

# Planning the First Central Artery in Boston

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*First conceived as part of the rail system, Boston's Central Artery shifted to being the key link in an area-wide system of highways.*

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**M**ost people today would find it hard to believe that the planning of Boston's Central Artery actually started within 20 years of the invention of the automobile — well before widespread use of motor vehicles could have been predicted. The first mention of a "Central Artery" in Boston was in 1912. However, at that time, the name applied to the railroad connections through Boston. It was not long thereafter that it was realized that, due to the geographical configuration of the harbor (with water acting as a barrier), in order to go from the north shore area to the south shore area of metropolitan Boston, you must go through the already built-up downtown area.

Just after World War I, planners began to think in terms of putting through traffic in downtown Boston on a level one story above ground. Public transit (the Tremont Street Subway, Red Line, Orange Line, and Blue Line) would be placed one story under ground, and

local circulation (pedestrians, horse-drawn vehicles, automobiles and trucks) would use the surface streets, along with the railroad connection from North Station to South Station on Atlantic Ave. The surface railroad was used only at night after World War II due to the heavy traffic use of the street during the daytime. It should also be noted that an elevated transit line along Essex Street connected the Boylston Street transit station with South Station and then proceeded along Atlantic Avenue to North Station. (This elevated transit line was removed during World War II due to lack of use and the need for scrap steel.)

## **Making Room for Automobiles**

During the 1920s, the Boston Planning Board turned its attention to planning street improvements to accommodate the growing use of automobiles and trucks. That board recommended many improvements taken for granted today — such as placing several of the transit stations underground (such as the Kenmore and Copley stations). These recommendations became the forerunner of a major transportation study by the Boston Planning Board. This report, begun in 1927 and released in 1930, was a classic for its day, was entitled, "Report on a Thoroughfare Plan for Boston," and was written by Robert Whitten, an engineering consultant. The report was extremely comprehensive. It made use of planning analyses 20 years before their time. The report recommended a

system of arterial streets or thoroughfares that were actually forerunners of the limited access systems planned 20 and 30 years later for many of the urban centers of the United States. The "Central Artery" was the centerpiece of this system. It was called that because most of the roads were arranged as arterials radiating from the center city to enhance access to downtown Boston.

Except for the Charlestown portion, the Central Artery was constructed 25 years later in almost the exact location as projected in the Whitten Report. Furthermore, many of that report's recommendations were implemented during the 1930s, 1950s and 1960s. World War II caused the complete shut-down of *all* infrastructure improvements for the duration. These projects included the work underway on the construction (and design) of Route 128 as a limited-access highway in the Peabody/Danvers area.

### **The Advent of the Interstate System**

After the war and along with the proliferation of the use of the automobile, the various state highway departments began the planning, design and construction of highway systems to improve access to the urban centers of the United States. Every urban center in this country had highway systems of some form under construction by 1956, the start-up of the Federal Interstate Program.

In 1946, the Massachusetts Legislature authorized the preparation of a master plan for a highway system for Metropolitan Boston. That report, after two years in preparation, was presented in 1948 as "The Master Plan for the Metropolitan Boston Area." This master plan recommended a series of eight radial expressways extending from the outer suburbs (most beyond Route 128) into downtown Boston, terminating at a ring expressway called the "Inner Belt," of which the "Central Artery" was to be the downtown component. Route 128, and many of the 1930 Whitten report recommendations, were included in this master plan.

By 1948, two major highway projects were begun in order to alleviate significant congestion at two locations that were identified in the master plan as areas requiring immediate attention. These projects were the Mystic River

Bridge and the East Boston Expressway — the latter being the Logan Airport connection to the Sumner Tunnel. Both projects commenced design in 1947 and were completed in 1950 and 1951. Another major project in planning and design by the Metropolitan District Commission (MDC) during this period was Embankment Road (now Storrow Drive), which the legislature mandated be connected to the Central Artery at the time the MDC project was authorized. This decision would later become detrimental to the design of the artery since it caused two major interchanges to be located within 500 feet of each other, thereby resulting in insufficient weaving distance for the effective operation of the two interchanges.

### **Initial Design Issues**

The legislature accepted the 1948 master plan and immediately authorized the design of the Central Artery as its first project. The engineering consultant was selected for the design and that effort began in the summer of 1949 with Dr. John B. Wilbur of the Massachusetts Institute of Technology as the Project Director. The first construction contract was let in October 1950, with 16 additional contracts let through May 1952 — extending from a connection to the Mystic River Bridge in Charlestown to Fort Hill Square (now One International Place) and including the Storrow Drive Connection. This portion of the Central Artery was an elevated highway designed in accordance with the 1948 master plan at a cost of \$35 million for construction. It is now affectionately referred to as the "Green Monster." With design completed to Fort Hill Square, the joint venture design team was de-activated at the end of February 1952, pending resolution of a disagreement between the City of Boston and the Massachusetts Department of Public Works (DPW) regarding the route of the Central Artery as it passed South Station and crossed Kneeland Street. The City of Boston engaged a consultant to develop a report indicating that it was less expensive in construction and right-of-way costs to follow Atlantic Avenue into the railroad yards rather than the route favored by the DPW through the downtown Leather and Chinatown districts.

Discussions between the Massachusetts DPW and the City of Boston started in the fall of

1953 and continued through the spring of 1954. DPW Commissioner John A. Volpe referred the issue of location to a consultant in February 1954. The consultant recommended keeping the route the DPW had wanted. However, the consultant recommended that the highway be put underground through that area! An estimate was prepared indicating an additional cost of \$10 to \$12 million to place about 3,000 feet in a cut-and-cover tunnel. Commissioner Volpe believed that extra cost was acceptable for the added value of resolving the disagreement and keeping the city linked together.

The design team was mobilized in May 1954 and contracts for the construction of transitions of the highway from elevated structure to grade were awarded in the fall of 1954 and the tunnel contracts awarded in the fall of 1955 at a total cost of \$18.4 million. (It should be noted that this was the first limited access highway placed underground in the United States.)

Design of the Central Artery continued as a viaduct parallel to Albany Street and thence into an interchange in the South Bay area for the future connection to the Inner Belt and the Southeast Expressway. The design and construction juncture with the Southeast Expressway was just east of Southampton Street. Design was completed in the summer of 1957. The construction cost from Broadway to Southampton Street was \$23.6 million, including a bonus to the contractor to accelerate the completion of the interchange so that it could be opened by July 1, 1959.

### **The Building of the Arteries**

The first section of the Central Artery opened for traffic on October 29, 1954, from Charlestown (Mystic River Bridge) to North Street (Sumner Tunnel) and the balance of the elevated artery opened in the fall of 1956.

The Southeast Expressway design was awarded in 1952 to two consultants and the Northeast Expressway design was awarded in October 1953. The entire Central Artery and the Southeast Expressway from Hingham to Boston opened on July 1, 1959, to coincide with the cessation of all commuter rail operations on the New York, New Haven & Hartford Railroad the day before. The Northeast Expressway was

designed to the Saugus River, constructed to the Route 60 Circle in Revere and opened in the fall of 1957 to Route 60 where it connects to Route 1 in Saugus. The Massachusetts Turnpike was designed and built during the period 1956 to 1960 from Route 128 west to the New York state line to connect with the New York State Thruway. The turnpike extension into Boston was designed and built from 1962 to 1965. The turnpike extension, in effect, replaced the Western Expressway of the 1948 master plan. The Northern Expressway (which later became I-93) from Charlestown to New Hampshire was designed and built from 1962 to 1970 as part of the interstate highway system. Route 2 from Route 128 to Alewife Brook Parkway was designed and built from 1962 to 1967.

### **A Change in Public Priorities**

A very compelling story unfolds when considering the adverse impact of the consequence of not building portions of the 1948 master plan on those elements that were built. This story begins with the wave of significant opposition to the construction of the interstate system in some urban areas of the United States, particularly in Boston during the early 1970s. This opposition was manifested by Governor Sargent's administration, which cancelled the remaining unbuilt portions of the system and substituting improvements and extensions of rail transit facilities. This substitution (interstate highways for mass transit facilities) became known in Washington, D.C., as the Interstate Transfer Program and was proposed by Massachusetts' first Secretary of Transportation, Alan Altshuler.

### **The Effects of Change**

The components of the 1948 master plan that were cancelled or, in some cases, simply abandoned were:

- The Inner Belt;
- The Southwest Expressway (I-95 South of Boston);
- The Northeast Expressway from Route 60 to Route 128 (I-95 North of Boston);
- Route 2 from Alewife Brook Parkway to Storrow Drive; and,

- The Route 3 extension to a connection to Route 2.

The elimination of components of the larger integrated system was done arbitrarily without regard to the consequential impact of eliminating those elements on the system that *had been* constructed. The impacts reverberated through the system and the most significant of these impacts is the gross traffic volume overload on the Central Artery. This impact is being addressed in the current Central Artery/Tunnel Project by:

- Extending the Massachusetts Turnpike (I-90) direct to Logan Airport;
- Widening the Central Artery to four lanes in each direction;
- Eliminating the severe conflicts of the inadequate weaving distances at North Station (already eliminated by the temporary ramps in Charlestown); and,
- Reducing the number of ramp access points to the artery.

So, indeed, the current Central Artery/Tunnel Project will contribute greatly to improve the effectiveness of the *entire* metropolitan Boston highway system, continue to enhance the region's network of multi-modal public transit through committed state/federal capital investment and create a great potential for urban development opportunities for Boston by eliminating the unsightly "Green Monster."

NOTES — A joint venture of Charles A. Maguire & Associates, DeLuw, Cather & Co., and J.E. Greiner Co. drew up "The Master Plan for The Metropolitan Boston Area." The joint venture of Charles A. Maguire & Associates and Fay, Spofford and Thorn-dike, Inc., was selected for the design of the original

Central Artery. The City of Boston engaged Clarkson Engineering Co. to develop a report on the siting of the Central Artery following Atlantic Avenue. DPW Commissioner John A. Volpe referred the issue of location to Parsons Brinkerhoff Quade & Douglas, of New York City, in February 1954. The Southeast Expressway design was awarded in 1952 to two consultants: Edwards & Kelcey for the Neponset Circle to Southampton Street section (northern) and Clarkson Engineering for the Neponset to Hingham section (southern). The Northeast Expressway design was awarded in October 1953 to Parsons Brinkerhoff Quade & Douglas for the section from the Mystic River Bridge in Chelsea to Route 60 in Revere.



CRANSTON R. ROGERS was educated at The Citadel and received his SMCE from the Massachusetts Institute of Technology. He worked on the design of the original Central Artery viaduct and was Chief Structural Engineer on the Dewey Square Tunnel and viaduct through South Bay. He worked as Project Manager on six major sections of interstate highway, three river bridges, three heavy transit tunnel sections and many Boston area infrastructure projects. He was recently Project Manager of the \$750 million D009A Section of the current Central Artery/Tunnel Project. He is an Honorary Member of BSCES and was awarded the Wheeler Medal by SAME. Currently, he is Vice-President with the Maguire Group and Manager of Transportation Design.

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