

JOINT DEVELOPMENT IN A SUBWAY STATION,
LARGE SCALE DESIGN

by
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ABSTRACT

Joint Development of a Subway Station, Large Scale Design
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Development of a planning strategy for the Alewife Study Area set a context for design of a part of the development --- the transit station. The station was designed as a catalyst for future development of the area, which is now a wasteland of phased out uses. The station was planned as a mixed-use jointly developed center, a part of which I designed in 50th scale plans and sections.

The planning strategy I assumed was regional in scope, with an elected regional planning body, which had the ability to set up task forces for special areas. The Study Area thus had a Task Force with its own planners and elected council and a development corporation which could acquire funds. Cooperation of various institutions and interest groups was facilitated through the task force.

I assumed a program for the whole Study Area and took the role of an architect hired by the Task Force to design the central focus, the station. Roads, subway tracks, cars, buses, people, shopping, office, parking --- all merged in this complex. Separate systems were integrated but defined clearly, roads and parking lots became two-sided, accommodating rather than devastating. The physical design reflected the cooperation of the planning strategy.

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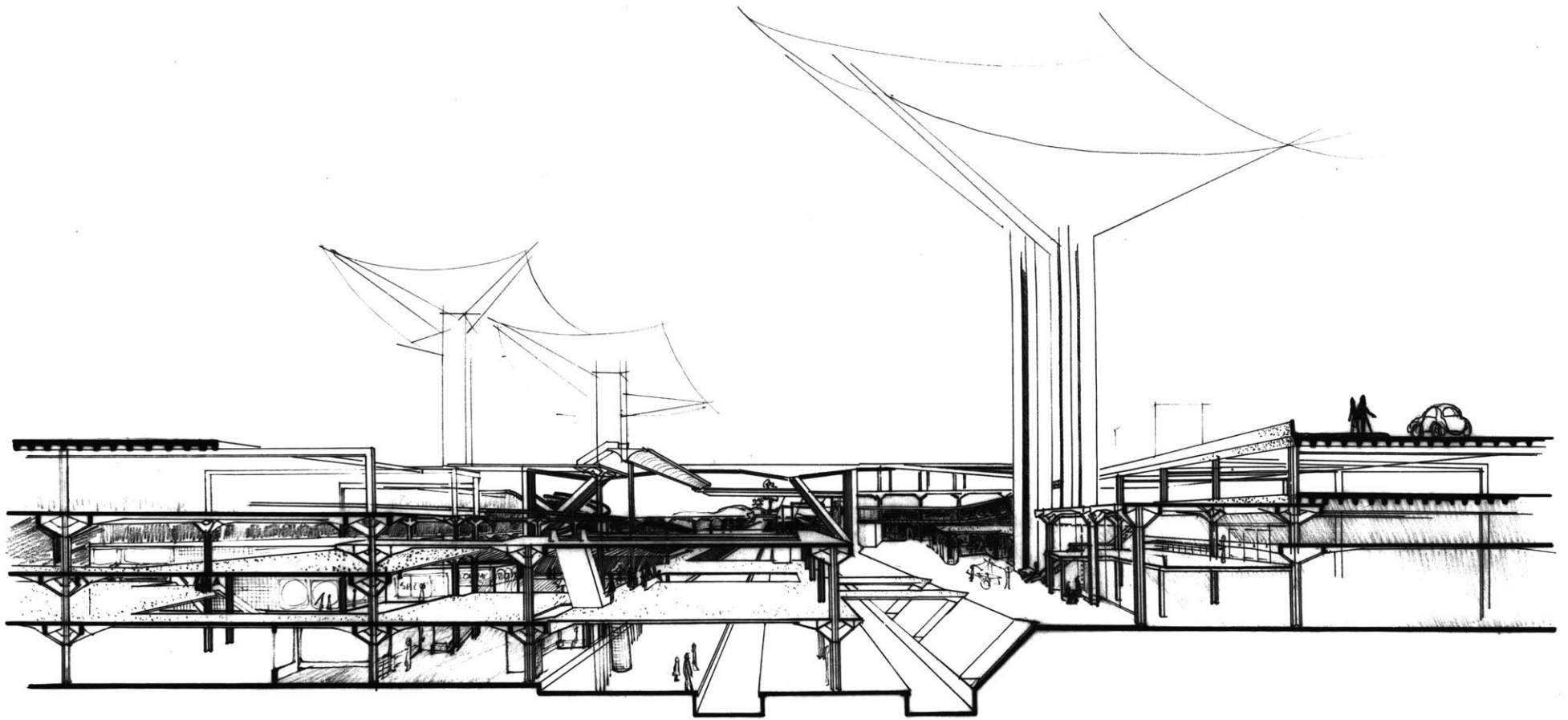


TABLE OF
CONTENTS

	page
Introduction	1
Background Planning Strategy	6
Implementation Framework	
Financing	
Preliminary Master Plan	10
Program	12
Staging	13
Description of the Master Plan	14
Design Guidelines of the Master Plan	16
Site Plan	20
First Stage of Development	21
Specific Site	21
Program	23
Program Description	23
Form Generators	33
Roads	
Parking	
Pedestrian Circulation	
Commercial Space	
Housing	
Closure	
Understandings of the Station	41
Building Methods	46
Conclusion	52
Bibliography	54
Footnotes	56
Acknowledgements	57

LIST OF
FIGURES

	page
Perspective	i
Alewife Study Area	5
Implementation Framework	8
Program	12
Staging	13
Basin and Gateway	17
Radial Context, Greenspace	18
Preliminary Station Concept	19
Site Plan	20
Plans	27-32
Roads	35
Sections	37,38
Closure	40
Canyon	42
Underground	43
Ghirardelli Square	44
Arch	45
Pre-cast Building System	47
Bridge	49
Tree	51

How is it possible to make a wonderful place out of a subway station? There are few enough references for this in the United States or anywhere. The stations in Moscow, white, with mosaics and chandeliers, were used as hospitals in war time. But subways here are denied, subterranean tubes which collect graffiti and dust. In Tokyo, one can get out of the subway car and be faced with beautiful displays of fruit, candy and kimono, as in Shibuya Station. Underground commercial areas are connected to stations, in Montreal. But here there is nothing to delight; one disembarks into a hostile environment. It is almost as though the subway tube is planned just like water mains or gas lines which run under the city unseen but essential; but these tubes carry people! These minimally workable environments are denied by the society, poorly maintained due to lack of funds, and they indirectly decrease revenues due to unsafe and unpleasant surrounds, and lack of nearby traffic generating uses. Given the numbers of people who use them one would expect some commercial facilities; given the need for proximity to transportation, especially in view of the "energy crisis", one would expect to see some housing and jobs near stations. One can have great images of an integrated use structure. But a mixed use development at such an activity center, although logical, also needs an unusual institutional framework to overcome legal, monetary and political stumbling blocks of joint development.

It was necessary to begin involvement early in

the planning process in order to do the architectural design of this station complex. I assumed programs and a set of events in order to get to that level of decision-making. No design, at this scale, has a significant ameliorating effect on a narrowly defined program, or poor plan for development. Design really begins at the planning stage. Form issues must have influence then as well as at the project end. Physical criteria at an early stage influence densities, types of use, integration into the local setting, the image of the development. If the designer inputs into these areas too late it is impossible to change the decisions already made in an on-going and often political process. Making the station a place where one might want spend an afternoon, and a place that fits the sense of the region are demands on physical form, but they are also criteria which dictate planning strategy. A program which delineates these criteria, makes its intentions clear to the future designers of particular places within a given master plan area. At the large scale, in a long scheduled development, these general intentions set the context for each piece of design, and promote continuity of the whole. And as the project evolves, it should also be possible to modify these intentions according to new informations, including new design criteria generated at the smaller scale.

Clearly, in school one can easily involve himself in all stages of a project. In this project involvement in the planning of the station area at Alewife Brook Parkway came in a studio at M.I.T. in a previous semester. The plan which my group evolved actually assumed at the

beginning, an implementation strategy for developing this area, which brought together all the different actors, including planners and designers, from the beginning stages of project development. For consequent work, I have assumed a role within this planning framework, not as a student. Needless to say, much freedom comes from being able to push through the system everything one needs. But it is a useful exercise to see what is possible.

The planning strategy in which I am assuming a role, involved the creation of a regional planning body as well as a local task force. From that task force came a Master Plan approved by the regional planners for the area. It included both a quantitative program and a coincident set of design guidelines. From that plan I assumed a first stage of development for the whole area, a part of which I took as a limited site to design. That part was the station, the catalyst for development of the whole site.

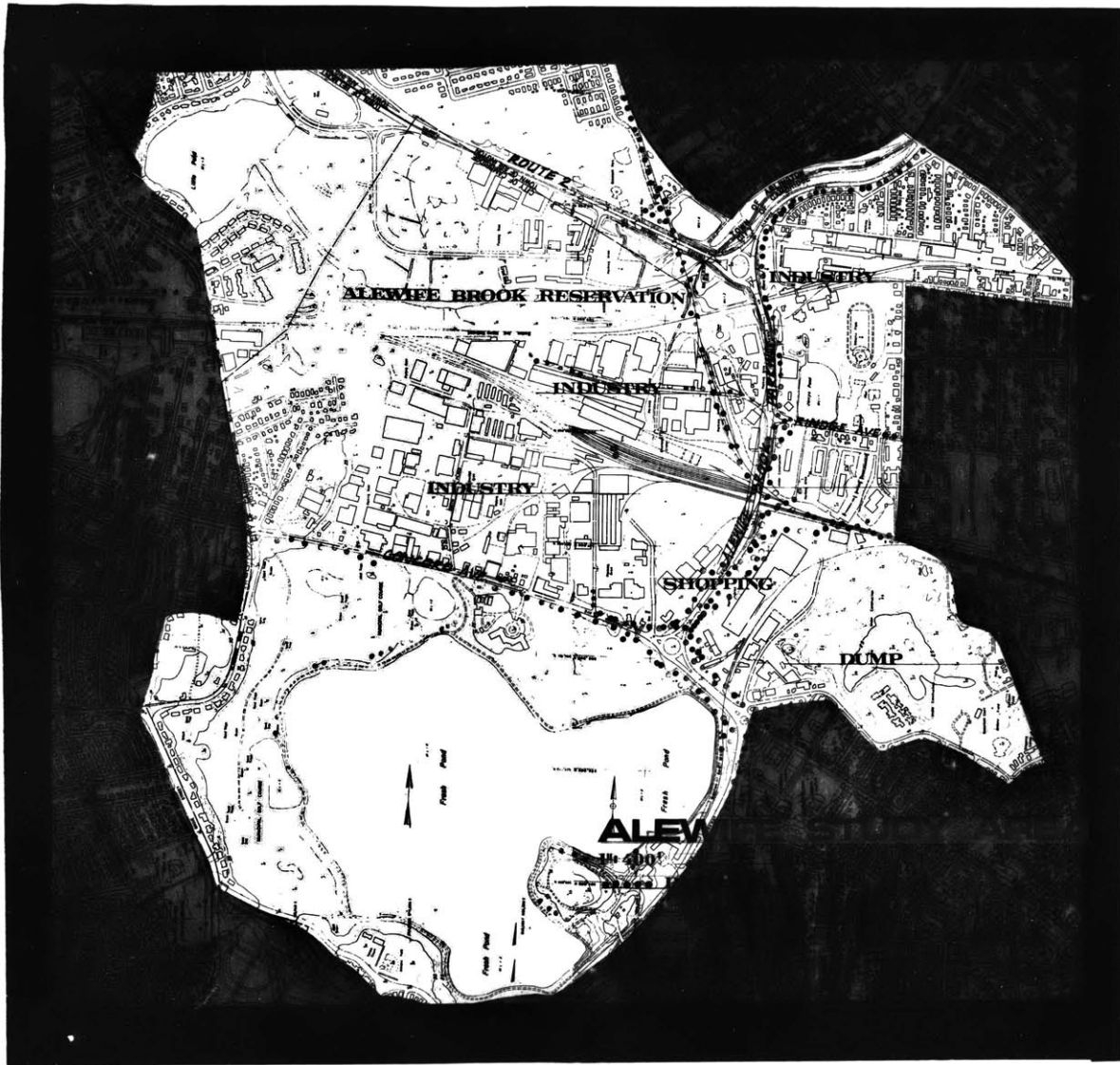
But, in this thesis I was not only testing the usefulness of following a plan to its conclusion, given the ideal institutional framework, but also seeing what a place with so many possibilities could become. Given an ability to design the station, as well as its environs, eliminates the usual constraints of existing buildings and roads. A suburban site, where land is somewhat cheaper than urban, offers more alternatives, including the ability to stretch out.

How does form get generated at this scale . . .
The ways of assembling parts must be similar at

any scale. Every part of a place fits into one scale larger, as into a weaving of grids. So, the development here begins taking its cues from the region, within which it has its own image. Then, the station has its own set of diagrams; internal circulation patterns, relations of uses, connections to larger circulation systems. And, there are notions of how the form will come to be, how those diagrams are built, how the largest scale building components are in fact physically constructed. And finally there is the understanding of what it would be to inhabit the place, and smaller scale decision-making both built and suggested.

It would be possible to design a number of plans for this station complex. Instead, I have pulled out the diagrams of the most basic form generators and designed one straw man. Although I have chosen a particular site and a certain market situation, the form generators and issues raised here can be extended to other stations or transportation centers.

In this paper, a brief introduction of the planning strategies is followed by the Master Plan for the whole area under study. The suggested program, a phasing diagram and design guidelines are discussed. The set of events occurring at the first stage is assumed and the station site delimited. Following that is program description of the station area. The design describes in a general way through plans, sections and diagrams this mixed-use transportation center.



BACKGROUND
PLANNING AND
DESIGN
STRATEGY

" The impetus for change will come in part from the aggregate impact of station, subway, and highway construction. Still more catalytic is the increased economic and social value created by improved connections to the regional transportation network.

Viewed in a static context, the advent of such a powerful new development could signal disruption, an intrusion which might radically alter the present stability of land uses and activity patterns on the site."

" What is now essentially a place of local significance will become a center of regional appeal. New people and institutions will travel to Alewife to work, shop, recreate, and to make their homes." †

Our studio group assumed the increasing importance of planning at the regional level and scale due to these effects of development, especially of mass transit, which extend beyond municipal boundaries. We also placed a value on having a development which could evolve, and would have an active and vital image/life to encourage investment and use. The strategies which follow reflect such objectives.

Implementation Framework

A. Regional Planning Body. A regional planning body should be formed to maximize the equitable distribution of social, economic, and physical resources in the area. The body should be comprised of two entities, the Planning Agency, and the Council, which would function in an advisory and technical capacity, to evaluate and coordi-

nate planning efforts. This Regional Planning Body would represent member municipalities (those now represented on the MAPC) and participating institutions. The Regional Council would be an elected body, representing member municipalities and responsible to them in conducting its duties. The Council would have the power to review, adopt, and enforce a Regional Master Plan. It would be vested with the following powers: assemblage of land by eminent domain; jurisdiction over municipal zoning ordinances, subdivision regulations and building codes; contractual powers with federal and state agencies. Such powers would enable the Council to have the appropriate level of review and control over regional development interests at Alewife.

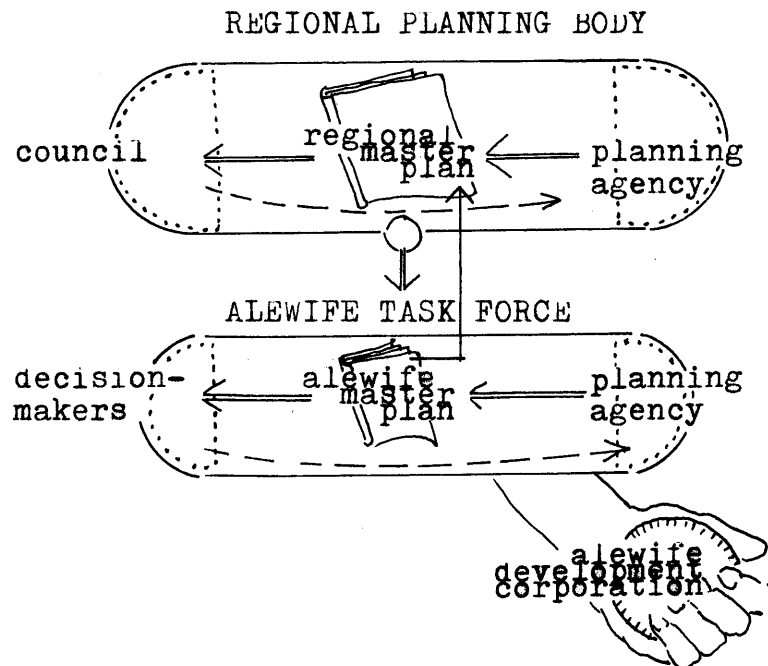
B. Alewife Task Force. In those areas of regional interest and concern, as determined by the Regional Council, there would be clear need for comprehensive and detailed planning efforts. These would be carried out by the Task Force, responsive to local needs and wishes. The Task Force would reflect the input of local governments, residents, and users in the drafting of detailed plans for the site. To achieve this voice, it would be comprised of the major institutional actors and representatives elected at large from local residents and interest groups. The Task Force would be mandated by the Regional Planning Body to enforce design review. It would be funded by both the Council and the specified municipalities. The Task Force would be the important vehicle for implementing decisions which meet the changing demands of its local constituency. Design review powers would be one of their mechanisms of control

In the event that the regional framework continues to be unacceptable to the Massachusetts State Legislature, and thus make the institution of a Regional Council impossible, the Alewife Task Force could remain as a supra-municipal body, vested with some of the powers which would have been held by that Council. The only crucial difference would be the loss of the authority to develop plans at a regional scale.

C. Alewife Development Corporation. To aid in the implementation of the program developed by the Task Force, it is recommended that a development corporation be formed. This organization would be responsible for regulating appropriate land uses and for overseeing projects critical to the establishment of a sense of place in the development. The key advantage of such a corporation would be the ability to generate venture capital through the sale of bonds.

2.

IMPLEMENTATION FRAMEWORK



Financing

In addition we assumed a radical change in the taxstructure whereby taxes generated by a municipality would be redistributed by the state on an equalized basis according to the needs of a community and or region. This would obviate the need for generating maximum tax producing uses on the site. We saw the change in tax structure occuring in the next ten years, and the formation of the regional planning body within the next three to five years.

In addition tho the ADC, it has been assumed that the development financing would include the participation of several public agencies: financial responsibility for the highway improvements fall with the DPW, for the park area with the MDC, for the station and parking facilities with the MBTA. Recognising the capacities for joint development for mixed use buildings, an arrangement to meet the higher costs of construction should be negotiated between these agencies. Free market activity will also be given the chance for participation, using the tools of normal development, especially in commercial and office development.

Hopefully, the present federal policy of complete dependance on private enterprise to produce housing will not continue. In the future, a balanced program of producer as well as user subsidy would provide the necessary capital to induce building.

It has been recommended by market analyses undertaken in the studio, that the provision of intensive out-patient health care facilities may be an element capable of giving unique

character to the development. The ADC has within its powers, the capability of financing this or another program more consistent with the needs of the area.

To function as a part of a regional system of green space linkage and recreation, the place requires the acquisition of extensive wetlands and pedestrian rights of way. The MDC is presently a major holder of the affected land and therefore is in an excellent position to sponsor such a program. And the costs of further land acquisition could be abated through grants by the Department of the Interior.

Thus, the financing program of the ADC is planned to be capable of easily acquiring, and generating funds; of having flexibility of project choice over an extended time period; and, of being sensitive to local desires.

The implementation strategy attempts to take enough control at this stage to create a viable place, to transfer understandings of the site to future designers (an information base), to insure that the key changes will occur, to allow the place to evolve sensitively. In order to be responsive it can only be partially defined. My continuation of this project to a design stage was a test of this kind of program, in part.

PRELIMINARY
MASTER
PLAN

In the studio we then assumed the role of the technical staff of the Alewife Task Force and prepared a preliminary Master Plan for theoretical presentation to the Regional Council. This included a program and design strategies. Using a framework of possible program elements we selected a number of loose alternatives for the site. Criteria which were tracked through the framework included economic and political feasi-

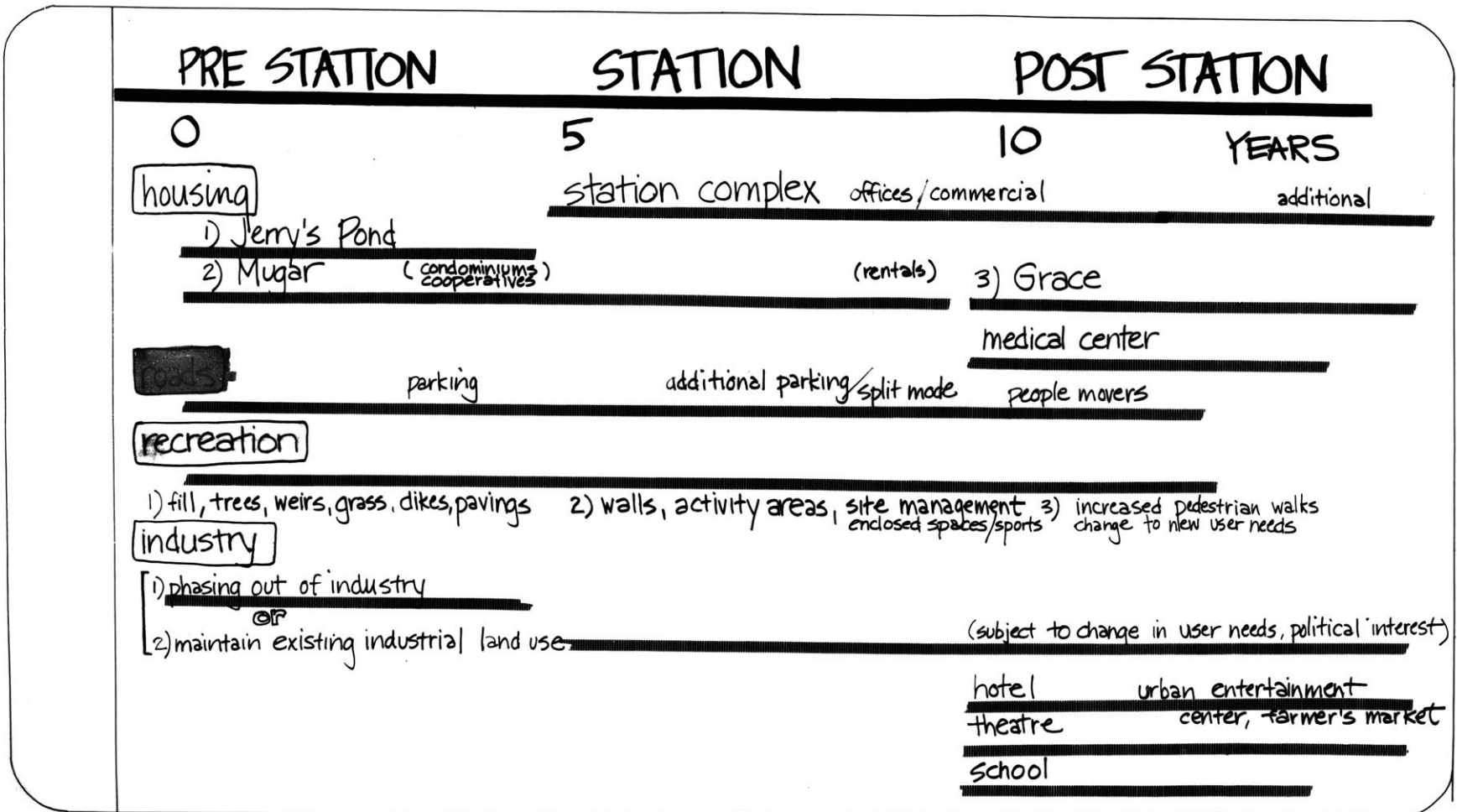
bility with respect to our assumptions, environmental impact, flexibility to adapt to future conditions. We choose to emphasize market trends, ecological values, political interests of Cambridge (low F,A,R,'s, blue collar jobs, housing needs). The program which seemed most reasonable and likely to occur assumed the subway to be at station location B³, the acceptance of the DPW highway interchange, and a twenty year time period.⁴

The Master Plan also had the following objectives:

- Preserve existing amenities on the site, by maintaining ecological balance and exploiting the natural potential of the site.
- Maintain , as far as possible, the existing demographic structure of the area.
- Close the gap between what the community needs and is then faced with; there is a belonging that must be understood for all user groups. New uses must be compatible and accessible.
- Create a place, which has a regional image, but is continuous in the local setting.

USE	Φ	TYPE	CARS	PARKING	Φ
STATION COMPLEX					
STATION	200,000	Includes subway storage and mechanical space	2,000		800,000
COMMERCIAL	200,000	Food, general merchandise & apparel, services, (farmer's market)	600		240,000
HOTEL/HOSTEL	100,000	150 rooms	150		60,000
SCHOOL	155,000	900 students, community facilities, playing fields	45		18,000
RESIDENTIAL	200,000	200 Luxury units	300		120,000
OFFICE	50,000	Sales offices, state & federal offices, small financial offices	150		60,000
INDUSTRY		A.D.L & existing industry south of the Fitchburg Line will stay. Industry in the "triangle" will be displaced in the first stage. W.R. Grace will be displaced in the third stage.			
COMMERCIAL	100,000	Service and convenience shopping for housing	300		120,000
RESIDENTIAL	1,800,000	1,800 units: 300 @ Jerry's Pond 800 @ Triangle 700 @ Mugar site 500 @ W.R. Grace site	450 150 1050 = 2,700 750		180,000 180,000 420,000 300,000
WETLANDS		To be developed as light recreation			
RECREATION		Cambridge Dump will be heavy recreation. Recreation will be included within housing areas			
OFFICE	100,000	Medical facility	300		120,000

PROGRAM



PHASING

DESCRIPTION
OF THE
MASTER PLAN

Commercial

200,000 s.f. of commercial space will develop around the station serving transit users and residents and regional needs, according to natural market expansion. Demand has been demonstrated for new commercial facilities at Alewife even without the advent of the station.

Hotel/Hostel

The new facility will serve visitors to Boston who will be using rapid transit, and visitors to a new medical facility.

Housing

The 2,000 units of housing planned for the site will fill the need for low income, elderly and middle income housing in Cambridge, and the demand for luxury apartments. The probable mix will be 30% low income and elderly, and 70% moderate and high income units.

By having 2,000 units at low F.A.R.'s and densities of 20-40 units per acre, which includes a mix of types, the demographic structure of the region will not be altered. The Jerry's Pond site will be filled and a new catchment basin provided that acts as a linear buffer between the Grace buildings and housing units. Housing on the Grace site is the suggested use replacing the industry after its eventual relocation.

School

A new school assumes the need generated by 2,000 new units of housing. The first stage would accommodate 400 students, with provision to expand.

Industrial

The industry which is being displaced by new development is that which is likely to change,

in the near future. It may be in the interest of those property-owners to sell their depreciated property at a profit as land values rise around the station. Presumably, other locations will offer a more favorable climate for those firms. The industry below the railroad tracks should remain an active industrial park, providing the area with blue collar jobs.

Office

The major office space will be a medical center of 100,000 s.f. This center will serve a regional need and be affiliated with the present infirmary and hospital. 50,000 s.f. will be built near the station and will include regional sales offices, some state and federal offices, and financial offices.

Recreation

Areas on the site will be designed to provide open space facilities for the surrounding region. The Alewife Brook-Little Pond area is a wetland environment and has considerable value as a wild-life and vegetation habitat and as a water retention system. However, rather than maintain this land as an ecological preservation, the area will be landscaped and developed to provide paths for pedestrians and cyclists, urban wild-life habitat and the opportunity for peaceful outdoor activity.

Railroads

- ° The Fitchburg mainline of the Boston and Maine crosses the site east to west. It will continue to carry 30 trains daily.
- ° The Bedford Branch of the mainline branches to the northwest. Commuter service on this line will be replaced with express buses, and freight service discontinued. However, since it connects

to Hanscom Field, it would remain for National Defense Emergency access purposes. Presently, it also defines an important pedestrian path. °The freight cut-off from the mainline to Somerville serves a number of industries and would remain behind the station, either wholly or partially submerged for some distance. ° Rail freight spurs branching south will remain.

DESIGN
GUIDELINES
OF THE
MASTER PLAN

Design guidelines and several basic design strategies are included in the Master Plan. Controls of the Task Force for their implementation include design veto over the DPW and the DOT, under-rights and air-rights over the parkway and Route 2 (Concord Turnpike), design review or a cooperation agreement with the MBTA, and the MDC at Alewife, and override over zoning ordinances, subdivision regulation and codes.

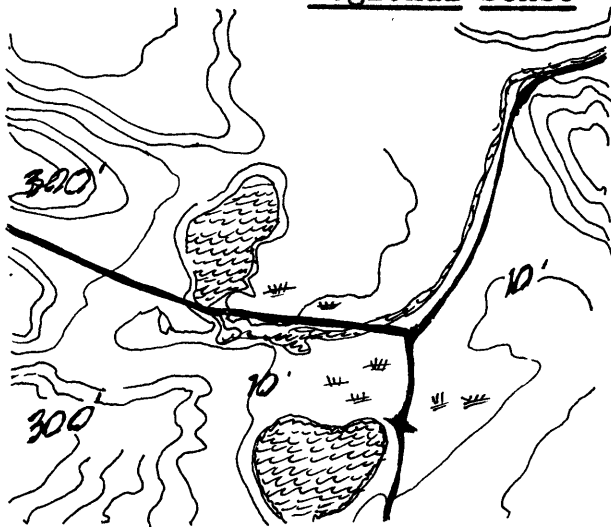
General strategies

First, the complex systems of roads, paths, bike, bus routes, subway and train lines suggest special handling. The systems should be separated to insure visual clarity and efficiency, but they should also be integrated for good transition between modes and general accessibility. Separation can be achieved through physical distance, level change, and through establishing clear vocabularies, actually "large scale buildings components", for each system. These components will be both natural and built families of form. Integration of systems can be achieved through physical interconnection and repetition of like spaces or visual pieces in different modal contexts.

A second strategy is to allow for expansion, change, re-use. One way is to generally allow for zones of expansion. Also, the large scale building components should be used in "growth-systems" suggesting additions. In the first stage both landscaping and structure will be made to suggest the quality and direction of future development.

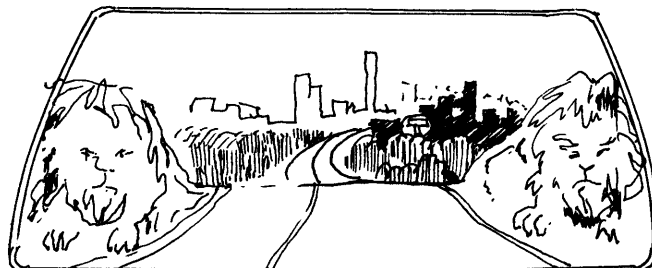
And a third strategy is to pay special attention to integration of new development with the existing weave of Cambridge, Arlington and Belmont (themselves very different). With the exception of the industrial are which is proposed to stay, the issue is treatment of the existing residential edges.

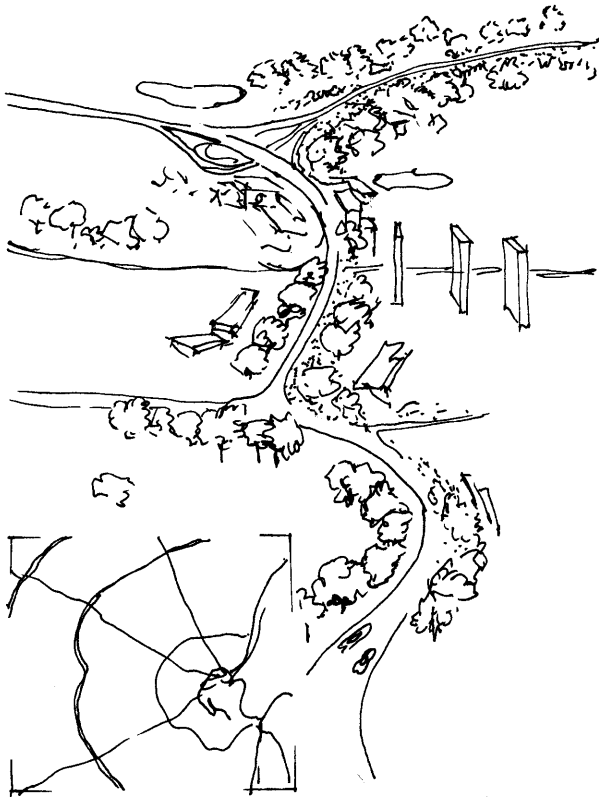
Regional Sense



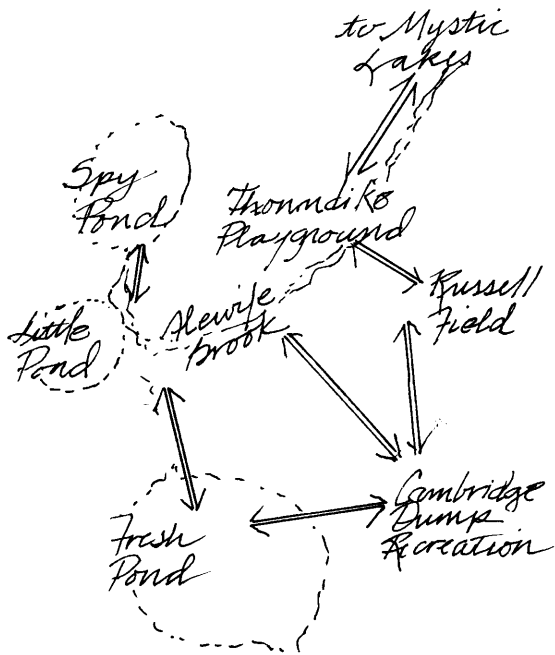
The Alewife area is a basin surrounded by the Belmont, Arlington hills to the west, and a small set of hills in Somerville to the east. This basin is part of an ancient glacial outwash plain. New development should agglomerate height and density in such a way that the flat basin character of the area is preserved, even emphasized.

The station is for the commuter a kind of entrance to Boston. Route 2 also offers a view of the city framed by the hills of Belmont and Arlington.





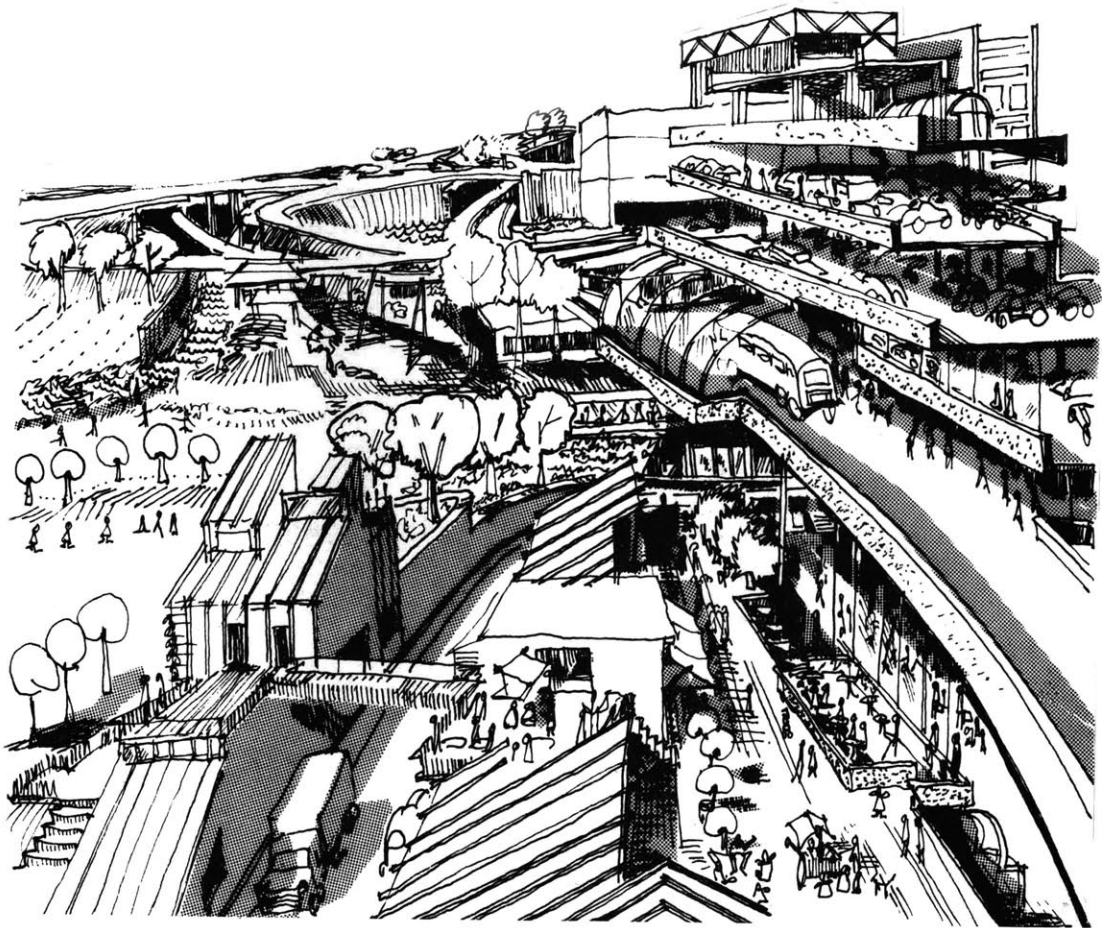
Boston is circled by roads such as Route 128, and Storrow Drive, connected by radials. Alewife Brook Parkway is a part of this system and that context could be emphasized by new building.



Olmsted's 1911 plan for the Metropolitan Park Commission included the Alewife area in its system of greenspace connections. Alewife Brook Parkway was to be a major green route connecting the Charles to the Mystic River. Seventy years later these ties can be made, or at the very least, emphasized.

The site map which follows (p.20), shows greenspace areas and new and existing pedestrian routes.

Preliminary Station Concept





FIRST
STAGE OF
DEVELOPMENT

The first stage includes a mix of uses and attempts to create a threshold level of density in which the various uses reinforce each other. It is comprised of those land uses which seem most likely to occur first given the existing tax structure and ease of land acquisition. See the site plan which follows for this set.

SPECIFIC
SITE

In the context of this first stage I have chosen the station complex as a site. I am now acting as an architect hired by the Task Force and utilizing the information of the Master Plan. The station complex is a kind of center of the development of the area and as such must draw importantly from the design guidelines and strategies. The station area is an intensification or epitome of the mixed use nature of the whole study area. It presents many "problems" for the designer in taking such disparate uses as roads and housing, subway and shops, and enabling them not only to coexist but to reinforce and make places for each other. The "problem" actually, is that typically the only way to deal with such diversity of use financially, spatially, and also psychologically, is to diagram function and separate the parts totally. Roads and subways are felt to be hostile, powerful elements, like snakes. The method of dealing with these is avoidance. The connections between these and other uses are ignored. So we have freeways and parking garages and subways that do not lend a shoulder or a belly, but instead get covered over or pushed aside. Or worse, they end up doing the covering and the pushing and the wasting. The separate diagrams get built and are no more than

workable solutions. It is necessary to understand the functional diagrams, but it is the relation, the integration of use which enables the place to be vital and habitable. The complex can be a wonderful, rich, entertaining, reciprocal, informing, coherent, accessible, imageable PLACE. It can be a catalyst for surrounding development as opposed to a wasteful, exclusive megalith imposed by a static process of problem solving and non-evolution.

The planning strategy which was formulated first was affected in part by notions of the regional sense and the station's environmental impact. The notions of the local impact of building, of interfaces between new and existing uses, of maintaining maximum potential of enriching the whole site, lead to the implementation plan, which brought all the various actors together so that, not only physically, but also institutionally those interests could cooperate. It is the planning strategy which makes institutional agreement; and now it must be the physical deployment of parts which reflects that cooperation.

PROGRAM

<u>Station Complex</u>	<u>s.f.</u>	<u>Parking</u>	<u>s.f.</u>
Station	200,000	2,000	800,000
Housing	150 units	225	90,000
Hotel	100,000	105	42,000
Commercial	100,000	300	120,000
Office	50,000	150	60,000

Adjacent Uses

Housing @ Jerry's			
Pond	150 units	200	80,000

Alewife Brook Park

Assumptions

- ° ability to modify heights of on/off ramps & ABP
- ° ability to determine location of station platform along the line

PROGRAM
DESCRIPTION

Station:

- ° ease of all modal splits
- ° aid movement of handicapped, with elevators, ample walkways, ramps, good directional information, etc.
- ° include as much natural lighting and ventilation as possible
- ° definition of night-time zones of activity
- ° 580' platform, minimum 2 stairs per platform.
- ° service facilities: 1,800 s.f.
 sale room, starter's room,
 porter's room, electrical
 room, signal equipment rooms,
 employee's rooms, storage and
 equipment rooms; wash room,
 lunch lockers, starter's office
 for bus terminal, pump room
- ° power substation 350s.f.
- ° fare circulation:
 capacity for 20 persons per minute
 access to paid and unpaid areas clearly
 separate, avoidance of cross circulation
 or excessive turning
- ° clear, efficient access
- ° noise:
 avoid sound focussing shapes; use planned

irregularity of structure; reduce noise of train as much as possible at the source; absorption through resonant absorbers and acoustic panels.

Parking

- 90° parking, stall depth 18'
- minimize congestion at and adequately ventilate cashier's space
- no excessive space hunting, division of lots well defined and signed to indicate when full; one way circulation, aisles parallel to long dimensions of lot
- bays to be aimed to station entry so pedestrian flow is along bays to fare collection
- 700' maximum walking distance, 400' preferred
- Car parking estimate is just above initial station requirements; it can expand to 5,000 or decrease to 1,700 spaces when Alewife is no longer a terminal station. Provision for the larger amount can be met only partially within the station.
- 80% of parking is from the Route 2 direction
- provide for 60% of all traffic occurring at peak hours

Kiss-ride

- 125 drop-wait spaces
- includes taxis @ 20 trips per hour, 50% from Route 2.
- 70% from Route 2
- includes drop-park traffic

Buses

- 10-12 stalls
- 33% from each direction
- utilize sawtooth platform recommended by MBTA
- include space for bus storage and holding
- possibility of future expansion
- allow for unobstructed pedestrian access.

Roads:

- preferential access from ABP and Route 2
- 4' structure approx., 22' clearance, 12' lanes, maximum 4.5% slope, 4' pedestrian refuge area
- up ramps 3-6%, down ramps maximum 8% slope
- deceleration land and taper 400'
- acceleration land and taper 700'
- 50' height limit



surrounded elevated avoided

- °reduce noise, dust, vibration or ameliorate
- °build on fill when possible
- °provision for peak hour demand
- °no traffic through parking lots
- °Improve visual quality of parkway as well as accomodating bicyclists and pedestrians

Commercial:

- °100,000 s.f. is assumed to be a critical mass for development; project can expand later; shops should be aggregated in initial stage
- °Represents $\frac{1}{2}$ the size of average shopping center within Route 128; should be an alternative to Fresh Pond Shopping Center, not a duplicate; may be in competition with Harvard Square.
- °Occurs in 2 main areas, above and below ground
- °Mall type: includes one main tenant, continuously covered, no more than 800' long, continuous in level changes to encourage movement and aid in views of other stores, group like stores together by type and time zone
- °underground area:
 - utilizes pedestrian movement to transit, users are primarily commuters, connected to above-ground area and also accessible by paths to nearby residents
- °outside area:
 - users come primarily in cars; parking is ample and identifiable; can have heavy shopping such as groceries, furniture; should aid in the visibility of shopping area as a whole.
- °kiosks, 100s.f. or less
- °special events area for promotion, seasonal decoration, demonstrations. . .
- °service access:
 - tunnels for outside area should be built along with basements at little additional cost; in inside area, tunnels are at the backs of the stores; this avoids allocation of prime space to service.

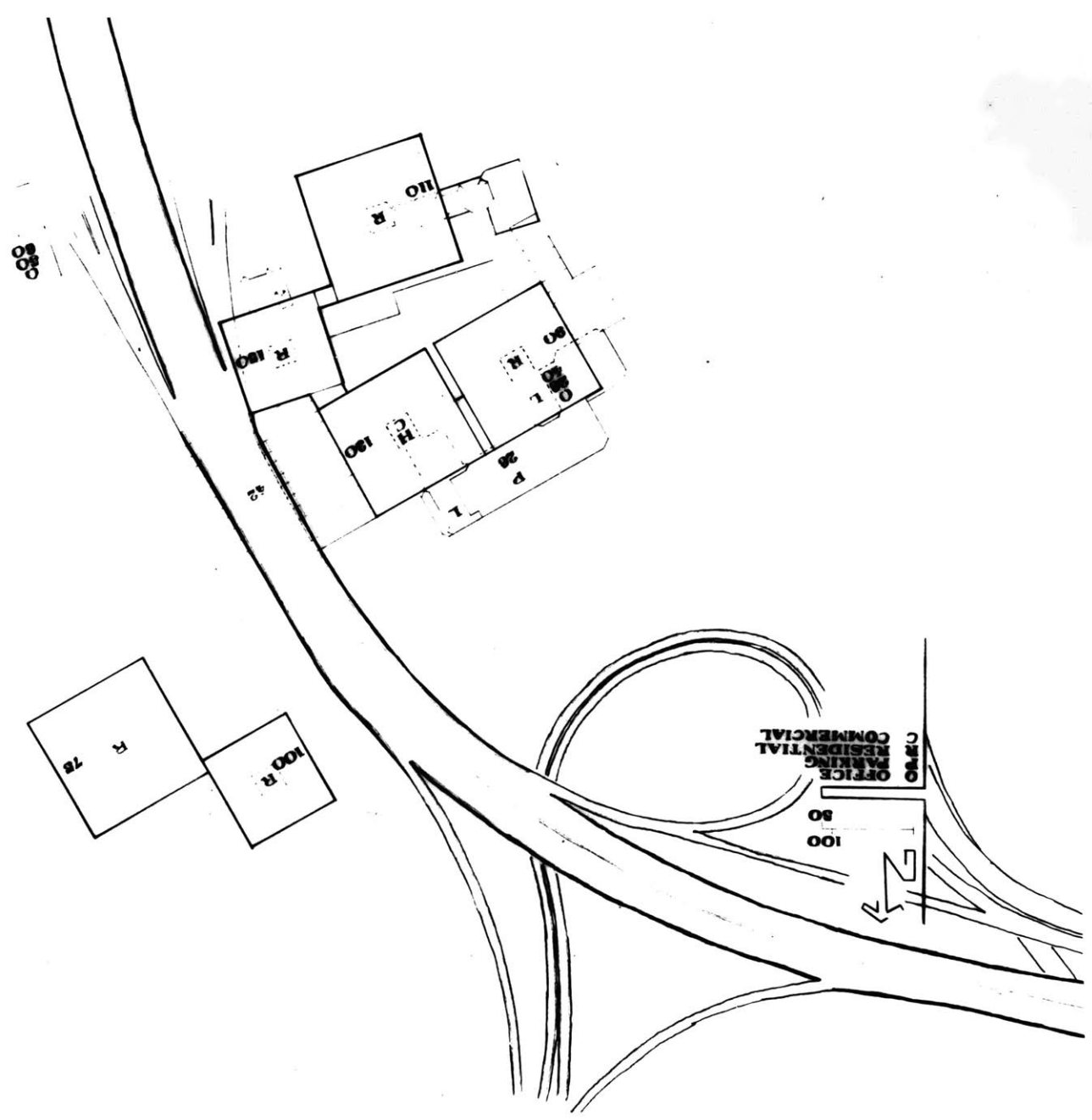
Offices:

- °25,000s.f. to grow to 50,000s.f.
- °includes regional sales offices, and services
- °medical offices are 20,000s.f. and are to be near health facility planned as well as transit; related uses include a pharmacy, optician, doctor's lunch, cardshop, and the like

Housing:

- °to have acces by a different road system than the station access
- °50 units to be related to the housing at Jerry's

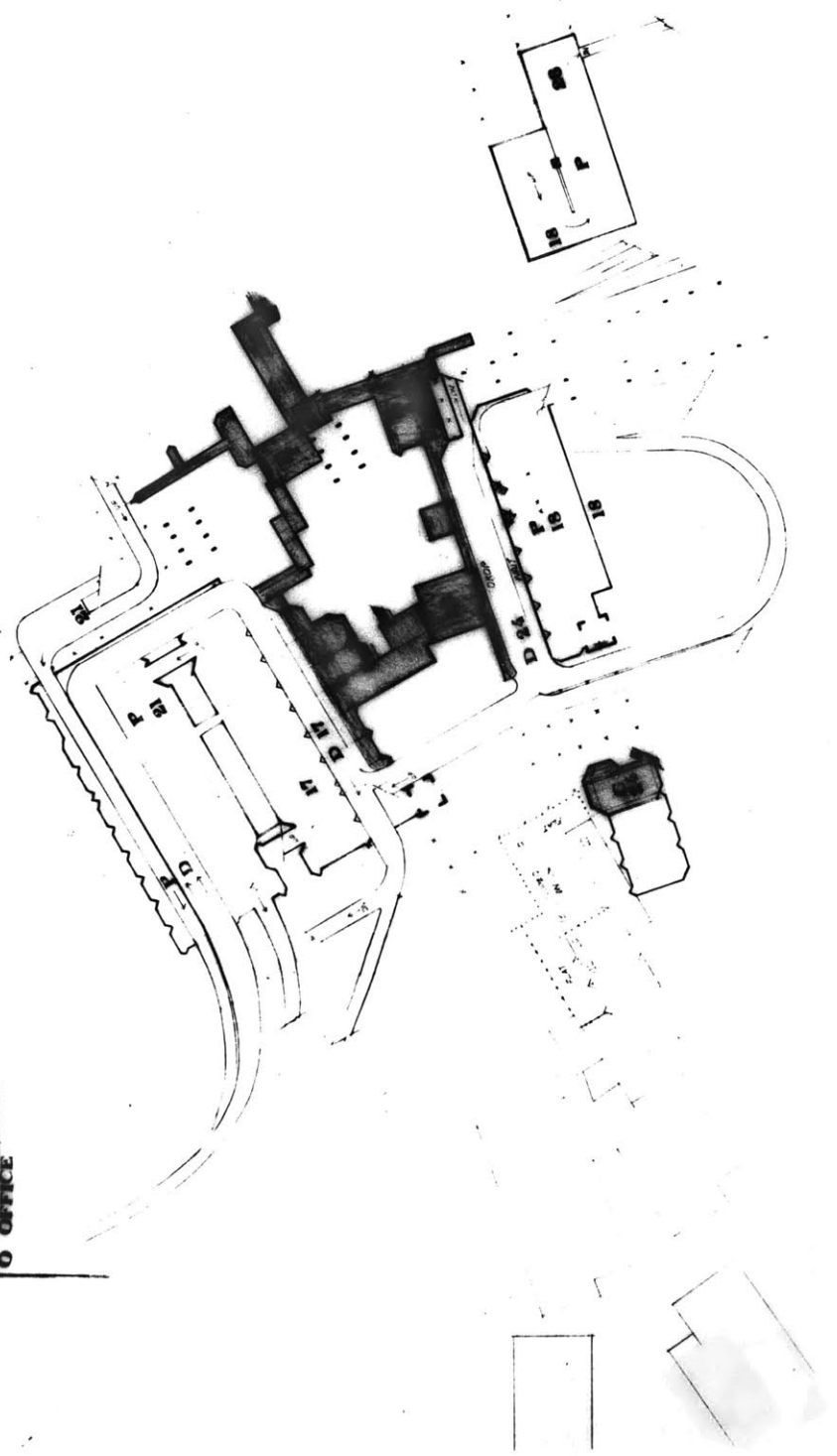
- Pond site, middle income
- ° convenient special parking areas
 - ° protect from noise and air pollution
 - ° integrate with surrounding neighborhoods
 - ° optimize use of recreation areas
 - ° elderly should have easy access to station,
 - ° housing must have enough density to be safe and make special structures economical



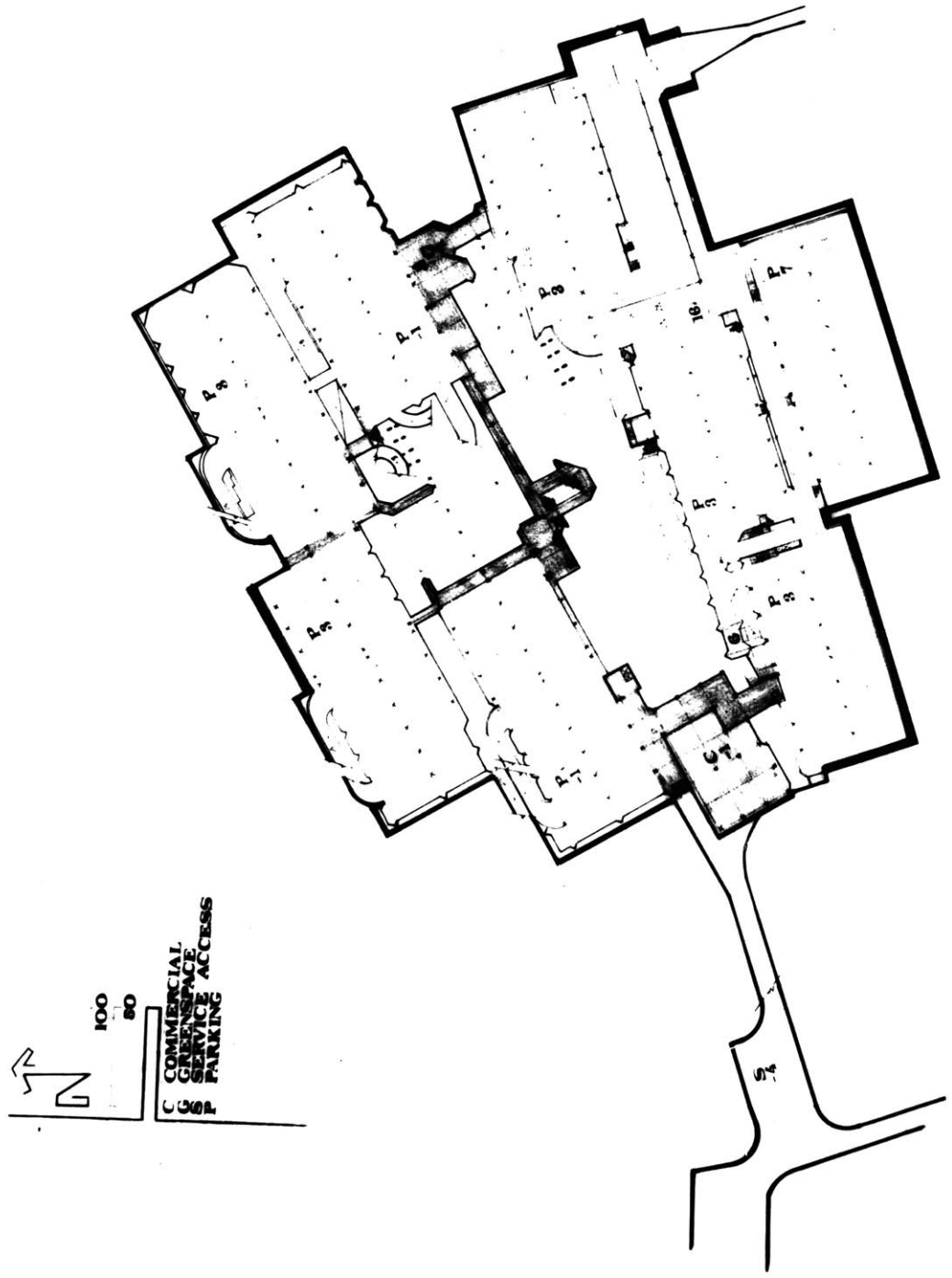
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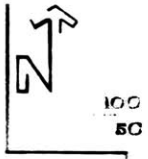


DEPT. OF
CORRECTIONS
RECEIVING
COMMERCIAL
OFFICE

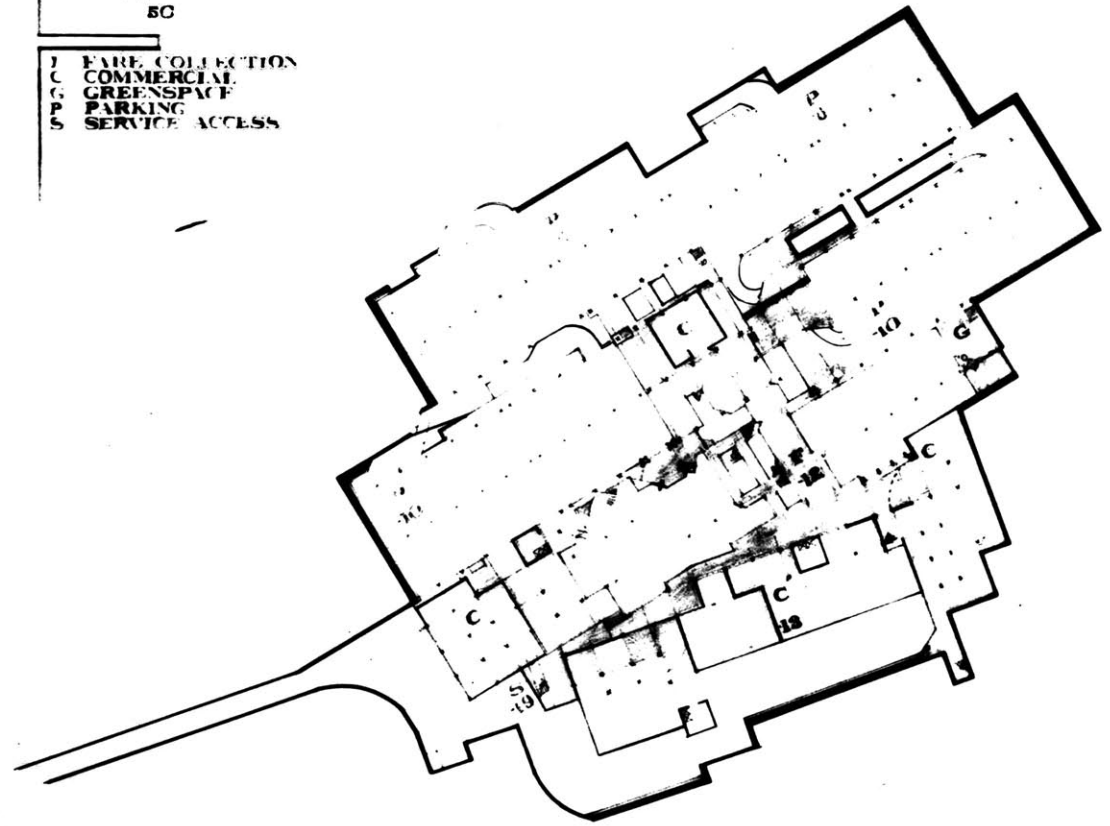








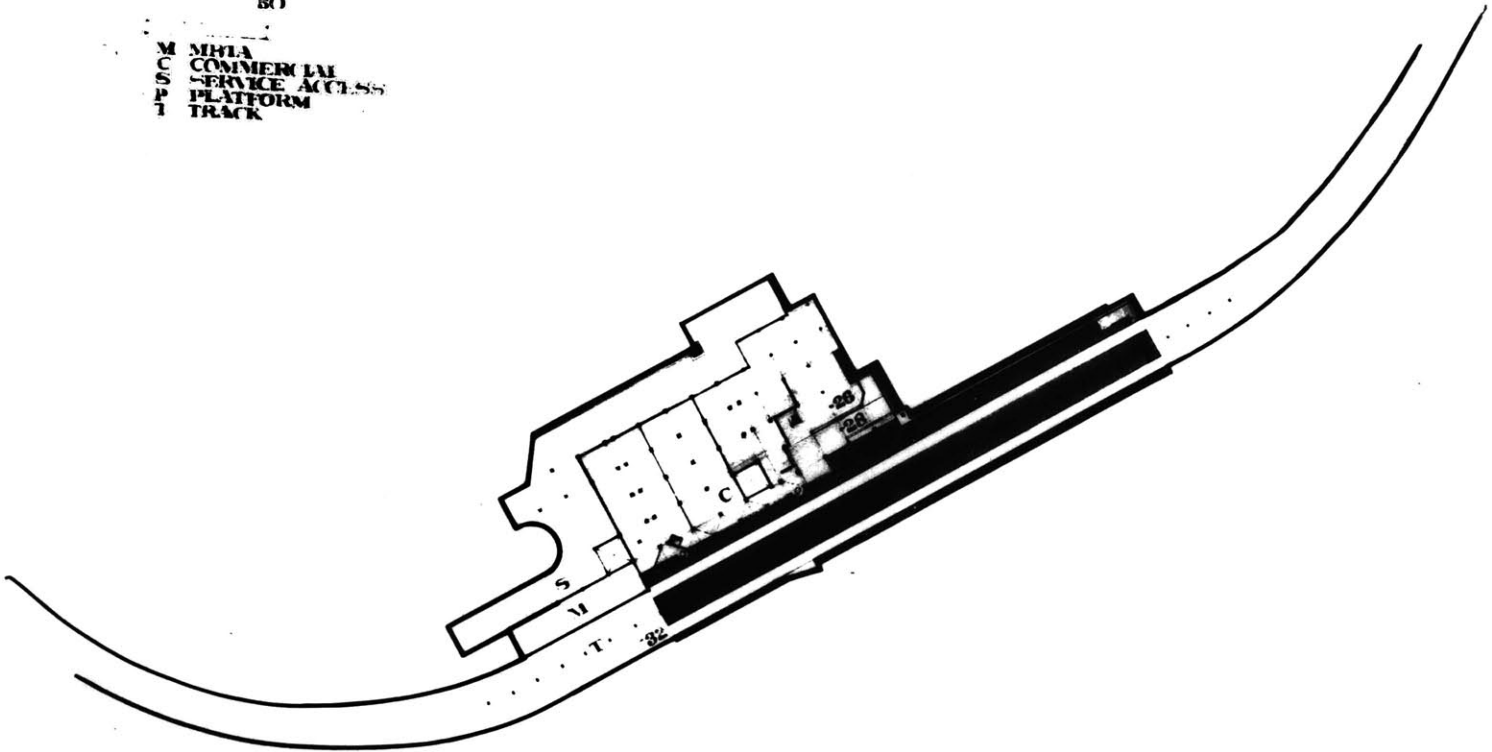
J FARE COLLECTION
C COMMERCIAL
G GREENSPACE
P PARKING
S SERVICE ACCESS





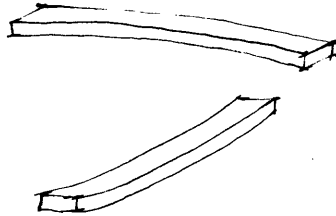
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M MHA
C COMMERCIAL
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P PLATFORM
T TRACK

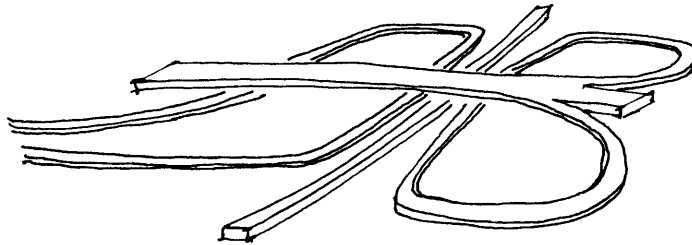


FORM
GENERATORS

The largest form determinants of the station are Alewife Brook Parkway and the subway alignment; these cross each other but are vertically separated by approximately 75'. It is the space between which is developed.



Large clover leaves resolve the two directions. These are the on and off ramps which give preferential access to cars and buses from Route 2 and the Parkway.



Roads

Cars coming to the station on these ramps are parking and/or dropping off passengers. Parking can be either short or long-term. Drop-off cars include "kiss-ride" vehicles, who drop and leave, and taxis, as well as those who drop passengers and then park. There is a need to enter in one direction and have the option to exit in a different direction. The Pattern of roads attempts expediency for all movements, without causing confusion through an overabundance of options. These open roads also have views which are pleasant and aid in the orientation of the drivers.

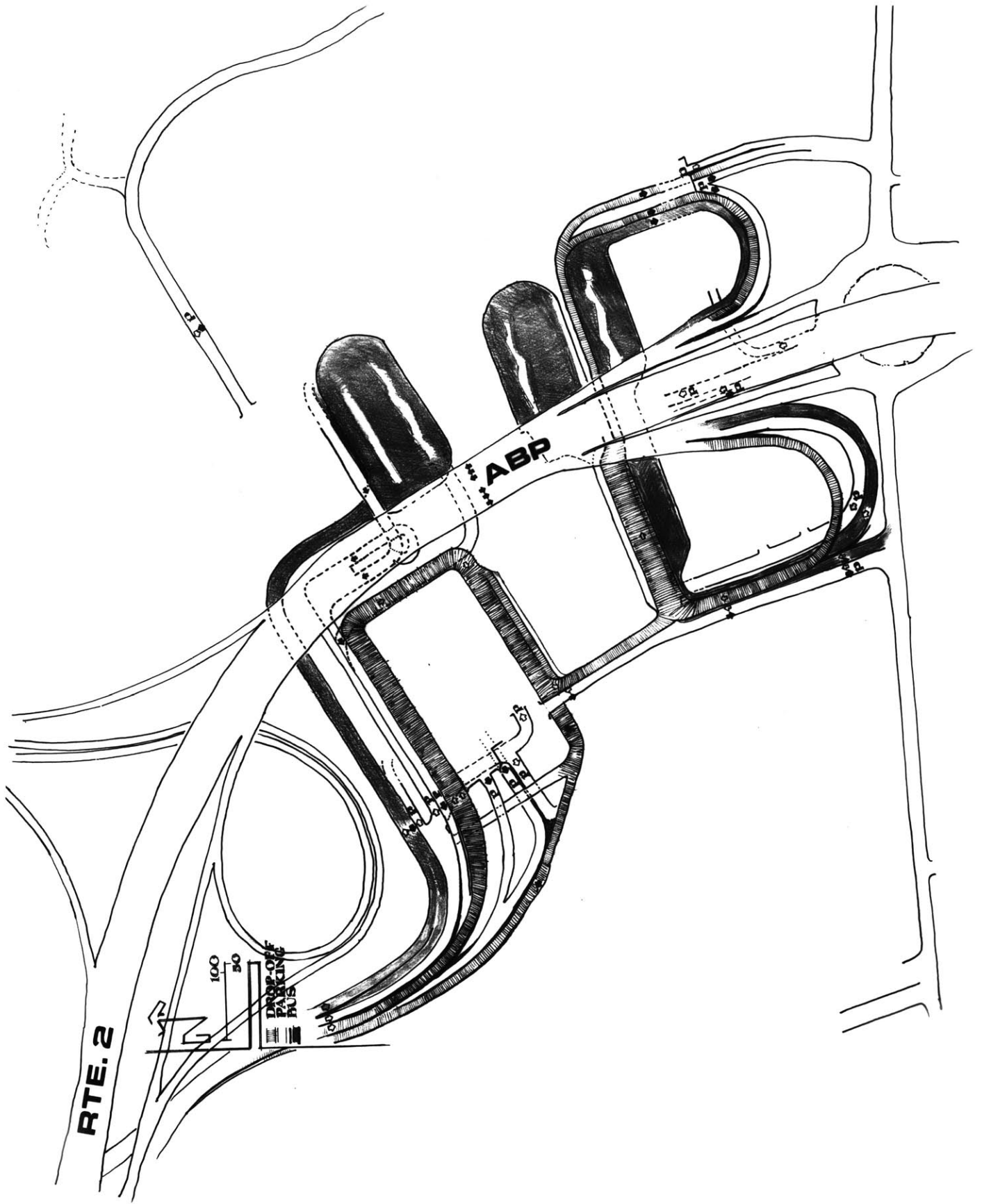
To avoid congestion, especially at peak hour,

circulation routes for different destinations do not cross, and ample turning radii are provided. Space needs become great to achieve these goals. In order that the vehicular circulation patterns do not dominate the whole complex two strategies were used. First, the spaces left within the turning radii are large enough to accommodate other uses. Secondly, routes are agglomerated vertically (cars above, buses below, parking underneath). This last also minimizes areas affected by noise, fumes, and vibration. In addition the patterns are contained, except for one crossover, on either side of the subway ditch, so that the line of the subway becomes the way through for other things; greenspace, people, a commercial "street".

Housing, parking for housing and the hotel, and offices, fit into the spaces created by the ramps. Access to these is by a separate contrapostal system connected to Rindge Avenue. These "local" roads will support increased traffic if later densities demand.

Parking

Access and egress in parking areas is from a few points in order to minimize confusing internal circulation. Lanes at control points flare out, as at toll booths, to reduce peak hour congestion. Cars move to a lot and then along its longest dimension for layout efficiency and ease of search. To further reduce search time the lots are separated to be filled and then closed sequentially; this requires good directional signing. The lots closest to the platform would fill first. Separation of lots also enables certain lots to be used for nighttime and weekend parking, while others

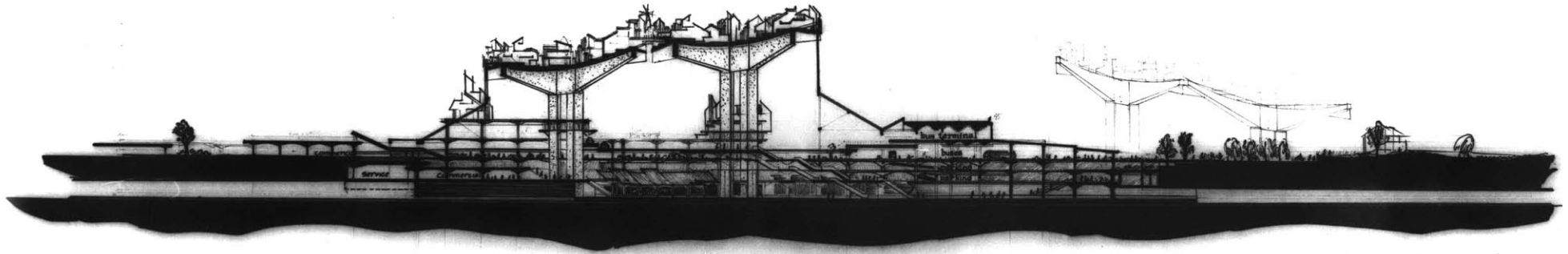


are cleaned and otherwise maintained. The lot definition is, in places, accomplished by a 4' level change, coincident with a gap in the structure, which provides a place for light, air, and ramps, to enter underground. Light and ventilation also occur along the edges of the lots.

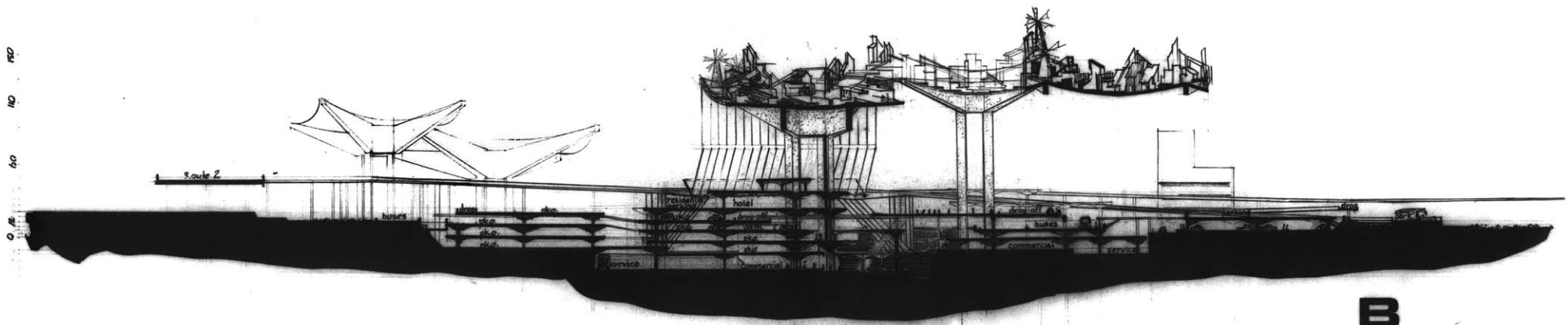
Pedestrian circulation in the parking areas occurs both along and perpendicular to the aisles, towards and along the commercial street, towards the main concourse (fare collection area, elevators, and escalators). From the back lots, pedestrians (who have the greatest walking distances) can move directly down to the commercial level and have an interesting trip to the main concourse.

Pedestrian Circulation

In addition to the movement from the parking areas to the concourse, there is the east-west movement to and through the station. On grade pedestrians and bicyclists move directly through. Or, shoppers and transit users can move gradually along the terraces to the east. Direct access from the upper bus terminal and points between to the lower fare collection is possible by elevators at the center of the station complex. These and other elevators also serve residents and office employees and visitors. Escalators move down from drop-off areas to grade through commercial and parking levels to fare collection and lower commercial. All paths and vertical circulation points serve a number of different pedestrian intentions (residents, commuters, employees, etc.). During peak hours there are routes which are most efficient for modal transfer. At night and on



A 1



weekends these routes serve the increased numbers of shoppers and recreationalists. The density of development is such that these routes can remain consistently active for safety and economy.

Commercial Space

The commercial area which is underground is designed to intercept pedestrian movement between the bus terminal, drop-off points, parking lots and fare collection area. Secondly, it is a kind of street which follows the greenspace path under the Parkway. And third, it forms the lobby areas of the housing and hotel above.

Several moderate sized tenants give equal weight to the various levels which form an oversized staircase down to the main concourse. The lowest level is designed primarily for subway users, visible by passing trains, but because of its unique underground character might also be a place one would go especially to shop in a cavern or eat in a grotto restaurant. Convenience shopping and neighborhood services would occur at -12 or +8 or +1 elevations. All of these areas would involve light shopping, articles that could be carried by those in transit.

The commercial area which is outside the station emphasizes use by people coming by car. It contains one large tenant, e.g. a supermarket, and heavier goods. It is connected above ground, visibly, to the underground area making a mall. Commercial expansion would occur lineally to the west. It could also take over some parts of the underground parking areas if demand for that space decreased.

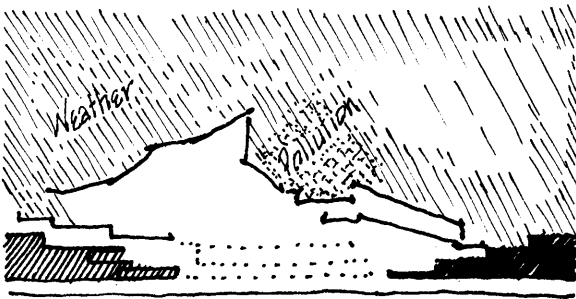
The place where outside and inside commercial

areas join is also at the intersection of the building grids of the station complex and the intersection of pedestrian paths. This space becomes the special area for displays, demonstrations and seasonal events sponsored by the merchants.

Service access occurs in a tunnel alongside basements, and at the backs of the underground stores under the back parking lots.

Housing

How is it possible to fit housing with its need for basic amenities into a complex such as this. With so much vehicular circulation occurring at grade it makes sense to replace that ground elsewhere. Replacing it in the sky was efficient in terms of cost as long as the structure was efficient in its use of materials, ease of construction, and could hold a sufficient housing density. The inverted umbrella structure achieved this and it also provides a green ground, views, and protection from air and noise pollution. The bowls are connected and begin to add up to a continuous "ground".



Closure

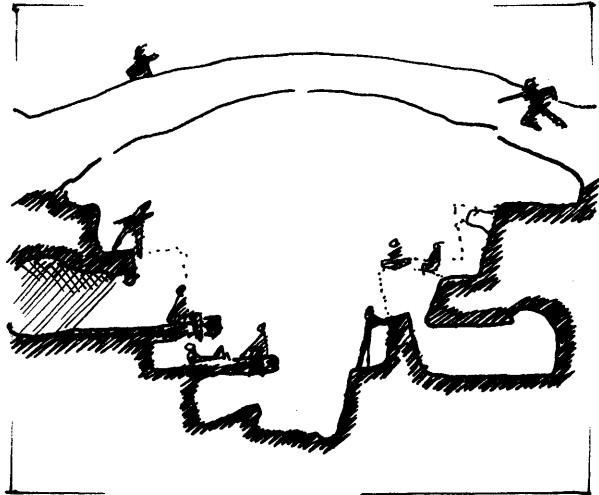
The inverted umbrellas and the roads offer partial cover to spaces below. Spaces left are filled with light rooves, hung from the edges of the bowls, tacked and made rigid at points by the structure below. Therefore, the station platform area and commercial "street" are sheltered. Local, smaller rooves enclose heated spaces.

UNDERSTANDINGS
OF THE
STATION

Referring back to original guidelines, one can ask what is the regional sense of the place; does it have a strong image? It does emphasize the Alewife basin with a low profile due to submerged parking; and higher densities are along the parkway, the on-off ramps stepping down like contour lines. The big umbrellas with their bowl shape further echo this. They also are arranged in such a way as to form a kind of gateway. They are at the scale of the road, not subordinated by it, and although light tensile structures, still maintain a dialogue with megalithic Rindge Towers apartments. But, atop the umbrellas is a scale of house on a par with the existing Cambridge neighborhood. The complex is, in a sense, overrun with housing, relating itself to the local neighborhood on both edges. The complex bridges, offers its underside as a roof for, the greenspace and general pedestrian paths. But although the station is penetrable it is aggregated enough to allow the Alewife Reservation to be maintained. The station activities, housing, commercial, and office live within the spaghetti of roads; they reinforce each other not only programmatically, but in their physical reciprocity.

But what is the quality of the place, how does one choose a building system which is more than satisficing? How does one describe the place? Its like what?

The station is like a canyon carved out by a river, the subway. The walls of the canyon cliff are eroded with caves and ledges, like the commercial edge and parking. One can see to the bottom, understand what the place is.



In the narrows below, supports are denser to resist greater loads from both above and below. The light quality is darker, filtered, coming in shafts, as in caves. See photograph, next page.

But above is the mesa, light baked, making a gathering place, like Ghirardelli Square. See page 44.

The canyon is spanned by a natural arch. It heightens, literally, the awareness of the canyon depth. It is involved, at its edges, with the cliff, a habitable support. But, it gives the ability to bypass the whole place, too, although it might be a little dangerous to be up there. See photographic analogy, page 45.







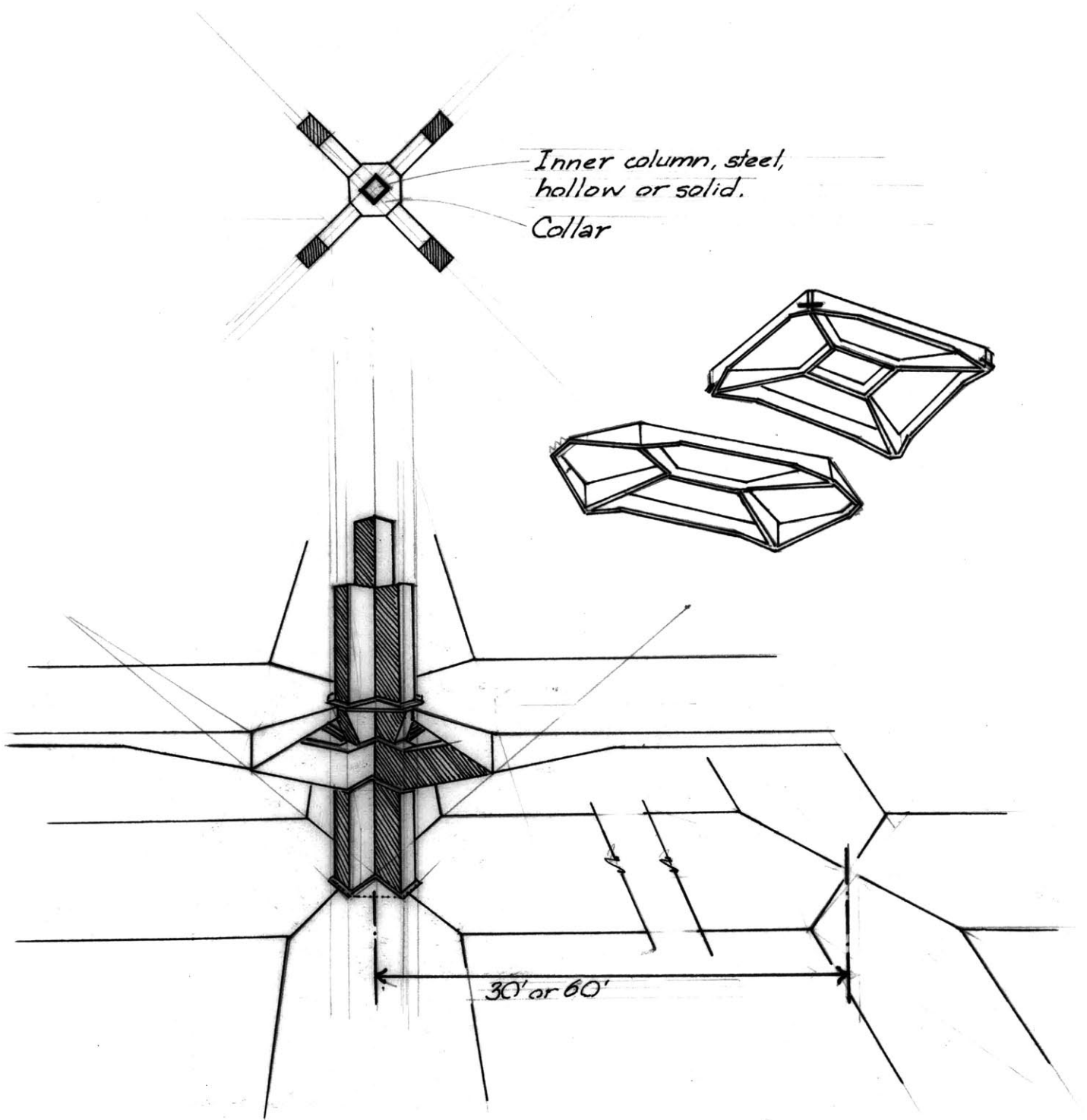
One cannot design, at this stage, every detail. But the stage can be set for a place to grow, to be added to with tertiary systems of other people's making. Others will associate with, use according to new needs, places that lend themselves/ suggest/ attract participation. The ways and places must be able to be described if they are also places which can be used. The place has to look like something, has to be good for many things. The previous analogies test this. Hopefully, they are also useful in enriching understandings of the plans and sections. They are a useful tool in designing, and can begin to suggest materials and methods by which a place is built.

BUILDING METHODS

A building system is what is made, it is the wish becoming. It is specific to use generally but flexible enough to allow for multiple use. It suggests use, but except for singular purposes, such as air ducts or road surfaces, it is adaptable to additional needs. It can be associated with at the speed of a car, or with the touch of a hand. Everything which is made has a life and a feeling.

The basic system for the station is a pre-cast column with four arms. Needs of parking garages dictate a 30'x 60' span, the commercial areas which are lower and must resist upward ground pressure have a 30'x 30' span. The floors are pre-cast panels, but the column can also adapt to a post, beam and continuous poured slab system. Variations in load on columns are made possible through the column's steel inner core which can vary in thickness. The precast floor system makes a larger continuous surface; level changes demand breaks in the

PRECAST BUILDING SYSTEM

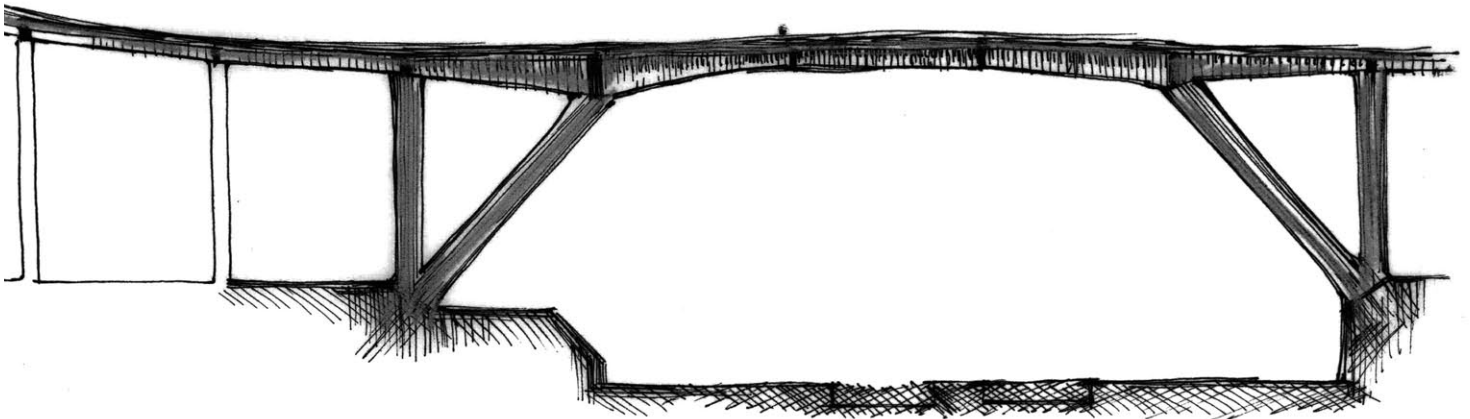
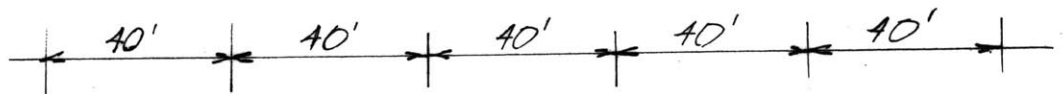
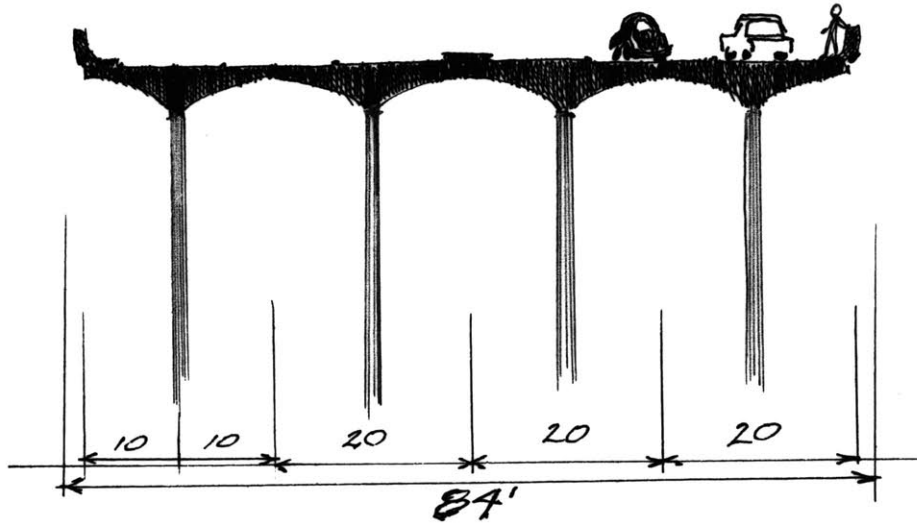


surface. Gaps for vents, light, stairs, can also be achieved by leaving out panels. The pre-cast system makes a two-directional surface. For more linear purposes such as the roads, beams, poured slabs and ramps are appropriate. The precast system has a varied edge, a series of diagonals; or, with small cantilevering pieces can have a straight edge.

With slight inefficiencies in the system, one can double the columns to make definitions for entrances, walkways, mechanical distribution. The pre-cast floors also could adapt to the support of retaining walls, and allow for various kinds of infill. In addition, the system is demountable. The system saves on material by being structurally efficient --- a diagram of the forces. See diagrams on the next page.

Similar in shape but not in size are the inverted umbrellas which contain the housing and hotel rooms. Four arms hold suspended steel plates in tension. The arms are in compression, transmitting the force to the ground through columns which have a solid core. The housing structures are braced in part by their attachments to the station structure from the waist down; and they are braced above by each other. The umbrellas, though large, are light, tensile structures. The loading must be rather uniformly distributed, and must be basically two to three story light frame construction, at a density to make the structures economical. The corten hung plates are covered with a layer of concrete, which can serve as foundation or be planted upon.

The bridge which arches over the station, allowing for openness and free circulation below has a span of 200', and as in the natural arch,



maintains a presence, a body. Its large supports are absorbed, even celebrated at the ground --- they become entrances, define spaces, are inhabited. For similar reasons of openness, the bus terminal sits up underneath the arch and is built of like pieces.

The tunnel for the subway is made of two standard concrete boxes, typical of the cut and cover system.

The grid of columns suggests growth directions around the station. The direction change in the middle of the complex accomodates the supporting of the Parkway. It opens out to the east edge, helping to define an entrance area, and reducing somewhat the reverberation noise of the subway car as it enters. Any particular physical need has a number of consequences, the physical assymetry resonates throughout the whole.

The result may be a broken edge, a gap, a level change or direction. The station is an integrated structure in that sense. It moves to the complexities of the program. Its parts are reciprocal, analogous to the tree growing over rocks, eroded from below, in the following photograph. Because this is so there are some efficiencies in making the plan loose, partially defined at the edges, not closely packed, inefficient in some areas for a time. It is this which allows the place to continue to resonate in time, with use, to become a rich evolving place, like the natural analogy.



CONCLUSION

The planning strategies allowed this plan to grow. And, it was important for preliminary designs to occur at the inception of the framework of implementation. These physical plans here presented are one kind of station. Others could have occurred with these strategies given a different set of assumptions along the way. But the generality, integration of uses, could only be designed within this or a similar planning context.

It is unfortunate that some simulation of user feedback could not have been included in this last work. And of course, having to make assumptions of first stage occurrences skewed the reality of this design.

It seems that at the same time various actors would be cooperating within the implementation framework, they would also have to be understand the physical implications of that togetherness. There is more to the Southeast Expressway's devastating route than expediency. Roads, like sandstone arches can have wonderful qualities, can make usable places underneath. If roads and subways are to be a part of the cities' systems, occurring in areas of some density, people must be able to see them as potential positive features of the landscape.

The planning strategy, in addition to cooperation, allows for a base of information; it gives an evolving place a history. Given a history, a context, a smaller piece such as this station site is aided in its conception.

Places which are designed at this scale can only begin to be human. If time had allowed, it would have been useful to go one step further, taking a part of the station and developing

it. The commercial and office spaces are as yet very diagrammatic. It would also be interesting to do more complete programming and design of the housing structures. Microclimate and energy considerations need further exploration.

It is my hope that this work will be of use to others designing planning strategies, at a large scale in the context of such strategies, designing mixed use structures; and it is hoped that people will learn to love and live with roads and subways and the spaces they create.

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FOOTNOTES

1. Abernathy, et al. "Alewife Study", M.I.T., 1974.
2. *ibid.*
3. Alan M. Voorhees et al., Boston Transportation Planning Review, Northwest, Jan. 1973.
4. Much of the Master Plan sections have been extrapolated from many different writings from the team work in the Super Studio, see acknowledgments.
5. Cambridge Seven Associates, Inc., MBTA, "Manual of Guidelines and Standards". Jan. 1973.
6. *ibid.*

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