

FEASIBILITY STUDY

Greenville

Highway / Railroad Grade Separation Study

Pitt County

Division 2

U-3839

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Prepared by the
Program Development Branch
Division of Highways
N. C. Department of Transportation

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2/26/98

Date

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I. GENERAL DESCRIPTION

This preliminary study describes a railroad/highway grade separation study in Greenville. The study is to evaluate railroad/highway grade crossings and identify sites suitable for grade separation. Such sites should have low land use impacts, an existing multi-lane cross section, and provide a reasonably direct corridor toward the Pitt Memorial Hospital complex. The goal is to provide a "free flow" corridor(s) to the Hospital complex that avoids potential blockage by train movements. The study area is shown on Figure 1. As a result of the study three at-grade crossings were selected as possible candidates for grade separations and cost estimates were developed for each. Other candidate sites were reviewed and rejected due to high land use conflicts, lack of available cross section, or out-of-direction corridor.

The cost estimates, shown below, were based on a unique grade separation concept. This concept provides for the inside through-lanes on the highway to be raised over the railway while the outside lanes remain at their existing level. A grade separation is provided for through and emergency traffic, while local traffic continues to cross the railroad at-grade. This concept minimizes right-of-way requirements and maximizes access to adjacent property. This concept is illustrated in Figure 2.

Fourteenth Street at CSX Railroad

Construction.....	\$5,400,000
Right-of-Way.....	<u>1,800,000</u>
Total.....	\$7,200,000

Arlington Avenue at CSX Railroad

Construction.....	\$6,300,000
Right-of-Way (No new r/w required).....	<u>0,000,000</u>
Total.....	\$6,300,000

Arlington Avenue at Norfolk Southern Railroad

Construction.....	\$6,300,000
Right-of-Way (No new r/w required).....	<u>0,000,000</u>
Total.....	\$6,300,000

II. NEED FOR PROJECT

The purpose of this project is to provide corridors with improved access to Pitt Memorial Hospital in Greenville. This would be accomplished by grade separating selected railroad/highway intersections to avoid blockage by train movements thereby delaying emergency vehicles. This project was requested by Board of Transportation Member Collice Moore.

The study area, shown on Figure 1, is divided into 4 quadrants by the main lines of the CSX Railroad and the Norfolk Southern Railroad. The CSX line runs north and south and the Norfolk Southern line runs east and west. Emergency vehicles (ambulances, fire-trucks, and police cars) are stationed in all quadrants, and the Pitt Memorial Hospital and related medical complex is located in the northwest quadrant. The Greenville Public Safety Officer (Chief Carney) reports that local ambulances and fire trucks are delayed by trains once per week, on average, and the duration of the delay is from 1 to 5 minutes. The magnitude of the delay to local law enforcement and emergency vehicles from outside Greenville is unknown.

There are existing highway/railroad grade separations with the Norfolk Southern line at Dickinson Street and at Charles Boulevard, as shown on Figure 1.

There are no existing highway/railroad grade separations with the CSX line in the study area. In the 1998-2004 TIP, Project U-3315 is an identified future need and includes a grade separation of the CSX line at Tenth Street.

Neither Fourteenth Street nor Arlington Avenue are on the State Highway System; however, both are Major Thoroughfares on the Greenville Thoroughfare Plan and both are Urban Minor Arterials on the North Carolina Functional Classification System.

III. DISCUSSION OF ALTERNATIVES

Fourteenth Street at CSX Railroad

Fourteenth Street crosses the CSX Railroad at grade as shown on Figure 1. The Average Daily Traffic (ADT) volumes on Fourteenth Street at this location for the years 1997 and 2020 are estimated to be 12,800 vehicles per day (vpd) and 23,000 vpd respectively. There are 4 trains per day reported at this location. The Exposure Index for this crossing is calculated to be 92,000. The Exposure Index is the product of the number of trains per day and the estimated design year average daily traffic. Grade separations should be considered in urban areas when the exposure index exceeds 30,000.

Fourteenth Street, west of the railroad, is a 4-lane curb-and-gutter street, approximately 44 feet (13.4 m) wide from face-to-face of curbs, and has sidewalks on both sides. East of the railroad, Fourteenth Street is a 4-lane curb-and-gutter street, approximately 49 feet (14.9 m) wide from face-to-face of curbs and has sidewalks on the north side only. Land use west of the railroad is a mix of dense multi-family residential and commercial development. East of the railroad development is less dense, and is a mix of office and commercial uses.

Construction of a grade separation at this site would require approximately 8 to 11 feet (2.4 to 3.3 m) of widening on each side of Fourteenth Street adjacent to the proposed bridge and approaches and would require new right-of-way approximately 90 feet (27.4 m) wide. No residential relocations are anticipated due to this grade separation; however, 2 business relocations are anticipated east of the railroad. The bridge approaches would be approximately 400 feet (122 m) long and the bridge would be approximately 800 feet (243 m) long. The design speed is 40 mph and the studied grade is 6%. A typical cross-section is shown on Figure 3.

Arlington Avenue at CSX Railroad

Arlington Avenue crosses the CSX Railroad at grade as shown on Figure 1. The Average Daily Traffic (ADT) volumes on Arlington Avenue at this location for the years 1997 and 2020 are estimated to be 23,500 vehicles per day (vpd) and 35,000 vpd respectively. There are 4 trains per day reported at this location. The Exposure Index for this crossing is calculated to be 140,000.

Arlington Avenue, at this crossing, is a 4-lane, median divided street, approximately 64 feet (19.5 m) wide from face-to-face of curbs, and has sidewalks on the north side. Land use west of the railroad is dominated by a large public school on the north side and a public park on the south side. East of the railroad, development is less dense and is a mix of office and commercial uses.

Construction of a grade separation at this site would require no widening on Arlington Avenue (with 11-foot (3.3-m) outside lanes) and would require no new right-of-way. The bridge approaches would be approximately 500 feet (152 m) long and the bridge would be approximately 1,000 feet (305 m) long. The design speed is 50 mph and the studied grade is 6%. Driveways entering Arlington Avenue in the vicinity of the bridge approaches would become right in/right out driveways. A typical cross-section is shown on Figure 4.

Arlington Avenue at Norfolk Southern Railroad

Arlington Avenue crosses the Norfolk Southern Railroad at grade as shown on Figure 1. The Average Daily Traffic (ADT) volumes on Arlington Avenue at this location for the years 1997 and 2020 are estimated to be 16,300 vehicles per day (vpd) and 33,000 vpd respectively. There are 4 trains per day reported at this location. The Exposure Index for this crossing is calculated to be 132,000.

Arlington Avenue, at this crossing, is a 5-lane street approximately 68 feet (20.7 m) wide from face-to-face of curbs. Land, both east and west of the railroad, and on both sides of the road, is farm land or undeveloped. This land appears to have prime development potential. At least two office park developments are planned on Arlington Avenue near this site.

Construction of a grade separation at this site would require no widening on Arlington Avenue (with 13-foot (4.0-m) outside lanes) and would require no new right-of-way. The bridge approaches would be approximately 500 feet (152 m) long and the bridge would be approximately 1,000 feet (305 m) long. The design speed is 50 mph and the studied grade is 6%. Driveways entering Arlington Avenue in the vicinity of the bridge approaches would become right in/right out driveways. A typical cross-section is shown on Figure 5.

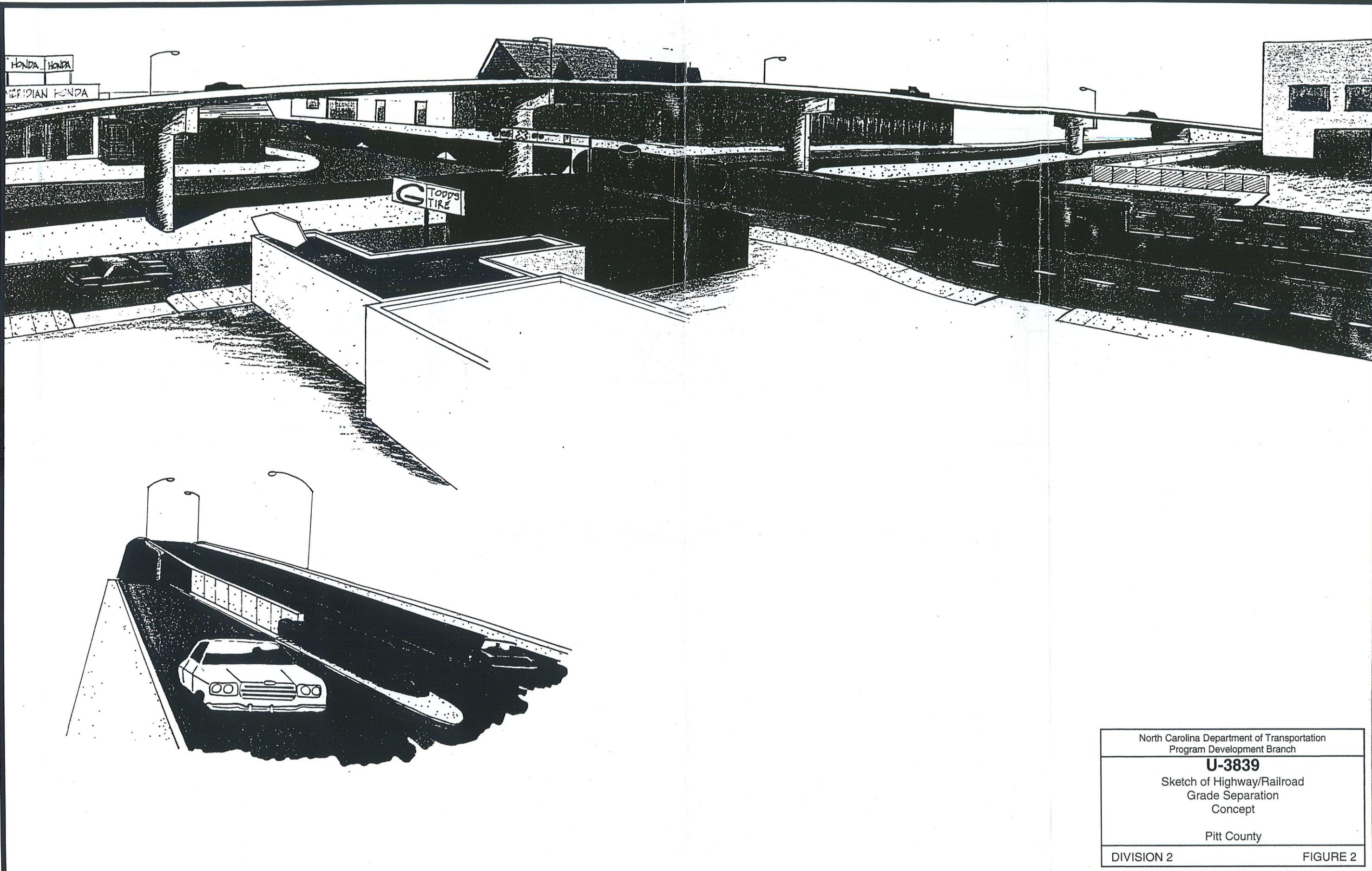
With any of the alternates, a signalized, at-grade intersection could be developed under the structure and slightly away from the railroad to facilitate land use access. The exact location of any such intersection would be limited by the overhead structure clearance.

IV. OTHER COMMENTS

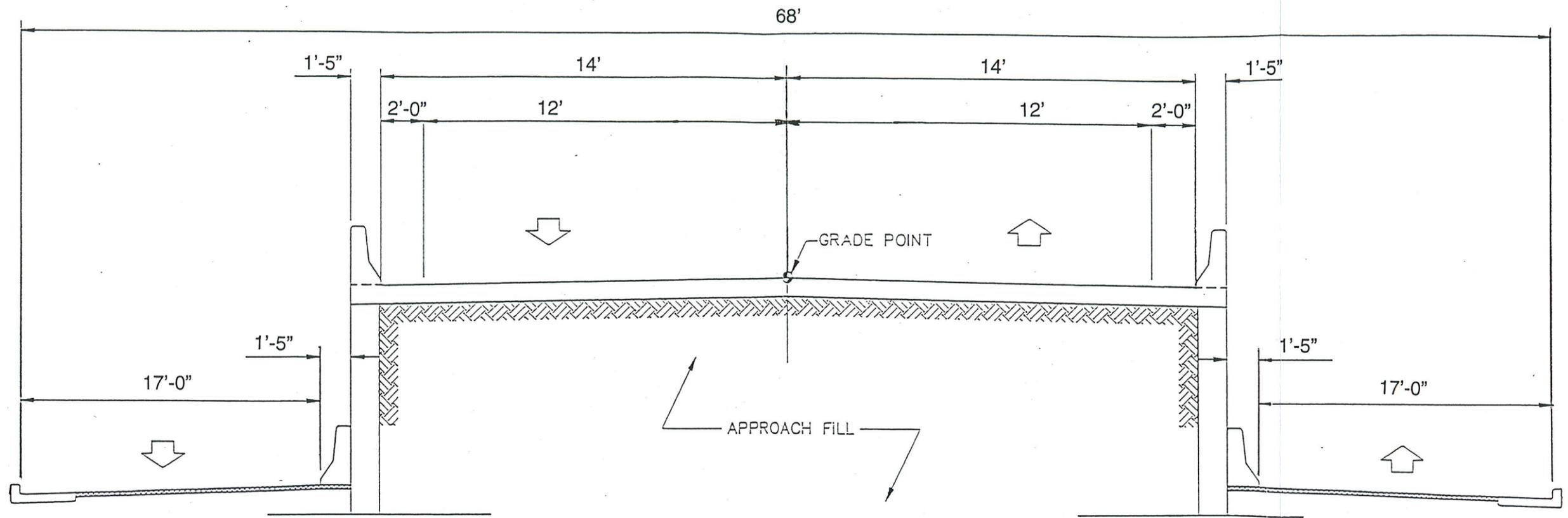
An environmental screening was not conducted for this study. No historic properties, endangered species, or wetlands are anticipated.

In accordance with NCDOT policy, the cost for replacing existing sidewalks is included in the construction cost estimate for this project.

The combination of possible railroad/highway grade separations provides a number of routes to the hospital area. Since an emergency can occur at any individual address, it is impossible to say which of these study sites provides the best route alternative. Some routes are more direct; others have more twists and turns. To achieve the goal initially stated, all of the sites, and even additional ones are needed.



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Sketch of Highway/Railroad Grade Separation Concept	
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SECTION THRU APPROACH TO BRIDGE

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Railroad Grade Separation Study	
Typical Cross-section at Arlington Avenue and Norfolk Southern Railroad	
Pitt County	
DIVISION 2	FIGURE 5