FOX BRIDGE NO. 1937 HAER No. VA-95
Spanning the North Anna River on U.S. Route 1,
approximately .45 mile south of Chandler
Crossing
Ashland vicinity
Hanover County
Virginia

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Northeast Region
Philadelphia Support Office
U.S. Custom House
200 Chestnut Street
Philadelphia, P.A. 19106

HISTORIC AMERICAN ENGINEERING RECORD

FOX BRIDGE NO. 1937 HAER NO. VA-95

Location: Spanning the North Anna River on U.S. Route 1, approximately .45 mile south of Chandler Crossing, Ashland vicinity, Hanover County Virginia

UTM: 18.4196200.283100
Quad: Ruther Glen, Virginia (photo-revised 1985), 1:24,000

Date of Construction: 1935

Engineer: C. S. Mullen, Chief Engineer
William R. Glidden, Bridge Engineer

Present Owner: Virginia Department of Transportation
1401 East Broad Street
Richmond, VA 23219

Present Use: Recently abandoned vehicular bridge

Significance: The construction of this bridge in 1935 and the concurrent upgrading of U.S. Route 1 to four lanes underscored the continuing success of the automobile and marked significant progress in the ongoing effort to create a national highway system. The unusual prominence given to this rural bridge and its 1926 twin—with the use of flanking concrete obelisks at each of the four approach spans—makes for one of the more unusual early crossings on the U.S. Route 1 corridor. Side-by-side comparison of this bridge with its earlier companion illuminates the development of metal truss technology during a period of great transition and standardization in bridge design and manufacture.

Project Information: This documentation was undertaken in March and April 1994 in accordance with the Memorandum of Agreement between the Virginia Department of Transportation, Federal Highway Administration, Advisory Council on Historic Preservation, and the Virginia Department of Historic Resources as partial mitigation of the impact from the proposed replacement of the U.S. Route 1 bridges crossing the North Anna River. Historical research was conducted by Veronica L. Deitrick of the William and Mary Center for Archaeological Research (WMCAR). The physical analysis and description were

undertaken by Mark R. Wenger and Willie Graham, consultants to the WMCAR.

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U.S. Route 1 between Richmond and Washington, D.C., was opened amidst great fanfare in 1927. The groundwork for this highway system was laid in the early 1900s when public and commercial interests united to lobby for better roads. This movement was very powerful during the 1920s as private citizens became convinced that automobile transportation was no longer a luxury, but a necessity. Within this framework, the second quarter of the twentieth century was a period of unparalleled bridge and road construction in Virginia's history. Ownership of automobiles, which was directly related to the demand for better roads in southern states, continued to increase every year (Preston 1991:166). Across the country, transportation departments could not keep up with the needs of increasing traffic. U.S. Route 1 is an excellent example for studying this phenomenon. By the mid-1930s, the design of the highway that was constructed less than a decade earlier could not adequately handle the traffic passing through the corridor. A major thoroughfare between Richmond and Washington, D.C., as well as an important local carrier, the highway also served to transport thousands of tourists throughout the South every year. In order to support the influx of traffic, the entire stretch between the two cities was widened to accommodate at least three lanes of traffic by 1936. As part of these improvements, a second bridge crossing the North Anna River was completed in 1935.

The 1935 North Anna Bridge was only one of many structures built across the state during this period. During their terms in office, Governors E. Lee Trinkle (1922–1926) and Harry F. Byrd (1926–1930) were both integral players in the development of the highway system in Virginia. Their administrations undertook massive road and bridge construction campaigns to "bring Virginia into the twentieth century" (Steele 1951:15, 30). During their combined eight years in office, 394 bridges were built. This means that on average about 49 bridges were built each year between 1922 and 1930. Later administrations built on this precedent, and during the period 1930 to 1935, 438 bridges were constructed averaging about 87 bridges per year. The jump in bridge construction during this last period was due to a number of factors, including the use of the Depression-era Civilian Conservation Corps labor and funding for bridge construction (Virginia State Highway Association 1935:15).

The tremendous increase in bridge construction during this era created a situation that demanded standardization in order to facilitate rapid planning and implementation of proposed structures. Thus, construction techniques and design became subject to prescribed methods devised to be followed routinely across Virginia. The 1935 North Anna Bridge was an exception to these rules because it was designed to complement the adjacent 1926 bridge. The 1926 bridge was designed to serve both a commemorative and a functional role by memorializing the Civil War campaigns that took place in the local area. Therefore, the 1935 bridge design included obelisks and other decorative features similar to those included in the first bridge. The newer of the two bridges was planned for the use of northbound traffic along the highway, while the 1926 bridge became the southbound lane.

By the time the second North Anna bridge was constructed, the poor roads, which had been an ineonvenience at the turn of the century, were considered a major hindrance to almost every aspect of industry and commerce and to the rightful mobility of citizens. Much of this

attitude was deeply rooted in the psychological attachment that American society showed for the automobile. A phenomenon in its own right, the rapid diffusion of autos across society during a span of approximately 30 years changed the face of American society. Popular sentiment, which initially regarded the automobile as a mere piece of sporting equipment, evolved to the point that a car was considered a necessity for an adequate lifestyle (Scharff 1991; Rae 1971). Farmers exemplified this transformation in attitude: typically, they purchased automobiles 10 to 15 years earlier than they installed indoor plumbing (Preston 1991). Increased independent mobility was apparently much more important than the convenience of running water (Preston 1991). The automobile also offered opportunities to several other groups who previously had little mobility, including the middle class and women. Both groups adapted quickly to the freedoms afforded by motorized vehicles. For many, owning an automobile provided the ability to act on personal choices shaped by family obligations, responsibilities, and loyalties (Scharff 1991:133). Novelist Edith Wharton poetically explained what the ability to travel across the country on roads such as U.S. Route 1 meant for her generation:

> The motor-car has restored the romance of travel. Freeing us from all the compulsions and complaints of the railway, the bondage to fixed hours and the beaten path . . . the road has given us back the adventure and novelty . . . of travel (as quoted in Scharff 1991:24).

Although interstate travel was possible on highways such as U.S. Route 1, Good Roads progressivism of the 1930s and 1940s failed to meet the needs of many rural residents across the South (Preston 1991:159).

The automobile and its rapid rise as a cultural icon created quite a paradox for Americans. The renewed popularity of Colonial architecture was perhaps only one sign that Americans were torn between the past and the future (Rhoads 1986). Gasoline was pumped from charming Colonial Revival cottages. The most popular restaurants routinely advertised their comfortable *traditional* decor. The popularity of colonial architecture at this time suggests "that [Americans] could only enjoy the freedoms of the modern age when surrounded by the verities of the past" (Rhoads 1986:152). Although they delighted in the speed and independent mobility of the automobile, American motorists often pulled into a Colonial Revival-style inn or service station with architecture that reassured; while transportation was indeed revolutionized by Henry Ford, the underpinnings of American culture remained intact.

After the completion of U.S. Route 1, many businesses were started along the roadside in an effort to profit from the numerous travelers journeying through the area. These enterprises included restaurants, service stations, grocery stores, and motels. Farmers in these areas also often took advantage of the influx of potential customers by setting up roadside markets. Advice for establishing these businesses could be found in publications such as *Roadside Markets*, a leaflet distributed by the U.S. Department of Agriculture beginning in 1928. Roadside development supplied essential services for the traveler and was a boon to local economies. Cross-country travel, previously restricted to railroad routes and schedules, was quickly

becoming a rite of passage performed by many modern-day adventurers in their splendid new motorcars. This kind of travel supplied many of these businesses with the majority of their clientele. Roadways that had substantial services attracted travelers (Labatut and Lane 1950:79). Well-developed roadsides were also beneficial to larger areas like Richmond, which could expect to become a chosen destination because of the ease of travel to the city. In fact, Richmond began actively advertising itself as "The Gateway to the South" (Quittmeyer 1951). Groups such as the Virginia Historic Highway Association emphasized the importance of capitalizing on the Florida-bound visitors passing through the state (Virginia Historic Highway Association 1924:5).

The tourist industry, however, was not the only sector of business attempting to capitalize on new marketing strategies aimed at the motorists. Companies selling products from after-shave to soda pop began huge campaigns to imprint their products and logos across the landscape (Preston 1991; Rhoads 1986). Signs along roadsides and painted barns became favorite media for these interests. A precursor to television, the highway was one of the first arenas where advertisers could exploit a virtually captive audience. The U.S. Route 1 corridor was an excellent example of this advertising phenomenon, with its barrage of roadside logos and other advertisements aimed at the automobiling public. Many are still visible along the road today, hanging on isolated signposts or painted on the sides of weathered houses and barns (Jones 1994). From the beginning, the public was severely disgruntled by them. Most felt that they were a blemish on the beauty of the nation's countryside and should be abolished (Rhoads 1986).

The area of southern Caroline County between the North Anna bridges and Carmel Church (approximately 1.8 miles along U.S. Route 1) is a good example of the type of roadside development mentioned above. In the 1930s through the 1940s, the Ruther Glen/Carmel Church area was locally ealled Scramblesburg due to its location at the crossroads between U.S. Route 1 and Route 207, the main route to Bowling Green (*Caroline Progress* 1932:13(19):3). A hodge-podge of service stations and general stores, as well as several hotels and restaurants, was opened along this stretch soon after road construction was completed (Caroline County Records [CCR] Deed Books [DB]). The communities of Carmel Church and Ruther Glen expanded, and boundaries between them faded as these enterprises blossomed. The area continued to host the roadside service industry until the mid-1960s, when most of the through traffic was diverted to Interstate 95. The remains of many of these commercial structures still exist, and several are owned by those who ran these businesses before the area was bypassed by the new limited-access highway.

An examination of this district provides several examples of the relationship between U.S. Route 1 and the lives of individuals and the community. The highway's development and later deterioration has significantly affected this area. One local property in the area with a distinct history is the restaurant known as Beverly's Grill, located .3 mile north of Fox Bridge on U.S. Route 1 along the west side of the road. The restaurant was built in 1947 and has been an integral part of the community for 47 years. Run and owned by the Beverly family, it was originally named the White Star Restaurant. Besides serving meals, the owners also operated a service station and garage on the premises. According to Josephine B. Jones (1994), a family

member and part owner of the business, "it was the only coloured establishment in the area—all of the truckers, and such would stop here you know, because they weren't allowed in anywhere else." A family of teachers, the Beverlys began to use extra dining room space to run a kindergarten and study hall program for local minority youth. This program has developed into an important part of the community and is still in service today.

The "automobile age" created a need for gasoline and service stations located conveniently near heavily traveled routes. Ruther Glen resident Oran Jerrill began his service station chain as the manager of the Tip Top station in the early 1930s. This structure still stands 1.1 miles north of the North Anna River bridges (VDHR No. 42-401) along the east side of the road. After his lease on that establishment expired, he moved to the property located directly across the highway from Beverly's Grill on the east side of U.S. Route 1. There he built a truck stop that was one of the largest in Virginia (Jones 1994). A local landmark, it is now a shipping station for a local oil distribution company. Another property of interest is the Rainbow Lake Motel and Restaurant, also owned by the Beverly family. Located .5 mile north of the bridges on the highway's eastern side, it is a typical tourist court that economically-minded automobile travelers frequented until after the Depression. Tourist courts were usually family-run businesses consisting of a small office and several inexpensive cabins. Low rates often made them preferable to newer hotels (Neville 1992:77). Due to the increase in automobile traffic during the post-Depression era, the motel replaced the tourist court in popularity. Motels had attached units and therefore allowed a greater density of rooms in a limited amount of space.

The Virginia State Highway Commission also developed areas along the roadside. Special crews and funds were allocated for landscaping and beautification along the primary route system. There was also an early move to construct public waysides. These were created to provide areas for travelers to rest and picnic during their journeys. One of the first waysides was built at the North Anna River crossing. It included two acres of land 10 miles north of Ashland at the North Anna River. The land was donated by Helen L. Richards for the express purpose of wayside development in March 1934 (CCR DB:98:216). It contained parking facilities, picnic tables, benches, and fireplaces and was to be protected and maintained by the area patrolman (Virginia State Highway Department, Landscape Division 1949:11). It can be assumed that the 1926 bridge, considered a showpiece by the highway department, was thought to be the perfect setting for such services.

Along the 1.8-mile stretch between Fox Bridge and the intersection of U.S. Route 1 and Route 207, there are at least seven former service stations, two restaurants, a general store, and a tourist court. Almost all of these businesses depended on the traffic from U.S. Route 1 for their clientele. The business opportunities offered by the U.S. Route 1 corridor had a substantial effect on the community, which began to expand soon after the construction of the road (*Caroline Progress* 1932:13(19):4). The estimated population of the Ruther Glen/Carmel Church area in 1923 was 675 people (*Caroline Progress* 1923:5(3):2).

Although U.S. Route 1 was not the first interstate highway to connect the East Coast from Maine to Florida, it quickly became one of the most important. U.S. Route 17, which had been established a few years before U.S. Route 1, bypassed almost all of the capital cities of the South. This was due in part to the Southern Atlantic Coastal Highway Association, which sponsored its development. The association was more interested in scenery than functionality, and although the members had originally selected the path that U.S. Route 1 takes through the project area as a segment of the highway, they concentrated on more scenic ocean views (Preston 1991). U.S. Route 1 was designed to connect the capital cities of the South directly to Washington, D.C., earning it the title of Capital Highway. This was also a factor when the Federal government distinguished it with its numerical designation in 1925 (Preston 1991:86).

By the 1960s, plans for the development of limited-access highways were well underway. Traffic along corridors like U.S. Route 1 was too heavy to be handled by the older four lane roads. These problems were augmented by the considerable number of exits and intersections that hampered the flow and safety of traffic. In many areas of New England, U.S. Route 1, which had become a main street in many of the small towns through which it passed, had been judged too congested for safe interstate travel by the end of the 1930s. At this time, states such as Connecticut had begun experimenting with limited access roads (Rae 1971). Soon after the construction of U.S. Route 1, secondary feeder routes began to be developed. By the time the 1935 North Anna River Bridge was constructed, the networks formed by these routes were quite expansive. The highway widening, which included the bridge construction, only served to increase traffic flow. Congestion was endemic, and many of the secondary routes became important "short cuts" for the hurried traveler (Preston 1991). The new interstate highway system created express routes that whisked automobiles past most areas and only allowed them to exit at designated locations. Construction began on Interstate 95 in the mid-1950s. When I-95 was opened in the project area during the 1960s, the businesses lining the sides of U.S. Route 1 began to decline. At the same time, expansive new chain-run businesses emerged directly adjacent to the exits of the new thoroughfare. Some of the buildings that had been used to sell food and gasoline have found other uses as antique stores, insurance offices, and garages. However, the vast majority have fallen into disrepair or disappeared completely.

The North Anna River bridges (VDHR No. 42-401) and U.S. Route 1, of which they are a part, have been significant both locally and to the state of Virginia. They are symbolic of a period of history that was characterized by major episodes of construction and development, an embodiment of the emergence of the infrastructure upon which we now depend. The bridge crossing is also a symbol of society becoming more independently mobile than during any other period of our history. Driving down U.S. Route 1 has been likened to driving through an open-air museum, as one can still see the remnants of local farmers' markets and services designed to aid the interstate traveler (Dale 1984:795). U.S. Route 1 has several contemporaries in other geographical areas including U.S. Route 66, which extends 2,000 miles from Chicago, Illinois to Santa Monica, California. In 1990, Congress passed the U.S. Route 66 Study Act. It was found that U.S. Route 66 played a significant role in the history of the twentieth century. As

a contemporary highway, U.S. Route 1 and its bridges and other related structures merit similar consideration.

Located just 13 feet 6 inches east of an earlier span (Fox Bridge No. 1936), this bridge carries the northbound lanes of U.S. Route 1 across the North Anna River. Like its neighbor, it consists of a steel truss main span and two concrete girder approach spans. The construction of the bridge in 1935, under the auspices of the Virginia Department of Highways, corresponded with the widening of U.S. Route 1 to four lanes. In the same year, a four-lane bridge over a rail line was completed on this road near Doswell, and in 1937, a four-lane concrete bridge completed the crossings necessary to make four-lane travel from Richmond to Fredericksburg possible. Like the adjacent structure, this bridge was erected by the Roanoke Iron and Bridge Company of Roanoke, Virginia.

The main span is a four-panel Warren through truss with verticals, made up of rolled and composite sections, and is schematically identical to its neighbor, Fox Bridge No. 1936. Its overall dimensions match that of the southbound bridge, yet some of its components were enlarged for added structural redundancy (both bridges were rated at 15 tons). All connections are riveted except the lower portal struts which, like those of the 1926 bridge, were raised in 1946 to accommodate larger trucks (see Appendix I).

The top chords are joined at the panel and intermediate points by composite lateral struts. Each of these struts is made up of four angles joined by lacing to form a square cross-section. Alternate lateral struts are intersected at their midpoint by two diagonal struts. Each diagonal strut consists of two angles joined with lacing to form a channel section. These attach to the lateral struts by means of two horizontal gusset plates.

The top chord and inclined endposts are 16 × 15.25-inch composite members made up of paired channels, each 15 × 3.5 inches, joined with a steel plate above and lacing below. All verticals are 8 × 6.5-inch rolled I-sections. The tension diagonals at each end are 10.5 × 8-inch composite I-sections made up of four 5 × 3.5-inch angles connected by stay plates spaced at 3-foot 3-inch intervals. The remaining tension diagonals are 13 × 7-inch composite sections composed of paired channels joined by stay plates spaced at 3-foot 3-inch intervals. Diagonals in the compression position are 13 × 12 inches overall, being paired channels, each 12 × 3 inches, joined by top and bottom lacing. The bottom chord is made up of paired channels (each being two angles and a plate) connected with lacing on the top and bottom sides. The end floor beams are 30.5 × 11-inch rolled I-sections. Intermediate floor beams are rolled I-sections, stiffened by a series of vertical angles riveted to the webbing. The stringers are 16.5 × 8-inch I-sections, riveted to angles, which are connected in turn to the floor beams.

As in the case of the 1926 bridge, the growing height of truck trailers and oversized loads necessitated raising the lower portal strut. Here too, further evidence of alteration is visible on the underside of the roadway. Unlike the approach span decking, the concrete deck of the main

span was formed with plywood and thus appears to have been completely replaced. This probably corresponds to the 1964 alterations noted in Appendix I.

At either end of the truss is a concrete pier composed of paired, conical columns connected by solid webbing, the whole capped with a thick beam on which the trusses bear. The webbing arches between the two columns, leaving an opening near ground level. These supports are virtually identical to those of the 1926 bridge. At the bearing points, the truss rides on a special expansion fitting let down into the concrete support. This allows the bearing points to move as the truss expands and contracts in extreme temperatures. These too are nearly identical to corresponding features of the 1926 bridge.

Plaques are found at both ends of the truss with the following text:

BUILT BY
VIRGINIA BRIDGE
& IRON CO
ROANOKE VA
1935

The size and detailing of these spans follow those of the 1926 bridge, except that here the pedestals bear no commemorative plaques. As on the earlier bridge, the concrete elements of the approach span appear to have been painted white at some point, reflecting aesthetic concerns associated with the structure's commemorative function.

Though U.S. Route 1 was a principal north-south artery for the Eastern states, it was initially improved to four lanes only between Washington, D.C., and Fredericksburg. Below this point, the widening continued along U.S. Route 17 to Norfolk. By the middle of the 1930s, it was necessary to improve U.S. Route 1 between Richmond and Fredericksburg, and new bridges were commissioned to accommodate the increased traffic flow.

Aesthetically, the new North Anna Bridge was intended to be a copy of the earlier span. There is, however, a significant technical difference. As compared with the 1926 structure just a few feet away, this span exemplifies the continued evolution and growing conformity of bridge design in Virginia during the 1930s. Characteristic of these developments is an abandonment of composite sections in vertical members in the present span. The 1926 bridge—built prior to the Virginia Department of Transportation's state-wide authority for such structures—has I-section verticals built up by riveting four angles to a flat plate. By the time Fox Bridge No. 1937 was erected in 1935, rolled sections were routinely employed for these members.

A similar pattern is evident when we compare the bottom chords of the two spans. Both are composite members, but on the 1926 truss, the channels comprising the sides of the chord are composite members; those on the 1935 bridge are rolled. In a simply supported Warren truss, verticals and bottom chords were tension members. In such cases, the structural

properties of the cross-section were less important than insuring that the entire member behaved as a unit under loading.

For any given bridge, rolled sections eliminated thousands of riveted connections and thus enhanced the structural integrity of individual members. For the same reason, rolled members reduced labor costs and diminished dead loads as well. Equally important, the growing standardization of rolled sections and their structural properties greatly simplified design. For all of these reasons, rolled steel presented substantial advantages to a centralized bridge-building authority.

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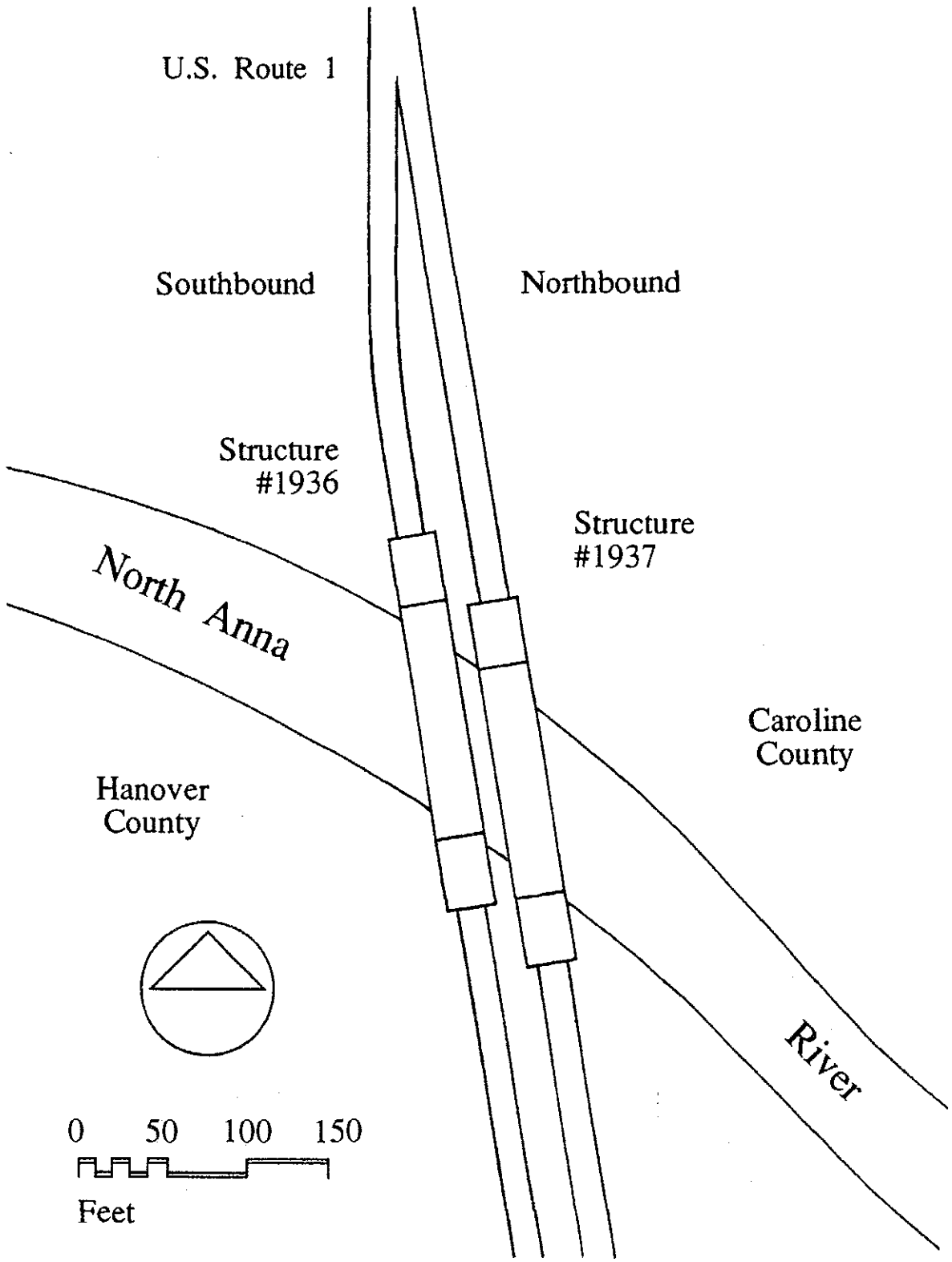
Site Plan


U.S. Route 1
Southbound
Northbound
Structure #1936
Structure #1937
North Anna
Caroline County
Hanover County
River
0 50 100 150
Feet

Appendix I

Schedule of Design and Repair Drawings
Virginia Department of Transportation
Richmond District

Fox Bridge No. 1937 Northbound Lanes

Plan No.	Year	Work
56-4	1935	New Bridge
56-4A	1946	Portal Repair
56-4B	1956	Armored Joint Repair
56-4C	1964	Strengthen Floor Beams and New Slab
56-4D	1973	Portal Repair
56-4E	1982	Portal Repair
56-4F	1984	Portal Repair
None	1988	Timber Bent Added to Support Concrete T-Beam