the phases of a Traffic Separation Study (TSS), described the public involvement program, and presented the preliminary list of recommendations. A copy of this newsletter is included in Appendix C.

5. Website

A website was created by NCDOT to provide daily access to the public on the status of the projects, meeting summaries, contact information and maps. The website is http://bytrain.org/safety/tss/greenville/tssIndex.html,

6. Greenville City Council Presentation

A presentation was held on the afternoon of February 12th to the City of Greenville City Council. NCDOT and the Consultant informed the Council of the progress of the study and their recommendations. City Council members did not have any major concerns or comments relating to the recommendations.

7. Public Hearing

A public hearing was held on June 12, 2008 with the Greenville City Council. There were a few comments relating to the existing W. 4th Street (Crossing # 641 558A) at-grade rail crossing by the City Council and public, all in which preferred that the existing rail crossing not be recommended for closure but to improve the crossing's safety mechanisms. A motion was made and approved by the City Council to recommend not closing the 4th Street at-grade crossing.

RECOMMENDATIONS

H. RECOMMENDATIONS

Highway/Rail Grade Crossing Recommendations

This section describes the recommendations on a crossing-by-crossing basis. Relevant information, data, and findings are included for each. Conceptual designs were placed on aerials for the specific recommendations and can be found in the Figures within this section, 1 through 45 (No Action, Removal of Rail Spur, Closure, Add Concrete Median, Adjust Vertical Profile, Add Median Barrier, Add Gates, Add Signal Preemption, Add Gates and Signal Preemption, and TIP projects). Table H-1 summarizes all of the highway/rail grade crossing recommendations, including estimated costs.

The primary objective of these improvements is to improve or eliminate the highway/rail grade crossings and the interference that now exists between railroad operations and vehicular traffic on many of the streets within Greenville.

For the purposes of this report, recommendations are classified as follows. The letter/number indicated prior to the street name and crossing number is cross-referenced to the Overall TSS Map (see Figure ES1):

- Near-Term (0-5 years)
- Long-Term (more then 5 years)

1. Near-Term Recommendations

Closures:
- 10 - S. Pitt Street (Crossing # 465 496V)
- 12 - Skinner Street (Crossing # 465 509U)
- 31 - Gum Road (Crossing # 641 859V)
- 33 - Dudley Street (Crossing # 641 553R)
- 37 - Alley Street (Crossing # 641 610C)

Add Gates:
- 2 - SR 1809/Windsor Road (Crossing # 465 483U)
- 8 - W. Berkley Road (Crossing # 465 492T)
- 16 - Spring Forest Road (Crossing # 465 516E)
- 28 - NC 33/N. Greene Street (Crossing # 641 852X)
- 32 - SR 1530/Airport Road (Crossing # 641 860P)
- 35 - W. 4th Street (Crossing # 641 558A)
- 36 - 5th Street (Crossing # 641 609H)

Add Signal Preemption:
- 27 - SR 1527/N. Greene Street (Crossing # 641 851R)

Add Gates & Signal Preemption:
- 7 - Elm Street (Crossing # 465 491L)
- 11 - Beatty Street (Crossing # 465 506Y)

Removal of Rail Spurs:
- 29 - SR 1591/Industrial Boulevard (Crossing # 641 853E)

Roadway Improvements – Add Concrete Median:
- 5 - US 264/Greenville Blvd (Crossing # 465 489K)
- 9 - SR 1702/Evans Street (Crossing # 465 495N)
- 14 - SR 1324/W.H. Smith Blvd (Crossing # 465 514R)
- 15 - Arlington Boulevard (Crossing # 465 515X)
- 30 - SR 1528/W. Belvoir Road (Crossing # 641 857G)

Roadway Improvements – Add Median Barrier:
- 4 - SR 1704/14th Street (Crossing # 465 488D)
- 40 - 14th Street (Crossing # 641 614E)

2. Long-Term Recommendations

Removal of Rail Spur (if UNX relocates and there is no need for the rail spur upon future redevelopment opportunities):

- 18 - W. 9th Street (Crossing # 465 709D)
- 19 - Ficklen Street
- 20 - W. 10th Street (Crossing # 465 708W)
- 21 - W. 11th Street (Crossing # 465 707P)
- 22 - W. 12th Street (Crossing # 465 706H)
- 23 - W. 13th Street (Crossing # 465 705B)
- 24 - W. 14th Street (Crossing # 465 704U)

3. Improvements Completed

Roadway Improvements – Adjust Vertical Profile:

- 34 - W. 3rd Street (Crossing # 641 557T) - The City of Greenville recently improved the vertical profile for W. 3rd Street.

4. No Action Recommended

The following intersections were recommended to provide no improvements. Reasons behind this decision stemmed from low accident rates and existing warning devices are located at crossings.

- 1 - SR 1726/Portertown Road (Crossing # 465 482M)
- 3 - SR 1807/Oxford Road (Crossing # 465 485H)
- 6 - Brownlea Drive (Crossing # 465 490E)
- 13 - US 13/Memorial Drive (Crossing # 465 512C)
- 17 - SR 1403-Allen Road (Crossing # 465 517L)
- 25 - NC 903 (Crossing # 641 847B)
- 26 - SR 1579/Staton Road (Crossing # 641 850J)41 - Howell Street (Crossing # 641 615L)
- 42 - Moye Hooker Connection/Line Avenue (Crossing # 904 748H)
- 43 - Arlington Boulevard (Crossing # 642 719W)
- 44 - US 264 Alt./Greenville Boulevard (Crossing # 641 618G) - however, future improvements may consist of widening rail crossing to accommodate future sidewalk improvements stemming from the City of Greenville Convention Center Streetscape Improvements project
- 45 - SR 1708/Fire Tower Road (Crossing # 641 620H)

5. Wye Connection Track & New Yard/Modify Yard Recommendations

STV/RWA recommended new wye connection track near the NS / CSXT railroad crossing at-grade. A new wye connection track would allow a free flowing south to east movement of freight traffic without blocking adjacent crossings from 14th Street to Arlington Road. In order to construct and operate the new connector track, the existing highway/railroad at-grade crossing at Pitt Street will have to be permanently closed.

In addition, by constructing the connector track, the existing CSXT yard will be relocated north of the NC 903 / NC 11 juncture to allow CSXT the ability to load/unload, switch or repair rail cars without blocking existing highway/railroad at-grade crossings. The new yard will consist of a 4,000 foot rail yard with two 2,000 foot long siding tracks on each side, as well as a new operations center. Figures H1 –and H2 display the wye connection track and new yard designs.

TABLE H-1 – Recommendations

Crossing Reference Number	Crossing Number	Street Name	Near-Term Recommendation	Est. Near-Term Cost	Long-Term Recommendation	Est. Long-Term Cost
H1	465 482M	SR 1726/Portertown Rd	No Action			
H2	465 483U	SR 1809/Windsor Rd	Add Gates	$ 145,000.00		
H3	465 485H	SR 1807/Oxford Rd	No Action			
H4	465 488D	SR 1704/14th St	Add Median Barrier	$ 150,000.00		
H5	465 489K	US 264/Greenville Blvd	Add Concrete Median	$ 185,000.00		
H6	465 490E	Brownlea Dr	No Action			
H7	465 491L	Elm St	Add Gates & Signal Preemption	$ 185,000.00		
H8	465 492T	W. Berkley Rd	Add Gates	$ 145,000.00		
H9	465 495N	SR 1702/Evans St	Add Concrete Median	$ 185,000.00		
H10	465 496V	S. Pitt St	Closure	$ 12,000.00		
H11	465 506Y	Beatty St	Add Gates & Signal Preemption	$ 185,000.00		
H12	465 509U	Skinner St	Closure	$ 12,000.00		
H13	465 512C	US 13/Memorial Dr	No Action			
H14	465 514R	SR 1324/W.H. Smith Blvd	Add Concrete Median	$ 185,000.00		
H15	465 515X	Arlington Blvd	Add Concrete Median	$ 185,000.00		
H16	465 516E	Spring Forest Rd	Add Gates	$ 145,000.00		
H17	465 517L	SR 1203/Allen Rd	No Action			
H18	465 709D	W. 9th St			Remove Rail Spur	$ 12,000.00
H19		Ficklen St			Remove Rail Spur	$ 12,000.00
H20	465 708W	W. 10th St			Remove Rail Spur	$ 12,000.00
H21	465 707P	W. 11th St			Remove Rail Spur	$ 12,000.00
H22	465 706H	W. 12th St			Remove Rail Spur	$ 12,000.00
H23	465 705B	W. 13th St			Remove Rail Spur	$ 12,000.00
H24	465 704U	W. 14th St			Remove Rail Spur	$ 12,000.00
H25	641 847B	NC 903	No Action			
H26	641 850J	SR 1579/Staton Rd	No Action			
H27	641 851R	SR 1527/N. Greene St	Add Signal Preemption	$ 40,000.00		
H28	641 852X	NC 33/N. Greene St	Add Gates	$ 145,000.00		
H29	641 853E	SR 1591/Industrial Blvd	Remove Rail Spur	$ 12,000.00		
H30	641 857G	SR 1528/W. Belvoir Rd	Add Concrete Median	$ 185,000.00		
H31	641 859V	Gum Rd	Closure	$ 12,000.00		
H32	641 860P	SR 1530/Airport Rd	Add Median Barrier	$ 150,000.00		
H33	641 553R	Dudley St	Closure	$ 12,000.00		
H34	641 557T	W. 3rd St	Adjust Vertical Profile	$ 100,000.00		
H35	641 558A	W. 4th St	Add Gates	$ 145,000.00		
H36	641 609H	5th St	Add Gates	$ 145,000.00		
H37	641 610C	Alley St	Closure	$ 12,000.00		
H38	641 854L	10th St Connector: SR 1598/W. 10th St			TIP U-3315	
H39	641 855T	10th St Connector: SR 1531/Dickinson Ave			TIP U-3315	
H40	641 614E	14th St	Add Median Barrier	TIP U-3839		
H41	641 615L	Howell St	No Action			
H42	904 748H	Moye Hooker Connection/Line Ave	No Action			
H43	642 719W	Arlington Blvd	No Action			
H44	641 618G	US 264 Alt./Greenville Blvd	No Action			
H45	641 620H	SR 1708/Fire Tower Rd	No Action			

FIGURE H-1 – 2

Map Crossing Reference Number	Crossing Number	Street Name	Existing Conditions Figure #	Crossing Photos	Recommendations Figure #
1	465 482M	SR 1726/Portertown Rd	C-1a	C-1b	H1
2	465 483U	SR 1809/Windsor Rd	C-2a	C-2b	H2
3	465 485H	SR 1807/Oxford Rd	C-3a	C-3b	H3
4	465 488D	SR 1704/14th St	C-4a	C-4b	H4
5	465 489K	US 264/Greenville Blvd	C-5a	C-5b	H5
6	465 490E	Brownlea Dr	C-6a	C-6b	H6
7	465 491L	Elm St	C-7a	C-7b	H7
8	465 492T	W. Berkley Rd	C-8a	C-8b	H8
9	465 495N	SR 1702/Evans St	C-9a	C-9b	H9
10	465 496V	S. Pitt St	C-10a	C-10b	H10
11	465 506Y	Beatty St	C-11a	C-11b	H11
12	465 509U	Skinner St	C-12a	C-12b	H12
13	465 512C	US 13/Memorial Dr	C-13a	C-13b	H13
14	465 514R	SR 1324/W.H. Smith Blvd	C-14a	C-14b	H14
15	465 515X	Arlington Blvd	C-15a	C-15b	H15
16	465 516E	Spring Forest Rd	C-16a	C-16b	H16
17	465 517L	SR 1203/Allen Rd	C-17a	C-17b	H17
18	465 709D	W. 9th St	C-18a	C-18b	H18
19		Ficklen St	C-19a	C-19b	H19
20	465 708W	W. 10th St	C-20a	C-20b	H20
21	465 707P	W. 11th St	C-21a	C-21b	H21
22	465 706H	W. 12th St	C-22a	C-22b	H22
23	465 705B	W. 13th St	C-23a	C-23b	H23
24	465 704U	W. 14th St	C-24a	C-24b	H24
25	641 847B	NC 903	C-25a	C-25b	H25
26	641 850J	SR 1579/Staton Rd	C-26a	C-26b	H26
27	641 851R	SR 1527/N. Greene St	C-27a	C-27b	H27
28	641 852X	NC 33/N. Greene St	C-28a	C-28b	H28
29	641 853E	SR 1591/Industrial Blvd	C-29a	C-29b	H29
30	641 857G	SR 1528/W. Belvoir Rd	C-30a	C-30b	H30
31	641 859V	Gum Rd	C-31a	C-31b	H31
32	641 860P	SR 1530/Airport Rd	C-32a	C-32b	H32
33	641 553R	Dudley St	C-33a	C-33b	H33
34	641 557T	W. 3rd St	C-34a	C-34b	H34
35	641 558A	W. 4th St	C-35a	C-35b	H35
36	641 609H	5th St	C-36a	C-36b	H36
37	641 610C	Alley St	C-37a	C-37b	H37
38	641 854L	10th St Connector: SR 1598/W. 10th St	C-38a	C-38b	H38
39	641 855T	10th St Connector: SR 1531/Dickinson Ave	C-39a	C-39b	H39
40	641 614E	14th St	C-40a	C-40b	H40
41	641 615L	Howell St	C-41a	C-41b	H41
42	904 748H	Moye Hooker Connection/Line Ave	C-42a	C-42b	H42
43	642 719W	Arlington Blvd	C-43a	C-43b	H43
44	641 618G	US 264 Alt./Greenville Blvd	C-44a	C-44b	H44
45	641 620H	SR 1708/Fire Tower Rd	C-45a	C-45b	H45

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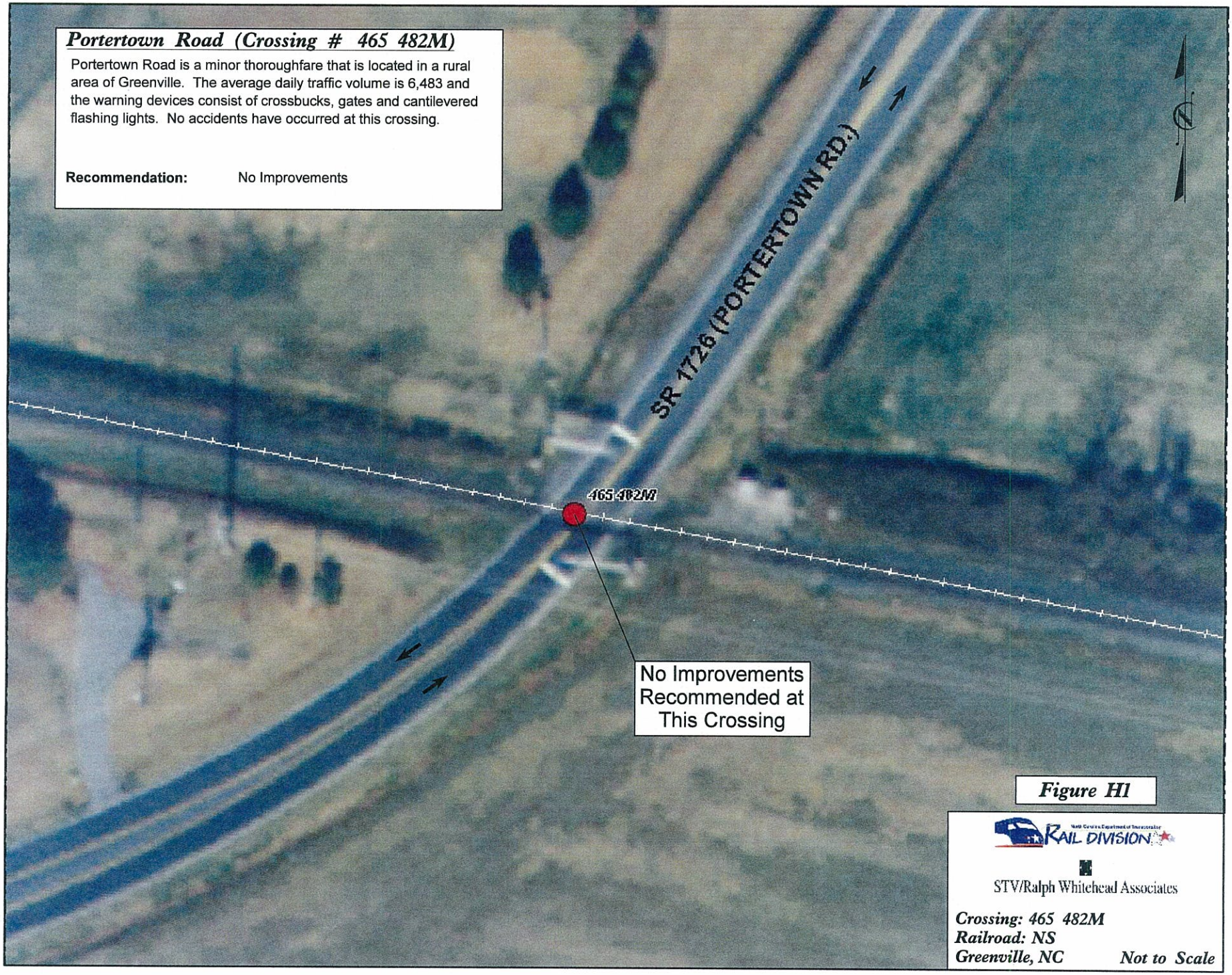
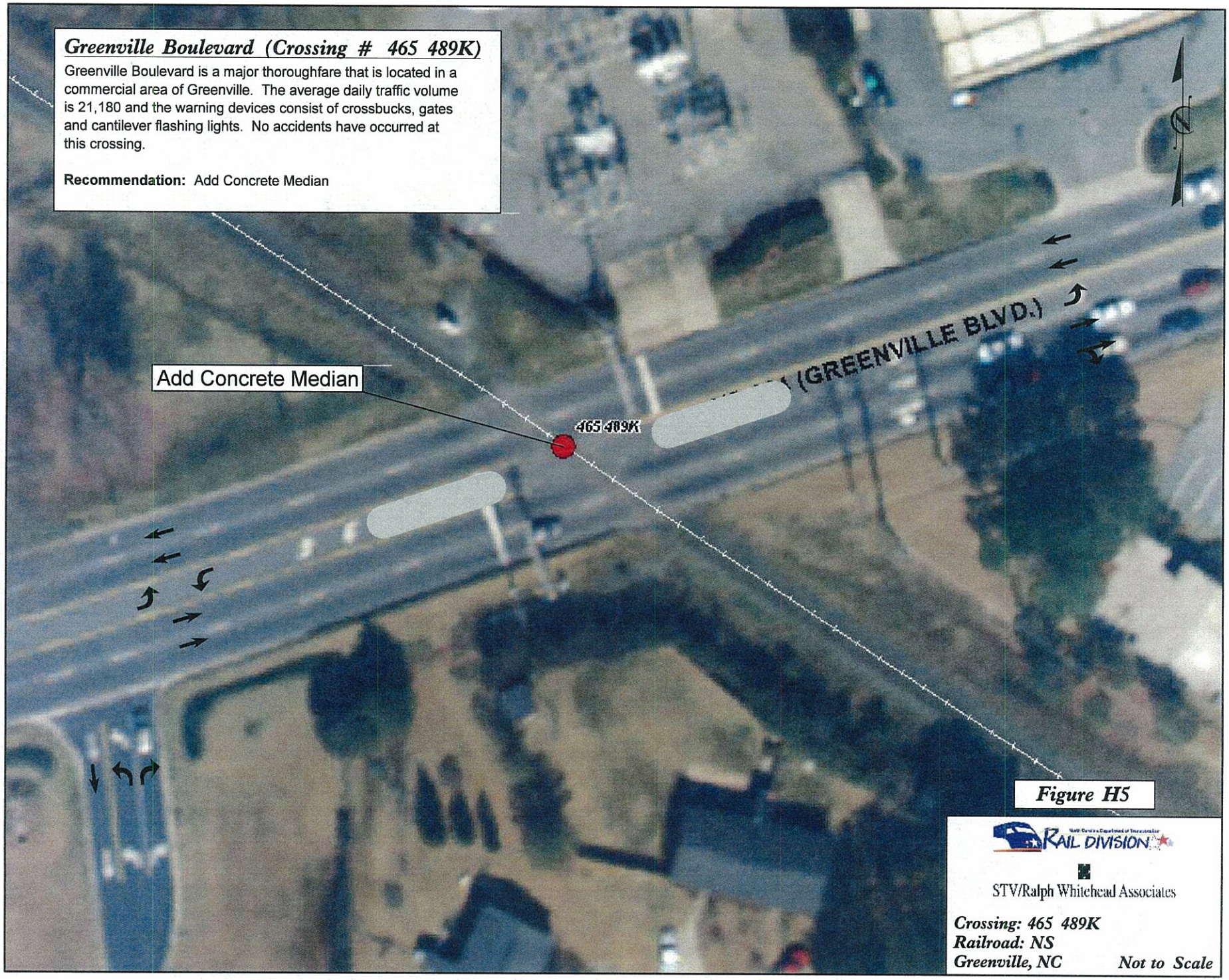
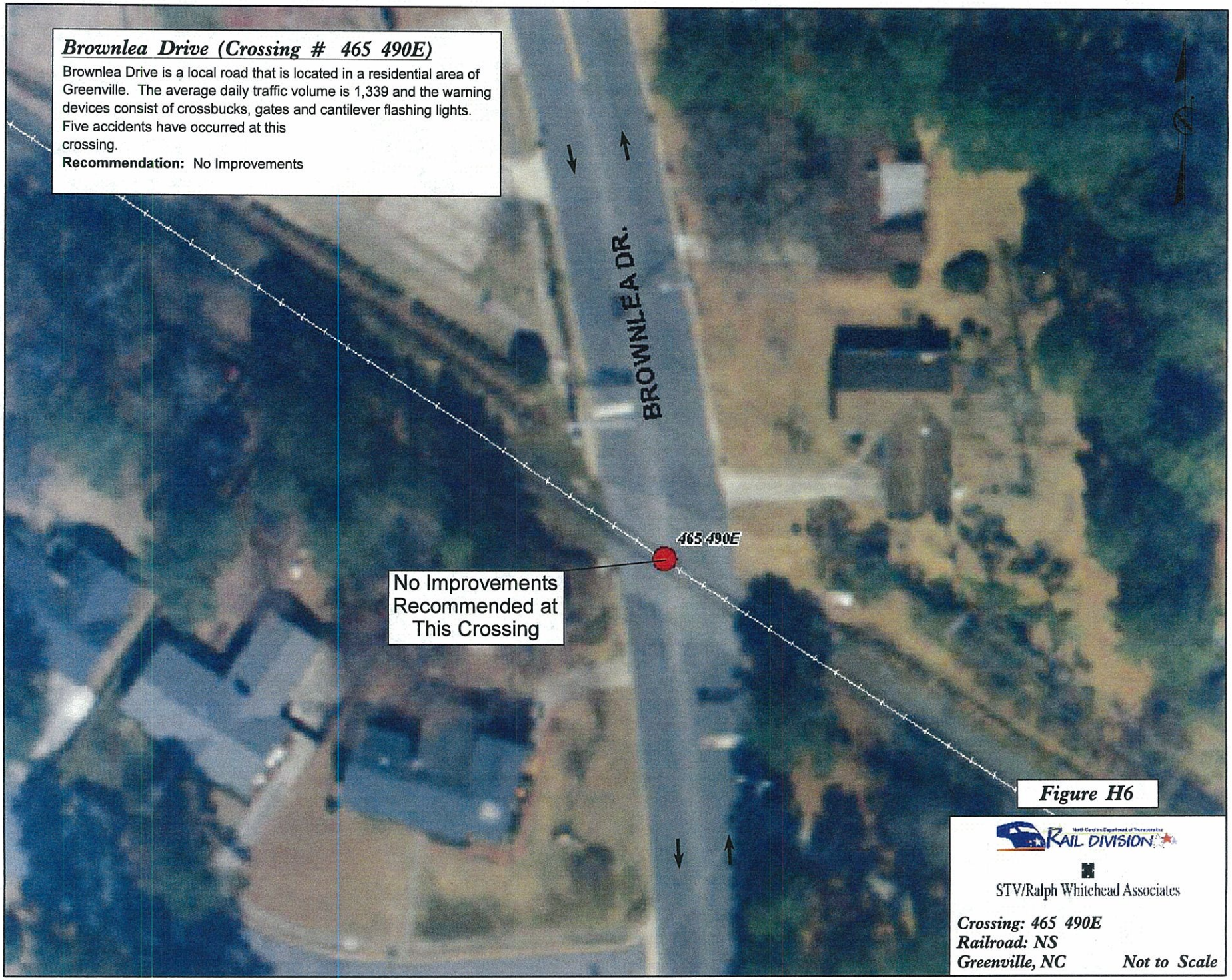

Portertown Road (Crossing # 465 482M)
Portertown Road is a minor thoroughfare that is located in a rural area of Greenville. The average daily traffic volume is 6,483 and the warning devices consist of crossbucks, gates and cantilevered flashing lights. No accidents have occurred at this crossing.
Recommendation: No Improvements
SR 1726 (PORTERTOWN RD.)
465 482M
No Improvements Recommended at This Crossing
N
Figure H1
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 482M
Railroad: NS
Greenville, NC
Not to Scale


Windsor Road (Crossing # 465 483U)
Windsor Road is a local road that is located in a residential area of Greenville. The average daily traffic volume is 584 and the warning devices consist of crossbucks, mast-mounted flashing lights and bells. Three accidents have occurred at this crossing.
Recommendation: Add Gates
WINDSOR RD.
465 483U
Add Gates
BROOK VALLEY GOLF & COUNTRY CLUB
Figure H2
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 483U
Railroad: NS
Greenville, NC
Not to Scale

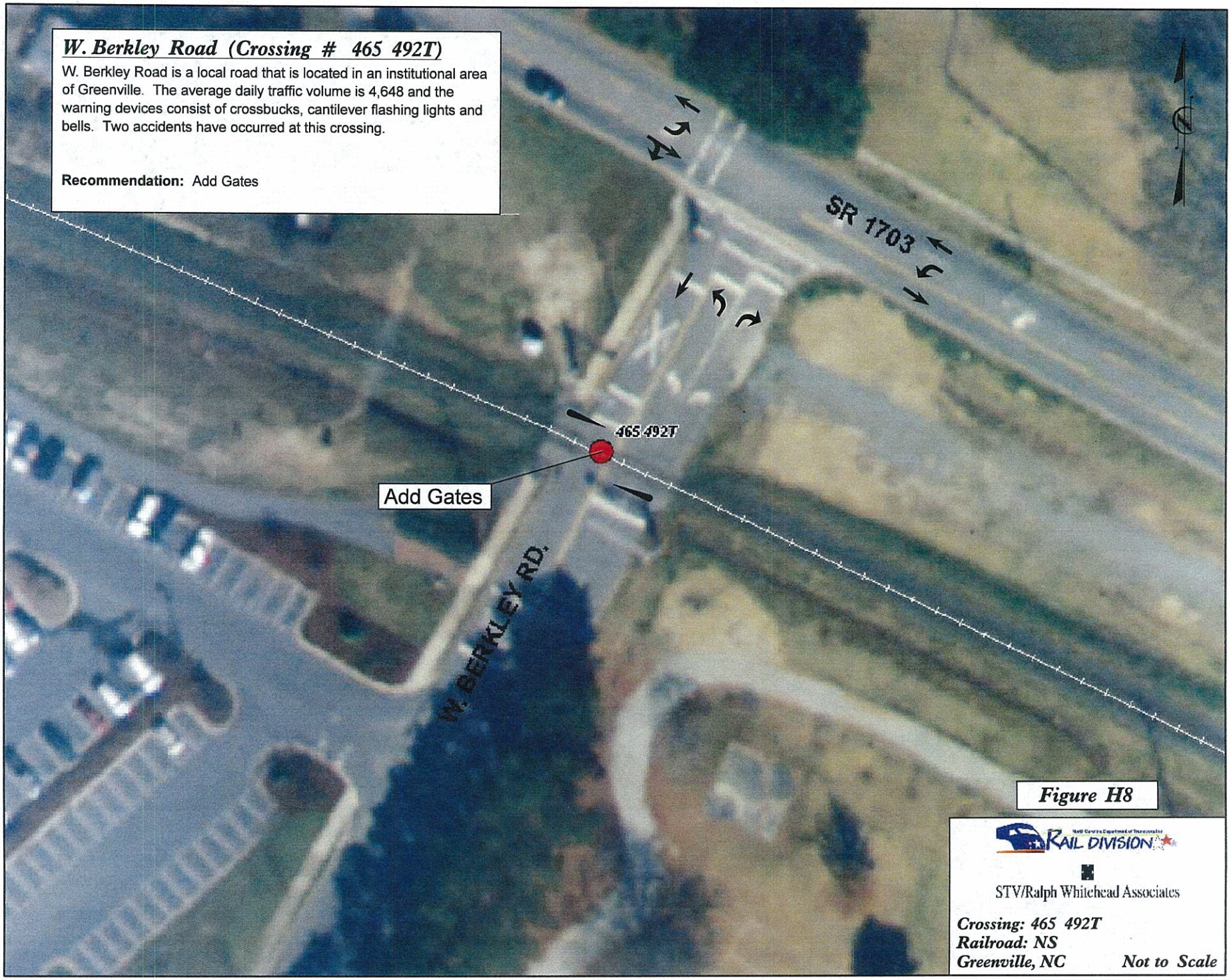

Oxford Road (Crossing # 465 485H)
Oxford Road is a local road that is located in a residential area of Greenville. The average daily traffic volume is 2,039 and the warning devices consist of crossbucks, gates. Three accidents have occurred at this crossing.
Recommendation: No Improvements
BROOK VALLEY GOLF & COUNTRY CLUB
465 485H
OXFORD RD.
No Improvements Recommended at This Crossing
Figure H3
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 485H
Railroad: NS
Greenville, NC
Not to Scale

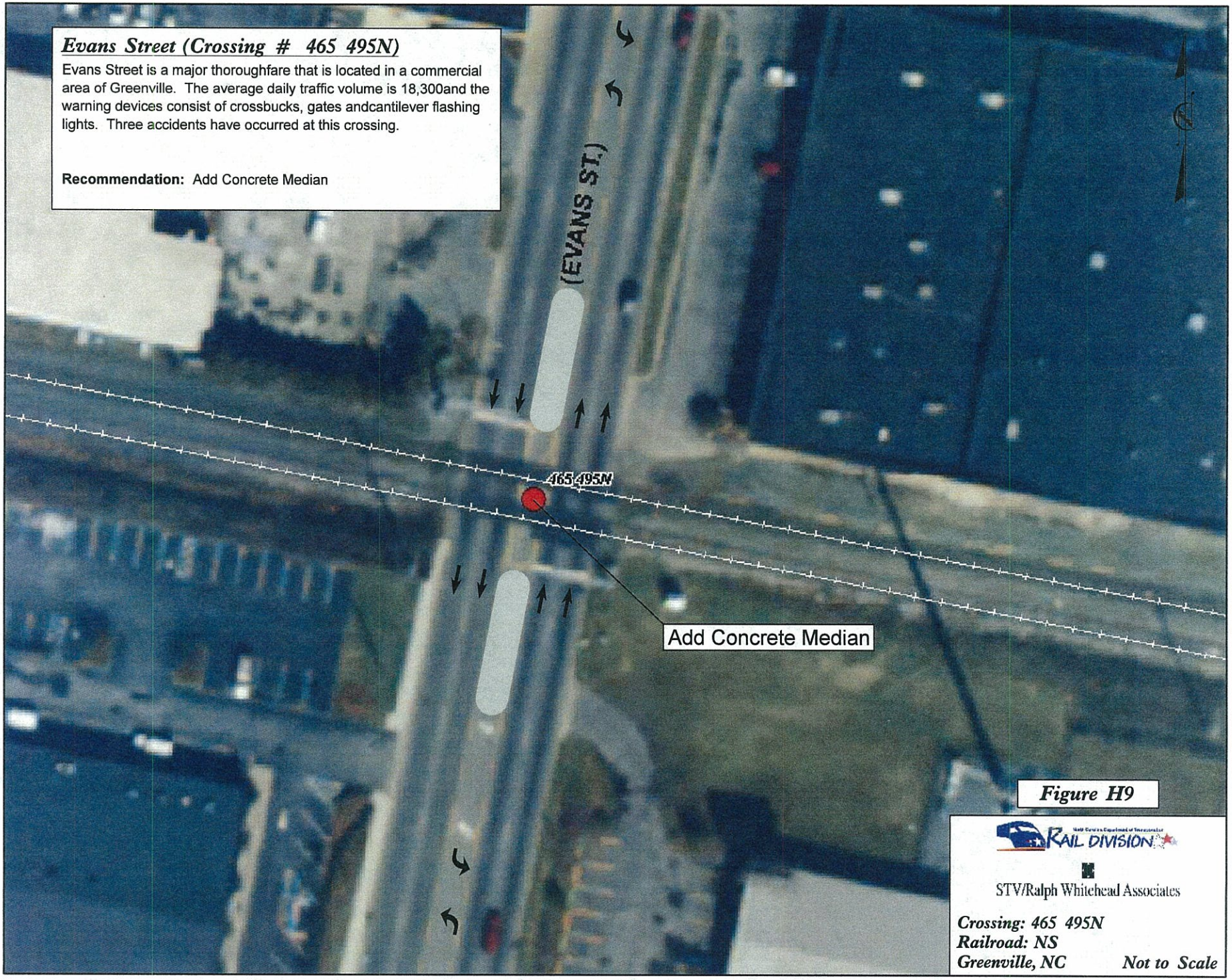

14th Street (Crossing # 465 488D)
14th Street is a major thoroughfare that is located in a commercial/residential area of Greenville. The average daily traffic volume is 15,595 and the warning devices consist of crossbucks, gates and cantilever flashing lights. Five accidents have occurred at this crossing.
Recommendation: Add Median Barrier
465 488D
Add Median Barrier
SR 1704 (14TH ST)
Figure H4
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 488D
Railroad: NS
Greenville, NC
Not to Scale


Greenville Boulevard (Crossing # 465 489K)
Greenville Boulevard is a major thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 21,180 and the warning devices consist of crossbucks, gates and cantilever flashing lights. No accidents have occurred at this crossing.
Recommendation: Add Concrete Median
Add Concrete Median
465 489K
(GREENVILLE BLVD.)
Figure H5
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 489K
Railroad: NS
Greenville, NC
Not to Scale


Brownlea Drive (Crossing # 465 490E)
Brownlea Drive is a local road that is located in a residential area of Greenville. The average daily traffic volume is 1,339 and the warning devices consist of crossbucks, gates and cantilever flashing lights. Five accidents have occurred at this crossing.
Recommendation: No Improvements
BROWNLEA DR.
465 490E
No Improvements Recommended at This Crossing
Figure H6
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 490E
Railroad: NS
Greenville, NC
Not to Scale


Elm Street (Crossing # 465 491L)
Elm Street is a major thoroughfare that is located in a residential area of Greenville. The average daily traffic volume is 9,123 and the warning devices consist of crossbucks, mast-mounted flashing lights and bells. One accident has occurred at this crossing.
Recommendation: Add Gates and Signal Preemption
465 491L
Add Gates
SR 1703
ELM ST.
N. OVERLOOK DR.
Figure H7
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 491L
Railroad: NS
Greenville, NC
Not to Scale


W. Berkley Road (Crossing # 465 492T)
W. Berkley Road is a local road that is located in an institutional area of Greenville. The average daily traffic volume is 4,648 and the warning devices consist of crossbucks, cantilever flashing lights and bells. Two accidents have occurred at this crossing.
Recommendation: Add Gates
SR 1703
465 492T
Add Gates
W. BERKLEY RD.
Figure H8
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 492T
Railroad: NS
Greenville, NC
Not to Scale



Evans Street (Crossing # 465 495N)

Evans Street is a major thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 18,300and the warning devices consist of crossbucks, gates andcantilever flashing lights. Three accidents have occurred at this crossing.

Recommendation: Add Concrete Median

Figure H9

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 465 495N
Railroad: NS
Greenville, NC ***Not to Scale***

S. Pitt Street (Crossing # 465 496V)

S. Pitt Street is a local road that is located in a residential area of Greenville. The average daily traffic volume is 950 and the warning devices consist of crossbucks. No accidents have occurred at this crossing.

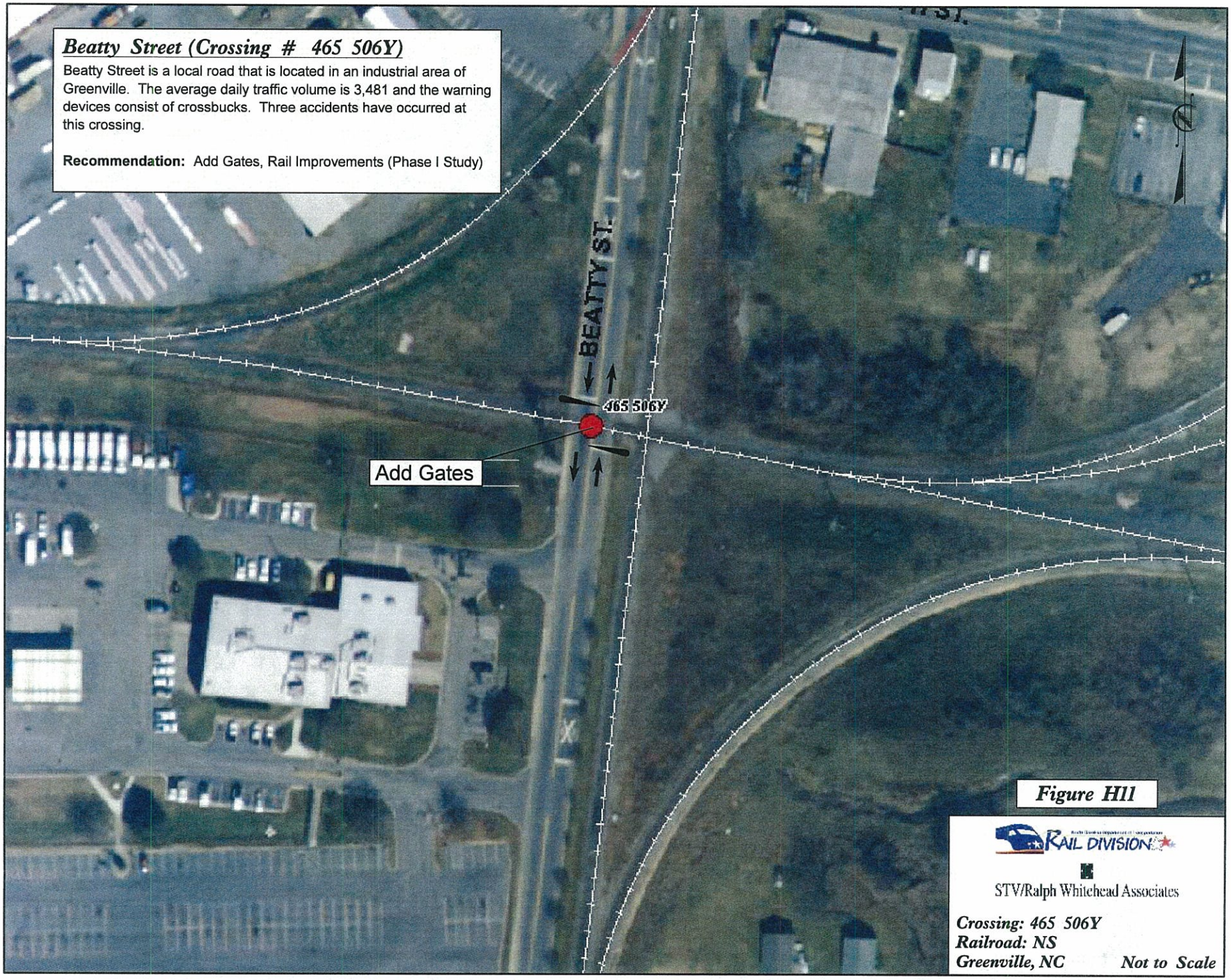
Recommendation: Close Crossing

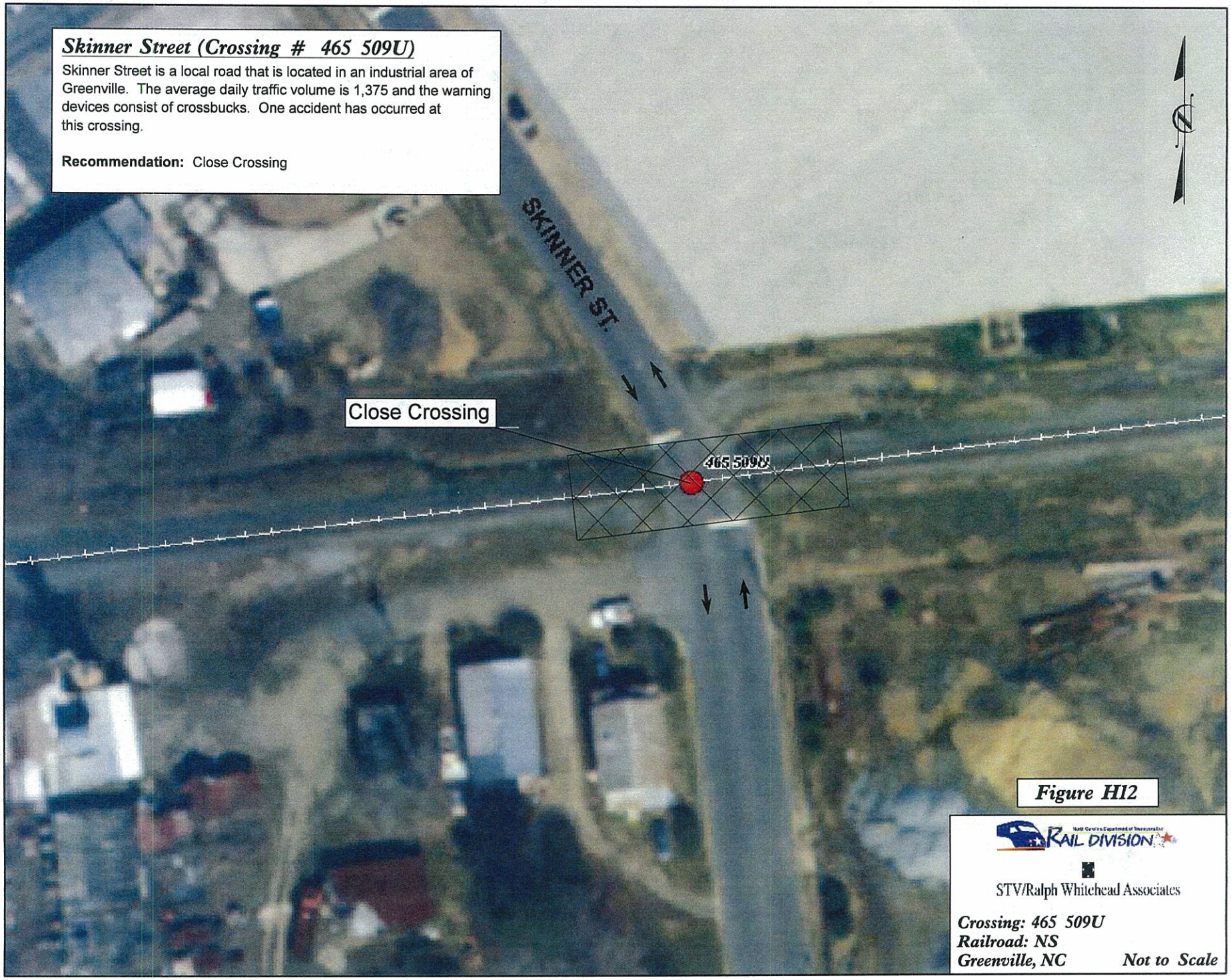
Figure H10

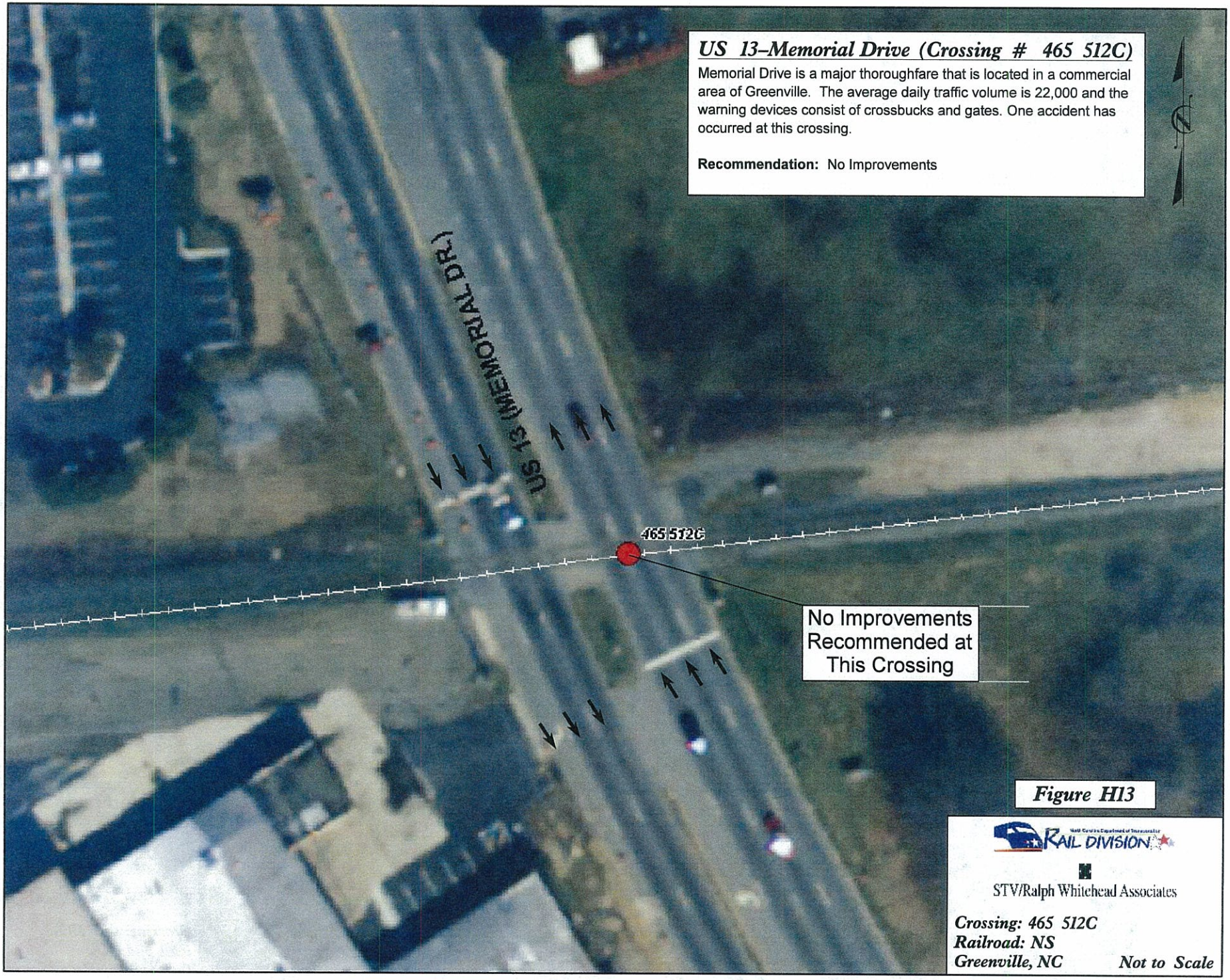
RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 465 496V
Railroad: NS
Greenville, NC ***Not to Scale***


Beatty Street (Crossing # 465 506Y)
Beatty Street is a local road that is located in an industrial area of Greenville. The average daily traffic volume is 3,481 and the warning devices consist of crossbucks. Three accidents have occurred at this crossing.
Recommendation: Add Gates, Rail Improvements (Phase I Study)
BEATTY ST.
465 506Y
Add Gates
Figure H11
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 506Y
Railroad: NS
Greenville, NC
Not to Scale


Skinner Street (Crossing # 465 509U)
Skinner Street is a local road that is located in an industrial area of Greenville. The average daily traffic volume is 1,375 and the warning devices consist of crossbucks. One accident has occurred at this crossing.
Recommendation: Close Crossing
SKINNER ST.
Close Crossing
465 509U
Figure H12
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 509U
Railroad: NS
Greenville, NC
Not to Scale


US 13–Memorial Drive (Crossing # 465 512C)
Memorial Drive is a major thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 22,000 and the warning devices consist of crossbucks and gates. One accident has occurred at this crossing.
Recommendation: No Improvements
US 13 (MEMORIAL DR.)
465 512C
No Improvements Recommended at This Crossing
Figure H13
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 512C
Railroad: NS
Greenville, NC
Not to Scale

W. H. Smith Boulevard (Crossing # 465 514R)

W. H. Smith Boulevard is a local road that is located in an commercial area of Greenville. The average daily traffic volume is 3,057 and the warning devices consist of gates and cantilevered flashing lights. No accidents have occurred at this crossing.

Recommendation: Add Concrete Median

Figure H14

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 465 514R
Railroad: NS
Greenville, NC ***Not to Scale***

Arlington Boulevard (Crossing # 465 515X)

Arlington Boulevard is a major thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 22,000 and the warning devices consist of crossbucks, gates and cantilevered flashing lights. One accident has occurred at this crossing.

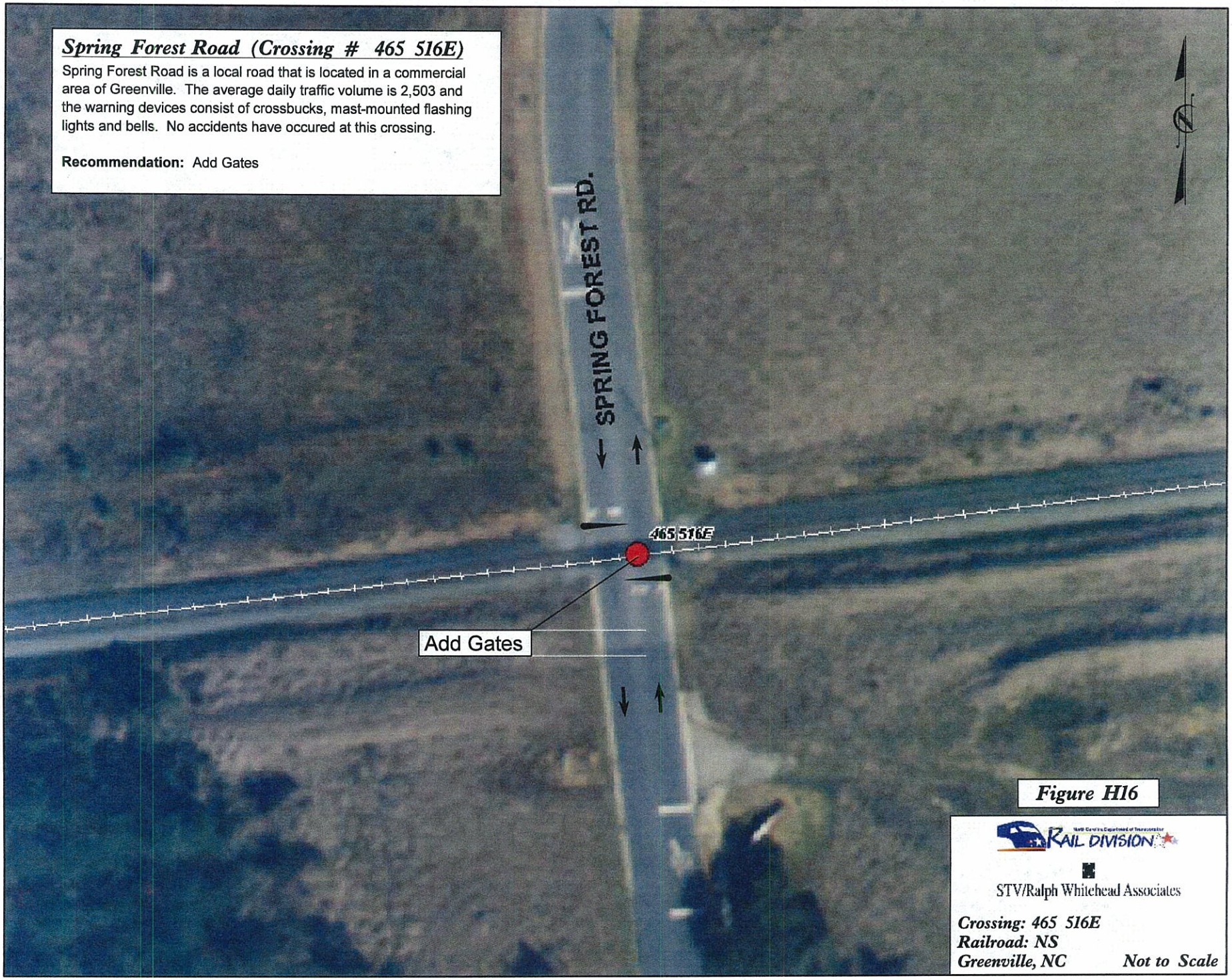
Recommendation: Add Concrete Median

Figure H15

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 465 515X
Railroad: NS
Greenville, NC ***Not to Scale***



Spring Forest Road (Crossing # 465 516E)

Spring Forest Road is a local road that is located in a commercial area of Greenville. The average daily traffic volume is 2,503 and the warning devices consist of crossbucks, mast-mounted flashing lights and bells. No accidents have occured at this crossing.

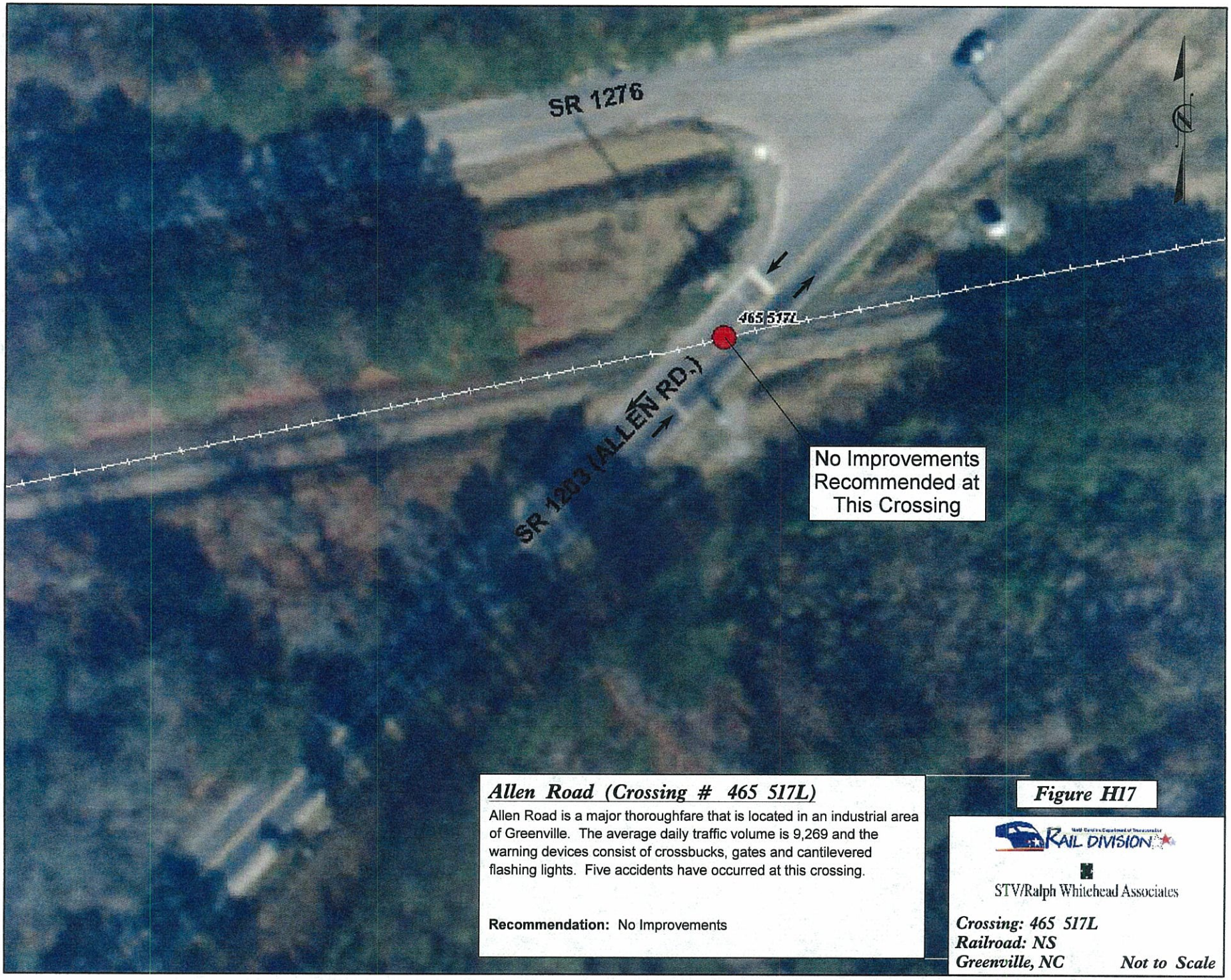
Recommendation: Add Gates

Figure H16

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 465 516E
Railroad: NS
Greenville, NC ***Not to Scale***



Allen Road (Crossing # 465 517L)

Allen Road is a major thoroughfare that is located in an industrial area of Greenville. The average daily traffic volume is 9,269 and the warning devices consist of crossbucks, gates and cantilevered flashing lights. Five accidents have occurred at this crossing.

Recommendation: No Improvements

Figure H17

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 465 517L
Railroad: NS
Greenville, NC

Not to Scale

Figure H18

West 9th Street (Crossing # 465 709D)

West 9th Street is a local road that is located in a commercial area of Greenville. The average daily traffic volume is 1,041 and the warning devices consist of crossbucks. No accidents have been occurred at this crossing.

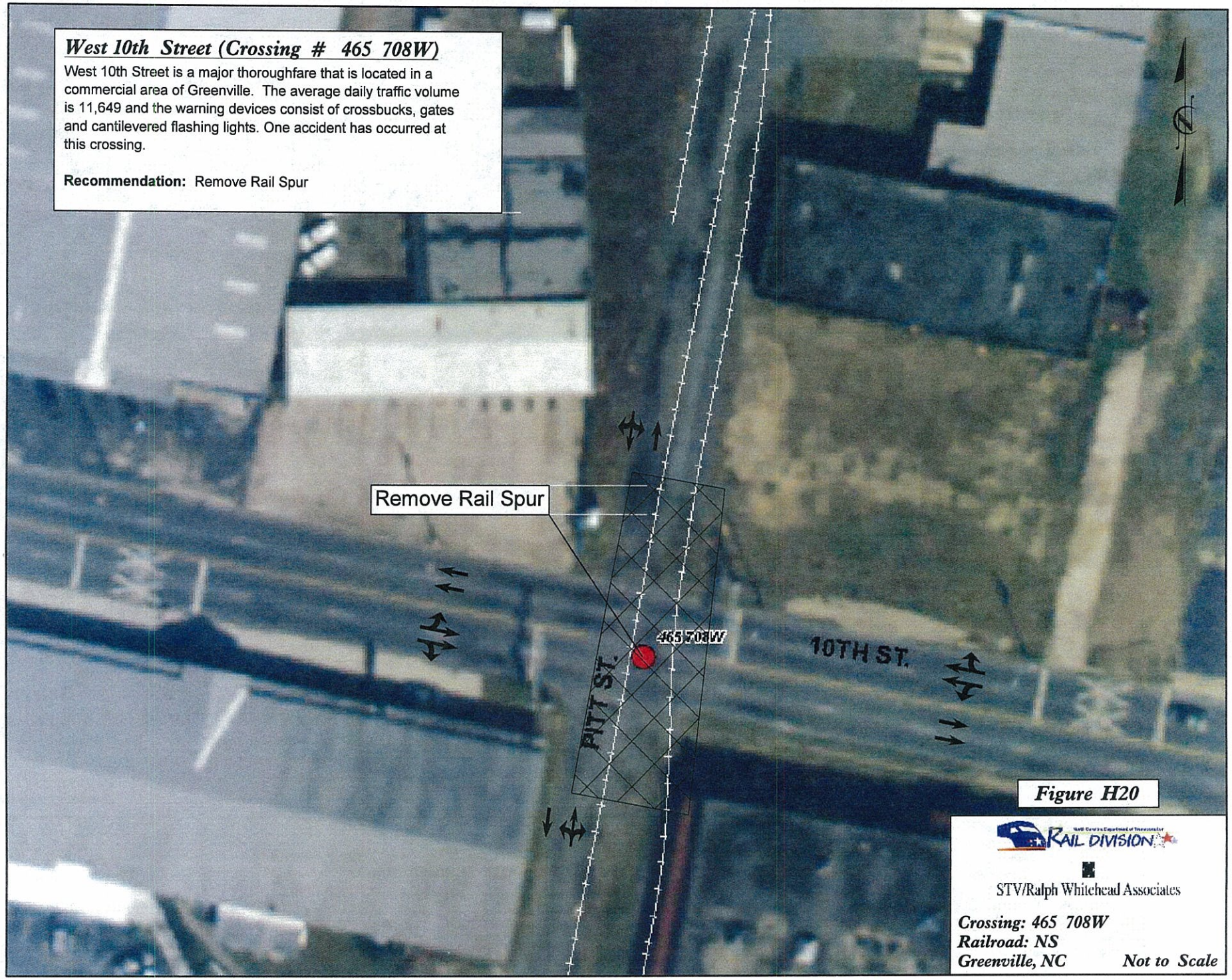
Recommendation: Remove Rail Spur

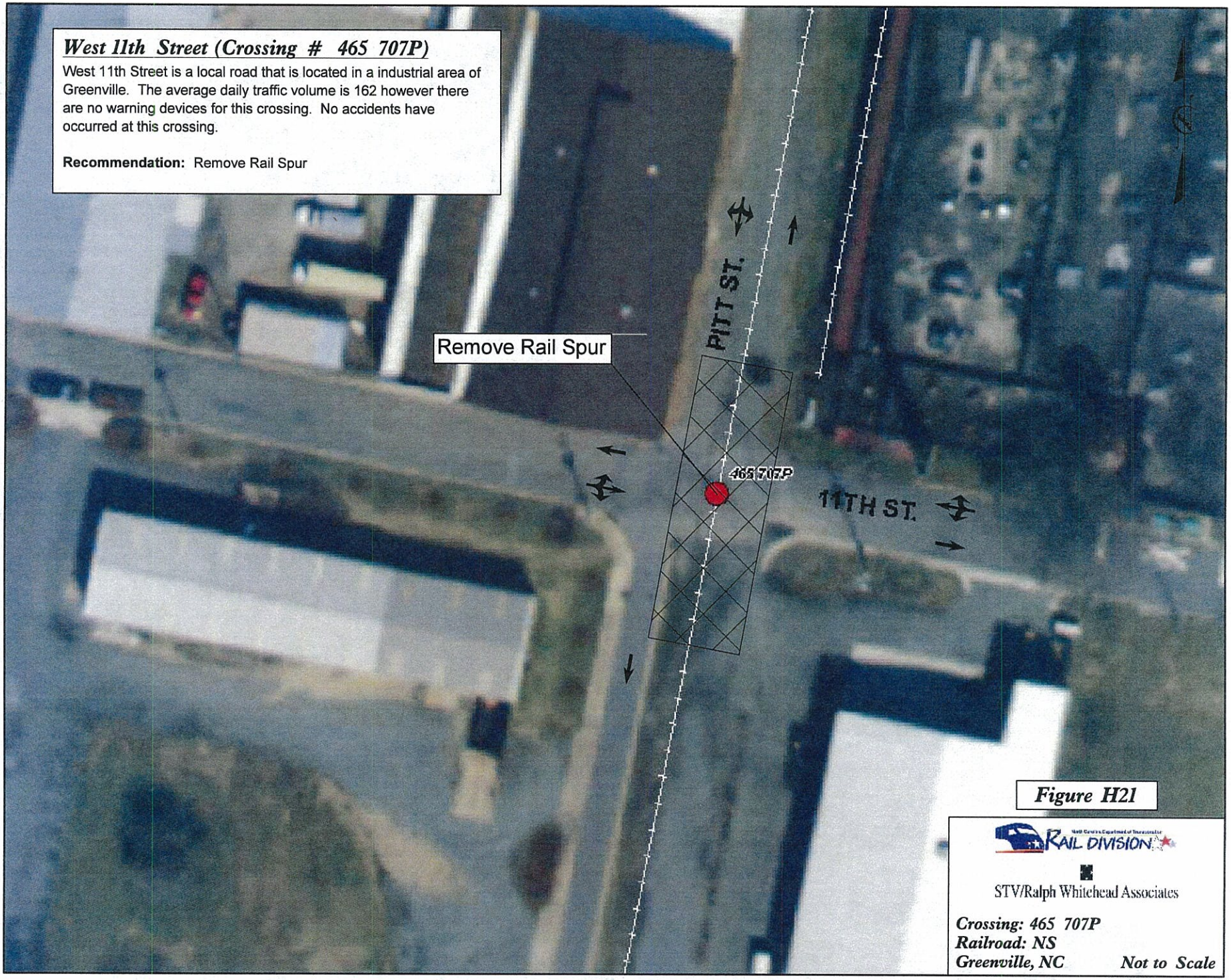
RAIL DIVISION

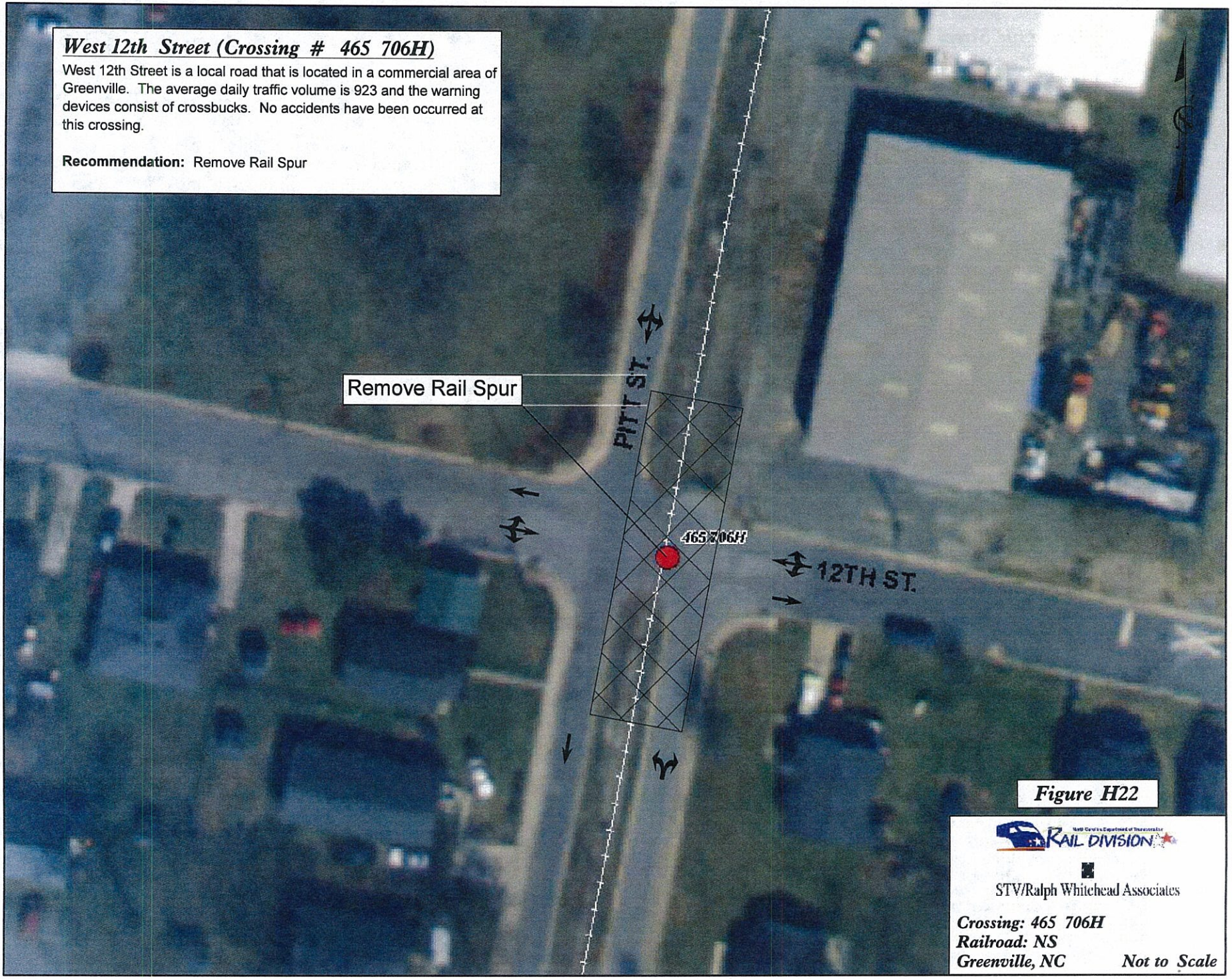
STV/Ralph Whitehead Associates

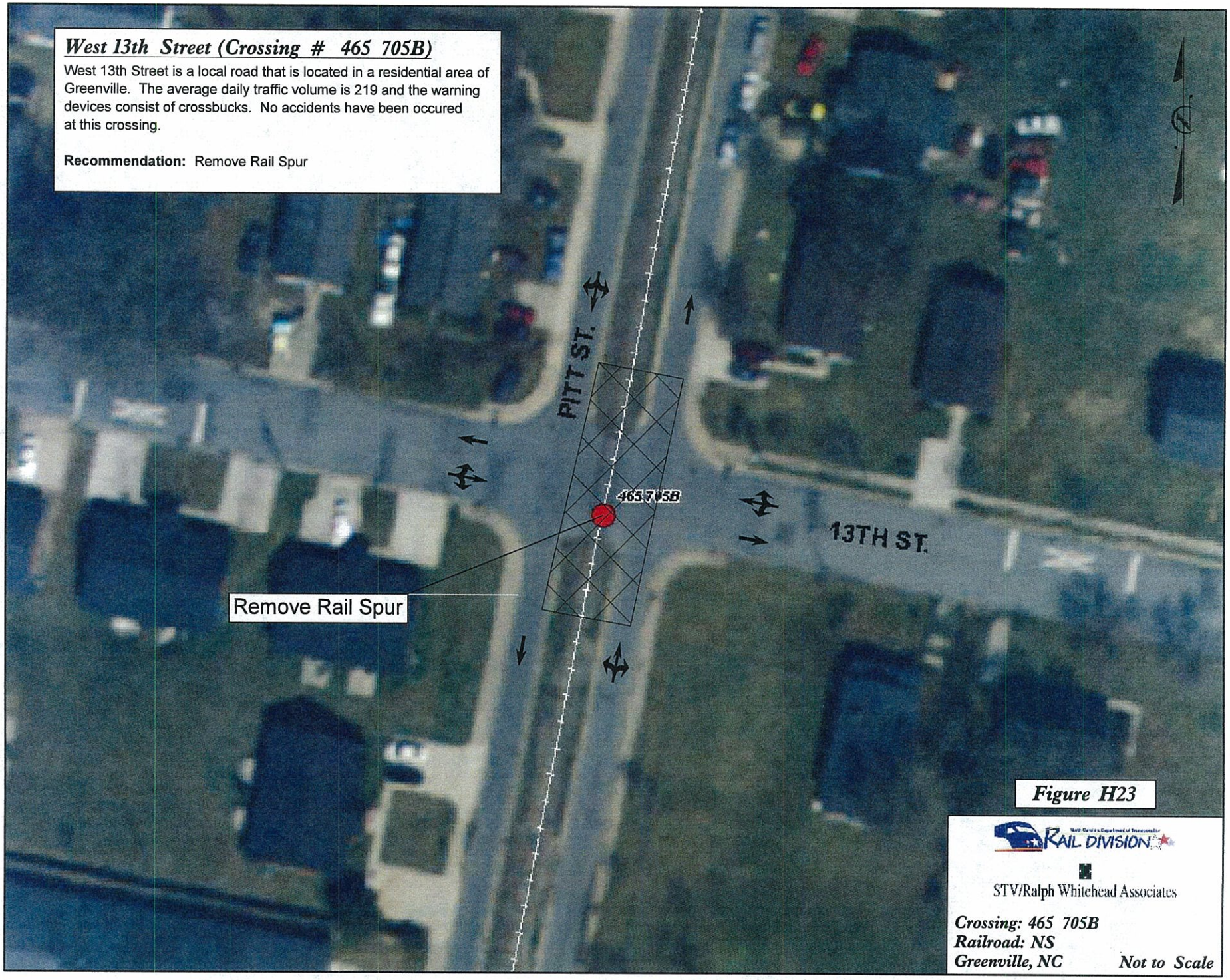
Crossing: 465 709D
Railroad: NS
Greenville, NC ***Not to Scale***

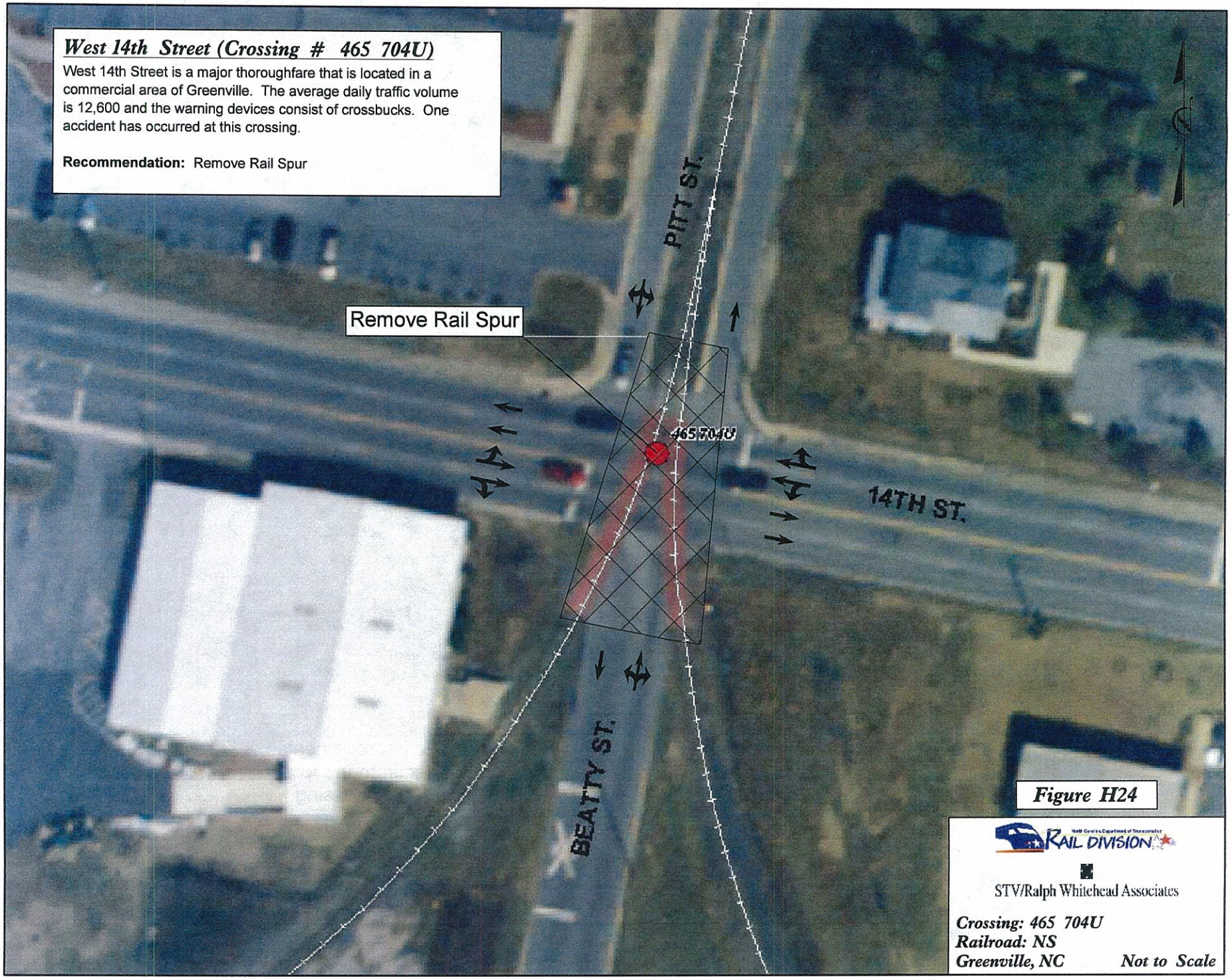

Ficklen Street (Crossing # XXX XXXX)
Ficklen Street is a local road that is located in a commercial area of Greenville. The average daily traffic volume is minimal and there are no warning devices. No accidents have occurred at this crossing.
Recommendation: Remove Rail Spur
FICKLEN ST.
Remove Rail Spur
XXX XXX
9TH ST.
N
Figure H19
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: Ficklen St.
Railroad: CSX
Greenville, NC
Not to Scale

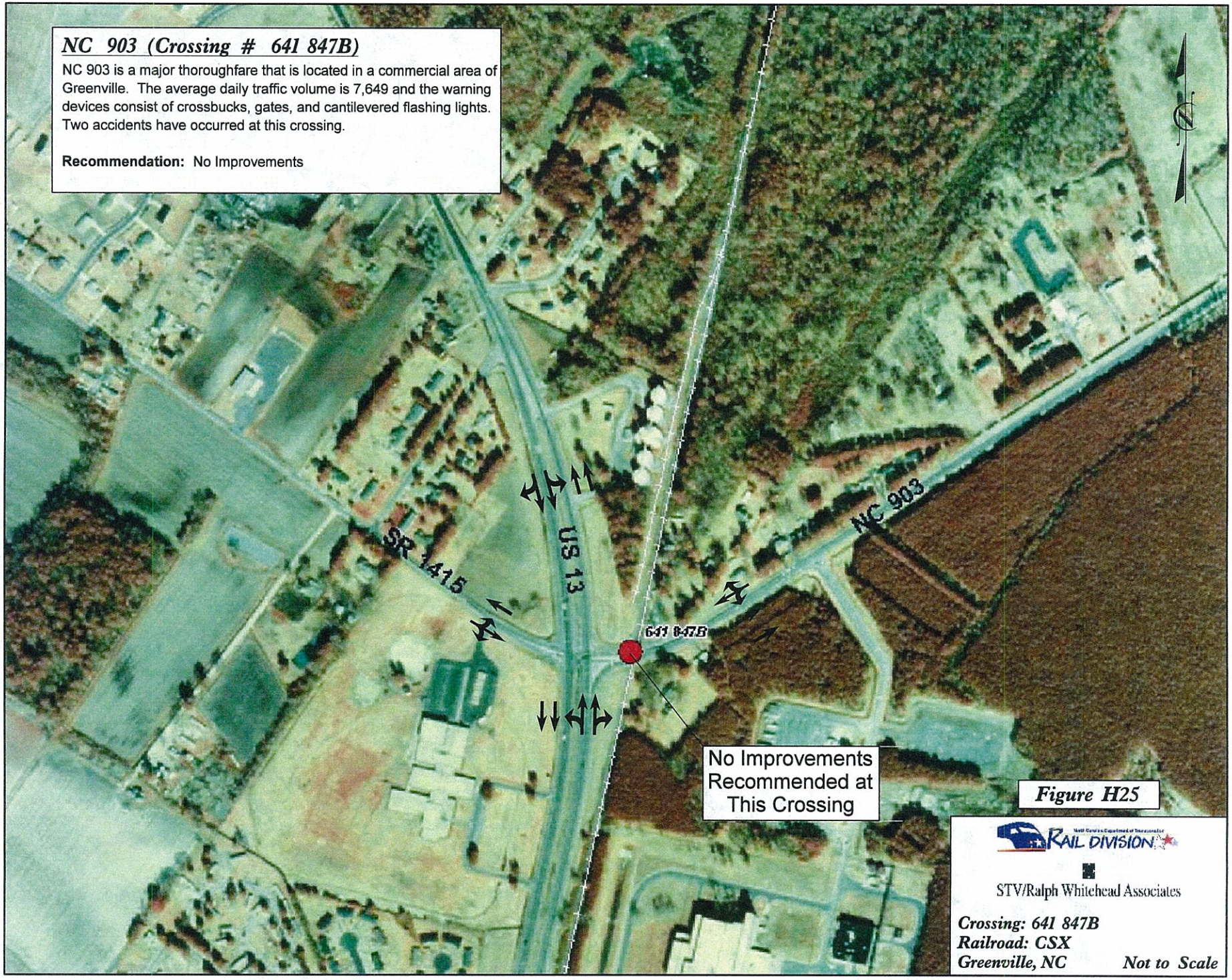

West 10th Street (Crossing # 465 708W)
West 10th Street is a major thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 11,649 and the warning devices consist of crossbucks, gates and cantilevered flashing lights. One accident has occurred at this crossing.
Recommendation: Remove Rail Spur
Remove Rail Spur
465 708W
PITT ST.
10TH ST.
Figure H20
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 708W
Railroad: NS
Greenville, NC
Not to Scale

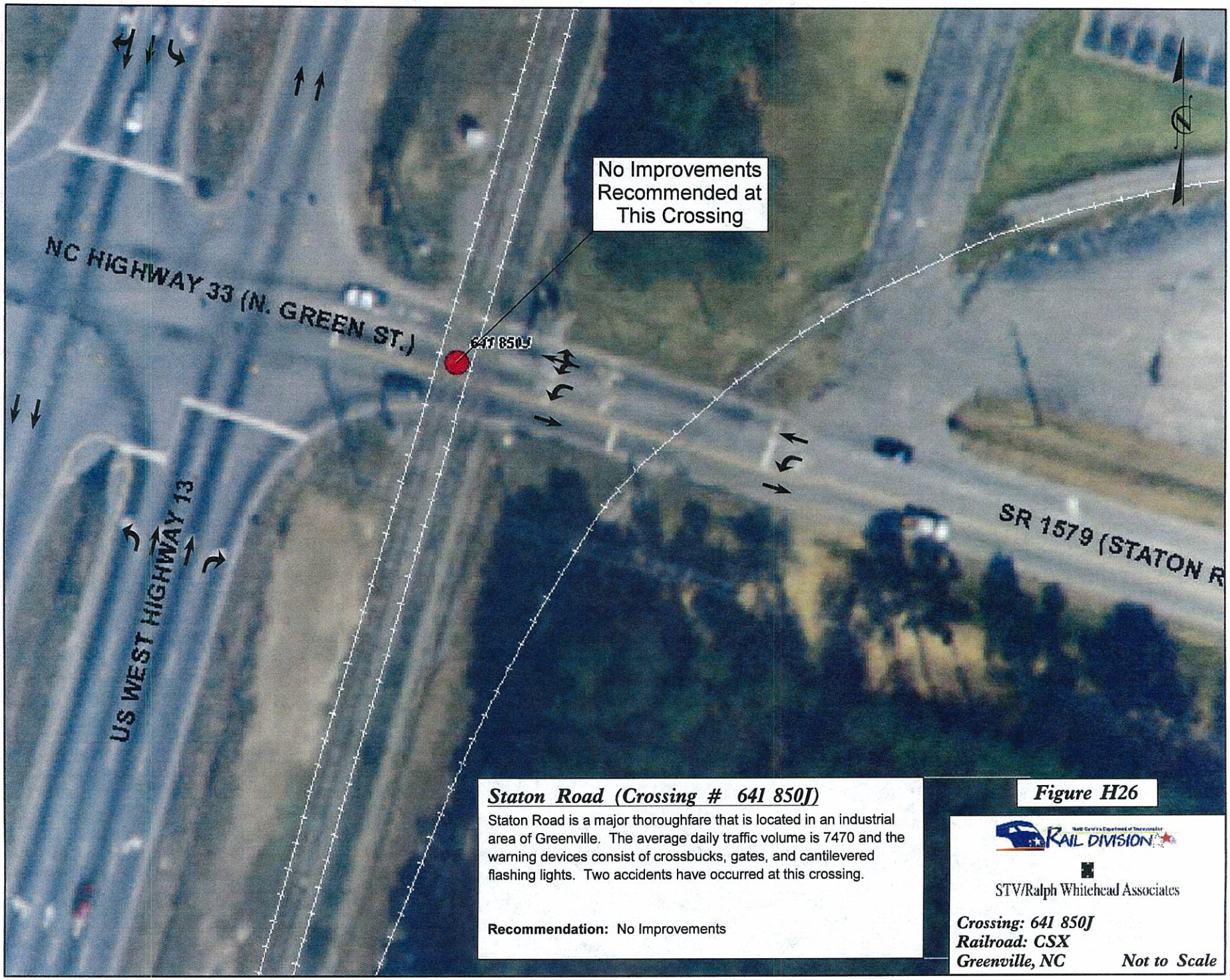

West 11th Street (Crossing # 465 707P)
West 11th Street is a local road that is located in a industrial area of Greenville. The average daily traffic volume is 162 however there are no warning devices for this crossing. No accidents have occurred at this crossing.
Recommendation: Remove Rail Spur
Remove Rail Spur
PITT ST.
465 707P
11TH ST.
Figure H21
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 707P
Railroad: NS
Greenville, NC
Not to Scale


West 12th Street (Crossing # 465 706H)
West 12th Street is a local road that is located in a commercial area of Greenville. The average daily traffic volume is 923 and the warning devices consist of crossbucks. No accidents have been occurred at this crossing.
Recommendation: Remove Rail Spur
Remove Rail Spur
PITT ST.
465 706H
12TH ST.
Figure H22
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 706H
Railroad: NS
Greenville, NC
Not to Scale


West 13th Street (Crossing # 465 705B)
West 13th Street is a local road that is located in a residential area of Greenville. The average daily traffic volume is 219 and the warning devices consist of crossbucks. No accidents have been occured at this crossing.
Recommendation: Remove Rail Spur
PITT ST.
13TH ST.
465 705B
Remove Rail Spur
Figure H23
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 705B
Railroad: NS
Greenville, NC
Not to Scale


West 14th Street (Crossing # 465 704U)
West 14th Street is a major thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 12,600 and the warning devices consist of crossbucks. One accident has occurred at this crossing.
Recommendation: Remove Rail Spur
Remove Rail Spur
PITT ST.
465 704U
14TH ST.
BEATTY ST.
Figure H24
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 465 704U
Railroad: NS
Greenville, NC
Not to Scale


NC 903 (Crossing # 641 847B)
NC 903 is a major thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 7,649 and the warning devices consist of crossbucks, gates, and cantilevered flashing lights. Two accidents have occurred at this crossing.
Recommendation: No Improvements
SR 1415
US 13
NC 903
641 847B
No Improvements Recommended at This Crossing
Figure H25
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 641 847B
Railroad: CSX
Greenville, NC
Not to Scale



Staton Road (Crossing # 641 850J)

Staton Road is a major thoroughfare that is located in an industrial area of Greenville. The average daily traffic volume is 7470 and the warning devices consist of crossbucks, gates, and cantilevered flashing lights. Two accidents have occurred at this crossing.

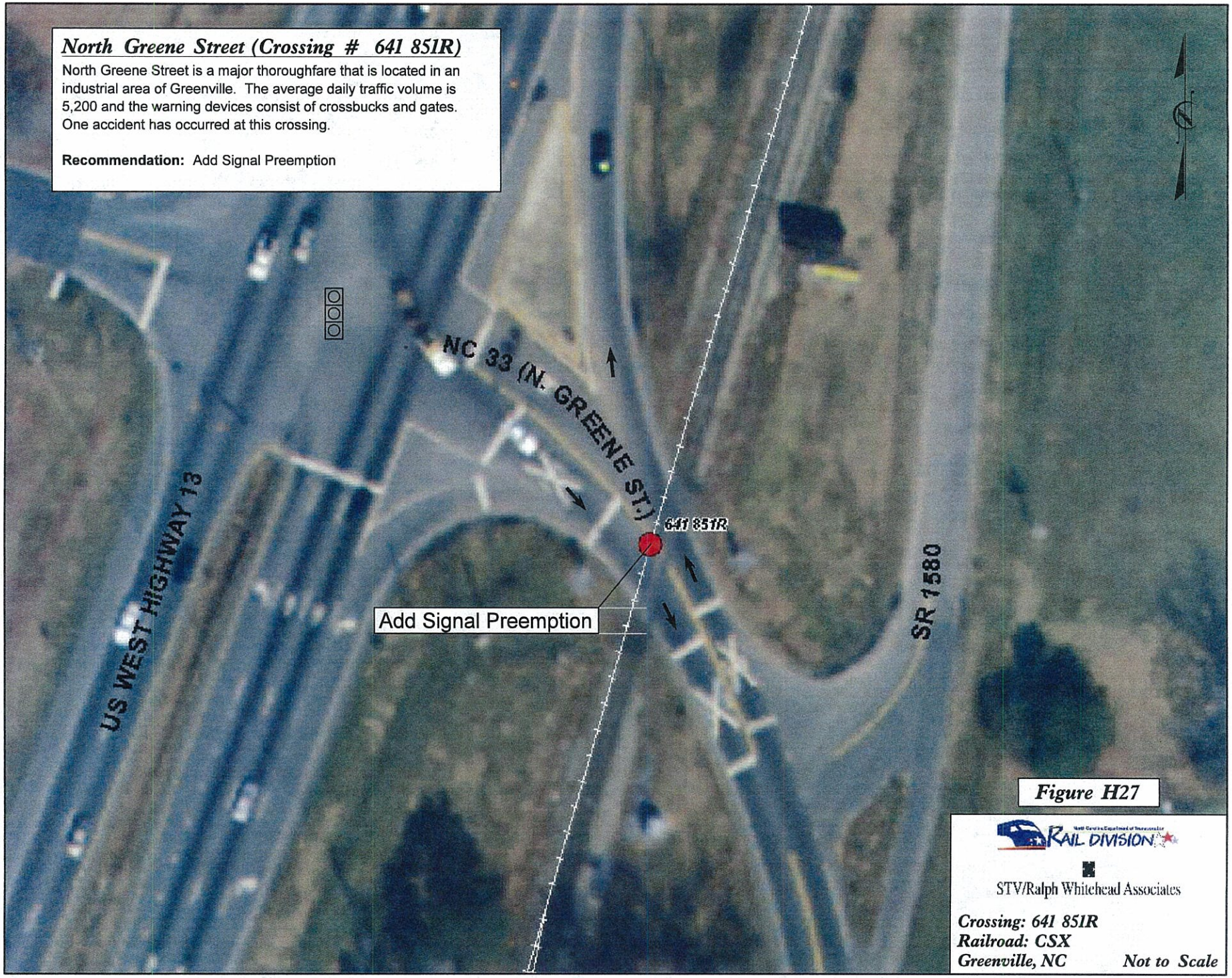
Recommendation: No Improvements

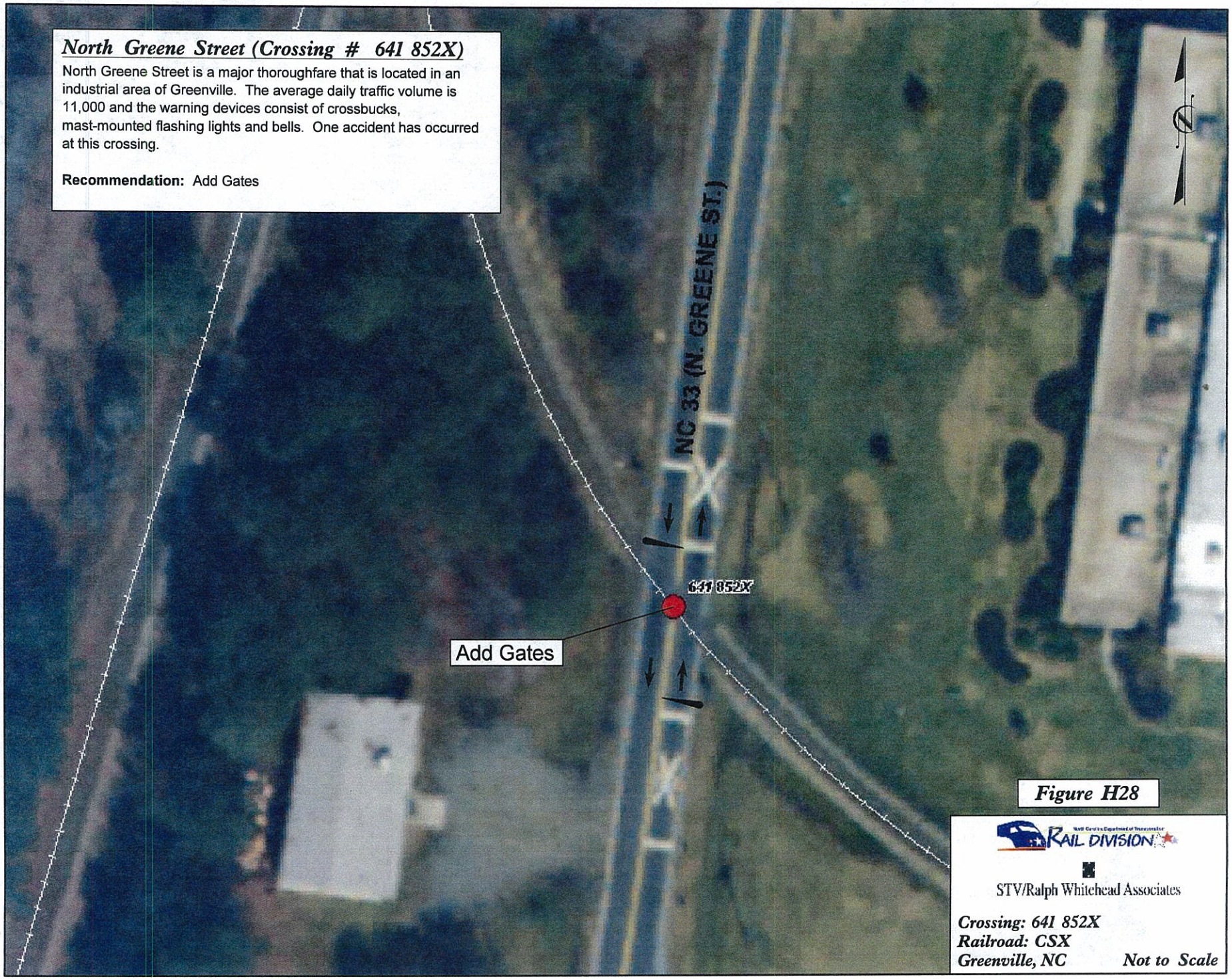
Figure H26

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 641 850J
Railroad: CSX
Greenville, NC ***Not to Scale***


North Greene Street (Crossing # 641 851R)
North Greene Street is a major thoroughfare that is located in an industrial area of Greenville. The average daily traffic volume is 5,200 and the warning devices consist of crossbucks and gates. One accident has occurred at this crossing.
Recommendation: Add Signal Preemption
NC 33 (N. GREENE ST.)
US WEST HIGHWAY 13
641 851R
SR 1580
Add Signal Preemption
Figure H27
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 641 851R
Railroad: CSX
Greenville, NC
Not to Scale


North Greene Street (Crossing # 641 852X)
North Greene Street is a major thoroughfare that is located in an industrial area of Greenville. The average daily traffic volume is 11,000 and the warning devices consist of crossbucks, mast-mounted flashing lights and bells. One accident has occurred at this crossing.
Recommendation: Add Gates
NC 33 (N. GREENE ST.)
641 852X
Add Gates
N
Figure H28
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 641 852X
Railroad: CSX
Greenville, NC
Not to Scale

Industrial Boulevard (Crossing # 641 853E)

Industrial Boulevard is a local road that is located in an industrial area of Greenville. The average daily traffic volume is 2800 and the warning devices consist of crossbucks. Two accidents have occurred at this crossing.

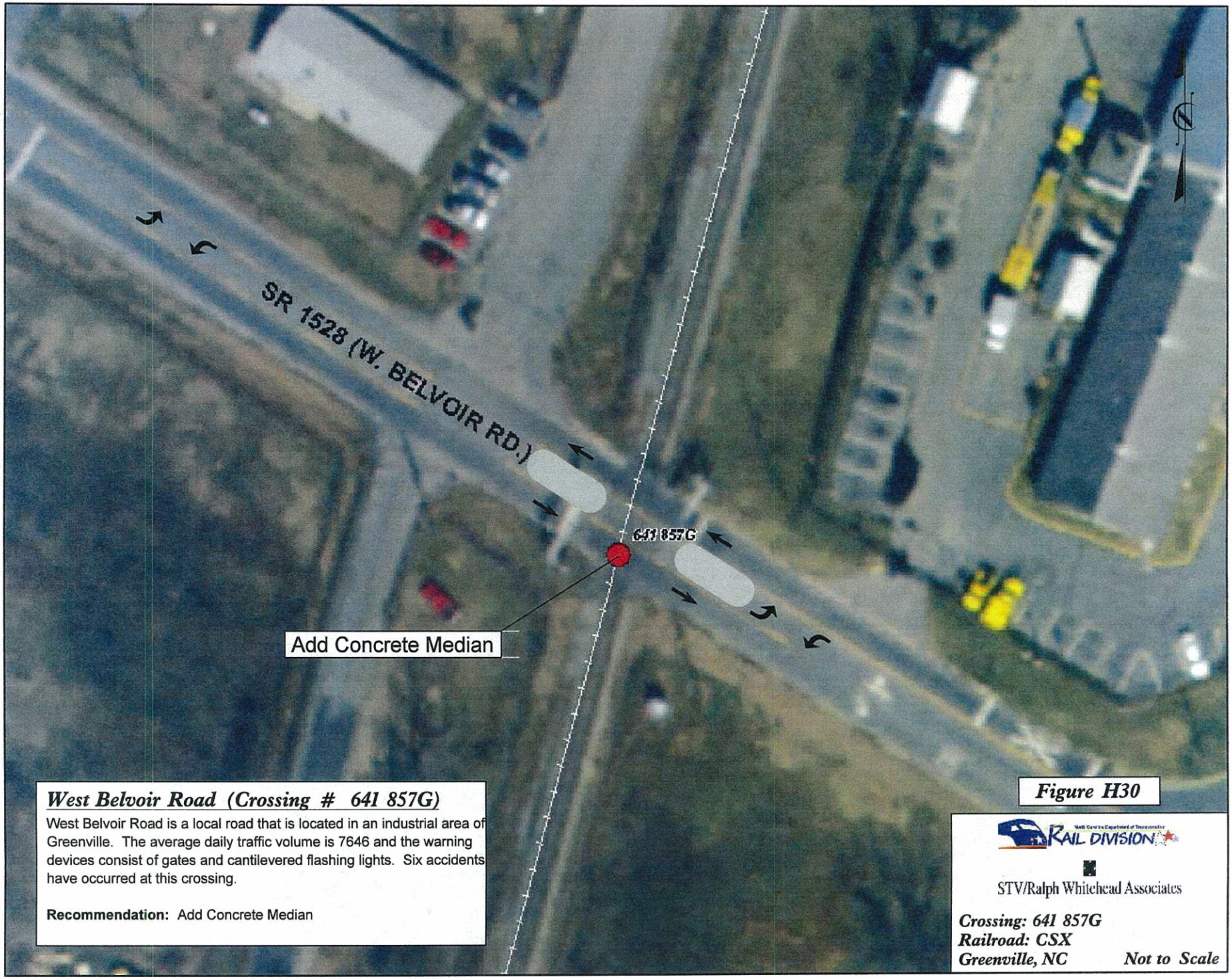
Recommendation: Remove Rail Spur

Figure H29

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 641 853E
Railroad: CSX
Greenville, NC ***Not to Scale***



West Belvoir Road (Crossing # 641 857G)

West Belvoir Road is a local road that is located in an industrial area of Greenville. The average daily traffic volume is 7646 and the warning devices consist of gates and cantilevered flashing lights. Six accidents have occurred at this crossing.

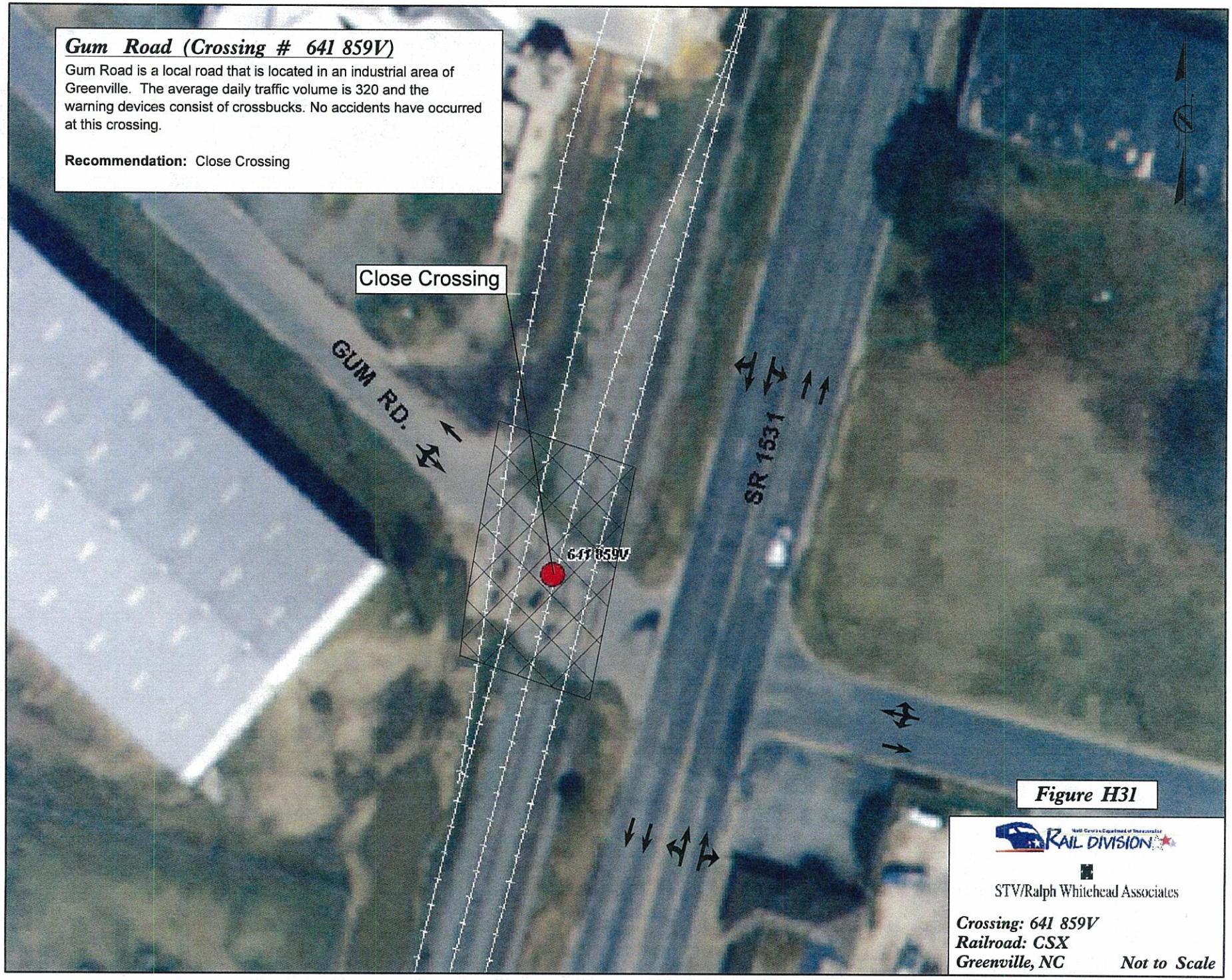
Recommendation: Add Concrete Median

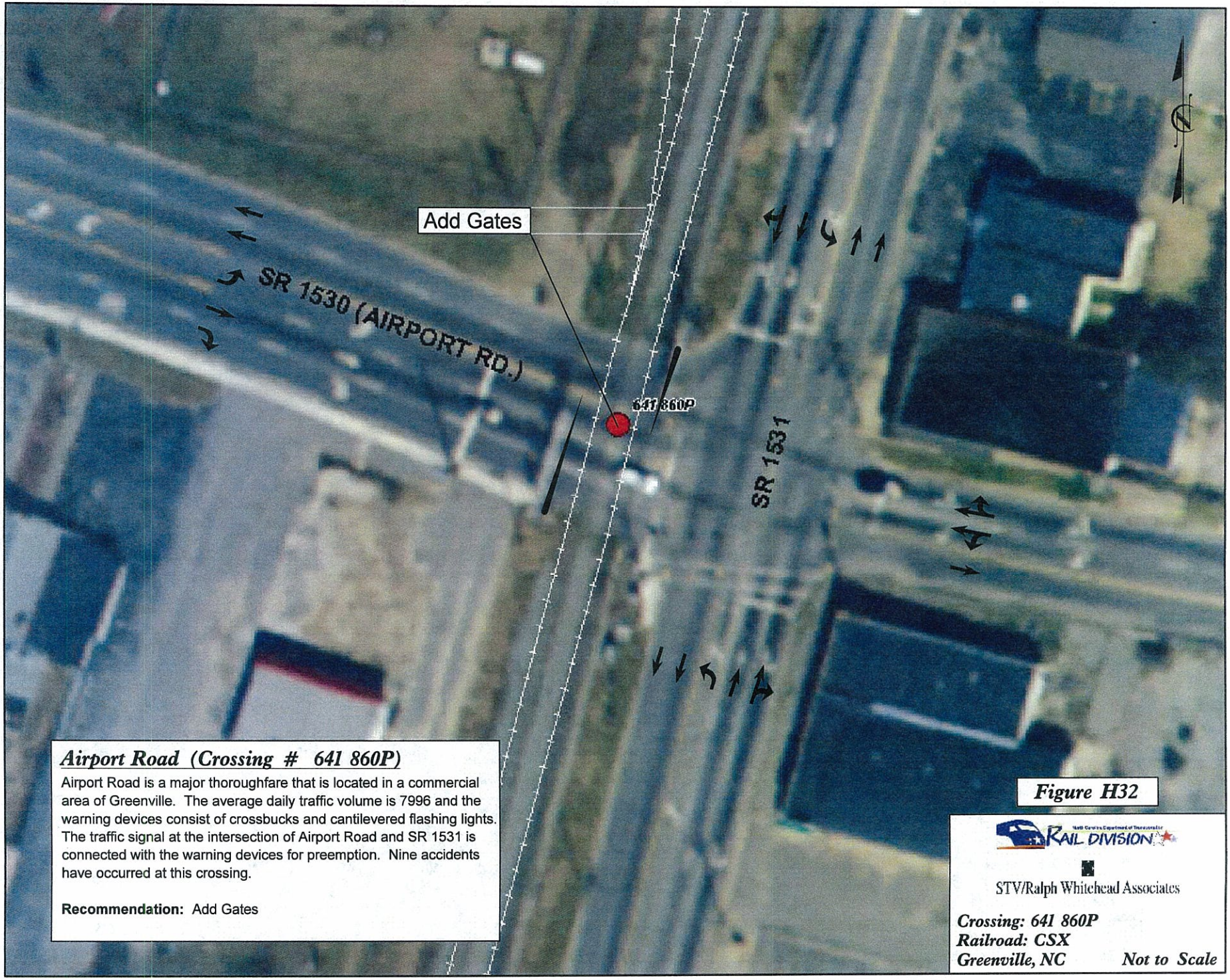
Figure H30

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 641 857G
Railroad: CSX
Greenville, NC ***Not to Scale***


Gum Road (Crossing # 641 859V)
Gum Road is a local road that is located in an industrial area of Greenville. The average daily traffic volume is 320 and the warning devices consist of crossbucks. No accidents have occurred at this crossing.
Recommendation: Close Crossing
Close Crossing
GUM RD.
SR 1631
641 859V
Figure H31
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 641 859V
Railroad: CSX
Greenville, NC
Not to Scale



Airport Road (Crossing # 641 860P)

Airport Road is a major thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 7996 and the warning devices consist of crossbucks and cantilevered flashing lights. The traffic signal at the intersection of Airport Road and SR 1531 is connected with the warning devices for preemption. Nine accidents have occurred at this crossing.

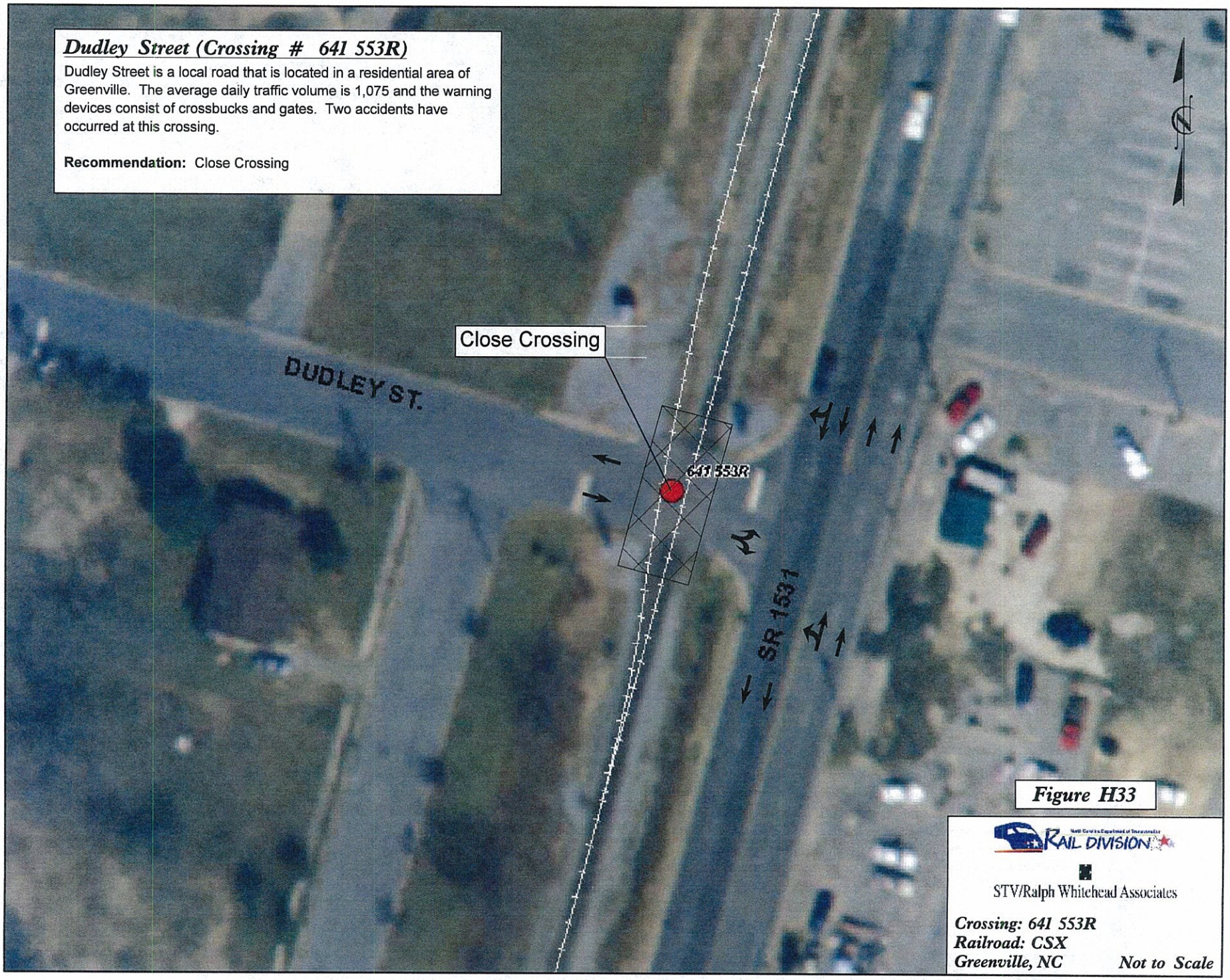
Recommendation: Add Gates

Figure H32

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 641 860P
Railroad: CSX
Greenville, NC ***Not to Scale***


Dudley Street (Crossing # 641 553R)
Dudley Street is a local road that is located in a residential area of Greenville. The average daily traffic volume is 1,075 and the warning devices consist of crossbucks and gates. Two accidents have occurred at this crossing.
Recommendation: Close Crossing
Close Crossing
DUDLEY ST.
641 553R
SR 1531
Figure H33
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 641 553R
Railroad: CSX
Greenville, NC
Not to Scale


West 3rd Street (Crossing # 641 557T)
West 3rd Street is a local road that is located in a residential area of Greenville. The average daily traffic volume is 2,786 and the warning devices consist of gates. One accident has occurred at this crossing.
Recommendation: Adjust Vertical Profile
3RD ST.
641 557T
NEW ST.
Adjust Vertical Profile
Figure H34
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 641 557T
Railroad: CSX
Greenville, NC
Not to Scale

West 4th Street (Crossing # 641 558A)

West 4th Street is a local road that is located in a residential area of Greenville. The average daily traffic volume is 1,176 and the warning devices consist of crossbucks. No accidents have occurred at this crossing.

Recommendation: Add Gates

Figure H35

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 641 558A
Railroad: CSX
Greenville, NC ***Not to Scale***

5th Street (Crossing # 641 609H)

Martin Luther King, Jr. Drive is a minor thoroughfare that is located in a residential area of Greenville. The average daily traffic volume is 3,998 and the warning devices consist of crossbucks and mast-mounted flashing lights. Two accidents have occurred at this crossing.

Recommendation: Add Gates

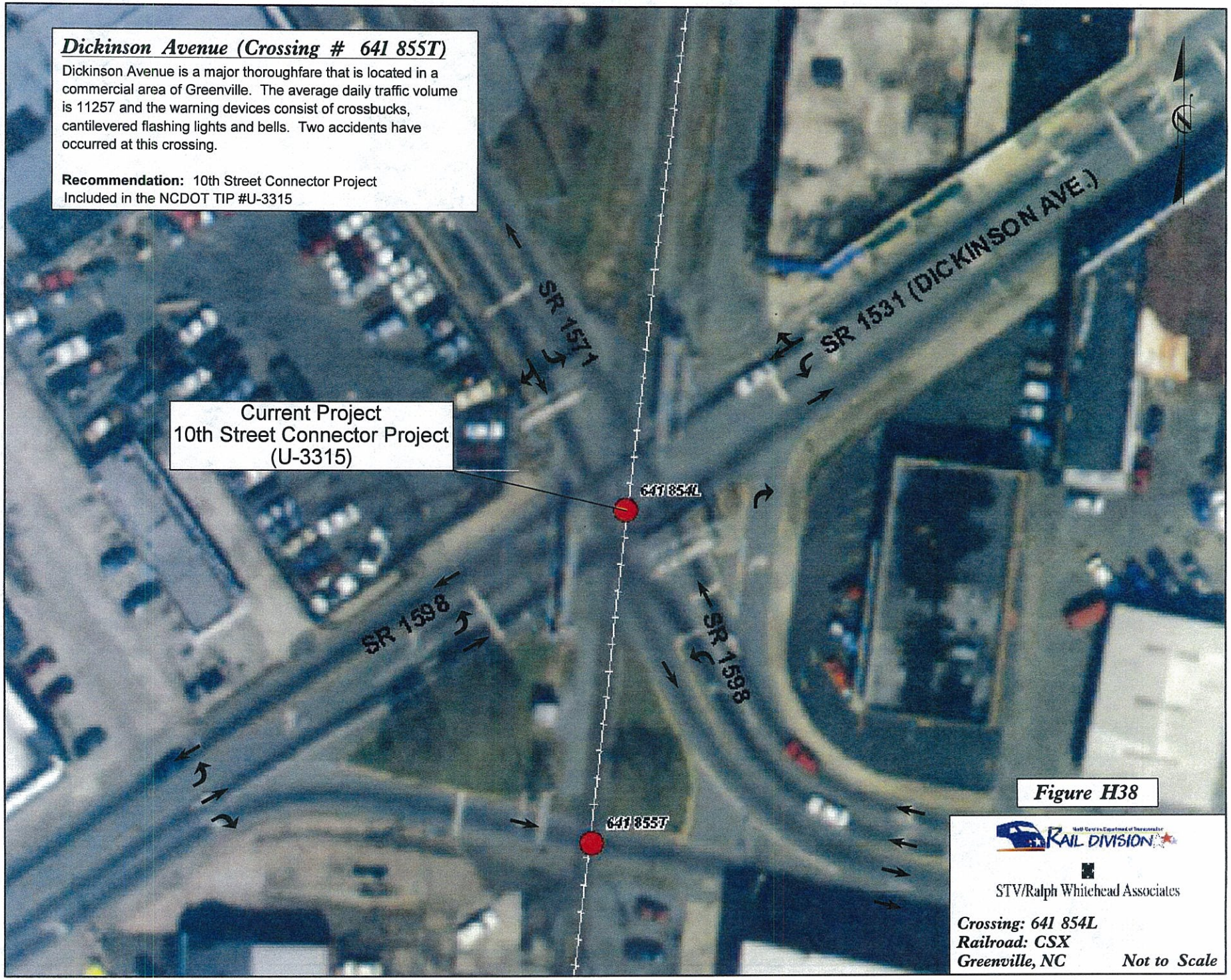
Figure H36

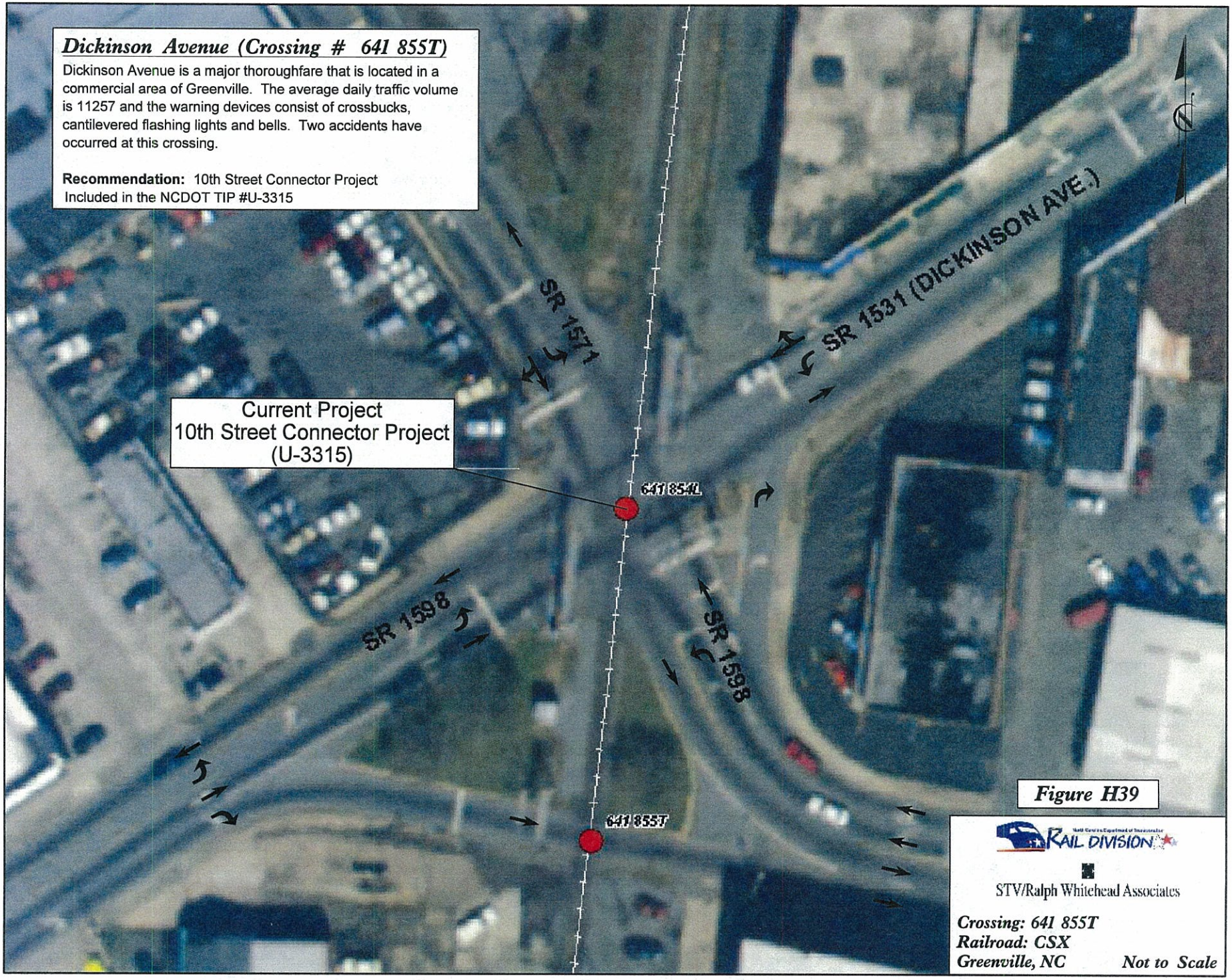
RAIL DIVISION

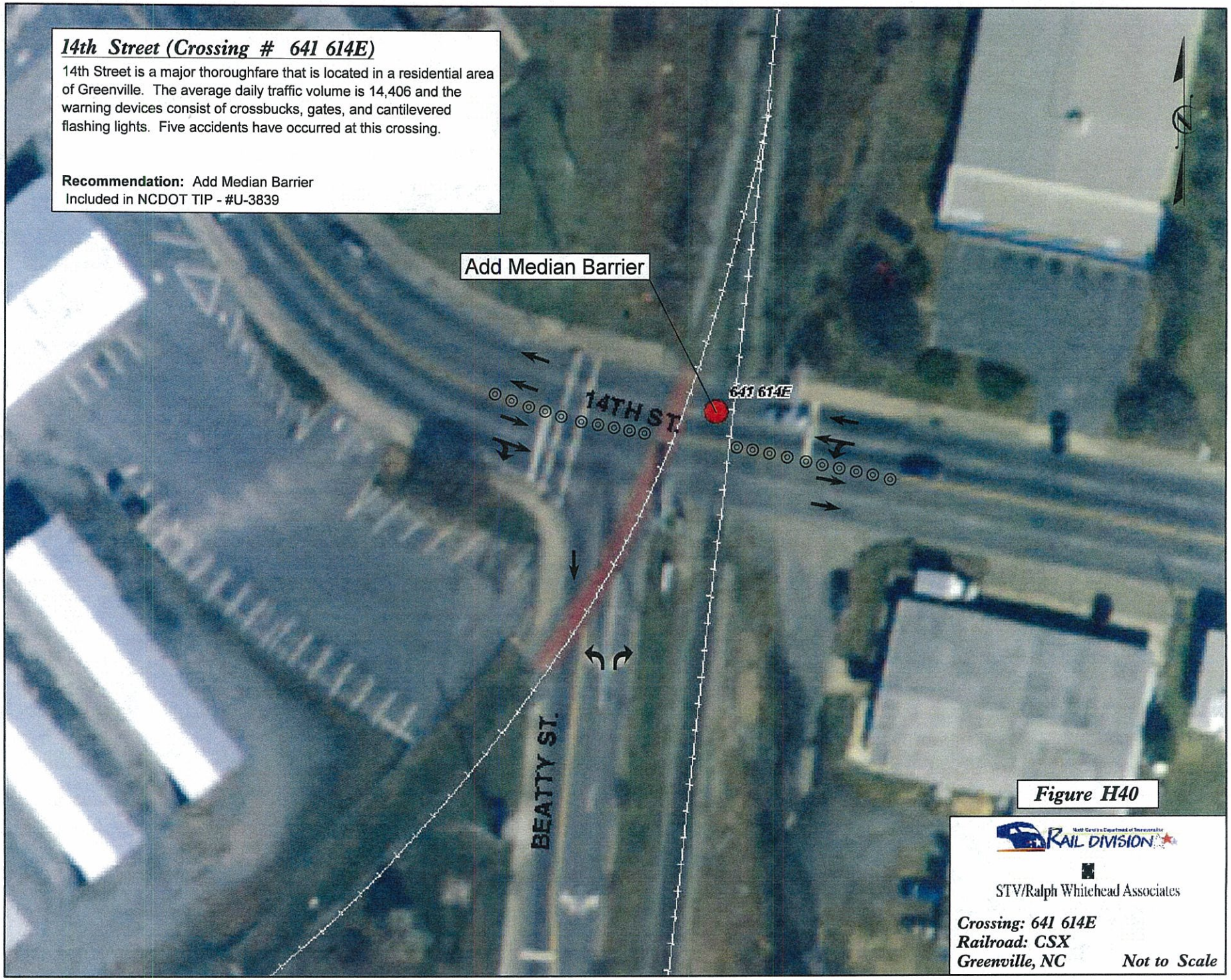
STV/Ralph Whitehead Associates

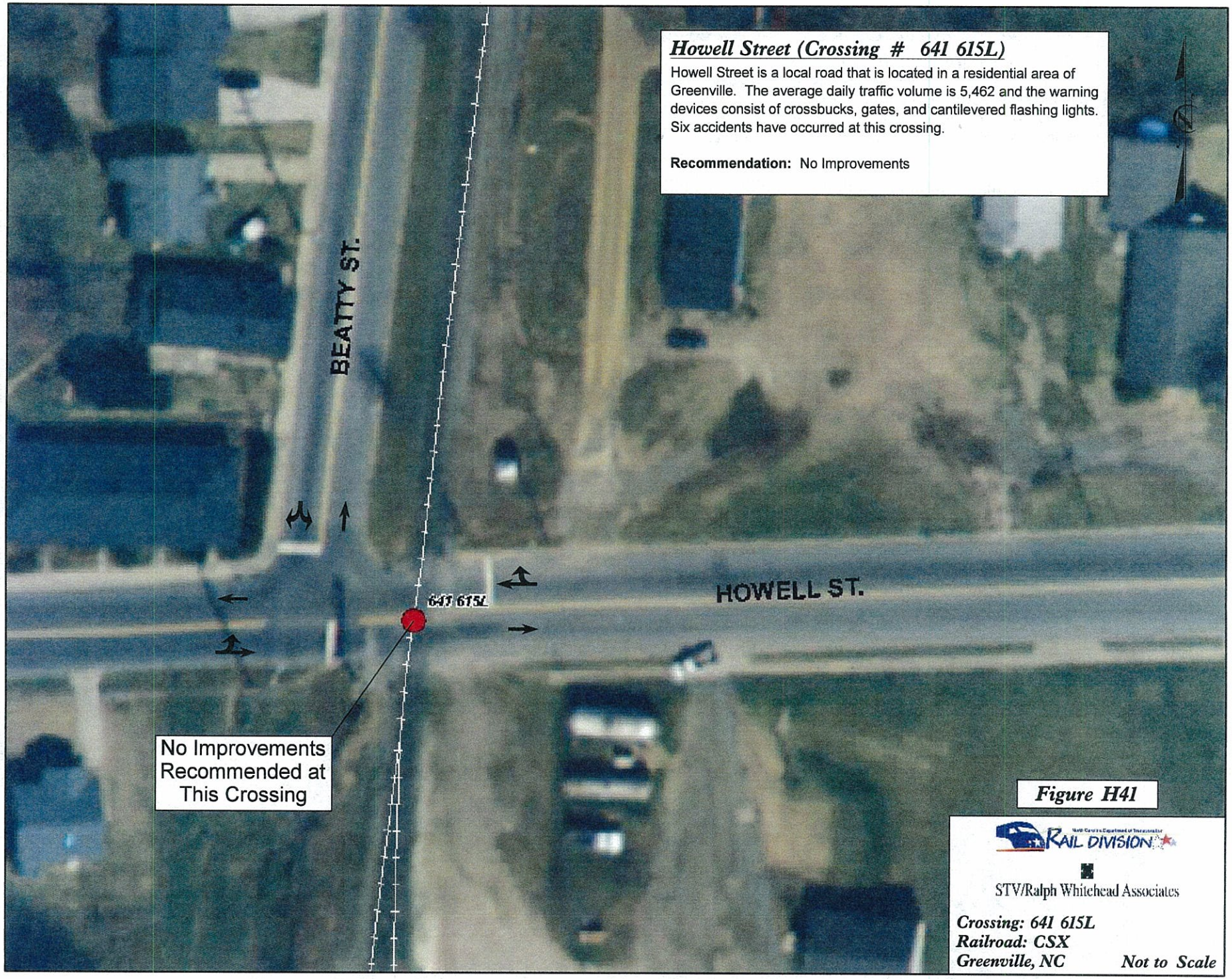
Crossing: 641 609H
Railroad: CSX
Greenville, NC ***Not to Scale***


Alley Street (Crossing # 641 610C)
Alley Street is a local road that is located in an industrial area of Greenville. The average daily traffic volume is 321 and the warning devices consist of gates and cantilevered flashing lights. Two accidents have occurred at this crossing.
Recommendation: Close Crossing
SR 1571
ALLEY ST.
641 610C
ATLANTIC AVE.
Close Crossing
N
Figure H37
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 641 610C
Railroad: CSX
Greenville, NC
Not to Scale


Dickinson Avenue (Crossing # 641 855T)
Dickinson Avenue is a major thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 11257 and the warning devices consist of crossbucks, cantilevered flashing lights and bells. Two accidents have occurred at this crossing.
Recommendation: 10th Street Connector Project Included in the NCDOT TIP #U-3315
SR 1571
SR 1531 (DICKINSON AVE.)
Current Project
10th Street Connector Project
(U-3315)
641 854L
SR 1598
SR 1598
641 855T
N
Figure H38
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 641 854L
Railroad: CSX
Greenville, NC
Not to Scale


Dickinson Avenue (Crossing # 641 855T)
Dickinson Avenue is a major thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 11257 and the warning devices consist of crossbucks, cantilevered flashing lights and bells. Two accidents have occurred at this crossing.
Recommendation: 10th Street Connector Project Included in the NCDOT TIP #U-3315
SR 1571
SR 1531 (DICKINSON AVE.)
Current Project
10th Street Connector Project
(U-3315)
641 854L
SR 1598
SR 1598
641 855T
Figure H39
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 641 855T
Railroad: CSX
Greenville, NC
Not to Scale


14th Street (Crossing # 641 614E)
14th Street is a major thoroughfare that is located in a residential area of Greenville. The average daily traffic volume is 14,406 and the warning devices consist of crossbucks, gates, and cantilevered flashing lights. Five accidents have occurred at this crossing.
Recommendation: Add Median Barrier
Included in NCDOT TIP - #U-3839
Add Median Barrier
641 614E
14TH ST.
BEATTY ST.
N
Figure H40
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 641 614E
Railroad: CSX
Greenville, NC
Not to Scale



Howell Street (Crossing # 641 615L)

Howell Street is a local road that is located in a residential area of Greenville. The average daily traffic volume is 5,462 and the warning devices consist of crossbucks, gates, and cantilevered flashing lights. Six accidents have occurred at this crossing.

Recommendation: No Improvements

Figure H41

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 641 615L
Railroad: CSX
Greenville, NC ***Not to Scale***

Line Avenue (Crossing # 904 748H)

Line Avenue is a minor thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 10,546 and the warning devices consist of crossbucks, gates and cantilevered flashing lights. Three accidents have occurred at this crossing.

Recommendation: No Improvements

Figure H42

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 904 748H
Railroad: NS
Greenville, NC ***Not to Scale***

Arlington Boulevard (Crossing # 642 719W)

Arlington Boulevard is a major thoroughfare that is located in the commercial area of Greenville. The average daily traffic volume is 30839 and the warning devices consist of gates and cantilevered flashing lights. Three accidents have occurred at this crossing.

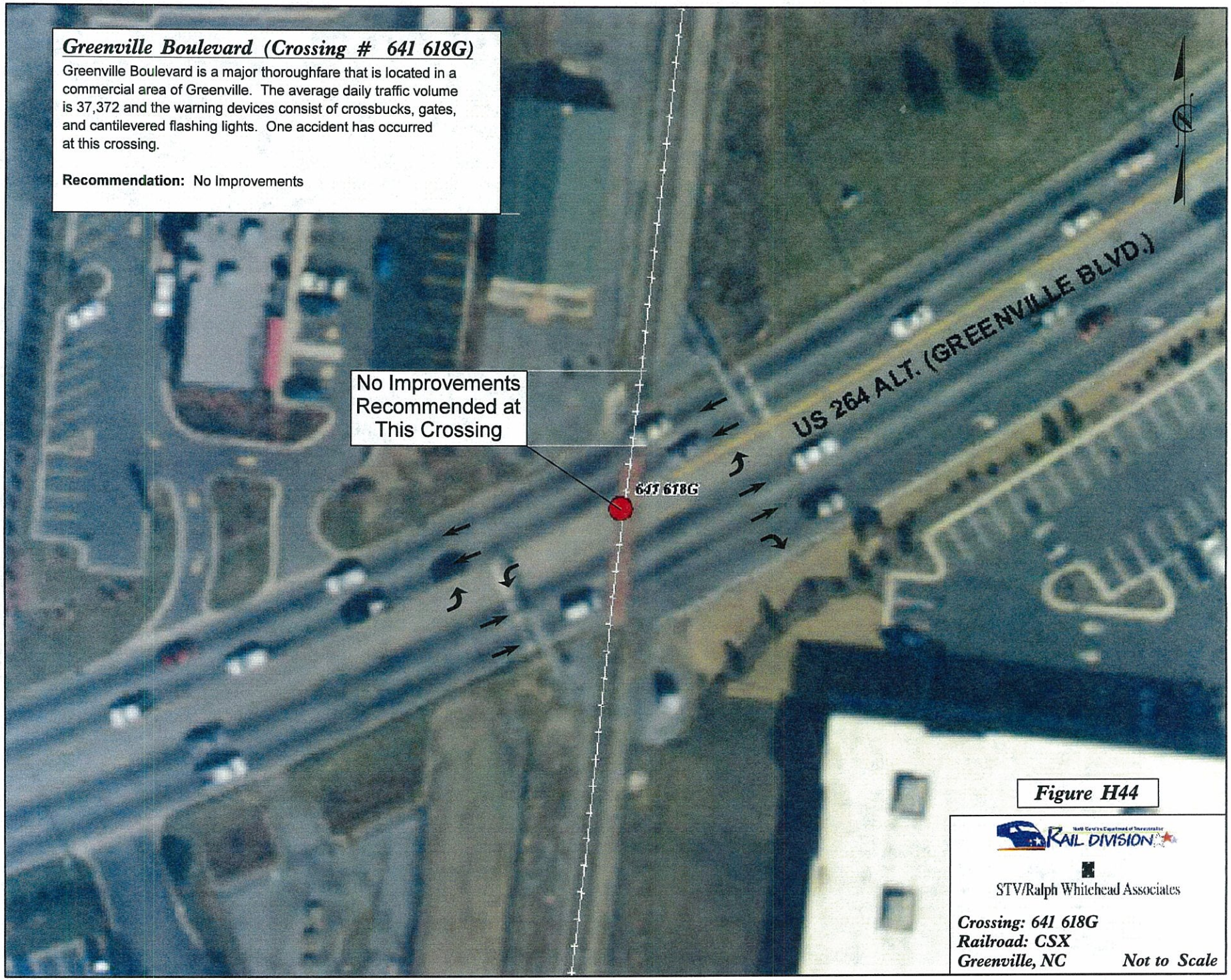
Recommendation: No Improvements

Figure H43

RAIL DIVISION

STV/Ralph Whitehead Associates

Crossing: 642 719W
Railroad: NS
Greenville, NC ***Not to Scale***


Greenville Boulevard (Crossing # 641 618G)
Greenville Boulevard is a major thoroughfare that is located in a commercial area of Greenville. The average daily traffic volume is 37,372 and the warning devices consist of crossbucks, gates, and cantilevered flashing lights. One accident has occurred at this crossing.
Recommendation: No Improvements
No Improvements Recommended at This Crossing
641 618G
US 264 ALT. (GREENVILLE BLVD.)
N
Figure H44
RAIL DIVISION
STV/Ralph Whitehead Associates
Crossing: 641 618G
Railroad: CSX
Greenville, NC
Not to Scale

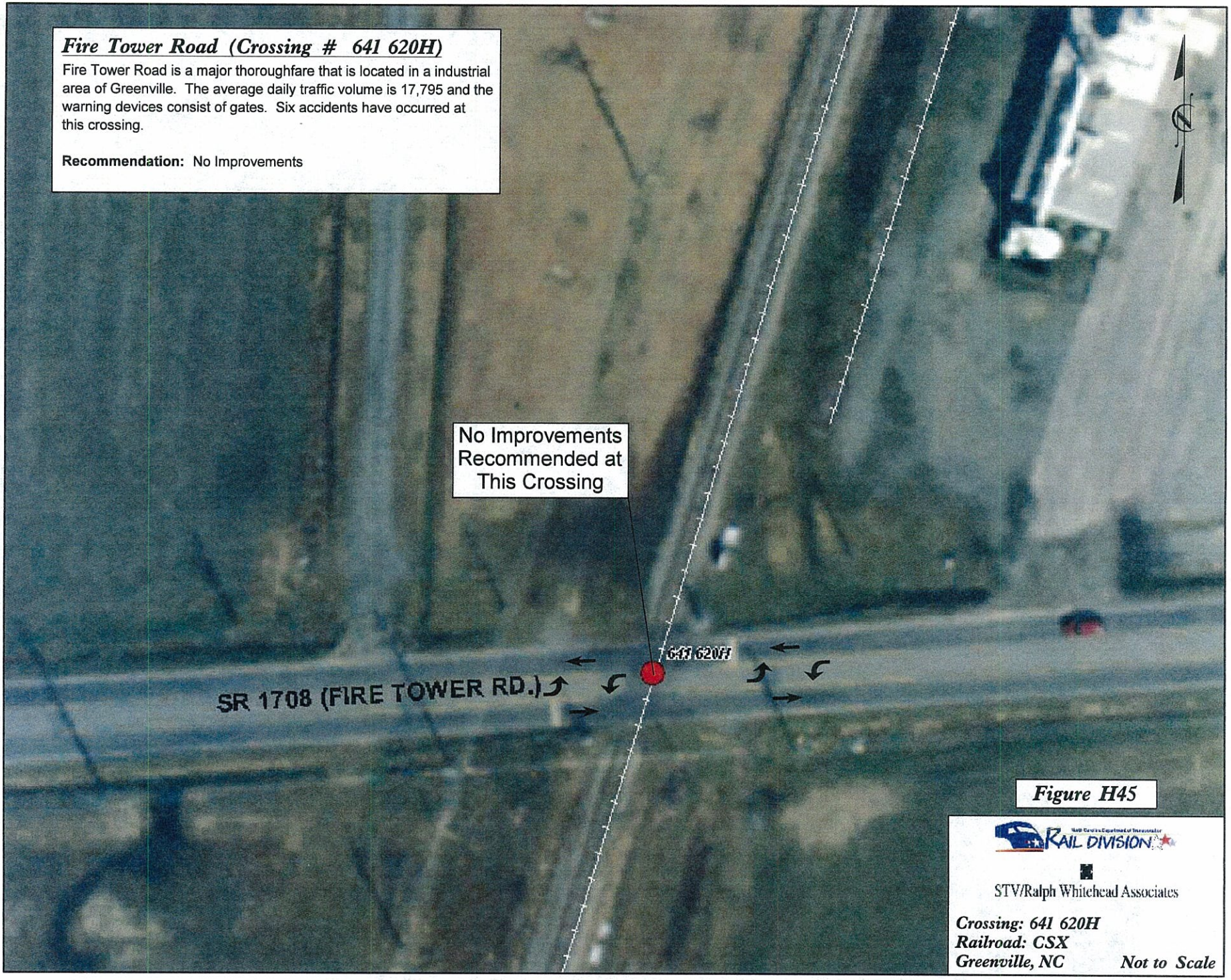


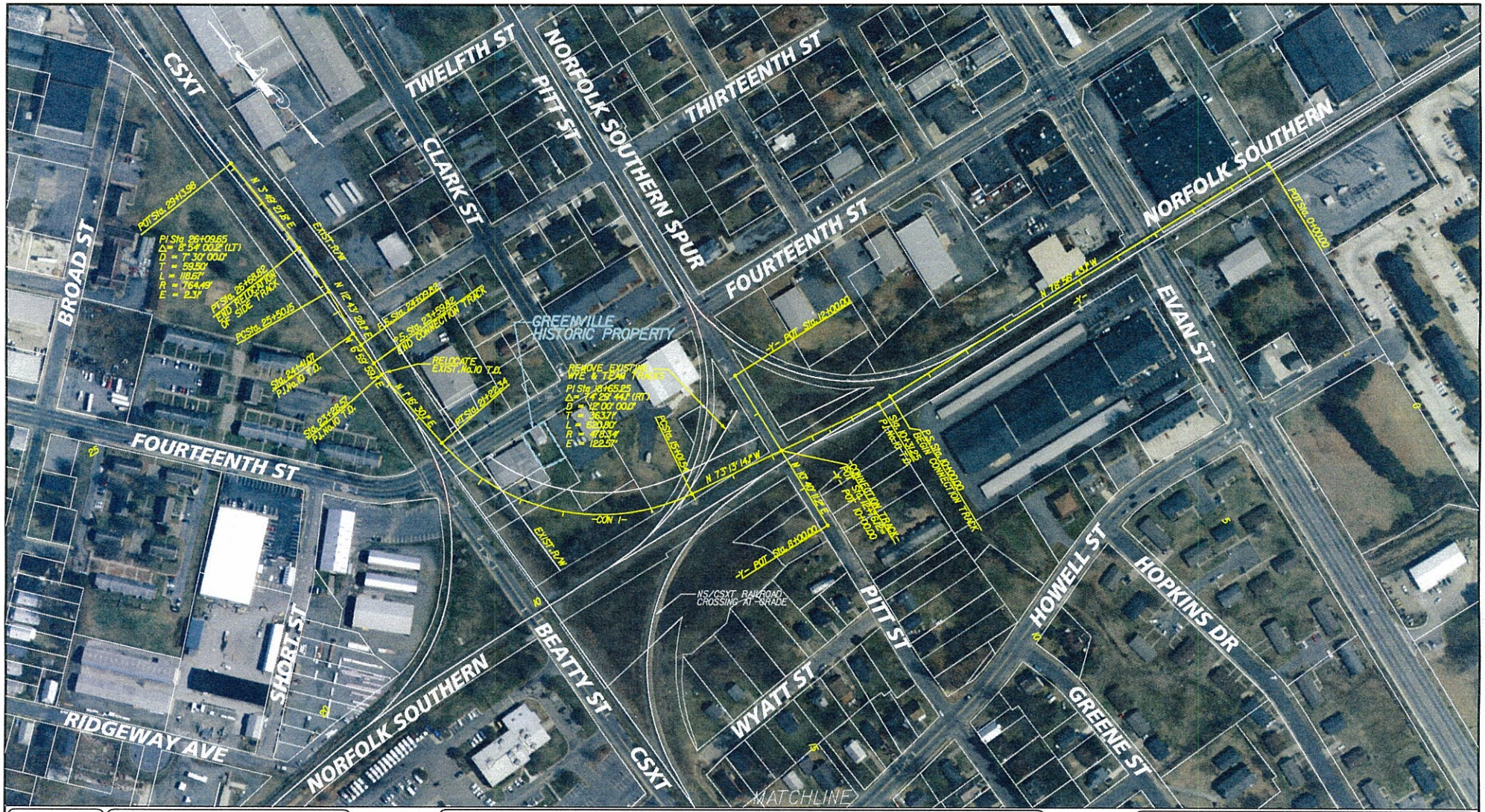
Figure H45

STV/Ralph Whitehead Associates

Crossing: 641 620H
Railroad: CSX
Greenville, NC

Not to Scale

Greenville Rail Improvements – Wye Connection Track and New Yard



REVISIONS:

NO.	DATE:	DESCRIPTION:

PREPARED BY: CEG | CHECKED BY: BDD

NC DEPARTMENT OF TRANSPORTATION

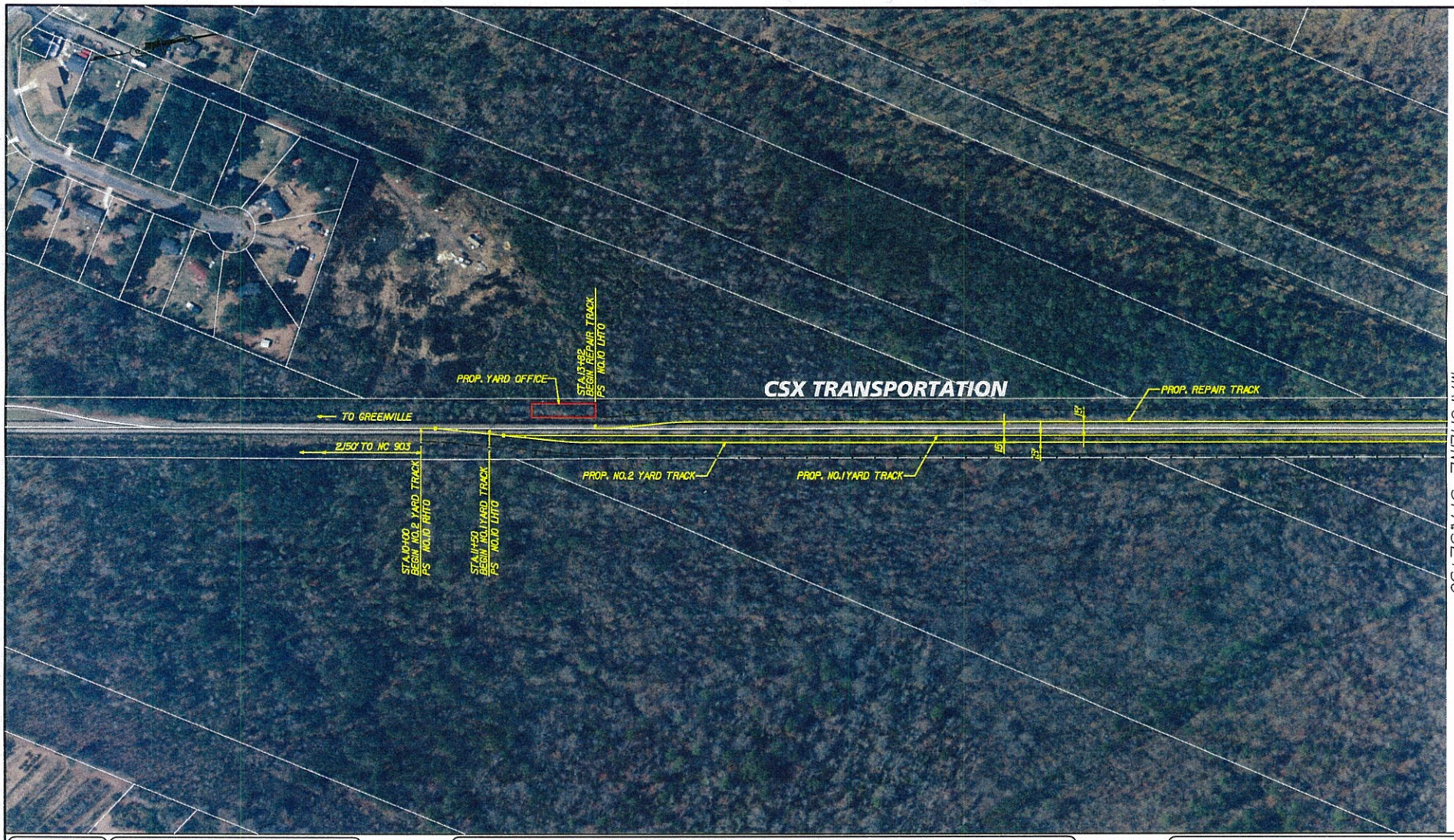
RAIL DIVISION

ENGINEERING AND SAFETY BRANCH
CAPITAL YARD
1556 MAIL SERVICE CENTER
RALEIGH, NC 27699-1556

PITT COUNTY
GREENVILLE

FIGURE 1

SCALE:	DATE:	DRAWING NO.
1"-200'	02/28/2008	SHEET 1 OF 1



REVISIONS:

NO.	DATE:	DESCRIPTION:

PREPARED BY: CEG

CHECKED BY: BDD

NC DEPARTMENT OF TRANSPORTATION

RAIL DIVISION

ENGINEERING AND SAFETY BRANCH
CAPITAL YARD
1556 MAIL SERVICE CENTER
RALEIGH, NC 27699-1556

PITT COUNTY
GREENVILLE

FIGURE 2

SCALE:	DATE:	DRAWING NO.
1"-200'	02/28/2008	SHEET 1 OF 2

REVISIONS:

NO.	DATE:	DESCRIPTION:

PREPARED BY: CEG | CHECKED BY: BDD

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION

ENGINEERING AND SAFETY BRANCH
CAPITAL YARD
1556 MAIL SERVICE CENTER
RALEIGH, NC 27699-1556

PITT COUNTY
GREENVILLE

FIGURE 2

SCALE:	DATE:	DRAWING NO.
1"=200'	02/28/2008	SHEET 2 OF 2

Appendix A

Public Meeting Summary
February 12th and 13th 2008
Greenville Traffic Separation Study

1. Project Overview

The North Carolina Department of Transportation (NCDOT) has developed the Traffic Separation Study (TSS) as an effort to pursue a more systematic approach to crossing safety. Traffic Separation Studies are a comprehensive evaluation of traffic patterns and road usage for an entire municipality or region that determines the need for improving and/or eliminating public grade crossings.

The NCDOT entered into a municipal agreement with the City of Greenville to complete a TSS. This study looked at two rail lines, CSX and Norfolk Southern (NS). However, Coastal Carolina Railway (CLNA) operates on the NS rail line through the City. A total of forty-five (45) grade crossings were evaluated as part of this study; 21 CSX crossings and 24 NS crossings.

2. Purpose and Intent

The purpose of the public meetings was to:

- Inform the public on recommended improvements listed in the traffic separation study
- Answer questions from the public about specific recommendations
- Allow the public to comment on specific recommendations

Among the items presented were maps of the proposed improvements for selected crossings, visualization boards, and newsletters. Open dialogue between the public and the project team was encouraged through the two events.

3. Meeting Dates, Times, and Location

Two public meetings were held at the Sheppard Memorial Library, 530 S. Evans Street, on February 12th and 13th 2008 from 5pm to 7pm.

4. Public Notices

4.1 Press Release

NCDOT placed a press release inviting the public to attend the workshop and comment on the project in local newspapers.

4.2 Newspaper Articles

Following the public workshops, two articles were published in The Daily Reflector. These articles discussed the TSS project and the proposed recommendations. Both articles listed the NCDOT Rail Division's contact information for sending comments and questions on the project.

4.3 TV News Coverage

The local WNCT news covered the public meetings and broadcasted a news clip of the public meeting, including interviews with the NCDOT Rail Project Manager and residents. They also posted two articles on their web site.

5. Meeting Procedure

5.1 Presentation

The meetings were organized in an open house format. Information displays were set up with maps illustrating crossing improvements. A newsletter outlining the study process and recommendations was also available.

City of Greenville staff, NCDOT staff, and project team consultants were made available throughout the display areas to assist attendees with the data being presented and also to solicit and record their input.

In addition, participants were asked to fill out comment sheets regarding recommended crossing improvements along the corridor. Unfortunately, there were no public comments received.

5.2 Attendance

Copies of the Sign-In Sheets are included with this document in the **Appendix**. The following attendance was recorded at the workshops.

- February 12th, 2008 (5:00-7:00 PM) – Sheppard Memorial Library **(7 Attendees)**
- February 13th, 2008 (5:00-7:00 PM) – Sheppard Memorial Library **(3 Attendees)**

City of Greenville staff, NCDOT staff, and project team consultants were made available throughout the display areas to assist attendees with the data being presented and also to solicit and record their input.

5.3 Public Officials Presentation

A presentation was conducted at a Greenville City Council meeting on February 12th, 2008. There were no concerns raised during the meeting regarding any of the improvements.

6. Summary of Public Input

Comment sheets were available at the meetings. There were no public comment sheets received by NCDOT Rail or the City of Greenville.

Appendix B

1000 W. Morehead St., Ste. 200
Post Office Box 35624
Charlotte, NC 28235-5624
(704) 372-1885
(704) 372-3393 FAX

RALPH WHITEHEAD ASSOCIATES, INC.

MINUTES OF MEETING: Greenville TSS Stakeholders Meeting #1

PROJECT: Greenville Traffic Separation Study

LOCATION: Public Works - Greenville

MTG. DATE: **February 23, 2006**

ATTENDING:

Nancy Horne .....NCDOT Rail
Neil Lassiter .....NCDOT
Tom Tysinger .....City of Greenville Public Works
David Brown ..... City of Greenville Engineer
Shelby Stevenson .....CSX Transportation
Sam Tyson .....Pitt County Communications
Linwood Hines .....City of Greenville Fire/Rescue
Joe Simonowich .....City of Greenville Police Dept.
Robert Jones .....City of Greenville Police Dept.
Noel Lee .....Pitt County Emergency Management
Allen Everette.....Pitt County Emergency Management
Stephen Smith ..... Pitt County Planning Dept.
Merrill Flood ..... City of Greenville Planning
Joey Weathington..... Pitt County Schools
Mac Manning .....Pitt County Sheriff
Steve Yetman .....City of Greenville
Brock LaForty .....Ralph Whitehead Associates

MINUTES:

The purpose of this meeting was to give the stakeholders an overview of the TSS study process and to present and discuss the preliminary recommendations. The meeting began at approximately 2:00 PM.

Nancy Horne opened the meeting and gave an overview of the TSS Study process and introduced the consultants working on this project. Brock LaForty discussed the work scheduled to date and briefly went over the schedule; the study has been staying on schedule to date. Brock then went over the data collection activities and fieldwork completed to date and handed out a packet of information on each crossing. He added that the only missing piece of the data collection was the school bus routes and Joey stated he would provide that information. Brock went on to give a broad overview of the preliminary recommendations for the 45 crossings that are part of the study. Brock mentioned that there were five areas that he wanted to focus on for this meeting because the recommendations included possible closures and removing railroad spur tracks.

Overall, RWA's preliminary recommendations were well received by the stakeholders.

The following key points were discussed in during the presentation of the preliminary recommendations:

- Crossing #641 853E (Industrial Boulevard) – Shelby was going to look into the status of the rail spur to find out the history of the activity on that line.
- Norfolk Southern Rail Spur to U.N.X. – Nancy was going to contact Norfolk Southern on its service to U.N.X. to see if there was a possibility of transloading the freight to and from that business. If this was a possibility, the railroad spur could be removed and would eliminate seven at-grade crossings.
- Crossing #465 509U (Skinner Street) – The City owns majority of the property adjacent to this crossing and there are have been previous conversations on closing this crossing.
- Crossing #641 553R (Dudley Street) – There is alternative access to this neighborhood and a possibility of a new connector street if this crossing was closed.
- Crossing #641 558G (4th Street) – The City has heard concerns from the residents in that neighborhood about cars speeding along this street. The City recommended taking this to the public meetings to see what kind of feedback the community provides.
- Crossing #641 610C (Alley Street) – This crossing is in an area targeted for redevelopment. Tom was going to discuss this crossing with other folks from the City and let Nancy and Brock know if it would be feasible to close the crossing.
- Crossing #641 859V(Gum Street) – The City recommended that Nancy and Brock discuss the crossing with the people at the mill to see if it would be feasible to close the crossing. Tom was going to find out who owns the mill and provide Nancy and Brock a contact person.

Nancy Horne then went on to discuss the next steps and that we would be conducting public meetings in May. The public meetings are followed by a two-week comment period. We would then hold the second stakeholders meeting in July to finalize the recommendations.

The meeting ended at approximately 3:00 PM.

These minutes serve as a formal record of the February 23, 2006 meeting.

Sincerely,

RALPH WHITEHEAD ASSOCIATES, INC.

(submitted via e-mail)
Brock LaForty, AICP

cc: All in attendance

RALPH WHITEHEAD ASSOCIATES, INC.

1000 W. Morehead St., Ste. 200
Post Office Box 35624
Charlotte, NC 28235-5624
(704) 372-1885
(704) 372-3393 FAX

MINUTES OF MEETING: Greenville Rail Studies

PROJECT: Greenville Traffic Separation Study

LOCATION: Public Works - Greenville

MTG. DATE: **July 10, 2006**

ATTENDING:

Marvin Blount	NCDOT BOT
Nancy Horne	NCDOT Rail
Paul Worley	NCDOT Rail
Arthur Petteway	NCDOT Rail
Neil Lassiter	NCDOT Division 2
Tom Tysinger	City of Greenville
Kyle Garner	City of Greenville
Brian Dehler	Ralph Whitehead Associates
Brock LaForty	Ralph Whitehead Associates

EXECUTIVE SUMMARY:

The meeting was held to discuss the rail improvements that NCDOT Rail Division is recommending for the Greenville area. The Phase 1 Study which includes new wye track and relocation of the rail yard will decrease highway congestion that occur because of current train operations. This study will be renamed "Greenville Rail/Highway Congestion Mitigation Improvements" and the cost estimates will be updated and include ROW. The report will be finalized and a copy, along with a letter, will be sent to CSXT asking for a contribution towards funding this project. The Phase 2 study will add the 14th Street grade separation and the new crossing related to the Thomas Langston Road Extension to the plan and all recommendations (including the new wye and rail yard relocation) will be presented at the public information meetings that will occur later this summer.

MINUTES:

The purpose of this meeting was to discuss the Greenville TSS Phase 1 Study results and the preliminary recommendations for the Greenville Phase 2 Study. The meeting began at approximately 9:15 AM.

The meeting began with introductions and then Brian Dehler gave an overview of the Greenville TSS Phase 1 Study. Brian discussed the new wye track and relocating the rail yard north of town. This would serve to relieve the blockages that are occurring within the Arlington, Howell, and 14th St area. Paul added that Danny Gilbert completed an operating cost analysis and that these improvements would save CSXT approximately $600,000 a year. Some general discussion occurred about the cost estimates, Right-of-way, and funding; Paul said he would like to package this report to try and get a contribution from CSX. Neil said that Doug Askew with NCDOT might be able to offer some assistance in coming up with an estimate on ROW costs for this project. Tom added that the Ferguson Group has researched avenues for funding out of Washington and has had very little success so far. Paul mentioned that FRA is using Greenville as a case study to look at areas across the country where improvements need to be made to relieve highway congestion due to rail operations. Paul would also like to rename Phase I to

"Greenville Rail/Highway Congestion Mitigation Improvements."

Brock then went on to give an overview of the Greenville TSS Phase 2 Study and went through the preliminary recommendations for the at-grade rail/highway crossings. The following items were discussed:

- Marvin added that it would be beneficial to discuss the removal of the rail spur on Industrial Boulevard with Pitt County Economic Development.
- The City asked that the Thomas Langston Road Extension be added to the mapping to show the new at-grade rail/highway crossing that would be needed. Tom also discussed the potential for at-grade crossings to be removed as part of the 10th Street Connector Project.
- Tom and Paul mentioned a feasibility study that was done for 14th Street. The Study should be reviewed and added to the preliminary recommendations. Tom added that 14th St is also listed in the TIP.
- The group thought it would be beneficial to present graphics and recommendations at the public meetings for both Phase 1 and Phase 2. Public meetings would probably not occur until late August or early September.

The meeting ended at approximately 10:30 AM.

ACTION ITEMS

- Nancy will contact Doug Askew and ask him about getting a ROW estimate done for the Phase 1 improvements.
- Once the ROW estimate has been completed by NCDOT, RWA will draft a letter to CSXT in regards to a contribution for this project.
- Brian will take a look at the cost estimates for the Phase 1 study and update as needed, he will also take a look at signal and communication costs if needed.
- The Phase 1 report will be renamed to "Greenville Rail/Highway Congestion Mitigation Improvements."
- Brock will contact Kyle Garner to get the alignment files, etc. for the Thomas Langston Extension
- Nancy will find a copy of the feasibility study done for the 14th Street grade separation and get a copy to RWA.
- Nancy will follow-up with Tom about upcoming public information meetings and the City's process, etc.
- NCDOT will prepare visualizations/graphics for the new wye and yard improvements for the upcoming public meetings.

Sincerely,

RALPH WHITEHEAD ASSOCIATES, INC.

(submitted via e-mail)
Brock LaForty, AICP

cc: All in attendance

1000 W. Morehead St., Ste. 200
Post Office Box 35624
Charlotte, NC 28235-5624
(704) 372-1885
(704) 372-3393 FAX

STV/RALPH WHITEHEAD ASSOCIATES, INC.

MINUTES OF MEETING:

PROJECT: Greenville Traffic Separation Study

LOCATION: City of Greenville, NC Public Works Facility Conference Room

MTG. DATE: **April 3, 2008**

ATTENDING:

Nancy Horne	NCDOT Rail
Jahmal Pullen	NCDOT Rail
Scot Sibert	STV/RWA
Daryl Vreeland	City of Greenville
David Brown	City of Greenville
Wesley Anderson	City of Greenville
Lt. Rob Williams	City of Greenville Police Dept
Mac E. Manning, Jr.	Pitt County Sheriff's Office
Linwood Hines	City of Greenville Fire/Rescue
James Rhodes	Pitt County
Neil Lassitar	NCDOT Div 2

MINUTES:

The purpose of this meeting was to provide the stakeholders with an update to the TSS study process and present and discuss the recommendations. The meeting began at approximately 1:00 PM.

Nancy Horne opened the meeting and gave an overview of the rail improvements being recommended in downtown Greenville and in the northern portion of the city, consisting of a new wye connection and CSX yard. She provided history and reasoning's behind the rail improvements. Nancy H. then updated the stakeholders on the status of the TSS Study process and introduced the consultant.

Scot Sibert explained the contents of the notebook that was handed out. The contents included: a summary of the public workshops, newspaper articles stemming from the workshops, copies of the workshop sign-in sheets and the newsletters, as well as maps of each recommendation. Scot S. then provided an overview of the public workshops that were held on February 12th and 13th, 2008, as well as a presentation to the Greenville City Council during the afternoon of February 12th, 2008. Scot S. then went on to focus on the individual rail crossing recommendations. Scot S. explained the reasoning's behind the recommendations to close six existing rail crossings; add concrete median barriers to five existing rail crossings, and add median barriers to two existing rail crossings; add gates to six existing rail crossings; add gates and signal preemption to two existing rail crossings; add signal preemption to another existing rail crossing.

Overall, STV/RWA's recommendations were well received by the stakeholders.

The following key points were discussed during the meeting:

- Crossings C1 – C8: During the design phase of installing concrete and median barriers, ensure that access is still provided to the adjacent properties.
- Crossing #465 496V (Pitt Street) – The closing closure would have to occur simultaneously as the wye improvements.
- Crossing #465 495N (Evans Street) – During the design phase, widen the concrete crossing to accommodate for the sidewalk improvements occurring along Evans Street and place the poles behind the sidewalks.
- Crossing #465 489K (Greenville Blvd) – During the design phase, widen the asphalt crossing on the north side to accommodate for the sidewalk improvements occurring along Greenville Blvd and place the signal devices appropriately to the sidewalks.
- Crossing #641 860P (Airport Road) - During the design phase, widen the concrete crossing to accommodate for the sidewalk improvements occurring along Airport Road and place the signal devices appropriately to the sidewalks.
- Crossing #465 488D (14th Street) – ensure that the improvements are scheduled at the same time as the wye improvements.
- Pitt County recommends continuing to keep them abreast of the rail improvements and TSS Study.

ACTION ITEMS

- Crossing #641 557T (W. 3rd Street) – Note in TSS report that the City of Greenville has completed this project.
- Crossing #641 618G (Greenville Blvd) – Note in the TSS report that this project is a long term project with no action at this time, however, if NCDOT and the City are unable to provide sidewalk improvements in conjunction with the City's Convention Center's Streetscape Improvements, NCDOT Rail may be able to provide improvements at this crossing.
- STV/RWA and NCDOT Rail will update the TSS Grade Crossing Map to reflect the street name changes.
- Crossing #641 553R (Dudley Street) & #641 860P (Airport Road) - David B. will look into the current ownership and ability to provide a connector street paralleling SR 1531 between Dudley Street and Airport Road in order to provide police and fire access to the neighborhood. David B. contacted Nancy H. after the meeting to let her know that right of way is privately owned and owned by the railroad for part of the length which would be needed.
- Crossing #641 859V (Gum Road) & #641 860P (Airport Road) - Nancy and Neil will look at possible ways to provide safety measures at Gum Road in order to prevent truck trailers from driving along the western side of the tracks from Airport Road to Gum Road.
- Crossing #641 620H (Fire Tower Road) - Nancy will check into the current

status of Fire Tower Road crossing's improvements that are part of a TIP project to ensure there the rail crossing provides a macadam crossing for pedestrians since Fire Tower Road is to have sidewalk improvements.

Scot S. then went on to discuss the next steps, which would be to provide a draft TSS Report to NCDOT Rail for review. Once any changes are made, a Public Hearing will be conducted with City of Greenville's City Council. A 30-day public notice period is required prior to the Public Hearing. Comments from the Public Hearing will then be incorporated into the Final Report to be adopted by the City of Greenville.

The meeting ended at approximately 2:15 PM.

These minutes serve as a formal record of the April 3, 2008 meeting.

Sincerely,

STV/RALPH WHITEHEAD ASSOCIATES, INC.

(submitted via e-mail)
Scot Sibert, AICP

Appendix C

CONTACT INFORMATION

If you have additional questions or would like to be included on the study mailing list, please contact Nancy Horne or Brock LaForty as per the information below. You can also visit **www.bytrain.org** to learn more about the Rail Division's safety programs and to read about specific studies and improvements that have been completed.

Nancy Horne, PE
Project Engineer
NCDOT Rail Division
1556 Mail Service Center
Raleigh, NC 27699-1556
Phone: 919-715-3686

Brock LaForty, AICP
STV/Ralph Whitehead Associates
1000 W. Morehead Street
Suite 200
Charlotte, NC 28208
Phone: 704-372-1885

STUDY PROCESS AND SCHEDULE

INVOLVES THREE PHASES:

1 **Preliminary Planning Phase (completed in January 2005):** During this phase, NCDOT and the City of Greenville agreed to work together to identify and implement improvements outlined in the future Traffic Separation Study (TSS). An engineering consultant (in this case, STV/Ralph Whitehead Associates) was then selected by NCDOT to conduct the TSS.

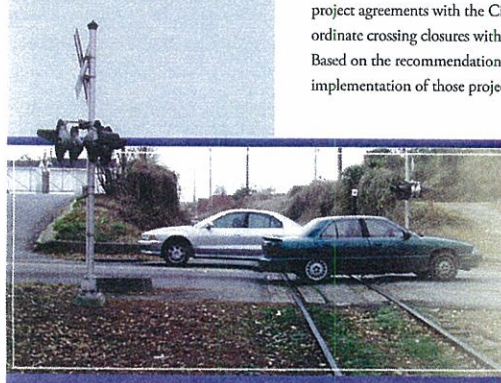
2 **Study Phase (currently underway):** STV/Ralph Whitehead Associates is evaluating all public crossings within the study area to determine the existing crossing conditions, average daily traffic (both trains and vehicles), and impacts of potential closings. The firm has prepared draft recommendations for NCDOT and local officials to review and to present to the public for comment.

NEAR-TERM RECOMMENDATIONS (within two years) may include installation of flashing lights and gates, enhanced devices such as four-quadrant gates and longer gate arms, installation of concrete or rubber crossings, crossing closures, median barrier installation, pavement markings, roadway approach modifications and crossings realignments.

MID-TERM RECOMMENDATIONS (two to five years) may include connector roads, roadway realignments, crossing closures, relocations of existing crossings to safer locations, and feasibility studies to evaluate potential grade separation locations.

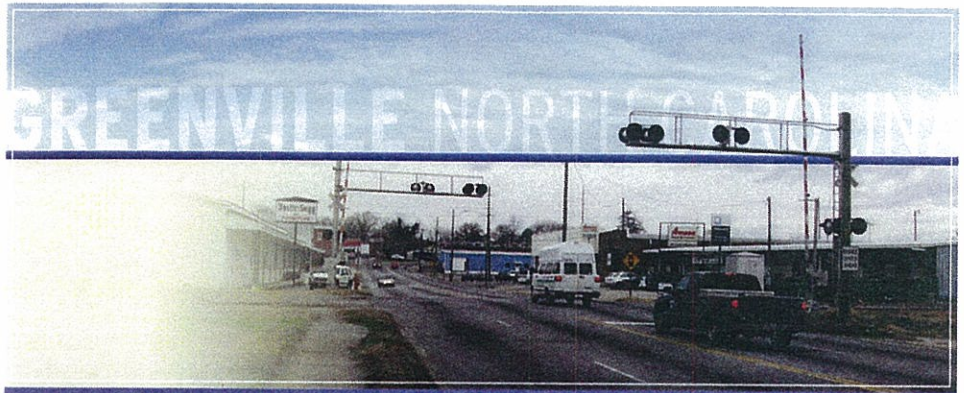
LONG-TERM RECOMMENDATIONS (five to ten years) may include grade separations, connector roads, and crossing closures.

3 **Implementation Process:** This phase will commence once the Study Phase is complete. During this phase, NCDOT officials identify funding sources for recommended improvements, develop project agreements with the City of Greenville, coordinate project design and property acquisition, coordinate crossing closures with railroad and state highway officials, and oversee project implementation. Based on the recommendations approved from the Study Phase, the study team will develop a plan for implementation of those projects.



The Traffic Separation Study recommended a series of improvements at crossings in and around the Greenville area. The map inside this newsletter shows the crossings and the improvement that has been proposed for each. The map can also be accessed by visiting **www.bytrain.org** and clicking on the "Greenville Rail & Transportation Improvements" link on the front page.

WWW.BYTRAIN.ORG



GREENVILLE, NC: TRAFFIC SEPARATION STUDY

IMPROVING RAILROAD CROSSINGS

IN GREENVILLE

A growing number of housing and job opportunities are contributing to population increases in and around the City of Greenville. As vehicle and train traffic continues to increase, Greenville's elected officials and North Carolina Department of Transportation (NCDOT) staff agree that a high priority must be given to safety enhancement projects like the Greenville Traffic Separation Study.

Since CSX Transportation and Carolina Coastal Railway operate trains through Greenville, continued improvements to crossings can help lessen the possibility of train-vehicle collisions. In addition, as trains pass across roadways, vehicular access at the tracks is blocked, affecting emergency services, deliveries, school buses and commuters. Improved crossings can help traffic flow through these intersections.

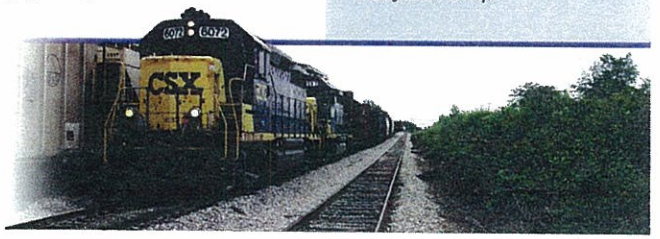
During 2006 there were 75 rail-highway grade crossing collisions in North Carolina, resulting in eight deaths and 21 injuries. To reduce the potential for train-vehicle collisions, NCDOT is working with communities across the state – such as Greenville – to conduct detailed engineering evaluations and implement recommended rail crossing improvements. After evaluating the volume of train traffic and flow of vehicular traffic patterns through town, the Traffic Separation Study (TSS), which was conducted by NCDOT consultant STV/Ralph Whitehead Associates, recommends crossing improvements that may include the following: upgrading existing, or adding new, flashing lights and gates; relocating existing crossings; or, in some cases, closing the crossing. These enhancements result in improving the safety of motorists, pedestrians, rail passengers and train crews. As of December 2006, NCDOT has closed approximately 120 public rail crossings based on recommendations from various TSS and corridor studies.

NCDOT is currently conducting a TSS of 45 highway grade crossings of the CSX Transportation and the Carolina Coastal Railway lines in the City of Greenville. The enclosed map illustrates the location of these crossings and the proposed improvement for each.

PUBLIC OUTREACH

The public outreach program's top priority is to initiate early and open communication with stakeholders, including area residents, property owners, agency representatives and others who might be interested in the Traffic Separation Study. Local officials, NCDOT Staff and representatives from both railroads have been meeting to provide input to the study.

Public meetings, like those held on February 12 and 13, are part of a comprehensive public outreach process being conducted jointly by the City of Greenville and the North Carolina Department of Transportation Rail Division to provide information and obtain public comments on plans to improve a number of railroad crossings throughout the city.



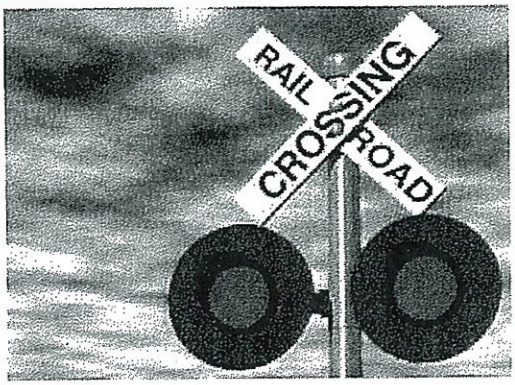
Appendix D

News

Greenville to Hold Public Meetings on Railroad Crossing Study

February meetings provide opportunity for information and comment

Friday, Feb 01, 2008 - 11:18 AM Updated: 09:27 PM



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By Press Release
GREENVILLE— The city of Greenville and the N.C. Department of Transportation will hold public meetings on Feb. 12 and 13, to provide information and obtain public comment on plans to improve a number of railroad crossings throughout the city.
The meetings will be held each night from 5 to 7 p.m. at the Sheppard Memorial Library, located at 530 S. Evans St., Greenville. The meetings are part of a comprehensive public outreach process being conducted jointly by the city and NCDOT's Rail Division.
NCDOT contracted consultant STV/Ralph Whitehead Associates to conduct a traffic separation study, which evaluates the volume of train traffic and vehicle traffic patterns through Greenville. The study recommended improvements for some crossings and closure for others. Since then, NCDOT and the city of Greenville have continued to work together to explore those recommendations and identify the best opportunities to improve rail safety throughout the city.
As part of its comprehensive statewide program, NCDOT is working

Video What's He: Hot

Stolen Car Stop In Ybor Y Gun, Cocaine

Former President Bush en McCain

Autism Group Demands A

Faulty direction, other wo 'Bottom'

with communities such as Greenville to reduce the potential for train-vehicle collisions. Detailed engineering evaluations have been conducted and recommended rail crossing improvements have been implemented, including upgrading existing or adding new flashing lights and gates, relocating existing crossings, adding bridges or underpasses for pedestrians and vehicles or, in some cases, closing the crossing. These upgrades result in improved safety of motorists, pedestrians, rail passengers and train crews.

For more information, contact Nancy Horne, PE at (919) 733-3686, via e-mail at nhorne@dot.state at (919) 715-8804. Citizens may also write, referencing Transportation Improvement Program pro 3309, to:

Nancy Horne, PE
NCDOT Rail Division Engineering and Safety Branch
1556 Mail Service Center
Raleigh, NC 27699-1556

NCDOT will provide auxiliary aids and services under the Americans with Disabilities Act for disable want to participate in this workshop. Anyone requiring special services should contact Horne at the phone, fax or e-mail as early as possible so that arrangements can be made.

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City, state seek input on railroad

By T. Scott Batchelor
The Daily Reflector

Tuesday, February 12, 2008

State and local engineers have scheduled sessions today and Wednesday to get public input on proposed improvements to railroad crossings in Greenville.

Officials also are seeking input on a proposal to ease traffic congestion by moving a train switching yard out of the city limits.

STV/Ralph Whitehead Associates has prepared draft recommendations for the state Department of Transportation and local officials to review and then present to the public for comment.

During 2006, there were 75 rail-highway grade-crossing collisions in North Carolina, resulting in eight deaths and 21 injuries, according to the DOT's rail division Web site. A grade crossing requires vehicles to traverse tracks in order to cross them.

Nancy Horne, state engineer for the project, said the study looked at 45 crossings in the city.

To reduce the potential for train-vehicle collisions, the DOT is working with communities such as Greenville to conduct detailed engineering evaluations and implement recommended rail crossing improvements.

Consultant STV/Ralph Whitehead Associates evaluated the volume of train traffic and flow of vehicular traffic patterns through Greenville. It recommends crossing improvements that may include upgrading existing flashing lights and gates, relocating existing crossings or, in some cases, closing the crossing.

Participants in meetings at Sheppard Memorial Library can see maps of the proposed changes and offer input, Horne said.

Also being studied is relocation of the train-switching yard between 14th Street and Arlington Boulevard to a location outside the city limits.

Currently, there is no track permitting the southbound CSX train to turn east toward PCS Phosphate in Aurora in neighboring Beaufort County. So, the train has to pull through the CSX-Norfolk Southern rail intersection to the switching yard.

Freight cars maneuver in and out of siding tracks in order to "build" an eastbound train.

According to a report from Ralph Whitehead Associates, this operation often occurs during peak travel

times, blocking the grade crossings at 14th Street, Howell Street and Arlington Boulevard. About 30,000 vehicles per day use Arlington Boulevard, and 14th Street handles about 16,000, according to the report.

David Brown, Greenville city engineer, said the state has allocated $3.1 million toward the relocation project. Horne said the project will cost about $8 million.

City officials have instructed their Washington, D.C., lobbying firm, The Ferguson Group, to seek federal earmarks of $3.5 million for the effort.

In addition, "We are looking at the railroad for a contribution, and that's being negotiated now," Horne said.

The meetings for the public are scheduled for 5-7 p.m. today and Wednesday in the conference room at Sheppard Memorial Library, 530 Evans St.

A meeting is slated for 1 p.m. today at City Hall to brief local officials associated with the project.

Rail Road Renovation Plan

Tuesday, Feb 12, 2008 - 10:56 PM Updated: 11:14 PM

By Andrew Doud
Eyewitness News 9
E-mail | Biography

Ever need to get somewhere in a hurry only to get caught in what seems like a never ending line because of a train? Well the city of Greenville is trying to make that a thing of the past. Tonight the state DOT met with people from our community, to get their thoughts on ways to improve the situation.

David Duncan has lived in Greenville for more than 30 years and he thinks it's about time. "I think this is the best idea they've had in years," said Duncan.

He says getting across train crossings in the city of Greenville is a nightmare. And feels we need to make it easier for trains and cars to co exist.

Nancy Horne, an engineer with the Department of Transportation, said there are two plans the public had a chance to give feedback on. The first calls fro lights or gates at nine crossings, roadway upgrades at eight, closing six all together, and twelve would be left alone.

One major change with the second plan would be a connector that would run from a rail system on 14th street. The only thing in the way is a building but that's owned by the city.

The other part of that plan would be to relocate the current CSX rail yard North of NC 903.

And Horne says the goal is not only about what is better now, but what will help in the future. "What this basically does for the city of Greenville is gives them near term improvements but a long term focus," said Horne.

It wont' be cheap. The total coast would be about 9 million dollars.

Go Back

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PRINT THIS

Public avoids track meet

By T. Scott Batchelor
The Daily Reflector

Thursday, February 14, 2008

Only about five people showed up for meetings held Tuesday and Wednesday to talk about changes to Greenville's railroad crossings, but their comments were positive, a state official said.

The two sessions of two hours each were held to get public input on proposed improvements to railroad crossings in Greenville.

Officials also are seeking input on a proposal to ease traffic congestion by moving a train switching yard out of the city limits.

Proposed changes to the 45 railroad crossings inside the city limits include adding safety gates, signals, concrete medians, and outright closure of roads traversing the tracks.

No changes are slated for 12 crossings under the draft plan.

STV/Ralph Whitehead Associates conducted the traffic-separation study and prepared draft recommendations for the state Department of Transportation and local officials to review and then present to the public for comment.

During 2006, there were 75 rail-highway grade-crossing collisions in North Carolina, resulting in eight deaths and 21 injuries, according to the DOT's rail division Web site. A grade crossing requires vehicles to traverse tracks in order to cross them.

Proposed changes to railroad crossings are made with safety in mind, said Nancy Horne, state DOT engineer for the project.

To reduce the potential for train-vehicle collisions, the DOT is working with communities such as Greenville to conduct detailed engineering evaluations and implement recommended rail crossing improvements.

The consultant evaluated the volume of train traffic and flow of vehicular traffic patterns through Greenville. It recommends crossing improvements that may include upgrading existing flashing lights and gates, relocating existing crossings or, in some cases, closing the crossing.

Horne said three people showed up for Tuesday's meeting at Sheppard Memorial Library. Only one had attended Wednesday night roughly 30 minutes before the forum's scheduled 7 p.m. wrap-up.

Officials had set up easels displaying color-coded maps at the library Tuesday and Wednesday.

People can make comments on the proposed changes during the next 30 days, Horne said.

Then the draft plan will be reviewed by "stakeholders," including the state DOT, emergency responders who would be affected by the changes, and city officials.

Horne said a public hearing would be scheduled in April or early May during a City Council meeting.

Improvements to the railroad crossings could take up to 1½ years, she said.

A "really rough estimate" on the price tag is up to $3 million, if all of the crossing changes are implemented, Horne said.

"We're still developing cost on this," she said Wednesday. "We have the funds to do this," she said of the crossing improvements.

Also being studied is relocation of the train-switching yard between 14th Street and Arlington Boulevard to a location outside the city limits, and creation of track that will allow a 90-degree turn there without the train having to be dismantled.

Currently, there is no track permitting the southbound CSX train to turn east toward PCS Phosphate in Aurora in neighboring Beaufort County. So, the train has to pull through the CSX-Norfolk Southern rail intersection to the switching yard.

Freight cars maneuver in and out of siding tracks in order to "build" an eastbound train.

According to a report from Ralph Whitehead Associates, this operation often occurs during peak travel times, blocking the grade crossings at 14th Street, Howell Street and Arlington Boulevard.

About 30,000 vehicles per day use Arlington Boulevard, and 14th Street handles about 16,000, according to the report.

Horne said that project would cost about $9 million.

David Brown, Greenville city engineer, said the state has allocated $3.1 million toward the relocation project. City officials have instructed their Washington, D.C., lobbying firm, The Ferguson Group, to seek federal earmarks of $3.5 million for the effort.

In addition, "We are looking at the railroad for a contribution, and that's being negotiated now," Horne said earlier this week.

Raj Jagad happened by the meeting on the rainy Wednesday night.

He reviewed the plans to allow the train to turn east and come back north without having to block traffic for what Horne said can range from 40 minutes to three hours.

"That would be really nice," Jagad said. He also bent the ear of local transportation officials with a call for some type of passenger train service for Greenville.

For more information on the traffic-separation study, including color-coded maps of the proposed changes, visit the state rail division Web site at www.bytrain.org/safety/tss.html, and click on "Greenville."

Find this article at:
http://www.reflector.com/local/content/news/stories/2008/02/14/railcrossings.html

☐ Check the box to include the list of links referenced in the article.

Editorial: Off track - Public missing at key rail meetings

The Daily Reflector

Friday, February 15, 2008

Few aspects of life in Greenville can prove as frustrating as the passage of trains through the city. Tracks bisect several key thoroughfares in this community and most observers would argue the times they are used are carefully selected to inflict the maximum amount of inconvenience for motorists.

How, then, can one explain paltry attendance at two forums inviting citizen input on the train situation and proposals to alleviate the problem? City residents must be willing to give readily of their time and energy if they hope to produce the more efficient and enjoyable community they claim to desire.

The slow closing gates of a railroad crossing are among the worst sites on city roadways, since they are almost certain to halt traffic for an untold length of time. The location of a switching yard between 14th Street and Arlington Boulevard means that the city not only plays hosts to numerous trains each day, but that many must be eased through a turn by backing them up and moving them through. It is a sight painfully familiar to drivers here.

The trains impediment to traffic are more than a mere inconvenience for those traveling across the city. They also complicate the delivery of emergency medical services since there is no direct route from Pitt County Memorial Hospital to east Greenville without crossing the tracks.

The Greenville City Council is not blind to the problem and has identified two key projects aimed at addressing the snarled traffic the trains cause. City government is planning to build the 10th Street Connector, a road project that would alleviate the railway crossing on that street at the western edge of downtown Greenville. And it hopes to relocate the switching yard outside of city limits.

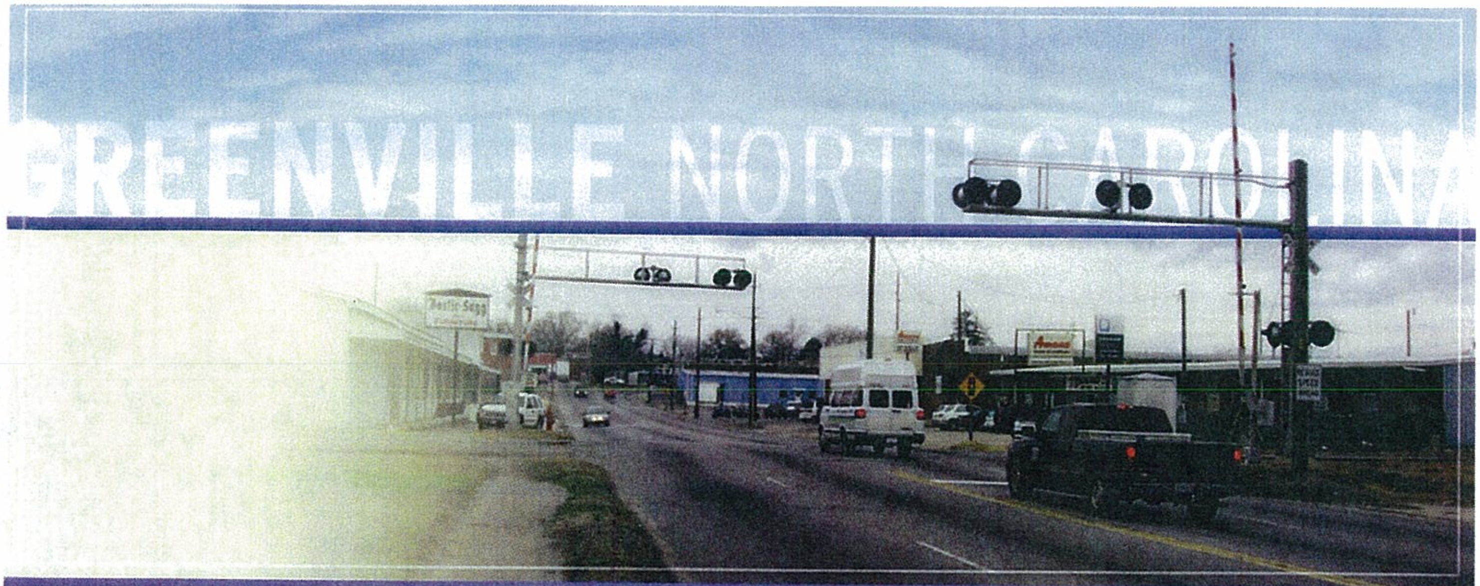
Those projects are included in a study of railroad crossings in the city conducted by STV/Ralph Whitehead Associates that measured traffic volume and studied how the crossings impacted the community. Recommendations were prepared for the state Department of Transportation and for local officials, who are trying to ease congestion

and address this key public concern.

Yet, for an issue that elicits such passion in casual conversation, concern was absent at public forums on Tuesday and Wednesday. Officials hoped to gain input about proposed changes to the crossing and to hear residents' thoughts on the trains. That goal was complicate by the attendance of only five people at the two meetings.

These projects will move forward without citizen input, but the public's voice is needed when the community debates how it intends to address a common problem — especially one so pervasive. Residents must remember that these are important opportunities to help shape the future of this city, and they should be eager to participate.

Appendix E



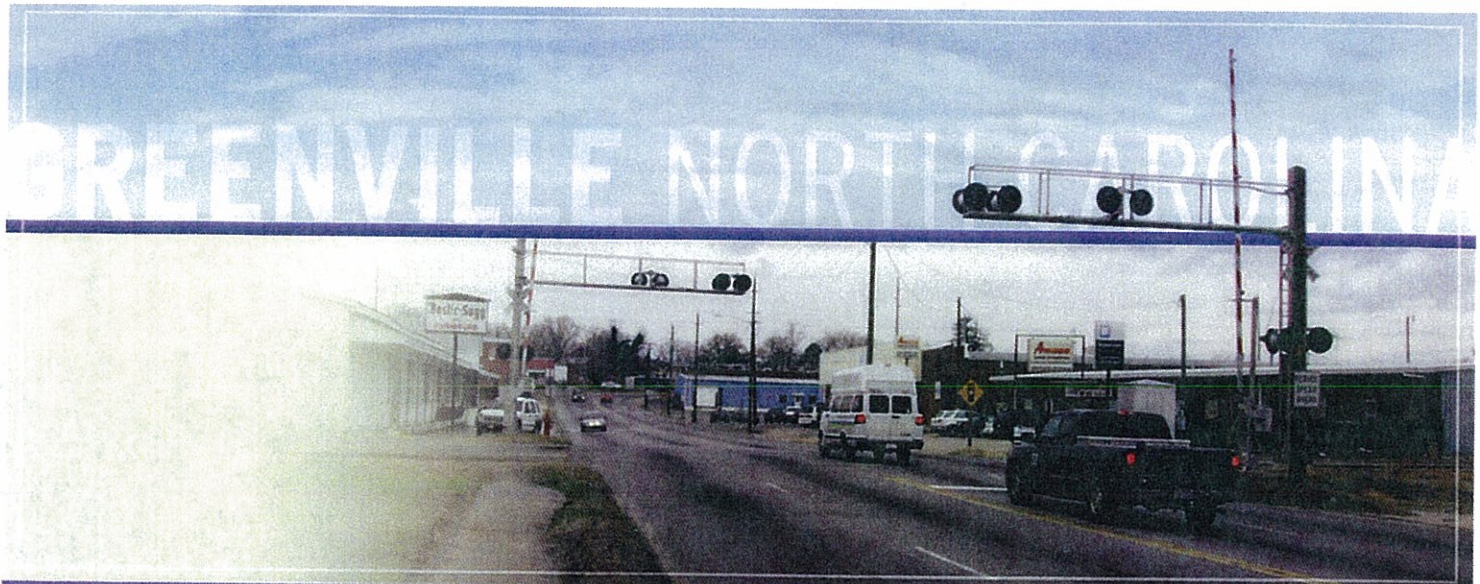
GREENVILLE, NC: TRAFFIC SEPARATION STUDY

PUBLIC MEETING

SIGN IN SHEET

2/12/08

Name (First & Last):	Street Address (please include city, state, and zip code):
ROBERT DOBBS	1833 STATON MILL RD. BETHEL, NC 27812
Calvin Mercer	210 Quail Hollow Rd Greenville, NC 27858
Neil Lassiter	P.O. Box 1587 G'VILLE, NC 27858
JAMES RHODES	1717 W. Fifth St Greenville, NC 2783

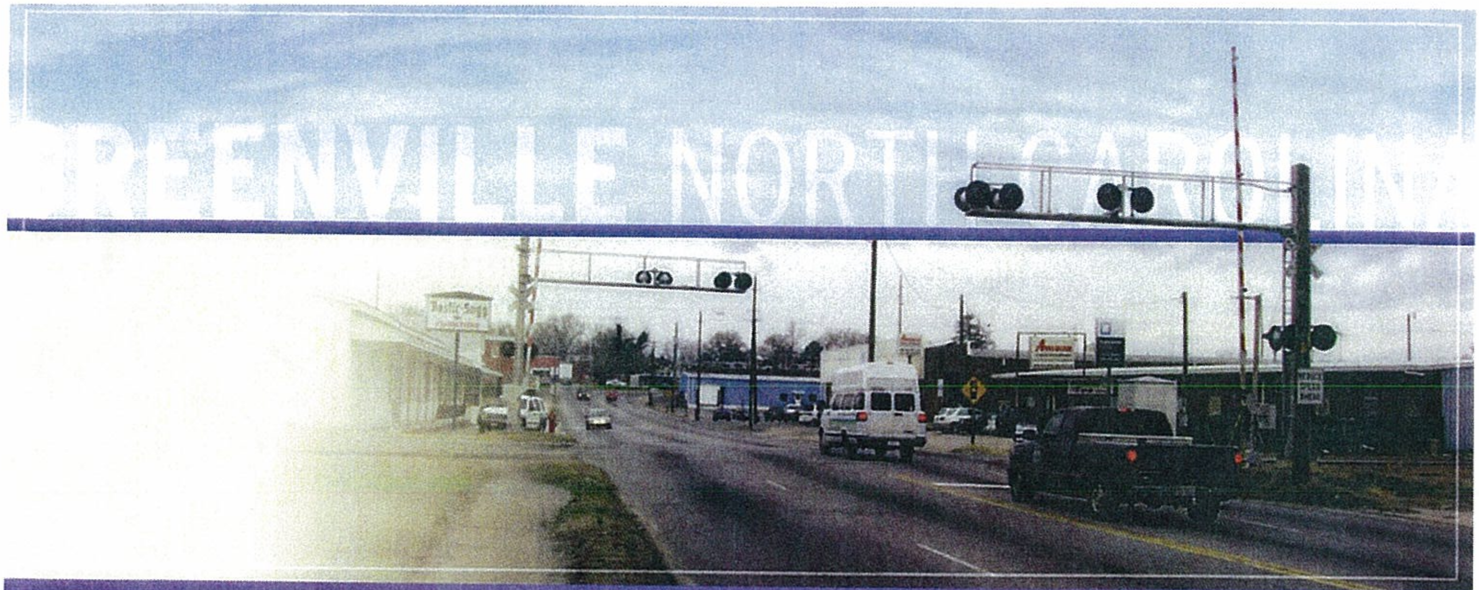


GREENVILLE, NC: TRAFFIC SEPARATION STUDY

PUBLIC MEETING

SIGN IN SHEET

Name (First & Last):	Street Address (please include city, state, and zip code):
Thomas Batchelor	The Daily Reflector
CLIFF KENDALL	125 ARBOR DR, GREENVILLE NC 27858
EDDY DAVIS (MERPO)	PO Box 1787 Wash, NC 27889



GREENVILLE, NC: TRAFFIC SEPARATION STUDY

PUBLIC MEETING

SIGN IN SHEET

2/12/08

Name (First & Last):	Street Address (please include city, state, and zip code):
Andrew Dowd	3221 S. Evans St. Greenville. 27834
Louise Duncan	1005 E. Rock Spring Rd. " 27858
David Duncan	110 Alexander Circle, Greenville, N.C. 27858