

**SPECIAL GREENWICH STREET  
DEVELOPMENT DISTRICT**

SPECIAL GREENWICH STREET DEVELOPMENT DISTRICT

by

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ABSTRACT

Special Greenwich Street Development District  
Carol Shen Glass

Submitted to the School of Architecture and Planning on May 19, 1971, in partial fulfillment of the requirements for the degree of Bachelor of Architecture.

The Special Greenwich Street Development District is an ordinance recently added to the New York City Zoning Resolution. The special district provides a 24-block area in downtown Lower Manhattan with a "District Plan" of services and circulation elements that must be constructed as development occurs.

The special district legislation is intended to both encourage development and to coordinate and direct it towards providing certain public improvements deemed necessary. A case study examination of the effects of the new zoning laws reveals the implications of the concepts of the district with regard to:

- (1) Design: the physical, formal response to legal requirements and the effects of those requirements on the design process.
- (2) Pedestrian System: in the immediate area of the case study, the effects of the "District Plan" upon contiguous pedestrian access patterns.
- (3) Working Environment: within the case study developments, the impact of the "District Plan" upon the quality of the environment for the working population.
- (4) Development: the effects of mandatory improvements and the bonusing system upon the economics of project development.

Evaluation of the legislation's effectiveness with regard to those four issues is based upon the testing and analysis of one site and three alternative project developments on that site.

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# 1 INTRODUCTION

## INTRODUCTION

The Special Greenwich Street Development District, a Special Purpose District, as defined in Section 200 of the New York City charter, was established and officially adopted into the Zoning Resolution of the City of New York on January 6, 1971. Ada Louise Huxtable hailed it as, "One of the most sophisticated zoning devices to be produced by urban man."<sup>1</sup> The District lies in downtown Lower Manhattan, just west of the Wall Street financial district. The new zoning code provides a framework, or "District Plan" of services and circulation elements that must be constructed as development occurs. Richard Weinstein, director of the Office of Lower Manhattan Development, who has worked with his staff, lawyers, and developers on the zoning district, calls it "the most significant piece of zoning legislation we've ever had."<sup>2</sup>

Although the 1961 revision of the original 1916 New York Zoning Resolution has been in force for a decade, its effects upon the City's environment as a whole were only recently comprehended. Individual tower buildings with a patch of open space at each base, strung out for blocks along the Avenue of the Americas, are evidence of the pervasive, powerful force unmanifest within the Zoning Resolution's controls on building size and bulk. Perhaps another decade will uncover the real impact of the Special Greenwich Street Development District. Although the ultimate test of the zoning legislation lies in the actual urban environment that evolves from the "District Plan," certain aspects of the zoning code can be examined, certain results be predicted and critical issues can be raised at the present time. The analysis of these predictable results can provide insights into the effectiveness of



the Special Greenwich Street Development District legislation towards improving the design of the urban environment.

The investigation of certain issues within this paper is necessarily constrained by the limits of time and research data available, and though of no less importance than the areas examined herein, four major issues remain unstudied. The first is that of the basic notion that the expansion of office growth be encouraged within the area designated by the "District Plan." The question of appropriate land use in that location is an actively discussed one. The Downtown-Lower Manhattan Association, a group of banking and business leaders chaired by David Rockefeller, supports the direction of the redevelopment of Lower Manhattan, "to continue to build on its established tradition as the focal center of banking, brokerage and investment, insurance and world trade.... Whatever else redevelopment entails, it is imperative that nothing impair or constrict lower Manhattan's fundamental role of creating jobs and generating revenues, serving in both respects to bolster the municipal economy and to bear a substantial share of the city's responsibilities, obligations and burdens."<sup>3</sup> A local citizens' community group, the Lower Manhattan Township, holds an opposing viewpoint: "Those several hundred thousand more office workers mean the end of everything in Manhattan but business."<sup>4</sup> The answer clearly cannot be ascertained without a comprehensive, unbiased planning analysis that includes all due consideration of the benefits and costs of office expansion not only with regard to employment opportunities, New York City's tax base and land values, but also to changes in the housing, educational and recreational needs of the City.

The second major issue, not unrelated to the first, that remains unstudied is that of the impact of the density generated by the "District Plan." The District is but a slice of the entire New York/East Coast region and an examination of the impact of the District's development on the entire regional environment - its services, utilities, air, power, and water resources - is a prerequisite for a complete assessment of the zoning legislation and its implications. Again, as with the question of the appropriate land use for the Greenwich Street area, this issue is a controversial one. The New York City Planning Commission, in its Plan for New York City made this statement: "But concentration is the genius of the City, its reason for being, the source of its vitality, and its excitement. We believe the center should be strengthened, not weakened, and we are not afraid of the bogey of high density. We hope to see several hundred thousand more office workers in the business districts in the next ten years, and we think the increase desirable and helpful."<sup>5</sup> The dissenting report of former Planning Commissioner Beverly Moss Spatt responded, "To argue for an intensification of the already unconscionable high degree of concentration in the heart of the City is sheer madness."<sup>6</sup> Without a thorough study of the region's capacity for growth and increased density and a look at both the benefits of strengthening the City's center and the costs of such intensification, the subject remains unresolved: Can a balance be achieved between the perils of concentration and the opportunities of expansion? Wolf von Eckardt keeps the controversy alive, asking, "More brownouts and blackouts and overloaded telephone circuits?"<sup>7</sup> An evaluation of the Special Greenwich Street Development District in this regard is beyond the scope of this thesis.

The third issue not covered within this paper is one also related to the above questions concerning the intensification of the downtown core: the impact upon the circulation of traffic. The impact of the future developments in the special district area upon regional and local transportation is an immensely complex matter, The Lower Manhattan Plan, Part II, devoted entirely to a transportation study of the area, involved representatives of the Departments of City Planning, Highways, Public Works, the Transit Authority, the Department of Street and Traffic, and others. A capacity study was conducted and with the aid of computer analysis, a street system network was designed and proposed. Although the system was tested for full development of Lower Manhattan at maximum allowable densities and found to have "sufficient capacity," the assignment assumed completion of a new peripheral expressway with parallel service roads, as well as residential construction which would ease the travel demand of projected higher employment. The capacity, however, was not checked for development without such peripheral expressway or residential construction. A consideration of the traffic problems of a site within the special district is inextricably tied to the larger scale traffic and transportation problems of the city-wide area. Any attempt to do a case study traffic analysis of one site, to predict the impact of its traffic flows, volume and trip generations without a thorough analysis of the transportation system of the city-wide area would be superficial, if not meaningless. Within the time constraints of this case study, a thorough transportation and traffic analysis was not possible.

The fourth issue not covered is that of the impact of the district on the subway system. The question as to the capacities of the mass transit system is obviously an important one, however, detailed quantitative analysis of peak hour

loads and station platform capacities was beyond the scope of this thesis. Reports have shown that access to Lower Manhattan is controlled not by the lack of capacity within the area, but by the lack of capacity outside the area: Midtown and Brooklyn. While The Lower Manhattan Plan reports, "In general there is enough capacity to handle twice as many people as are now accommodated,"<sup>8</sup> the Downtown-Lower Manhattan Association's Third Report four years later warned, "Never has the case been more compelling for increasing the capacity of the overstrained subway facilities serving Lower Manhattan than now when Lower Manhattan faces a big increase in working population."<sup>9</sup> Based on projects under construction or in planning, by 1972, 96,000 additional passengers will be using "facilities that are sorely inadequate right now."<sup>10</sup> The Third Report also identified four critically overloaded stations: Bowling Green on the Lexington Avenue IRT, South Ferry on the Seventh Avenue IRT and Broad Street and Whitehall Street on the BMT. Despite the lack of quantitative data regarding the impact of the special district, it is evident that the design and condition of stations is poor and that the subway ride is a crowded and uncomfortable one without the developments outlined in the "District Plan." The Transit Authority has plans for rebuilding the Bowling Green station, which is within the boundaries of the special district. The Office of Lower Manhattan Development, authors of the special district legislation, states, "The capacity of the other six stations in the district is limited not by platform size but by inadequate access to the stations."<sup>11</sup> The evaluation of the issue of subway access and transit capacity would itself require a thorough, quantitative study as extensive as the study undertaken.

Focus of Thesis

A means of approaching the problem of the analysis and evaluation of the special district legislation is to study its direct effects on the development of a specific site within the "District Plan." The case study is a useful tool whereby the planning concepts of the New York City Planning Commission, diffused within a complex legal framework, can be elucidated. The four major considerations undertaken within the context of the case study in this thesis reflect principle areas of concern, as expressed with "General Purposes," Section 86-00 of the Zoning Resolution, to which the Special Greenwich Street Development District directed its legislation. These considerations are:

- (1) Design: the physical, formal response to legal requirements and the effects of those requirements on the design process.
- (2) Pedestrian System: In the immediate area of the case study, the effects of the "District Plan" upon contiguous pedestrian access patterns.
- (3) Working Environment: within the case study developments, the impact of the "District Plan" upon the quality of the environment for the working population.
- (4) Development: the effects of mandatory improvements and the bonusing system upon the economics of project development.

Evaluation of the legislation is based upon the testing and analysis of the "District Plan" and its effectiveness with regard to those four issues.



VICINITY MAP



## BACKGROUND AND SETTING

Lower Manhattan has physically expanded since the Old Dutch settlement dating back to 1650. The financial district occupies the irregular streets of this central core. Land-fill east of Pearl and west of Greenwich Street was accomplished by the English who established a regular grid street pattern for the edges of the island in the 1800's. Until recently, the geographical differences also defined functional areas. The "hilly" core marked the boundaries of the high-prestige financial district, whereas the flat, land-fill areas contained other commercial activities like shipping, warehousing and markets.

Lower Manhattan, today most notably the place of the financial district for the entire nation, has a past history as the central business district for all of Manhattan. This business center, however, has been moving northward out of Lower Manhattan since the mid-1800's to Union Square, then to 23rd Street and to 34th Street, and now, north of Grand Central to East Midtown. Formerly, also a place for manufacturing and wholesaling, many downtown industries have relocated or have been displaced. The goods-handling activity has also sharply declined, leaving most waterfront areas obsolete and under-utilized. The downtown area is now very specialized, almost a city within itself, devoted to business and office functions. The major component parts of the office core today are: (1) the financial community; (2) insurance; (3) corporate headquarters; and (4) shipping.

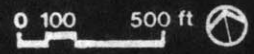
Redevelopment of those areas undergoing change has shifted the boundaries of the office core. The business core has recently expanded beyond the edges defined by the old Dutch city and peripheral land-fill areas. To the south and east,

the proposed move of the Stock Exchange triggered extensive redevelopment along Water Street. The World Trade Center, as well as the possibility of new housing and commercial development along the waterfronts (Battery Park City, for example) has created new opportunities for the potential redevelopment of the entire area, to the west from "peripheral" use to the expansion of the office core.





GROWTH OF MANHATTAN ISLAND

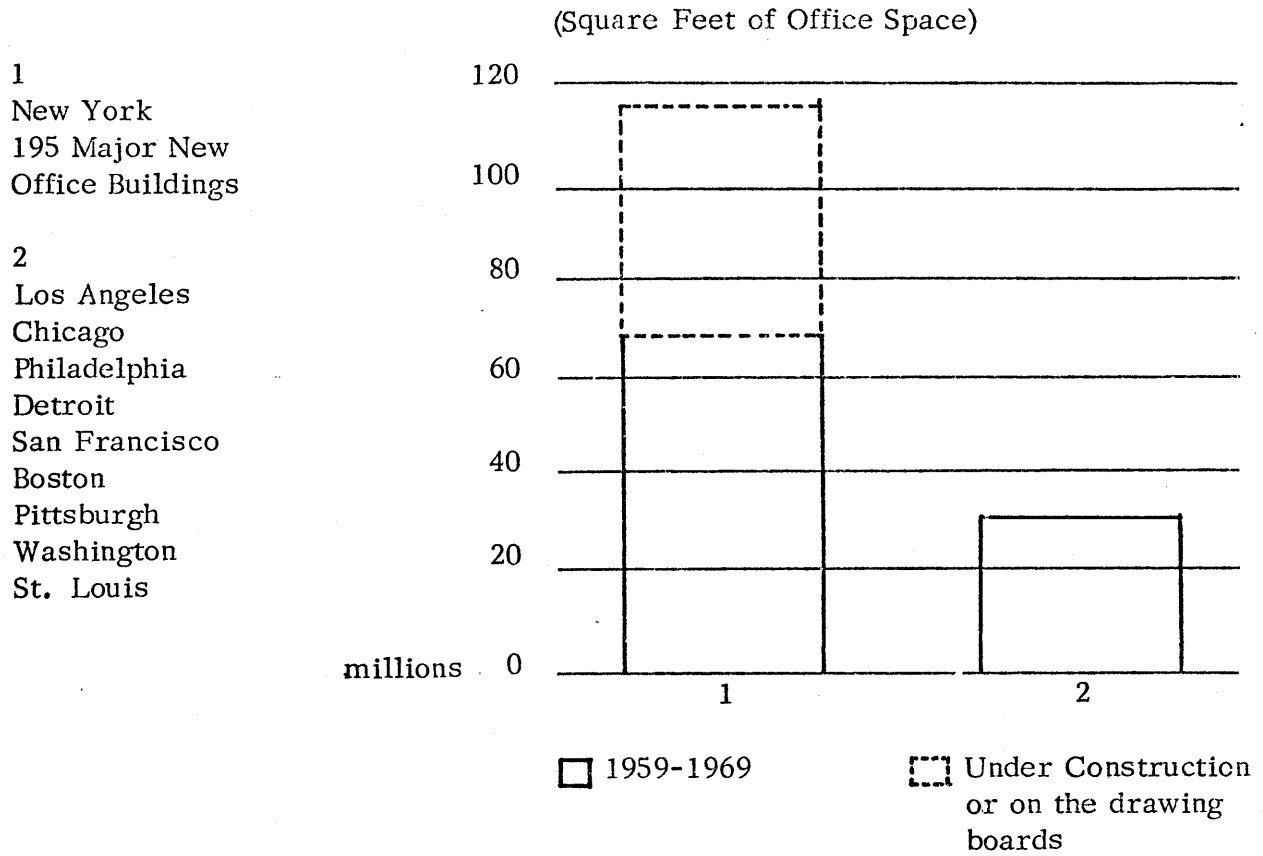




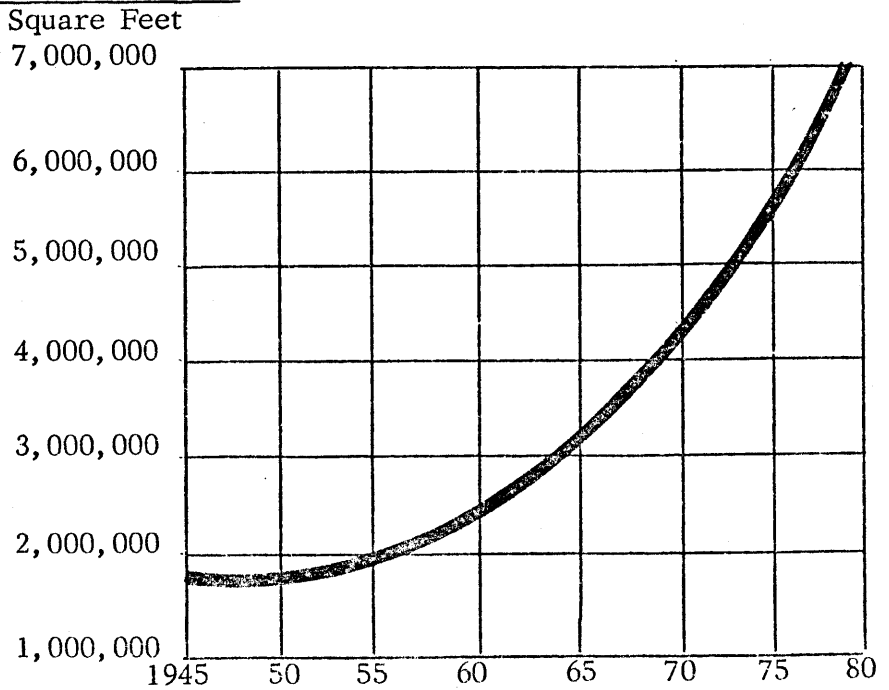
TOPOGRAPHY






**OFFICE GROWTH**  
Post War Office Construction



Annual Rate of Office Space Construction





-  under construction
-  completed 1950-1968
-  modernization

**PROJECTS SINCE 1950**





## BACKGROUND PLANNING CONCEPTS

Although the legislation itself is a new concept in terms of urban design implementation techniques, the concepts behind the development plan of the Special Greenwich Street Development District have been well established for years within the New York City Planning Commission.

A major study was prepared for the Planning Commission in 1966, The Lower Manhattan Plan, whose stated purpose was to develop a framework of policies "to enable the City to respond creatively to private initiative and to guide public activities so that this area reaches its great potential."<sup>12</sup> Basic elements of the study were extensive analysis of the area, outline of long term goals and strategy proposal for development.

This document clearly had enormous impact on those planners of Lower Manhattan's redevelopment and one of the direct responses to The Lower Manhattan Plan is the Special Greenwich Street Development District. For a more complete understanding of the planning principles expressed within the special district, the following is a brief summary of some of the major principles, goals, and conclusions of that report.

First, the concept of a highly concentrated regional core was adopted, "with the proviso that concentration not exceed the limit of capacity of Lower Manhattan to absorb growth, based on transportation facilities, land available and liveability."<sup>13</sup> Based on national, regional and city-wide goals, the impact of this concept upon Lower Manhattan meant, "further growth and diversification of functions assuming

it can be achieved without more congestion. "14

Three major problem areas for Lower Manhattan were identified: Functioning, Environment, and Access and Movement. The Plan's evaluation of the present situation pointed out that the goals for the area must reflect the means for resolving those problems. The following are excerpts from the stated city-wide and local goals for Lower Manhattan:

LM Goal #1: Create a Strong, Coherent and Diversified Core  
...a strong, efficiently functioning Core in an attractive working environment... More recreation, more restaurants, more entertainment, more parks, better shopping, new urban services and new urban excitement are needed... Renewed environment...

LM Goal #2: Provide for Prime Office Space Expansion  
...prime office space close to and a part of the present Core...major new areas for office growth can be expected around the World Trade Center... Continuity between these areas of new growth and the older parts of the Core must be carefully planned...

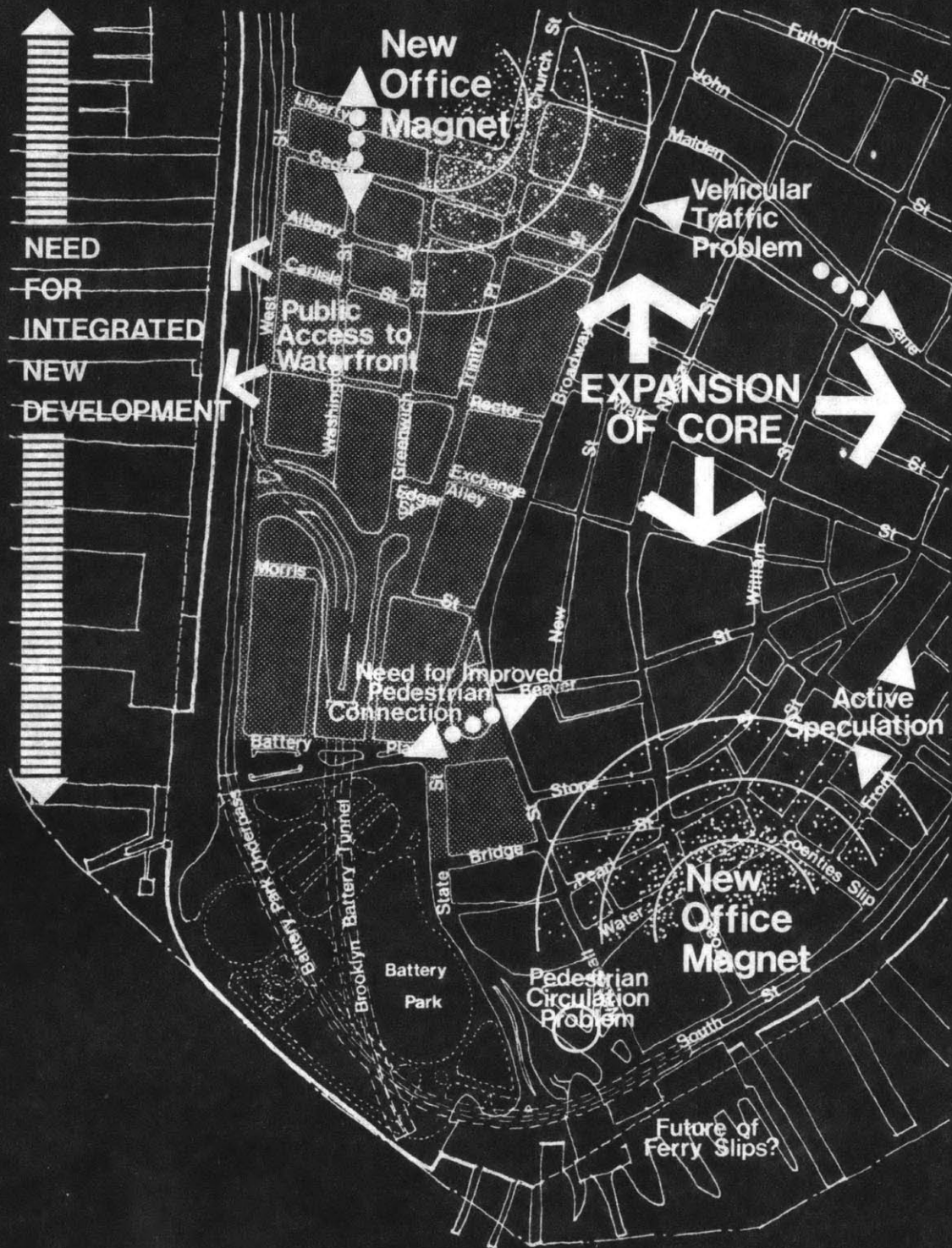
LM Goal #3: Develop a New Lower Manhattan Residential Community  
Demand for housing...already substantial...key part of strategy of diversifying the Core...specifications for this housing should include that it should be large enough to be a viable total community...

LM Goal #4: Improve Regional and Local Transportation  
Vehicular: Elimination of all non-essential traffic in primarily pedestrian Core, re-routing through traffic... internal street system to serve as distributors and service street...  
Pedestrian: ...separation of pedestrian and vehicle traffic...walking scale and character...creation of pedestrian "precincts" and pedestrian streets...  
Internal Movement: ...supplemental new intra-downtown mass transit system...  
Mass Transit Access: Improvements in Lower Manhattan's transit links to Westchester, Staten Island, Queens and New Jersey as well as to the rest of New York...Improved stations, and local linkages can increase ridership and greatly enhance the transit environment.

- LM Goal #5: Take Maximum Advantage of the Waterfront  
... such a great working population so close to the water... high priority to the renewal of Lower Manhattan's waterfront...
- LM Goal #6: Protect Existing Jobs  
... The blue collar working areas of northwest and north Lower Manhattan cannot be duplicated... goal of postponement of radical change...
- LM Goal #7: Enhance the Old Form of Lower Manhattan With the New  
The skyline of downtown is so famous and evocative... appropriate development in the vicinity of the World Trade Center, both inland and offshore, can reincorporate these towers into the larger downtown scale... internal scale: the street canyons... allow tighter construction in the downtown area.
- LM Goal #8: Enhance the City's Economic and Tax Base  
By development of Lower Manhattan to its full potential consistent with sound planning principles and a good quality of environment, the area can enhance the City's economic and tax base... highest and best use of Lower Manhattan should be sought.<sup>15</sup>

The Report's conclusion was "that the future of Lower Manhattan will be determined more by what people want and take collective action to get, than by unseen market forces whose cumulative impact is beyond the community's capacity to influence. This conclusion points up the critical role that planning can have..."<sup>16</sup> It is evident that The Lower Manhattan Plan provided the guideline set of long-range goals used by the New York Planning Commission and the Office of Lower Manhattan Development, in particular, and upon which much of the design of the Special Greenwich Street Development District was based.





**"EXISTING CONDITIONS: PROBLEMS"**

Lower Manhattan Plan, 1966



Special Greenwich Street  
Development District, 1971

## GENERAL CONCEPT OF ZONING

The regulation of land use, in the form of zoning ordinances is today familiar and acceptable in both large cities and small towns across the United States. The first comprehensive zoning law was passed on July 25, 1916 in New York City, establishing districts for land use control and a set of legal rules regulating the height and coverage of buildings. Zoning was initially a negative "police power," prohibiting certain harmful occurrences which would threaten the health, safety and general welfare. Later, permissive-type regulations provided additional protection, for any newly developed (or forgotten) establishment had to be placed within the proper district before being permitted anywhere. Although very simply born out of the concept of protection for "universal good," zoning over the past sixty years has developed into an extremely complex and pervasive mechanism for the control of both land use and development.

There is no question that the power of the zoning ordinance is great and far-reaching. Numerous examples of the primary and secondary effects of zoning laws can be seen and felt in cities across the country: suburban zoning laws determining what is in the interest of "the community" in land use terms can actually fix the kind of residential population able to live within that community; in New York City, where zoning's primary purpose is one of regulating the density and intensity of land use, detrimental side effects upon the character of the city can be witnessed on some of the streets in Midtown Manhattan, where the image of monotonous "Slab City" originated.

More recently, zoning has been used in a more positive fashion by those who

recognize its potential for directing and controlling urban growth and change towards the improvement and enhancement of the environment, both physically and socially. Henry Cohen, in the forward of The New Zoning, writes, "It has fostered revitalization of decaying areas and encouraged private builders to provide features that improve the quality of new buildings and the environment and that ease the burden on public facilities."<sup>17</sup> Zoning legislation is presently being used to accomplish specific purposes beyond land use restraints. Innovative land regulation is being tried and tested by a number of planners seeking solutions to difficult problems within urban environment: traffic congestion, pedestrian access problems, declining areas. Through zoning, it may be possible not only to avoid misuse of land, but in addition, to improve the quality of the environment.

The major thrust of new zoning techniques has also taken a turn in a more positive direction along with the broader and more positive approaches and goals of recent zoning. The basic philosophy behind current positive zoning techniques is one of incentive, where a large number of forces come to play: those within the development industry, those concerned with "the public interest," those in city government who create the legislation itself. Basically, the new zoning system consists of economic incentives which are offered the private developer in return for certain amenities he provides which are "in the public interest." Donald Elliot, in his introduction to The New Zoning explicitly states that the term, "in the public interest," is understood at a specific moment in time and a specific part of the city."<sup>18</sup> The definition of "the public interest" both in terms of government policy and of physical planning concepts, is a most complex and delicate problem, and furthermore, is a key factor in the zoning system's ability to deal successfully

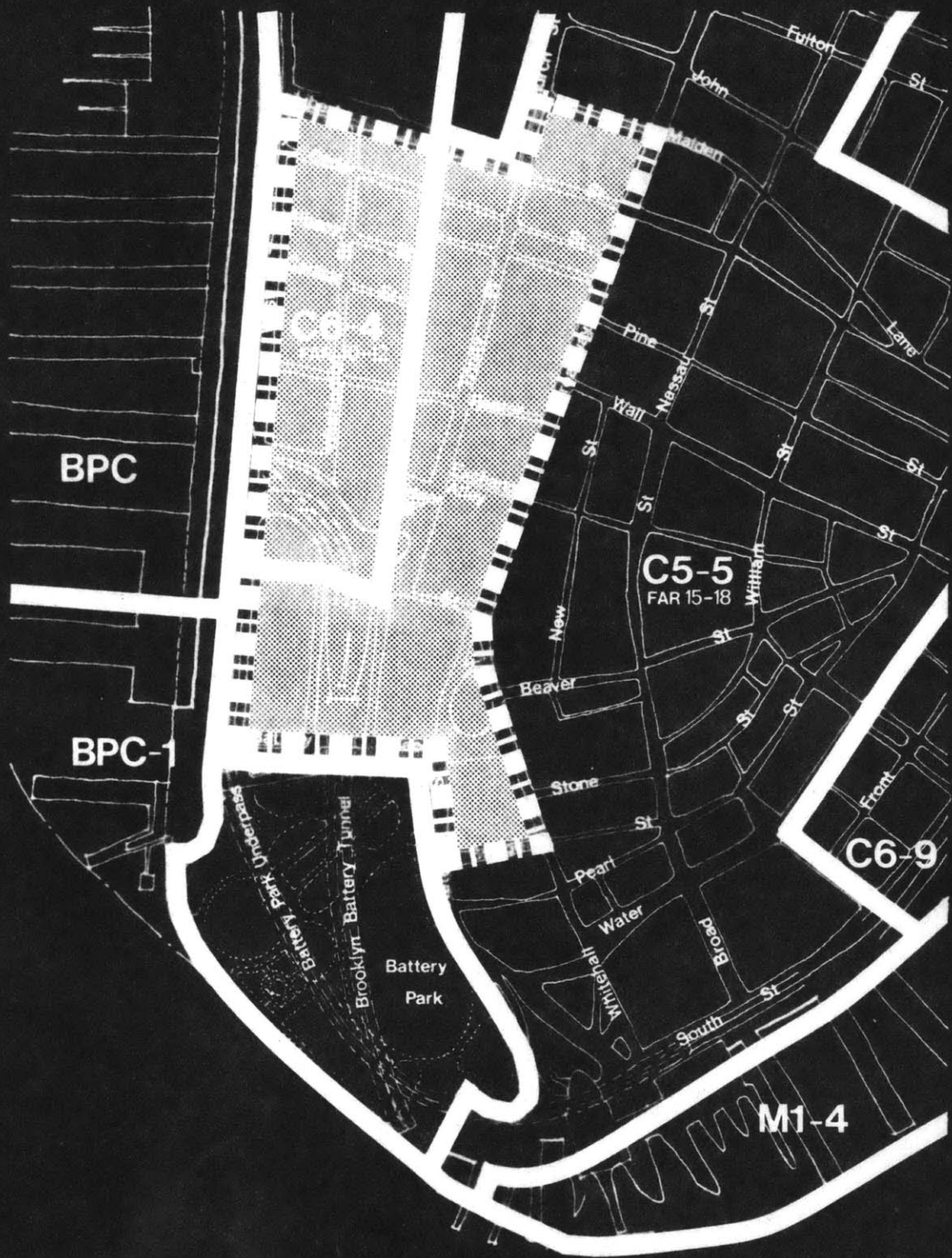
with today's urban problems. "Underlying the entire concept of zoning is the assumption that zoning can be a vital tool for maintaining a civilized form of existence only if we employ the insights and learning of the philosopher, the city planner, the economist, the sociologist, the public health expert and all the other professions concerned with urban problems."<sup>19</sup>

Jonathan Barnett defines incentive zoning as "a mechanism for implementing planning and urban design decisions without the continuous intervention of government officials that occurs in urban renewal, and without government subsidy."<sup>20</sup> In New York City, the first zoning incentive appeared as a floor area bonus for the provision of a plaza in certain high density districts. The intent was to provide public open space out of private development, but since this feature has been used so extensively, the regulation is only partially successful. Barnett writes, "The proliferation of plazas accentuates even further zoning's tendency to pull development into the center of the block, and to impose design solutions that are not related to surrounding development, or to topography and orientation."<sup>21</sup>

In response to certain limitations of uniform regulations, such as the plaza provision in the 1961 Zoning Resolution of New York City, there has been an attempt to achieve better land use patterns to accomplish specific purposes. A more flexible approach to complex economic and social problems, one that more easily can respond to the "public interest" of a specific moment in time and a specific part of the city is the concept of the special zoning district. New York's Special Theater District in the Times Square area of midtown Manhattan is a case in point. The New York City Planning Commission responded to the particular problem of preserving the theater district by making the construction of a new

legitimate theater economically feasible: floor area bonuses are given the private developer if a new legitimate theater is included as part of his building. Thus, with particular goals in mind for a specific area and its individual needs, planners and urban designers working through government legislation are able to direct the growth and development of the area as a whole. Potentially, special district legislation, using the power of the new positive zoning techniques, is a method by which the government can have private development in the district respond to local public needs.

# 2 THE DISTRICT



**ZONING DISTRICTS**

**■ ■ ■ ■ Special Greenwich Street Development District**



## THE SPECIAL GREENWICH STREET DEVELOPMENT DISTRICT

In view of the previous sections concerning the history of the Lower Manhattan area and past planning recommendations with respect to it, the Special Greenwich Street Development District is a logical product of planning policy. It is a recent supplement to the 1961 Zoning Resolution revision, and like the Special Theater District and the special district created around Lincoln Center, it is a product of the new approach toward policy implementation in New York City, as well. Within the framework of governmental decision-making process, the Office of Lower Manhattan Development is attempting to harness the power of the zoning laws as an urban design tool.

The Special Greenwich Street Development District governs a twenty-four block area of Lower Manhattan. Its boundaries are: the World Trade Center on the north, Broadway and the Wall Street financial district on the east, Battery Park on the south and the West Side Highway on the west. Approximately half of the sites within the district are undeveloped or underdeveloped and have a good potential, therefore, for redevelopment and new construction. The special district legislation is intended to both encourage this development and to coordinate and direct it towards providing certain public improvements deemed necessary.

Most of the major goals expressed in The Lower Manhattan Plan are incorporated by the special district (refer to page 16), namely:

- LM Goal #1: Create a Strong and Diversified Core
- LM Goal #2: Provide for Prime Office Space Expansion
- LM Goal #4: Improve Regional and Local Transportation  
(Vehicular, Pedestrian, Mass Transit Access)



LM Goal #7: Enhance Old Form of Lower Manhattan With the New  
LM Goal #8: Enhance the City's Economic and Tax Base

Providing for prime office space expansion, strengthening the Core and enhancing the City's economic and tax base are all mutually reinforcing. Prior to the special district ordinance, however, the private developer fulfilling these goals was not responsible for the project's impact on the diversity of the Core as a whole, the regional and local transportation systems or the "old form of Lower Manhattan." The district regulations, therefore, concentrated on: (1) Design; (2) Circulation systems; (3) Working environment; and (4) Incentives for those developments which comply with requirements of the "District Plan."

In considering the "old form of Lower Manhattan" the district controls the development of certain areas to maintain the character of urban spaces in the area by requiring specific site configurations where deemed necessary. Amenities like plazas, arcades and special district elements, more fully described below, are coordinated on a district-wide scale in an attempt to create an urban environment where buildings and the spaces around them are related to one another.

The elements whose relationships to one another are "designed" by the "District Plan" are components of a comprehensive pedestrian circulation system. Three major considerations guided the design of this pedestrian circulation system:

1. Access to mass transit systems: east-west movement associated with the several subway stations and north-south movements generated by PATH (Port Authority Trans-Hudson) at the World Trade Center and the Staten Island Ferry.
2. Continuity between the district and its surrounding area: movement

between the special district and the Wall Street core (east-west), the World Trade Center and Battery Park (north-south) and in the future, the proposed Battery Park City development along the waterfront to the west.

3. Separation of pedestrian and vehicle traffic: the constrained street system within the district, which must accommodate vehicles, service and pedestrians.

The "District Plan" thus provides for a multi-level pedestrian system and establishes a street system of vehicle and pedestrian distributors and service streets. It also includes several new or improved subway station entrances.

The special district not only attempts to coordinate the circulation elements throughout the area, but also incorporates public amenities in and among them to add improvements to the working environment in the business core. By requiring that 2-1/2 percent of the total floor area of each development be devoted to convenience retail or service establishments or theaters, the zoning legislation has compelled new projects within the district to provide expanded opportunities for shopping and eating. These opportunities are in response to the goal of a more attractive working environment.

The fundamental district requirements are straightforward: inclusion of retail uses, access restrictions on parking and service, requirements at specific locations to build to the lot line, and requirements and/or options to build special district components of the pedestrian circulation system.

The components of the system are defined in detail within the zoning regulations and are listed within the "Excerpts" section below. The major types are:

(1) mandatory pedestrian circulation improvements which must be developed in conjunction with the contiguous lot; (2) elective pedestrian circulation improvements which are neither conditional to the development, nor necessarily contiguous with that lot; (3) mandatory lot improvements which must be provided as part of the development; (4) preferred lot improvements, which are elements of the "District Plan" that are not conditional to the development, but may be built without a special permit; and (5) discretionary lot improvements, which are plazas and arcades which any developer may choose to provide.

The developer is compensated for the expense of providing the components of the system prescribed in the "District Plan" with floor area allowances for pedestrian circulation improvements (PCI's) and floor area bonuses for lot improvements.

86-046 Floor Area Allowance for PCI's

- |  |                             |
|--|-----------------------------|
| a. for an elevated shopping bridge           | 700 sq. ft. per linear foot |
| b. for an enclosed pedestrian bridge         | 270 sq. ft. per linear foot |
| c. for an open pedestrian bridge             |                             |
| 1. single span                               | 90 sq. ft. per linear foot  |
| 2. multiple span                             | 100 sq. ft. per linear foot |
| 3. with stair or ramp                        | 120 sq. ft. per linear foot |
| d. For a pedestrian deck                     | 10 sq. ft. per square foot  |
| e. for each tree provided on pedestrian deck | 300 sq. ft. per tree        |

86-058 Bonus Floor Area for Lot Improvements

- |  |   |
|--|---|
| a. for shopping way                            | 400 sq. ft. per linear foot   |
| b. for a shopping arcade                       | 100 sq. ft. per linear foot   |
| c. for an elevated shopping way                | 300 sq. ft. per linear foot   |
| d. for a loggia                                | 100 sq. ft. per linear foot   |
| e. for a pedestrian connection                 | specified in Zoning Resolution  |
| f. for required escalators                     | 20,000 sq. ft. per pair of 32 inch wide escalators if single run provided; 30,000 sq. ft. bonus if double run with intermediate landing provided. |
| g. for each tree provided on an elevated plaza | 300 sq. ft. per tree  |

## THE BONUSING SYSTEM

The special district regulations do not merely define the conditions which control development, but also provide certain procedures which encourage such development within the district, where incentive is deemed necessary. These provisions are structured into four basic operations, the first of which involves no bonus incentive. The second, third and fourth provisions both compensate for the cost of certain amenities and encourage the development to follow the "District Plan."

- (1) Fundamental Requirements: 2-1/2% of the floor area for Use Group G, the restriction of access to parking and loading facilities from certain streets, and the requirement to build to certain lot lines. These fundamental requirements, similar to building envelope requirements of the Zoning Resolution, impose no specific cost to the developer and are not therefore, compensated by bonuses.
- (2) Adjusted Basic Maximum Floor Area Ratio: in areas (northwest portion of the district) zoned C6-4, where the basic maximum FAR is 10.0, the floor area allowances granted for the provision of Mandatory and Elective Pedestrian Circulation Improvements and for contributions to the District fund (see more detailed explanation of District fund below) can raise the basic maximum FAR 10.0 to an adjusted basic maximum of FAR 15.0. In areas zoned C5-5 where the basic maximum FAR is 15.0, the basic maximum cannot be adjusted. Floor area allowances in C5-5 areas may be used as floor area bonuses.

- (3) Bonus Floor Area: Floor area allowances from Mandatory and Elective PCI's and District fund contributions that are in excess of amounts required to "adjust" the basic maximum, as well as bonus floor areas granted for provision of Lot Improvements can increase the FAR to 18.0 (absolute maximum).
- (4) Increased Tower Coverage: Tower coverage of a development can be increased from 40% (the maximum of the 1961 Zoning Resolution) to 55% for the bonus floor area attributable to Mandatory PCI's or Mandatory Lot Improvements that is in excess of the FAR 18.0 limit. The rule is that for each 0.2 points of FAR above 18.0, from bonus floor area due to mandatory improvements only, 1% increase of tower coverage is allowed up to 55%.

The compensation of the cost of construction and maintenance of public amenities, i. e., elements of the "District Plan," whether it be as allowances or bonuses, is credited in terms of floor area. The method for determining the amount of floor area appropriate for a particular amenity is based upon the concept of exchange: advantages given to the developer in return for advantages given by the developer to the public. The basic rate of exchange is in terms of the estimated worth of a square foot of bonus floor area. Herman D. Ruth, in his article, "Economic Aspects of the San Francisco Zoning Ordinance Bonusing System," explains the procedure for approximating the value of an incremental net rentable square foot of space. Substituting New York City factors, the following analysis is patterned after Ruth's analysis of San Francisco.

- (1) At 80% efficiency (net to gross square footage) and with a current 10% vacancy factor, the net rentable area to gross area is 72%. (80% minus 10% of 80%).
- (2) New York City construction costs run \$40-45 per gross square foot, or an average of \$42.50 per gross square foot. Dividing by the net rentable to gross area figure of 72%, cost per net rentable square foot is \$59.25.
- (3) The yearly net net rental of one square foot of space is net rental less operating expense: (\$10 per square foot less 34%, or \$3.40) \$6.60  
Capitalized value at 10% capitalization rate is \$66.00 per square foot.
- (4) The value of an incremental net rentable square foot of office space is equal to the capitalized value of a net net square foot minus the construction cost per net rentable square foot.

CAPITALIZED VALUE of a net net rentable square foot	\$66.00
Less BUILDING COST of a net rentable square foot	<u>59.25</u>
VALUE OF AN INCREMENTAL NET RENTABLE SQUARE FOOT OF SPACE	<u>\$ 6.75</u>

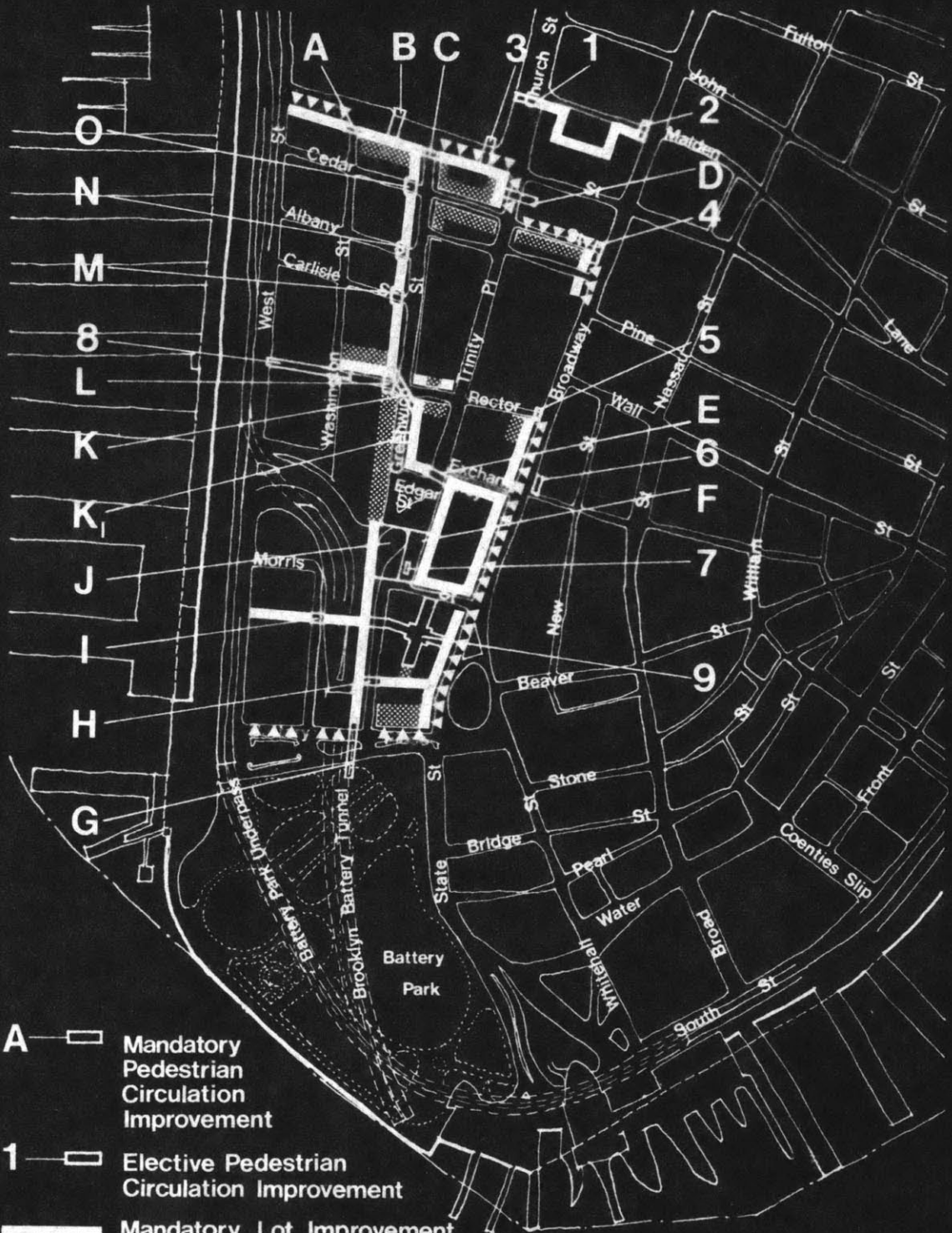
The value of one incremental square foot of space is the basic unit of exchange given to the developer for the public amenities he is required or is encouraged to build. For example, the cost of one pair of 32-inch escalators, straight run is approximately \$140,000. The bonus given is \$140,000/\$6.75 per square foot, or 20,000 square feet floor area. The construction cost of any one of the district amenities can be estimated, and bonuses, in direct proportion to the cost can be assigned in terms of increments of floor space.

The Greenwich Street Development District Fund provides that cash contributions can be made to a fund which will be used to improve the seven subway stations in and adjacent to the special district. Fund contributions operate as elective PCI's do: floor area allowances generated may be used only to increase the floor area of the development. Priority is given to mandatory PCI's. Only when the floor area allowances for mandatory and elective PCI's total less than that necessary to achieve an adjusted basic maximum of FAR 15.0, and if no elective PCI will achieve FAR 15.0 (either generates too much or too little floor area allowance) may the developer contribute \$6.75 for each square foot of floor area he needs. Each year, the monetary rate is adjusted by the City Planning Commission based on changes in the assessed value of the land in Lower Manhattan.


The basic notion behind the floor area allowance/bonus is that hidden beneath the direct exchange of costs of amenities for increments of value of floor areas, lie important benefits to the developer. The incentive is necessary to encourage development, but just how much the developer is favored is an important issue. Very simply, the additional cost of constructing an amenity is but a small percentage of the project cost. Further, the developer's initial capital investment is approximately a tenth of this total project cost. For example, if the cost of amenities amounts to 10% of the total project cost, the developer's initial capital investment required with respect to those amenities is only 1% of the total project cost. Thus, the cost of an amenity affects the required amount of capital investment very little. The income from the bonus floor area awarded to offset those costs, however, directly increases the cash flow of the development. The high

return on investment from the floor area allowance/bonus is the powerful incentive behind the simple exchange of floor area for amenity costs.





- A — Mandatory Pedestrian Circulation Improvement
- 1 — Elective Pedestrian Circulation Improvement
- Mandatory Lot Improvement
- ▒ Preferred Lot Improvement
- ▼▼▼▼ Building to the Street Line

0 100 500 ft 

**THE DISTRICT PLAN**

EXCERPTS FROM  
SPECIAL GREENWICH STREET DEVELOPMENT DISTRICT

86-00

General Purposes

The Special Greenwich Street Development District (hereinafter also referred to as the "District") established in this resolution is designed to promote and protect public health, safety, general welfare and amenity. These general goals include, among others, the following purposes:

- (a) To foster and promote the orderly expansion of commercial office development so that the City of New York will enhance its position as a national center for economic and commercial affairs, provide an expanding source of employment opportunities for its inhabitants and encourage the development of a desirable working environment;
- (b) To develop and implement a plan for improved pedestrian and vehicular circulation, including the grade separation of pedestrian and vehicular circulation systems, in order to avoid congestion arising from the movements of large numbers of people;
- (c) To improve the rapid transit facilities in the area and pedestrian access thereto, including the provision of subsurface pedestrian connections from centers of major commercial development to the transit facilities;
- (d) To retain and promote the establishment of a variety of retail consumer and service businesses so that the needs and requirements of the area's working population will be satisfied;
- (e) To provide an incentive for development in a manner consistent with the foregoing objectives which are integral elements of the Comprehensive Plan of the City of New York;
- (f) To encourage a desirable urban design relationship between each building in the District, between the buildings and the District's circulation systems and between the development in the District and in the adjacent areas of Battery Park City and the World Trade Center;
- (g) To encourage development in accordance with a District Plan, including the provision of mandated improvements, by the coordinated relaxation of tower coverage and other height and setback regulations; and

- (h) To promote the most desirable use of land in accordance with a development plan and thus to conserve and enhance the value of land and buildings, and thereby protect the City's tax revenues.

86-03

#### District Plan

The District Plan for the Special Greenwich Street Development District identifies the physical improvements to be provided in the District in exchange for bonuses allowed under provisions of this Chapter. The physical improvements are of four general types - mandatory pedestrian circulation improvements, elective pedestrian circulation improvements, mandatory lot improvements and preferred lot improvements, each of such improvements being described and its bonus set forth in the provisions of and appendices to this Chapter.

86-04

#### Pedestrian Circulation Improvements

86-041

##### General

Pedestrian circulation improvements are those elements of the District Plan which are identified in Appendices B and C. Such improvements are of two types - mandatory and elective. Mandatory pedestrian circulation improvements are those elements which shall be built by the developer of a zoning lot in the block or blocks identified in Appendix B and for which the developer is allowed the additional floor area specified in Section 86-046 (Floor area allowance). Elective pedestrian circulation improvements are those elements identified in Appendix C which a developer may elect to build, and for which the developer is allowed the additional floor area specified therein. Any development within the District shall be eligible for the additional floor area authorized by Section 86-047 (Additional floor area for pedestrian circulation improvements) subject, however, to the limitations imposed by Sections 86-048 (Basic maximum floor area ratio) and 86-06 (Floor Area Limitations).

86-042

Elevated shopping bridge

86-043

Enclosed pedestrian bridge

86-044

Open pedestrian bridge

86-045

Pedestrian deck

86-048

Basic maximum floor area ratio

- (b) For any development in that portion of the District superimposed upon a C5-5 District the basic maximum floor area ratio set forth in Section 33-12 (Maximum Floor Area Ratio) shall remain at 15. Any such development may provide elective pedestrian circulation improvements and receive the additional floor area attributable thereto, provided that such development (i) provides those mandatory pedestrian circulation improvements and mandatory lot improvements, if any, designated by the District Plan to be constructed on the zoning lot and (ii) complies with the provisions of Section 86-06 (Floor Area Limitations). Any additional floor area attributable to the provision and pedestrian circulation improvements shall be credited as bonus floor area.

86-05

Lot Improvements

86-051

General

Mandatory lot improvements are those elements of the District Plan identified in Appendix B which shall be built by the developer of the zoning lot on which they are mapped, and for which the developer is allowed the floor area bonus specified in Sections 86-058 (Floor area bonus) and 86-059 (Floor area bonus for certain lot improvements). Preferred lot improvements are those elements of the District Plan identified in Appendix B which may be built without a Special Permit from the City Planning Commission as set forth in Section 86-08, by the developer of the zoning lot on which they are mapped, and for which the developer is allowed the floor area bonus specified in Section 86-058 (Floor area bonus) and 86-059 (Floor area bonus for certain lot improvements).

86-052

Shopping arcade

08-053

Elevated shopping way

86-054

Shopping way

86-055

Loggia

86-056

Pedestrian connections

86-057

Frontage allocated for Use Group G (uses set forth in Section 86-092)

86-06

Floor Area Limitations

86-061

Bonus floor area limitations

Floor area bonuses for (i) mandatory or preferred lot improvements, (ii) pedestrian circulation improvements where the additional floor area attributable to such improvements is credited as bonus floor area as provided in Section 86-048 (Basic maximum floor area ratio), or (iii) amenities for which bonus floor area is allowed under the provisions of the underlying districts, or under such provisions as modified by the provisions of this Chapter, are limited as follows:

- (a) Aggregate floor area bonuses for any development in the District shall not exceed 40 percent of the basic or adjusted basic maximum floor area ratio as set forth in Sections 33-12 (Maximum Floor Area Ratio) and 86-048 (Basic maximum floor area ratio), respectively.
- (b) That portion of the aggregate floor area bonuses attributable to improvements or amenities other than mandatory lot improvements or mandatory pedestrian circulation improvements shall not exceed 20 percent of the basic or adjusted basic maximum floor area ratio.

86-062

Floor area ratio limitation

In no event shall the floor area ratio for any development exceed the basic or adjusted basic maximum floor area ratio by more than 20 percent except that on a zoning lot the permitted floor area ratio may exceed the basic or adjusted basic maximum floor area ratio plus 20 percent if developed in accordance with the provisions of Section 86-11 (Modification of Regulations for Commercial Development Extending into More Than One Block) or the provisions of Section 74-79 (Transfer of Development Rights from Landmark Sites).

86-03

Conversion of excess bonus floor area into tower coverage

Bonus floor area for which a development would be eligible under the provisions of this Chapter but for the floor area ratio limitations set forth in Section 86-062 may be converted into increased tower coverage so that the maximum percent of lot area which may be occupied by a tower shall be the sum of 40 percent plus one-half of one percent for every .1 by which the floor area for such development would exceed floor area ratio 18, provided that in no event may tower coverage on a zoning lot exceed 55 percent.

86-07

Modification of Height and Setback Regulations

86-071

Increased tower coverage

86-072

Building walls along certain street lines

86-073

Exemptions from tower setback requirements

86-09

Special Use Regulations

86-091

Minimum retail requirement

86-092

Use Group G

- A. Convenience Retail or Service Establishments
- B. Retail or Service Establishments
- C. Amusements

86-11

Modification of Regulations for Commercial Development Extending into More than One Block

For a site located in the District the minimum requirements which must be satisfied before consideration by the Commission of an application for development under the provisions of Section 74-74 (Commercial Developments Extending into More than One Block) are modified to the following extent:

To be included in the site for such development a zoning lot need not be, for an aggregate distance of at least 190 feet, directly across a street from other zoning lots included in the site. It must, however, either be across a street and opposite to other zoning lots included in the site or, in the case of corner lots, front on the same street intersection as other zoning lots included in the site.

## DESCRIPTION OF IMPROVEMENTS BY BLOCK

Block 19 (Note that Section 86-11 makes it possible to develop this block in conjunction with block 20N or block 53S.

### Mandatory Pedestrian Circulation Improvements

PCI:E. An enclosed pedestrian bridge spanning Trinity Place between the southeast corner of block 19 and the northwest corner of block 20N and providing pedestrian access between the elevated public pedestrian circulation systems required in both blocks. Not required if PCI:10 is accomlation systems required in both blocks. Not required if block 20N has not been redeveloped to provide the pedestrian connection.

PCI:K1. An enclosed pedestrian bridge spanning Greenwich Street between the east lot line of block 18N and the west lot line of block 19 and providing pedestrian access between the elevated shopping ways required in both blocks. Not required if block 18N has not been redeveloped to provide the elevated shopping way.

PCI:K. An enclosed pedestrian bridge spanning the intersection of Rector and Greenwich Streets between the southeast corner of block 53S and the northwest corner of block 19 and providing pedestrian access between the elevated shopping ways required in both blocks. Not required if PCI:L is accomplished or if block 53S has not been redeveloped to provide the elevated shopping way.

### Mandatory Lot Improvements

- (a) A shopping way along Greenwich Street.
- (b) A pedestrian connection along the south lot line between street level At Trinity Place and street level at Greenwich Street.
- (c) A pedestrian connection along the south lot line between the elevated shopping way along Greenwich Street and PCI:E.

### Preferred Lot Improvements

- (a) A pedestrian connection between the 7 Ave. IRT Rector Street Station (at the north end of the west lot line) and street level at Greenwich Street.
- (b) A pedestrian connection between the Bwy BMT Rector Street Station (at the north end of the east lot line) and street level at Trinity Place.



- (c) A covered pedestrian space at the north end of the block with a view toward Trinity Church. This covered pedestrian space may qualify for bonus floor area under the provisions of Section 86-08 (Modification of Special Permit Regulations) if, in addition to meeting the requirements set forth in Section 12-10 (Definitions) as modified by Section (86-059), the covered pedestrian space
  - (1) has direct pedestrian access from Greenwich Street, Rector Street and Trinity Place,
  - (2) provides a public space in which a pedestrian connection, including not less than one pair of 32-inch wide escalators, is accomplished between street level and the 7 Ave IRT and Bwy BMT Rector Street Stations, and
  - (3) provides for the penetration of daylight into both subway stations or concourses.

Block 20N (Note that Section 86-11 makes it possible to develop this block in conjunction with block 19.)

#### Mandatory Pedestrian Circulation Improvements

PCI:E. An enclosed pedestrian bridge spanning Trinity Place between the southeast corner of block 19 and the northeast corner of block 20N and providing pedestrian access between the elevated public pedestrian circulation systems required in both blocks. Not required if block 19 has not been redeveloped to provide the pedestrian connection.

#### Mandatory Lot Improvements

- (a) Build to lot line on Broadway (east lot line).
- (b) An elevated shopping way along Trinity Place (the west lot line).
- (c) A pedestrian connection along Exchange Alley (the north lot line) between street level at Broadway and the elevated shopping way at Trinity Place.
- (d) An arcade with a minimum width of 15 feet along Broadway (the east lot line).
- (e) An elevated plaza spanning Trinity Place between the west lot line of block 20N and the east lot line of Greenwich Street and extending from PCI:J and PCI:F on the south to block 19 and PCI:E on the north. This

elevated plaza may qualify for bonus floor area under the provisions of Section 86-08 (Modification of Special Permit Regulations) if, in addition to meeting the requirements for plazas set forth in Section 12-10 (Definitions) as modified by Section 86-059, the elevated plaza

- (1) provides commodious, and obviously public pedestrian access from street level on Greenwich Street near the intersection with Edgar Street as well as from PCI:F, PCI:J, the elevated shopping way in block 20N and the elevated pedestrian circulation system in block 19, and
- (2) provides for pedestrian facilities including but not limited to benches, outdoor cafe, and kiosks for uses from Use Group G.

This elevated plaza is not required if the triangular property south of Edgar Street and between Greenwich Street and Trinity Place is not available for development with block 20N.

# **3 A CASE STUDY**



CASE STUDY SITE AREA



## GENERATION PROCESS OF BUILDING STUDY ALTERNATIVES

Based on consultation with Richard Roth, Jr. in New York City and two developers experienced with regards to high-rise office construction, the basic assumptions are:

- (1) The major critical factor regarding high-rise office design is the relationship between the core and the rentable floor area. Two basic requirements for this relationship are:
  - (a) minimize size of core, which includes elevators, shafts, stairs, with respect to the rentable floor area, (this primarily determines the efficiency of the building), and
  - (b) maintain a distance of 35 to 45 feet from core to outside wall for optimum rentable floor space.
- (2) The primary factor determining core size is the elevator requirement. Two rules which govern elevator needs are:
  - (a) larger floor area per floor (story) affects the need for elevator linearly, and
  - (b) greater number of floors (stories) affects elevator demand exponentially. Detailed elevator analysis considers population, car capacity, car speed and travel time, local and express service systems and so forth, however, the following was used: rough "rule-of-thumb" that one elevator is required per 45,000 square feet for the first ten floors and one elevator for each 35,000 square feet for

up to approximately a thirty story office building.

- (3) One general concept of efficient office building configuration is to maintain the lowest possible surface to volume ratio, a notion which maximizes interior, rentable gross area and minimizes some construction costs.

The above three general concepts control high-rise office building design forcefully. Both (2) and (3) suggest larger floor areas and lower building height are more efficient and desirable. However, (1b), optimum core to outside wall distance, implies certain limitation on the size of a single floor.

The point at which a single floor becomes too large is influenced by the market demand for office space. Tenancy accommodations range anywhere from 2,000 square feet to 50,000 square feet, and more. The medium size requirement is generally between 10,000 and 20,000 square feet. The single tenant with large floor area requirements (greater than 20,000 square feet) is an advantage, for the developer can efficiently build and rent an entire, large floor. The core to outside wall dimension is not critical in this case because interior spaces can be used by the single tenant. With a large floor, a problem arises with the tenant having smaller space needs, wanting only part of one floor (5,000 to 10,000 square feet). The subdivision of a floor into separate tenant space is often less efficient than the single tenant floor, where numerous corridors are necessary, for example. Also, each tenant requires some perimeter, so the subdivided floor is limited in size by a workable perimeter-to-interior space relationship.

Thus, the speculative office developer has to consider a number of factors in determining the optimum floor size; building efficiency both in construction

terms and with regard to rental marketability for current and future tenant needs. Should a developer have a committed tenant with large floor area requirements, marketability becomes a less critical issue. A purely speculative office high-rise that is built without a committed tenant must face the market forces for rental upon completion. Should the tenancy demand be for small and medium size areas, the very large floor can lose any efficiency advantage with subdivision. There are strong arguments for either case: building efficiency with regard to large floor areas versus marketability and efficiency of limited floor areas.

The appropriateness of one concept over the other could not be established within the context of this study. The advantage of larger floor areas (greater than 20,000 square feet, approximately) is acknowledged by the New York City Planning Commission, for one bonus provision allows greater lot coverage in return for mandatory pedestrian and lot improvements. It is assumed herein, however, that the developer will attempt to achieve the largest floor area allowable without jeopardizing the marketability of the rentable floor space.

The Building Study Alternate 1 development was governed by the pre-district zoning regulations. Under the provisions of Sections 33-442 and 33-451, a developer could build to FAR 18, with maximum allowable bonus area. Alternate 1 is the familiar stepped construction which is a response to street wall, initial setback and sky-exposure plane requirements. In this case, the largest floor area allowable within the bulk and setback requirements is built. The tower portion (top 18 floors) can pierce the sky-exposure plane provided the floor area per floor is no greater than 40 percent of the lot area. This alternative is in the range of 85 to 90 percent efficient because where there are larger core requirements at the

lower portion of the building, the floors are larger. The small floors are in this case at the top where the core size is reduced. It is interesting to note that two other major types of building configurations also possible within the pre-district zoning regulations were outlined and rejected. The first was a tower and plaza project, governed by Section 33-445. In this case, maximum FAR was 18 when maximum tower coverage allowable was 40 percent, resulting in a floor area per floor of 16,675 square feet and a tower height of 45 stories. This alternative was rejected because of excessive inefficiency by "reasonable" development standards. The second pre-district alternative was one governed by Section 33-445 also. This section contained a provision for relaxing tower coverage requirements in return for reduced density. Thus, the development could be built with tower coverage up to 55 percent, or a floor area of 22,360 square feet in this case, if the floor area ratio was 15. This reduced ratio, while it allowed for a building with larger floor areas, fewer stories and greater efficiency, also meant a lower development potential. The chosen alternative, Alternate 1, represents the optimum development in investment terms with greatest development potential and reasonable rate of efficiency.

Building Study Alternatives 2 and 3 comply with the special district regulations. Governed by Sections 33-441 and 86-073 of the zoning regulations, the development potential in these cases is FAR 18 with maximum allowable floor area bonuses. Additional bonus potential lies in the provision allowing increased tower coverage, or larger possible floor areas.

Prior to the special district legislation, Section 74-74, "Commercial Developments Extending into More Than One Block" required a zoning lot to be directly



across the street from the other zoning lots included in the site. This provision was modified by Section 86-11 for site development within the Special Greenwich Street Development District, to allow zoning lots either across a street and opposite to other zoning lots or, in the case of corner lots, those that front on the same street intersection to be included in the site. The Zoning Resolution in general encourages large-site assembly, for the larger the site, the greater the zoning lot area and potential for setbacks and bonuses. On any given site, the larger the site, the greater the development potential. Alternate 3 represents a site assembly of two corner lots fronting on the same street intersection. The two-block site was tested, for not only is greater development potential possible, but "District Plan" requirements are also more extensive.

The program was generated primarily by the "District Plan" and the allowable maximum development potential. The amenities provided are just those elements which are mandatory by code. As the zoning calculations show (Tables I & II ) the mandatory improvements alone generate more bonus area than the maximum allowable the developer can use. Therefore, no additional amenities were even considered.

The three alternatives in no way represent the optimum design solution for high-rise office space for the particular site. They were generated for the purpose of approximating rental schedules and project costs and to illustrate the requirements of the "District Plan." The attempt was to be as straightforward as possible, following code requirements strictly as well as maximizing rentable area and maintaining reasonable efficiencies. The alternatives serve only to give general, reasonable building configurations which thereby offer a means for

comparison and evaluation of the special district legislation.

Design decisions, based on "reasonable assumptions" were exercised in the process of generating the alternatives in four instances where legislative regulations did not specify absolute restrictions. The first is the provision of 90 car spaces in Alternates 2 and 3. The site level change, where Trinity is approximately 12 feet below Broadway entry level, and the elevated plaza at Edgar Street and Trinity Place posed a problem for the use of street level space along Trinity Place. The incorporation of off-street parking facilities is consistent with the Downtown-Lower Manhattan Association's recommendations, for the emphasis is upon restricted street parking to ease interference with traffic flow. Service access along Trinity Place is also permitted at that location by the special district zoning ordinance.

The second design decision occurred regarding street level space on Broadway. A logical use for a Broadway address, first floor space is rental to a branch bank occupant. High rental rates can be obtained from such a tenant, making this choice a "reasonable" one for these cases.

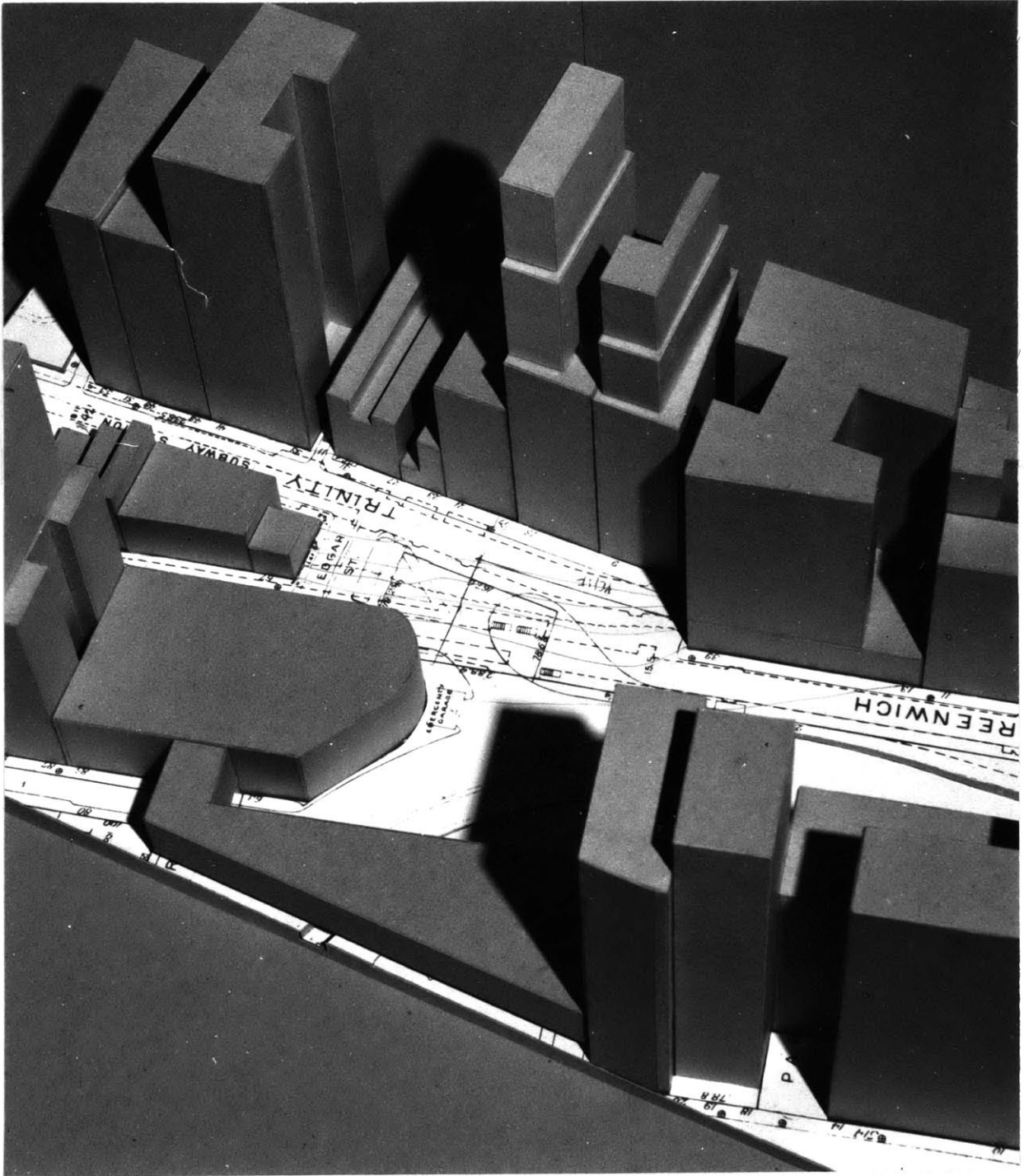
The assumption upon which the third decision was made cannot be quantitatively supported. The tower location for the alternatives designed post-district was not restricted with regards to the north lot line at Exchange Alley. The assumption was made that floor space at the north lot line, with windows approximately 12 feet from the 32 story building across the Alley, would not be reasonable and would be less marketable than floor space which was set back some distance from the north lot line. The stories above the 85-foot street wall along Broadway requirement (Section 86-072) were thus pulled back from the lot

line at Exchange Alley. A secondary effect of this setback was an increase of perimeter to interior space along the north side of the building core, thus more closely approaching the optimum 45 feet core to outside wall dimension.

The fourth design decision exercised was a response to the narrow, irregular block of the two-block development in Alternate 3. This block, developed according to zoning requirements of the special district contains two levels of commercial space. It was assumed that a low-rise building, up to the 85-foot maximum street wall height (before initial setback requirements govern) would be a reasonable portion of such a development. Thus, three levels of office space, approximately 20,000 square feet each were programmed for floors 3 through 5 above the commercial space of the small block.

Only one deviation from the mandatory requirements set forth on the "District Plan," occurred in the process of generating the alternatives. Alternates 2 and 3 both include an elevated plaza spanning Trinity Place within the developments. The special district legislation, however, requires that the plaza boundaries extend from a point 75 feet south of Edgar Street to the pedestrian bridge (or its future location, as in the case of Alternate 2) at the north. The size of this required plaza, approximately 25,000 square feet, is so great that the bonus floor area generated in return for all the amenities required on the site is beyond the maximum allowable limits. A smaller plaza was therefore used in Alternates 2 and 3, based on the assumption that the required plaza was an unreasonably large construction for the site's development potential. The smaller plaza, spanning Trinity Place and meeting the same requirements as set forth in the "District Plan"

permits a more reasonable bonus (incentive) allocation for that site and its limits of development potential.



EXISTING SITE:  
VIEW ACROSS GREENWICH STREET TO NORTHEAST

ALTERNATE 1: Pre-district Regulations

DESCRIPTION: Full site coverage at all floors within the sky exposure plane, governed by Sections 33-442 and 33-451. Stepped building configuration with plaza on north and east lot lines at street level.

ZONING LOT AREA: 41,760 sq. ft.  
 MAXIMUM FAR 18.0, 40% TOWER COVERAGE 751,640 sq. ft.

BASIC MAXIMUM @ FAR 15 626,370 sq. ft.

PLAZA BONUS FLOOR AREA 122,000 sq. ft.

DEVELOPMENT POTENTIAL 748,370 sq. ft.

PROPOSED DEVELOPMENT ("Floor Area" for FAR)

Floors 1- 6 (29,120 sq. ft. each) 174,720 sq. ft.  
 Floors 7-14 (26,390 sq. ft. each) 211,120 sq. ft.  
 Floors 15-17 (22,880 sq. ft. each) 68,640 sq. ft.  
Floors 18-35 (16,250 sq. ft. each-tower) 292,500 sq. ft.

Total Floor Area 746,980 sq. ft.

RENTAL SCHEDULE

Office space (85% efficiency) @ \$10 per sq. ft.

CONSTRUCTION COST

Office 746,890 sq. ft. @ \$40/sf \$29,990,000  
 Plaza 12,200 sq. ft. @ \$ 9/sf 110,000  
 \$30,100,000



ALTERNATE ONE - street level





ALTERNATE ONE floors 2-14

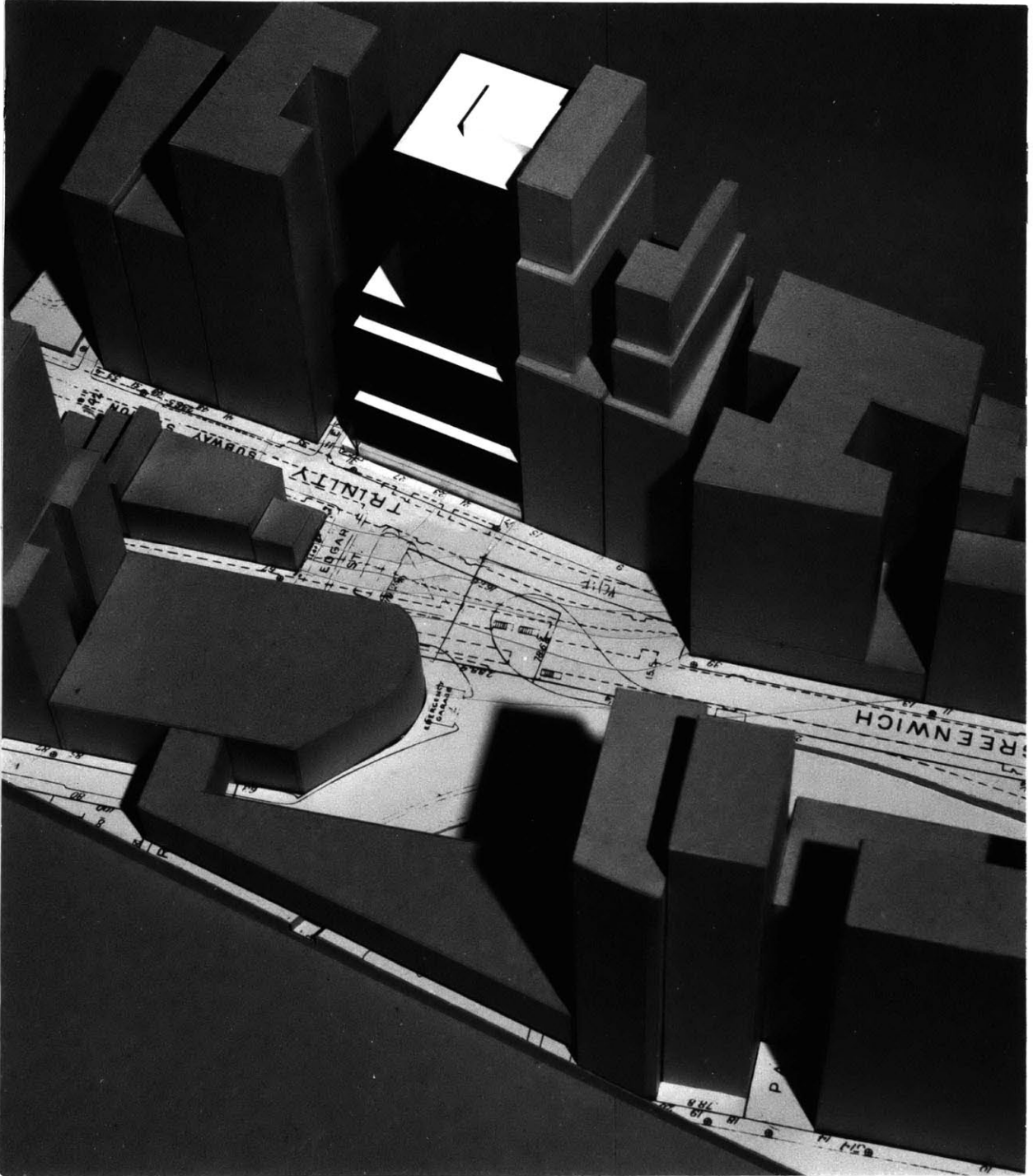




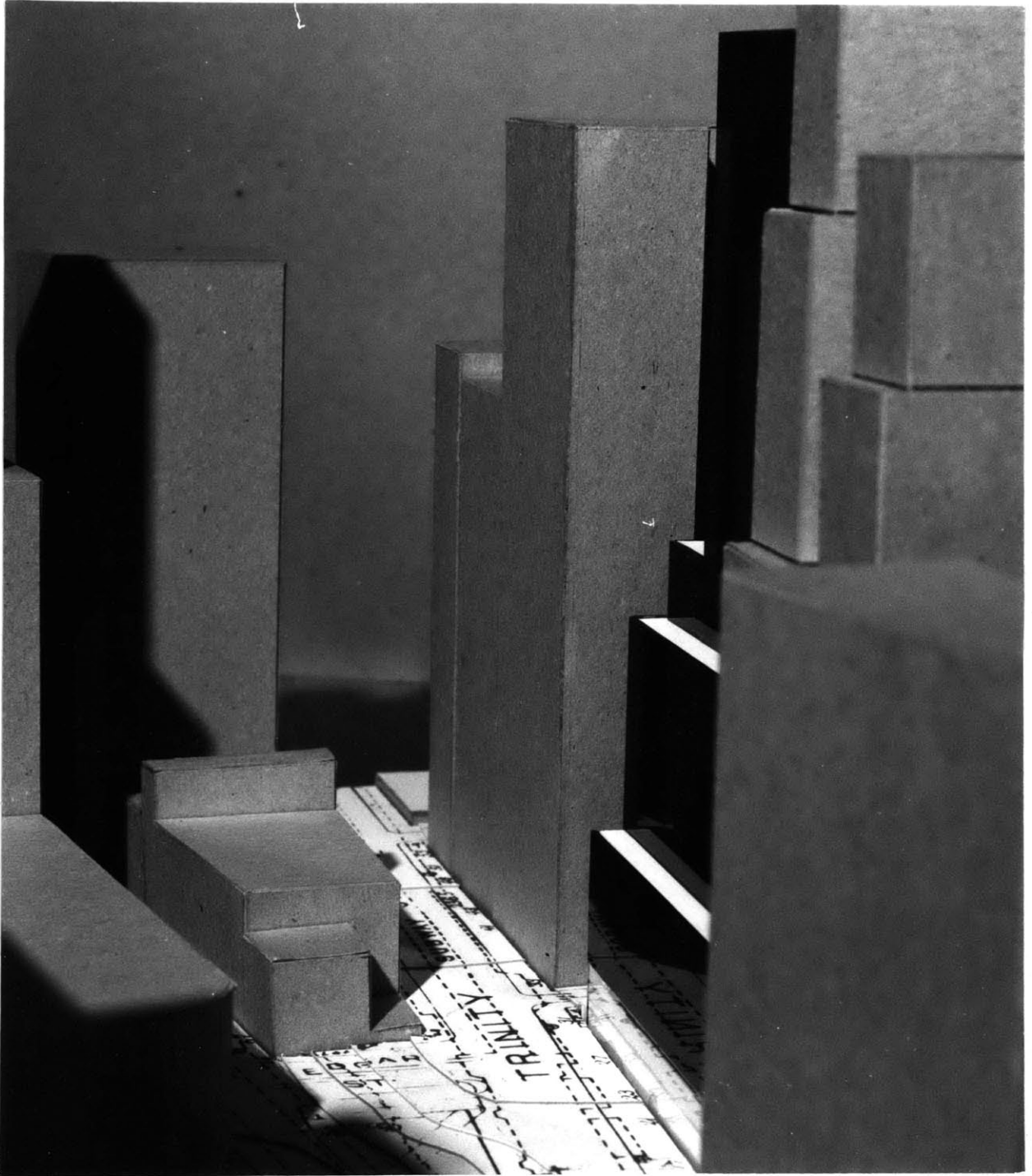


ALTERNATE ONE floors 15-35





ALTERNATE 1:  
VIEW ACROSS GREENWICH STREET TO NORTHEAST



ALTERNATE 1:  
VIEW NORTH ALONG GREENWICH STREET TO TRINITY PLACE

BLOCK 20N: ZONING CALCULATIONS  
ALTERNATE 2

(Assume public ownership of Triangle, but that it is "available for development")

Zoning Lot Area: 44,660 sq. ft.  
Coverage Area: 58,300 sq. ft.  
Z. L. A. 44,660  
EL. Pl. 13,700

Allowable Lot Coverage (54%) 31,510 sq. ft. maximum

TABLE I

	Floor Area (Bonus)	Cumulative Floor Area	Floor Area Ratio	Cumulative Tower Coverage
BASIC MAXIMUM	669,900	669,900	15.0	40%
Mandatory Lot Improvements				
(b) Elevated Shopping Way Trinity 197' (300sf)	59,100	729,000		
One pr. escalators (Exchange Alley)	20,000	749,000		
(c) Pedes. Connection @ Exchange Alley				
-Loggic 160' (100sf)	16,000	765,000		
-Escalator (one pr.)	20,000	785,000		
(d) Arcade @ Broadway 212' x 15' (3sf)	9,540	794,540		
(e) Elevated Plaza (to inside of shopping way) 16,650	166,500	961,040 (+157,160)	18.0	40%
Required Trees (13@ 300sf)	3,900	(+161,060)	(+2.8)	converts to: 54%

ALTERNATE 2: Tower and District Requirements

DESCRIPTION: Full site coverage for first six floors,  
 building to lot line along Broadway.  
 Governed by Sections 33-441 and 86-073  
 and "District Plan" requirements for  
 Block 20N.

ZONING LOT AREA:		44,660 sq. ft.
Block 20N	41,760 sq. ft.	
Triangle	2,900 sq. ft.	
MAXIMUM FAR 18.0, 55% Tower Coverage		803,150 sq. ft.

PROPOSED DEVELOPMENT ("Floor Area" for FAR)

Commercial		20,100 sq. ft.
Bank		7,200 sq. ft.
Office Lobby		9,600 sq. ft.
Floors 2-6	31,500 sq. ft. each	156,500 sq. ft.
Floors 7-30	25,200 sq. ft. each	604,800 sq. ft.
<u>Shopping Way</u>	(enclosed)	<u>2,950 sq. ft.</u>

Total Floor Area		801,150 sq. ft.
------------------	--	-----------------

Tower Coverage		43.2%
----------------	--	-------

RENTAL SCHEDULE

Office space (87% efficiency) @ \$ 10 per sq. ft.  
 Bank space (90% efficiency) @ \$ 25 per sq. ft.  
 Commercial (90% efficiency) @ \$ 20 per sq. ft.  
 Parking 90 spaces @ \$800 net/space

ALTERNATE 2: Construction Cost

Commercial	20,100 sq. ft.	@ \$ 40/sf	\$ 804,000
Bank	7,200 sq. ft.	@ \$ 40/sf	288,000
Office Tower	761,300 sq. ft.	@ \$ 40/sf	30,452,000
Office Lobby	9,600 sq. ft.	@ \$ 50/sf	480,000
Shopping Way	2,950 sq. ft.	@ \$ 50/sf	147,500
Parking	90 spaces	@ \$2,900/space	261,000
Loggia	2,400 sq. ft.	@ \$ 40/sf	96,000
Escalators	2 pair	@ \$140,000 each	280,000
Stairs	2,850 sq. ft.	@ \$ 20/sf	57,000
Elevated Plaza	16,650 sq. ft.	@ \$ 53/sf	882,500
Trees	13	@ \$2,000 each	<u>26,000</u>
Total Building Cost			<u><u>\$33,774,000</u></u>



ALTERNATE TWO - service level





ALTERNATE TWO - entrance level







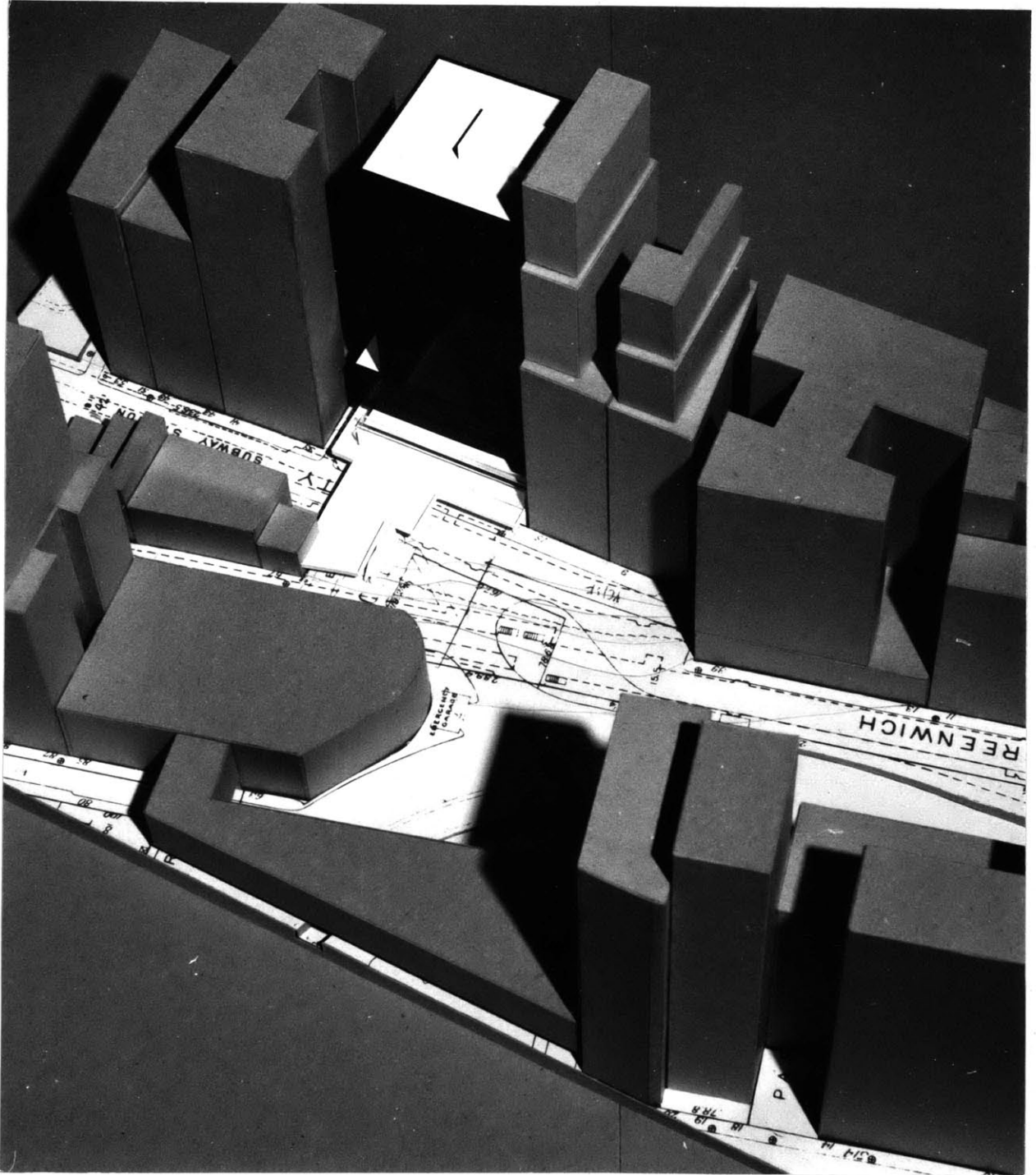
ALTERNATE TWO - plaza level



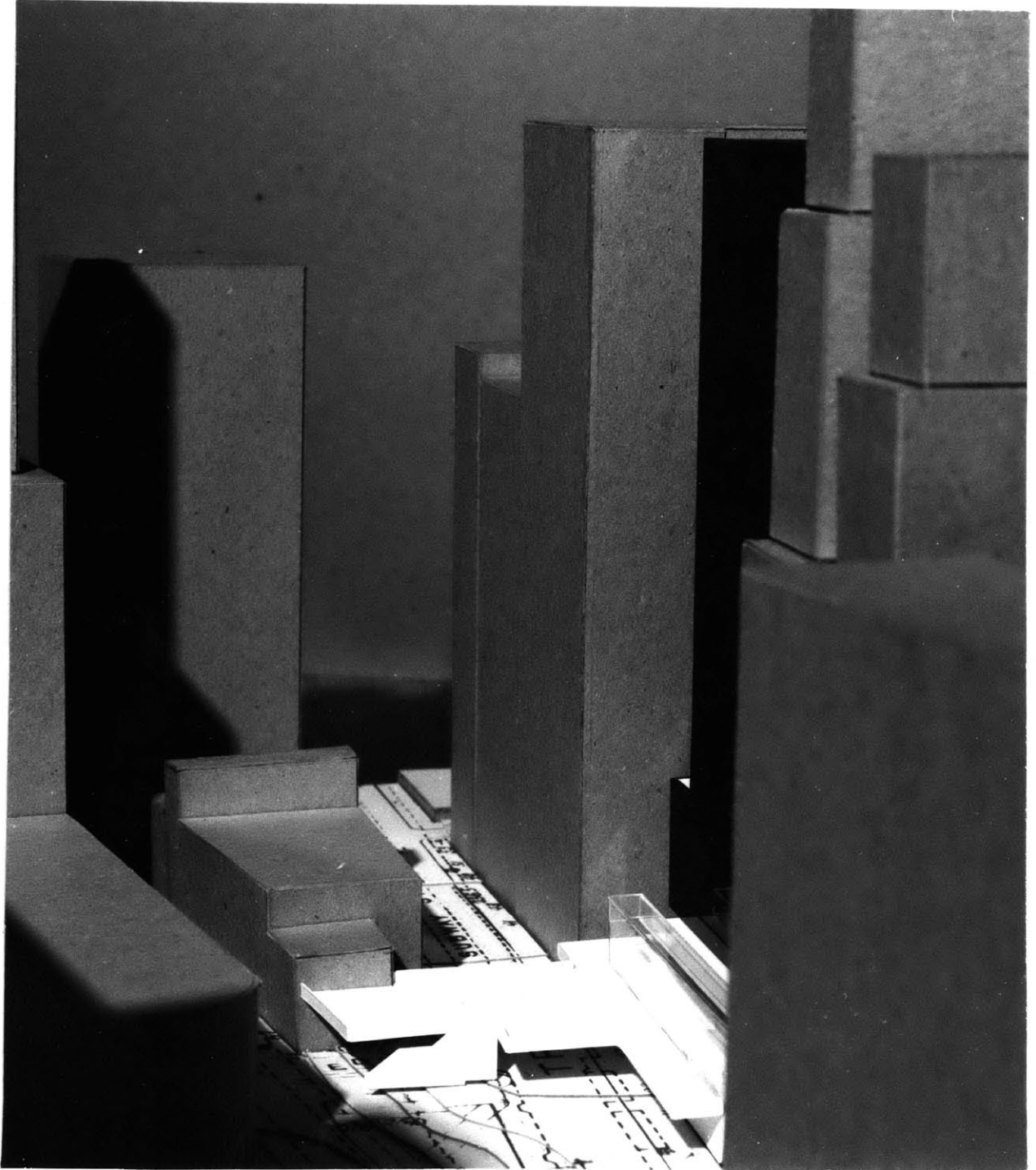


ALTERNATE TWO floors 2-30





ALTERNATE 2:  
VIEW ACROSS GREENWICH STREET TO NORTHEAST



ALTERNATE 2:  
VIEW NORTH ALONG GREENWICH STREET TO TRINITY PLACE

BLOCKS 20N and 19: ZONING CALCULATIONS  
ALTERNATE 3

(Assume public ownership of Triangle, but that it is "available for development")

Zoning Lot Area: 70,200 sq. ft.  
Coverage Area: 81,800 sq. ft.  
Z. L. A. 70,200  
El. Pl. 10,400  
PCI:E 1,200

Allowable Lot Coverage (51%) 41,720 sq. ft.

TABLE II

	Floor Area (Bonus)	Cumulative Floor Area	Floor Area Ratio	Cumulative Tower Coverage
BASIC MAXIMUM	1,053,000	1,053,000	15.0	40%

Block 19 Mandatory Improvements

PCI:E, (pedes. bridge) 80' (270 sf)	21,600	1,074,600		
(a) Shopping Way, Greenwich St., 280' (400sf)	112,000	1,186,600		
Escalators, 2 prs. @ (20,000sf) each	40,000	1,226,600		
(b) Pedes. Connection @ Edgar St., street level arcade, 55' x 15' (3sf)	2,470	1,229,070		
(c) Pedes. Connection @ Edgar, second level (see "Elev. Plaza" - 20N				

Block 20N Mandatory Improvements

(a) Build to lot line along Broadway		no bonus		
(b) Elevated Shopping Way Trinity, 197' (300sf)	59,100	1,288,170 (+ 24,570)	18.0	40%

BLOCKS 20N and 19: ZONING CALCULATIONS (Cont.)

TABLE II (Cont.)

	Floor Area (Bonus)	Cumulative Floor Area	Floor Area Ratio	Cumulative Tower Coverage
(c) Pedestrian Connection @ Exchange Alley				
- Loggia, 160' (100sf)	16,000	(+ 40,570)		
- Escalator, one pr.	20,000	(+ 60,570)		
(d) Arcade @ Broadway 212' x 15' (3sf)	9,540	(+ 70,110)		
(e) Elevated Plaza 11,000sf to inside of shopping way	111,000	(+180,110)		
Req'd trees @(300sf)	2,400	(+183,510)	(+2.2)	
			converts to:	51%

ALTERNATE 3: Tower, Low-Rise and District Requirements

DESCRIPTION:

Two block site assembly. Low-rise on Block 19, high-rise on Block 20N. Governed by Sections 33-441 and 86-073 and "District Plan" requirements for both Blocks 19 and 20N.

ZONING LOT AREA		63,600 sq. ft.
Block 20N	41,760 sq. ft. (\$220/sf)	
Block 19	25,540 sq. ft. (\$205/sf)	
Triangle	2,900 sq. ft. (no land cost)	
MAXIMUM FAR 18.0, 51% Tower Coverage		1,263,600 sq. ft.

PROPOSED DEVELOPMENT ("Floor Area" for FAR)

Commercial, Block 19		35,720 sq. ft.
Office Space, Block 20N		93,440 sq. ft.
Commercial, Block 20N		12,050 sq. ft.
Office Lobby		9,600 sq. ft.
Bank		7,200 sq. ft.
Floors 2-6	39,900 sq. ft. each	199,500 sq. ft.
Floors 7-34	31,920 sq. ft. each	893,760 sq. ft.
Shopping Ways	(Greenwich, Trinity)	7,230 sq. ft.
<u>Pedestrian Bridge</u>	<u>(enclosed)</u>	<u>1,200 sq. ft.</u>
Total Floor Area		1,259,700 sq. ft.
Tower Coverage		38.9%

RENTAL SCHEDULE

Office space (85% efficiency) @ \$ 10 per sq. ft.
Bank space (90% efficiency) @ \$ 25 per sq. ft.
Commercial (90% efficiency) @ \$ 20 per sq. ft.
Parking           90 spaces       @ \$800 net/space

## ALTERNATE 3: Construction Cost

Commercial, Block 19	35,720 sq. ft.	@ \$ 40/sf	\$ 1,428,800
Office Space, Block 19	93,440 sq. ft.	@ \$ 40/sf	3,737,600
Commercial, Block 20N	12,050 sq. ft.	@ \$ 40/sf	482,000
Office Lobby, Block 20N	9,630 sq. ft.	@ \$ 50/sf	482,000
Bank	7,200 sq. ft.	@ \$ 40/sf	288,000
Office Tower	1,093,260 sq. ft.	@ \$ 40/sf	43,730,400
Shopping Way	7,230 sq. ft.	@ \$ 50/sf	361,500
Pedestrian Bridge	1,200 sq. ft.	@ \$ 120/sf	144,000
Parking	90 spaces	@ \$2,900/space	261,000
Loggia	2,400 sq. ft.	@ \$ 40/sf	96,000
Escalators	4 pair	@ \$140,000 each	560,000
Stairs	3,850 sq. ft.	@ \$ 20/sf	77,000
Elevated Plaza	11,000 sq. ft.	@ \$ 53/sf	583,000
Trees	8	@ \$2,000 each	<u>16,000</u>
 Total Building Cost			 \$51,847,300





ALTERNATE THREE

service/  
Greenwich Street level



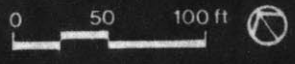


ALTERNATE THREE - main lobby level





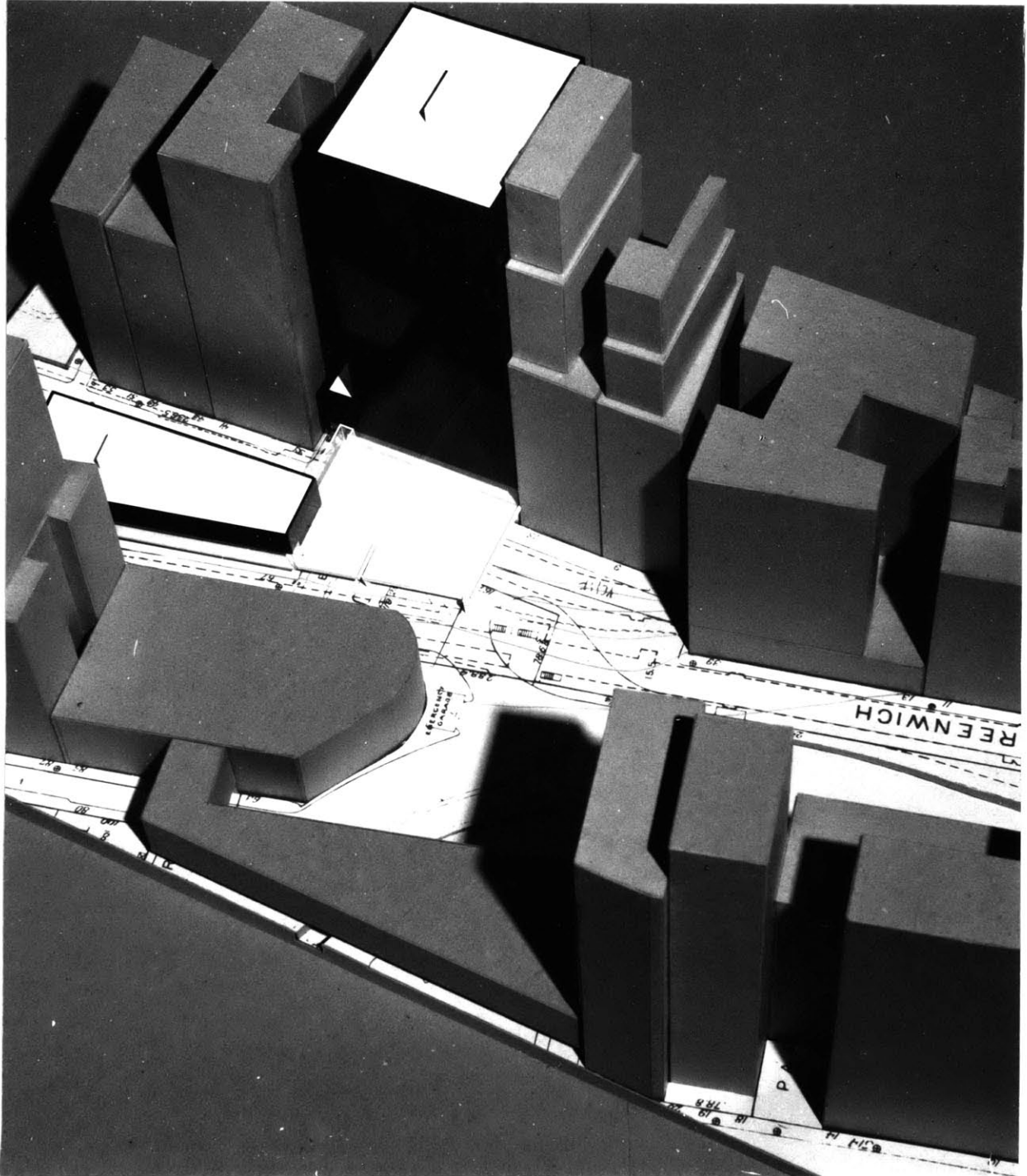
ALTERNATE THREE - plaza level



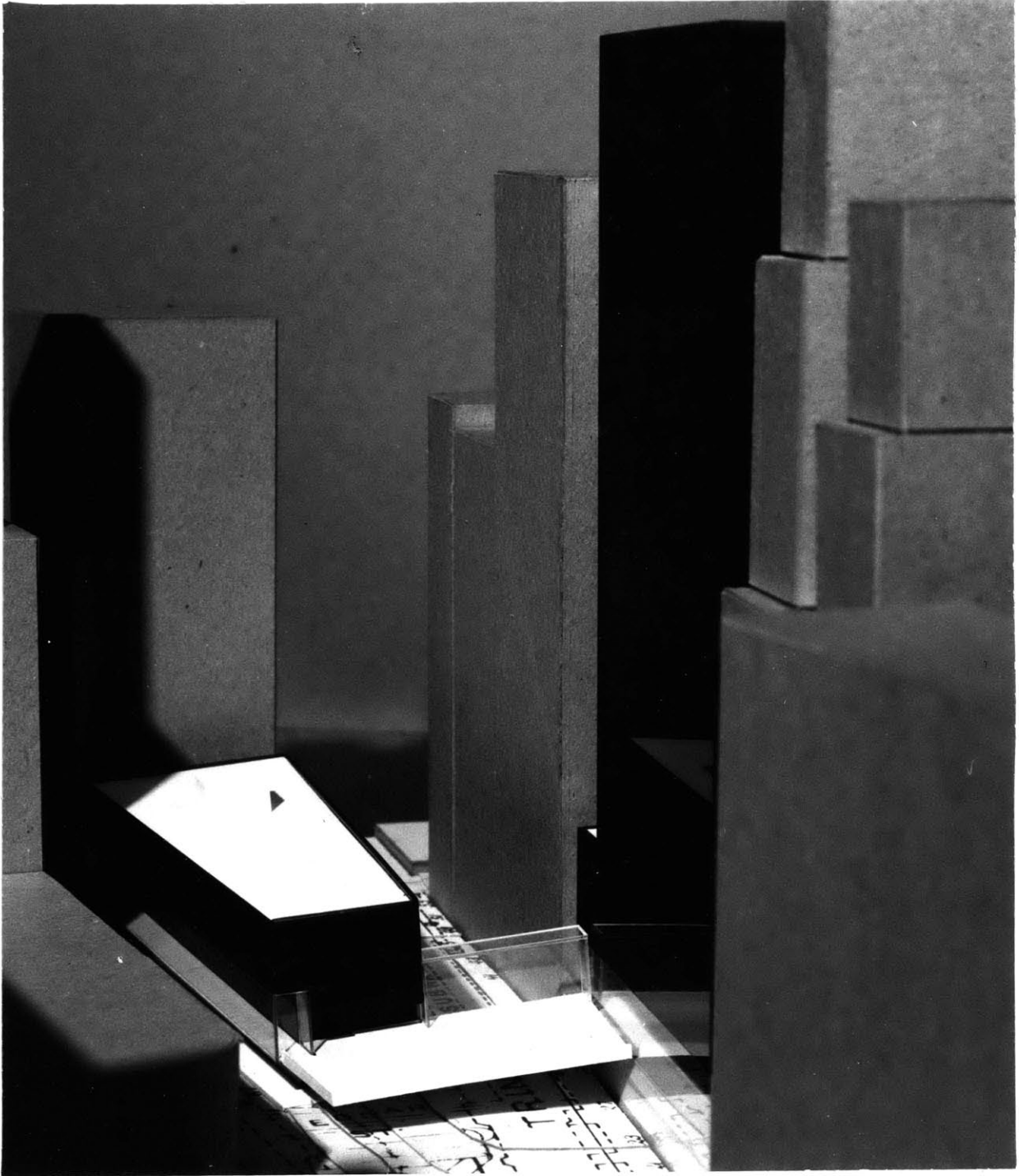


ALTERNATE THREE floors 2-34





ALTERNATE 3:  
VIEW ACROSS GREENWICH STREET TO NORTHEAST



ALTERNATE 3:  
VIEW NORTH ALONG GREENWICH STREET TO TRINITY PLACE

# 4 ANALYSIS

## ANALYSIS - DESIGN/PROCESS

The three alternatives generated for this case study serve to illustrate the forces at work within the Zoning Resolution and the Special Greenwich Street Development District on the building configuration and building design.

Alternate 1 illustrates the basic building configuration defined by the pre-district zoning codes. Offered floor area bonuses, the developer is encouraged to provide open space at the street level of the building. Sky exposure plane limitations result in familiar stepped-tower construction. No other major constraints, other than those market forces which encourage efficient floor areas and those height, setback and bulk regulations, affect the building design.

In contrast, however, the design of Alternates 2 and 3 are quite specifically constrained by District regulations. Specific mandatory improvements must be provided by the developer. In the interest of area-wide goals, certain requirements are set for each specific site included within the District. The case study allows a closer look (at the scale of an individual site and development) at the effects of the requirements outlined on the "District Plan."

The generation of the two special district alternatives uncovered two major kinds of problems which cause building design difficulties.

- (1) The case where problems arise because district requirements define specific relationships or levels that are inappropriate.
- (2) The case where certain requirements, fulfilled just to the extent to which they are bonusable, (this notion is assumed to



be "reasonable" for the case study) leave certain areas of the site inadequately designed.

Two of the first type - problems arising directly from inappropriate district requirements - are evident in both Alternate 2 and Alternate 3. Section 86-072 requires that the "development shall have an exterior wall

- (i) coincident with such street line,
- (ii) constructed along the entire length of the portion of the street line bounding the zoning lot, and
- (iii) with regard to ... (Block 20N)..., rising without setback, for a height above curb level of not less than ... 85 feet."

This requirement to build to the street line serves to preserve the "canyon" quality of lower Broadway. Providing a "street wall" along Broadway, for the entire length of the street line (the east lot line of Block 20N) suggests full site coverage of the north, east and south portions of the site at Broadway for a height of not less than 85 feet, or approximately six stories. A problem arises because a 38 story building stands at the south lot line of Block 20N, and to the north, less than 20 feet from the north lot line, across Exchange Alley stands a 32 story building. The first six floors of both Alternates 2 and 3 are thus more than 200' long along Broadway (a response to Section 86-072) and have only 20 feet to the neighboring building at the north end and a solid wall at the south end of each floor. The design of a functional and marketable interior for those six floors has been made quite difficult by the street wall requirement, for they are long floors with mediocre perimeter conditions.

Another district requirement states that the elevations of the second-level pedestrian system be referenced from curb height. (Section 86-053) Alternate 3 illustrates the inherent difficulties of the strict ruling, "has its floor located 22 feet above curb level." The curb elevation below the shopping way along Greenwich Street is 15 feet, while the curb elevation below the elevated shopping way along Trinity Place is 18 feet. Therefore, a 3-foot differential between two elements of the pedestrian system exists. Intermediate connections accommodating these level differences are thus required within the design to correct and adjust to the shifts. Alternate 3 is an example where less rigid elevation specifications would have allowed the entire pedestrian system to extend continuously for two blocks with no level changes (for example, all levels at elevation 37': 22 feet above curb height of Block 19 and 19 feet above curb height on Block 20N.)

The other major problem, that of the limits of usable bonus floor area, affects project design indirectly. The mandatory requirements generate bonus floor area up to, and in this case, beyond limits of maximum allowable development. The district regulations have in effect taken responsibility for establishing design priorities by assigning all usable bonus floor area to specific elements. The developer must provide the specified elements and then has no bonus area remaining for other elements that could improve the overall design, since additional bonus would make the project greater than the FAR 18, 55% coverage limits. Needless to say, a developer "could" provide any amenities he desired, but only at extra cost to the total project.

One such case occurred in Alternate 3. Between the pedestrian bridge over Trinity Place and the shopping way along Greenwich Street, a pedestrian connection

is required. The only enclosed space fulfilling this requirement is a "covered pedestrian space" which must be at least 1,500 square feet and adjacent to shops and so forth. The bonus for this amenity cannot be added to the development potential, since other mandatory elements have already generated the maximum allowable. Without an incentive, a developer will more likely provide a pedestrian connection that fulfills the requirement and adds less to the development cost.

The pedestrian connection between the bridge and the shopping way can be any one of a number of elements, but the developer given the option will choose one of maximum benefit and least cost to him. The selection does not guarantee successful design. For example, Alternate 3 provides an elevated plaza for the above mentioned pedestrian connection. This satisfies the requirement. However, since it is an outdoor, unprotected connection, it disrupts the continuity of the air-conditioned and heated pedestrian elements that it is meant to connect. This is a case in which design suffers where the lack of incentive is a constraint.

The project design, in general, of Alternates 2 and 3 is more complex than that of Alternate 1. The mandatory inclusion of retail and service establishments and a peripheral, multi-level circulation system adds a new dimension to office space construction. While Alternate 1 is a one-sided, glass lobby project, Alternates 2 and 3 potentially relate to public space on three sides: north at Exchange Alley, east along Broadway, and west on Trinity Place. The effectiveness of the district regulations to promote use of public space is more closely examined in the following section.

## ANALYSIS - CIRCULATION SYSTEMS

The major emphasis of the district regulations was upon the improvement of the circulation of "large numbers of people." Pedestrian movement was viewed primarily either as sidewalk congestion and conflicts with vehicles at intersections, or as masses of people requiring access to and from subway stations.

From a detailed study of the requirements for Blocks 19 and 20N and an analysis of development options, the case study clearly indicates sidewalk congestion and pedestrian/vehicle conflicts at intersections take priority over subway access improvements on this particular site. For example, on Block 19, multi-level pedestrian circulation improvements are mandatory - shopping ways, pedestrian connections and bridges, yet a connection to the Seventh Avenue IRT and Broadway BMT Rector Street station from street level is a "preferred lot improvement." In this particular case study, it is important to note, the emphasis upon providing certain portions of a general circulation improvement program over other portions does more than establish "priorities." Since the mandatory requirements alone generated more bonus floor area than can be built, the implication is that any improvement which is optional is essentially without a compensating bonus. The bonus/incentive system is thus structured to discourage any improvements beyond the upper limit of allowable bonus floor area, or maximum floor area ratio. Once the allowable maximum development potential is reached, those improvements not required by law will remain unconstructed. For example, in Alternate 3, the mandatory improvements required for Blocks 19 and 20N, in and of themselves, generate more bonus area than the proposed development can apply toward the

building program, (tower coverage cannot be above 51%). Thus, the preferred lot improvement on Block 19 offers no benefit to the developer and the subway station is doomed to be "preferred" and unimproved.

The second-level pedestrian system on Blocks 19 and 20N are given priority over subway station improvements. As illustrated by the "District Plan" and as displayed in Alternates 2 and 3, the system contains serious access problems.

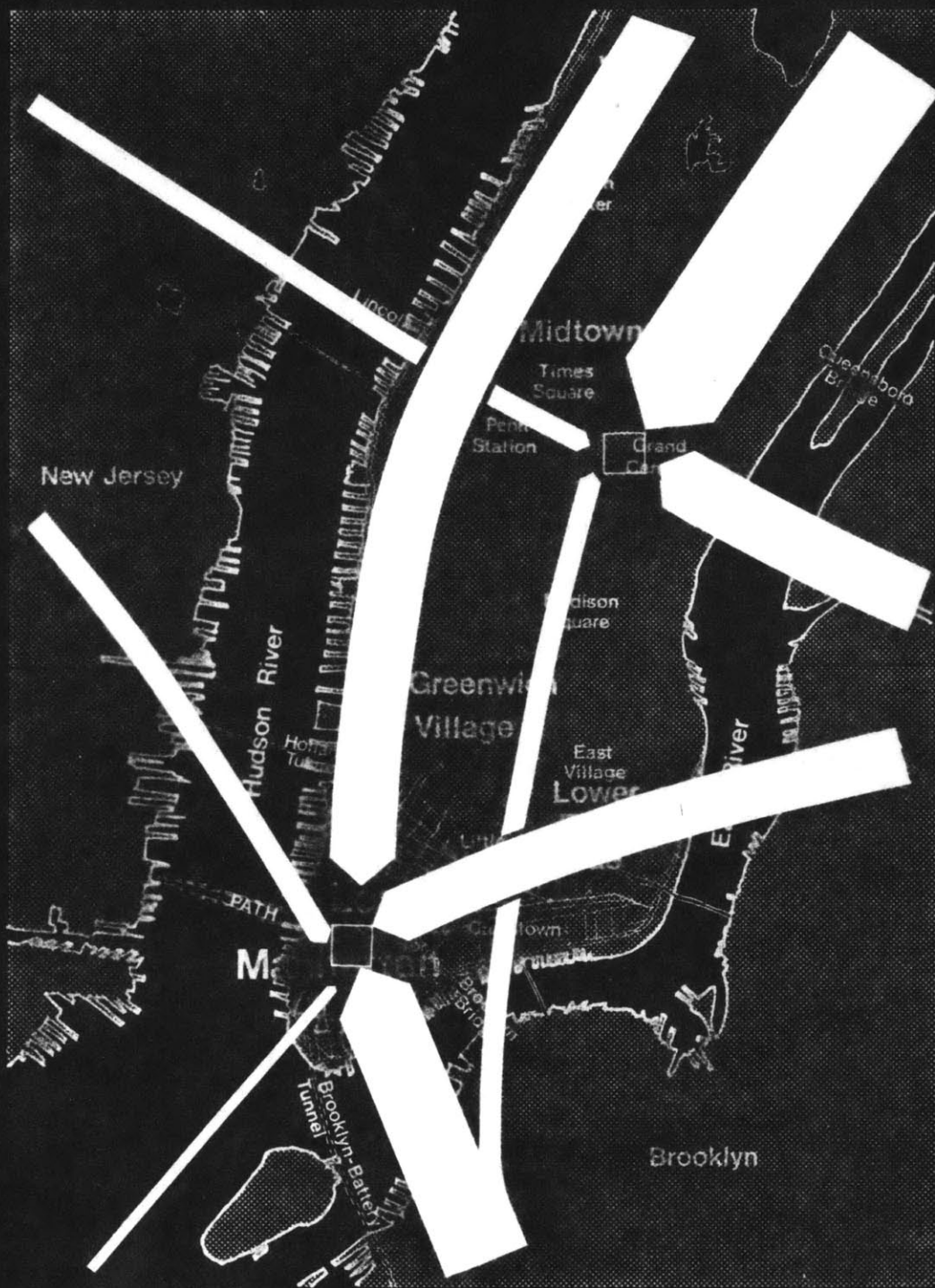
On the north lot line of Block 20N, a pedestrian connection along Exchange Alley between street level at Broadway (elevation 30') and the elevated shopping way at Trinity Place (elevation 40') is mandatory. Section 86-056, defining "pedestrian connections" states that a connection between two clearly separate levels "shall not be less than a pair of 32-inch wide escalators." The ten-foot level change, required by code to be accomplished with an escalator, thereby establishes an abrupt change from elevation 30' to elevation 40' at Broadway and extends elevation 40' (a loggia) along the north lot line. The escalators and ten-foot level change interrupt pedestrian flow rather than ease it at that location. It is unlikely that a pedestrian will ride ten feet up on an escalator and back down a twenty-two foot level change on Trinity Place or Greenwich Street when Exchange Alley, as is, accommodates traffic flow smoothly.

The increment of the district-wide circulation system of Blocks 19 and 20N is accessible at intersections. However, travel in any one direction is of such short duration, it is questionable whether the level changes required to engage pedestrians will result any use. Without contiguous developments it is doubtful that except for pedestrians destined for the elevated plaza or the retail and service establishments, any major portion of pedestrian traffic can be diverted to the

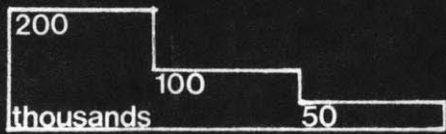
second level for, at most, a two block walk.

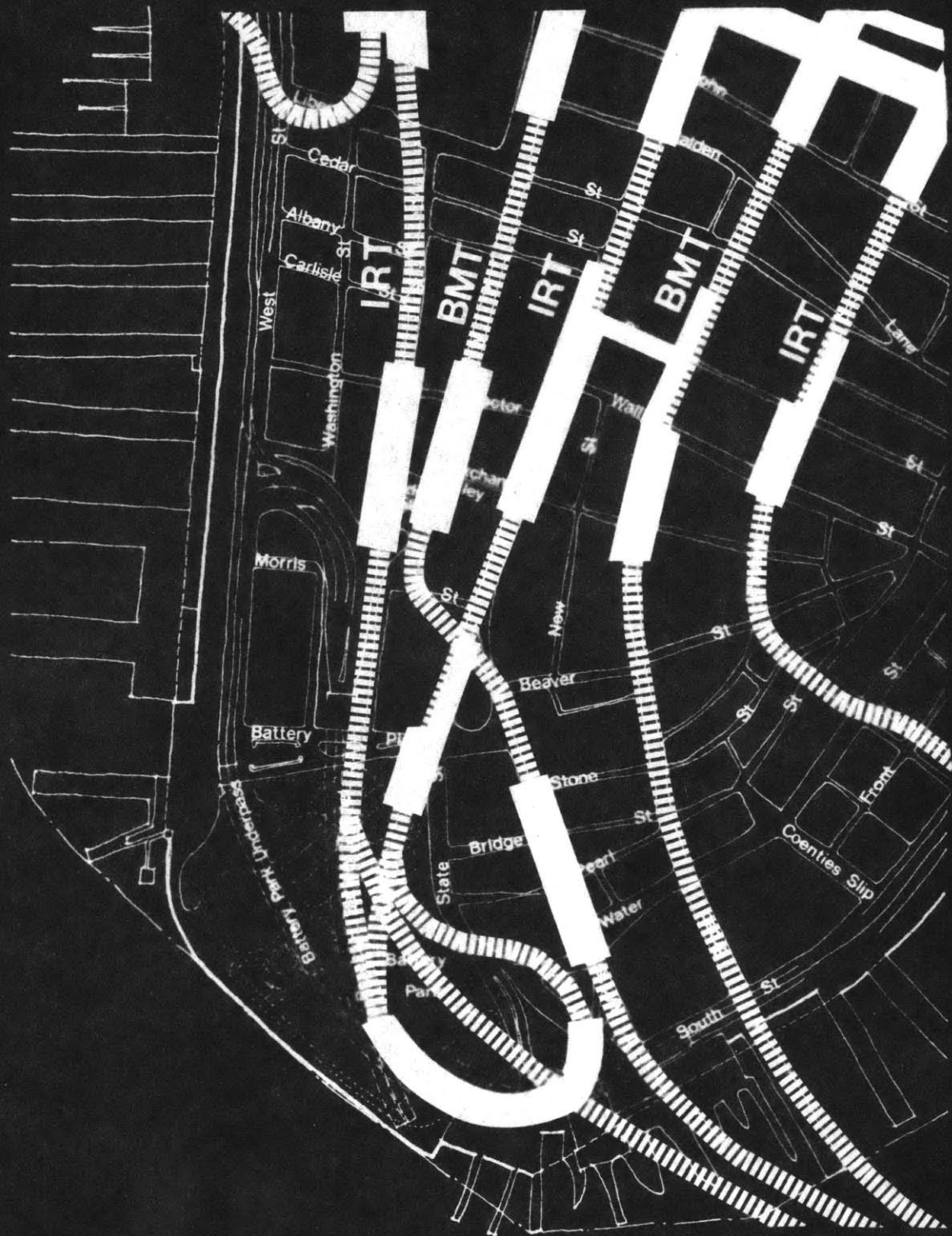
Given the uncertain use of the second-level pedestrian system on the site examined, the incidence of pedestrian/vehicle conflicts remains unchanged. The impact, if any, of the pedestrian bridge over Trinity Place upon the numbers of pedestrians crossing the street and upon the pedestrian conflict with street traffic would be insignificant without the development of adjacent circulation improvements.

The alternatives generated on Blocks 19 and 20N do not contain improvements which ease the morning and evening peak access problems to subway stations. Commuter patterns indicate subway riders will arrive to the site at three major stations: the BMT Rector Street station, (Brooklyn-Uptown) the Lexington IRT Wall Street station, (Queens, East side) and the Seventh Avenue IRT Rector Street station (Midtown, West side). With large numbers of people arriving below grade, the district did not encourage transitional pedestrian circulation improvements to grade level. Lot improvements such as the arcade on Broadway eases pedestrian flow at grade, but again, emphasis of improvements was upon the second-level system within the district.



**COMMUTER  
TRAVEL  
PATTERNS**  
Lower Manhattan  
East Midtown





SUBWAYS







Cars per hour

.....	0 - 250
-----	250 - 500
-----	500 - 1000
=====	1000 - 2000
=====	2000 - 4000

**TRAFFIC VOLUME**





**BUS ROUTES**



## ANALYSIS - WORKING ENVIRONMENT

One of the major aims of district legislation was to improve the general working environment of the downtown office core. Two important aspects of a good "working environment," as interpreted by the planners of the district, are noon-time eating and shopping opportunities. The special district requires that 2-1/2 percent of the floor area of new developments be devoted to retail and service establishments. The regulation, in part a response to the trend of declining retail shopping and the proliferation of vast, empty plazas (evident along newly-developed midtown avenues) is aimed at providing a variety of pedestrian level opportunities for the working population in the district and from the nearby business core.

In addition to encouraging diversification of street level uses, the "Use Group G," 2-1/2% retail requirement also is intended to enhance the pedestrian circulation system introduced into the area by district regulations. Together, the multi-level pedestrian system and shopping opportunities are the primary contributions the special district provides in seeking to improve the working environment.

The basis for evaluating the effectiveness of these measures in improving the general working environment is the case study alternatives previously outlined. Alternate 1, the pre-district office building is essentially the type of project district regulations discourage. It is unlikely that street level spaces would attract uses other than travel bureaus, banks, lobbies and so forth. The

street and pedestrian level uses in Alternates 2 and 3, however, are carefully controlled to encourage varied uses and tenants at each project's perimeters.

As discussed in the previous section, however, the use of the upper level pedestrian system in both Alternate 2 and Alternate 3 is uncertain. It is questionable whether the two-block increment in Alternate 3 and, moreso, the one-block shopping way of Alternate 2 could provide sufficient attraction to encourage pedestrians to make the level change. Although street level pedestrian movement is presently hampered at peak hours and increasing densities in the future are predictable, the use of an increment of the multi-level circulation system, even enhanced by shops and restaurants, is doubtful. The primary reason for its failure to function as intended is the inadequate resolution of access problems. Level changes, accomplished at an escalator are abrupt and disruptive to the continuity of movement. Gradual access, from areas already at higher elevations, such as Broadway, is discouraged by present zoning, since incentives are offered for the provision of escalators at level changes. In effect, there is little continuity of movement to the elevated system in Alternates 2 and 3, for pedestrian flow at points of level change is disrupted.

In the case of Alternates 2 and 3, the access problems can in turn jeopardize the shops and activities occurring along the pedestrian circulation system. Shops along the enclosed shopping way will not have the visibility and exposure street level establishments have. The numbers of pedestrians diverted to the second level system for one or two blocks are likely to be a small percentage of those who will continue to use the street level sidewalk. The viability of the small retail businesses which are highly dependent upon peak hour activity, located along the

second level shopping ways is questionable. They are, in a sense, isolated from the majority of pedestrian passersby. In turn, the use of a circulation system which needs the attractions of shopping and eating opportunities may diminish further should shops choose not to locate in the shopping ways.

As an increment of an as-yet undeveloped district-wide system, the entire shopping/circulation scheme faces the potential problems of disuse. These being the primary provisions for improving the working environment, it is uncertain whether the district regulations have in fact any real impact upon the development of a more desirable place to work at all.

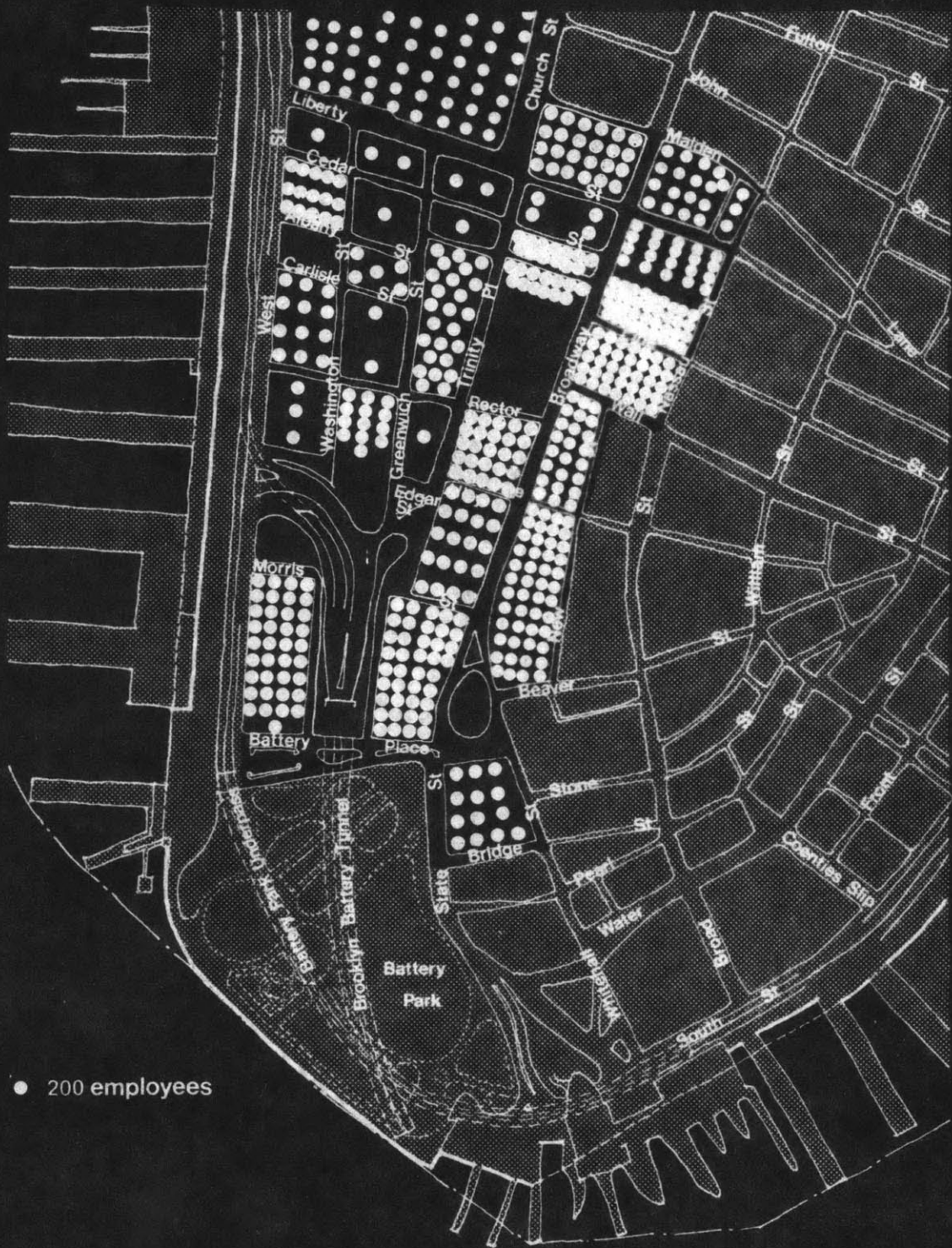
Particular to this case study, Alternates 2 and 3 are required to provide an elevated plaza spanning Trinity Place. To be bonused, it must not only provide pedestrian access among the second level district elements adjacent to it, but also must provide facilities such as benches, an outdoor cafe, and kiosks for "Use Group G" retail consumer establishments. Trees are mandatory. The location of this plaza has a number of advantages. It is in direct view of the World Trade Center plaza, three blocks north. More important, it is to the southwest of the Block 20N development and is exposed to the afternoon sun all year round. The exit from the Brooklyn Battery tunnel is to the south and west of the plaza, however, and leaves the open plaza subject to the noise and fumes of the heavy traffic entering and leaving the tunnel. In addition, strong winds off the Hudson River sweep northwest across the open area. The advantages and disadvantages play against one another. Whether the plaza is a welcome, attractive new place adding to the desirability of the district's working environ-

ment depends more upon its ability to invite pedestrian and noon-time activity.

The employment densities in the area certainly indicate the potential use of a public, open area in that location is good. But again, its success heavily rests upon the accessibility of the pedestrian elements and activities contiguous to it.

The future use of the plaza, once adjacent developments are accomplished appears promising. As long as those developments do not occur, however, the plaza faces the same problems the entire pedestrian circulation system does: disuse.

Although certainly not intended, should this be the case, the "District Plan" may have added just another vast, abandoned, vacant open space to the city, in the name of "public benefit."



● 200 employees

VICINITY EMPLOYMENT DENSITIES



## ANALYSIS - DEVELOPMENT

One of the more interesting aspects of the special district legislation is the potential gain (or loss) the developer stands to receive by incorporating requirements and bonuses into his project. Each amenity the developer provides "for public benefit" means a larger total development cost due to added construction costs. Further, the amenities themselves do not provide the developer with any direct return benefits, for they generate no income. In addition, they require maintenance and therefore add to the overall operating expenses.

In exchange for the extra costs incurred in fulfilling special district requirements, the developer is given certain allowances to increase the size of the income-earning part of the development. The impact of the bonus provisions upon the economics of a project is an important issue that can be determined quantitatively. The benefits and the costs of bonuses and amenities are difficult to isolate from the total development package. A single bonus provision affects numerous project economic factors, and outside the context of the total project, the economic analysis of an improvement and its bonus is meaningless. For example, a certain amount of bonus floor area given a developer for providing a pedestrian circulation improvement does not simply increase the rental income of the project. Consideration must also be taken of the cost of constructing that additional floor area and of building the PCI itself. The operating expenses, fees, financing costs, and so forth, all are affected by bonus floor area and interplay to affect the total project.

To approach the issue of the impact of the zoning district upon project development, each of the case study alternatives was examined in terms of a rate



of return (a ratio of the net income free and clear to the total development cost) and a return on equity (a ratio of the income after debt service to the developer's initial investment, or equity.) The comparison of the project economics of the alternatives generated from the special district requirements to the project economics of the pre-district alternative serves to illustrate the overall effects of the bonus system on development. Alternate 1 is the "base" development, where an office building is developed to maximum allowable potential. The pre-district zoning ordinance contained no further requirements for development. Alternates 2 and 3 contain numerous improvements and include bonus floor areas, whose effects on project development are reflected in the project economics and valuation of those alternatives.

The programs, rental schedules and construction costs previously outlined were used for this study. Case I was based on the following assumptions:

- (1) Office space efficiency at 85%; commercial space efficiency at 90%.
- (2) Office vacancy allowance 5%; commercial vacancy allowance 10%; parking vacancy allowance 5%.
- (3) Operating expenses, including real estate taxes, maintenance, etc at 34% net revenue.
- (4) Projected permanent financing: 90% capitalized value (Capitalization rate 9.5).
- (5) Debt Service constant at 10% (10K)

Two other tests were made for each of the three alternatives:

Case II Rate of return and return on investment with a lower interest rate. Debt Service Constant = 9.6K

Case III Rate of return and return on investment with a 10% vacancy allowance for office space.

## PROJECT ECONOMICS AND VALUATION: Alternate 1

	I	II	III
	Base	9.6K Debt Service	10% Vacanc
<b>I NET INCOME FREE &amp; CLEAR</b>			
<u>Gross Revenue</u>	\$ 6,350,000	\$ 6,350,000	\$ 6,350,000
<u>Vacancy Allowance</u>	(5%) 317,500	(5%) 317,500	(10%) 635,000
<u>Net Effective Revenue</u>	\$ 6,032,500	\$ 6,032,500	\$ 5,715,000
<u>Expenses</u>			
Op. Exp., taxes, maint., etc.	(34%) 2,050,000	(34%) 2,050,000	(34%) 1,940,000
<u>Net Income Free &amp; Clear</u>	\$ 3,982,500	\$ 3,982,500	\$ 3,775,000
<b>II VALUATION (A)</b>			
<u>Building Cost</u>	\$30,100,000	\$30,100,000	\$30,100,000
<u>Land Cost</u>	9,187,000	9,187,000	9,187,000
<u>A &amp; E, Legal, misc. fees</u>	1,305,000	1,305,000	1,305,000
<u>Total Development Cost</u>	\$40,592,000	\$40,592,000	\$40,592,000
<b>III RATE OF RETURN</b>			
<u>Total Development Cost</u>	\$40,592,000	\$40,592,000	\$40,592,000
<u>Net Income Free &amp; Clear</u>	3,982,500	3,982,500	3,775,000
<u>Rate of Return</u>	9.8%	9.8%	9.3%
<b>IV VALUATION (B)</b>			
<u>Capitalized Value</u>	(9.5) \$42,000,000	(9.5) \$42,000,000	(9.5) \$39,700,000
<u>Projected Perm. Financing</u> (90%)	\$37,800,000	37,800,000	35,700,000
<u>Equity</u>	2,792,000	2,792,000	4,862,000
<u>Total Development Cost</u>	\$40,592,000	\$40,592,000	\$40,592,000
<b>V RETURN ON EQUITY</b>			
<u>Net Income Free &amp; Clear</u>	\$ 3,982,500	\$ 3,982,500	\$ 3,775,000
<u>Debt Service</u>	(10k) 3,780,000	(9.6k) 3,630,500	(10k) 3,573,000
<u>Income Avail. to Equity</u>	202,500	352,000	202,000
<u>Return on Equity</u>	7.26%	12.61%	4.16%

ALTERNATE 2:  
INCOME ANALYSIS

5% and 10% Office Vacancy Allowance

	<u>Office</u>	<u>Retail</u>	<u>Parking</u>
<b>I NET EFFECTIVE REVENUE (A)</b>			
<u>Gross Revenue</u>	\$6,471,000	\$ 523,800	\$72,000
<u>Vacancy Allowance</u>	(5%) 323,600	(10%) 52,400	(5%) 3,600
<u>Net Effective Revenue</u>	\$6,147,400	\$ 471,400	\$68,400
	Total		
<b>II NET INCOME FREE &amp; CLEAR (A)</b>			
<u>Net Effective Revenue</u>	\$6,687,200		
<u>Expenses</u>	(34%)		
Op. Exp. taxes, maint.	2,273,000		
Amenity maintenance	8,800		
<u>Net Income Free &amp; Clear</u>	\$4,405,400		
<b>III NET EFFECTIVE REVENUE (B)</b>			
<u>Gross Revenue</u>	\$6,471,000	\$ 523,800	\$72,000
<u>Vacancy Allowance</u>	(10%) 647,100	(10%) 52,400	(5%) 3,600
<u>Net Effective Revenue</u>	\$5,823,900	\$ 471,400	\$68,400
	Total		
<b>IV NET INCOME FREE &amp; CLEAR (B)</b>			
<u>Net Effective Revenue</u>	\$6,363,700		
<u>Expenses</u>	(34%)		
Op. exp., taxes, maint.	2,160,000		
Amenity maintenance	8,800		
<u>Net Income Free &amp; Clear</u>	\$4,194,900		

## PROJECT ECONOMICS AND VALUATION: Alternate 2

	I	II	III
	Base	9.6K Debt Service	10% Vacancy
I NET INCOME FREE & CLEAR			
<u>Net Income Free &amp; Clear</u>	\$ 4,405,400	\$ 4,405,400	\$ 4,194,900
II VALUATION (A)			
<u>Building Cost</u>	\$33,774,000	\$33,774,000	\$33,774,000
<u>Land Cost</u>	9,187,000	9,187,000	9,187,000
<u>A &amp; E, legal, misc. fees</u>	1,471,000	1,471,000	1,471,000
<u>Total Development Cost</u>	\$44,432,000	\$44,432,000	\$44,432,000
III RATE OF RETURN			
<u>Total Development Cost</u>	\$44,432,000	\$44,432,000	\$44,432,000
<u>Net Income Free &amp; Clear</u>	4,405,400	4,405,400	4,194,900
<u>Rate of Return</u>	9.93%	9.93%	9.46%
IV VALUATION (B)			
<u>Capitalized Value</u>	(9.5)	(9.5)	(9.5)
<u>Projected Perm. Financing</u>	\$46,400,000	\$46,400,000	\$44,200,000
(90%)	41,760,000	41,760,000	39,780,000
<u>Equity</u>	2,672,000	2,672,000	4,652,000
<u>Total Development Cost</u>	\$44,432,000	\$44,432,000	\$44,432,000
V RETURN ON EQUITY			
<u>Net Income Free &amp; Clear</u>	\$ 4,405,400	\$ 4,405,000	\$ 4,194,900
<u>Debt Service</u>	(10k)	(9.6k)	(10k)
<u>Income Avail. to Equity</u>	4,176,000	4,010,000	3,978,000
<u>Return on Equity</u>	\$ 229,400	\$ 395,000	\$ 216,900
<u>Return on Equity</u>	8.60%	14.75%	4.64%

## ALTERNATE 3

## INCOME ANALYSIS:

5% and 10% Office Vacancy Allowance

	<u>Office</u>	<u>Retail</u>	<u>Parking</u>
<b>I NET EFFECTIVE REVENUE (A)</b>			
<u>Gross Revenue</u>	\$10,169,000	\$1,021,900	\$72,000
<u>Vacancy Allowance</u>	(5%)	(10%)	(5%)
	<u>508,500</u>	<u>102,200</u>	<u>3,600</u>
Net Effective Revenue	\$ 9,660,500	\$ 919,700	\$68,400
Total			
<b>II NET INCOME FREE &amp; CLEAR (A)</b>			
<u>Net Effective Revenue</u>	\$10,648,600		
<u>Expenses</u>	(34%)		
Op. Exp., taxes, maint.	3,621,000		
Amenity maintenance	<u>25,300</u>		
<u>Net Income Free &amp; Clear</u>	<u>\$ 7,002,300</u>		
<b>III NET EFFECTIVE REVENUE (B)</b>			
<u>Gross Revenue</u>	\$10,169,000	\$1,021,900	\$72,000
<u>Vacancy Allowance</u>	(10%)	(10%)	(5%)
	<u>1,017,000</u>	<u>102,200</u>	<u>3,600</u>
<u>Net Effective Revenue</u>	\$ 9,152,000	\$ 919,700	\$68,400
Total			
<b>IV NET INCOME FREE &amp; CLEAR (B)</b>			
<u>Net Effective Revenue</u>	\$10,130,100		
<u>Expenses</u>	(34%)		
Op. exp., taxes, maint.	3,442,000		
Amenity maintenance	<u>25,300</u>		
<u>Net Income Free &amp; Clear</u>	<u>\$ 6,662,800</u>		

PROJECT ECONOMICS AND VALUATION: Alternate 3

	I	II	III
	Base	9.6K Debt Service	10% Vacancy
<b>I NET INCOME FREE &amp; CLEAR</b>			
<u>Net Income Free &amp; Clear</u>	\$ 7,002,300	\$ 7,002,300	\$ 6,662,800
<b>II VALUATION (A)</b>			
<u>Building Cost</u>	\$15,847,300	\$15,847,300	\$15,847,300
<u>Land Cost</u>	14,423,000	14,423,000	14,423,000
<u>A &amp; E, legal, misc. fees</u>	2,265,000	2,265,000	2,265,000
<u>Total Development Cost</u>	\$68,535,300	\$68,535,300	\$68,535,300
<b>III RATE OF RETURN</b>			
<u>Total Development Cost</u>	\$68,535,300	\$68,535,300	\$68,535,300
<u>Net Income Free &amp; Clear</u>	7,002,300	7,002,300	6,662,800
<u>Rate of Return</u>	10.20%	10.20%	9.73%
<b>IV VALUATION (B)</b>			
<u>Capitalized Value</u>	(9.5)	(9.5)	(9.5)
	\$73,700,000	\$73,700,000	\$70,200,000
<u>Projected Perm. Financing</u> (90%)	66,330,000	66,330,000	63,180,000
<u>Equity</u>	2,205,300	2,205,300	5,355,300
<u>Total Development Cost</u>	\$68,508,300	\$68,508,300	\$68,535,300
<b>V RETURN ON EQUITY</b>			
<u>Net Income Free &amp; Clear</u>	\$ 7,002,300	\$ 7,002,300	\$ 6,662,800
<u>Debt Service</u>	(10k)	(9.6k)	(10k)
	6,633,000	6,360,000	6,318,000
<u>Income Avail. to Equity</u>	\$ 369,300	\$ 642,300	\$ 344,800
<u>Return on Equity</u>	16.72%	29.12%	6.44%

# **5 CONCLUSIONS**



## CONCLUSIONS

By limiting the scope of analysis to a case study site and alternative developments, a more thorough and deeper understanding of the Special District's implications was gained.

Project economics and valuation demonstrated that the added costs of constructing and maintaining the public amenities required by the special district have been equitably compensated by the rental income from the bonus floor areas in each alternative. The above tabulations indicate no significant change in the rates of return between the pre-district development (Alternate 1) and those designed after special district legislation. The net income free and clear from each of the projects allows approximately a 10% rate of return for the total development cost in each case.

The developer is more interested, however, with the return on equity, for this ratio indicates the project's potential return on his capital investment. The equity in a project depends upon the amount of financing the developer is able to obtain. The amount of financing available is, in turn, directly related to the value of the project. The income from a project is one indication of its value; consequently, the amount of income is a critical factor in determining the project's return on equity.

The tabulations show an appreciable gain of return on equity with Alternates 2 and 3 over that of Alternate 1. This confirms the basic notion that bonus floor area offers the developer real incentives for development. The Alternate 3 return on equity, 16.72%, is substantially greater than the respective returns for Alternates 1 and 2, which indicates that the district regulations encourage large site assembly.

Case II calculations were based upon a slightly lower debt service constant to show the effect of lower interest rates on project economics. A reduction of approximately 1% can almost double the return on equity for a developer.

Case III calculations illustrate the crucial role income plays in development economics. A decrease in gross revenue of only 5% has enormous impact on the return on equity. Likewise, one can extrapolate from this relationship that a very small increase of gross revenue can boost the return on equity a tremendous amount. Thus, a small bonus of floor area means a small increase of gross revenue, which has a great impact on the developer's return on investment.

Where the city planning commission's power lies is in the determination of what improvements shall be bonused. The case study proves the bonus system works: the city makes requirements, offers bonus incentives to the developer who fulfills these requirements; the developer's return on equity is more attractive if requirements are met and their

bonuses are included; the project will be built because it renders a substantial profit.

The developer is primarily interested in that bonus, regardless of what the "public amenity" may be. Whether it is a bridge or subway improvement, a sidewalk or trees, as long as the development economics are attractive, the requirements will be met.

Therefore, it is clear that the planning and design concepts must be evaluated carefully, for it has been shown that practically anything, if bonused enough, will be built.

The design concept in the Special Greenwich Street Development District represents the visions and images its authors hold of the "The City of Tomorrow...." a New-York-City- land of skyways, moving walkways, plazas and fountains.... the bustling hub of shopping and business activity. Written into the form of official zoning legislation, the utopian images of multi-level circulation, through 30-foot high super-arcades, are being built in the "public interest" "to promote and protect public health, safety, general welfare and amenity."

The case study analysis uncovered one major problem: one cannot legislate complex, comprehensive architectural designs. The design of spaces, places, uses, and the interfaces between them is an intricate process dealing with problems at many scales. Beyond the

concerns at a district-wide scale, one must consider numerous specific details. The particulars of building and site requirements cannot be disregarded in the process of design. The danger of design through legislation is that it is unable to effectively deal with the small, yet critical levels of specificity one must consider in the design process. As quoted previously, Barnett criticized the plaza provision of the 1961 Zoning Resolution for its tendency "to impose design solutions that are not related to surrounding development, or to topography and orientation." A number of provisions in the special district requirements suffer in part the same tendency.

In addition to this ineffectiveness in dealing with the detailed aspects of design process, the district does not face the realities of the time scale.

Clearly, the concept of a special district is a strong one, with tremendous potential for cooperation between public government agencies and private development. Improper use of this potential, that is, directing its energies to achieve inappropriate goals, is not to the public's benefit. The most effective application of the potential energy of special district zoning is in directing the development of incremental elements which are related to general, long-range planning goals and not to a specific, long-range design, the success of which is dependent upon the satisfactory completion of a number of specific increments

built over an indeterminate length of time.

Each and every increment developed over time must, in and of itself, be of value to the city at large and its immediate surroundings. More to the public's benefit than long-range plans for implementation of a complicated design and complex physical framework, is the straightforward improvement of existing conditions that need amelioration. While the Special Greenwich Street Development District made provisions for numerous intricate elements which are part of a utopian construct, a realistic examination of the needs of the working population and the working environment reveals a number of immediate, crucial problems that emphasis upon those intricate elements have overshadowed. While the district seeks to "encourage the development of a desirable working environment" priority is not on the solutions of these problems, which would be of immense value with regard to the working environment. In addition, each improvement could be direct and simple to accomplish under the bonusing system.

- (1) access to subways: improvement of stairs, entrances.  
More entrances.
- (2) subway stations: repair and improvement of general conditions. Renovation and expansion of stations.
- (3) Sub-street level to street level flow: transitions at or near subways.

- (4) pedestrian congestion: improvement of sidewalk, additional sidewalks.
- (5) interior working spaces: inside effects of building bulk and density control. Improvement of interior office environment.

The primary area in which a special district can successfully deal is in directing incremental development by development change over time. The principle weakness of the Special Greenwich Street Development District zoning is that its success depends upon the completion of the majority of its many developments. To attempt to accomplish a comprehensive plan with extremely critical interrelationships among its various parts, by means of a mechanism that is by nature a piecemeal process is inappropriate and ineffective.

APPENDIX  
PROJECT DEVELOPMENT ASSUMPTIONS - CANDO

With the assistance of Niles O. Sutphin, Director of Development and Design at CLM Systems, Inc. and the output from their CANDO System (Computer Analysis of Development Objectives) the three alternatives generated within different zoning constraints were studied in detail with regard to economic return on investment. Although one can argue against the absolute validity of any one assumption (the loans, the escalation schedules, and so forth) the intent here was only to create a set of assumptions that, in general, was reasonable. Rent scales and land costs were provided by Alfred Schimmel, real estate broker in New York City.

The computer analysis is based on a sophisticated development model. The inputs for the capital investment schedule, loss participation schedule, income analysis, expense analysis, escalation factors, financing (five loans) and depreciation lines and write-off, were provided by Mr. Sutphin as he judged would be appropriate for the alternate programs generated by zoning regulations. The assumptions regarding vacancy allowance, tax savings, escalation factors, rental and expense starting times, financing and depreciation were held constant for all three alternatives. From one analysis to the next, the new inputs were just those income and construction costs specific to each alternative. The focus of the analysis was to uncover the effect the special district requirements had upon the economics of project development -- the added net rentable square feet due to bonuses, as well as added construction costs were included for comparison purposes.

The basic development assumptions were:

- (1) Start building construction 1/1/72
- (2) Building complete 1/1/74
- (3) Short term construction loan @ 10% 2 years
- (4) Permanent take-out begins  
(permanent financing) 1/1/74
- (5) Assume land owner is part of joint development team and he speculates on the land. Therefore, there is no interest on land purchase during construction.
- (6) Land owner paid the full cost of land on 1/1/74 (completion of building) and is paid \$50,000 payment on that date.
- (7) Joint venturers, building and land developers, both in 48% tax bracket for 25 years beginning 1/1/72.
- (8) Rent income for floors 2-6 from 10/1/73 to 1/1/74.
- (9) Rent income in general starting 1/1/74.
- (10) Vacancy loss, 5%, beginning 1/1/76.
- (11) Escalation of floor income at 4% from 1/1/74.
- (12) Expenses including taxes, maintenance, insurance, etc. figured at 34% rental income.
- (13) Escalation of expenses at 3% starting 1/1/75.
- (14) Permanent financing equals 90% of development costs at 7-1/4%. (10% equity). Payments beginning 1/1/74. 25 year amortization period.
- (15) Depreciation over 30 years declining balance 150% plus straight line beginning 1/1/74



The first representative year for Return on Investment is 1977. Using the formula,  $ROI = (CF + TS)/IC$ , that is, return on investment equals the sum of the cash flow plus the tax savings divided by the initial capital investment, ROI on 1/1/77 is:

- |                                     |       |
|-------------------------------------|-------|
| A. Alternate One, pre-district      | 17.1% |
| B. Alternate Two, Block 20N         | 23.1% |
| C. Alternate Three, Blocks 19 & 20N | 22.3% |

While the validity of the return itself can be questioned, the exercise is useful for comparative purposes. The floor area bonuses of the Special District do enhance the project development return on investment, and are, therefore, powerful incentives.

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