A PROJECT AROUND THE BOSTON CENTRAL ARTERY

by

Mario Rufo

B.S.A.D. Massachusetts Institute of Technology
1974

Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Architecture at the MASSACHUSETTS INSTITUTE OF TECHNOLOGY May 1979

(© MARIO RUFO 1979

Signature of the author

Richard Tremaglio, Adjunct Professor of Architecture Thesis Supervisor

Accepted by

Professor Imre Halasz, Chairman

Departmental Committee for Graduate Students

AUG 1 4 1973
# TABLE OF CONTENT

<table>
<thead>
<tr>
<th>Abstract</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>4</td>
</tr>
<tr>
<td>Program</td>
<td>7</td>
</tr>
<tr>
<td>Site</td>
<td>12</td>
</tr>
<tr>
<td>Planning Objectives</td>
<td>13</td>
</tr>
<tr>
<td>Design Objectives</td>
<td>18</td>
</tr>
<tr>
<td>The Design</td>
<td>22</td>
</tr>
<tr>
<td>The Drawings</td>
<td>27</td>
</tr>
<tr>
<td>The Model</td>
<td>43</td>
</tr>
</tbody>
</table>

-2-
ABSTRACT

A PROJECT AROUND THE BOSTON CENTRAL ARTERY

MARIO RUFO

Submitted to the Department of Architecture on May II, 1979 in partial fulfillment of the requirements for the degree of Master of Architecture.

This project, centered around the Boston Central Artery, extends from N. Washington st. to Congress st. in downtown Boston. The Central Artery represents an intimidating wall of steel isolating the North-End and the waterfront area from the rest of the city. The purpose of this project then, is, on one hand, to alleviate some of the problems created by its presence such as: the disruption of street continuity, the curtailment of access to the North-End and the waterfront, the congestion of vehicular traffic; and on the other and most importantly, is to provide a link between the old and historic on one side of Central Artery, and the new on the other; To integrate the urban fabric of the historic to that of the skyscraper.

Thesis Supervisor .......................................................... Richard Tremaglio
Adjunct Professor of Architecture

-3-
INTRODUCTION

The Central Artery, besides being the most conspicuous eyesore in downtown Boston today, is, in effect, a blatant example of urban planners' myopia and unsensitivity toward urban fabric and urban cohesiveness. It cuts through the city's oldest historic district, destroying in its path, and isolating the community behind an enormously intimidating wall of steel. The North-End and the waterfront area are, in fact, almost completely separated from the rest of the city. The disruption created by the Artery becomes acutest along the North-End edge, from Haymarket square to Atlantic avenue. The presence in this area of four Artery's ramps, an exit and an entrance for Sumner and Callahan tunnels, the irrational layout of surface streets and the discontinuity of others, make vehicular traffic at this point chaotic and congested. Pedestrian movement is unsafe if not downright dangerous. With the curtailment of access to pedestrians and automobile the area has become a closed enclave. This "side effect" caused by the Artery has proved to be very fortunate indeed.
By making the area inaccessible to outsiders, the North-End has been able to keep its physical character, its ethnic homogeneity, while at the same time it has unwillingly discouraged incompatible land use.

The North-End today is one of Boston's most humanly active neighborhoods.

While the problems along the North-End edge typify the situation in the project site; other problems remain such as the Artery's visual blight, the noise, the air pollution, the positioning of entry and exits ramps, that need to be dealt with.

The project, therefore, extends from North Washington street to Congress street.

It will occupy those lots directly under the Central Artery that are now either used for parking, or that will be recovered with the reorganization of the surface streets.

This project tends, on one hand, to solve some of the most immediate problems such as:

- the reestablishment of street continuity,
- the repositioning of the Artery's ramps,
- the redistribution of vehicular movement,
- the reestablishment of pedestrian networks.

On the other hand and most importantly, it tends to be a link, a connection between the old and historic on one side
and the new on the other side of the Central Artery. It tends to integrate and provide a transition between the two very different fabrics.
THE PROGRAM

This project represents a desire to mitigate one of Boston most blighting influences, the Central Artery.

It represents, in effect, an attempt to restructure the area surrounding it.

It merely represents an idea and such being the case there is no program.

There are no specifications for land use; there is no area requirement, and in strictly speaking sense there are no zoning restrictions.

However, there are a set of objectives.

Physical, environmental, planning, and transportation objectives that in order to be satisfied will place definite constraints upon the physical design.

These objectives would establish a set of criteria for density and mix of use and their relationship.

The volumetric envelope buildings, their height and massing, exterior treatment and relationship between private and public spaces.

Moreover, they would determine pedestrian networks, visual amenities, open spaces, traffic patterns, air quality, and noise levels.
The program in its general terms consists of placing a mixed-use development along a strip of land that goes from India street to North-Washington street in downtown Boston. The development calls for retail, rental office, and residential uses.

The historical importance of the location will require a design continuity between past and present, an integration of old and new.

The south side of the site is more appropriate for higher density development, while the north side, facing the North-End, will be less intensively developed.

However, there are environmental and planning issues which were not considered.

The feasibility of the project, for example, as a real estate development, since nothing is known about projected demands for different kinds of spaces and uses, and about the need and capacity to accommodate large numbers of users.

It was not established what effect noise and air pollution would have on residential users on top of the Artery.

The impact that such development would have on the Quincy and Faneuil retail market and the North-End market.

The effect it would have on the North-End population, the displacement it would cause, if any, new people coming in.

Finally, what impact it would have on the area the increased surface traffic level.
RETAIL REQUIREMENTS

The creation of flexible, competitive space designed to handle small to large businesses.
Since there is no way of predicting tenants, flexibility is of the utmost importance.
maximum visibility and display space, ease of entry, and store as an extension of the pedestrian network were, as well, major considerations.

RENTAL OFFICE REQUIREMENTS

The potential variety of users, from small professionals to large corporate firms, demand again design flexibility and accessability.

RESIDENTIAL REQUIREMENTS

As for the other uses, residential space demands flexibility. From small studio apartments to large ones; from one level apartments to multi-leveled ones as to accomodate the largest and varied number of people from different income and social levels.
The purpose is to create a framework for housing that leaves the individual householder with potential responsibility for the arrangement of his housing. This will be based on the principle of separation between structure and infill. It is the infill that will carry design flexibility within a fixed context. At the same time to provide a residential framework level that is separated from other uses, while at the same time being an integral part of the whole.

PARKING REQUIREMENTS

Underground parking facilities will be provided for the development users as well as for the users of adjacent commercial and office facilities.

OPEN SPACE REQUIREMENTS

Ample and adequate open spaces will be provided to relieve some of the pressure that is inherent, because of the close proximity, of the structures in the North-End.

Street lighting, landscaping, and built furnishing will be provided as well.
PEDESTRIAN REQUIREMENTS

One of the fundamental prerequisite of this project is to re-establish movement throughout the entire area that is now very much hindered by the Artery's ramps and the cross-traffic volume.

To provide through the whole area enough pedestrian links as to make a total separation between pedestrian and vehicular movement.
THE SITE

The site will occupy mainly parcels now directly under the Central Artery.
Some are used for parking, others will be recovered and amplified with the reorganization of surface streets.
The site is defined by Cross street on the north side; New congress, Blackstone, and Clinton street on the south; Atlantic avenue and Commercial street on the east side. It will include seven parcels, four are quite large, the other three are extensions of long blocks that were interrupted by the Artery.
However, these boundaries are somewhat fictitious because the project at levels higher than ground expands beyond these limits.
It, in fact, incorporates and uses some of the existing structures such as City Hall, Quincy market, etc. . The whole area adjacent to the Artery is an integral part of the project.
It can be said, therefore, that the project extends from City Hall on the west, to Cross street on the north, to Atlantic avenue on the east, and India street on the south.
PLANNING OBJECTIVES

The resolution of all the problems described in the previous pages is an integral part of the design process. The following planning objectives represent, therefore, the first step of the process through which the restructuring of the area begins to take place.

The area being considered needs fundamental and profound structural changes.

Changes that will substantially affect the physical design, and that will alter in a dramatic sense the conditions at ground level.

The necessity of these changes is dictated by the curtailment of access toward the North-End and the Waterfront, and by the general chaotic state of confusion that the area is in.

They include the reorganization of street layout, the improvement of traffic patterns, the establishment of pedestrian networks, the repositioning and removal of the Artery's entry and exits ramps, the separation of expressway and local traffic, the reestablishment of street continuity.
THE REORGANIZATION OF STREET LAYOUT AND
THE REESTABLISHMENT OF STREET CONTINUITY

The movement of pedestrian and vehicular traffic to the North-End is being curtailed mainly by the interruption of Hanover and Cross street, caused by the Artery's ramps. With the removal of Callahan tunnel's OFF ramps, north-bound and south-bound; the removal of the ON ramp south-bound, and the repositioning of the ON ramp north-bound further north, Hanover street will run continuously up to New Congress street, while Cross st. will be extended from North-Washington street to Atlantic avenue.

By connecting Cross st. to North-washington st and two other major streets, New Sudbury and New Chardon, we would have another regional entrance point into the North-End that can alleviate the traffic volume now using North st and Atlantic avenue.

On the east side of the site meanwhile, Atlantic ave. will join Clinton st. as well, permitting easy access to the waterfront, while the road running under the Artery and parallel to Atlantic ave. will be eliminated, gaining at same time valuable parcels of land.
THE REESTABLISHMENT OF PEDESTRIAN NETWORKS

Movement all along the project site is hindered by Artery's ramps, cross traffic, interrupted streets, and parkings lots. It will certainly be facilitated, toward the North-End the waterfront, with the reconnection of Hanover st. and Cross street.

Carrying the level of City Hall plaza into the site, over New Congress street, and continuing it over Atlantic avenue, the separation of pedestrian and vehicular traffic would be accomplished.

Furthermore, by bringing the pedestrian flow of Salem street and Endicott st. into the site, we would have reestablished the historic movement pattern.

By bringing the same diagonal into the other two parcels not only would we have the same recognizable and understandable pattern throughout the site, the diagonal pattern would serve environmental purposes as well, being it aligned with the north-south axis, it allows light, air, and people to penetrate across the long blocks and under the Central Artery.

-15-
THE IMPROVEMENT AND REDISTRIBUTION OF VEHICULAR TRAFFIC PATTERNS

Many traffic problems on the Central Artery, and at the exit and entrance of the two tunnels, are a direct result of the conflicts that come to exist, at this points, between local and expressway traffic.

It would seem that, by separating the two traffic levels, the problems will be greatly reduced.

With the construction of an underground "connector" that could extend from the Expressway at Congress st. to as far as Leverett circle, and connected directly to the two tunnels, we would achieve, in fact, the separations between local and expressway traffic.

The "connector" would take up, then, the tunnels- expressway traffic, the regional and local traffic.

The Artery will, then, assume more the character of a limited access expressway.

With the "connector as a link between the expressway, the tunnels, and the city, many of the ramps would cease to serve any purpose.

In fact, the Callahan tunnel OFF ramps, the ON ramp south-bound, and the North Station OFF ramp can all be removed; while the the ON ramp north-bound will be repositioned...

-I6-
further north.

The Haymarket OFF ramp will take the place of the Callahan tunnel OFF ramp.

The tunnels' exit and entrance will remain and used exclusively by local traffic.

As a consequence of these major interventions, the local surface traffic will far less intensive; and with the reorganization of the street layout, pedestrian and vehicular movements will be a lot more rational and a lot less hazardous.
DESIGN OBJECTIVES

The design objectives of this project are:

to provide a link between the old and the new;

to integrate the urban fabric of the historic district to that of the skyscraper;

to provide a gradual transition between the two very different fabrics;

to provide a continuity of activities at street level;

to provide an integration of usages such that the places generated will be humanly active for the most part of the day.

By taking advantage of the level change existing between City Hall plaza, the North-End and the Waterfront, a network of pedestrian paths, higher than ground level, were generated. These paths introduce and represent a different way of conceiving and understanding the city.

The city is not perceived here as an agglomerate of single structures complete in themselves and in which the relationship between the single element and the totality may be represented as the summation between the parts and the whole, and the balance so obtained is destroyed at the moment a single element is taken out of context.

Spatial composition, that is, is not the only means through which individually conceived buildings are grouped together.
It is instead conceived as a totality in which the totality itself embraces the elements.
In other words, the total image is not basically altered, even though some elements are taken out or different ones added.
The concept introduces "linkage" or "network" as the generator of the system in which units and system are closely integrated and evolve together.
There is no hierarchy between the element and the system.
The concept may be new, nevertheless some of our best cities and towns were built using precisely the same principle.
In these places the distinction between totality and elements is non existent.
One generates and is generated by the other, they are totally integrated. These places, however, grew in an organic manner; they took generations of men working over decades and centuries of time.
The link here, for the most part, is external, in which shapes of space between elements became the visually organizing factor.
In our environment, we build in a very abbreviated time span, we must, therefore, fully comprehend what this concept involves.
Linkage is simply the glue of the city. It is the act through which we unite all the layers of activity.
Insofar as the city is successful, the city will be a recognizable and humanly understood entity.
Linkage, then, is more than just a physical entity; it is spatial, social, and temporal as well.

This project tends to the realization of this principle. While we have been successful in making unified and complexes forms at ground level, with street and piazzas as linkage, we have fallen short in achieving it in a threedimensional sense, except maybe in some medieval town.

In fact, a high-rise building denies us the experience of its form and the experience of rising through its many layers, enclosed as we are in elevators.

Here, the concept of three-dimensional linkage is brought to the high-rise towers in order to make them transparent to us, understandable, and part of the living environment.

The project proposes a new way of moving through the city other than at ground level or vertically.

The proposed paths represent, literally, streets in the air, with the same activities and uses that make them so viable at ground level.

They connect the city by interrelating much of the existing structure.

These paths would flow from high-rise to high-rise, from building to building, from structure to structure.

By opening up these structures at these levels, by bringing these paths into them and up as the structures rise, the
structures would become part of a total environmental experience that is essential to our understanding of them, and their relationship to their surrounding.

By bringing into these structures diversified activities and uses, then and only then, these paths would assume the character of the streets.

We must perceive our urban society and urban field as a dynamic entity of interrelated forces, and any new element introduced in its context will change its equilibrium as time passes.

As time goes by, and the need to replace obsolete structures arises the system is able to grow and expand.

the relationship between the system and the new element will always be an integral one.

Bringing such diverse system in an old historic district is a kind of linkage in itself.

It gives morphological demonstration of the ever changing and diverse character of city life.

It offers a new kind of choice to people: the possibility that one can live in an a historically blessed place in a new house.
THE DESIGN

This project's goal was to overcome the intimidating barrier that is the Central Artery. It runs across the entire site, and being perpendicular to the movement at ground level, it assumes an even more awesome aspect.

It seemed that the best way of overcoming the powerful horizontal thrust of the Artery would have been to establish a diagonal movement throughout the site. A diagonal movement that would continue into Endicott, Salem, and Marshall street on one side of the site; and Commercial street and Faneuil Hall on the other. A movement that would free the corners of each parcel and bring the streets into the site.

Moreover, it would align with the north-south axis and would allow light and air to filter through the site, while the built-form would have the optimal solar orientation. Opening up the lot corners would tend to bring movement into the site; by building up the ground, gradually the movement is led up over the Artery.

Reinforcing the vertical movement at this point are exposed and visible elevators and stairway shafts.
A continuity of material is established with the ground form built with the same material as that of the historic district. The ground form in this case is the generator of the movement system, either vertical or diagonal. It also represents the infill, being it under and around the Central Artery, while the Artery itself represents the unifying structure.

At opposite directions to the diagonal movement stand what I call the built and the non-built forms. The "built" corner of the lot has to distinct aspects. The outside one, the one closest to the historic fabric will assume the same fabric, texture, and scale of the historic district. The "non-built" side will be left open, of course, at ground level, as to alleviate the pressure of the closely knit fabric of the North-End.

---

North-End

---

Artery

---

diagonal movement
The south side of the lot will be more intensively built, being closer to the new part of the city.
The north side, toward the North-End, will place itself in a volumetric relationship with the old fabric.
The internal element of the "built" corner, while of the same material as the other, is of a different character.
Character that will change as we move up, and as the uses change.

The character, here, is dictated principally by the need, again, of bringing the movement up over the Artery.
Again, the vertical movement is reinforced by the exposed elevators and stairway shafts.
By repeating the same diagrammatic process over the next site a system is beginning to take shape.
A system that can define the part and is in itself definable.
By having introduced more than one common factor in each part, we have created a link.

Of course, what will link the entire project is the horizontal trust of the Artery; the common design elements will help reinforcing this linkage.

Once the common elements are established the system is determined.

With the determination of the system, then, each parcels could take a different character of its own and still be part of the totality.

The two built forms on the south side, used by the retail and rental office, will share the same vertical movement, and will be part of a pedestrian network that will include the ground form.

The accessibility and the store as part of the pedestrian network are very important factors here.

As we move up we reach the main pedestrian level.

This level represent a street in the air.

There are enough activities and use that it will be viable and humanly active for most of the day.

This level is connected to existing structures adjacent to the Artery. In so doing the structures become parts of the whole while offering new activities and uses.

Moving higher, to the residential level, the pedestrian net-
work will assume a different character.
It will become more private, with activities and uses that will pertain solely to residential users.
The separation of the framework and the units infill is essential in creating the design flexibility necessary.
The infill is what determines the size and shape of the units.
The purpose is to create a framework for housing that leaves individual householder with potential responsibility for the arrangement of his housing.
A PROJECT AROUND
THE BOSTON
CENTRAL ARTERY

PLAN AT + 4
SCALE 1:100
PAGE 28
A PROJECT AROUND THE BOSTON CENTRAL ARTERY

PLAN AT +64

SCALE (1/100')

PAGE 31
A PROJECT AROUND THE BOSTON CENTRAL ARTERY
A PROJECT AROUND THE BOSTON CENTRAL ARTERY
A PROJECT AROUND THE BOSTON CENTRAL ARTERY
A PROJECT AROUND THE BOSTON CENTRAL ARTERY
VIEW FROM THE SOUTH
VIEW FROM THE WEST