

A PROJECT OF URBAN RENEWAL

by

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A.R.I.B.A.

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January, 1960.

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## A PROJECT OF URBAN RENEWAL

Submitted by Peter Charles Sugar in partial fulfillment  
of the requirements for the Degree of Master in Architecture.  
January, 1960.

It is intended in this thesis to explore new possibilities for developing an important city sector, taking into account the contemporary problem created by our increased use of the automobile. A way in which this may be achieved is by some kind of vertical separation of the various functions, that make up a sector, rather than employing the more traditional horizontal one.

With such an object in mind, a site was selected, in consultation with the Boston City Planning Board. It is bordered by Huntington Avenue, the tracks of the Boston-Albany Railroad, Dartmouth Street, Columbus Avenue and Massachusetts Avenue. It is considered an important area for the following reasons:-

- a) It adjoins the new Prudential Center.
- b) It is bisected by the New York-New Haven Railroad, which at the moment is providing a strong barrier between the residential districts to the north, and the negro quarters to the south, a barrier, which is considered undesirable both socially, and in terms of future development.
- c) It is a site, which could well become the link in the future between the South End and the Prudential Center.

It is proposed to develop this site architecturally, for mixed use, to be partly a business area - with offices and shops, and partly a high-density residential district - with apartments, a hotel and dormitory-type dwelling-units for students and young people. There are also to be limited warehousing facilities for the retail-trades.

267, Putnam Avenue,  
Cambridge, Massachusetts.  
January 11, 1960.

Dean Pietro Belluschi,  
School of Architecture & City Planning,  
Massachusetts Institute of Technology,  
Cambridge, Massachusetts.

Dear Dean Belluschi,

I hereby submit my thesis entitled "A Project  
of Urban Renewal", as partial fulfillment of the requirements  
for the Degree of Master in Architecture.

Very truly yours,

Peter C. Sugar

Acknowledgements

I should like to express my grateful thanks to the professors of the Massachusetts Institute of Technology, to the gentlemen of the Boston City Planning Board, and to my friends, who with their kind advice and comments have assisted me in the carrying out of my thesis.



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### Introduction

"The City is a fact in nature, like a cave, a run of mackerel or an ant-heap. But it is also a conscious work of art, and it holds within its communal framework many simpler and more personal forms of art. Mind takes form in a city; and in turn, urban forms condition mind. For space, no less than time, is artfully reorganized in cities: in boundary lines and silhouettes, in the fixing of horizontal planes and vertical peaks, in utilizing or denying the natural site, the city records the attitude of a culture and an epoch to the fundamental facts of its existence. The dome and the spire, the open avenue and the closed court, tell the story, not merely of different physical accommodations, but of essentially different conceptions of man's destiny. The city is both a physical utility for collective living and a symbol of those collective purposes and unanimities that arise under such favoring circumstance. With language itself, it remains man's greatest work of art."<sup>1</sup>

There is a great difference to-day between what a city ought to be, and what it actually is. It ought to be a centre for our population, where people from the surrounding areas congregate, in order to live, to work, to manufacture and exchange their products, and to exchange and discuss their ideas, which in turn will promote new concepts beneficial to the whole community, the whole city. In fact, the current trends tend to work in the opposite direction. For many years past, developments in the

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<sup>1</sup> Lewis Mumford: "The Culture of Cities" (1938) p.5.

city have had the result of denying the citizens the right to make the city a pleasant place to live in.

It is attractive to be in the centre of the city. If the city is the focal point of communal existence, likewise the city-centre is the very heart of urban life. To have a place of business in the city-centre becomes a kind of status-symbol, that the businessman quickly recognizes and wishes to act upon. If this was once true of the individual businessman, it is equally true to-day of the large business organizations and corporations. Their acceptance of this idea can be witnessed by the presence of the head-offices and showrooms of most of the leading organizations and corporations in our city-centres to-day, even though the actual location of their factories and workshops may be far away.

A large office has a large number of office-workers, who inhabit it during the day. As they cannot live on the location, they come from the neighbouring areas and the surrounding countryside. Also, as the business expands, apart from the larger accommodation, it will require a more numerous staff, thereby increasing the daily rate of influx into our cities and city-centres.

These two factors, as sketched in above, are the two main causes of the congestion in our cities to-day. Even with the realization of the evils of this congestion, little has been done to alleviate it. A few isolated businesses have moved out into the surrounding country, and established a sort of cloistered campus, where they carry on as well as they can, away from the real flow of life-blood of the community. But, in general, the draw of the metropolitan centre is still a dominant influence. The demand to

inhabit the central areas has resulted in a corresponding shortage of available land. There is no slackening in the rate of movement towards the centre - if anything, the pace has increased.

A large demand and a lack of availability have resulted in a consequent rise in the value of land. Small tracts have acquired astronomical values. Hence, naturally, any new site previously unbuilt upon is much sought after.

As land-values rise, so progressively it becomes less feasible to use central areas economically as places of habitation - with isolated exceptions. The population, that once lived in the central areas, is slowly being crowded out. It is forced to leave, and search out new places of habitation, on the fringes of the city, in the suburbs, in the surrounding countryside. The vacated houses, furtively leased in the meantime to others, await their doomed fate, to be demolished and turned over to a developer, to make a fat profit on in building new places for business and commerce.

In the meantime, the lines of communication have extended. People, who could once walk a few city blocks, have now to spend long, fruitless, nerve-racking hours in travelling miles to their places of employment. What means exist for this? Trains, rapid-transit systems and the motor-car.

The rapid-transit system is speedy, it is safe, and it is inexpensive to use. However, it suffers from the disadvantage of being noisy, uncomfortable and indescribably crowded during the rush-hours. On the other hand, a motor car affords privacy, lack of crowding, and acts as a sign of social prestige.

The rapid-transit systems are often operated at a loss. They have to be subsidized, and therefore are not as extensive and adequate, as they ought to be. At the same time, for reasons just stated, people prefer to use their automobiles.

Our cities still exist in most cases to-day on a street-pattern designed for a bygone day, for outmoded means of transportation. The streets are incapable of coping with the daily deluge of motor-vehicles, that descend on the centres during rush-hours. There is little room for the traffic, which consequently moves at snail's pace. There is even less room for the parking of motor-vehicles.

While some planners would wish to ignore the motor-car, and exclude it altogether from city-centres, I feel, that this is an unrealistic view-point. The motor car is here to stay, and we must learn to live with it. Congestion in the central areas has tended to produce a reaction against centralization, a move towards de-centralization. Metropolitan centres are being drained of their life-blood, contrary, I believe, to the real interest of the community.

"The automobile runs on a two-way street" - says a real-estate speculator. "The motor, that brings the city to the country, can also bring the country to the city. By providing better facilities, our cities must bring back the patronage they have lost." <sup>2</sup>

This is very true. But 'the providing of better facilities' is an ambiguous statement. Whom are the facilities to be

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<sup>2</sup>Roger L. Stevens in the Architectural Forum, November 1953. p.104.

better for? Present signs tend to answer - "the automobile". The rapid development of the highway-system is extending the freeways into the centres of our communities. There is a very real danger, that with our population moving into the suburbs, our cities will eventually disintegrate. Los Angeles can be quoted as an example - "a hundred suburbs in search of a city"<sup>3</sup>. Its freeways are excellent, but as a result, in some instances buildings can be found marooned on little islands amidst a sea of pavements, which like some giant sea-monster, embrace them from all sides with their sinuous tentacles. Perhaps this is one reason, why an effort should be made at a better integration of the transport system with the urban landscape.

Once the stream of cars is deluged onto the antiquated street-system of many of our cities, the problem is still with us. "The pedestrian has been pushed against the wall ... We have a beautiful net of highways for automobiles, but in the city we also have to give back the pedestrian his right of way."<sup>4</sup>

"The whole scale of thinking in terms of communications is inadequate. It should be in terms of the total design of all means of communication, not as isolated engineering achievements, but as integrated elements of town-planning. Nothing short of the complete separation of motor-vehicles and pedestrians throughout the city, either at different levels, or in properly designed

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<sup>3</sup>The Editors of Fortune: "The Exploding Metropolis" (1958) p.9.

<sup>4</sup>Walter Gropius in the Architectural Forum, November 1953. p.104.



Figure 1. "A giant sea-monster" (?) - (The California Freeway System - by the Department of Public Works, September 1958. p.17.)

precincts, should be the aim."<sup>5</sup>

To return to an earlier statement, for all the existing evils, the city centre is still acting as a kind of magnet. Land is needed for further development - and land is still scarce.

It is not suggested, that one should build over open land; the existence, mercifully, of such land near our central areas is an excellent asset for recreation, strolling, playground for our children, and general relaxation from our daily toils. But there exists another type of open land. The railroads push right into the heart of our cities. Their wide tracks running past rows and rows of dwelling units are not a particularly attractive sight, often creating a chasm, almost insurmountable, between adjoining neighbourhoods, reducing the value of buildings nearby, aiding in their falling into a state of disrepair, and often turning them into slums.

One could advance the idea, that some of the railroads already depressed below the grade, should be covered and built over, thus producing valuable additional building space, at the same time getting rid of one of the dividing agents of our cities.

It is proposed in this thesis to attempt a project of urban renewal, and look at some of the problems here stated.

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<sup>5</sup> P.E.A. Johnson-Marshall on "Comprehensive Redevelopment" in the Journal of the Royal Institute of British Architects, April 1959.p.193.



### The Site

A site has been selected, in consultation with the Boston City Planning Board, with the following boundaries:- Huntington Avenue on the north-west, the tracks of the Boston-Albany Railroad on the north, Dartmouth Street on the east, Columbus Avenue on the south-east, and Massachusetts Avenue on the south-west. The area enclosed is 67.5 acres.

The site has great importance due to a number of factors. It is bisected along an east-west axis by the New York-New Haven Railroad, whose right of way cuts through Boston, creating a veritable canyon between the South End and Roxbury on one side, and the more fashionable Back Bay on the other, with only very few connecting bridges between them. The south side of the tracks has developed into a negro quarter, and socially it is very difficult, indeed almost impossible to cross "over the bridge"<sup>1</sup>. This kind of barrier is most undesirable in terms of future development, and an attempt will be made to obliterate it.

The Prudential Center, "the world's largest integrated business, civic and residential development", "the jewel in the crown of tomorrow's Back Bay"<sup>2</sup> will adjoin the site to the north of Huntington Avenue. One may not endorse these glowing terms of adulation, but one must admit, that the Center will undoubtedly prove to be a draw for urban life.

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<sup>1</sup>Robert W.Morgan Jr.: "Over the Bridge" in the Atlantic, February 1959. p.73.

<sup>2</sup>Comments in the "Prudential Center" - published by the Prudential Insurance Company - Northeastern Home Office - 1958.



Figure 2. Site photographs - by the author

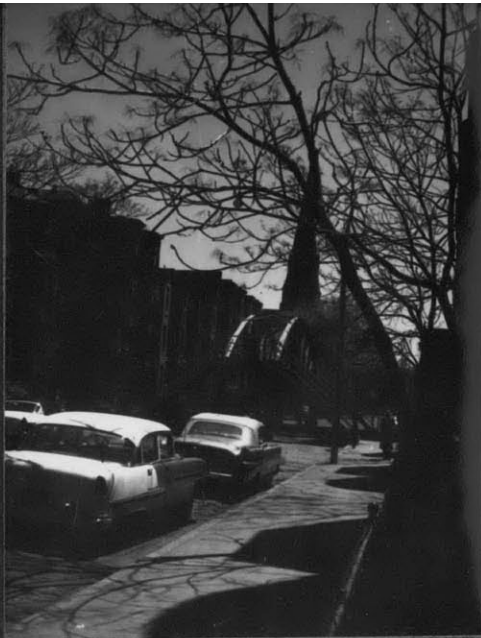


Figure 3. Site photographs - by the author

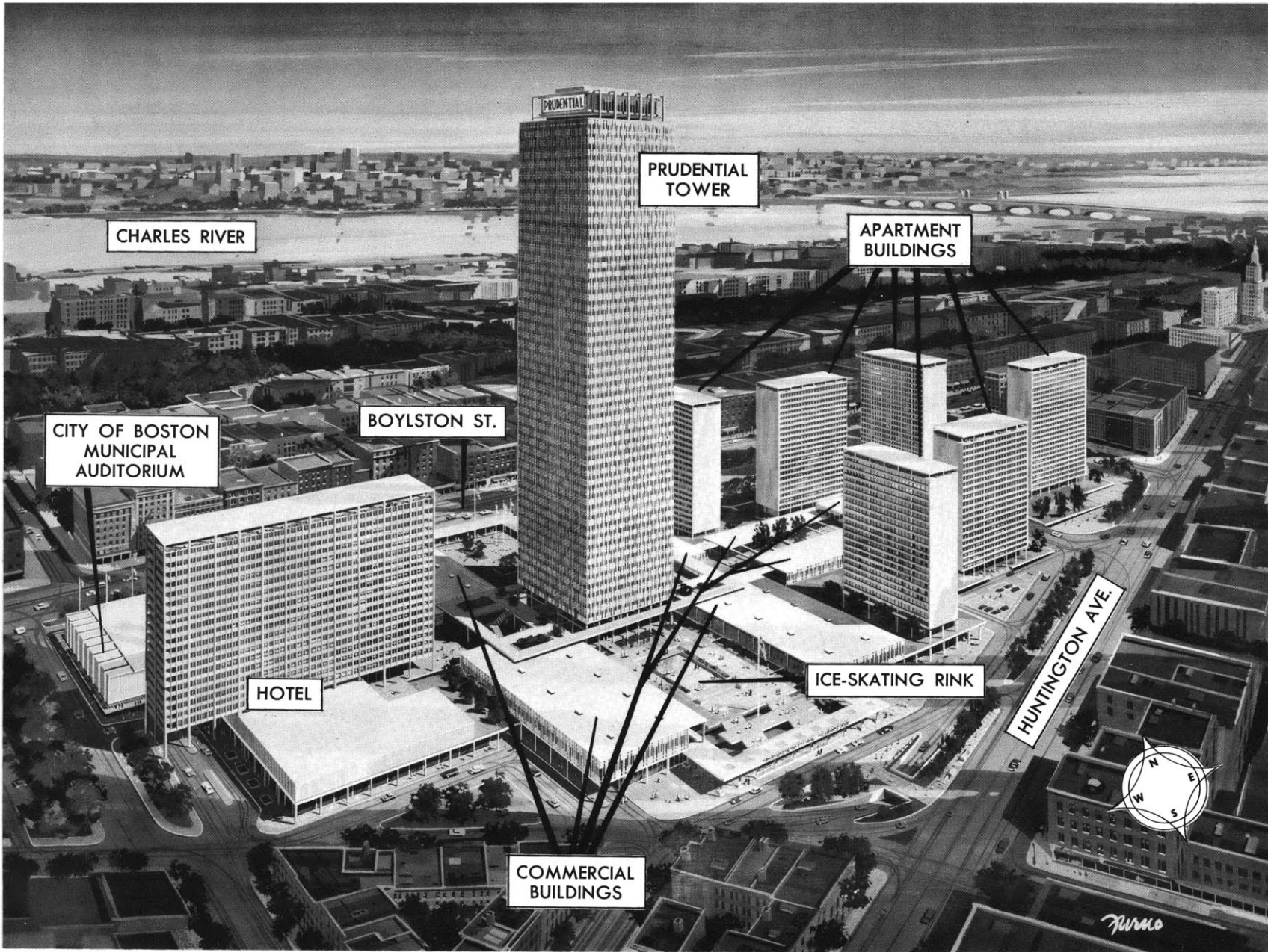




Figure 4. Site photographs - by the author

Sometime in the future, the slums of the South End will have to be cleared, and the area redeveloped as a residential district fit for decent human habitation. At such time, the site selected will become the link between the South End on the one hand, and the Prudential Center and Back Bay on the other.

At the moment, the site is covered by buildings, mostly houses, in various stages of dilapidation. It is proposed to demolish these buildings, and start with a clean slate. There exists on the other hand a church, on Columbus Avenue, between West Rutland Square and West Newton Street. It is proposed to preserve this church. It is felt, that it already acts as a kind of visual focus for the site, among its other functions as a religious building, and it could well be retained as a landmark, identifying one of the entrances to the site in the future.



PRUDENTIAL CENTER - BOSTON

Figure 5. By the courtesy of the Public Relations Department, the Prudential Insurance Company of America.

### Programming Factors

The site was originally zoned wholly for residential use. It was intended to serve middle-income families, and act as a kind of transition between the poorer families of the South End, and the higher income families of the Prudential development. But other considerations have come to the fore.

If one looks at the pattern of schools, both existing and proposed, they all appear to lie south of the site chosen. Therefore, in considering the residential area, it would be preferable to think in terms of families with one or no children.

Huntington Avenue is at the moment quite a centre for the younger generation. There are the intellectual attractions of Northeastern University, Jordan Hall and Symphony Hall at one end, and the jazz-clubs and night-spots at the other. In between the two, there is a natural flow of activity, back and forth. This is accentuated by the number, though a very inadequate number of student-hostels already in the area. When thinking in terms of residential development, a place should therefore be given to young people and students.

Considerations, such as these will, of course, create dwelling-units with the number of people in each being well below the national average.

The advantage of open spaces has already been pointed out. There is a tentative proposal to establish a pattern of pedestrian circulation in Boston, a system of walkways, perhaps after the manner of Philadelphia, with a concurrent system of small parks, scattered along en route, lying on the natural line of this pede-



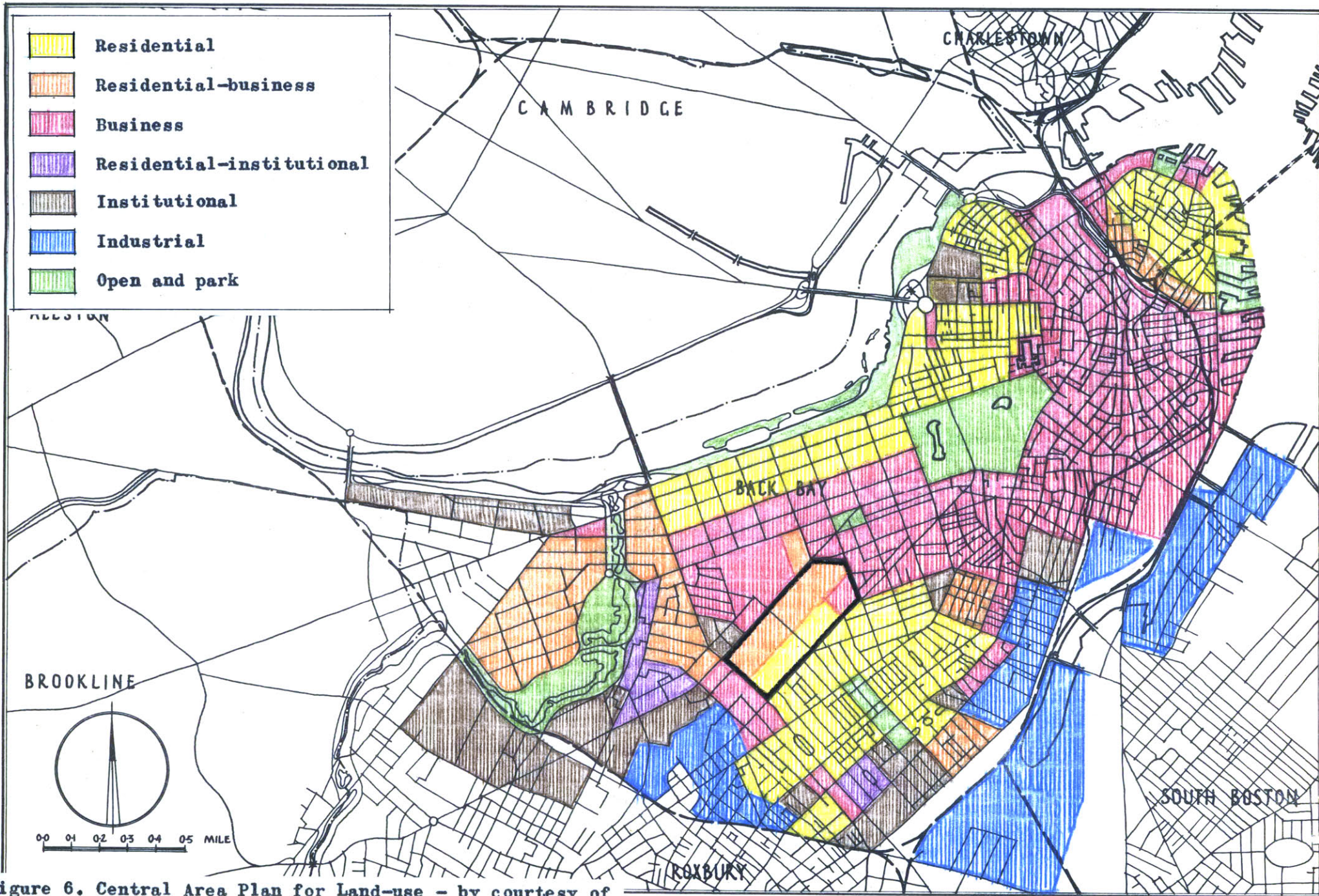


Figure 6. Central Area Plan for Land-use - by courtesy of the Boston City Planning Board



striation traffic-flow. These parks would have to be carefully sited, to become focal points and rest-areas, where the lines of circulation would meet, rather than be placed out of the way, away from their rightful locations. As there will have to be an access-way running east-west, possibly along and above the present railway-tracks, heading towards the down-town areas, and another running north-south, from the South End to be developed in the future, and the Prudential Center and Back Bay, at their intersection, on this site, one such park could be established.

When thinking about a community centre, it should be observed, that there is already a cultural centre based on Symphony Hall, and therefore it would be logical for a community centre to be located in the western half of the site. Furthermore, as it is intended chiefly for the use of younger people and childless couples, it ought to include such facilities, as a swimming pool, small auditorium, club-rooms, meeting rooms and games-rooms.

Downtown Boston is, like many of its counterparts, heavily congested. There is practically no land available for new developments, and the present floor area ratio is a very high 8:1. Yet it is vital to have room for expansion, if Boston is to maintain its position, as a leading business and commercial centre. To quote a report on this aspect:- "The City Planning Board believes, that while Boston must rely mainly upon its existing business and industrial areas in meeting the requirements of the future, every chance to expand these sites by conversion of suitable contiguous areas should be considered carefully. Only in this way can the city continue to grow as a healthy heart of the expanding metro-

politan community."<sup>1</sup>

It is also important to point out, that while retail business has been rising in volume for Boston, as a metropolitan area, the trend is in the opposite direction for the downtown district. The reasons for this could be the congestion and lack of adequate off-street parking facilities.

Hence grounds exist to extend the business and commercial district westward. With the Prudential Center, the immediate surrounding areas would become a more attractive location. Consequently, premises for business concerns could be located on the site selected. This business could and should include some shopping facilities, especially as the site will house a number of people greater than at present.

The densities affecting the development will be a floor-area ratio of 3:1 for the business district (the figure is 8:1 in the down-town area, as already stated), and 300 persons per net acre for the residential district. The latter figure is fairly high, but as it would include a number of so-called non-housekeeping units, one can think in terms of a higher density, than, say, in the South End, where zoning calls for a figure of 60 to 85 families per net acre.

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<sup>1</sup>General Plan for Boston - Boston City Planning Board. Preliminary Report - 1950. p.29.

### Transportation

Transportation is an ever present problem. I feel, that some of the background to the selected site ought to be mentioned here. The circulation pattern for Boston is not quite clear at the moment in terms of the future. However, as planning stands now, it is intended, that an inner ring road, to parallel the outer ring of Route 128, should be the only freeway approaching the centre of the city. The possibility of a freeway piercing the centre and terminating right at the doorstep ought to be discounted. Its disadvantages are obvious in that it would dump a large volume of traffic at a point already heavily congested.

From the inner ring road, there would be a number of feeder roads serving the downtown and the districts north of Commonwealth Avenue. Huntington Avenue and Columbus Avenue would be such feeders in an east-west direction, while Berkeley Street, West Newton Street and Massachusetts Avenue would serve the same function in a north-south direction.

From the point of view of the site chosen, Columbus Avenue must be looked upon as the major means of access, for several reasons. It could well be widened to one-hundred feet instead of the present eighty. It is not unduly overloaded with traffic, and could take a much greater volume, which becomes obvious from the study of the Cordon Count for 1954. Finally, the new Prudential Center will greatly increase the traffic load on Huntington Avenue.

Turning one's attention to the state of the railroads, they are slowly and steadily losing ground. If present trends continue, it can be estimated, that commuter traffic by rail is going

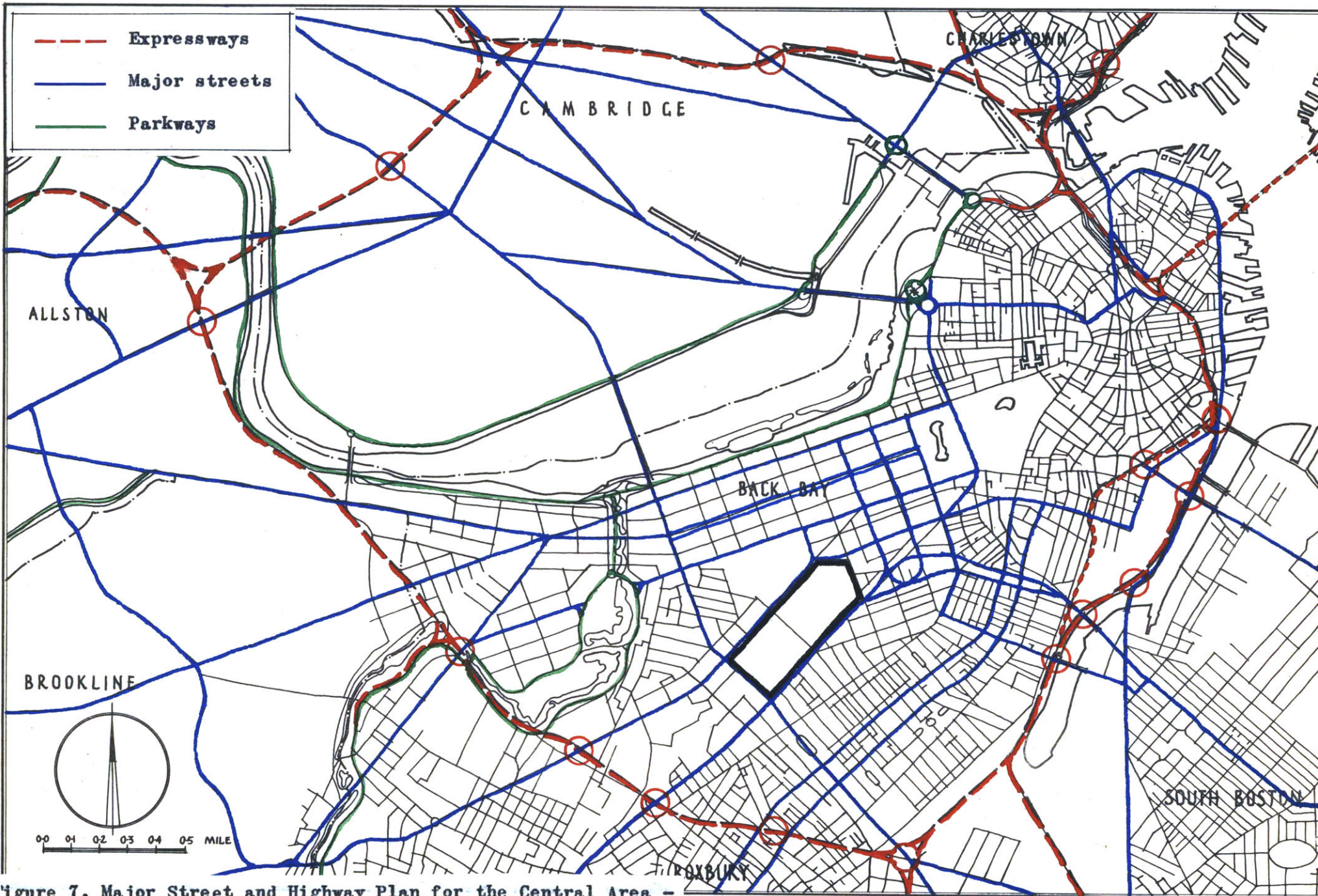


Figure 7. Major Street and Highway Plan for the Central Area -  
 (The Boston City Planning Board)

to diminish rapidly, and will soon disappear. Similarly, with the development of highways and air-traffic, even main-line service may be reduced appreciably, possibly by as much as 50%, with the result, that only, say, twelve trains a day will continue to use Back Bay Station.

The section of the New York-New Haven Railroad in question has five tracks at the moment. If the above presumptions should materialize, only the centre three tracks of the railroad will remain in operation. This poses the interesting possibility of the basement storeys of any new buildings along the tracks being used for warehouse-storage purposes, employing the side-tracks, as a means of access. Such warehouses should be used for the storage of goods related to the retail-business.

The Railroad ought to welcome this possibility, as a means of gaining additional income. Even, if only one side-track would be used for warehousing purposes, the other ought still to be retained, to allow the Railroad a certain amount of flexibility.

At one time, there was the possibility of turning over to the MTA the use of some of the tracks for rapid transit facilities. But this must be discounted, as the public transport system of the MTA, as existing and planned appears to be adequate, especially with the proposed new Stuart Street Subway. Neither would the Massachusetts Turnpike Authority be interested in the use of the tracks, as they are now contemplating a six-lane highway, connecting Weston with South Station along the tracks of the Boston-Albany Railroad.

Examining the MTA facilities in slightly greater



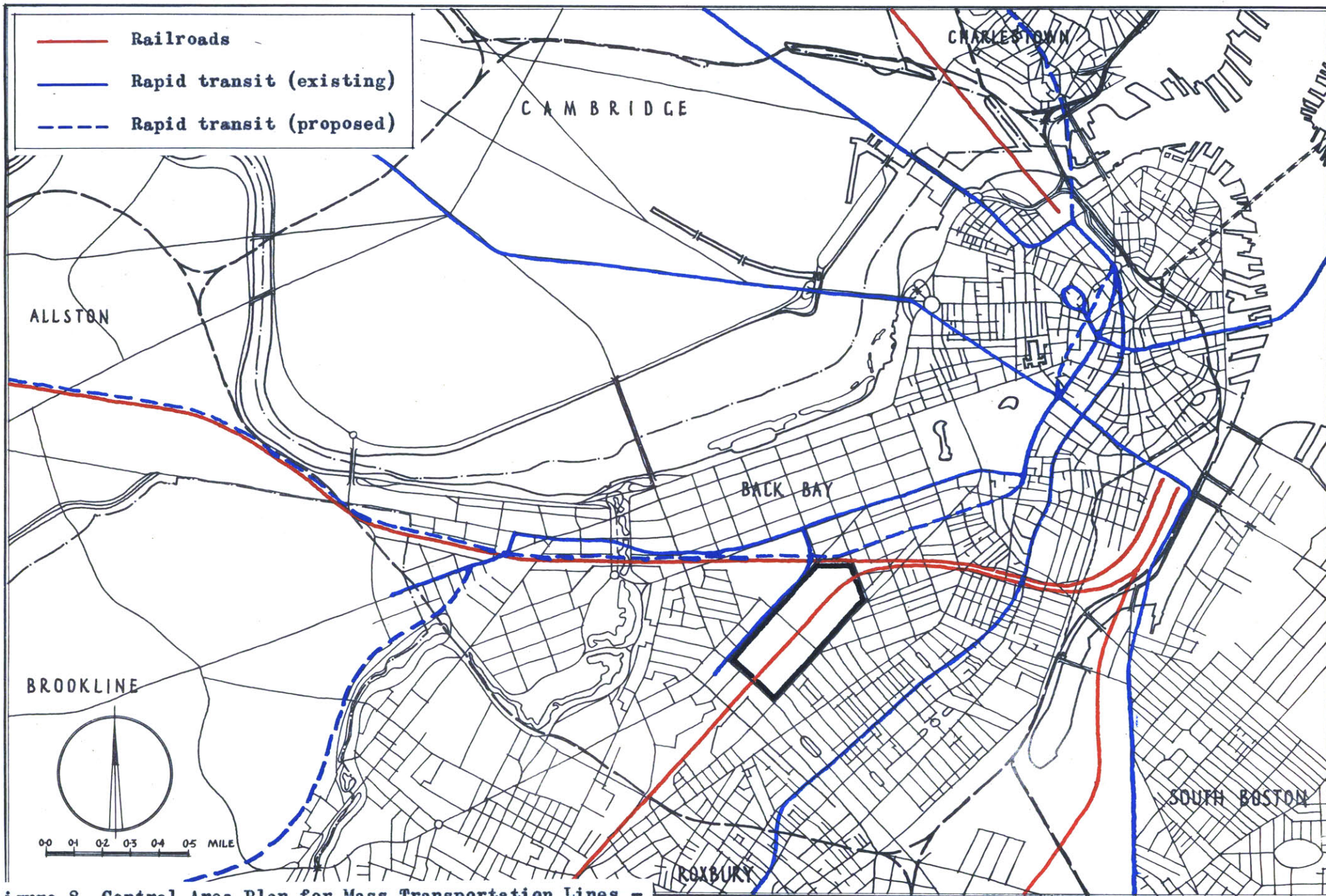


Figure 8. Central Area Plan for Mass Transportation Lines -  
 (The Boston City Planning Board)

detail, one finds two subway stations adjoining the site. They are Symphony and Mechanics. There are also a number of stations within reasonable walking distance of the site. They are Massachusetts Station, Copley Square and a new station planned for a location between Trinity Place and Clarendon Street, on the new Stuart Street Subway already mentioned. In addition, the existing facilities at Massachusetts Station, Mechanics and Copley Square are to be improved by the installation of escalators.<sup>1</sup>

There are four bus lines presently operating in the area. Two lines connect with the down-town districts - the no.52 bus from Copley Square to South Station (a rush-hour service only), and the no.54 bus along Boylston Street to Bowdoin Square. One line, the no.68 bus runs along West Newton Street to the South End, and one line, the no.47 bus along Massachusetts Avenue to Dudley Station.

The facilities here described would appear to indicate that sufficient provisions exist to enable future residents of the site, if they should so desire, to use the public transport system in communicating with the surrounding districts. On the other hand, for reasons already stated, the automobile will still be a major factor in transportation. Therefore, in any future plan formulated for the site, adequate off-street parking will have to be provided to make the project self-sufficient in this respect.

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<sup>1</sup> See the Report of the Trustees of the MTA on Rapid Transit Facilities in connection with the Prudential Development. March 20. 1959.

Programme

With all the above-stated factors in mind, the following programme has been decided upon:-

Business use

1,191,000 sq.ft. (1/3) 9.15 acres

Shops and restaurants

315,000 sq.ft. (1/3) 2.40 acres

Local shopping centre

2.10 acres

Community centre

50,000 sq.ft. of building 2.00 acres

(The type of accommodation to be contained to be:-

Swimming pool,  
auditorium and dressing rms,  
small meeting room,  
small library,  
exhibition space,  
billiards and table-tennis,  
crafts room,  
multi-purpose room,  
first-aid room,  
lounges,  
small office,  
storage space.)

Park 10.00 acres

Streets (appx. 22.3% of the site) 15.00 acres

Dwelling units 26.85 acres

Total 67.50 acres

At a density of 300 persons per net acre, there would therefore be 8055 people. The following break-down is suggested:-

Hotel --- 155 rooms and ancillary accommodation --- 155 units

20% of the people in families with one child; 1581 people --- 527 units

50% of the people in families of two 3950 people -- 1975 units



|   |     |                   |
|---|-----|-------------------|
| Of the rest, 1000 people in single<br>units           | --- | 1000 units        |
| 580 people in twos                                    | --- | 290 units         |
| There would also be student-hostel<br>accommodation:- |     |                   |
| 500 male students                                     | --- | 500 units         |
| <u>289 female students</u>                            | --- | <u>289 units</u>  |
| <u>Total</u>  |     | <u>4736 units</u> |

Over the whole site, there should be car-parking accommodation for 6000 cars.

Further to this programme, a small fire-station and a small clinic will be included in the requirements, as well as an estate office to manage the rental and upkeep of the accommodation.

### The Objectives

The objectives in any design proposed for the site would appear to me to be three-fold.

All too often to-day, new developments follow a traditional, orthogonal type of layout, so much so, that practically every variation of this approach must have been tried out at one time or another. I feel, that one must look into systems other, than this, which would allow one a greater flexibility. At the same time, present-day schemes create divisions in function by following an almost arbitrary, empirical line, employing horizontal separation, where buildings are placed on a site haphazardly, with little or no cohesion. I feel, that development could be so devised, that vertical separation could be obtained, placing the money-earning facilities, such as warehouses, shops and offices at the bottom, and interlocking them with residential buildings on top. The latter could then enjoy a greater freedom, being divorced to a certain extent from functions they are not at all concerned with. This kind of vertical separation could also keep the automobile to one level, or one set of levels, and completely liberate the site at another level for the sole use of the pedestrian.

One can observe the Prudential Development, and soon realize the implications of its magnitude. It is said to be twice the size of the Rockefeller Center in New York. Also, the 52-storey Prudential Building "will rise more than 750 feet above the ground to become the tallest building in the world outside Manhattan."<sup>1</sup>

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<sup>1</sup>See "Prudential Center" op.cit. p.3.

These advertizing remarks suggest to me something other, than what they seem to imply. I feel, that buildings of such huge, gargantuan proportions are out of place in a city such as Boston, failing entirely to take into account the existing topography and city-scape, or even attempting to harmonize with the present scale. At the same time, the Center is now under construction, and therefore the design for my site will in some manner have to provide for a link between the mammoth scale of the Prudential Development, and the smaller scale of buildings, that will in the future exist in the South End.

Railroads can be placed in a tunnel without artificial ventilation for a length not exceeding 2500 feet.<sup>2</sup> This would allow me to cover over the tracks of the New York-New Haven Railroad for almost their entire extent along my site, and thus overcome their harmful effect of creating a chasm between adjoining areas.

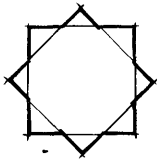
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<sup>2</sup> See the American Railway Engineering Association Manual.

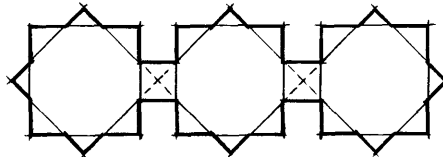
The Design

In the design, I am proposing to work with a system of squares. By placing these squares over each other, and rotating their axes by 45 degrees on each floor, the resulting geometric order is such, that enables one to join these squares in a series, either of straight lines at right angles or at angles of 45 degrees to each other.

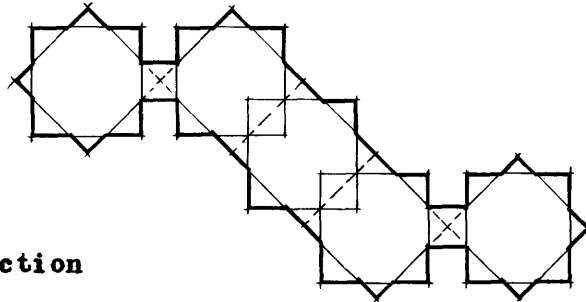
Basic unit



Straight line



45° junction



Apart from the flexibility in space enclosure, this system, I feel, has other advantages. It makes it possible to express individual units to the onlooker without destroying the strong relation, which any unit has to the system as a whole. It gives each individual unit a reasonable amount of privacy, which is especially important, when dealing with a residential density of a very high order. Also, a great number of balconies can be provided organically

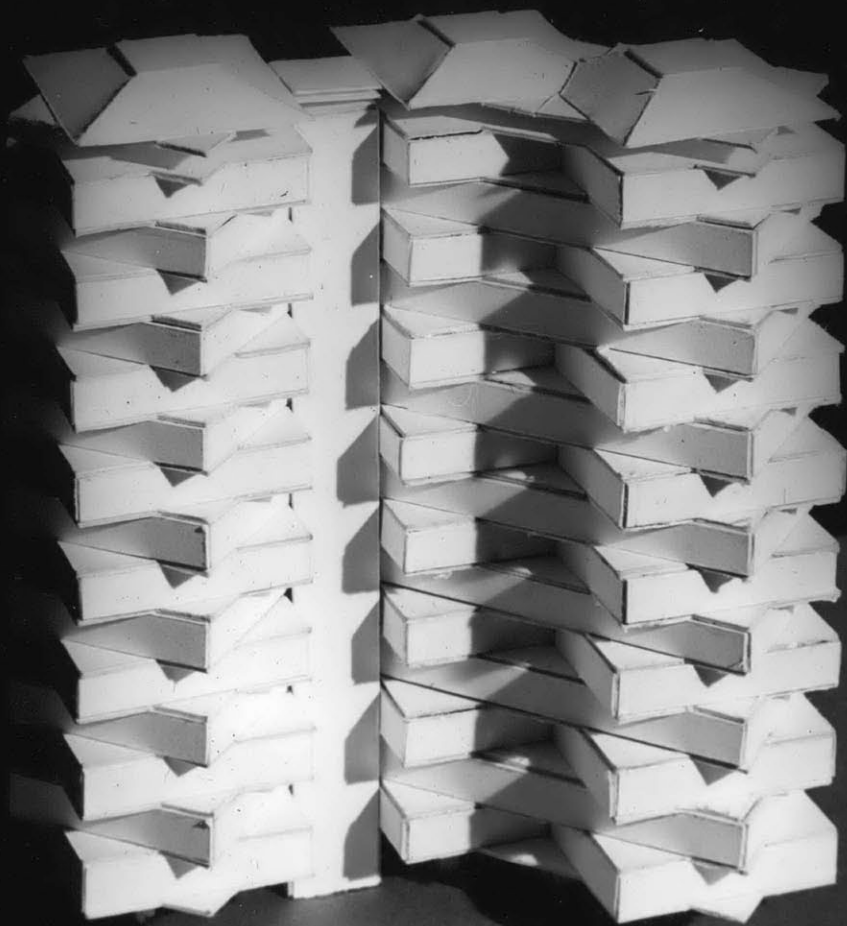


Figure 9. Model showing typical grouping of units

within the system, rather than becoming an attachment on the facade. The latter point has two advantages. It gives each living space an external extension, an amount of 'open space' especially important to people living on the upper floors, not in close proximity to the ground below. Moreover, balconies and apartments, alternating and twisting at 45 degrees give a great amount of richness to the facade, in contrast to the number of contemporary, flat, box-like buildings in our cities.

The height of the apartment buildings has been set at fifteen floors. It is felt, that this height is more akin to the scale of Boston, while it also acts as a link between the South End and the Prudential Center, the apartments of the latter being twenty-five storeys high.

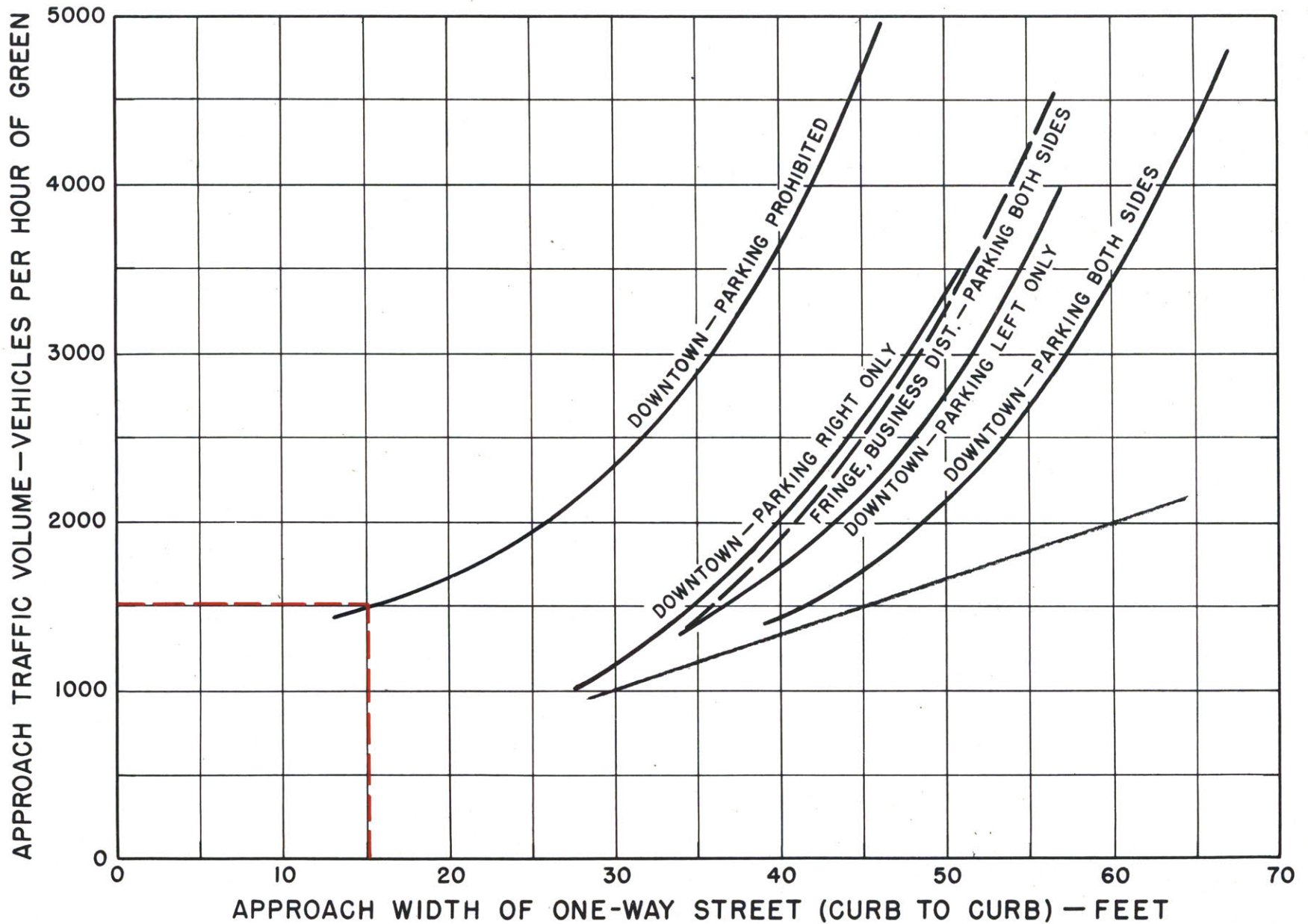
The commercial buildings have been kept to four storeys above street level. They have been treated simply, to become a foil to, and at the same time emphasize, the richness of the apartment buildings. I feel, that the latter gain their richness by means of a visual breakdown of their large scale to the smaller scale of the individual apartments. In contrast to this, the simple, broad treatment of the commercial buildings is more in harmony with the scale of their function.

Apart from the possibility of some of the commercial buildings becoming department stores, the street floors of these buildings have been designed as shops and stores, in order to enliven the street-scape for the passer-by. At the same time, the floors facing out towards the centre of the community are also devoted to shopping, and the promenades, with their 60,000 square feet of shops

have, in fact, been designed as the shopping centre of the neighbourhood. This permits residents to shop at close proximity to their homes, without ever having to go out onto the surrounding streets.

The disrupting effects of the automobile circulation on pedestrian circulation have already been discussed in detail previously. I have aimed at separating the pedestrians from the automobiles, as soon as they enter the site. A platform has been placed over the site, which is intended for pedestrian use only. It would be landscaped, with some changes of level, to give the passer-by a variety of visual experiences. Underneath the platform are three floors of car-parking, approached by a 30'0" wide ring-road encircling the site. There are four entrances and exits, each 15'0" wide. The calculations have been based on the attached diagram (fig.10.), which would allow the peak-hour condition of approximately three-thousand cars to clear from the site in just over thirty minutes.

The warehouse facilities have a separate circulation system. This type of activity would continue all day, and I feel, that it must not interfere with the rush-hour traffic in the mornings and evenings.



**FIGURE 10 - INTERSECTION CAPACITIES OF ONE-WAY STREETS  
FIXED-TIME SIGNALS**

(By courtesy of the Traffic Engineers Department - MIT)



### The Structure

Structurally, a column-spacing at centres of 30'0" has been adopted. This would work well with the car-parking. Also, it subdivides conveniently into centres of 15'0", which is a dimension well suited to the residential buildings above. These buildings are constructed with a cluster of four columns at their core, from which each floor-slab would be cantilevered, with only stiffening members on the facade. This would make it possible to raise the buildings off the ground, reducing their 'weight' for the pedestrian, while at the same time providing him with an additional spatial vista.

The wind-bracing would be incorporated into the walls of the staircase-towers. The quasi-sinuous curve of the buildings adds further to their stability in resisting wind-pressures.

As every floor-slab is identical in shape, the structure would lend itself to a lift-slab type of construction. I feel, that this possibility ought to be explored, when tenders are invited from the contractors.

Supporting a structure of this weight is somewhat of a problem, when dealing with the existing soil-conditions in Boston. At present, the situation is such, that piles for heavy buildings are being driven to a stratum of rocks at a depth of 200'0", while lighter buildings can be supported on a layer of sand at a depth of 35'0". This latter condition entails the acceptance of a certain amount of settlement.

On the other hand, there exists the possibility of

'floating' the entire structure, by considering it as a kind of giant 'raft' out of which the taller buildings would rise. This type of solution is free from any settlement, provided that soil equal in weight to the weight of the whole structure is removed from the site. I feel, that this could well be done, by utilizing the railroad, that runs through the site, to remove any excess soil.

The Financial Basis<sup>1</sup>

I am including a financial estimate in this thesis, but in doing so, I should like to point out certain inadequacies. I feel, that making any accurate calculation at this stage is virtually impossible, due to several factors:- the yearly fluctuations in construction costs, the changing structure of the Boston property tax assessments, and the lack of knowledge as to the cost of the structural system proposed, something that could be ascertained only after a careful structural analysis. Furthermore, even though an informed guess can be made as to the amount of taxes, that will have to be paid annually to the city, this figure would have to be approximate, as no exact assessment would be available until final completion of the project. Therefore all, that I am attempting to show here, with the limited amount of information at my disposal, is that this development is theoretically feasible from any future developer's point of view.

The calculations have been based on the following figures:-

1. Excavation costs of \$5 per cu.yd.
2. Construction costs:-
  - a) Offices, shops and community centre at \$20 per sq.ft.
  - b) Apartments at \$17 per sq.ft.

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<sup>1</sup>Information regarding this chapter has been obtained from the following sources:-

- a) "Tax Policy" Volume XXVI. No.1. January 1959.
- b) Mr.Oliver Park of the Assessing Department of the Boston City Hall.
- c) The offices of the Architects' Collaborative, Carl Koch & Associates and Hugh A. Stubbins & Associates.

c) Warehouse and garage at \$8 per sq.ft.

3. Land-cost of \$3 per sq.ft. (This figure is perhaps lower than the final value of land after completion of the project. However, it is considered, that the city would accept such an offer due to the zoning and density restrictions it is imposing on the scheme.)

4. Landscaping costs of \$4 per sq.ft.

5. Taxes payable to the city to be calculated at 20% of gross annual income.

6. Maintenance of the project (including repairs due to dilapidation) to be calculated at 40% of gross annual income.

7. Offices to be let at \$5 per sq.ft. per annum.

8. The apartment rents to be as follows:-

a) Family-units at \$210 per month

b) Units for couples at \$180 per month

c) Units for people living in twos at \$200 per month

d) Units for single people at \$135 per month

e) Study-bedrooms for students at \$40 per month.

These figures are based on an average rent per room of \$30 per month. This can be compared with a rent per room of \$48 per month, as worked out in the case of the new West End Development.

9. The hotel-rooms to rent at an average of \$12 a night

10. The warehouse space to be let at \$4 per sq.ft. per annum

11. The garage space to be let to an operator(s) at

\$1.50 per sq.ft. per annum.

The actual figures will now be as follows:-

Debit

|                              |                       |
|------------------------------|-----------------------|
| Land-cost                    | \$ 8,820,900          |
| Excavation cost              | 2,784,750             |
| Offices                      | 19,820,000            |
| Shops                        | 6,300,000             |
| Community centre             | 1,000,000             |
| Apartments                   | 81,518,400            |
| Warehouse and garage         | 40,100,400            |
| Landscaping                  | <u>3,022,400</u>      |
| <u>Total cost of project</u> | <u>\$ 163,366,850</u> |

Credit

|                                      |                      |
|--------------------------------------|----------------------|
| Offices                              | \$ 5,955,000         |
| Shops                                | 1,575,000            |
| Apartments                           | 8,291,160            |
| Hotel                                | 669,000              |
| Garage                               | 7,218,000            |
| Warehouse                            | <u>800,000</u>       |
| <u>Gross annual income</u>           | <u>\$ 24,508,160</u> |
| Annual taxes (20%)                   | \$ 4,901,632         |
| Annual maintenance cost (40%)        | <u>\$ 9,803,264</u>  |
| Therefore - <u>Net annual income</u> | <u>\$ 9,803,264</u>  |

This income would represent a fraction over 6% of the original capital outlay. In conclusion, it should be noted here, that in connection with the Prudential Development, a city official had stated, that 6% was a reasonable return to be expected on this type of investment.

### Conclusion

Many residential developments to-day would appear to do two things. They are either placed on their sites in a haphazard, disorganized fashion, or else fail to regard the surrounding city, as something to which they themselves also belong. The result in the latter case is an almost total separation from the adjoining city-sectors. At the same time, the community centre of the new development tends to express itself not as such, but rather as a civic centre. Instead of harmonizing with its neighbours, it sets up in competition with them. To mention just one example, some of the entries to the Society Hill Competition in Philadelphia seemed to me to have been conceived on these principles.

I have in my design attempted to open up the street-front of the development, to provide open spaces on the fringe, and an invitation to the passer-by, by means of gently sloping landscaped areas, or terraces and staircases, to enter the neighbourhood, and enjoy the facilities provided by the scheme.

It is for the onlooker and critic to pass judgement on the success or failure of my enterprize.

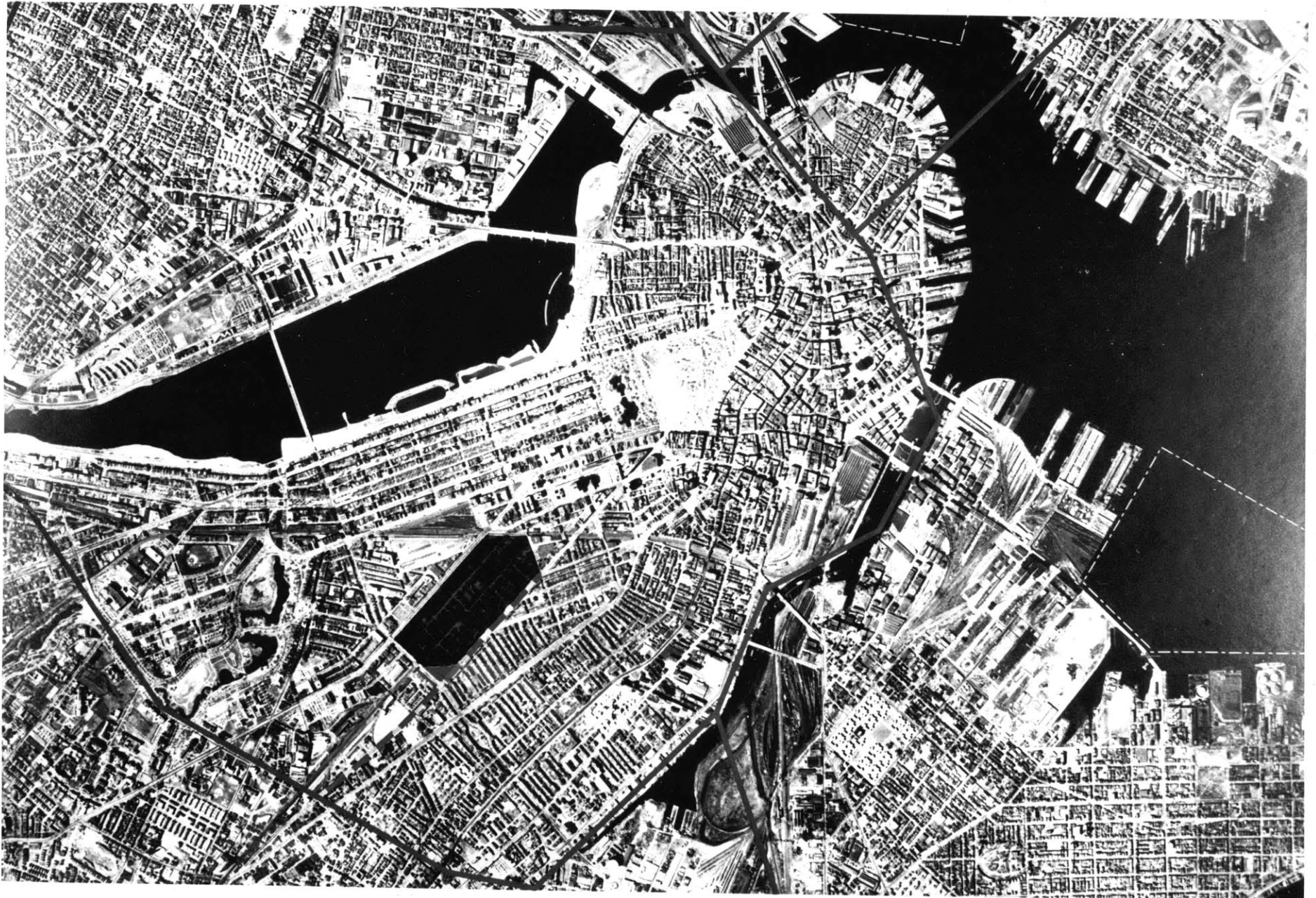


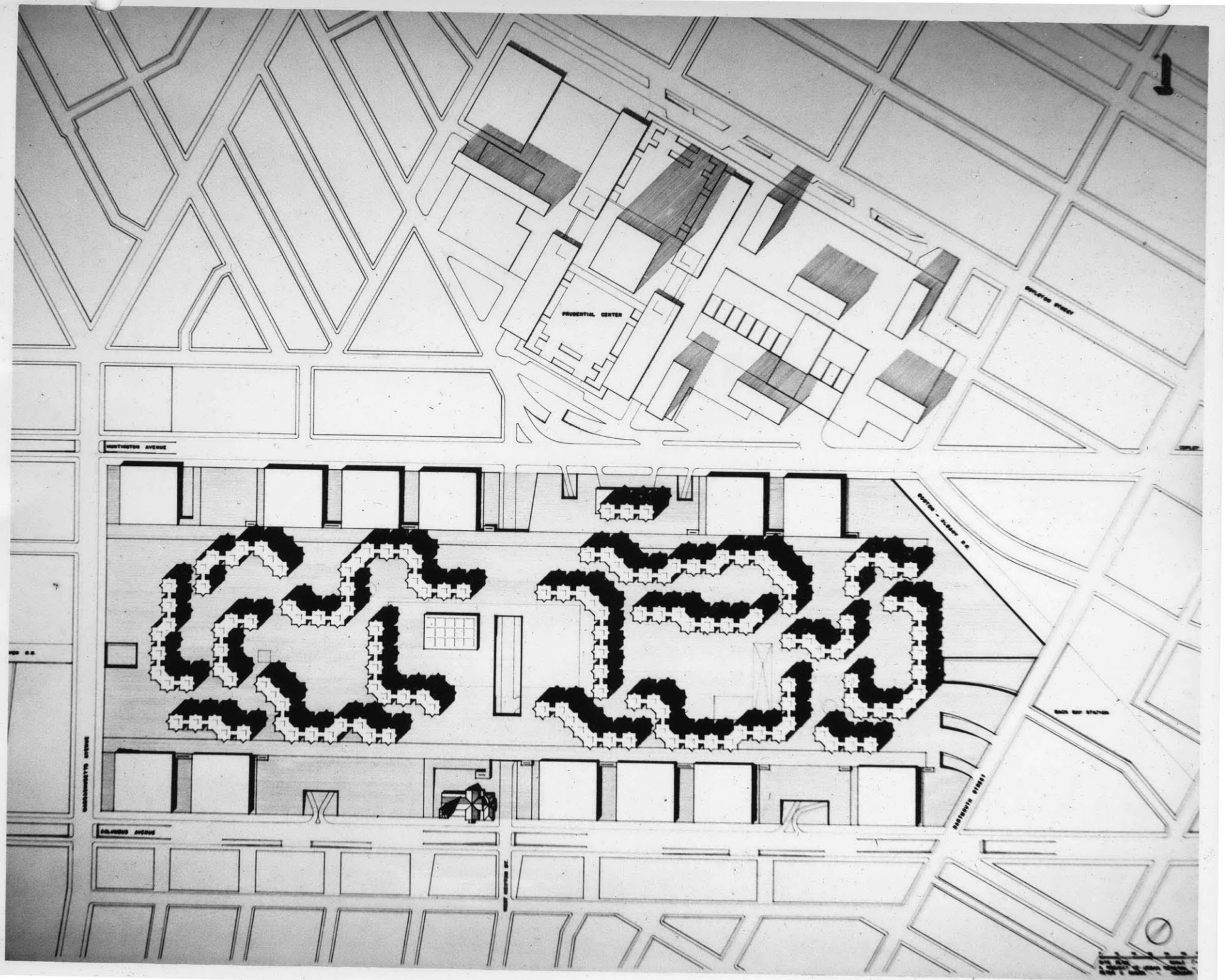
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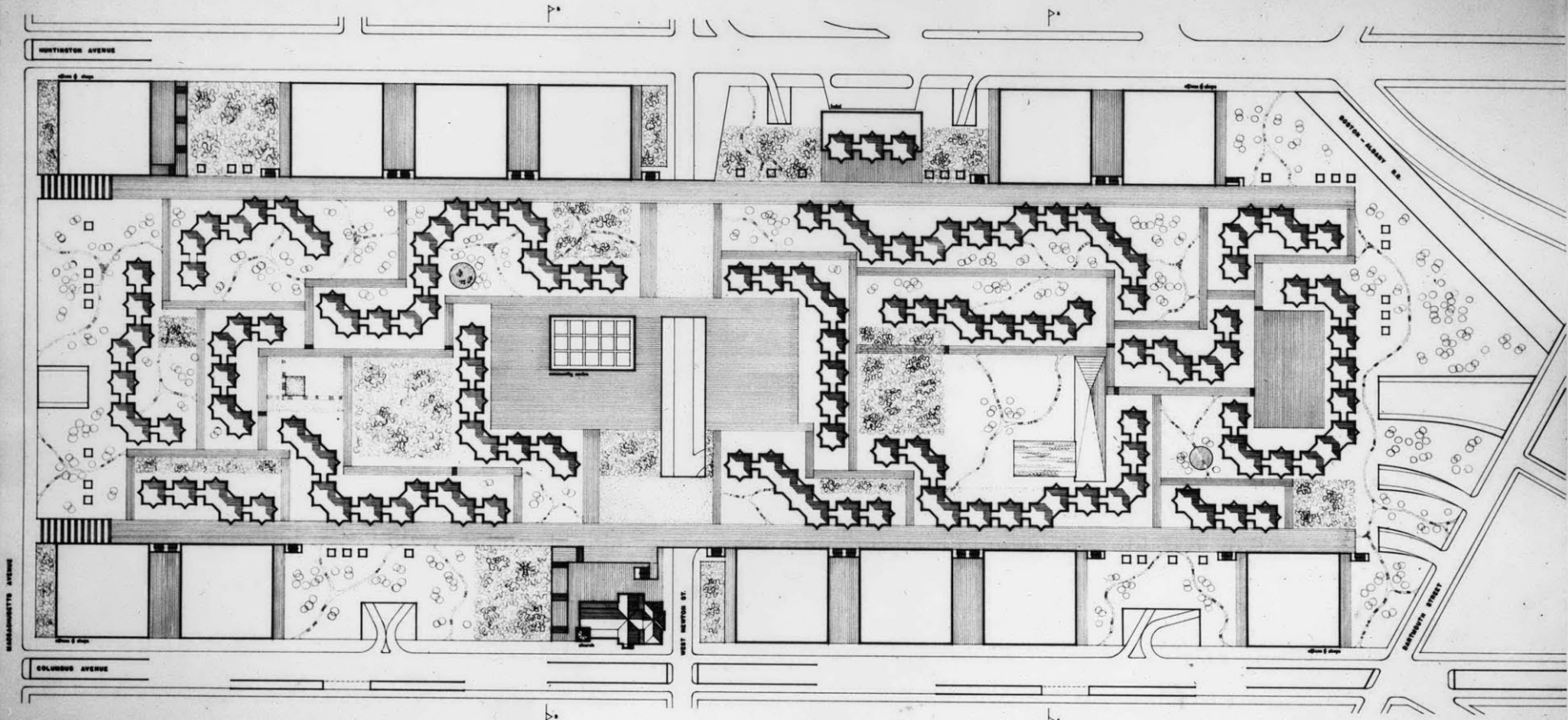
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(on the levels of the water-table in the Back Bay)
23. Mr.Davidson of the Boston College Seminar Research Bureau  
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24. Mr.B.Heald, Division Engineer of the New York-New Haven  
Railroad.
25. Mr.R.Sullivan, Superintendent of Transportation of the MTA.

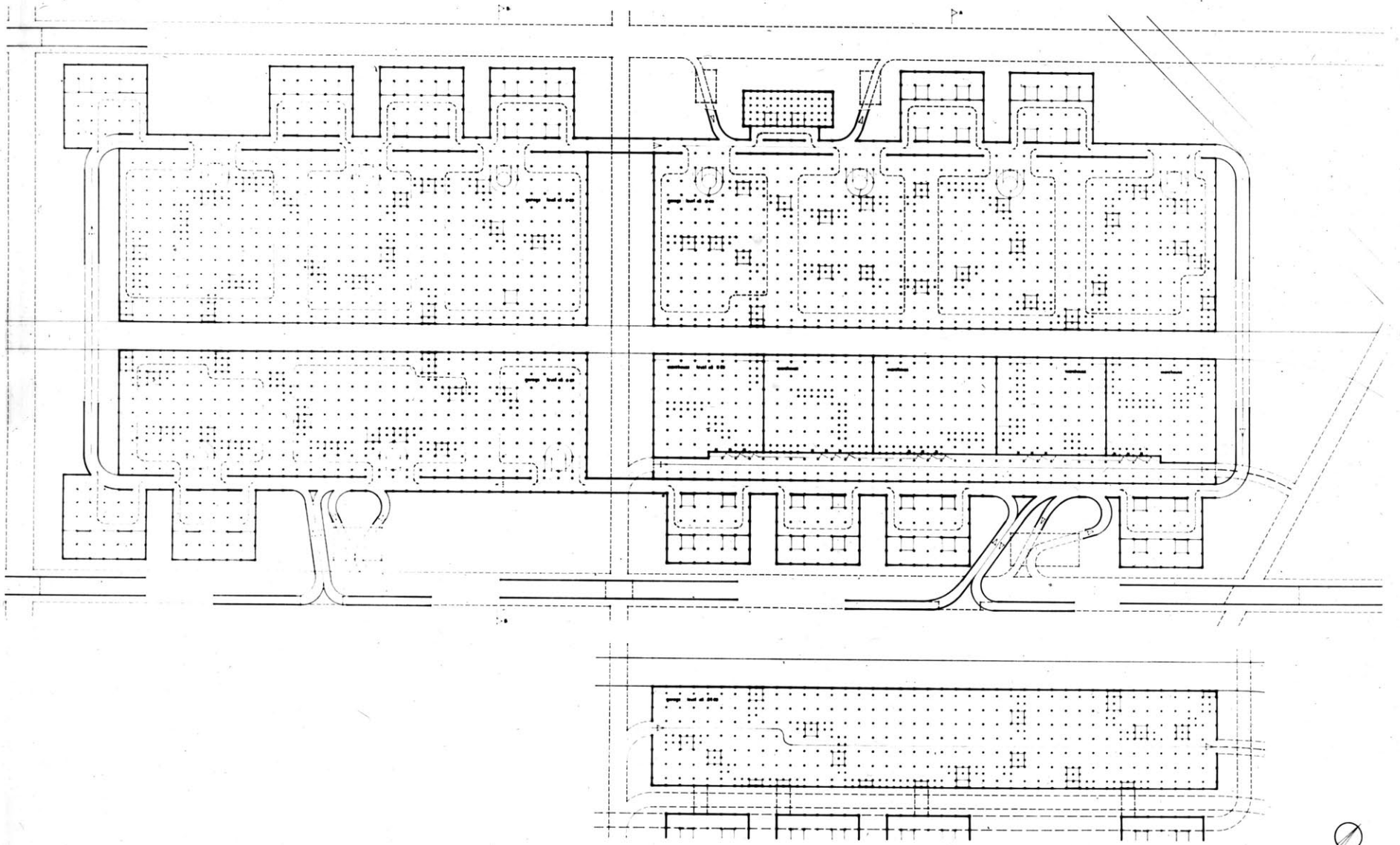
# A PROJECT OF URBAN RENEWAL



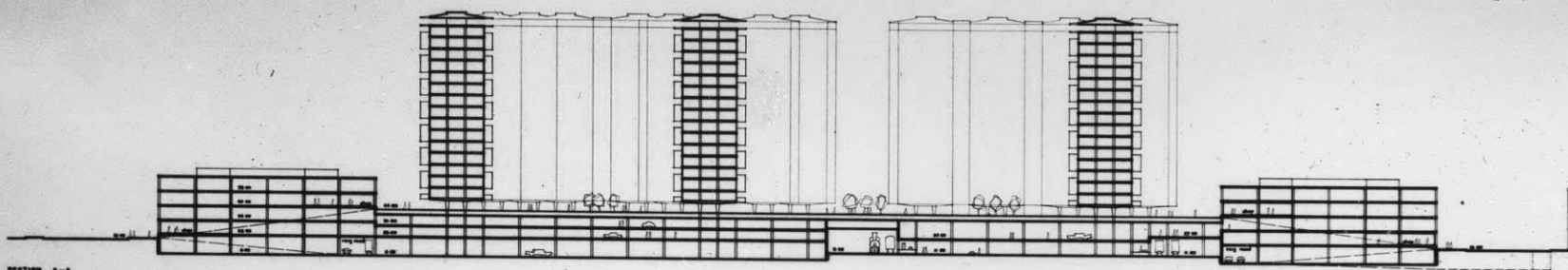




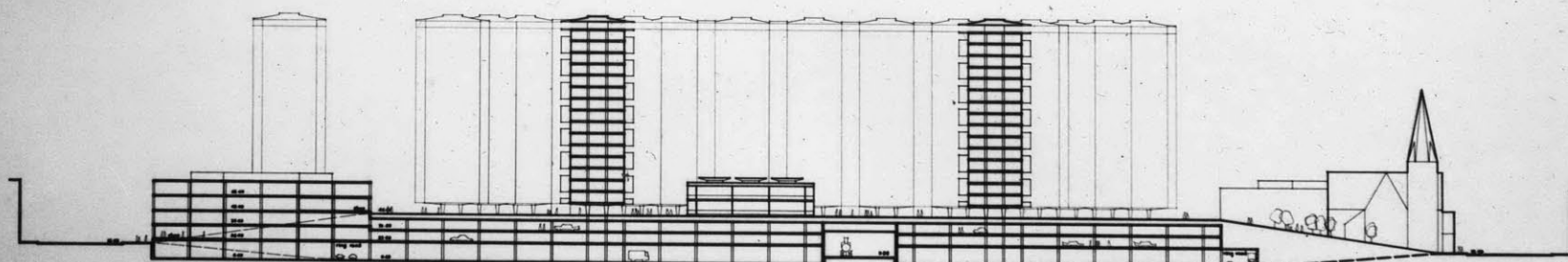








SECTION A-A



SECTION B-B



