Atlanta, Freeway System Reconstruction

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The genesis of Atlanta was transportation. The beginning was only 153 years ago in 1833 when a railroad surveyor named Stephen Long drove a stake to locate the intersection of two railroad lines, one coming south from Chattanooga and the other west from Augusta. Mr. Long predicted that no great town would grow around this railroad terminus, only a blacksmith shop and a country store.

A historical marker now locates the railroad zero milepost intersection in underground Atlanta very near Five Points, the heart of downtown Atlanta, Georgia.

Stephen Long's predictions turned out to be as inaccurate as many subsequent growth predictions for the City of Atlanta.

The railroads dominated Atlanta's early development and severely restricted its street pattern. Also a rail cordon completely encircles the central business district, with very few major street crossings.

Construction of the original freeway system in Atlanta did not begin until after 1946, when H. W. Lochner & Company and DeLeuw Cather & Company completed a report on transportation needs. This report recommended an expressway system that became the core of Atlanta's existing freeway network. By 1955 the construction of this freeway system was well underway.

In 1956, with the passage of the National Interstate Act, the partially completed expressway system was incorporated into the Interstate Highway System. The roadways built before the Interstate Act were financed with bond funds sold by the city of Atlanta and Fulton County, with the Georgia State Highway Department sharing in the construction cost. After 1956 the system was largely financed with Interstate Highway funds.

The early freeways were constructed using state-of-the-art methods, but did not avoid bad design elements such as poor alignment, steep grades, and no acceleration or deceleration lanes, or inside lane drops.

The 130-mile freeway system in Atlanta was completed in 1967 with typical sections of 4 and 6 lanes. No additional work was done on the system until 1978. An attempt was made in the mid-1960s to eliminate a major flaw in the original system. That flaw was the combining of two freeways, Interstate 75 and Interstate 85, into a common roadway through downtown Atlanta. A new route called Interstate 485 was proposed through the east side of Atlanta. This route went through the Morningside

residential community, and the proposal led to environmental suits based on the environmental protection laws enacted in the late 1960s. The City of Atlanta withdrew its support for the proposed roadway, and the route was eventually taken off the planning map in 1972.

The remaining gaps in the Interstate System throughout all Georgia were closed in 1978. With the approval of a new transportation plan for the city of Atlanta, emphasis was shifted to reconstructing the freeway system in Atlanta. Population growth had rendered the old system grossly inadequate. According to predictions, older sections of the freeway designed for 52,000 vehicles daily would have to carry more than 200,000 vehicles per day in the year 2000.

The new plan called for adding additional lanes to the existing system and constructing a 100-mile rail transit system. Georgia DOT Commissioner Thomas D. Moreland referred to the reconstruction as adding muscle to the old skeleton. The reconstruction was labeled "Freeing the Freeways." As the Department developed the program, officials identified three major areas of concern: cost, environmental effects, and construction under traffic.

The first major task was determining how to finance the project. This was solved in a number of ways, including evaluating the eligibility of the various freeway segments for Interstate participation. In 1963 Congress realized that a 1975 horizon for Interstate design left only a 12-year traffic growth projection and the law was corrected to provide for a full 20-year traffic projection period. Atlanta's system was caught in this squeeze, and therefore became eligible for Interstate funds to bring their traffic projections back up to full 20-year period. Some segments were justified because they had been constructed before the Interstate financing program with other than Interstate funds and many of the radial freeways were to contain high-occupancy-vehicle lanes, which also made them eligible for Interstate financing.

The second major concerns were environmental effects and public relations. The Department of Transportation held public meetings to review environmental concerns. The most common worry turned out to be anticipated noise. The construction of noise barriers between the expanded freeway and major residential areas solved this problem.

The final major task in the initial development was to design the freeway in such a manner as to maintain traffic during the construction. The Georgia DOT commissioner charged the designers with keeping the same number of lanes that existed before construction open during construction. This required considerable effort in the designing, as a principal criterion was traffic handling as well as cost effectiveness. As the projects were let to construction, contractors and construction engineers worked together with the designers and many modifications of stage construction plans were developed where money and time could be saved without compromising safety or existing traffic capacity. Many innovative ideas resulted by using this procedure.

Safety was another prime concern. On many of our reconstruction sections, we actually experienced a reduction in accidents.

The Georgia DOT now has all work either completed or under contract, except for one segment of Interstate 20. All of this has been accomplished since 1978. The total cost to date is $1.4 billion. When the project is finished in 1990, we will have completely reconstructed 130 miles of urban freeway in 12 years, from start to finish. Construction of the original system took nearly 20 years.

Let's now discuss some of the main segments of roadway.

I-285

This route completely encircles Atlanta. The reconstruction of I-285 began in 1978. Half the highway was only four lanes wide, and the plan called for eight. The four-lane was the easiest portion since 64 foot wide medians allowed the addition of two lanes in each direction in the median while maintaining traffic on the outside. The completed section included resurfacing the old lanes.

There were some sections where we only had a 40-foot median and in order to develop a full eight-lane section, it was necessary to construct one lane in the median, and move traffic over into this lane while the outside lane was reconstructed. Of course, this affected all the overhead bridges and required complete reconstruction of the overhead bridges in the narrow median sections.

I-75/I-85 COMMON ALIGNMENT

This section of I-75/I-85 runs from Williams Street to the Brookwood Station, and was originally constructed in the early 1950s as a six-lane section with bad curvature and no deceleration or acceleration lanes. This segment has now been widened to a twelve-lane section, the alignment changed both horizontally and vertically, and several ramps eliminated to reduce weaving problems. All bridges had to be rebuilt while maintaining traffic on the existing roadway and on the cross streets. This was done through extensive use of temporary shoring. Additional right of way was kept to a minimum by the application of retaining walls almost the entire length of the project.

I-85 FROM BROOKWOOD STATION/I-75 INTERCHANGE TO LENOX ROAD

This reconstruction converted the existing expressway to an arterial street connector. A new freeway was built immediately adjacent to the old freeway, thus getting the two facilities for the price of one. This also greatly aided maintenance of traffic during construction. A 4,800-foot viaduct was constructed at one point along the project to maintain the existing expressway interchange with the local street system and also to span a railroad and a creek.

I-85 FROM LENOX ROAD NORTH TO I-285

This section of freeway was widened from four to eight lanes. The original project had a two-way uncontinuous frontage road system on each side that complicated the interchange ramp intersections with the cross roads. The frontage road system was converted and redesigned to be one way to improve the flow of traffic in a highly commercial and industrial area. Several special U-turn arrangements were provided to avoid the difficulties of indirect travel and additional traffic in the interchange areas.

I-85/I-285 NORTH INTERCHANGE IN DEKALB COUNTY

The original interchange, a cloverleaf between two major freeways, I-85 and I-285, was further complicated by a local access on each leg. The redesign of the interchange

involved reconstructing the freeway-to-freeway interchange as well as the four local access interchanges while accommodating nearly 290,000 vehicles per day during construction.

The bidding allowed alternate designs. DOT provided a design for steel boxes and segmental concrete boxes. The contractor-proposed design, which was awarded, provided for the conventional cast-in-place concrete boxes. This necessitated a good bit of false work and innovative protection for that false work during construction.

The four-level interchange is now almost complete at a cost of $65 million.

I-75/I-85 IN DOWNTOWN ATLANTA

The downtown central business district segment has been under construction for about one-and-one-half years. The reconstructing will increase an existing eight lanes to fourteen lanes. Building the portion immediately east of the central business district required relocation of 90 families from the Capitol Homes and Grady Homes Public Housing Projects. Extensive use of walls reduced high-cost right-of-way acquisition for this portion of freeway.

I-20/I-75/I-85 INTERCHANGE

The large I-20/I-75/I-85 interchange immediately south of the central business district and adjacent to the Atlanta Stadium is now under construction to add capacity, eliminate left-hand exits, provide acceleration/deceleration lanes, and improve local access for the stadium area. Squared-off bridges were used extensively at the skewed intersections. This technique kept minimum span distances and reduced grade adjustments.

We could not have accomplished this work without using innovative designs. One such innovation is the extensive use of precast retaining walls. Another example is a reinforced earth-type wall consisting of precast panels supported by frictional straps in a granular backfield. Another example is a bin wall or precast hollow box filled with aggregate. These walls can be erected with minimal equipment in all kinds of weather in less than one-fourth the time needed to build conventional reinforced concrete walls. The variety of wall facings improves the appearance of these walls.

Other special techniques involved the use of slurry retaining walls. These require the excavation of a trench in the ground as the form work for the wall. The trench is filled with a slurry to keep the sides from caving in; a cage of reinforcing is then forced into the slurry, and concrete pumped in from the bottom. The wall is either strutted against a parallel wall or tied back for structural integrity. This method enabled us to limit excavation, eliminate shoring, and maintain groundwater levels adjacent to multistory buildings.

Of course, all the planning, design, and construction was coordinated with our MARTA system or rapid rail transit system, which is under construction simultaneously. We have a MARTA rail station built over the freeway to be widened. An existing street was raised, the rail line and station placed at the existing street elevation, and the structure widened to provide for a twelve-lane future freeway where a six-lane facility now stands.

Park-and-ride lots are also a part of the coordinated transportation plan for Atlanta.