

# Georgia Historic Bridge Inventory Update

## HISTORIC TRANSPORTATION CONTEXT, 1955-1965



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**DRAFT**

*Detail from Cummins ad, Dixie Contractor (1956).*

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**GEORGIA HISTORIC BRIDGE INVENTORY UPDATE**  
**FOR BRIDGES BUILT FROM 1955 THROUGH 1965**

**Historic Contexts**

**Overview**

In order to evaluate the National Register eligibility of the 1955-65 non-interstate highway bridge population, two historic contexts have been prepared: (1) *Historic Transportation Context, 1955-65*; (2) *Historic Context for Bridge-Building Technology in Georgia, 1955-65*. Both contexts are updates to prior studies of Georgia's pre-1955 highways and bridges, and, as such, build upon many of the same historic themes and associations. Of particular significance is the continued influence of the federal-aid highway program and its implementation by the State Highway Department of Georgia (SHD, predecessor to the Georgia Department of Transportation). Uniformity and standardization of roadway and bridge designs were long-term goals pursued by federal and state engineers starting with the establishment of the federal-aid highway program in 1916. This goal was largely fulfilled by the 1950s and continued into the 1960s and beyond, placing Georgia bridge-building practices well within the mainstream of national trends, including the use of standardized bridge types, designs, and specifications.<sup>1</sup>

The contexts assist with evaluating and understanding the historical significance of each of Georgia's more than 1,800 non-interstate highway bridges built from 1955 through 1965. They provide the background necessary for considering each bridge as an example of its type and design, as well as its association with state and local community planning and development, keeping in mind that bridges don't stand in isolation but are links in roadway systems. For these reasons, the transportation context focuses on trends in the development of the state's non-interstate highways, while the technology context focuses on a range of standardized bridge types.

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<sup>1</sup> For information on Georgia's pre-1955 highways and bridges, see Georgia Department of Transportation (GDOT) and the Georgia Department of Natural Resources, *Historic Bridge Survey* (1981); and Lichtenstein Consulting Engineers, *Historic Bridge Inventory Update, Historic Contexts* (1995, revised June 2001). Congress established the federal-aid highway program in 1916, and it has continued with modifications ever since. The state legislature established the State Highway Department of Georgia in 1916, in large part to comply with the provisions that a professionally staffed department implement the federal-aid program at the state level.

## Foreword: How the Interstate Highway System Impacted the Development of Georgia's Other Roadway Systems

The non-interstate bridges in the 1955-65 study population are on state highways (US and SR-designated routes), county roads, or city streets, exclusive of bridges that carry or cross over interstate highways (I-designated routes).<sup>2</sup> The focus of the transportation context is these non-interstate roads and bridges; nonetheless, it is important to keep in mind that the interstate system is the dominant transportation story of the period. That story strongly influences and, in most instances, overshadows the contexts of the other road systems, where most work was the improvement or replacement of existing roadways and bridges, not the construction of modern freeways on new alignment. The interstate system had a profound impact on everyday patterns of travel, movement of goods, and land use in Georgia and throughout the nation. It also had a significant impact on the improvement of other classes of road because of the need to upgrade those roads and bridges that fed the interstate routes.

Although the interstate system was first contemplated nationally in the late 1930s, it was not fully funded until the Federal-Aid Highway Act of 1956 when Congress adopted a 90%-10% federal-state funding formula with revenues raised through the federal fuel tax and other excise taxes on motorists. Significant to the story of all of Georgia's other highway systems after 1956, the formula meant that the federal government paid the lion's share of building high-speed limited-access freeways – the most expensive highways to build, especially in cities. The new 90-10 formula unencumbered state highway budgets allowing for widespread improvements to non-interstate roads and bridges. Prior to 1956, the costs of federal-aid projects had been split 50-50, and most states, including Georgia, struggled to make their federal match, let alone make significant progress on freeways. Before the 90-10 formula in 1955-56, for example, Georgia received only \$33 million in federal aid for its \$32 million match – a \$1.03 return on every dollar. After the 90-10 formula in 1961-62, Georgia received \$73 million in federal aid for its \$27 million match – a \$2.70 return on every dollar.<sup>3</sup>

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<sup>2</sup> For procedural reasons, a separate historic context was prepared for Georgia's interstate highway system. See, Lichtenstein Consulting Engineers, *Historic Context of the Interstate Highway System in Georgia*, GDOT (January 2007). The Federal Highway Administration signed an agreement with the Advisory Council on Historic Preservation exempting the interstate highway system from Section 106 in February 2005. Under the agreement only a select list of interstate bridges of national-level significance will be considered historic, i.e., eligible to the National Register. No bridges of national-level significance were identified in Georgia.

<sup>3</sup> Biennial Report (1955-56), p. 39; (1961-62), np; (1965-66), pp. 54-55. Years reported are fiscal years starting on July 1.

As a result of the Federal-Aid Highway Act of 1956, the SHD was able to reconstruct and improve most state-owned routes with a special emphasis on eliminating the sharp curves and narrow roads and bridges built during the improvement campaigns of the 1920s and 1930s. It is unlikely that Georgia could have afforded all of these improvements without the fiscal relief provided by the 90-10 federal funding of interstate construction. After 1956, federal and state dollars also flowed in greater amounts to counties and cities for improvement of their roads and bridges through a variety of revenue-sharing programs, including the federal-aid secondary program, the SHD's county contract system, and the Georgia Rural Roads Authority (GRRRA). Local roads officials were required to follow the specifications and standards established by SHD engineers in order to receive those funds, thus even local projects came to look very much alike in all corners of the state.

## HISTORIC TRANSPORTATION CONTEXT, 1955-1965

### A. Georgia's Highways Respond to the Automobile Age

The highway improvement campaigns of the 1950s and 1960s have rightly been interpreted as part and parcel of America's "love affair" with the automobile. Historians use terms like "the automobile age" and the "car culture" to describe society as a whole as it accelerated into the postwar period. Indeed, the automobile influenced everything from architecture to music and family structure. As well, Americans came to rely on their elected officials and state highway departments to provide smooth riding surfaces and well-maintained roads and bridges, and they vocally complained when they didn't. As a result, the topic of highways was a central issue in postwar politics and government.

Georgians, as did all Americans, embraced automobiles and modern highways. The number of registered vehicles in Georgia increased fourfold from about ½ million in 1945 to over 2 million in 1966. Furthermore, the average Georgia motorist who was driving about 6,000 miles per year in 1950 was driving over 10,000 miles per year by 1970. Much of this change in driving habits occurred in the Atlanta metropolitan region and other Georgia cities with their expanding populations, placing enormous pressures on street systems, many of which had been last improved in the days of the Model T. Simply put, more people were spending more time in their cars and driving farther. This had a decisive impact on trends in road and bridge construction, especially demands to increase the capacity and safety of highways in and around cities.

All levels of Georgia government sought to respond to the public's insatiable appetite for automobile travel by improving roads and bridges. A simple equation was that as more people drove, they used more fuel and paid more fuel taxes, increasing the revenues available to pay for highway projects. Georgia state highway revenues grew from \$38 million in 1955 to \$96 million in 1965. At the same time, fuel sales increased from about 1 billion gallons in 1956 to 1.7 billion gallons in 1965. This did not, however, equate to a cash-rich highway program; on a per-mile basis, Georgia still had one of the smallest highway budgets east of the Mississippi River. Highway officials constantly reported that they had insufficient resources to complete all of the needed projects. Traffic was wearing out or exceeding the capacity of roads and bridges faster than the SHD could improve them. In 1960, for example, the SHD estimated that it would take 20 years at existing funding levels to bring the state highway system up to then-current standards.<sup>4</sup>

The fundamental fact of Georgia's highway development was that government was almost always in the mode of responding to the demand for better roads and bridges,

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<sup>4</sup> Biennial Report (1956), pp. 39, 71-73. Biennial Report (1966), pp. 54-57.



**Figure 1.** Charles A. Marmelstein, state bridge engineer, 1956 to 1967. Source: *Georgia Highways* (1958).

rather than building ahead of it. In contrast to the growing number of automobiles, total highway mileage remained relatively constant, increasing by little more than 3% from 96,000 linear miles in 1955 to 99,000 linear miles in 1965. With the major exception of the new interstate highways, this meant that existing routes were being asked to handle the heavier traffic volumes. Engineers spent most of their non-interstate efforts working to replace, upgrade, or maintain existing roads and bridges.<sup>5</sup> Each year the SHD oversaw hundreds of projects including upgrading pavements, widening old roads, straightening or modifying poor alignments for safer higher speed travel, improving intersections, and adding safety features such as shoulders, medians, guide rails, and signs. Thousands of narrow, sharply aligned, or under capacity bridges were replaced, bypassed, or improved.

As a result, the period from 1956 to 1966 was the most prolific decade of highway bridge building in Georgia's history. No fewer than 2,500 bridges were built – an average of over 250 bridges per year or about one new bridge each work day. The SHD's bridge division, headed by state bridge engineer Charles A. Marmelstein (Figure 1),<sup>6</sup> amassed an impressive record of accomplishment that testifies to its ability to complete an astounding amount of work efficiently and economically in response to the transportation demands of the automobile age. Their work from those years accounts for about one in five of all highway bridges in service in Georgia in 2007.<sup>7</sup>

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<sup>5</sup> Georgia's 1,100-mile interstate highway system accounted for about a third of the new highway mileage built from 1955 to 1965.

<sup>6</sup> Marmelstein was born in Savannah in 1898 and received a B.S. in civil engineering from the University of Georgia in 1921. His first job was as a draftsman for the North Carolina State Highway Department, but he returned to Georgia in 1922 as an engineer with Truscon Steel of Atlanta. He joined the SHD in 1923 as a resident engineer recruited by State Bridge Engineer Searcy B. Slack. Marmelstein rose from bridge construction supervision to bridge design to assistant state bridge engineer in August 1933, and he was named state bridge engineer in June 1956 replacing Clarence Crocker. Marmelstein retired in 1967.

<sup>7</sup> GDOT, National Bridge Inventory (NBI) Data, April 2007.

## B. Georgia's Roadway System Classification & Its Impact on Roads and Bridges

A key to understanding the evolution of Georgia's postwar highways is understanding the roadway classification that informed decisions about whether to retain or replace old roads or bridges and determined standards for new construction. By 1949, the SHD had classified every Georgia roadway into one or more of seven systems – (1) the National System of Interstate and Defense Highways, (2) the Georgia State Highway System, (3) the Federal-Aid Primary System, (4) the Federal-Aid Secondary System, (5) the County Road System, also known as the Post Road System, (6) the City Street System, and (7) the Forest Highway System. Classification was used to determine a route's eligibility for federal or state aid. Within each classification further distinctions were made based on traffic counts, topography, and setting, determining specific standards for new construction and improvement (Table 1, p. 9).



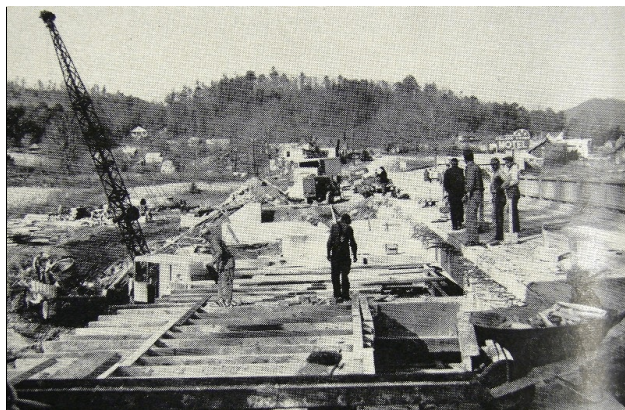
**Figure 2.** A factor in the ability to set higher geometric standards after WWII was the availability of larger, more powerful machines for grading and moving earthwork, allowing for economical construction of cuts and fills, as shown in this view of US 23/441 in Rabun County in 1960. In the 1920s and 1930s, this would have been too costly because of the heavy labor and time involved. Source: *Biennial Report* (1959-60).

Engineers strove to bring all roads and bridges within a particular classification up to minimum standards as defined by the SHD's Geometric Design Standards, first published in 1949 and updated about every five years thereafter. The standards incorporated national guidance from the federal Bureau of Public Roads (BPR) and the American Association of State Highway Officials (AASHO), so that Georgia's standards were not significantly different from those of other states. They defined more than two dozen variables including design speed, curvature, gradient, stopping sight distance, number of lanes, width of lanes, surface type, width of shoulders, safe bridge loads, signage, and other geometric and safety features. Heavy-volume, urban arterial highways had the highest standards while low-volume rural

roads had the lowest. For example, an urban route on the federal-aid primary system with greater than 4,000 average daily traffic count (ADT) was required to meet a standard of two 24'-wide concrete travel lanes with 40'-grass medians and 10' surface-treated shoulders. In contrast, a rural highway on the federal-aid secondary system

with low traffic counts (less than 400 ADT) was required to have a 24'-wide bituminous pavement and unimproved 5'-wide grass shoulders.<sup>8</sup>

Two important bridge design standards were live-load capacity and roadway width. During the study period, a bridge on a rural county road with less than 99 ADT could be retained if it met minimum acceptable standards of a 6-ton live-load and roadway width of 12'. Any new bridge on that same low-volume county road would, however, have to meet a live-load rating of H15 (i.e., a theoretical design vehicle equivalent to a 15-ton truck) and roadway width of 24'. On the other hand, a high-volume rural state highway bridge had to meet minimum acceptable standards of H20-S16 live-load (i.e., a design vehicle equivalent to a 36-ton semi-truck) and 28'-wide roadway plus full shoulders to retain any bridge and for all new construction. Obviously, these standards meant that old, light, narrow bridges would be more likely to survive on low-volume county roads but would be programmed for replacement on more heavily traveled state highways. These standards also had considerable bearing on the selection of bridge types for new construction, with, for example, a standard precast reinforced-concrete slab bridge designed for H15 on a low-volume county road having no application on a high-volume state highway where H20-S16 was required.



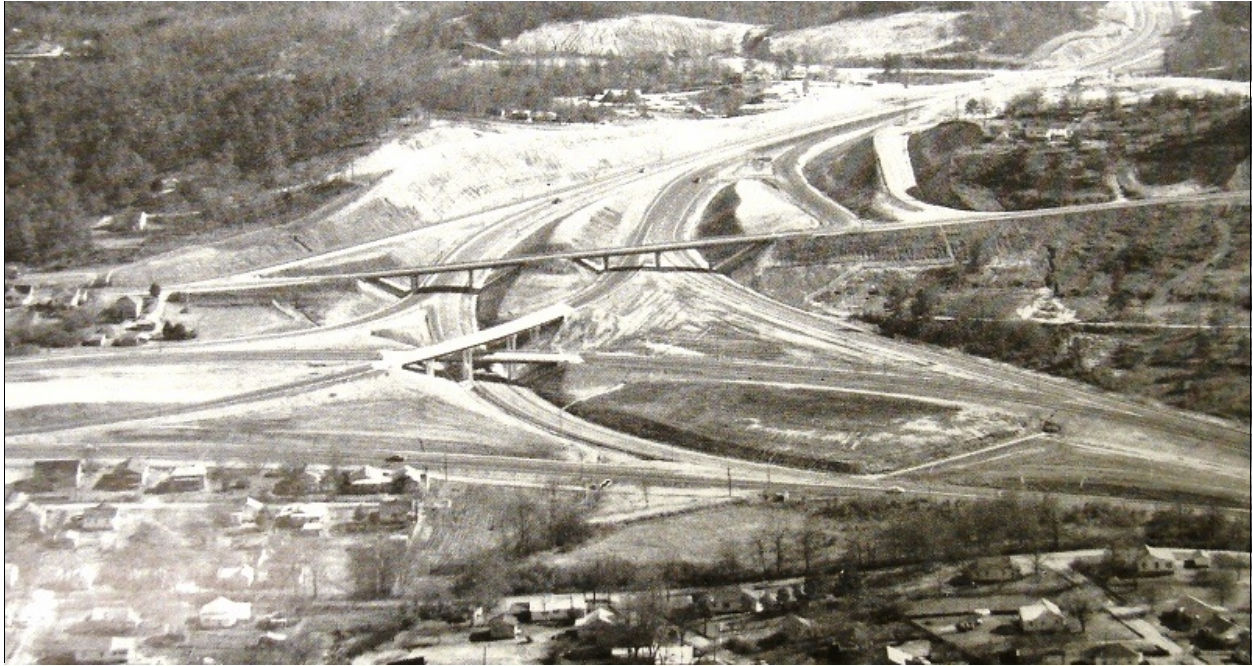
**Figure 3.** Widening the Betty's Creek bridge on US 23-441 near Clayton in 1958. Many older bridges were widened to bring them up to the geometric standards for their classification. Source: *Biennial Reports (1957-58)*.

After 1949, the SHD's efforts were geared toward upgrading the state highway system to the geometric standards, which meant that many older bridges were either replaced, widened (Figure 3), or by-passed. With increased federal and state funding in the late 1950s and 1960s, the pace of this type of bridge work accelerated. Of particular concern were the many long, narrow bridges in the coastal areas that were vital links in the state highway system. Built in the late 1910s to 1930s, most no longer met the new geometric standards. Widening or replacing these bridges was a priority but very costly.<sup>9</sup>

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<sup>8</sup> SHD, *Geometric Design Standards for Use on Location and Design*, (Atlanta: 1949, revised July 1, 1953 and April 1, 1961); "Turning an Old Road into a New One" and "Athens Bypass," *Georgia Highways* (Nov. 1958)

<sup>9</sup> A sidebar to the standards story was its impact on ferries, which were considered bottlenecks on all but very low-volume classifications. In the 1930s, Georgia had about 20 ferries in operation, but due to the concerted efforts of the SHD, ferry services were replaced



**Figure 4.** The three-level interchange of US 27, US 441/SR 20, SR 1E, and SR 101 at Rome, completed in 1960. Source: *Biennial Report (1961-62)*.

Interchanges were another area of bridge work impacted by the standards. Limited-access freeways were required to meet the highest geometric standards, and this meant controlling traffic access at interchanges. The SHD had been building interchanges since the late 1930s, but the number of interchanges expanded greatly after 1956 with the interstate highway program. Typical interchange designs included diamond-shaped and cloverleaf, but some more complex directional interchanges were required where major highways intersected. A notable example was Georgia's first three-level interchange (Figure 4), built in 1958-60 at the junction of US 27, US 441/SR 20, SR 1E, and SR 101 just inside Rome's southeast city limit.<sup>10</sup>

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with bridges so that only four remained in operation in 1958. The four were (1) Old Campbellton Ferry over the Chattahoochee River at the Douglas-Fulton county line; (2) Bridge's Ferry over the Ocmulgee River on SR 83 on the Forsyth-Monticello county line; (3) Dames Ferry over the Ocmulgee River on the Forsyth-Gray county line; and (4) Underwood Ferry over the Flint River. "Georgia Ferries End Colorful Chapter in Highway History," *Georgia Highways*, Vol. 1, No. 1 (Jan. 1958), np.

<sup>10</sup> "Work on Rome-Cartersville Road Moves Rapidly," *Georgia Highways* (Aug. 1958), pp. 12-13.

**TABLE 1. GEORGIA HIGHWAY SYSTEMS AND BRIDGE STANDARDS, 1955-65**

<b>System</b>	<b>Description</b>	<b>Bridge Standards</b>
National System of Interstate & Defense Highways	Interstate highways were, with the exception of the pre-1956 Atlanta Expressway, built under the Federal-Aid Highway Act of 1956. The original authorization was for approximately 1,100 miles of limited-access highways in Georgia. The interstate highway system is also part of the Georgia State Highway System.	H20-S16 live loads. Mandatory 12'-wide travel lanes with full shoulders carried through all bridges less than 150' long.
Georgia State Highway System	Established in 1919. State-owned and maintained highways connecting population centers and serving as cross-state routes. In 1956, there were over 15,000 miles on the system. As a result of the construction of the interstate highway system and additional roads taken over from counties, the system had grown to about 17,000 miles in 1965.	Design standards based on ADT, rural/urban, and federal-aid system (see below).
Federal-Aid Primary System	Established in 1916. About 7,100 miles of arterial highway inclusive of the interstate highway system, US-numbered routes, and many SR-numbered routes. All roads on the primary system are also part of the state highway system.	Design standards based on ADT and rural/urban. Max. standards similar to interstate highways. Min. standards of H15 and 24'-wide to retain for low-volume roads. Min. new construction standards of H20-S16 and 28'-wide.
Federal-Aid Secondary System	Established in 1938. About 13,100 miles of secondary highway eligible for federal aid including about 6,800 miles on the state highway system and the remainder on the county and city systems.	Standards based on ADT and rural/urban. Min. new construction on most low-volume rural roads set at H15 and 24'-wide. Bridges rated at H10 with 18'-roadways could be retained for traffic volumes less than 400 ADT.
County Road System (Post Road System)	All roads not on the state highway system and not within the boundaries of a municipality. The longest of the roadway systems, measuring about 73,000 miles. Owned and maintained by the County Commissioners of Roads & Revenues.	Min. standard of 6-ton and 12'-wide to retain a bridge with less than 100 ADT. New bridge construction standards were a min. of H15 and 22'-wide.
City Street System	About 7,400 miles, owned and maintained by cities and municipalities. After 1946, some city streets were included in the federal-aid systems if they served as connectors to federal-aid routes outside of the city limits.	For major urban streets, a min. of H20-S16 for new bridges and H15 to retain a bridge. Standards for minor urban streets the same as the county road system. Standards same as the federal-aid system for those streets included on the primary and secondary systems.
Forest Highway System	About 360 miles that were eligible for a special category of federal-aid reserved for improving roads within U.S. forests. The forest highway program was established in 1917 as part of the federal-aid highway program.	State standards apply to forest highways on the state highway system. Local forest road bridges are typically either designed by federal engineers for heavy loads (i.e. log trucks) or are local access constructed at the discretion of local units of the U.S. Forest Service.

### C. The Significance of the Federal-Aid Highway Program

Essential to an understanding of the highway construction programs of every state in the U.S., not just Georgia, is the basic administrative structure that has guided decision-making for most of the 20th century. The fundamental point is that American highway administration is a premier example of *federalism*, the governmental system in which authority is shared by the states and the central government in Washington. This means that power and authority have been shared by officials in state highway departments and the federal Bureau of Public Roads (BPR) and its successor agency the Federal Highway Administration (FHWA). The federalist system of highway administration came into being in the early decades of the 20th century and was firmly established by the 1940s. It has had a profound impact on the patterns of road and bridge construction since federal highway officials have worked with their state counterparts to share technical knowledge and develop nationally applicable technical guidelines, including those for bridges.

The BPR was created in 1893, but a coordinated program of federal funding did not take shape until 1916 when Congress established the federal-aid highway program. Under this program, state highway departments have been responsible for planning, building, and maintaining roads and bridges, while federal engineers have overseen and approved state construction plans, specifications, and estimates, and inspected the finished work. The SHD was established by Georgia in 1916 in direct response to the federal-aid highway program, but Georgia, and indeed most southern states, initially created politically weak highway departments out of traditions that were suspicious of centralized power and favored “local control of local affairs.” The federal government, however, used a “carrot-and-stick” approach to overcome local prejudices. In order to receive the ever-increasing federal-aid funds, states were required to build-up the professional staff of their highway departments and give them technical control over the state highway systems, as well as to develop their own dedicated sources of highway revenue – primarily motor-fuels taxes – to make the federal matches.

Importantly, standards for construction were identified as a state concern under the federalist structure. Federal engineers were expected only to inspect and approve state decisions. In reality, a very different relationship developed among federal and state engineers. The simple fact was, especially in the early years of the federal-aid program, that most state engineers and their agencies lacked knowledge and expertise about road and bridge design and materials, while the BPR staff in Washington knew a great deal about such matters. The BPR adopted a variety of cooperative mechanisms for disseminating the knowledge and ideas developed in federal labs. By 1905, for example, BPR engineers were issuing their findings through the committees of the American Society for Testing Materials (ASTM). And after 1916, the BPR supported the creation of committees within the American Association of State Highway Officials (AASHO, renamed AASHTO in 1968) as the nation’s leading venue for the

development and adoption of construction and materials guidelines for state highway projects. The BPR also initiated state planning functions, paying for traffic surveys starting in the 1920s, and formally setting aside a percentage of federal-aid funds to support planning divisions in every state highway department starting in 1936. Georgia's state engineers, like those in most states, were heavily involved in AASHO committees and activities. State Highway Engineer Morris L. Shadburn, for example, served on the AASHO committee that devised the interstate highway numbering/marking system in 1957-58 and then served as AASHO president in 1965. Such a cooperative structure meant that the leadership of the BPR did not dictate standards or procedures to their state counterparts but fostered instead a genuine sense of partnership.<sup>11</sup>

Under the federalist system of highway administration each state had latitude, within limits, to develop its own approach to road and bridge design and materials standards. The BPR never sought to impose uniform national standards, and tolerated variation in standards among the states, compromising on items where state officials could justify variations for local conditions and precedent. State bridge engineers, for example, determined what bridge types and designs to favor based on the price and availability of materials and labor, climate, the engineers' individual preferences, and other factors. BPR officials judged this approach critical to maintaining a shared commitment to the federal-aid program. Uniformity remained a long-term goal pursued through ASTM and AASHO, while each state highway department developed its own specifications book so that it was rare that construction practices in one region of a state varied greatly from those in another.

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<sup>11</sup> For a definitive overview of the federal-aid highway program and its profound influence on highway and bridge construction, see Bruce Seely, Building the American Highway System: Engineers as Policy Makers (Philadelphia: Temple University Press, 1987); "Former Engineer Shadburn Dies Suddenly in His Home," The Survey, Vol. 6, No. 1 (Jan. 1971), p. 1.

## **D. Georgia Highway Politics and Its Impact on the Patterns of Road and Bridge Building**

While no Georgia road or bridge projects stand out as individually significant for political reasons, they collectively reflect important and complex patterns in state politics that shaped highway policy and the funding and geographical distribution of projects. A significant pattern, dating to the late 19th century and continuing particularly strong in Georgia through the 1950s, was state support of roads programs that mostly benefitted rural and small town interests. One such program, established in 1955, was the Georgia Rural Roads Authority (GRRRA), which spent more than \$100 million on rural roads and bridges. Due to the civil rights movement, the 1960s saw an erosion of the power of conservative rural interests in Georgia's state government. State highway policy adapted to the changing political reality with more equitable funding and distribution of road and bridge projects in cities and suburbs.

### The State Highway Board and the Balance of Power

The state highway board that governed the SHD was the nexus of political decisions impacting roads and bridges in Georgia. Prior to 1963, the board had three members appointed by the governor. One of the members served as chairman directing SHD operations and working closely with the chief engineer, the department's highest ranking professional employee. In 1963, the board was reconstituted with ten members appointed by the state legislative delegations of each of Georgia's congressional districts. This was to make the board more accountable to the legislature, better representing all regions of the state in highway matters, and limiting the power of the governor's appointees. The measure also established the position of director of the SHD, an appointed chief executive to oversee the department's day-to-day operations. The governor appointed the first director to a four-year term, but subsequent directors were appointed by the board.

Underlying the power of the state highway board was the fact that it had discretion over where to use federal and state highway revenue. Although the federalist system established a balance of power between the federal and state governments, federal officials were generally reluctant to earmark funds for specific projects, rather they set general policies about how to distribute funds to each of the states and roadway classifications. It was then left to states to set priorities and develop specific projects within the federal guidelines.

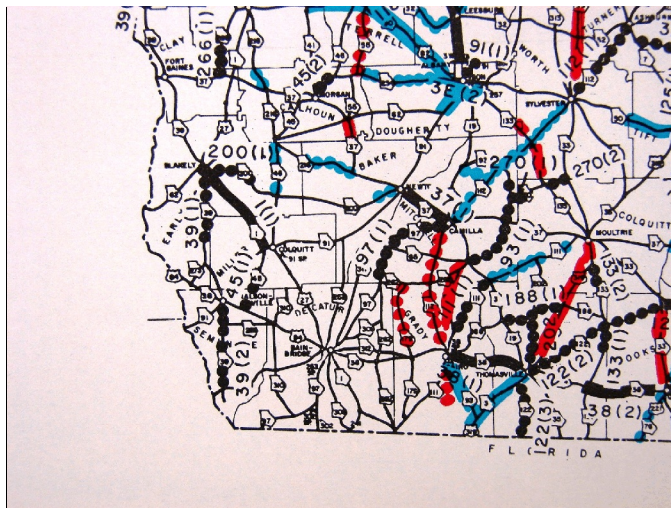
With the advice of the SHD's senior engineers, the state highway board established policy, allocated the budget, and earmarked funds for specific projects. The board approved engineering recommendations for which roads to include or exclude on the federal-aid and state highway systems. Generally speaking, the most heavily traveled and established routes remained on system, but there could be considerable

modification made to right-of-way and alignment as the roads were progressively upgraded to higher standards. There was constant political pressure to move local roads and bridges into higher classifications so they could be improved using state or federal funds, and the board was closely attuned to the projects desired by local political leaders. State engineers were particularly concerned with objective data – such as traffic counts – to justify recommendations for which projects to fund, while the board tempered those recommendations with its own political calculations.

The board relied heavily on state engineers to manage costs through close supervision of project details. This relationship between the board and engineers reinforced the standardized approach to road and bridge construction, since the cost of a standardized design was far more predictable than individualistic designs. Standardization also provided engineers a defensible position from which to base their decisions if there were ever any questions about the necessity, quality, or cost of the work recommended to the board. It also served as a check on contractors if a standardized design cost significantly more at one site than another.

One of the most interesting facets of Georgia highway politics was that elected state officials had a specific history of periodically upsetting the balance of power established by the federal-aid program. The best known instance of this was Governor Eugene Talmadge's June 1933 declaration of martial law and the forcible removal of

the state highway board and chief engineers from their offices by military guard. This event was precipitated by Talmadge's insistence on installing his own hand-picked men, as well as a desire to divert highway funds and avoid compliance with federal minimum-wage laws. Talmadge eventually had his way, although the BPR temporarily withheld Georgia's federal aid and many talented engineers, such as state bridge engineer Searcy B. Slack, left state service.



**Figure 5.** Southwest corner of Georgia from SHD Project Map, 1960. Project locations are highlighted by black, red, and blue dots, representing phased projects from 1960 to 1962. The map reflects state politics: notice that Decatur County (southern tier, second from left) has no projects. This was the home of former Governor Griffin who had opposed Ernest Vandiver for Governor in 1958. Source: GCGM (1960).

An impact of the Talmadge administration was that every election cycle from 1937 to 1963 the board was dissolved, thus allowing the newly elected governor to appoint all of its members. Over a short period, a mutually beneficial pattern of

patronage developed with board members expected to use their influence to steer projects toward the home districts of the politicians who had supported the governor's election. Control of the SHD became an openly accepted spoil of gubernatorial politics until the board was reorganized and made more accountable to the state legislature in 1963. Spoil ranged from moving SHD division offices to provide jobs in counties that had supported the governor to depositing SHD funds in favored local banks. It was taken for granted that the roads and bridges in the governor's home county would receive extra funding and that the governor's opponents risked losing funding (Figure 5). Since so much was at stake, it was rather predictable that the SHD was politicized, especially around election time. The tension between professional highway administration, with its goal of objective standards for improving all of the state's highways, and gubernatorial politics was a defining feature of Georgia highway administration during the study period.

### The Influence of the County-Unit System of Elections: An Emphasis on Rural Roads and Bridges

Rural counties had a point of political leverage that was unique to Georgia – the county-unit system of elections. County “courthouse gangs” used it with great effectiveness to influence gubernatorial elections and curry favor for rural road and bridge projects until it was struck down as an unconstitutional infringement on voting rights by a federal court in 1962. The county-unit system was the Georgia Democratic Party's method of nominating candidates to state office, and because Georgia was a one-party state, the winner of the primary was invariably the winner of the general election. The county-unit system was not based on population. It gave each county two votes for each representative in the state house of representatives, which itself was not population-based but had from one to three representatives from each county. The system was heavily biased against populous counties, and it had the effect of concentrating power in the hands of white rural voters and minimizing the power of African-American urban voters, reflecting its origins during Reconstruction. Under the county-unit system, Georgia's eight most populous counties, which contained nearly 37% of the population, had only about 12% of the county-unit votes in 1960.

Statewide elections could easily be won by carrying a majority of the rural counties, and thus candidates curried favor by catering to the most conservative rural elements in the Democratic Party. This was significant to Georgia's highways since candidates often promised to use their influence to secure projects in return for the support of rural and small-town politicians. Gubernatorial candidates always campaigned on promises to use state funds to improve rural roads and bridges, but they rarely mentioned the need to build urban expressways or improve congested city streets. A further irritant to Georgia's urban areas was that some rural counties were well known to have exceptionally low property-taxes, “phony” homestead exemptions, and lax tax-collection

procedures. Instead, these counties relied on their power under the county-unit system to secure needed operating revenues from the state rather than their tax base.<sup>12</sup>

The county highway contract was the most pernicious of the practices used to reward rural counties for their unit votes. Each year the state highway board allocated funds to Georgia's counties through a contract that paid them to do work on non-state roads and bridges. The county under the terms of the contract was to do this work itself, with its own machinery, but in practice counties often had the work done by contractors (who were in the worst cases one-in-the-same as the local officials). Counties also diverted the funds to non-road purposes, such as schools. Rural counties tended to be the largest beneficiaries of the practice, and some relied almost exclusively on the county contracts to fund all of their road and non-road operations. It was widely acknowledged that the board passed out county contracts as political favors, and conversely withheld them to punish political opponents. The disparity between rural and urban counties under the county contract system was striking. Emanuel County, for example, received \$114,000 in county contracts in 1962 and spent \$133,000 total on its roads and bridges. Fulton County, on the other hand, received \$155,538 in county contracts and spent over \$8.4 million on roads and bridges, while reporting that over one-half of its 1,200 miles of county roads remained unpaved.<sup>13</sup>

In 1962, a federal court struck down the county-unit system as unconstitutional and required Georgia to reapportion representation in the state house of representatives on the basis of population. The end of the county-unit system, which was finally carried out in March 1965 after the appeals process had run its course, was among the most significant civil rights reforms in Georgia's history. It had the effect of shifting the balance of political power, giving urban areas and their large African-American populations more representation and political opportunity. A secondary effect was that the state highway board's practice of awarding county contracts as political favors

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<sup>12</sup> Numan V. Bartley, The Creation of Modern Georgia, 2<sup>nd</sup> ed (Athens: University of Georgia Press, 1990), pp. 161-63; 201-05; Arthur K. Bolton, "Legislators Continue Efforts to Expedite Tax Equalization Acts," Georgia County Government Magazine (GCGM) (Jan. 1962), p. 7; Griffin Smith, "President's Message: Facing Up to Urbanization," GCGM (Sept. 1965).

<sup>13</sup> "Roads and Politics," Atlanta Journal (Feb. 2, 1967); Mr. Jim's Scrapbook, 1958, Record Group 27-6-6, Georgia Archives; "County Road Expenditures," GCGM (March 1962), insert; "Fulton County Budgets \$1,175,00 for Its 1,200-miles Network of Roads," GCGM (July 1963), p. 18. The county contract system was not legal for disbursement of federal-aid, but the SHD had poor accounting controls, and some counties co-mingled the funds. More than once the BPR warned the SHD that federal dollars had been inappropriately diverted to county-contract projects. In 1959, for example, the SHD lost \$50,000 in federal aid because Burke County had spent the funds under a county contract.

withered and, not surprisingly, state aid to improve urban roads and bridges slowly increased, as well as state support for urban mass transit.<sup>14</sup>

### The Highway Funding Challenge: Reinforcing the Use of Economical Designs

Every road and bridge project during the study period can be traced back to one or more federal, state, or local highway programs that funded it. Due to increases in federal and state funding, a record amount of work was completed in Georgia from 1955 to 1965, but there was never enough funding for all of the needed projects nor all of the projects desired by the SHD's political leadership. Engineers were under constant political pressure to manage costs and stretch the available program funds as far as possible. This climate reinforced the use of economical designs that offered the state good value for its money.

One of the most obvious solutions to the highway funding problem was to increase user taxes, especially the fuels tax. Georgia's tax rate increased from 3¢ per gallon in 1955 to 4½¢ per gallon in 1956, but this was a modest rate compared to a national average that was at least 50% greater over the same period (Georgia's tax rate regularly ranked in the bottom tenth of state rates). Tax increases were not especially popular with Georgia voters or their elected officials, and several attempts to increase the rate were rebuffed by the state legislature.

Georgia's highway program was on a pay-as-you-go basis because the state constitution prevented the government from directly issuing bonds. Local units of government could win legislative and voter approval to issue bonds for specific projects – like Fulton County's successful bond issue for the Atlanta Expressway in 1947 – but gaining approval was a time-consuming and uncertain process. In 1939, Governor Eurith D. Rivers found a way to circumvent the state constitution by establishing a state hospital authority empowered to sell bonds to build hospitals. The authority was on paper "independent" of the state, although its directors were appointees of the governor. The state "rented" the hospitals from the authority, which then used the rent to pay back the bonds. It was an ungainly arrangement that resulted in high interest payments, but it allowed Georgia to borrow money for capital projects for the first time since Reconstruction. Based on this precedent, the state legislature in the 1940s to 1960s established authorities for parks, ports, schools, government office buildings, and roads and bridges. In general, the authorities completed many worthwhile projects. Not until

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<sup>14</sup> Harold P. Henderson and Gary L. Roberts, eds., Georgia Governors in an Age of Change From Ellis Arnall to George Busbee (Athens: University of Georgia Press, 1988), pp. 177-78.

1972 was a constitutional amendment ratified by voters to allow the state government to incur debt openly.<sup>15</sup>

One of these authorities, the Georgia State Bridge Building Authority (GSBBA), was a significant means by which the state secured funds for the construction of bridges. It was established in March 1953 with an initial bond limit of \$30 million. Bridges built with GSBBA funds were “leased” to the SHD for fifty years with the rent used to repay the bonds. The SHD’s bridge engineers designed and supervised construction, so GSBBA bridges were physically no different than other state-built bridges, only the funding source was different. The GSBBA funded the construction of 94 bridges in 1953-54 (\$16 million) and 126 bridges in 1955-56 (\$14 million). The GSBBA was renamed the Georgia State Highway Authority (GSHA) in 1961 with expansion of its powers to fund bridges and highways and its bond limit was increased from \$30 million to \$100 million, and then to \$130 million in 1962. The funds were used to improve the state highway system, primarily by realigning, reconstructing, or widening the pavements and replacing or widening the bridges on US and SR-numbered routes. Some funds were also used to upgrade the SHD’s maintenance yards and equipment.<sup>16</sup>

Another way to pay for much-needed highways and bridges was with tolls. More than 1,000 miles of toll roads were built in the U.S. from 1946 to 1960, mostly in northern states (exceptions in the southeast were Florida, Virginia, and West Virginia), but the turnpike movement lost momentum with passage of the Federal-Aid Highway Act of 1956 because federal funding could not be used on toll roads. Toll roads were occasionally discussed in Georgia during the mid 1950s, but the idea had little of the necessary political support among conservative rural interests to become a reality. A Georgia Toll Road Authority was established and actually surveyed a route along US 41 from Cartersville to the Tennessee state line in 1953-54, but nothing came of the effort. More successful was the Georgia State Toll Bridge Authority, established in March 1953 as a means of issuing \$6.6 million in bonds to build the Sydney Lanier Bridge, a vertical-lift movable bridge over the Turtle River in Glynn County. The bridge opened to traffic in 1956 and was made toll free in 1962. It was replaced by a high-level cable-stay bridge in 2003.<sup>17</sup>

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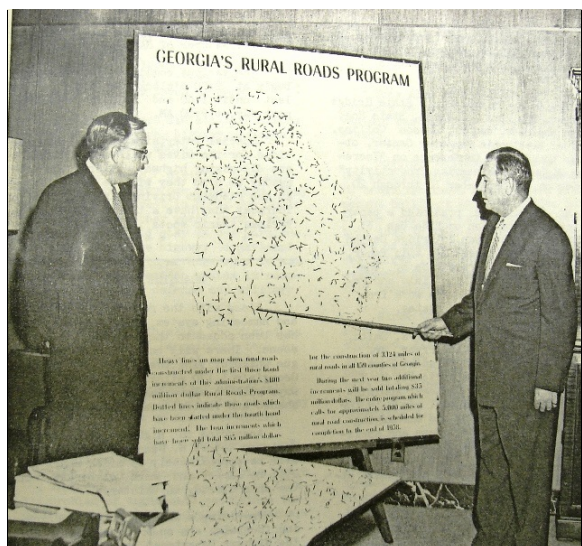
<sup>15</sup> Biennial Report (1955-56), pp. 83-84; Bartley (1990), p. 191; “State Authority Financing Attracts Attention of Commission on Efficiency and Improvement,” GCGM (September 1963), p. 21. The State Supreme Court upheld the constitutionality of the authorities to repeated challenges by fiscal conservatives.

<sup>16</sup> Biennial Report (1955-56), pp. 77-78, 109; (1959-60), p. 77; (1961-62), n.p.

<sup>17</sup> Biennial Report (1955-56), pp. 79-80; (1965-66), p. 64; “Coastal Highway Travelers Now Freed of Toll Stop on Sidney Lanier Bridge,” GCGM (January 1963), p. 13; “What Is Your State Doing About New Roads,” Dixie Contractor (Jan. 19, 1955), p. 16.

## The Georgia Rural Roads Authority: Highway Politics and Scandal, 1955-58

By the late 1940s, many of Georgia's rural residents were coming to expect that their local roads and bridges should be improved and better maintained, especially in light of what they enjoyed on the state highways. In 1948, Governor Herman Talmadge made improving rural county roads and bridges a priority. His administration greatly expanded the state highway system to include more rural secondary roads and bridges that could be then improved with federal and state aid, thus relieving the counties of the responsibility. The state highway board under Talmadge also increased the amount of direct aid by county contracts. These programs had by 1955 paid for improvement of about 20% of Georgia's more than 70,000 miles of rural county roads and bridges.



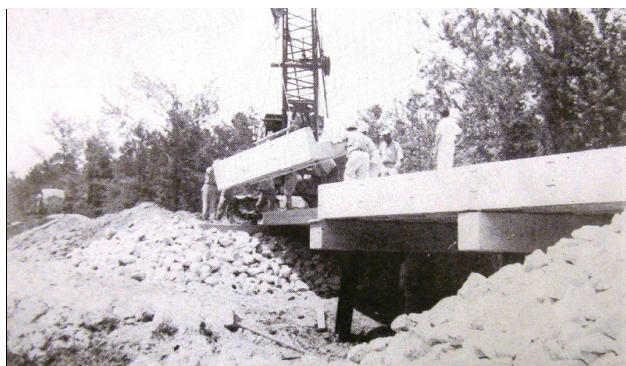
**Figure 6.** Governor Griffin (right) displays a map of GRRR projects. Source: GCGM (1956).

Governor S. Marvin Griffin, who took office in 1955, sought to build on the Talmadge record. The General Assembly established the Georgia Rural Roads Authority (GRRR) at Governor Griffin's request with authorization to issue up to \$100 million in bonds for the improvement of rural roads and bridges not on the state highway system (Figure 6). The authority was composed of a five-member board appointed by the governor, and from the outset the GRRR was Griffin's pet project. The SHD recommended projects to the GRRR, but the GRRR was independent and could accept or decline the recommendations. Furthermore, the SHD was required to lease GRRR roads and bridges for fifty years to repay the bonds, even though the counties continued to maintain and own the roads and bridges.<sup>18</sup>

The GRRR was authorized to reimburse the SHD for engineering, but in reality a very different relationship developed in which regional GRRR offices were set up to handle the engineering and contracting. These offices hired their own staffs and did not report through the usual chain of command of the SHD, although they were located in SHD division offices. According to some observers, many GRRR employees were hired for their political connections, padding the payrolls. Shockingly, there were hints that GRRR employees drank on the job, accepted gifts from contractors, used state equipment for private purposes, and filled personal cars at the state gas pumps. In one documented case, the GRRR paid to pave the private parking space of a member of its

<sup>18</sup> Biennial Report (1955-56), pp. 25-26, 75-76; (1957-58), pp. 25-26, 78-79; (1959-60), pp. 23-24; (1961-62), n.p.

board. And although having spent nearly twice as much on county roads as the Talmadge administration, the Griffin administration in fact paved about 3,000 miles less. A 1960 *Reader's Digest* exposé reported, "Never in Georgia history had so many stolen so much." Still, Governor Griffin became known as the "good roads" governor, and in later years, he considered paving rural roads his single greatest accomplishment in office. The GRRRA resurfaced and widened some 12,000 miles of county roads, including the construction of some 250 bridges from 1955 to 1958. Many of these bridges were the SHD's standard precast reinforced-concrete slab bridges designed for low-volume rural road classifications (Figure 7).<sup>19</sup>



**Figure 7.** A precast reinforced-concrete slab unit is swung into position on a GRRRA project, Waverly Hall-Talboton road over Hinton Creek. Source: *Biennial Report* (1957-58).

The GRRRA was but one component of the troubles that plagued the SHD during the 1955-58 Griffin administration. The *Atlanta Constitution* gave considerable coverage in 1958 to a scandal involving about \$250,000 in state highway funds transferred to the City of Baxley, and then used by the mayor to award street paving contracts to himself. The mayor was an honorary member of Governor Griffin's staff. In another instance, the SHD was in open violation of state law for paving the streets in a new residential development in the governor's home county of Decatur. The developers were well-known

associates of the governor. And to make matters worse, SHD employees were arrested for accepting bribes for tipping off truckers to the schedule of weight-checking stations.<sup>20</sup>

The scandal swirling about the SHD played a significant role in the 1958 gubernatorial election that pitted Lieutenant Governor Ernest Vandiver against State Highway

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<sup>19</sup> Henderson and Roberts (1988), p. 106; Roy F. Chalker, "Address to the Georgia Contractors Association," Mar. 13, 1958, as reprinted in *Georgia Highways* (Apr. 1958), pp. 1, 5; *Biennial Report* (1955-56), p. 42, p. 106; Lester Velie, "Strange Case of the Country Slickers vs. The City Rubes," *Reader's Digest* (April 1960), p. 108, as quoted in Henderson and Roberts (1988), p. 108. In November 1954, the BPR had discharged to the SHD responsibilities relative to plans and specifications for the federal-aid secondary program with a categorical approval meaning that federal engineers did not have to review and approve each project. BPR did retain responsibility for final inspection. In 1957, the task of preparing federal-aid secondary plans was transferred from the SHD to the GRRRA field offices in an effort to relieve SHD engineers so they could concentrate on developing plans for interstate highways.

<sup>20</sup> Mr. Jim's Scrapbook; Harold Paulk Henderson, *Ernest Vandiver, Governor of Georgia* (Athens: University of Georgia Press, 2000), pp. 72-73.

Chairman Roger H. Lawson, Sr. Lawson had been appointed in 1957 by Governor Griffin with the intent of using the chairmanship as a spring board to higher office. In early 1958, Governor Griffin came out in favor of increasing the GRRRA's borrowing authority by \$50 million, and Vandiver knew that this money would be used to influence county-unit votes in favor of Lawson. He began working immediately to defeat the bond measure. Vandiver was able to use the disgrace surrounding the GRRRA to claim that the \$50 million was nothing more than "a political slush fund." This convinced a slim majority of the house of representatives to vote against the bill, and handed Governor Griffin the only major legislative upset of his term in office. Shortly after the house vote, Lawson withdrew from the race, and Vandiver became the frontrunner for governor. Vandiver would later say that defeating the GRRRA bond bill won the election.

Naturally, Governor Vandiver's administration swept clean the GRRRA and replaced Lawson. Vandiver appointed Jim L. Gillis, Sr. as the new chairman of the SHD in 1959. Gillis immediately fired about 400 employees on the grounds of saving \$1 million. Most of the terminations, however, were in the GRRRA's field offices and were politically motivated. The Vandiver administration did not dissolve the GRRRA but the General Assembly agreed to the governor's request in February 1959 that the GRRRA board be made one-in-the-same as the state highway board and agreed to pay the GRRRA's bonded debt from general appropriations rather than state highway funds.<sup>21</sup>



**Figure 8.** *Jim L. Gillis, Sr., chairman of the SHD (1948-55, 1959-63) and director (1963-70). Source: Biennial Reports (1965-66)*

#### The Jim Gillis Years, 1959-1970

The GRRRA scandals were the spark for gradual but significant changes in Georgia highway administration. Leading this effort was James Lester Gillis, Sr. (Figure 8), a fixture in Georgia politics and highways from the late 1930s to early 1970s. Born in Soperton in 1892, he served for nearly 40 years as chairman of the Treutlen County Democratic Party and 20 years as a Treutlen County road commissioner. Rising through the party ranks, he was appointed to the state highway board in 1937, serving out a term that ended in 1939. He was re-appointed by Governor Talmadge in 1948 and made chairman in 1950, a position he held until forced to resign by Governor Griffin in 1955. Gillis backed the successful candidacy of Ernest Vandiver for governor in 1958 and was rewarded with re-appointment to chairman in 1959. After the reorganization of the board as a 10-member body in 1963, Gillis was selected as the first director of the SHD. Governor Jimmy Carter requested his

<sup>21</sup> Mr. Jim's Scrapbook; Biennial Report (1963-64), p. 65.



**Figure 9.** During the late 1950s to 1960s, federal and state programs provided increasing funds to improve city streets and bridges. Shown here, widening 4th Street in Columbus. Source: Georgia Highways (1958)

resignation in late 1970, which the 78-year-old Gillis provided. Although a product of the county-unit system of government and identified with its inequities, Gillis oversaw reforms that tightened controls over county contracts and brought an end to the scandal-ridden practices of the Griffin administration. He presided over the development of Georgia's interstate highway system, and he gradually modernized the SHD's administrative practices. He was a very crafty politician, serving with five governors, and he had a deep working knowledge of the state and its roads and bridges. His scrapbooks and papers, now preserved at the Georgia Archives, are an amazing chronicle of the SHD in the 1950s to 1960s.

Gillis knew how to use highway projects to reward his political allies, but he also knew how to adjust to shifts in power. After the end of the county-unit system, Gillis balanced the SHD's funding priorities to better serve areas of the state that had growing populations, like Atlanta's booming suburbs, and the coastal counties, like Glynn,

that saw phenomenal growth due to beach resorts. He advanced projects in cities, especially interstates, and he made it possible for cities to negotiate directly for state contracts (Figure 9), whereas in the past only counties had that privilege.<sup>22</sup>

Gillis worked amicably with the SHD's professional staff including chief state highway engineer Morris L. Shadburn, who served from 1948 to 1967.<sup>23</sup> While Shadburn saw to

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<sup>22</sup> "Local Politics Intervenes: \$1.5 Million Road Near Douglas Goes Nowhere," Atlanta Constitution (Mar. 7, 1966), Office of Public Relations, News Clipping, Record Group 27-6-6, Georgia Archives; "What Could Happen to Your County's Population during the 1960-70 Decade," GCGM (Nov. 1962), pp. 17-19; "Georgia's Road Pattern," GCGM (Sept. 1963), pp. 12-13; "Highway Politics, Urban Style," GCGM (Oct. 1963), p. 35; "Board of Managers Speak Out on County Contracts," GCGM (Jan. 1965).

<sup>23</sup> "Former Engineer Shadburn Dies Suddenly in His Home," The Survey, Vol. 6, No. 1 (Jan. 1971), p. 1; "M. L. Shadburn," Proceedings of the Fourth Annual Georgia Highway Conference (Feb. 7-9, 1955), pp. II-III. Hereafter cited as Georgia Highway Proceedings. Morris L. Shadburn (1897-1971) was a native of Buford and a graduate of Georgia Tech in engineering in 1917. After service in WWI, he briefly joined the SHD but soon left to work as a consulting engineer on water control projects in Louisiana and Mississippi, including the seawall in Gulfport. He returned to Georgia in 1930 as an engineer with the Atlanta office of the Pennsylvania Dixie Cement Corp. Shadburn rejoined the SHD in 1933 as an assistant division engineer and worked his way up to state highway engineer in 1941. After returning to private consulting from 1943 to 1948, he was reappointed by Gillis and continued to serve until reaching the mandatory retirement age of 70 in 1967.

the engineering, Gillis was first and foremost a politician who understood the importance of personal relations. He was known to just about everyone as “Mr. Jim,” and he relished his role as point-of-contact for the local officials and businessmen who came to Atlanta “hat-in-hand” to ask for his support of road and bridge projects. Presiding in the front office on the first floor of the state highway building, Gillis kept a long row of chairs in the outer hall that were often full to overflowing with visitors waiting their turn. He was the personification of the SHD, and thus came under heavy criticism for actively supporting candidates for state office. His work for Carl Sanders in 1962 as an “unofficial” campaign director was thought unseemly by some. He canvassed the rural county courthouses on behalf of Sanders and used county contracts to reward counties for their support in the election. Nonetheless, he remained relatively untainted by scandal and his supporters and opponents alike generally commended him on doing a fine job of directing the department’s activities.<sup>24</sup>

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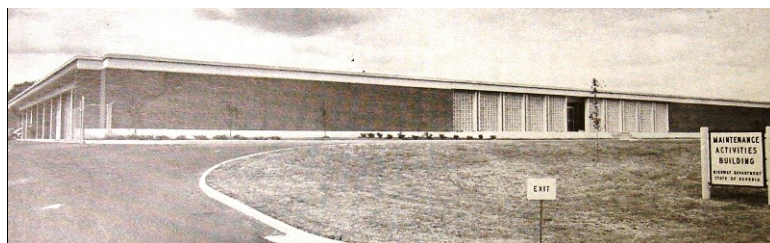
<sup>24</sup> Biennial Report (1963-64), p. 11; GCGM (Sept. 1962), p. 6; “James L. Gillis and the Kettlehead Drums,” GCGM (Nov. 1964); “Mr. Jim Resigns Post,” The Survey, Vol. 1, No. 12 (Dec. 1970), p. 1; Doug Hudson, personal communication with P. Harshbarger (July 1, 2007).

## E. Administrative and Organizational Reforms at the SHD: Changing Approaches to Road and Bridge Planning, Design, Construction, and Maintenance

The late 1950s to mid 1960s were years of reform at the SHD. These reforms, which included building up the department's maintenance forces, tightening of contract controls, and updating of employment practices, were intended to improve the efficiency and quality control of road and bridge work. The expanded programs and the public's demand for improved highways placed enormous pressure on the SHD to complete the work as cost-effectively and quickly as possible. The pace of work was hectic, especially with the interstate program in high gear. Doug Hudson, a bridge engineer in the SHD, recalls the "crazy times" when the bridge division was understaffed and put in long hours. He also said, however, that the politics tended to stay in Jim Gillis's office and not significantly impact the staff who worked upstairs in the state highway building. From his perspective as a staff engineer, political pressure, if any, came in the form of controlling costs and designing roads and bridges that were economical and low maintenance, thus stretching the department's budget as far as possible and complementing the standardized approach to bridge design and construction.<sup>25</sup>

### Building Up State Maintenance Capabilities

When appointed chairman in 1959, Jim Gillis recognized that the existing funding system emphasized new construction over maintenance. The winter of 1957-58 had been particularly severe with prolonged rains and freezes causing serious damage to roads and bridges. Many of the damaged facilities had not been repaired. Georgia spent far less on maintenance than other states in the region and Gillis and the senior engineers recognized this. Georgia spent about \$668 per mile maintaining state highways while Tennessee spent \$1,931, Alabama \$1,174, and South Carolina and Florida both well over \$1,000 per mile. It showed in the condition of Georgia's roads and bridges, and Gillis made it a priority to remedy the disparity.



**Figure 10.** The 1964 maintenance activities building in Forest Park was among the facilities constructed to enhance the SHD's maintenance capabilities. Source: *Biennial Report (1965-66)*.

Gillis began building up the SHD's maintenance capabilities by increasing the staff and budgets of the district field offices. He lobbied for a special \$100 million bond issue for reconstructing worn out state roads and bridges. In 1961, due to balanced budgets and good economic growth, Governor Vandiver supported Gillis's request for the bond issue,

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<sup>25</sup> Hudson, 2007.

which easily passed the state legislature. As a result, in 1962 the SHD's maintenance spending surged over the \$1,000 per mile mark for the first time, placing it on par with neighboring states. The money was also used to build twenty maintenance garages and warehouses. A major push of the program was upgrading the remaining 2,000 miles of dirt roads on the 15,000 mile state highway system. This was accomplished by 1964 when the SHD reported that the system no longer had any dirt roads.<sup>26</sup>

### Increasing the Pace of Work & Tightening of Contract Controls

Among the challenges Gillis and senior state highway engineers faced was criticism of the slow pace of work. The Second Street Bridge project in Macon was typical. This bridge had been programmed since the late 1940s, but one delay after another kept the project from progressing including lack of money, right-of-way negotiations, engineering manpower shortages, and relocation of utilities. An editorial in the *Macon News* (Jan. 10, 1963) quipped... "what we'd like to know is what has been delaying the job for so long. Is there a saboteur in the State Highway Department, some unidentified clerk who hates Macon and keeps forgetting to drop Bibb County's name in the pot when it comes time to let bids? It would seem so. How else explain the fact that a bridge everybody has been saying for a long time is going to be built never seems to get built?" The bridge project was started finally in 1963 and completed in 1966.<sup>27</sup>

In response to this type of unfavorable press, the SHD looked for ways to complete projects more efficiently. The state highway board welcomed an intensive outside study beginning in 1963 by the Commission for Efficiency & Improvement in Government, also known as the Bowdoin Commission after its chairman William R. Bowdoin, a prominent Atlanta banker.<sup>28</sup> The commission was formed by the reform-minded Governor Sanders to look at all aspects of state operations, not just the SHD. The state highway board approved the use of federal planning funds to hire a consultant firm, Highway Management Associates of Madison, Wisconsin, to offer technical advice to the commission. The commission's final report proposed a number of practical administrative reforms, the most important of which were pre-qualifying of contractors and tightening of contract administration to minimize problems with non-competitive

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<sup>26</sup> Biennial Report (1955-56), pp. 25-6; (1963-64), p. 51; Office of Public Relations, News Clippings, Record Group 27-6-6, Georgia Archives; Chalker (1958), pp. 1, 5.; M. L. Shadburn, "Georgia," SASHO Proceedings (1963), p. 22.

<sup>27</sup> "Editorial," Office of Public Relations, News Clipping, (Jan. 10, 1963), Record Group 27-6-6, Georgia Archives.

<sup>28</sup> Henderson and Roberts (1988), p. 175. The Bowdoin Commission members were leading businessmen and professionals appointed by Governor Sanders. The commission avoided partisan politics by identifying obvious weaknesses in state government and offering reasonable remedies. Sanders used his influence to see that the commission's recommendations were implemented to the greatest extent possible.

bidding, laxity of inspection, and performance on contracts. Most of these reforms were adopted by the SHD, with the desired results.



**Figure 11.** Contractors gather to listen to bids for road and bridge work. Source: Georgia Highways (1958).

The Bowdoin Commission was especially critical of the SHD's habit of granting contractors' requests to push back project start dates and extend deadlines. In 1962, for example, about half of the SHD's projects started late, and about one-fifth required deadline extensions. The commission also suggested using a calendar rather than work-day method of calculating project time because this would better hold contractors to deadlines. As a result, the SHD tightened its rules for contract extensions with higher fines for work not completed on

schedule. It handed out over 30 citations to contractors making unsatisfactory progress in June 1964, and more road and bridge projects, especially interstate projects, began to be completed on time.<sup>29</sup>

Another reform that had the effect of increasing the pace of road and bridge work was pre-qualification of contractors beginning in June 1965. Pre-qualification was an application process by which contractors proved that they had the capability to complete the jobs on which they were bidding. It also set limits on the amount of work that a contractor could have at one time based on an analysis of the contractor's capital, organization, and past achievement. State bridge engineer Charles A. Marmelstein headed the pre-qualification effort, investigating systems in other states before adopting a model successfully used in Virginia.<sup>30</sup>

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<sup>29</sup> "Proposals for the Highway Department: A Good Report for Jim Gillis," GCGM (Mar. 1965), pp. 10-12. The calendar-day method was a stricter method of counting project time since it forced the contractor to agree to complete the project by a certain date. The work-day method allowed contractors to take into account days lost to poor weather, holidays, etc. Thus a project scheduled for 6-month completion under the calendar-day method was to be complete in 6 months. A project scheduled for 6 months under the work-day method could take considerably longer. Problems in the SHD's contract administration had been evident for many years, see, for example, "State Highway Programs Get Going," Dixie Contractor (Aug. 17, 1955), p. 16.

<sup>30</sup> Biennial Report (1965-66), p. 25; SHD, A Pocket Look at Your Highway Department (Atlanta, 1967); Office of Public Relations, News Clippings, (1963-64), Record Group 27-6-6, Georgia Archives; C. J. Collings, "Prequalification of Contractors," SASHO Proceedings (1965), p. 33. Some contractors strongly objected to pre-qualification on the basis of the additional paperwork and the capacity limits. It caused significant frustration when contractors working across several states found the pre-qualification rules and limits different from one

## Employment Practices & the Impact of the Civil Rights Movement

To meet the demands of the interstate program, as well as the growth in other federal and state road and bridge programs, the SHD grew from approximately 5,000 employees in 1955 to a peak of about 9,000 employees in 1973. The large number of new employees created organizational challenges, especially the need for more formal programs of recruiting, training, and quality control, including impressing on employees the need to maintain state standards and specifications. The expansion of the SHD also coincided with the civil rights movement and its efforts to extend opportunities for minorities. As a result, a greater diversity of individuals became involved in the planning, design, and construction of roads and bridges, but as with much of southern society, the changes at the SHD were not made willingly or easily, and were largely a result of federal oversight.<sup>31</sup>



**Figure 12.** To better accommodate the growing workforce, the State Highway Building in Atlanta, constructed in 1931, was modernized and expanded with a major five-story addition that opened in 1957. Source: *Biennial Report (1957-58)*.

The SHD was not a center of the civil rights movement, like Georgia's education system, but it was subject to many of the same federal rulings that brought an official end to discrimination and segregation. Beginning in 1956, all SHD contracts involving federal aid were required to include a clause on non-discriminatory practices, but these provisions were ignored for many years by most southern state highway departments and contractors. In September 1963, at the urging of Attorney General Robert Kennedy, federal attorneys issued a powerfully worded letter to the SHD ordering it to revise to enforce affirmative action. Contractors on federal-aid projects were henceforth required to sign affidavits that they did not

discriminate. They also were made to post signs and place the non-discriminatory wording on all advertising and job employment notices.

The SHD had always hired minorities, but primarily as maintenance laborers for African Americans, and as clerical help for women. Title VI of the federal Civil Rights Act of 1964 officially ended discriminatory practices in all agencies that received federal funding, yet it was more than a decade before significant effects began to be seen at the SHD with more minorities taking on professional engineering and administrative

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state to the next.

<sup>31</sup> *Biennial Report (1957-58)*, p. 28; (1959-60), p. 99; (1963-64), p. 101; "Thompson-Street Co. Underway with Ga. State Highway Building," *Dixie Contractor* (Dec. 21, 1955), p. 32; *Georgia Highway Proceedings (1962)*. The theme of the conference was quality control.

functions. The top management of the SHD professed to live up to the letter of the law, but like much of Georgia society, did not pro-actively seek to develop new opportunities for minorities. Governor Carter's administration was the first to demonstrate a concerted effort to appoint minorities to leadership roles in state government, but as late as 1976, fewer than 9% of the SHD employees were minorities and less than 6% were women and almost all of them were still in maintenance or secretarial activities. The department did not adopt its own affirmative action plan until 1976.<sup>32</sup>

### The Impact of Engineering Manpower Shortages

One of the SHD's most pressing employment problems was a shortage of qualified engineers in the face of the expanded demands of federal and state highway programs, especially the interstates beginning in 1956. The shortage caused a reorganization of the bridge division and the adoption of new computer technology to cut down on the man hours required to complete design calculations, but no significant changes in the types of bridges being built, in part because the department had no resources to devote to trying out and refining new bridge technologies. The department's senior engineers were also unwilling to go against the long-standing policy of limiting the amount of work it sent out to consulting engineers. Consultant engineers were used only for certain projects that might have caused a bottleneck or involved some highly specialized work, such as movable bridges.



**Figure 13.** SHD engineers examine the standard aluminum railing posts for a bridge on the US 1 expressway in Augusta. Source: *Georgia Highways* (1958).

The source of the engineering manpower shortage was twofold – the aging of the SHD's senior engineers and the inadequate number of new engineering graduates entering state employment. SHD employees had been placed on the merit system in 1950 and taken into the state retirement system in 1953. These reforms, which were generally meant to insulate rank-and-file employees from political reprisals and provide an inducement to long-term civil service, also meant that they could retire after 35 years service or at age 60, whichever came first. Compulsory retirement was at age 70. Hundreds of the department's most-

senior engineers who had joined during the building boom of the 1920s qualified for retirement in the 1950s and 1960s. Due to the Depression and WWII, the 1930s and 1940s had been lean years for the SHD, so there were few engineers with long-term service to step up and take the places of the retirees. Furthermore, it was becoming

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<sup>32</sup> Office of Public Relations, News Clipping, (Aug. 14, 1963), Record Group 27-6-6, Georgia Archives; Cook (2005), p. 309; GDOT, "Affirmative Action Plan," (Atlanta: 1976).

increasingly difficult to attract entry-level engineers for a variety of reasons, among them competition with consulting firms, which generally paid better, and the difficulties college civil engineering programs were having attracting students because of competition with other specialities, especially electrical, nuclear, computer, aerospace, and chemical engineering, which offered many new and exciting opportunities to young professionals.<sup>33</sup>

To counter the engineering manpower shortage, the SHD sought out ways to attract and retain engineers. It established a civil engineer training program in 1951, rotating trainees through all of the SHD's units, and upon completion promising them a permanent assignment of their choice. A co-operative three-month internship program was initiated with Georgia Tech and the University of Georgia with a peak number of 50 summer interns in 1958. The department also hired a recruiter to visit college campuses, and it started a special "junior" engineer program that allowed engineers to work while they completed their college degrees; 40 students were hired as junior engineers in 1957. Although these programs showed results, it was some years before the new recruits had the experience to independently complete the most technically demanding jobs, like designing bridges.<sup>34</sup>

Another avenue for meeting manpower shortages was using new technologies to save labor. Aerial mapping began in 1950 and the savings were so significant that the SHD purchased its own plane and camera in 1952. According to the department's records, aerial surveys saved 70% over on-the-ground surveys and 40% of drafting time for roadway plans. By 1960 all new roadway and bridge work started with aerial survey and the SHD had purchased a plotter that could efficiently transfer aerial photographs to plans. Other technologies used to save time in the field included the tellurometer, a surveying device for measuring distances using microwaves, and radio communications with in-car and hand-held sets.<sup>35</sup>

The bridge division, like all of the engineering divisions, struggled with engineering manpower shortages. To address this, state bridge engineer Charles A. Marmelstein reorganized the Atlanta bridge design office on a squad-type basis in 1957. Each squad of four to six engineers was headed by a senior bridge engineer who also undertook the training of the less-experienced personnel so they could become more efficient. By all reports, the system worked very well. The engineers who supervised bridge construction in the field tended to be young. Senior management was concerned that they lacked in-depth knowledge and were sometimes spread too thin over large jobs. Hal Rives, the assistant state bridge engineer, pointed out that contractors took

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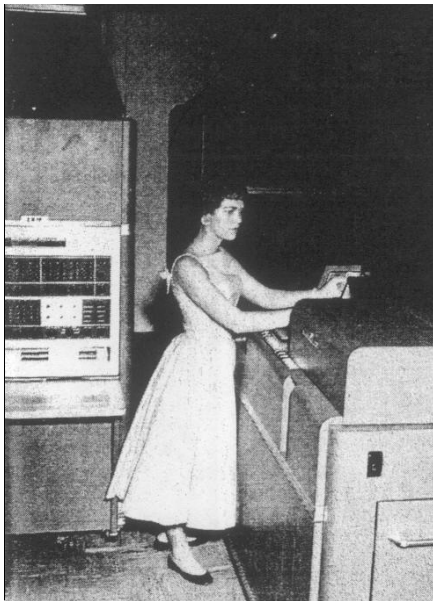
<sup>33</sup> Biennial Report (1955-56), pp. 91-92; (1957-58), p. 110.

<sup>34</sup> Biennial Report (1955-56), pp. 92-93; (1957-58), pp. 96-97; Chalker (1958), pp. 1, 5; "Georgia Engineer Recruiting Program," Georgia Highways, Vol. 1, No. 2 (Feb. 1958), pp. 12-13.

<sup>35</sup> Biennial Report (1959-60), p. 99

advantage of inexperienced men, and common mistakes on bridge jobs were the improper curing of concrete, the inappropriate placement of reinforcing steel, and the re-use of formwork from other jobs resulting in differences in dimension, especially of wingwalls and railings. After 1960, the SHD instituted more rigorous training for its field engineers, which began to pay dividends with fewer problems in the quality of the finished work.<sup>36</sup>

### Computerization Saves the Day



**Figure 14.** SHD management was so pleased with the results of computerization that the IBM 650 was deserving of this “glamor” shot in the first issue of the in-house magazine Georgia Highways (1958).

The key to the SHD’s successful completion of so many bridges with so little engineering manpower was the use of computers to cut-down on time consuming calculations and data collection that had traditionally tied up engineers for hours on end. The workhorse of the SHD’s early computerization efforts was an IBM 650 magnetic drum processing machine, which used punch cards to enter data (Figure 14). The SHD was the third state highway department in the nation to have a computer, bested only by California and Texas.

The finance department purchased the IBM 650 in 1956 to help it with payroll, but it quickly found other applications. By 1958, it was being used regularly to calculate horizontal distances for surveys, earth quantities for highway construction, maximum slopes for earth fills, super-elevation for curves, bridge skews, moments in continuous-design bridges, grades for proposed roadways, and to check contractors’ bid calculations. Many of the SHD’s programs were sufficiently well-regarded to be adopted by other state highway departments in the region. The savings from computerization were direct and immediately evident; the SHD reported that the computer was able in 84

minutes to perform the same earthwork calculations that typically took 56 engineering man-hours. Computerization also extended to automated controls of ever larger and more powerful construction machinery. In 1962, the SHD employed for the first time a fully computer-automated central-mix concrete plant for use on the construction of I-285 at the Dunwoody-Chamblee interchange.<sup>37</sup>

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<sup>36</sup> Hal Rives, “Things to Do and Things Not to Do When Building a Bridge,” Georgia Highway Proceedings (1960), pp. 105-10.

<sup>37</sup> “The Story Behind the Figures,” Georgia Highways (Dec. 1958), pp. 1-3. “Highway Miracle: Zip, Whizz! Concrete Mixed,” Office of Public Relations, News Clipping, (Aug. 31, 1962), Record Group 27-6-6, Georgia Archives; “Georgia Highway Department to Use Mechanical Brain to Save Man-Hours,” Dixie Contractor (Dec. 21, 1956), p. 50.

Computerization played a significant role in allowing state bridge engineers to design a record number of standardized bridges during the late 1950s and 1960s. Charles A. Marmelstein was nationally recognized among his peers as a leader in the use of computers for bridge design. In the late 1950s, he was chairman of AASHTO's National Committee on Electronics for Bridge Design, and in September 1957, he was a featured speaker at the "Increasing Highway Engineering Productivity Conference" at the Massachusetts Institute of Technology. Bridge engineer Doug Hudson, who was hired by Marmelstein in 1947, describes bridge design work prior to the computer as "overwhelming." Calculations, especially for bridges on the interstate system, were very time consuming because of the variations in skew and curvature required to fit the bridges to the geometric standards. Working with slide rules and desk calculators, it could easily take an entire week to work out the curvature of a single bridge. With the computer, on the other hand, Hudson stated that all he had to do was fill out a one-page input sheet, leave it in the in-box in the afternoon, and in the morning all of the calculations would be complete.<sup>38</sup>

The first computer program developed by Marmelstein's staff was one for building skewed bridges on horizontal curves. IBM representatives came to Atlanta in 1956 to give a week-long workshop on computer programming, and subsequently Marmelstein assigned bridge engineers Russell Chapman and Jose Nieves to attend programming school at IBM headquarters in New York. Three-months later Hudson recalls the two announcing that they had completed and proofed the horizontal-curve program. It worked like a charm.

Another program was for calculating the bending moments in continuous-design bridges. The division had been designing continuous bridges since the 1930s for reasons of economy of material, but compared to the computer-aided design the old approach was limited. Prior to the computer, the engineers relied heavily on continuous designs using standard lengths, widths, and right-angle skews (e.g., the two-span continuous steel stringer units of 20'-20'). For any continuous-design bridge that had a non-standard length, width, curvature, or skew, however, the calculations were always done using assumed values that could only be checked when the design was complete. Doug Hudson remembers these complex calculations often having to be done three or more times before finding values that were acceptable. He said it was "miraculous" to have a computer program that could do this work literally overnight, enabling engineers to quickly select the size beam that would do the job adequately at the lowest cost, saving thousands of dollars.<sup>39</sup>

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<sup>38</sup> Biennial Report (1959-60), p. 93; Office of Public Relations, News Clipping, (Aug. 14, 1963), Record Group 27-6-6, Georgia Archives; Hudson 2007.

<sup>39</sup> "Engineers Attend Conference," Georgia Highway Happenings (Oct. 1957), p. 11; "The Story Behind the Figures," Georgia Highways (Dec. 1958), p. 2; Biennial Report (1957-58), pp. 107-10; Hudson (2007).

By the early 1960s, the computer had shown its worth in performing calculations for standardized bridge types, and programmers were now ready to take on more complex problems. The SHD was a national pioneer in the development of the Critical Path Method (CPM) of progressing highway projects using computers. CPM used a logical sequence of steps to figure an average, reasonable time for completing a complex series of interrelated tasks. CPM was developed by the Dupont Company in 1956 as a way of planning and tracking defense department projects. In the late 1950s, the U.S. Navy used CPM to speed the Polaris missile program, which finished two years ahead of schedule. Georgia was the first state highway department in the nation to use CPM in 1962, and state engineers found it very useful spotting possible bottlenecks in project progress. The one big advantage to CPM was that each project task was coded on punch cards; if the time to complete any task changed, the corresponding card could be re-punched, and all of the other project tasks dependent upon it revised accordingly. The first SHD project to use CPM was the planning and construction of a 700'-long bridge over stadium gulch at the University of Georgia in Athens. The bridge was designed to resolve a traffic flow problem on Lumpkin Street, as well as to provide improved pedestrian access to Sanford Stadium. After the initial trial in Athens, the SHD successfully used CPM to advance complex interstate highway projects, since the computer programming required could not be justified for smaller projects.<sup>40</sup>

#### The Challenge of New Transportation Responsibilities: Public Relations, Safety, Scenic Highways, and Highway Beautification

Beginning in the late 1950s, state highway departments across the nation were challenged to respond to new transportation responsibilities, most them resulting from requirements of the federal-aid program and interstate highways. These responsibilities were significant because they prefigured the eventual transformation of the highway departments into multi-faceted transportation agencies during the late 1960s and 1970s. In Georgia, they clearly signaled the reorientation of the SHD from its traditional focus on rural roads and bridges to a much more comprehensive approach to transportation planning throughout the state. While few of these new responsibilities had a direct impact on bridge design prior to 1966, they did indicate the department's growing involvement in a wider range of concerns, foreshadowing other changes, especially the department's response to federal mass transit and environmental laws that would be passed in 1966 and later, and the SHD's reorganization into the Georgia Department of Transportation in 1972.<sup>41</sup>

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<sup>40</sup> Biennial Report (1963-64), p. 101; "Computer Speeds Up Road Jobs," "Bridge Eases Tired Feet at University," and "New UGA Bridge Eases Traffic Flow on Lumpkin," Office of Public Relations, Press Releases and News Clippings, (Nov. 1962-July 1963), Record Group 27-6-6, Georgia Archives; Roger H. Brown, "Critical Path Method of Scheduling Work," Georgia Highway Proceedings (1963), p. 12; Hal Rives, "Critical Path Method of Scheduling Project Rab (4) SP 1645 (17) Clarke," Georgia Highway Proceedings (1963), pp. 27-46.

<sup>41</sup> For a fuller treatment of this subject, Lichtenstein Consulting Engineers, *Historic Context of the Interstate Highway System in Georgia*, GDOT (January 2007).

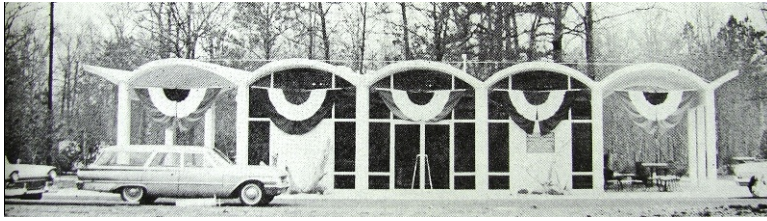
The expanding highway programs, especially the new interstates and their difficult right-of-way negotiations, prompted the SHD to do a better job communicating with the public. A public relations department was established in the fall of 1956 to inform the media about the tremendous increase in construction. SHD officials, in general, felt that the public didn't understand or appreciate the full scope and complexity of their work and often failed to see the "big" picture of the efforts to upgrade entire highway systems, rather than simply fix the worn-out pavement and bridges serving a particular business or residence. As late as 1967, the SHD was still struggling with this, even reporting that many of its own employees didn't do an effective job of understanding or communicating. Much of this was attributed to the department's rapid growth and the failure of word-of-mouth communications to reach all employees. In response, the public relations staff published *A Pocket Look at Your Highway Department* in 1967 as a guide for employees. Other public relations issues, such as the impact of highways on community land-use patterns and the environment, were also of increasing concern but, except for the looming battles over the location of Atlanta's suburban interstates, were not generally understood or identified by the SHD until the mid to late 1960s when national legislation such as the National Historic Preservation Act of 1966 and the U.S. Department of Transportation Act of 1966 forced it to begin assessing effects on cultural and environmental resources and to hire specialists for those assessments.<sup>42</sup>

Safety was an area of roadway and bridge design addressed with greater rigor beginning in the mid 1960s. Safety had always been a concern of engineers, but most safety features, like railings and signs, were based more on professional judgment and logic than scientifically tested assumptions. Interstate highways had been built with balanced design for safety, but fatal accidents still occurred at alarming rates. In response, the state legislature established a Georgia Traffic Safety Committee in 1964. As a result of the committee's recommendations, Georgia started a mandatory auto safety inspection program in 1965. Significant changes in the safety features of highways and bridges did not occur until the federal government took a leadership role. The Federal-Aid Highway Act of 1965 required each state to have a formal highway safety program by the end of 1967. BPR and AASHTO test facilities began work almost immediately on devising national standards for roadside features and geometry that could be applied by each state. After new federal guidance was issued in 1967, the SHD bridge division began to seriously rethink its railing designs for safety, including adopting such designs as Jersey-shaped safety barriers.<sup>43</sup>

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<sup>42</sup> Biennial Report (1957-58), p. 91; SHD, A Pocket Look (1967).

<sup>43</sup> "OK Given to First Auto Inspection Stations in Georgia," GCGM (Nov. 1964), p. 34; "Address of F. C. Turner, Chief Engineer, U.S. Bureau of Public Roads," SASHO Proceedings (1965), pp. 8-10; "Safer Night Driving: Bridges Get New Reflective Paint," Office of Public Relations, News Clipping, (n.d., circa 1962), Record Group 27-6-6, Georgia Archives.



**Figure 15:** The SHD opened Georgia's first state-run tourist information center on US 301 near Sylvania in 1962. Source: GCGM.

Activities that fell under the broad heading of promoting scenic development and roadside beautification were another indication of the expanding responsibilities of the SHD. The department had since its inception understood the importance of good roads to tourism in Georgia's scenic

areas, but this had not taken the form of a coordinated program. The success of the Blue Ridge Parkway in North Carolina and Virginia, begun in 1935, prompted interest in extending the parkway into Georgia's mountains. Although this scheme was eventually shelved due to lack of support from the National Park Service, it did result in a scaled-down fashion in the Senator Richard B. Russell Scenic Highway through the Chattahoochee National Forest. The highway basically followed the old Logan Toll Road, but was regraded with an eye to fitting it to the landscape. Work was done from 1963-66 in cooperation with the U.S. Forest Service, which wanted to open the area for recreation. The scenic highway, which was modeled after many earlier parkways and scenic roads throughout the U.S., was not significant for its design, but it did serve its intended purpose of opening up one of Georgia's last remote regions. There were other scenic-development efforts, most notably the widening and paving of the road to the top of Brasstown Bald Mountain, the highest point in Georgia, in 1957-58. The mountain had been bought by the U.S. Forest Service in 1936 and the work involved widening and improving a winding logging road that had first been opened by the Pfister & Vogel Timber Company sometime prior to 1936. Paving was completed in 1958 along with the construction of a visitors center atop the mountain. Once again, the highway design was not significant, but it did open up a popular tourist destination.<sup>44</sup>

The SHD also responded to public concerns about roadside appearance. The department worked with the state legislature to pass a state billboard and junkyard law that became effective in April 1964 making Georgia among the first states to regulate the erection of billboards and plant shrubs to screen junkyards. Similar regulations

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<sup>44</sup> "Brasstown Bald ... Georgia's Highest Peak," Georgia Highways (July 1958), pp. 1-3; "State's First Tourist Information Center on U.S. 301," GCGM (Feb. 1962), p. 13. As part of President Lyndon Johnson's War on Poverty, special highway funds were also allocated for economic development of Georgia's Appalachian region. Created by the Appalachian Development Act of 1965, the Appalachian Development Highway (US 19 from the North Carolina line near Harris through Towns, Union, Lumpkin, Dawson, Forsyth and Fulton counties and into Atlanta) received 70-30 federal-state match for engineering and right-of-way and 50-50 construction funds. Georgia received \$17 million under the project, but ironically it was plowed into construction of I-85/US 19 in Fulton and Gwinnett counties. It also included special provisions for removal of billboards, beautification projects, and landscaping coordinated with local garden clubs "Appalachian Development Highway," Office of Public Relations, News Clipping, Record Group 27-6-6, Georgia Archives.

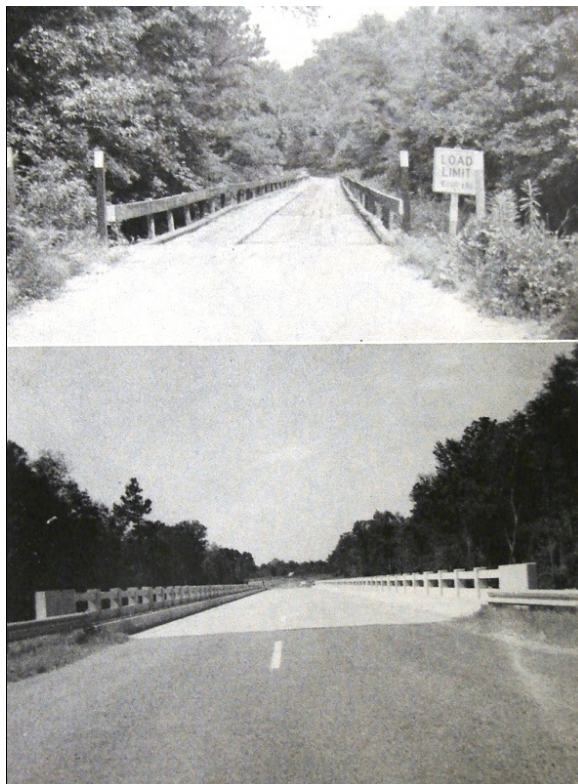
became federal requirements under the Highway Beautification Act of 1965, but Congressman Russell Tuten of southeast Georgia inserted language that billboard regulations would be “in keeping with customary use” in local areas, thus diluting any attempts at national billboard standards. His conservative district had a strong billboard industry that objected to the provisions of the state and federal billboard laws. Although the SHD had employed a landscape architect since the 1930s, an official landscape design section was established in 1965 with the main purposes of enforcing the billboard regulations, screening junkyards, and preserving natural beauty. One of the section’s first activities was taking a state inventory of junkyards. The landscape section also recommended ways to improve roadside appearance, such as the flattening of cut and fill slopes and adding native plant materials.<sup>45</sup>

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<sup>45</sup> Biennial Report (1965-66), pp. 84, 165; Office of Public Relations, News Clippings, (1964-66), Record Group 27-6-6, Georgia Archives.

## F. Road and Bridge Building by Counties and Cities

Approximately 1,200 of the bridges in the 1955-65 study population are owned by counties or cities. The majority are short-span bridges located on low-volume roads, and most are undistinguished standardized steel stringer bridges or precast reinforced-concrete slab bridges that are simple and economical to design and build. The reasons for this are several, but can generally be distilled down to the fact that the bridges were more often than not built with the technical advice of SHD engineers who had developed the designs to meet the standards for secondary and county roads throughout Georgia. Very few Georgia counties or cities could afford custom designs or the services of consulting engineers, and thus relied heavily on the SHD.



**Figure 16.** Federal-aid secondary program paid for the replacement of many county bridges, such as the before-after photos of this bridge on the Oconee-Milledgeville road in 1958. The new bridges had to meet state standards for roadway width and capacity. Source: *Biennial Reports (1959-60)*.

Securing federal and state aid for road and bridge projects was an on-going concern of local officials, and the quality of the roads and bridges always a big topic in county politics. The SHD public relations staff kept news clippings from local papers, and these frequently describe county commissioners and mayors coming to Atlanta to meet with state highway officials to ask for their support of specific projects or assistance with worn out roads and bridges. After 1956, due to the impact of the federal interstate funding formula and growing gas-tax revenues, the state government had more funds at its disposal to distribute to local units of government. In 1963, a fairly typical year, about \$25 million in state aid was distributed for use on county and city roads and bridges. About \$9.3 million of that \$25 million went to counties and cities in direct grants for specific road and bridge projects and about \$12 million went to county road commissions in the form of county contracts. Another \$3.6 million went to pay for work done by state forces on county roads, a practice that tended to benefit poor rural counties that could not afford to employ their own road crews.<sup>46</sup>

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<sup>46</sup> "Where Road Funds Go," *Atlanta Journal and Constitution* (May 31, 1964). Office of Public Relations, News Clipping, Record Group 27-6-6, Georgia Archives.

In securing labor to build roads and bridges, most Georgia counties fell into one of two models, the “free” labor system or the “prison” labor system. Although the systems had significant differences, both relied on manual labor and unskilled and semi-skilled workers. This reinforced the need to seek out bridge types that were simple to design and build, like steel stringer and precast concrete bridge types.

Prison labor became very common on Georgia roads and bridges starting in 1908 when state laws required that counties work their prisoners on public projects. At the time, it was considered a positive reform that ended the sometimes brutal and corrupt practice of convict leasing (i.e., the system by which wardens leased the prisoners out to work for private individuals and companies). As the 20th century progressed, prison road gangs themselves became a subject of controversy, with the federal government determining that no prisoner labor could be used as a match on federal-aid projects in 1922. Governor Arnall ordered an end to convict labor on state highway construction projects in 1947. Still, Georgia’s counties continued to use prisoners on their road and bridge jobs well into the 1960s, with more than half of the counties reporting some use of convicts in 1962. Furthermore, many counties ignored BPR regulations and used convicts on federal-aid secondary projects. In March 1962, the SHD received an unequivocal warning from the BPR that no prison labor whatsoever could be employed within the limits of a federal-aid secondary project undertaken by the counties. This strongly worded warning promoted a gradual phasing out of the use of convicts on county projects, although some counties continued to use convict labor for basic maintenance and non-federal-aid work.<sup>47</sup>

Mitchell and Troup counties illustrated the two approaches to labor on county projects. Mitchell County was a typical prison labor county that attributed its good roads and bridges to the advantages of working with convicts. In 1962, the county reported that it had from 45-50 prisoners working at all times with an average daily cost of \$2 per prisoner. The county commissioners felt it would cost five times as much to employ “free” labor. The convicts were taught to operate construction machinery, and they could work overtime without extra cost to the county. Troup County, a “free” labor county, abolished its prison farm in 1941 and set up a county road department. By the early 1960s, the department had about 50 full-time wage workers maintaining about 900 miles of roadway, and it had crews to perform every type of work, including bridge construction. Earl Edwards, chairman of the Troup County Board of Commissioners, felt that Troup County had “the best kept and maintained” roads and bridges in the state because of its long-term employees and the pride they took in their jobs.<sup>48</sup>

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<sup>47</sup> “Convict Labor Not Allowed on FAS Road Construction Projects,” GCGM (March 1962), pp. 10-11.

<sup>48</sup> Earl Edwards, “Troup County Finds “Free” Labor Best,” and “Mitchell Makes Improvements with Prison Labor for Citizens,” GCGM (Oct. 1962), pp. 11-15; “County Road System Explained in Display,” Lagrange Daily News (Apr. 18, 1963). Office of Public Relations, News Clippings, Record Group 27-6-6, Georgia Archives.

## G. Conclusion

Between 1955 and 1965, Georgia was able to undertake large-scale programs to improve the state's non-interstate highways, while at the same time planning, designing, and building the interstate highway system. Much of this was made possible by the 90%-10% funding formula for interstate construction passed by Congress in 1956, freeing up other sources of revenue for use on non-interstate highways. Also underlying this accomplishment was the maturation of the State Highway Department of Georgia (SHD) as a highly qualified and increasingly efficient and professional organization dedicated to the improvement of the state's roads and bridges.

In order to gear up for these unprecedented efforts, the SHD increased in size from about 5,000 to 9,000 employees, going through growing pains that included political controversy and scandal, a shifting emphasis from rural to urban roads and bridges, tightening of contracting procedures, changes in employment practices, and the adoption of new time-saving technologies, particularly computers. The SHD also expanded its horizons to become more highly involved in activities that went beyond the roadway to include public relations, comprehensive urban transportation planning, and roadside landscaping and scenic development. These were precursors to fundamental changes in highway administration that would become increasingly evident during the environmental movement of the late 1960s and early 1970s.

Significant to the development of the state's non-interstate roads and bridges, the decade after 1955 saw increased financial resources directed toward upgrading the state's more than 90,000 miles of existing roadway to statewide geometric standards for all classifications of roadway from the most heavily traveled US-numbered highway to the most lightly traveled county road. Much of this work including replacing, widening, or by-passing old bridges that did not meet the standards. These standards incorporated guidelines developed by the American Association of State Highway Officials (AASHO) at the national level, and thus promoted uniform development. Since standards were higher for roads with higher ADT or on the federal-aid systems, many of the older bridges on these roads were replaced or altered to meet the new standards.

The SHD's bridge engineers met the challenge of surveying, planning, and designing interstate and non-interstate highway bridges by adopting more efficient methods of completing their work. Facing manpower shortages, Georgia's state bridge engineers were among the first in the nation to use computers to perform complex calculations and track multi-stage projects. Computers made it easier to design skewed and super-elevated bridges that conformed with geometric design standards, a critical component of safe, high-speed highways. Due to their emphasis on efficiency and economy, Georgia's bridge engineers and contractors were able to construct on average about one new bridge each work day from 1955 to 1966, a remarkable accomplishment.