SINGAPORE: DESIGN GUIDELINES FOR AN URBAN WATERFRONT

by

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In Singapore, the emerging social trends and the evolving attitudes towards the built environment call for a more contextual approach to urban design that is sensitive to the social needs, cultural identity, and climatic conditions. This implies that changes are required in the present development strategies which are predominantly based on economic criteria, operational efficiency and functional needs, and which borrow their models from other rapidly developing cities such as Hong Kong.

In my thesis, I have used the master plan for waterfront development at Marina Bay, Singapore, to probe the deficiencies in the present planning and development strategies used in Singapore. Furthermore, I have analyzed the Marina Bay master plan to identify areas that need to be revised and rethought in order to recommend steps towards improving the existing master plan.

The changes that need to occur have been identified as:

- Re-evaluating the priorities and objectives of new development to achieve a finer balance between economic criteria and the quality of the built environment.
- Discarding outdated approaches in urban design that are not responsive to the social, cultural and climatic context.
- Extracting ideas from vernacular architecture and cultural traditions and incorporating them into contemporary urban design and waterfront development.
- Involving public opinion and citizen participation in the planning process.

- Increasing the utilization of local professionals who are sensitive to local trends and issues related to new development.
- Evaluating in detail ideas from abroad for their appropriateness in Singapore before eagerly embracing them.

Having made these changes to the current development strategies in Singapore, the course of action that I consider essential to the planning and designing of the Singapore waterfront are:

1) Establishing an urban design framework,
2) Formulating a set of design guidelines and
3) Setting up a design review process to monitor the implementation of the design guidelines.

To support these recommendations, I have drawn upon two case studies, Mission Bay, San Francisco and Battery Park City, New York, as examples of urban waterfront developments that have used design guidelines and followed similar procedures in achieving their development goals.

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CHAPTER I
INTRODUCTION
Singapore has physically undergone massive changes over the past two decades. Since its independence in 1965, the government has successfully pursued an aggressive development program to meet the demands for residential, commercial and industrial space.

In the past, the planning strategy has focused on encouraging development and promoting efficient use of infrastructure, which translated into high density developments and high rise buildings that were often monotonous and unexciting. But after 25 years of building for the growing population and a maturing Singapore society, the demands for space have evolved towards better quality spaces that offer diversity, simulation and choice.

Paralleling these changes has been the opening of the city's waterfront for redevelopment. Previously used for port and industrial activities, the waterfront has been increasingly seen as an attractive place for residential and recreational uses due to the infill of the coastline to create new land and the removing of incompatible uses along the waterfront to create vacant land for development.

Thus today, Singapore needs new planning strategies to meet these new demands for an improved quality in the built environment. Part of these new strategies include: a new concept for its urban waterfront; changes in the planning policies and changes in attitudes towards the natural, social and built environment; and urban design guidelines to direct development towards a future goal.

In my thesis, I will advocate the use of a contextual approach to urban design and the introduction of citizen participation in the planning process as part of the new planning strategies that should be exercised in Singapore. I will also develop urban design principles and concepts for the Singapore waterfront as well as recommend a set of guidelines that are consistent with these concepts.

My methodology for generating an appropriate set of design guidelines will include examining the present planning and development strategies in Singapore, highlighting social trends that could affect new development, analyzing the master plan for a selected waterfront site in Singapore, and evaluating the success of design guidelines as a planning and design tool in two major waterfront developments in the USA: Mission Bay, San Francisco and Battery Park City, New York.

The aim of my thesis is to suggest improvements to the present planning and development strategies used in Singapore and to illustrate the benefits of design guidelines.
as a framework for planning, urban design and decision making, and ultimately as a way of realizing the full potential of urban waterfront in Singapore.

By doing so, my hope is that the urban waterfront may become a special public place where both citizens and visitors can interact with each other in a setting that is invigorating, stimulating and diverse.

OVERVIEW OF THE THESIS

CHAPTER I
Introduction

This chapter provides a summary of the social and development trends that have lead to the need for an improved planning and development strategy in Singapore and highlights my methodology and the contextual approach taken in creating a set of design guidelines for the Singapore waterfront.

CHAPTER II
Waterfront Development in Singapore

I will provide a brief outline of the history and types of waterfront uses in Singapore and the processes by which waterfront sites have become available for redevelopment.

The present development strategies and upcoming social trends and changes in attitudes towards the physical environment will also be discussed with regards to their implications for new developments in Singapore.

CHAPTER III
Case Studies
Mission Bay, San Francisco
Battery Park City, New York

This section comprises two case studies on waterfront sites in major American cities Mission Bay, San Francisco and Battery Park City, New York. These case studies are intended to provide evidence to support the use of design guidelines as planning tools and as devices to control and direct development towards pre-established objectives and goals.

The case studies will also provide insights to the alternative roles that the Urban Redevelopment Authority (URA), the City agencies, the developers and citizens can take in the planning and development process. Most importantly, these case studies provide lessons that will shed light on the future direction Singapore should take in strengthening and improving upon its current planning and development strategies.
CHAPTER IV
Analysis of the Marina Bay Master Plan

I will review and analyze the Marina Bay master plan prepared by the URA in order to understand the development strategies, objectives and concepts currently used in developing the Singapore waterfront. This analysis will provide the basis for discovering the deficiencies and inadequacies of the present development strategies not for the purpose of criticism but as a starting point to show how these deficiencies may be overcome by improvements in the current development strategies and more importantly, by incorporating design guidelines as part of the planning and designing of the waterfront.

CHAPTER V
Concepts and design guidelines for the Singapore Waterfront

Taking into consideration the implications of emerging trends in Singapore, the issues that were missed in the original Marina Bay master plan, and the lessons from the two case studies, I will adopt a contextual approach to planning and urban design using urban design principles appropriate to Singapore’s social, cultural and climatic context. My intent is to revise the Marina Bay master plan by recommending a planning framework and a set of design guidelines that will direct new development towards achieving a higher level of quality, urbanity, vitality and aesthetics, as well as to give the urban waterfront a sense of identity and a sense of place. The design guidelines will be organized around urban design principles regarding:

1) Hierarchy of Streets
2) Size of Building Blocks
3) Location and Quality of Open Spaces
4) Visual and Physical Access
5) Types of Land Uses
6) Building Mass and Heights
7) Architectural Design

CHAPTER VI
Recommendations for Implementation

In this final chapter, I will suggest methods of implementation that could be used in Singapore should the City choose to introduce design guidelines into their planning strategies for future development. My recommendations will include ways in which the City can improve upon existing methods of implementation to accommodate the use of design guidelines as well as changes in the present development strategies which pave the way for the facilitation of design guidelines in the planning process.
CHAPTER II
SINGAPORE'S WATERFRONT DEVELOPMENT
Singapore is situated at the crossroads of trade between the Pacific Ocean, Indian Ocean and the South China Sea. Located at the tip of the Malaysian Peninsula, Singapore was established as a British colony in 1819 and became a settlement for the East India Company as well as an outpost for the British. Because of its geographic location and sheltered waters, Singapore rapidly grew as a free trade port. (Fig 2.1)

Under colonial rule, the growth of the port was orderly and controlled by the Town Plan. The Town Plan covered areas between the Singapore River and Kallang Basin and specifically on the Southern coastline of Singapore and on either bank of the Singapore River where the heart of commercial activity and the greatest growth was occurring.

This plan was initiated by Sir Stanford Raffles in 1822, three years after he had founded Singapore, with the purpose of indicating areas for different land uses and allocating residential districts for the different ethnic groups who had settled in Singapore. (Fig. 2.2)

The Town Plan also introduced to Singapore a street system comprising of orthogonal grids which indicated the subdivision of land into lots and designated areas for public spaces. Furthermore, it contained perhaps the first design
guidelines to be implemented in Singapore. The Plan required that shop houses be a certain width and linked by covered passageways, and that all commercial buildings be constructed of masonry with tile roofs.¹ The impact of these guidelines are still evident in the rows of shop houses that line the historic Singapore River. Unfortunately, these guidelines did not survive the era of modern architecture in Singapore which began in the 1940's² except for the use of covered walkways in the CBD which have been recently reintroduced to the City Planning Code (Appendix 1).

By 1900, immigrants from China, India and Europe poured into Singapore in search of employment and fortune. Singapore's importance as a port also grew significantly to become the seventh largest in the world in terms of tonnage of shipping in 1903.³

Finally in 1959, after 140 years as a British colony, Singapore broke away from colonial rule and became part of the Federation of Malaysia. But bitter disputes led to Singapore's claiming its independence as a nation in 1965. Today, the population of Singapore is 2.7 million and the Port of Singapore has become the second largest in the world in terms of tonnage. Though its significance as a Port has not changed, the waterfront has continuously been evolving especially in the past two decades. These changes were prompted by several factors, including:
1) changes in the political and economic structure,
2) the government's attitudes towards the growth and development of the CBD, and
3) the relocation of the shipping industry.

Together these factors influenced Singapore's urban waterfront redevelopment through the expansion of the financial district to the water's edge; the reclamation of the shoreline to create more land for development; and the relocation of Port facilities leaving behind vacant land for new uses.

Fig. 2.2: The Town Plan of 1822, origins of the grid in Singapore
b) PRESENT DEVELOPMENT STRATEGIES

The kinds of environments that have evolved in Singapore are the direct result of a set of government development strategies that have physically transformed Singapore into a modern metropolis. These strategies are important in terms of the attitudes towards development they have formulated in their path. Since all new development is subject to these established strategies, it is necessary to view them in the light of their impacts thus far.

During its early years of independence, Singapore had to restructure its economic framework in order to attract foreign investments and to spur economic and physical growth. Thus between 1965-1972, it adopted an open-door policy for foreign investments, provided tax incentives to developers as well as supported these with a commitment to improve human services and infrastructure. 4

By 1972, Singapore had achieved a level of economic and political stability that allowed its leaders to direct the future of Singapore towards that of a 'Global City' instead of a Regional Center. This meant that greater economic emphasis was to be placed on developing Singapore as a center of banking, finance, communication, trade and shipping. 5

The economic restructuring spurred development and rapid physical growth. But prior to this, several programs had already been launched to improve the physical environment and provide housing and employment to boost the economy.

Examples of these successful programs include massive tree planting throughout the country, widening and paving sidewalks and environmental improvements. Together they earned Singapore the title of the "Clean and Green" City. 6

Upgrading was also experienced in the the provision of utilities, services and infrastructure as well as health, recreational and educational facilities.

Thus, improvements to the physical environment coupled with the Urban Redevelopment Authority's (URA) land sale program succeeded in attracting local and foreign investments in the property market and in turn fueled the machine of redevelopment in urban areas. 7

In 1966 the Land Acquisition Act enabled the government to attain land for urban redevelopment. Together with land reclamation efforts, large tracts of urban land were made available for development.
To encourage private investment in Singapore, the initial land sales included incentives in the form of low down payments with interest free installments over ten years, lower property taxes and exemption from development charges. But these were not without constraints, contractual agreements accompanying land sales included pre-determined regulations regarding allowable plot-ratio (FAR), type of development, building setbacks and height controls with which new development had to comply. In addition, constraints pertaining to project ownership and time of completion were part of conditions the URA imposed on developers. \(^8\) (Appendix 2)

e) EFFECTS OF LAND USE AND DEVELOPMENT POLICIES ON THE URBAN WATERFRONT

The development strategies of the early 70's did much to transform the Singapore waterfront. Not only were waterfront parcels cleared and made available for development but new land was reclaimed from the sea which offered a cornucopia of opportunities for new development.

Relocation of Port facilities

Part of the land use strategy was to eliminate incompatible waterfront uses and relocate the port and support services further down the coastline into deeper waters and newer facilities.

Historically, Singapore had a swampy coastline and even with the landfill that occurred in the 1880's, the waters were still shallow and ships were not able to dock close to the shore. Thus, unlike other historic waterfronts characterized by projecting piers, the Singapore waterfront was characterized by smaller water vessels, (lighters or 'tongkangs'), which shuttled cargo between the anchored ships and riverfront warehouses. The Singapore River was then the focus of trade and commerce and its banks were lined with two to three story shop houses and warehouses.
supporting the shipping industry.⁹ (Fig. 2.3)

But with containerization in the shipping industry, port facilities were relocated to the new Keppel Harbor. This made the work of the 'tongkangs' obsolete. Although some are still in service for uncontainerized shipments and for ships that cannot afford the port taxes, the 'tongkangs' too have been relocated. As a result, the volume of activity that once existed along the Singapore River declined rapidly.

Though traditional waterfront uses have vanished, the waterfront provides the opportunity for new water-related uses to be developed for recreation, entertainment and transportation such as marinas for pleasure boats, facilities for row and paddle boats, terminals for water taxis and floating restaurants.

In the seventies, the financial district located at the Southern waterfront, and stretching along Shenton Way from the Singapore River, was experiencing physical growth as Singapore advanced to become a financial center of South East Asia.

The sale of cleared sites within the financial district though initially slow to pick up soon gained momentum as local and foreign investors in real estate realized the profitability of these developments. Investors and developers were also attracted by Singapore's political stability and government support in the form of infrastructure and tax incentives.¹⁰ The increased interest in development within the financial district lead to greater demands for land in the CBD. Thus, after the port facilities had been relocated, the land around the Singapore River became prime land for urban redevelopment. (Fig. 2.4)
Already, parts of it have been cleared and new high-rise office towers constructed in place of the old shop houses that were in disrepair and not economically efficient. Only recently this indiscriminate demolition of the historic waterfront has been halted by a new wave of concern for historic preservation.\(^\text{11}\)

**Reclamation of the Southern shoreline**

In the late 1960's, the URA performed studies to establish a master plan for island-wide land uses. These studies included the analysis of traffic problems and congestion that was on the rise.\(^\text{12}\) Part of the solution was to build a new highway system that would bypass the congested bottlenecks caused by the only two bridges across the Singapore River that provide access to the financial district.\(^\text{13}\) The solution included reclamation of the shoreline for the construction of the new highway and at the same time creation of new land on which to expand the rapidly growing downtown area. (Fig. 2.5)

In total, these extensive reclamations resulted in creating an additional 670 hectares along the Southern shoreline forming East Coast Park and the crescent shaped Marina Bay which is enclosed by Marina South, Marina Center and Marina East.\(^\text{14}\)
The reclaimed East Coast area consists of more than 2000 ha of reclaimed land, 600 ha of which has now been developed as the new Changi International Airport.\(^{15}\)

The remaining vast areas of landfill around Marina Bay has only seen a fraction of the development that has been planned. Even so, results of the first phase of development remains questionable. On one of the landfill sites is Marina Center, a mega-structure consisting of three hotels and retail which is imposing in its scale and magnitude and absolutely isolated in its relationship to the urban fabric. (Fig 2.6)

In contrast are a small scale recreational facilities at Marina South\(^{16}\) which appear to have been modelled after an auto-oriented strip mall. Though these two developments have been undeniably successful in drawing people to their sites, they can be criticized as developments that have contributed to the on-going destruction of the street scale and the function of the street as a pedestrian path and as a place of activity.

Developments based on large building programs such as the three hotel and shopping complex at Marina Center have lead to larger scale buildings and consequently larger block sizes. These large buildings have in many ways diminished streets as access routes since they have fewer openings onto the street and tend to possess an internalized circulation and distribution system that competes with the functions of the street.\(^{17}\)

On the other hand, the smaller scale recreational developments at Marina South though more responsive to the street scale, have forgone their potential for transforming their streets into lively gathering places by designing their layout around vehicular access instead of pedestrian needs.

New Uses for Waterfront sites
Efforts to reclaim the coastline have presented opportunities to reintroduce the public to the waterfront. Already, East Coast Park, a linear waterfront park on the 300m wide coastal strip of land between the water's edge and the new highway has been developed as a 10 km stretch of recreational facilities providing areas for golfing, tennis, bicycle paths and even low-cost holiday rental homes.\(^{18}\)

In the attempt to bring people back to the waterfront, a variety of water-related uses have also been created such as beaches for swimming, marinas for water sports and piers for fishing. The creation of such an extensive area for recreation is part of the government's commitment to provide new lifestyles and human services for Singaporeans in the 21st century.
Fig 2.5 Reclamation of the southern coastline
d) EMERGING TRENDS AND IMPLICATIONS FOR NEW DEVELOPMENT

Although these development strategies have gained momentum and acceptance in the past 20 years, new trends have risen in response to these strategies. These new trends have been stimulated by changes in social values and attitudes towards the built environment as well as by the growing concern with the preservation and creation of a cultural identity.

The significance of these new trends for the Singapore waterfront development is that any planning effort for new development must attempt to be responsive and sensitive to these new trends in order to achieve long term success and stability over time. The reason is that these trends may be an indication of issues that will soon gain importance in Singapore and perhaps eventually lead to the restructuring of past planning strategies in order to accommodate them.

Fig 2.6: Marina Center mega-structure, imposing in its scale and isolated from the urban fabric
**Historic preservation**

Over the past few years, historic preservation has become an important issue in the agenda for urban planning. This emerged out of the concern voiced by the Singapore Heritage Society about the loss of Singapore's cultural heritage due to the demolition of older neighborhoods.

The Land Acquisition Act enabled the URA to claim much needed land for redevelopment. In its wake, this has lead to the destruction of the old urban fabric and a traditional way of life. Buried in the rubble of these old neighborhoods was also a pattern of streets and open spaces that contributed to the richness and experience of urban life.

Previously, the need for historic preservation had been overlooked since the cost of preservation did not meet the economic and financial criteria of the government. Ironically, it was the economic driving force that finally placed historic preservation on the discussion table since the demolition of old neighborhoods lead to the loss of tourism dollars from the lack of exotic and ethnic places to visit in a rapidly modernizing Singapore. 19

Fortunately, the losses in vernacular architecture have become less severe as some buildings are now protected either by being designated as historic monuments by the Singapore Monuments Board and the Singapore Heritage Society or by being zoned as a conservation district by the URA for adaptive reuse such Emerald Hill and portions of Chinatown.

Historic preservation was also slow to come about in Singapore because the government was reluctant to underwrite its financial losses in real estate returns by preserving large areas is historic neighborhoods. 20 But its decision to do so has been well rewarded as real estate values in most historic areas have more than doubled their value after being restored to their original beauty.

Although most historic buildings stand devoid of their original urban context, these older buildings sit among their towering neighbors as reminders of an architectural style and a way of life that have evolved over time, and that only by the threat of destruction have begun to be appreciated. (Fig 2.7)

In Singapore, as in many historic neighborhoods in North America, these historic buildings are expensive to restore and maintain and many historic areas have consequently become gentrified. Already, in Singapore, the increase in land values of rehabilitated historic buildings has prevented the previously displaced residents and tenants from returning
and instead attracted 'yuppies' and the elite who either purchase these buildings as homes or as speculative properties.

Thus, the lifestyles that once existed in these neighborhoods have been lost and no amount of restoration can bring them back. Though government subsidies could be offered to original owners and residents for the cost of restoration and rehabilitation, these subsides are unlikely to be implemented in Singapore.

Implications
The sky-rocketing demands for historic buildings as living spaces not only contributes to the increase in their value but more importantly indicates that there is a growing demand for the types of life-style and physical environments that these historic neighborhoods offer. Though some people are lured back to these places by nostalgia, many others seek to live in these historic areas because these districts have a strong 'sense of place' created by their tightly woven urban patterns, sense of scale, intricacy and beauty in their architectural style and ornamentation. The human scaled environment, arcades for pedestrians, closely spaced columns, uneven ground level, changing levels of light, crooked streets, mysterious back alleys, and windows with shutters are just a handful of the qualities that people have come to seek in order to enhance their living experience. (Fig 2.8)

The positive response to historic preservation in Singapore gives cues to the direction in which this trend will take and therefore is important to the planning for new development. First, this trend suggests that the approach to urban design in Singapore must change. Architects and planners must learn to discard the outdated, anti-urban theories of the Modern movement and replace them with a more humanistic and contextual approach to design.

Fig 2.7: Historic shop houses among their towering neighbors
Second, new developments should extract the qualities inherent in Singapore's vernacular architecture and traditional urban pattern, and translate them into design principles appropriate for contemporary development.

Third, variations in outdoor and indoor spaces, building elements, as well as architectural details should contribute to the experience of the place. Thus, the playful application of these variations in design must be sought in new developments.

**Changes in Social Needs and Values**

Today, Singapore is at the beginning of an exciting new era. Economically, it is experiencing a time of affluence and stability which in turn has produced demands for more richly diversified living and working environments. Singaporeans today also have a different set of expectations and aspirations than a generation ago and these expectations will inevitably influence planning to take new directions.

The impacts of this influence can now be felt in the Singapore housing market where demands for quality has altered the approach to constructing the new housing stock.

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Fig 2.8 Historic areas have a strong 'sense of place' created by human scaled environments, arcades and changing levels of light.
The speed and mass production in housing construction during the 70's has slowed down significantly. Since the Housing and Development Board (HDB) launched its aggressive housing program, it has successfully provided housing for 70% of its population through innovative home-ownership schemes. Now that the basic needs of providing shelter and homes for the urban poor are no longer a pressing problem, the emerging trends in demand point toward creating a quality of life that is rich, diverse and indigenous to Singapore.

As a result, housing projects built in the 70's are going through remodeling and upgrading to meet the changing needs and increasing demands of residents. Furthermore, new construction undertaken by the HDB has reflected greater attention to quality and design. If this trend continues, increasing number of citizens will begin to demand a higher quality not only in their housing but also in their physical environment and provision of services.

Changes in life-style, social structure and demographics are important in the planning for future development since this directly affects the physical environment. For instance, the popular "two is enough" slogan in the 1970's which encouraged two child families had great impacts on the family sizes in Singapore. In fact, the effectiveness of this campaign to control population growth surpassed all prior expectations. By the 1980's, the apparent threat of a zero population growth and an increasing number of elders with fewer children to support them forced the government to encourage larger families instead.

Another social change that has gained national attention is the increasing number of single career women who are marrying at a later age or not at all. Altogether, these changes imply different spatial needs especially in housing as well as new preferences in location of the housing stock.

Implications
In the future, we can expect to find that citizens will be more involved in the actions of public agencies, especially those agencies whose policies and actions will inevitably affect and change the quality of their living environment. Thus, new development must take into consideration that citizen participation will soon be part of the decision making process and must prepare for its arrival by revising the present development strategies to accommodate public involvement.

With regards to building design, the climate of changing social values and needs and the re-modeling of housing units all shed light on another issue, the flexibility of living and
working spaces. Physically, new development must be able to respond to changing spatial needs and possess the capability to expand in order to accommodate these needs. For example, the increasing number of single men and women demand smaller housing units and prefer locations closer to the City and in close proximity to social activities and entertainment, while the growing number of elders require barrier-free environments and housing that is located close to services.

On the other hand, traditional extended families are still prevalent and require greater spatial needs within the home. The HDB has already began to accommodate these larger families by designing housing units which are either larger or have adjoining units.

Finally, if the popularity of historic preservation, a trend already well established in modern cities, is any indication of how development trends in Singapore follow the development trends in Western developed countries, then the planning for new development in Singapore will do well by keeping its eye on the West and consider the option of creating mixed-use projects which include housing within the city.

The prospect of living and working downtown present the opportunity to enjoy city life and yet be within walking distance of the office. This not only creates 24-hour activities in the otherwise deserted CBD after dark but also reduces the number of vehicle trips into the city during peak hours.

At present, some mixed-used projects have been constructed in the CBD. International Plaza, a high rise at the heart of the financial district provides luxury housing which is separated from the office and commercial uses below. But such examples are rare and have not been popular since the lack of services and limited operating hours do not support downtown living. Thus, in order to promote and increase residential uses within the City, related services must be reinforced to support the needs of residents.

**Reaction Against Mega-Structures**

Resistance against large-scale development such as interconnected, multi-use complexes for shopping, offices and hotels is a combined reaction against the de-humanizing effect of these structures due to the lack of human scale; the isolation of these buildings from their urban context; their poor relationship to the street edge; the internalization of pedestrian functions to create an anti-urban environment; and their inappropriate and insensitive architectural style.
But the existence of mega-structures did not occur by chance. It was born out of several factors, including: the large sub-division of land; the large building programs that require large structures; the shortage of small developers in the real estate; the response to the hot and humid climate; and the adoption of an architectural style that is inappropriate to Singapore.

So far, in support of new development, the City has been responsible for installing the infrastructure and providing street access to potential sites. In terms of planning, the government's involvement has been in land use zoning and the subdivision of land for private developers.

Because the lots have been very large and usually sold to one developer, they tend to attract only large development companies who in turn propose large-scale building programs resulting in mega-projects. For example, the reclaimed land at Marina Center was the first urban waterfront site to be developed for commercial purposes and now houses three major hotels and shopping complexes interconnected as one large scale project with shared parking. Soon to be developed in an adjacent lot is Suntec City, another large-scale commercial and office development. (Fig 2.9)

Although these projects provide much needed office space, planning has been inadequate in providing relationships between buildings and open spaces, relating built form to the urban context and the enhancing human scale. As a result, projects have mostly focused on internal pedestrian circulation with little or no emphasis on street-level activity.
Access to these projects has been created predominantly for automobiles with little attention given to pedestrian access. The problem of large-scale development is further intensified by the sale of land to the highest bidder. Urban design criteria have been secondary to price and the URA has required little in return from the developer in terms of commitment to good and responsible design and sensitivity to the impacts of development on the surrounding areas.

The only conditions that the developer has had to meet in order to obtain a building permit are restrictions in the type of use, height, density and building setbacks that have been established by the URA on a parcel by parcel basis.

Although the URA has recently adopted a design review process to evaluate projects in their response to the urban design and aesthetics, the decisions of the design review board have mostly been subjective and not based upon firmly rooted guidelines.

Consequently, the lack of design guidelines and regulations for new development has left design and development in the hands of corporations, developers and financial institutions. As a result, the flux of corporate investment in the development scene has transformed the city into a showplace for the private ego at the expense of the public realm.

As a whole, mega-structures have produced an urban environment that is 'anti-urban' in scale since many new large-scale developments are inward looking and fail to address the street edge. There has been concern among architects and citizens that many new developments have ruined the urban fabric that has existed before redevelopment.24

It is important to understand how buildings that are so removed from their urban context and human scale have found their way into the heart of our cities. The Modern movement was adopted in Singapore at a time when urban renewal efforts had cleared parcels in the inner city and the government was eager to attract private investment in a sluggish real estate market. Thus, the URA was not in a position to be too restrictive or selective in the development opportunities.

Also, after World War II, new building technologies, the return of local architects educated abroad as well as experts from developed countries brought with them the Modernist movement and later the International Style which became popular in Singapore and eventually led to the dehumanization of urban spaces. The International Style was most evident during the building boom of the 70's, where new construction in the CBD and along the waterfront
consisted of high-rise towers often with four to five story bases or towers that disappear into the ground without acknowledging ground level activities. As a result, buildings were characterized by sleek buildings surfaces, flush curtain walls with little articulation, minimal sculpturing of building forms and almost always an absence of ornamentation. The overall effect on the Singapore skyline has been towers that are bulky, monolithic, devoid of human scale and uninteresting.

Unfortunately, Singapore still has an over-dependence on foreign architects such as I.M. Pei and Kenzo Tange whose design philosophies advocate the use of the International Style. These outdated design philosophies have never been sensitive to the climate, culture, lifestyle, scale and context of Singapore but the URA has often been too eager to embrace them without fully understanding the appropriateness of these philosophies to Singapore. Today, it is critical that planners, architects, the City, the public and especially developers recognize the fallacy of adopting the International Style and the Modernist approach to planning in Singapore. They need to respond by making a commitment to a more contextual approach to planning and design.

Climatically, the success of mega-structures in Singapore is due to the comfort and relief of air-conditioned spaces in the humid equatorial climate. The preference for environmentally controlled buildings has resulted in most pedestrian traffic being removed from the street as much as possible and replaced by internal circulation within the building enclosure. Skybridges also enable pedestrians to move from one building to another without ever having to go outdoors.

The hot and humid climate has often been used to justify internalized circulation but comfortable outdoor spaces are not unknown in Singapore. In fact, if well planned, outdoor spaces can be very successful. An example is the tree-lined boulevard along Orchard Road in the shopping district where wide, continuous and generously shaded pedestrian paths provide a pleasurable walking experience. Also, along Shenton Way in the financial district, the arcades and overhangs, together with sufficient landscaping to buffer auto traffic, provide a hospitable pedestrian zone.

Thus, the issue is not the uncomfortable climate that discourages outdoor spaces and pedestrian activity but the lack of well designed pedestrian environments that are conducive to external pedestrian circulation.
So far, the development trends and attitudes towards large scale development leave much to be desired. Although there is not much to be done to reverse the development of the mega-structures that have transformed Singapore's urban environment, a lot may be achieved in order to prevent more from being constructed.

Implications
The problem of large-scale development, if left unaddressed, can be detrimental to the physical environment and deprive Singapore of its urban context and cultural identity. Already there have been pleas to the City to re-think their development strategies, revise their urban design principles, subdivide large parcels of land and reintroduce the use of streets as pedestrian environments.

In the past, legislative and financial incentives have been offered to encourage the private sector to invest in real estate development. These incentives have been very successful in attracting investments such that the URA has progressively reduced these incentives and concessions to developers. Thus, today the City has the upper hand and is in the position to place greater demands on developers to meet objectives and design guidelines of the City.

A new development strategy structured around development agreements between the City and the developers which binds developers to a set of design guidelines is one that new developments should adopt. Such an agreement between the developer and City agencies such as the URA will ensure that the interests and needs of the public are kept in mind and that development will lead to the creation of a more socially responsive environment for all users beyond mere economic criteria.

The Identity Crisis
Although Singapore has managed to establish a strong political and economic identity since its independence, Singaporeans are still struggling to find their cultural identity and most of all a physical and visual identity through its built environment.

Due to the racial and cultural diversity, the search for an identity in the built environment that is expressive of the various cultures and at the same time indigenous to Singapore has been a difficult one. But the search could begin with an analysis of Singapore's vernacular architecture.
The three to four story historic shop-houses have left an architectural heritage of building styles and ornamentation. They have also provided design principles that should be reconsidered, such as a responsiveness to the climate and the human scale. These buildings are excellent examples of how colonial building designs have successfully adapted to a different culture and climate to produce eclectic building types that, through time, Singaporeans have accepted as their own. (Fig 2.10)

Although Singaporeans recognize that a mere duplicating these historic buildings cannot provide any meaning or sense of identity in modern day Singapore, importing modern architecture from the West suffers the same fallacy.

In discussing building design in Southeast Asian countries, Yeang says that a detailed analysis of the forms, devices and images of vernacular architecture is essential to abstract from them the basic principles that can be translated into forms that are appropriate and reflective of contemporary conditions. As examples of such principles, he cites the use of arcades and sun screening devices such as louvers, lattice work and shutters. 26

Fig 2.10: Singapore vernacular architecture

Thus, in order to create a physical environment that is indigenous to Singapore, an architectural vocabulary is required which builds upon the past and which can only be developed over years of maturing and experimentation. But as trends and styles change and the search for a meaningful expression continuous, there is the need for a basic framework to guide future developments.

Implications

In Singapore, there is the need to establish a planning framework together with concepts for new development. In addition, a set of design guidelines which support these concepts needs to be formulated. Together, they will help in
the search of a cultural identity. These guidelines should
draw upon design principles inherent in vernacular
architecture and by no means limit creativity or artistic
expression. Instead they should strive to enrich the
environment and to enhance urban spaces by ensuring that
future developments are of the desired level of quality and
that they contribute to the overall 'sense of place' instead of
subtract from it.

The task of implementing these design guidelines is crucial
to their success. The various methods of implementation
differ in the amount of design control each provides to the
City, ranging from design guidelines that are mere
recommendations to those that are mandatory. Therefore,
prior to implementing these design guidelines, the City must
decide upon the method that is most appropriate for their
use.
FOOTNOTES

1 Gretchen, M, Pastel Portraits, Singapore Coordinating Committee, Singapore, 1984


3 Gretchen, M, Pastel Portraits, Singapore Coordinating Committee, Singapore, 1984


5 ibid. p. 95


7 Lim, William, Equity and Urban Environment in the Third World, DP Consultant Service Pte Ltd., Singapore, July 1975. (p. 150-151)

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CHAPTER III
CASE STUDIES

Mission Bay, San Francisco
Battery Park City, New York
The two case studies examined below address the question of the success of design guidelines at achieving the design concepts and objectives presented in the respective master plans. Together, what they suggest provides a basis on which concepts and design guidelines for the Singapore waterfront can be formulated.

Mission Bay, San Francisco and Battery Park City, New York have been selected for this purpose. Both projects are located on urban waterfront sites in major cities and in close proximity to the CBD. Thus, they can provide ideas about waterfront development as well as insights as to how design principles can be utilized to integrate these sites into their urban fabric as well as distinguish them as identifiable neighborhoods with their own unique characteristics.

These case studies have also been chosen for their considerable size and relatively flat topography. They share similar physical properties as Marina Bay in Singapore by being either landfill sites or possessing shorelines with few projections and piers. In terms of land uses, Mission Bay and Battery Park City represent projects that involve mixed-use development, a land use program which I intend to introduce in Marina Bay.

Most importantly, both projects possess a master plan that outlines the objectives and intentions for each development as well as a set of design guidelines prepared by architects and planners that control and direct new development towards achieving these objectives.

In terms of the planning process, Mission Bay involves the City Planning department while Battery Park City has an independent agency, the Battery Park City Authority, to manage development. In both cases, the City Planning Department and the Battery Park City Authority have similar responsibilities that range from initiating the master plan and design guidelines, implementing the design guidelines, structuring the design review process and overseeing construction. The active role taken in decision making, development and construction of the site can provide insights to the different levels of control the City and separate agencies can have over the development process. Together they illustrate the possible new roles that the government and city agencies such as the URA can undertake in Singapore.

The position of the developers in these two case studies are also interesting to note. In the development of Battery Park City, there are many developers involved whereas in Mission Bay, there is only one major developer for the entire site. Since in Singapore the trend has been to involve only a
few large developers, it will be interesting to compare the development agreements and planning strategies employed in these two case studies in order to understand the different approaches in implementing the use of design guidelines for development.

In Mission Bay and Battery Park City, design guidelines have an important part in determining the outcome of the physical environment and providing the City with a form of control over this outcome. These design guidelines vary in detail and sometimes also in subject, therefore it is important to assess their success at achieving their goals. Lastly, these case studies provide supporting evidence for the introduction of design guidelines in the development of the Singapore urban waterfront.

Although these case studies are both located in the United States and are climatically and culturally different from Singapore, the urban design principles and the lessons drawn from these case studies can still be useful and relevant in Singapore.
CASE STUDY: THE MISSION BAY PLAN, San Francisco

The Mission Bay Plan is a specific plan within the Central Waterfront Plan adopted by the City and County of San Francisco that outlines issues of permitted uses, zoning control, height and density restrictions and location of residential, commercial and open space.

Planning for Mission Bay began in 1981 when Catellus Development Corporation proposed a development scheme for the Mission Bay site. Their initial plan comprised of several high-rise office towers with a maximum height of 42 stories and 21.8 million sf of commercial and office space. The proposal was opposed by citizens of San Francisco who did not want a second downtown and who instead requested for a predominantly low-rise housing development with large open spaces to be provided for the community.

In response to the diverse set of interests between the developer and citizens of San Francisco, a citizen review process was established in 1985 by the San Francisco Department of City Planning and Catellus Development Corporation. The aim of this interactive planning process was to incorporate the views of citizens and special interest groups and to make the necessary revisions to development.
plan for approval. Finally, with public input and the involvement of several government agencies and consultants, the Mission Bay Plan was approved in 1990.1

The approved Mission Bay Plan was designed by Skidmore Owings and Merrill Architects and Planners (SOM) who also assisted in compiling the set of design guidelines for adoption. In terms of the land use program, the amount of commercial space was reduced to 6 million sf and the maximum height shrunk to 8 stories. In the master plan housing is given the highest priority and altogether provides 8000 housing units. (Fig 3.2)

The design guidelines for the Mission Bay Plan have since become part of the San Francisco Municipal Code (City Planning Code) by amending the existing code to establish Mission Bay as a specific plan.2 Development proposals put forth by Catellus would therefore have to go through a design review process for approval prior to construction.

The Mission Bay Plan is unique in the planning history of San Francisco due to its size, its level of City and citizen involvement and the degree of detail established in the design guidelines. Therefore the success of the Mission Bay Plan will have a significant influence over the future planning strategies in San Francisco as well as set the precedence for large-scale development in other cities.

Fig 3.3: The Mission Bay Plan showing adjacent neighborhoods
Fig 3.2: The Mission Bay Plan designed by Skidmore, Owings and Merrill
a) SITE AND PROJECT DESCRIPTION

Location
Situated only a mile South of San Francisco's financial district, Mission Bay consists of 315 acres covering the North and South of China Basin Channel. The major land owner is Catellus Development Corporation, several parcels on the site are also owned by the City of San Francisco and the Port. (Fig 3.1)

Physical description and connections
Mission Bay is connected to regional transportation by Interstate 280 that runs along the West boundary of the site. It also has arterial streets that lead to I-80 and US 101. In terms of public transportation, direct access from the site to downtown San Francisco regional transit terminals is provided by the San Francisco Municipal Railway MUNI bus and the CalTrain Peninsular Service.

To the North of the site lies the south of Market which is primarily an area for office and light industrial uses. On the West is a design center for showrooms while along the Southwest edge is North Potrero which houses transportation activities and manufacturing. Finally to the South and Southwest, separated by I-280 and the Southern Pacific Railroad tracks, is the Potrero Hill residential neighborhood. (Fig 3.3 and Fig 3.4)

Historic use
Historically, Mission Bay was once a shallow bay surrounded by swamp land. In the mid 1860's the first Southern Pacific terminals and warehouses as well as the City dump were built in this area. Due to the growth of the San Francisco Port, infill of Mission Bay began in order to meet the increasing demands for land.

Infill of the site was completed after the 1906 earthquake when Mission Bay was used as a dumping ground for debris. By the 1920's, piers were constructed to serve shipyards, mill and lumberyards.
Existing use
At present, the site is zoned M2 for heavy industrial uses with height limits ranging from 40 to 200 feet. The existing land use comprises of transportation related activities such as rail lines and rail yards as well as warehousing and storage facilities. Sand and gravel operations also occupy part of the site along with a houseboat and sail boat community in China Basin.3

b) CONCEPTS AND OBJECTIVES
The underlining planning concept for Mission Bay is to create an urban neighborhood which is finely integrated with San Francisco’s system of open spaces and network of streets. (Fig 3.5)

The site has been programmed as a mixed-use neighborhood where residents will live and work within the site. In support of this, the Plan emphasizes on easy access via public transportation so as to minimize the reliance on automobiles.

Finally, the Mission Bay Plan hopes to develop its own distinct character that distinguishes it from other neighborhoods yet possessing the same high quality as other neighborhoods in San Francisco.

Concept for the Network of Streets
The network of streets in the Mission Bay Plan consists of a hierarchy of streets that range from arterials to residential streets. The streets function as a links between Mission Bay and the surrounding neighborhoods to the North, West and South. For instance, King Street will connect Mission Bay to other waterfront areas North of the site and consequently be developed as part of the Embarcadero Parkway.
In the Mission Bay Plan, streets are also designed to serve as view corridors to the water with every street leading to either to China Basin Channel or San Francisco Bay. Along the Northwest edge of the site, the street pattern South of Market will extend to China Basin. The continuation of this street pattern is appropriate since this area will predominantly house large blocks of office space with only some residential uses. (Fig 3.6)

On the other hand, the site South of China Basin consists of a finer grid in order to form smaller residential blocks while still maintaining a similar orientation. On the Southern portion of the site, the streets are different from the North as they follow existing street patterns of the adjacent Potrero Hill neighborhood instead. Although the orientation of streets changes, the juxtaposition of the two grids is reconciled at Crescent Park where the streets eventually become parallel to the waterfront.

Fig. 3.6: Network of streets

Fig 3.7: System of open spaces
Concept for the System of Open Spaces

The system of open spaces in the Mission Bay Plan provides the organizing framework for the site that connects with city wide open spaces and waterfront parks. In general, the open spaces along China Basin Channel and San Francisco Bay have been designed to facilitate public access along the waterfront for residents and regional users. Being located along the perimeter of the Mission Bay neighborhood, these waterfront parks provide recreational facilities without compromising the serenity and privacy of the residential neighborhood. Within the residential neighborhood, smaller parks such as Crescent Park provide residents with more intimate open spaces.

Throughout the site, parks and open spaces are distributed such that they occur at least once along each street and within 450 ft walking distance from residential areas to encourage frequent usage and promote accessibility to residents.4

Program of Uses

The Mission Bay Plan covers 315 acres and comprises of 56 blocks. Its development program provides for 8,000 new housing units, 4.8 million s.f. of office space, 900,000 sf of light industrial and commercial space, and a 500 room hotel. In addition, it creates 70 acres of public open space and 14 acres of community services such as recreation and cultural centers, schools, fire and police stations. It is anticipated that 16,000 people will be living in Mission Bay on completion of the residential development, with 14,500 residents being housed South of China Basin.

In order that new developments in Mission Bay are compatible with the surrounding uses and urban context, the massing, design and land uses for Mission Bay will respond to the existing uses in each adjacent neighborhood. For instance, the buildings along Townsend Street will echo the building types South of Market whereas the buildings on the Southern edge of the site along Mariposa Street will be more residential in nature.

Building Densities and Heights

The Mission Bay Plan intends to create a neighborhood similar in quality and detail to older San Francisco neighborhoods and therefore draws upon the characteristics of building types found in San Francisco. For example, new residential row houses are required to be three to four stories with bay windows and front stairs, and each row house individually designed to achieve diversity.

Building heights throughout the site are restricted and regulated according to use. North of the Channel, the offices and residential buildings have to meet a 110 ft height limit
while the light-industrial buildings between I-280 and Owens Street may only reach a maximum of 85 ft. Building heights for the rest of the neighborhood is 55 ft with buildings adjacent to open spaces being lower in height or stepping back so as to maximize views to open spaces. Building heights will also be reduced with proximity to the Bay. In principle, although the Plan encourages some variation in building heights, it prevents and discourages any dominating new construction.

**Historic Preservation**
To recall the history of Mission Bay, Long Bridge Street will be developed into a major shopping street with emphasis on pedestrian oriented activities. Long Bridge, which no longer exists was built in the 1860's as a transportation link to downtown San Francisco for streetcars, railway vehicles and pedestrians. It later became a major recreation site before the Mission Bay land fill was completed. Also, the Third and Fourth Street Bridges will be preserved as historic landmarks since together they form the gateway to Mission Bay.
c) DESIGN GUIDELINES AND ANALYSIS

Given the extensive set of design guidelines in the 'Mission Bay Plan for Adoption', a few guidelines have been selected and summarized. These form the basis for analyzing the success of design guidelines in achieving the objectives of the Mission Bay Plan.

Block Sizes and Parceling of Land

- A hierarchy of streets will be developed ranging from arterial streets with 150 ft to 158 ft right of way to typical residential streets with 58 ft right of way. (Fig 3.8 and Fig 3.9)
- These streets create block frontages which range from 250 ft to 850 ft, therefore larger blocks subdivided by creating mid-block lanes will increase the possibilities for additional building frontages, mini residential parks and the provision of on street parking spaces.
- The effective use of streets and mid-block lanes will subdivide the site into 56 development parcels of various sizes.
- The typical block size will be 385 ft by 285 ft which will accommodate a variation of building arrangements and the creation of mid-block parks of different sizes.

Fig 3.8: Major street: Third street with 100 ft right of way
Analysis

Although the entire site is held by Catellus Development Corporation, 56 individual development parcels have been created in Mission Bay to allow the possibility of other developers participating. By keeping each parcel small, large-scale developments that occupy the entire street block will be avoided. (Fig 3.10)
In order to prevent monotonous and continuous block-like buildings, a different architect is required to design each parcel. This breaks down the design into an even finer grain, providing diversity and variety to the development. As a result, the developer and the public will benefit from the value created by good design and a strong neighborhood character. Furthermore, should the design of these buildings be unsuccessful, these mistakes will be smaller and therefore more tolerable. In the end, because of the fine grain created, even developments of poor quality will not take away from the overall character of the neighborhood.\

**Open Spaces and Parks**

- Open spaces in Mission Bay vary in character and in use. At the heart of the neighborhood is Cresent Park, a formal open space that is linked to the less formal open spaces at the periphery of the site. (Fig 3.11)
- Cresent Park is located at the focal point of the entire site and this 2.5 acre park serves as a symbolic center of the neighborhood. (Fig 3.12)
- Cresent Park will be an unstructured open space of mostly turf and a water element at the center which emphasizes the powerful form of the park.
- The water element will consist of a pool with a sitting wall that becomes incorporated into the terrace of an outdoor amphitheater. The amphitheater will have steps that vary in height and size to accommodate a variety of seating.
- Radiating from this park will be landscaped axes that physically and visually link pedestrians to major waterfront parks such as Mission Bay Green and China Basin Channel. Mission Bay Green will be the largest open space on the site. It consists of 12.4 acres of open space running 3,000 linear ft. parallel to the San Francisco Bay.
- Facilities and planned activities will be provided such as playing fields for softball and soccer with future provisions for basketball, volleyball and tennis courts. The Northern tip of Mission Bay Green will terminate into a tidal wetland.
- Other smaller and semi-private neighborhood parks and mid-block parks will be developed throughout the site. They will cater mostly for residents and located within 450' walking distance from all residential areas. Also, these neighborhood parks will occur at least once along every residential street.
Fig 3.11: System of open spaces

Fig 3.12: Crescent Park and Mission Bay Green
**Analysis**

The Mission Bay Plan has been successful in creating a variety of parks and open spaces within the neighborhood. Mission Bay Green forms a natural and informal waterfront edge and is further enhanced by the provision of the tidal wetlands.

Crescent Park located at the heart of the neighborhood and along a major local shopping street has the potential of being very successful as a collector and destination point. The strong radial axes also form visual and physical connectors to major waterfront parks such as those along China Basin Channel and San Francisco Bay. These clear connectors are essential in completing a network of paths and nodes that lead to important destination points throughout the site.

In the design guidelines for open space provisions, the Mission Bay Plan prides itself in creating more open space than any other San Francisco neighborhood. But in doing so, the problem arises in the level of utility of these planned open spaces.

For example, mid-block parks contained in the interior of each block are intended to provide semi-private open spaces. But these mid-block parks require much maintenance in order to remain in use and also run the risk of being under-utilized since their inappropriate size or lack of sunlight could make these parks poor outdoor spaces. Moreover, these parks have to compete with private yards, roof gardens and other small neighborhood parks and in the end become neglected as left over spaces from development.

**Location of Uses**

- Commercial and retail uses will be concentrated along the major arterials and residential shopping streets.
- Third Street has been designed as a thoroughfare for the site along which retail and commercial activities will support regional users with larger retail facilities and offices on the lower two floors of residential buildings.
- Long Bridge Street located within the heart of the Mission Bay Neighborhood will be developed as the major local retail street for residents.
- Along the major arterials, 2 floors of commercial uses are encouraged with 4 floors of residential uses above. (Fig 3.13)
Analysis

Both Third Street and Long Bridge Street will be developed as major shopping, retail and commercial streets. Although Third Street is intended to be more regional, there is a tendency for these two adjacent streets to compete. This condition is apparent in other cities such as Boston where two parallel shopping streets, Newbury and Boylston Street in the Back Bay have been created. As a result, the smaller scale Newbury Street receives far more pedestrian traffic than the more regionally oriented Boylston Street with larger scale developments.

This is because the small scale local shopping streets tend to have a more openings to the street and a better relationship to street activities. Also, smaller individual rows of shops create a more stimulating environment for pedestrians and shoppers than large stores with long frontages that only have a few openings.

Parking

- Access to parking should be via mid-block lanes or secondary streets. Major streets such as King Street will have no curb cuts except to allow for the mid-block passageways. This is to ensure safe and continuous sidewalks. (Fig 3.14)

- Parking structures should not be located at street corners and should have minimal street frontage.
• The design of parking structures should respond to the materials and openings of adjacent buildings. Horizontal banding should be avoided.
• All freight handling in the office district will be conducted within the building.

**Analysis**

By having access to parking via secondary streets and preventing parking structures from having frontage on major streets, design guidelines ensure that street frontages are reserved for commercial and residential uses that enhance the streetscape. Also, by requiring parking structures to be constructed with similar materials of adjacent buildings and by discouraging horizontal banding, parking structures will blend into the design of adjacent buildings and respect the scale and character of the neighborhood.

**Pedestrian Access**

• In order to encourage pedestrian travel, a network of sidewalks, mid-block lanes, jogging trails and open space corridors have been developed for Mission Bay.
• Public open spaces and neighborhood parks will be designed exclusively for pedestrian use with provisions for the physically challenged.
• All pedestrian routes will be designed to make future connections to the surrounding neighborhoods.
• In residential areas, typical sidewalks will be 10' including a 3' setback zone. (Fig 3.15)

Fig 3.15: Typical sidewalks 10' wide with 3' setback zones

• Landscaped jogging paths of 28' wide and parallel to sidewalks will form a 2 mile route around the neighborhood and connect with public open spaces.
Pedestrian paths will also link with gathering places and all open spaces as well as provide direct access from residential areas to the MUNI Metro transit stations.

- As far as possible, pedestrian walkways will be buffered from auto and transit traffic.
- There will be special paving at all major pedestrian crossings.
- Street lighting will be designed to respond to the spacing of street trees and be incorporated with paving design.

**Analysis**

The typical 10 ft wide sidewalk with an additional 3 ft setback zone is consistent throughout the neighborhood. The rationale for these narrow sidewalks is that the maximum building height in Mission Bay is only 8 stories and therefore the corresponding sidewalks need not be any wider to create a comfortable street scale.

Although these 13’ sidewalks may be functional, some variation in width can be afforded along major regional shopping streets such as Third Street since the volume of pedestrian traffic along these streets can be anticipated to be greater than along residential streets. Also, the wider sidewalks will facilitate pedestrians stopping to browse along retail streets.

Therefore, a hierarchy of sidewalks should be developed in Mission Bay in response to the hierarchy of streets and closely related to the level of activity anticipated along retail streets instead of having only one standard width of sidewalks throughout the site.

Furthermore, the design guidelines have not been specific about how the pedestrian walkways will be buffered from traffic. Street sections provided have not indicated extensive landscaping or screening of pedestrian paths from traffic along arterial streets. In fact, the single row of trees applied along all sidewalks is repeated over the site without being reinforced along major streets to act as buffers.

**Building Heights/Streetwalls**

- The design guidelines call for a variety of building heights between 55 ft and 110 ft but do not permit parking structures to exceed 55 ft.
The maximum height for office buildings is 110 ft and restricted to 8 stories. Commercial buildings are limited to 6 stories.

Taller buildings are encouraged at the corner of blocks to mark street intersections. (Fig 3.16)

Heights of buildings next to open spaces such as Mission Bay Green and the Southern edge of China Basin are permitted to be only 3 stories and required to be uniform in architectural style.

Similar to the San Francisco urban fabric, offices and commercial buildings will have no front or side setbacks.

Building setbacks are not allowed at the corners. Setbacks greater than 30 ft will be required to maintain the street frontage with architectural or landscaping elements. Entry recesses should not distract the continuation of the street wall.

Frequent openings to the street are encouraged with entrances that are monumental and greater than one story.

Analysis
The intent in Mission Bay is to create a continuous street edge by maintaining the streetwall, but setbacks are allowed as long as the continuation of the streetwall is maintained by other means. This allows for greater diversity along the street edge while still respecting the continuity of the streetwall.

In general, the entire Mission Bay plan calls for a medium to low-rise development. Although the guidelines encourage taller buildings at the corners of blocks, most of the site will consist of four story buildings with the exception of eight story office buildings and six story commercial developments. The resulting effect especially when viewed from the water could be a uniform neighborhood with no 'delightful surprises'.
In an interview with John Kriken, he mentioned as part of the shortcomings of the guidelines that the project should have more height variation especially at strategic corners and when buildings front open spaces. Unfortunately, the guidelines have not made this adventurous step in creating more variation in heights especially in places where taller buildings could provide contrast to the lower buildings and act as landmarks at special locations on the site.

Lastly, the design guidelines also recommend that housing along the water’s edge should reflect its unique location and be different from nearby housing without waterfront frontage. But these guidelines do not specify how this may be achieved. Certainly the guidelines do not intend these buildings to be differentiated by increased heights. By not having design guidelines to suggest how these buildings should respond differently to the water’s edge and by leaving the design to the discretion of the architect, the Mission Bay Plan may be letting go of the reins at the wrong time and may be running the risk of these buildings being similar to the rest of the neighborhood.

**Architectural Design**

- Mid-rise residential buildings will be required to be less than 100 ft wide or be subdivided into modules of 100 ft or less. This is to ensure that these 4 to 8 story buildings will not create a monotonous street wall but instead seem like a row of smaller buildings.
- Low-rise, 3 to 4 story residential buildings will recall row houses of old San Francisco neighborhoods by accenting a 25 ft wide module.
- Buildings facades should be inviting by having more glass to wall surface along the street and should be open to provide transparency between the street and building activities within. But extensive use of glass curtain wall is discouraged.
- In general, buildings are required to have articulated bases and formal organizing elements such as a hierarchy of opening sizes.
- In order to break down building bulk, changes in building articulations are encouraged such as changes in cornice heights, roof forms, color, materials and building heights. (Fig 3.17)
- One-level overhead bridges will be permitted to connect buildings that are separated by a mid-
block passageway. These bridges should be a maximum of 15 ft wide and provide minimum clearance of 36 ft. Bridges can be opened or closed but should be located to minimize its visual impact.

• Signages should be restricted to the first two stories of buildings and building identification should be incorporated into the building design and entrances.

Analysis
Requiring low-rise buildings to emphasize the 25 ft module and mid-rise buildings to express modules of 100 ft or less can be efficient tools in breaking down the scale of the street by decreasing the width to height ratio of buildings. The vertical expression of these modules also create interest and rhythm along the street. These methods used to reduce monotony can be coupled successfully with the creation of multiple openings onto the street and ground level transparency. Together they can ensure that there will be a certain degree of liveliness along the street that engages pedestrians even along longer building frontages.

By permitting overhead bridges to link buildings on the second floor, the design guidelines should also indicate that these connections must not be further developed as alternative internal circulation routes to sidewalk pedestrian access. This is to avoid the beginnings of a totally internalized circulation system that has diluted street activities in so many modern cities.

Fig 3.17: Building articulation and variation
d) LESSONS FROM THE MISSION BAY CASE STUDY

1) The Planning Process

Citizen participation in the planning process for the Mission Bay Plan is an illustration of how the public and the City can be involved in the planning, programming and development of large tracts of predominantly privately owned land. Citizen involvement is an essential element in the planning process for the Mission Bay Plan since the proposal for development required citizen support before it could gain approval from the City.

The task of including the public in the planning process has been vigorous and lengthy but its achievements in realizing a consensus and an approved master plan should be commended. Citizen involvement contributed to the formulation of the master plan, design guidelines, program of land-use, quality of open spaces, character of neighborhood and provision of services on the site. (Fig 3.18)
In total, more than 100 public meetings, 150 informational meetings and 20 hearings were held to review the master plan. Even workshops and design charrettes were organized to facilitate this process over a period of five years until the plan was approved in 1990.8 The support of both citizens and the City also ensures that the master plan will achieve long-term stability crucial to a project of this magnitude and time frame.

2) Design guidelines as Policy
Transforming design guidelines into policy by incorporating the Mission Bay Plan as a specific plan9 is important and necessary in a project the size of Mission Bay since stability of the master plan over time and adherence to the established guidelines are both crucial to the success of the development. By making the design guidelines part of the planning code, citizens are assured that their initial efforts in creating an acceptable development proposal for Mission Bay will not be lost by the developer attempting to make changes to suit their own agenda several years down the line when public interest in the project has cooled down or when there is less resistance against the project.

Furthermore, one developer for the entire 300 acre site can have much greater bargaining power than smaller individual developers for the same site. The single developer can bargain for concessions from the City over time, this is specially true if members of the planning committee and the design review staff change over the years. In fact, trouble begins when there is little continuity in development agreements and when the developer is not bound to past obligations to the City and the design guidelines.

Although transforming design guidelines into City Planning Codes assures the permanence of these rules, there are disadvantages to consider. Design guidelines that have been made into policy are less flexible to changes and improvements should the City and the developer discover that these guidelines are no longer relevant or appropriate or that new needs have emerged or that hindsight gained from the first phase of construction provides new information which could be incorporated into the design of Mission Bay.

3) Small Parcels and Mid-block Lanes
Critical to the success of creating a diverse neighborhood and achieving the level of variety desired is the parceling of land into smaller lots and the creation of mid-block lanes. Especially in Mission Bay where there is only one developer, the parceling of land into 56 individual parcels and the creation of mid-block lanes assure that large-scale developments which could occupy the entire block or more than one block will be avoided. Also, by requiring that each
parcel be developed by a different architect, a variation in design solutions can be achieved which adds diversity within the neighborhood and enhances the sense of each building being designed individually.

4) The Radial vs the Linear Approach to Site Design
The use of focal points, network of streets and system of open spaces are some urban design tools commonly used to provide an organizational framework for the site. These have been combined in different ways in various cities to achieve cohesiveness, order and meaning in the urban pattern.

In Mission Bay a radial approach to site design is taken because the nature of the site is as long as it is wide and is therefore best suited to a radial site arrangement.

The site is thought of as one cohesive neighborhood strengthened by the idea of creating one major focal point at the heart of the neighborhood. Crescent Park has been design for this purpose and acts as a gathering space as well as a node from which activities are dispersed radially to the natural edges of the waterfront.

The lesson to note from the Mission Bay Plan is that the urban design principles employed to establish an organizational framework must respond to and be derived from the objectives, intentions and concept for the site as well as its physical characteristics. (Fig 3.19)

Fig 3.19: A radial approach to site design

5) Building Heights
Building heights in Mission Bay stress on enhancing site unity and contributing to the overall cohesiveness of the neighborhood. It does not focus on creating a dramatic skyline or series of landmarks that indicate special points on the site. Thus, it can be criticized as lacking diversity and
height variation and creating an altogether bland neighborhood.

Though taller buildings are encouraged at corners to indicate the intersection of streets, strategic locations such as at Crescent Park have been excluded and instead required to be uniform in height. (Fig 3.20)

Though Mission Bay is intended to be a low-rise development, the point still remains that vertical elements and variation in building heights can become important symbolic features on the site and therefore should be pursued aggressively. The role of landmarks should not be underestimated nor should their use be avoided for fear of creating dominating structures. (Fig 3.21 and Fig 3.22)

6) The Pedestrian Environment

In Mission Bay, specially designed pedestrian paths to the waterfront in the form of landscaped corridors can be quite successful since it provides pedestrians with visual and clear physical connections to their destinations. But elsewhere in the site, the sidewalks are only 13 ft wide regardless whether they are along residential or retail streets. Because the sidewalks in Mission Bay lack differentiation in response to ground level uses and also lack a hierarchy relating to the hierarchy of streets, sidewalks have not been fully explored as opportunities to create variety in the streetscape. Sidewalks with greater widths, increased landscaping and even street furniture can be introduced along retail streets to support pedestrian activity and provide a greater separation and a buffer from heavy auto traffic.

Fig 3.20: Uniform building heights around Crescent Park
7) Creating a Natural Edge

The emphasis on a natural water's edge is the basis for the design of open spaces along the Mission Bay waterfront. Instead of creating a hard edge esplanade, the Mission Bay Plan has chosen to create a soft edge and even goes so far as to create tidal wetlands at the Northern part of Mission Bay Green. This approach to the waterfront is unique in such an urban setting and though many urban waterfronts such as Baltimore Inner Harbor and Toronto's Harbourplace all possess hard edges, the natural waterfront offers many advantages. It allows large unobstructed open spaces that vary in width for greater flexibility of passive and active uses. These waterfront parks can also accommodate planned activities that cater to a greater cross section of the population. Also, the contrast with its urban setting creates a refuge from the hustle and bustle of the city and invites the public to engage in the waterfront. Opposed to a waterfront esplanade, the natural waterfront edge operates more as a destination point and activity area than a promenade for pedestrian circulation.

Most importantly, the informal waterfront allows individuals to just enjoy the outdoors as a place to be alone to contemplate or as a gathering place for more social activities. It is this range of choices that makes the natural waterfront so attractive as a place and as an asset to the city.

Fig 3.19: A uniform neighborhood when viewed from the water

Fig 3.20: A predominantly low-rise development without vertical landmarks
1 Department of City Planning, *Mission Bay Plan Proposal for Adoption*, Department of City Planning, City and County of San Francisco, January 1990.

2 Department of City Planning, *City Planning Code Article 9: Mission Bay*, Department of City Planning, City and County of San Francisco, September, 1990.

3 Department of City Planning, *Mission Bay Plan Proposal for Adoption*, Department of City Planning, City and County of San Francisco, January 1990.

4 Interview with John Kriken

5 Department of City Planning, *Mission Bay Plan Proposal for Adoption*, Department of City Planning, City and County of San Francisco, January 1990.

6 Interview with John Kriken.


8 Interview with Daj Oberg

9 Department of City Planning, *Mission Bay Specific Plan, Chapter 4: Implementation*, Department of City Planning, City and County of San Francisco, September, 1990.
CASE STUDY: THE BATTERY PARK CITY PLAN, New York

a) SITE AND PROJECT DESCRIPTION

Location
Battery Park City is located close to the tip of Manhattan along the banks of the Hudson River. It consists of 92 acres of landfill stretching north to south from Chambers Street to Pier A and Battery Park. (Fig 3.25)

Physical description, connections
Surrounding Battery Park City is the Tribeca District, the World Trade Center, the Wall Street financial district and finally Battery Park at the southern tip of Manhattan.

Battery Park City easily accessible by major subway lines, bus routes, the PATH tubes from New Jersey and the Staten Island Ferry and is physically connected to the World Trade Center by two elevated pedestrian bridges.

Historic Use
Historically, Lower Manhattan was the center of trade and commerce and the banks of the Hudson River was a bustling seaport. But by the 1960's, much of the port activity had dwindled and relocated to newer facilities. Also, many businesses in Manhattan moved to the Midtown area. As a
consequence, piers along the Hudson River became underutilized and were left to deteriorate.¹

The creation of Battery Park City was thus conceived in the late 60's as a plan to revitalize the financial district, bring people back to the waterfront and provide much needed housing in Lower Manhattan.

Therefore, landfill along the Hudson River in Lower Manhattan began using rock and earth from the adjacent World Trade Center construction site. Finally, the completed landfill became the site for Battery Park City.

**The Development Agreement**

In 1968, the Battery Park City Authority (BPCA) was created by the State legislature to manage and develop Battery Park City. The BPCA controls the site and is responsible for financing as well as designing the streets, parks and utilities on the site. Planned development on the site such as offices and apartments is initiated by private developers who lease the land from the BPCA.²

The significance of Battery Park City as a case study is the method in which development is implemented. A set of design guidelines have been created which ensure that the objectives and the intent of the 1979 master plan are being met. These guidelines also set standards that meet the memorandum of understanding between the City and the State as well as the large scale development approval granted...
by the City after a Uniform Land Use Review Process (ULURP)

For each site, developers are subjected through a request for proposal. Developers then submit a financial proposal to the Battery Park City Authority including a program of uses.

After financial terms have been established with successful bidders, the Battery Park City Authority must certify the approval of the developer's choice of architects and engineers. Following the signing of leases, the Battery Park City Authority reviews the developer's plans and specifications through a phased review process. The design review process involves the Battery Park City Authority and consultants to certify that the development is in accordance with the design guidelines.

On receipt of the Authority's written approval of contract documents, the developer must then obtain all other approvals from City agencies and the Building Department prior to construction. However, the right to build within the guidelines has to be approved in advance through the large scale development approval process.

From then on, all changes must be certified by the Battery Park City Authority and bi-monthly progress reports must be submitted by the architect during construction. Also, all through construction, the Battery Park City Authority will perform site visits to verify that construction is being carried out as approved.
b) CONCEPTS AND OBJECTIVES

The Battery Park City master plan and design guidelines were prepared for the Battery Park City Authority by Alexander Cooper and Stan Eckstut. These guidelines contain regulations and planning standards for the development of Battery Park City.

Program of Uses

The Battery Park City Plan consists of several physical parts which will be developed in phases, with each adhering to their separate and distinct set of design objectives and guidelines.

The focus of Battery Park City Plan is the World Financial Center, a commercial centerpiece development around the North Cove. It comprises of four office towers of heights varying from 33 to 51 stories, two nine story gateway buildings, and a 18,500 sf Winter Garden centered around a 3.5 acre plaza around North Cove. In total this complex will add 6 million sf of commercial and office space to Lower Manhattan along with 150,000 sf of retail space.4

The rest of the Battery Park City site is dedicated to residential development and the provision of neighborhood parks and public open spaces. Almost 30% of the total area will be developed as public open space and 42% allocated for residential uses. The residential density for the entire site ranges from F.A.R.9 to F.A.R.12

Directly north of the World Financial Center is the North Residential Area. This is an 8 block area on which 3,300 to 4,000 dwelling units have been planned. South of the World Financial Center is the 9 acre Rector Place Residential Area (Phase II) which has already been completed. This neighborhood is developed around Rector Park and provides 2,300 dwelling units in a total of 12 buildings parcels.

Lastly, located at the southern tip of the site is the 12 acre Battery Place Residential Neighborhood consisting of 9 residential blocks. This development will add 3,500 dwelling units to the total development. (Fig 3.26)

Network of Streets

By extending the existing grid of Lower Manhattan onto the site, the network of streets will provide a framework for development in which orientation and continuation of the surrounding urban pattern is maintained to enhance a smooth transition between the site and the rest of the city.

The hierarchy of streets begins with the north-south avenues being the principal streets as well as the focus of commercial
and pedestrian activity. Next, the secondary east-west streets will provide access to buildings, parking and service areas and will lead to the waterfront. These secondary streets will be landscaped and developed as special places when they terminate at the waterfront with some streets designed as loops and one-way streets to prevent through traffic from penetrating into quieter residential areas. Lastly, private service streets will mainly carry residential traffic and provide access to interior parcels.

Adopting the Lower Manhattan grid will create average block sizes of 200 ft by 400 ft which is similar to the traditional New York blocks established in 1811. This block size has in the past proven to enable both smaller individual buildings as well as large developments to occupy the entire block. This block size also allows greater flexibility in parceling sites and invites the participation of both small and large developers. (Fig 3.27)

**System of Open spaces**

In the 1979 master plan, public spaces have been conceived as the key elements of the site, while the buildings are intended to be the background. These open spaces will be linked by a continuous esplanade which will be an extension of the existing Battery Park at the tip of Manhattan. When completed, this two-tiered linear esplanade along the edge of the Hudson River will be more than a mile long and offer unimpeded harbor views. In addition, neighborhood parks such as Rector Park and North Park will be integrated with the esplanade to provide open spaces for residents within walking distance of their homes. (Fig 3.28)
**Public Access**

By concentrating commercial activity in one location, the master plan attempts to consolidate pedestrian and auto traffic. Most pedestrian activity will be at-grade except in the World Financial Center and at locations where crossing West Street is difficult. In the World Financial Center, pedestrian traffic is expected to be great especially at peak hours. Thus, an elevated pedestrian system 32 ft above grade enables pedestrians to move directly from the lobbies of all commercial buildings to the adjacent World Trade Center with access to public transportation links. Since 92% of all work trips are expected to be made by public transportation, the linking of the World Financial Center to the World Trade Center via elevated pedestrian bridges enable easy access to the subway system and the PATH.5

These elevated pedestrian walkways have been integrated with outdoor circulation patterns such that pedestrians can reach the waterfront esplanade without crossing any streets. In order that sidewalks remain continuous for the comfort and safety of pedestrians, curb cuts are not permitted on the major north-south avenues and Rector Place. Instead, vehicular access to parking as well as service areas will be via side streets with accessory parking to be screened, enclosed and set back from the streets and parks. (Fig 3.29, 3.30)

Fig 3.29: Left: Pedestrian Circulation
Fig 3.30: Right: Vehicular Circulation
Density and Building Heights
Streetwall buildings are required in Battery Park City. This building type has been the time-tested tradition of defining the street edge in New York neighborhoods. Typically, the streetwalls on the west side of the Avenues will be kept lower than the east side so as allow maximum solar penetration to the streets.

In terms of building bulk, towers are set back from the street line as well as concentrated in specific locations to emphasize destination points on the site, minimize shadows on open space and prevent obstruction of waterfront views.

c) DESIGN GUIDELINES AND ANALYSIS

Purpose of the Design Guidelines
The design guidelines in Battery Park City pertain to the hierarchy of streets, treatment and location of open spaces, allocation of uses and building entrances, maintenance of a street wall, placement of towers and the design of architectural elements such as arcades.

In order to establish the design guidelines for Battery Park City, a study of carefully selected residential neighborhoods in Manhattan was performed to identify the qualities and architectural characteristics that make these neighborhoods successful. Some of these characteristics were then incorporated into the Battery Park City design guidelines in order to create a new neighborhood that expresses the same degree of quality as the older New York neighborhoods.

For example, in keeping to the traditional style of New York buildings, new buildings in Battery Park City are required to have a top, middle and base so as to reinforce a sense of cohesiveness by expressing the same architectural vocabulary. Also, buildings are required to have a stone base of 1 to 3 stories high especially on front property walls. In order to achieve greater variety, upper floors are encouraged to have recesses, setbacks, balconies and bulk heads.
although they should not be obvious except when viewed from the water to form a varied skyline.

Design Guidelines are an important tool in the development of Battery Park City, they serve to protect the investment of each developer by ensuring that future development on adjacent parcels will be subjected to similar controls and regulations.

Unlike the design guidelines for Mission Bay San Francisco, each of the three residential neighborhoods in Battery Park City have their own unique set of guidelines that respond to specific physical characteristics of each site. In this section, a handful of design guidelines have been selected and summarized from the Battery Place Residential Area, Rector Place and the North Residential Neighborhood. These will provide the basis for analysis.

Also, to analyze the success of the design guidelines at achieving their goal, portions of the site that has already been constructed and occupied such as Rector Place Residential Area (Phase II) will be useful as references by which predictions can be made about the success or failure of the design guidelines for the other unbuilt areas of the site.

System of Open Spaces
- The esplanade will remain the most important open space and will consist of two levels. The upper level consisting of stopping points with benches and shade trees and the lower level providing a continuous walkway along the water's edge. (Fig 3.31)

Fig 3.31: The Waterfront Esplanade with two levels of activity

- Developed as part of this neighborhood is North Park which will be the largest open space in Battery Park City serving both residents and the community at large.
• The other major open space is the North Avenue Median Park, a linear 50’ wide median strip similar to park Avenue in New York or Commonwealth Avenue in Boston. The intent is to provide a protected open space within the North Residential Neighborhood different from the waterfront North Park.

• Rector Park will be the major open space in the Rector Place Neighborhood. The character of this park will be intimate and meditative mainly for local residents.

• Other open spaces will be overlook parks where the side streets terminate at the esplanade. These street end parks will be elevated 3' above the esplanade and designed as gathering places for passive recreational use.

Analysis
The esplanade provides a great walking experience. Having two levels creates gathering points and quieter seating areas on the upper level which overlooks the flow of pedestrian movement below. The consistent use of materials give the esplanade a sense of unity, continuity and level of quality that leads one to expect the same in all open spaces at Battery Park City.

The development of a median strip as an open space and an organizing element is special to the North Residential Neighborhood. Although these median strips create an internal neighborhood focus like Rector Park and eventually lead to the water’s edge at North Cove, these median strips are interrupted by side streets that run across them making each strip only a block long.

The advantage of the median parks is that they add to the street dimension and set the buildings on either side of the street 140 ft apart, creating the sense of a grand boulevard.

Rector Park in the Rector Place Residential Neighborhood is a comfortable, well protected and intimate neighborhood park that is well used by residents of all ages. Its location, size and especially its low fence enclosure reinforces the feeling of being a semi-private space. (Fig 3.32)

Other features that have also been successful are the street end parks. Being slightly raised above the esplanade, they provide views to the River and the skyline of Lower Manhattan in the background. Located at the end of streets and the beginning of the esplanade, they are excellent transition zones between the public esplanade and the more private residential neighborhood. Also, the public art and areas for passive activity in these street end parks provide the
necessary magnet that draws people within the neighborhood to the waterfront.

The only design guidelines for these street end parks are that they should be elevated 3 ft above the esplanade and accessible to the physically challenged via ramps. These spaces are otherwise not subjected to any regulations and left to the discretion of the designer. Yet, these street end parks prove that with much creativity, they can become successful, well designed and frequently used open spaces.

Network of Streets/Sidewalks

- The hierarchy of streets consists of avenues and service streets. North-south avenues will be the major thoroughfare through the site and will vary from right of way of 85 ft to 100 ft.
- Major north-south avenues will have 13 ft sidewalks on the west and 27 ft sidewalks on the east.
- Arcades on the west side will provide shelter while the sidewalks will be planted with a single row of trees. (Fig 3.33)
- On the east side of the avenue, the sidewalks are 27 ft wide and provide generous space for pedestrian circulation and a double row of trees.
- In the North Residential Neighborhood, the north-south avenue will have a right of way of 140 ft consisting of two 30 ft streets separated by a 50 ft median strip and 15 ft sidewalks on either side.
- Since the streetwalls and height limits on both sides of North End Avenue will be similar, the sidewalks on both sides of the street will respond to the building heights by having the same 15 ft width and planted with a single row of trees. (Fig 3.34)
Arcades are not required except at strategic locations where the median strips for the North Residential Neighborhood ends.

Fig 3.33: Major north-south Avenues with 13' sidewalks on the west and 27' sidewalks on the east

Fig 3.34: North Residential Neighborhood width 50' median strip and 15' sidewalks on either side
Analysis
Although the size of the major north-south avenues in Battery Park City varies with location, the treatment of the sidewalks, landscaping and the provision of arcades are similar. Thus, as a whole, the different neighborhoods will project a consistent image and quality of experience that binds these neighborhoods together and provides a sense of continuation and unity.

The width of streets and sidewalks in the North Residential Neighborhood differs from the other neighborhoods where sidewalks on either side of the major north-south avenues vary in width. This is because in the North Residential Neighborhood, the sidewalks have been designed to respond to the respective building heights along its length. In other neighborhoods, the building heights on the east side are typically higher than on the west and therefore have sidewalks that are wider on the east side.

The relationship between building heights and sidewalk widths illustrate how different design elements can be interconnected with each other and correspond to different site conditions as they occur. By setting up such a relationship, each element will be designed to enhance the overall sense of the neighborhood. This is an important characteristic of the design guidelines in the Battery Park City Plan and it is this level of detail and care in the formulation of the design guidelines that have made them successful at achieving the planning concepts.

Location of Uses
• Retail and commercial uses are prohibited along the waterfront side of the site except in selected corners which will be restaurant locations.
• Ground level retail and commercial uses are centered along north-south avenues and enhanced by the provision of arcades on the west side. (Fig 3.35)
• These non-residential uses will terminate 50 ft of Rector Place where ground floor uses become exclusively residential.
• Professional offices will be located on the east side of major avenues. (Fig 3.35)

Analysis
In many waterfront developments such as in Boston, there is concern about the privatization of the waterfront by residential uses. Oftentimes, although public access is provided along the water's edge, it is uninviting to the general public. The Battery Park City master plan attempts to strike a balance between private residential developments and
the public waterfront by creating a transition zone between private uses and public access.

Along the esplanade, these transition zones come in the form of required 10 ft landscape easements between buildings and the esplanade. Also, a property wall is required to define the edge where the easement meets the esplanade. The purpose of the property wall is two-fold. It creates a semi-private area for residents and separates them from public uses. Also, it prevents the feeling of 'encroachment' of private developments on public space.

By prohibiting retail and building lobbies along the water's edge, the sense of privatization of the waterfront is eliminated. The creation of a solid one story high wall and a landscaped easement along the edge of residential buildings that front the esplanade also reinforces the public nature of the esplanade.

But in the North Residential Neighborhood, lobbies and building entrances are allowed to face the waterfront since these buildings are physically separated from the water's edge by North Park and by auto traffic along River Terrace which prevents residential developments from seeming to claim the waterfront as exclusively their own.9

Fig 3.35: Preferred ground floor uses
In Battery Park City, professional offices are encouraged on the east side of the street fronting wider sidewalks but these offices do not generate as much traffic as the retail and commercial uses on the arcaded west side. Thus, there seems to be a mismatch between the anticipated volume of pedestrian traffic and the corresponding width of the sidewalk.

**Location of Building Entrances**

- In the Rector Place Neighborhood, lobbies will be located away from major auto routes and concentrated around Rector Place and side streets. (Fig 3.36)
- Along the major north-south avenue, building entrances are recommended on both sides of the street to enliven the street by creating pedestrian activity along these streets.
- On the west side, lobby locations will be centered at mid-block and designed to work with the series of arcades.
- On the east side, lobby locations are preferred at the corner of the blocks to ensure visibility and pedestrian activity.

Fig 3.36: Rector Place Neighborhood. Location of Entrances

**Analysis**

Rector Place is unique in that it requires concentration of building entrances around Rector Park which is not part of the major thoroughfare. Thus, most entrances are taken off the major north-south avenues. The problem which arises is that this creates a separation of pedestrian activity and removes residential pedestrian traffic from the major retail streets where shops may benefit from the liveliness of pedestrian activity.
But the advantages of locating entrances off Rector Place is that there is greater privacy for residents when building entrances are arranged around and over look the neighborhood park.

By integrating building lobbies with retail entrances along the north-south avenues, the sidewalks will become active with more pedestrian traffic than if the lobbies were located along side streets. Thus, retailers and businesses will benefit from the increased pedestrian flow.

Unique to the North Residential Neighborhood is the location of entrances off River terrace which faces the waterfront. Normally, building entrances are prohibited along the waterfront but because the North Residential Neighborhood is separated from the waterfront by North Park and River Terrace, the overall impact of locating entrances facing the water is far less detrimental to the public nature of the waterfront.

**Streetwalls/Building Heights**

- There are a variety of building heights that are required in the guidelines. These range from 40 ft to 52 ft, 60 ft to 85 ft, 110 ft to 135 ft and 150 ft to 250 ft.

- Mid-block parcels in some neighborhoods are required to have low-rise buildings of 40 ft to 52 ft in order to minimize shadows on private yards and public spaces.

- In general, buildings with frontages along the west side of major avenues are required to maintain a 60 ft to 85 ft streetwall as well as a series of arcades. (Fig 3.33)

- On the east side, the street walls are taller and required to be 110 ft to 135 ft in height. (Fig 3.33)

- Along both sides of North End Avenue buildings will have 110 ft to 135 ft streetwalls with no setbacks or recesses allowed below the 110' building height. (Fig 3.34)

- In addition, all towers are also required to emphasize the 110 ft to 135 ft height.

**Analysis**

The North Residential Neighborhood differs from other neighborhoods by the introduction of low-rise 40 ft to 52 ft mid-block buildings. Also, it differs in its treatment of streetwalls. While in other neighborhoods the streetwalls on the east side of north-south avenues are generally higher to form a continuous high spine on one side of the street, the North Residential Neighborhood seeks instead to create a
consistent streetwall on both sides of North End Avenue creating a symmetry with the median strip as the major axis.

**Location of Towers/Massing**

- Placement of towers are designed to create a dramatic skyline and to indicate symbolic locations in each neighborhood. Some towers are designed as gateways to each neighborhood while others function as the termination of the major north-south avenue axis.
- Towers on the east side of Battery Place will increase in height towards the tip of Manhattan to create a dramatic skyline. (Fig 3.37) Heights increase from 250 ft to 400 ft with towers setback at increasing distances from the street in order to maintain a view from each building and reduce impacts at street level which is a criteria for locating towers. (Fig 3.38)
- A 320 ft tower at the southern tip of the site will complete a set of 'gateway' towers while a 400 ft tower to the north will end the northern axis of the Battery Place corridor.
- At the northern end of the site, the tallest tower of 350 ft will be located to "conclude the riverfront skyline of Battery Park City." Also, in the North Residential Neighborhood, towers are located fronting the water.
- In Rector Place, two high-rise towers are planned to form a gateway to express the termination of Rector Place and the beginning of the esplanade.

![Fig 3.37: Section looking east: Towers east side of Battery place will increase in height towards the tip of Manhattan](image)
Analysis

Due to the physical difference between the North Residential Neighborhood and other sites, towers are allowed and encouraged along the waterfront. This is because the buildings in this neighborhood are not directly next to the water's edge as in the case of other neighborhoods. Also, River terrace that runs between North Park and the buildings provides some distance and separation between the water's edge and the towers.

In other neighborhoods, buildings are located in close proximity to the waterfront and are not separated from the waterfront esplanade by a roadway. Therefore towers that front the water are limited to those that have symbolic functions.

For example, towers in Rector Place serve to strengthen the neighborhood identity by creating a gateway to reinforce the focal point at Rector Park. Whereas in Battery Place, a spine of towers line the east side of north-south avenues.

Fig 3.38: Battery Place: Towers setback at increasing distances from the street to maintain views
Architectural Design

- The provision of signage will be minimized and prohibited from projecting out from buildings. Signage for retail uses must be within the arcade and prevented from occurring on the outside face.

- The use of arcades will be restricted to the west side of north-south avenues and will provide access to retail and commercial spaces, create sheltered walkways and unify signage in along the street.

- Arcades are also specified to be of a certain size. They are required to have a minimum depth of 12 ft and clearance of 20 ft. Also, the column spacing must be equal and not less than 17 ft apart. (Fig 3.39)

- The floor of the arcade will be designed as an extension of the concrete sidewalk and have a inside facade with windows to enhance retail activity.

- In addition, no vents or mechanical rooms should be adjacent to the arcades.

- The use of arcades in the North Residential Neighborhood is minimized and are only required at the intersection of Murray Street and North Avenue.

- Guidelines for the arcades in the North Residential Neighborhood are very specific. They require arcades to be divided into 3 equal bays with a minimum of 12 ft depth and 12 ft inside clearance. (Fig 3.40)

Analysis

The use of arcades are required in both Rector Place and Battery Place neighborhoods but this requirement has since been reevaluated since the arcades built in Rector Place have not been too successful along the west sides of the principal north-south avenues.

These arcades create a dark and uninviting atmosphere that takes retail off the street. Moreover retailers also do not like the arcades since it decreases the visibility of their shop fronts especially when signage is required to be within the arcaded space.

Thus since the completion of Rector Place Neighborhood, arcades have been re-worked as an option instead of a mandatory requirement in response to complaints from retailers. This reflects the flexibility of the design guidelines to refinement and fine-tuning. Ideally, design guidelines should be able to adjust and adapt to changes and respond to functional needs as they arise. 10
In the North Residential Neighborhood, the use of arcades is not extensive or required to be continuous. Instead, the function of the arcades are to mark a special point where the 50 ft median strip ends at the southern edge of the neighborhood and where North End Avenue narrows down to an undivided roadway.

Fig 3.39: Arcades on west side of north-south avenues

Fig 3.40: Arcades in the North Residential Neighborhood
d) LESSONS FROM THE BATTERY PARK CITY CASE STUDY

1) Flexibility of Design Guidelines
In terms of adhering to the design guideline requirements, some flexibility is allowed in the form of concessions to developers when the need arises. But there is a fine balance to be achieved. Since the guidelines are intended to provide a level of comfort for all developers, the level of comfort deteriorates as too many variances and concession are made. This may lead to other developers expecting the same and result in the Battery Park City Authority loosing its leverage. Thus, although the guidelines should provide room for change and refinement, the Battery Park City Authority must also be able to hold up to their principles.\textsuperscript{11}

2) Designing without Guidelines
In this case study, it is important to point out that there has also been successes without detailed regulations. The street end parks are examples of creativity and designer discretion in dealing with public open spaces. The design guidelines did not recommend the types of uses, materials or the treatment of these spaces except that these street end parks must be elevated 3 ft above the esplanade. (Fig 3.41)

Fig 3.41: Street end parks elevated 3 ft above esplanade
Even so, these street end parks are well designed and have become frequently used outdoor spaces providing a variety of gathering spaces away from the main pedestrian flow along the esplanade. This being the case, it may be safe to assume that in some instances, good and responsible design need only be prompted and not regulated to produce fine results.

3) Linear Connectors
In the Battery Park City master plan, the only connectors that attempt to tie the entire 92 acre site together are the linear and public elements: the waterfront esplanade, the principal commercial north-south avenues through the site and West Street. Because these linear connectors run along the edges of the site, diligent planning must include ways in which each neighborhood is linked and integrated with these connectors. Rector park and the Street End Parks are successful in this way by providing 'pockets' of open space that attempt to bring the esplanade into the neighborhood.

The problem of connecting with the waterfront and with other neighborhoods arises in the North Residential Neighborhood where the strong organizational piece is the 50 ft landscaped median strip along North End Avenue. First, this median strip runs north-south and is parallel to the waterfront and does not bring the esplanade into the neighborhood. Second, there are hardly any visual links to the waterfront. The only view of the waterfront from this open space is down North End Avenue where it terminates quite a distance away at North Cove.

Third, unlike other neighborhoods, it does not physically connect with the esplanade or even North Park, largest open space in Battery Park City. Finally, the problem of connection is worsened by the location of towers along River Terrace facing the water which presents the danger of creating yet another obstacle to the waterfront.

4) Esplanade as Open Space and Street
In the Battery Park City Plan, instead of a linear park along the waterfront, the esplanade works both as an open space and a major pedestrian route providing an alternative way to get around the site other than using the sidewalks along north-south streets. (Fig 3.42)

The success of the esplanade is due to its proximity to and easy accessibility from the surrounding neighborhoods making it effortless to reach and experience the water's edge.
Fig 3.42: Esplanade as an alternate pedestrian route

But the success of the esplanade as a pedestrian route may draw pedestrian off the major commercial north-south avenues that depend on pedestrian traffic. Thus, there could be a separation between shoppers and people just out for a stroll who will prefer to take the waterfront route.

In the North Residential Neighborhood, residents are separated from the waterfront by the traffic along River Terrace then by North Park. This results in pedestrians having to cross the street to get to the waterfront and therefore limits its use as a major pedestrian route. The waterfront pedestrian routes in North Park are therefore different from the esplanade by being more recreational in intent and acting more as a destination point than an alternate route to reach the other end of the site.

In terms of open spaces, the North and South Cove Plaza, the esplanade as well as the street end parks do not offer weather protection in form of a sheltered area. Because of the requirements for streetwall buildings, the only form of shelter is indoors or within the arcades along the major avenues.

As part of the series of open spaces, sheltered areas can be provided along the esplanade or even incorporated into the design of street end parks. Some seating areas on the upper tier of the esplanade could also be covered by a glazed shelter to allow sunlight to penetrate and yet protect from the rain.
5) Consistency for Cohesiveness
Rector Place Residential Neighborhood has achieved a strong sense of identity due to the consistency of its sidewalks, landscaping, streetwalls and 1 to 3 story stone base. (Fig 3.43) Similarly, the esplanade is successful as a continuous walkway by using compatible paving, street furniture, lighting and landscaping. On the whole, the repeated use of certain types of materials, ways in treating sidewalks and attitudes towards design express an overall sense of unity and degree of quality that Battery Park City is aiming for and has achieved in its completed portions of the site. As a result, the entire development at completion will portray a level of detail and quality that one comes to expect and thus becomes the hallmark of Battery Park City.

6) Neighborhood Identity
The repeated use of streetwall buildings, required building setbacks and the mandatory one to three story stone base all contribute to the strong sense of unity and cohesiveness in Battery Park City.

Nevertheless, some of the architects feel that these guidelines are "regressive and repeat old vices" in building design. The purpose of the design guidelines is to "create a sense of context when none really exists" but somehow Rector
The lack of diversity is not due to the restrictiveness of the design guidelines but perhaps due to the design review process. As part of the Authority's control over development, adjacent or opposite parcels are prevented from being designed by the same architect. In spite of this, some of the developments are very similar in materials and detail. This is because developers still tend to either consult the same architect since they assume that this may speed the design review process or because the design review process has not completely fulfilled its task of upholding the criteria of diversity and variation in building design, materials and details.

An example is Liberty Place, Liberty House and Liberty Terrace at Rector Place. These three buildings were undertaken by the same developer and although a different architect was consulted each time, there is still a repeated use of the same window units, color of brick and level of ornamentation which results in these buildings looking very similar to each other.

7) Private vs Public Spaces
So far, the waterfront esplanade has been very successful in providing pedestrian access to the waterfront and in balancing the need for private open spaces for residential developments along the water's edge. The required property wall works to define the edge of the esplanade as well as forms a separation between private and public uses. (Fig 3.44) The success of the esplanade can also be attributed to its being given priority as a public amenity and as a major element that not only ties the entire site together but extends to the existing Battery Park at the southern tip of Manhattan.

Fig 3.44: Section: Property wall providing separation between public and private uses.

8) Creating a New Skyline
An interesting point to note in the Battery Park City master plan is that the location of towers has been designed to respond to the physical characteristics of the site. The
placement of towers also has a symbolic function to mark the beginning and the end of each residential neighborhood. As a whole, they are intended to create a dramatic skyline in Lower Manhattan.

Although conceptually, this approach may be successful in achieving a sense of identity for each neighborhood, the actual success of the careful placement of towers in expressing Battery Park City as a whole is yet to be seen. The danger of locating towers to express four different neighborhoods in different ways is that the unity of the whole may be lost in the process and the initially well planned placement of towers could result in a chaotic skyline relying only on the strength of the existing World Financial Center to provide the overall identity of Battery Park City.

9) Water-Related Uses
An element that is missing in the design guidelines and concepts for Battery Park City is the development of water-related uses along the waterfront. Initially, the intent was to create "a spine of action on both sides of the Hudson that engages the waterfront". But so far, only a marina for 26 luxury yachts has been created in the North Cove together with ferry services and boating facilities at the northern edge. In an interview with Thomas Kozlowski at the Battery Park City Authority, he felt that there is a potential for developing more water-related uses such as facilities for water-taxis, ferries and even a water shuttle service to the airport.

These water-related uses could be planned to occur around North and South Cove or on axis with the street end parks and Rector Place to reinforce these open spaces and create special places.

1 Battery Park City Authority, Battery Park City Draft Summary Report and 1979 Master Plan, October, 1979.
2 ibid.
3 ibid.
4 Battery Park City Authority, Battery Park City Commercial Center Development Guidelines, October, 1980.
5 ibid.
6 Battery Park City Authority, Battery Place Residential Area Design Guidelines, May, 1985.
7 Battery Park City Authority, South Residential Area Design Guidelines, April 1981.
9 Interview with Tom Kozlowski.
10 ibid.
11 ibid
12 Interview with Tom Kozlowski.
13 ibid.
a) INTRODUCTION TO THE SITE

Location and Description

The area that constitutes Marina City is vast, but can be understood as being segmented by Marina Bay and Kallang Basin. These two bodies of water have created three areas, Marina South, Marina Center and Marina East. Physically, Marina South (243 hectares), the financial district and Marina Center (106 hectares) together form the enclosure for Marina Bay. ¹ (Fig 4.1)

Marina South is a vast landfill area ripe for development and the site that I have chosen is the Northern edge of Marina South which forms the characteristic crescent shaped edge around Marina Bay and bounded by East Coast Parkway, an expressway which provides direct access to the site and which runs East to West across the Island connecting the International Airport to the CBD along its length. Additional access to the site will be provided by the future extension of the Mass Rapid Transit system (MRT) while other means of public transportation have yet to be planned.

The site is situated next to the financial core of the CBD and in close proximity to the civic and cultural heart of the city. Being also near the mouth of the historic Singapore River, the site is therefore at the confluence of a variety of surrounding land uses which creates opportunities while at the same time provides a rich urban context.

Fig 4.1: Site Location Map, Marina Bay Singapore
Fig 4.2: Marina Bay master plan by the URA. Infill of the Bay to create a formal waterfront
b) THE MARINA BAY MASTER PLAN
Since the site I have chosen is subjected to plans for the development of the Marina Bay area, it is important to understand what the Urban Redevelopment Authority (URA) of Singapore has already planned for Marina Bay and the implications of these plans on the selected site. (Fig 4.2)

By reviewing the master plan, I hope to identify aspects of the physical plan that are inconsistent with the concepts inherent in the master plan, address issues that require further definition or rethinking, and propose revisions to the master plan to incorporate ideas that may have been overlooked.

Since the original ideas of the master plan can be desensitized, underemphasized or even lost in the translation from the concepts to the physical plan, I will first examine the Marina Bay master plan to establish what these goals are.

Function of the master plan
The purpose of the Marina Bay master plan is to establish a framework by which the URA can identify development proposals that may be implementable over the next decade (1989 - 1999), and to provide a basis for scheduling future development. The master plan provides proposals which aim at optimizing urban waterfront development and phasing out incompatible uses.²

The urban design principles concerning the physical characteristics, land use and links to the surroundings areas presented in the Marina Bay master plan revolve around the theme of creating a bay for national events and celebrations. In line with this is the creation of public open spaces, water-related recreational activities, retail, entertainment and restaurant facilities.

The organizing element that links these various activities around the Bay will be a waterfront esplanade which provides pedestrian access to the water’s edge and which threads together adjacent open spaces and landmarks within the city. By creating continuous pedestrian walkway, the master plan hopes to better define the shoreline and enhance the experience of being at the water’s edge. (Fig 4.2)

In terms of land use, the intent is to expand the financial district into the Marina South area and to create a focal point for the CBD that acts as a symbolic center for the financial district. Thus, the network of streets for new development of the expanded the new financial district will be based on the existing city grid in the CBD.
Design Guidelines

So far, there are no detailed or specific design guidelines established in the URA's master plan. The objectives and concepts presented are merely intended to provide an organizing framework for future development along the waterfront. The master plan is therefore subject to changes and alterations by the URA at any point in response to new demands and projected rates of physical growth.

Design guidelines if any will be established on a parcel by parcel basis as the development of each individual parcel becomes apparent. The decision against design guidelines for the entire site is intended to provide flexibility of the physical plan and to allow alterations to be made in the future. But by not having design guidelines to control future development, the URA is in danger of losing sight of its original objectives for the waterfront since there is no device by which the URA can evaluate the success of projects in meeting their design and planning goals. Consequently, changes made on a parcel by parcel basis will lead to an unstable plan that becomes inconsistent over time and therefore lose its direction and validity as a planning tool.

Design guidelines are therefore necessary to manage and direct incremental growth and to assure that new developments will always reinforce the original objectives and concepts set forth in the master plan. Failing this, developments will seem arbitrary and the overall development will suffer from a lack of cohesiveness and a sense of place, qualities unbecoming of a 'Global City'.

Especially on a waterfront site such as Marina Bay which has the added amenity of a prominent and visible waterfront, design guidelines ensure that the potentials of being at the water's edge will not be lost and that mistakes from misguided decisions and poor design will be kept to a minimum.
Inland body of water is an ideal venue for water-based events and celebrations.

Walkway is narrow, not easily accessible, and terminates abruptly at Overseas Union Shopping Centre.

Bay is too wide (780m across).

Land adjacent to East Coast Parkway is too narrow for development.

Good view of cityscape from Marina Centre.

Good view of cityscape from Marina South.

Existing mooring and harbour craft activities restrict usage of bay.

Restricted pedestrian and vehicular access to Marina South.

Fig 4.3: Analysis of the existing Marina Bay by the URA
Fig 4.4: A comparison of Marina Bay with other waterfronts by the URA
c) CONCEPTS AND ANALYSIS OF THE 1987 MARINA BAY MASTER PLAN

The following concepts have been summarized from the 'Master Plan for the Urban Waterfronts' prepared by the URA. Since the concepts represent developments that are likely to take place if the master plan is carried out without further revisions, it is necessary to analyze the master plan and the concepts in order to provide arguments that would convince the URA to re-evaluate and revise the master plan before new developments proceed.

The Reshaping of Marina Bay

- Further reclamation of the Bay will reshape it into a scale and size that will create more land between the expressway and the water for future developments
- Reshaping of the Bay will help develop a distinct urban character for the area.
- Also, the scale and urban setting after reclamation will be excellent for power boat and dragon boat racing.

Fig 4.5: Marina Bay, existing configuration compared with proposed infill
Analysis
In the master plan, the present size of the Marina Bay is considered too large and lacking scale and spatial definition. Furthermore, the strip of land wedged between the expressway and the water's edge is considered too narrow for development, thus additional landfill has been proposed to widen this strip of land such that development can occur. (Fig 4.3)

The decision to infill the Bay was based on studies of other waterfronts around the world in particular Sydney Cove and Baltimore Inner Harbor. (Fig 4.4) By comparing Marina Bay with these two waterfronts, the studies concluded that Marina Bay is at present "too large resulting in a loss of scale and spatial definition" and therefore requires additional landfill in order to achieve an 'optimum' size and configuration. (Fig 4.5) To further substantiate this point, the master plan adds that the proposed landfill will create a Bay suitable for water-related activities such as speed boat racing. (Fig 4.6)

But closer examination shows that the foundations for filling the Bay are not based on solid ground. The Baltimore Inner Harbor is not an appropriate analogue for the Singapore Marina Bay since it derives its form from being a historic harbor and part of a string of piers that facilitated pre-containerized shipping.

On the other hand, Marina Bay being an infill site has no historic relationships with Singapore's port development except for the fact that it is in close proximity to the historic Singapore River. Thus, reshaping the Bay into the form of an inner harbor is irrelevant.

In addition, the master plan does not refer to studies performed in order show how the 'optimum size' for Marina Bay was derived. It merely mentions that the dimensions for Marina Bay are much larger than Baltimore Inner Harbor and therefore lack spatial definition in comparison.

Furthermore, the size of the circuit for speed boat racing should not be a determinant for the size of the Bay even though this annual event is considered an 'international' event and therefore an important water-related use. The decision to tailor the Bay to suit such specific activities is short-sighted and the opportunity cost of developing alternative uses is high since it not only limits the possibilities of developing other water-related uses, but also reduces the user groups to a handful of special interest groups.
Fig 4.6: Size of the Bay will be tailored for power boat racing

Fig 4.7: Waterfront esplanade along the Bay after infill

Fig 4.8: Twin towers at the focal point of Marina Bay

Fig 4.9: Proposed high-rise development along the water's edge, a continuation of the CBD
There seems to be some confusion over the issue of scale in the master plan. The URA proposes to fill the Marina Bay to match the size of Baltimore Inner Harbor which is only a quarter the size of Marina Bay.

However, the enclosure of high-rise buildings that have been planned along the water's edge crowds and destroys the scale of the Bay and are disproportionate to the reduced size of the Bay. (Fig 4.8 and Fig 4.9) Even in Baltimore, the buildings around the Inner Harbor are low and have building forms and activities that reinforce their intimate relationship with the scale of the Harbor.

Thus, the URA needs to re-evaluate its decision to fill the Bay noting that what really needs to be 'scaled down' are the sizes of buildings along the water's edge and not the size of the Bay.

*The Extension of the City Grid*

- The formal grid of the existing Shenton Way financial district will be extended into Marina Bay in order to facilitate the extension of the financial district onto the site.

**Analysis**

I foresee two problems arising from the use of the existing city grid. First, much of the original grid is no longer in existence and the system of streets that has evolved in the older downtown neighborhoods does not conform to an orthogonal grid. Second, what is left of the original grid dates back to the first Town Plan issued by Sir Stanford Raffles and has not since been refined or adapted for the new uses and spatial requirements of a modern city. Third, the use of a similar grid size may not be relevant in this case since Marina South offers the opportunity to create a new urban fabric. I find it necessary therefore to perform studies in order to determine the appropriate city grid, if any type of grid is to be used at all.

Moreover, in the Marina Bay master plan, the physical layout claims to derive its formal grid from the financial district, yet the grid developed in the master plan is not at all in tune with that of the financial district. In the Marina Bay master plan the typical block sizes are 150m by 150m (approximately 460 ft by 460 ft) and much larger than the finer grain blocks in the financial district which are only typically 50m wide with varying lengths.

In Battery Park City, existing streets were extended onto the site to create block sizes similar to the traditional New York
blocks which have proven to be successful over time. Mission Bay on the other hand adopted the existing grid only when appropriate to the planned uses for the site and created smaller blocks within the residential areas that required a finer grid.

Thus in Singapore, a more appropriate grid should be derived from the planned uses on the site. The size of blocks should respond to the dimensional requirements of each use such that each development maximizes the dimensions of the block and minimizes the creation of awkward left over spaces.

**Focal Point and Views**

- The formal profile of the shoreline is intended to reflect the grandeur and dignity of a modern city. (Fig 4.7)
- Key vistas will be strengthened by the use of open space, boulevards and buildings. Visual connection between them will also be strengthened to provide clear views around the Bay for events and festivals as well as views into the Singapore River and Kallang Basin.
- Marina Bay will be developed as the focal point of the Downtown district.

**Analysis**

The master plan suggests that in order to make Marina Bay the new focal point of the financial district, the shape of the Bay needs to be formalized by creating a hard geometric edge. In addition, the focal point will be created by a square plaza and a pair of high-rise office towers placed at the water’s edge and protruding into the Bay. (Fig 4.8 and Fig 4.9)

Though the idea of creating a focal point is valid, the twin towers and plaza are poorly located. (Fig 4.10) The edges of the plaza are well defined by buildings but the sweeping views that could otherwise be experienced at this plaza are restricted by the placement of two towers in front of it, thus narrowing the cone of vision from the plaza.

Fig 4.9: Plaza and towers at the waterfront poorly located
Also, at its current location, the plaza would function poorly as a waterfront open space since it is surrounded by roads and detached from the major pedestrian paths along the waterfront. It would fair better if the twin towers were removed from the site altogether and the plaza extended to the waterfront in their place. In this way, views to the waterfront will be maximized, the plaza will be easily accessible via pedestrian routes and the plaza will be connected to other waterfront spaces.

Finally, the choice of locating the twin towers at the water's edge seems suspiciously similar to the single tower landmark at Baltimore Inner Harbor. Thus the Marina Bay master plan needs to extract ideas from their analogies and to take their examples beyond the step of literally copying them.

I would also argue that the form of the Bay need not be 'formal' in order to create a focal point. More essential to creating a focal point is the pattern of the urban fabric, its relationship to open spaces, the surrounding buildings and the way in which it embraces that shoreline.

The present crescent shape of Marina Bay should be preserved since it provides an expanse of uninterrupted panoramic view of Marina Center, City hall, the Singapore River and the financial district. Its concave curve also has the potential of providing a sequence of open spaces and destination points along its length to create walking experiences that differ from a straight edge.(Fig 4.7)

**Open Space and Pedestrian Access**
- Pedestrian networks for the city will be developed to link places of interest such as Raffles Place and Empress Place.
- Access to Marina South will be provided by an additional stop along the Mass Rapid Transit (MRT) route.

**Analysis**
At present, although the financial district is located along the Southern shoreline, buildings have made little effort to acknowledge the existence of the waterfront. The high-rise buildings may provide excellent views of the waterfront but none have made the attempt to relate to the water and encourage access to the water's edge. This is due to the fact that for a long time, the waterfront has not been an attractive or desirable place to be and because there is no existing system of walkways or open spaces that allow access or activity along the shoreline.

The success of open spaces and parks hinges on the accessibility of these places for the pedestrian, their visibility
from different points of the site and activities that draw people to these destinations. In the master plan, more effort and diligence must be expended to provide physical and visual links to open spaces and parks.

The problem with the open spaces in the Marina Bay master plan is that there is no sense of continuity. The open spaces seem to be developed as isolated entities without an underlining concept that links them together. Furthermore, surrounding open spaces in relatively close proximity such as the 'Padang' in front of City Hall and civic spaces have no way to connect with new development.

In Battery park City, a strong sense of continuity is created by the waterfront esplanade which extends beyond the site to connect with Battery Park at the Southern tip of Manhattan. Also, other open spaces within the neighborhood such as Rector Park and the street end parks are directly linked to the esplanade to become fingers of open spaces that extend from the esplanade into the neighborhood.

The pedestrian network though mentioned as an objective in the Marina Bay master plan does not appear apparent in the physical layout. There is an esplanade along the water's edge leading to the waterfront plaza but falls short of continuing into the financial district and connecting with historic landmarks within walking distance of the Bay.

Fig 4.11: Open spaces are not connected to adjacent public open spaces within the city such as the 'Padang' and monument park.
The largest open space in Marina Bay is a city park intended to provide an urban green for employees in the financial district and the general public. This park is elaborately planned for a variety of uses but unfortunately, the park is completely isolated by major arteries on three of its four sides and separated from the entire Bay by the traffic along East Coast Parkway. (Fig 4.12)

![Diagram of Marina Bay showing the city park and major arteries]

Fig 4.12: The City Park is completely surrounded by major arterials and no form of pedestrian access has been created from the waterfront to the park.

Also, access to the large city park seems impossible by foot since it involves crossing the high speed East Coast Parkway. Moreover, when one eventually reaches the park, the meandering pathways within the park do not even attempt to come close the the urban edge in order to provide entry points into the park.

Furthermore, although some hint of pedestrian routes has been suggested in the master plan, there is little indication as to how these will be achieved. In Singapore's climate, pedestrian walkways require intensive planning in order to become successful spaces. Adequate shade from the sun and shelter from frequent showers are crucial. Also, walking long distances is not part of the lifestyle of an average Singaporean. To induce use, these pedestrian pathways must be continuous, inviting, easily accessible, shaded and provide a sequence of walking experiences by linking with important destinations and landmarks. (Fig 4.13) This requires a much finer grain of planning and design beyond providing a right of way for pedestrian access along the waterfront.

The opportunities to integrate pedestrian activity and open spaces and to develop these as the organizing elements for the site has been missed. It is clear that streets are the primary framework in the Marina Bay master plan and not open spaces.
In Battery Park City, the open spaces are meant to be the important organizing framework for the site while the buildings become the background. But in Marina Bay, the reverse is true. The streets and buildings are treated as the major components while the open spaces are often treated as left over spaces or located in less appropriate places since the buildings are always given priority.

Program of Uses
- Marina Bay will be developed as an extension of the financial district and zoned for commercial and office use.
- Designated areas will be developed for leisure and recreational facilities while the waterfront will accommodate a mix of uses to ensure 24 hr activities.

Analysis
Due to the cost of reclaimed land and the push for more office space, this new waterfront site has been seen as the opportunity for the financial district to expand. Thus, most of the land along the edge of the Bay has been zoned for commercial and office use with some allocation for recreation and open space.

Thus far, no residential uses have been planned for the edge of the Bay. Instead, residential uses have been confined to the interior of the landfill behind the East Coast Parkway. But the site along the waterfront offers the opportunity to create a great variety of uses and the advantage of providing housing in this area should not be overlooked. Introducing residential development onto the site will help sustain 24-hour uses and ensure that activities along the waterfront do not shut down after office hours. Also, many events can be

Fig 4.13: Orchard Road in Singapore. Completely shaded sidewalks, continuous, wide and easily accessible.
planned to enliven the area. These supported by the resident population can save Marina Bay from suffering the same fate as the deserted downtowns in many modern cities. Moreover, public open spaces tend to be more actively used when integrated with residential development.

Living downtown is an opportunity that has not been fully explored in Singapore due to the zoning of land uses and the provision of large quantities of housing outside the city limits. Thus the stock of housing within the CBD is minimal and of mixed quality.

There are examples of luxury housing that exists downtown, located in towers above office and commercial uses but these have not been successful since residents often complain of insufficient services within the CBD to support living downtown.

Thus, in the planning of mixed-use projects, new developments should provide adequate services to support residential uses. Having achieved this, it can be expected that in the future more people will choose to live downtown in an area bustling with activity and life, especially singles or married couples without children who seek the excitement and stimulation of a richly diverse neighborhood.

d) CONCLUSION

Improvements and Revisions

The deficiencies in the master plan for Marina Bay prepared by the URA stems from several sources. First, there is a lack of clarity about the priorities and objectives that the master plan is trying to achieve. For example, the master plan states that pedestrian links are important yet the physical plan for Marina Bay indicates an insensitivity towards pedestrian needs by planning around the use of the automobile instead.

Second, there is a lack of a cohesive planning framework for developing the site. The urban design principles such as the system of open spaces, the network of pedestrian links and the hierarchy of streets are missing or incomplete. Successful planning requires these to be fully developed in order for the site to be a cohesive collection of interconnected functions.

Third, there has been a poor choice of examples used as precedents and analogues for Singapore as illustrated in the mismatching of Baltimore Inner Harbor with Marina Bay. In depth research is required if analogues are to be used in the urban design of Singapore. Planners must not simply pluck foreign examples out of their context and implant them in Singapore. Instead, a more than superficial understanding is
required in order to select the appropriate analogues to extract the underlining ideas that will be useful to Singapore.

Fourth, there exists a fundamental problem with the issue of scale along the waterfront. Development surrounding the Bay should be scaled in relation to the size of the Bay and buildings that front the Bay should have heights and mass that are compatible with the activities along the water's edge.

Fifth, there is an over reliance on foreign architects and planners who bring with them urban design theories that are either outdated or inappropriate to the Singapore context. This has in the past lead to misguided decisions concerning planning and development strategies such as large-scale urban renewal and demolition of historic neighborhoods.

Thus, government agencies such as the URA must learn to break away from the prestige that comes with the names of renowned foreign architects and planners. Most importantly, Singaporeans must overcome its inferiority complex in order to trust the capabilities and good judgement of their local professionals who possess greater knowledge than foreign experts about the social, cultural and political structure within which planning must take place.

**Future Steps**

The positive steps that can be taken to improve upon the planning and development strategies for the Singapore waterfront are to re-evaluate the objectives and priorities that the master plan aims to achieve and then to use urban design principles to establish a *planning and organizational framework* for the site.

Following this, the City needs to create a set of *design guidelines* that work within these urban design principles to produce results that fulfill the objectives of the master plan. The design guidelines should not only include rules for site design but should also outline intentions for building mass, heights and architectural design. By having design guidelines that set standards which range from large-scale site design to finer grain architectural design, the design guidelines ensure that all pieces of the development, regardless of how large or small will contribute to the overall sense of the whole site.

Finally, the benefits of *citizen participation* in the planning process should not be overlooked nor should the public's ability to contribute ideas and direction be under-estimated. Public involvement ensures that economic development does not over-shadow public interests in the City's list of priorities and objectives. Also, by incorporating the concerns
and needs of citizens in the design guidelines, citizens can rest assured that new developments will have their interests in mind. Furthermore, the master plan will have the public support essential to its longevity and success.


3 ibid.


The previous analysis of the Marina Bay master plan is the basis on which new concepts and design guidelines will be formulated. The intent is to provide an alternative way of approaching the planning and designing of the Singapore waterfront and to provide suggestions for the necessary revisions to the existing master plan.

Much of the criticism of the existing Marina Bay master plan stems from the lack of a spatial framework for organizing the site. In the process of embracing the modern movement and its urban design theories, Singapore has sacrificed the framework of rules where buildings are always subordinate to the urban order.¹

"Each generation must rework the definitions of the old symbols which it inherits from the generation before; it must reformulate the old concepts in terms of its own age."²

Thus, the development of Marina Bay requires a clear planning framework based on urban design principles and concepts for the waterfront. Together with a set of design guidelines, these will help recreate the ingredients for good city form and introduce meaning, excitement, diversity and richness to urban life.³

In formulating concepts for the Singapore Waterfront, I have taken into account the development trends occurring in Singapore, the results from my analysis of the existing Marina Bay master plan and lessons from the two case studies. It is important that these concepts be far-sighted enough to accommodate and anticipate concerns that may emerge in the future by attempting to predict and respond to the direction in which current trends will eventually lead. It is the ability to achieve the latter that determines the success and stability of concepts over time.

Also, the planning framework for streets, squares and open spaces must be established prior to the design of individual buildings so that the buildings will reinforce the patterns of open space. Furthermore, the planning framework must touch on the finer details of urban design such as building mass and heights to prevent the domination of out of scale buildings.⁴
Fig 5.1: Marina Bay organized into precincts
Fig 5.2: Proposed network of streets and system of open spaces
Fig 5.3: Pedestrian Circulation
Fig 4.4: Program of uses for Marina Bay
Fig 5.5: Waterfront Uses
SITE ORGANIZATION AND LAYOUT

Marina Bay as Four Precincts

In Marina Bay, the concept of creating distinct neighborhoods within the site will be similar to Battery Park City. Four precincts will be developed each with its own center of activity, waterfront uses and focus. (Fig 5.1)

- The commercial center should be located at the southern end of the site closest to the Shenton Way financial district and developed as the continuation of the CBD. The focal point should be a formal park which connects the MRT station to the water taxi terminal and the amphitheater with a 'floating stage' at the waterfront. Thus, this precinct will also become the activity center and transportation center of the site such as the World Financial Center with its Winter Garden at Battery Park City.

- Next to the commercial center, a moderate to high density residential neighborhood should be developed. Its center of activity should be an inlet of water carved into the site to form a shallow, gentle pool for wading and sailing toy boats.

- The civic and cultural precinct should be located at the heart of Marina Bay with views across the Bay to City Hall and the historic Singapore River. A large civic plaza should be developed as its center piece on axis with a marina at the water's edge and major pedestrian and auto routes to City Park.

- At the northern tip, the site is only 80m wide. Thus, landfill is recommended at the northern portion of the site to create more buildable land and a "natural" waterfront edge including an 'island' within the Bay. This precinct should be developed as a moderate density residential neighborhood fronting the 'island' within the Bay.

Linear Connectors: Streets and Open Spaces

In the two case studies, the urban design principles used in organizing Mission Bay differ from Battery Park City. In Mission Bay a radial approach is taken while a linear approach is used in Battery Park. The difference in their approaches responds to the different concepts behind the creation of the neighborhood and the physical characteristics of each site.

By comparing these two approaches to urban design, Mission Bay and Battery Park City illustrate that there are several alternatives in setting up an organizational framework that is unique and appropriate to each site.
Since Marina Bay is 1.3 km in length and varies in width from 350m to 80m at the northern tip, a linear approach to urban design similar to Battery Park City should be taken which is compatible with the physical characteristics of Marina Bay.

**Streets and Open Spaces**

Boon Tat Street should be extended from the CBD onto the site to become the major through street in Marina Bay running parallel to East Coast Parkway and linking the site to the financial district. (Fig 5.2)

A system of open spaces should also be developed which connects the activities and destinations within the site to citywide open spaces. The major open space should be a linear waterfront esplanade beginning at the southern end of the site as a hard curved edge and ending at the northern tip as a natural soft edge which forms an 'island' to terminate the site. (Fig 5.2)

Points of connection across the site from the waterfront to City Park should also be strengthened. These should be clear landscaped pedestrian routes that enable smooth flows of pedestrian traffic. (Fig 5.3) Pedestrian crossings should also be provided across the East Coast Parkway via underpasses and overpasses. These access points should also be reinforced by integrating with focal points for each precinct and terminating at destination points within City Park such as a planetarium, cultural center and recreational facility.

**Program of Uses**

Referring to the two previous case studies, the location of different uses in Mission Bay are planned to occur at selected areas and sited to relate to adjacent uses in the existing neighborhoods. This direct response to the existing land uses is an attempt to knit new construction with the surrounding urban fabric. The same intention to respond to adjacent land uses is also illustrated in Battery Park City where the World Financial Center is linked to the World Trade Center across West Street.

Although the connections between new and existing land uses are carried out and developed to different degrees in these two case studies, the underlying principles of responding to adjacent uses and fitting into the existing urban pattern are similar. In Singapore, the location of new land uses should take into consideration the uses already existing in the adjacent neighborhood and should build upon those existing uses in a manner that is appropriate to the site.

Thus, commercial and office uses in Marina Bay should be concentrated at the southern end of the site to form a
commercial center next to the existing financial district. These uses should continue from the commercial center to the northern tip of the site to form a backbone for Marina Bay. (Fig 5.4) Although commercial and office uses will be the predominant uses along this spine, retail uses are encouraged at the ground level and residential uses on the upper floors of office towers similar to International Plaza in the CBD.

The majority of the housing in Marina Bay should be within the two residential enclaves, and ground level retail uses in residential neighborhoods should be encouraged especially along buildings that front major pedestrian streets.

Waterfront Uses
In order to develop the waterfront potential of Marina Bay, a variety of waterfront uses should be pursued aggressively. (Fig 5.5) The suggested waterfront uses include:

- **A floating maritime museum** is recommended in the Telok Ayer Basin which separates the commercial center from the CBD. This will become a tourist attraction to draw visitors to the site as well as an educational center to teach the public about the Singapore waterfront.

- **A waterfront amphitheater and ‘floating stage’** will facilitate outdoor concerts and movies and help to promote nighttime uses of the waterfront.

- **Water taxis and historic river cruises** in the traditional 'tongkangs' can provide access to other waterfront developments, activities and destinations. Location of these uses should also be within easy access of the Marina Bay MRT station.

- **Water transportation to cruise ships** that cannot dock in the shallow waters of the Bay could be accommodated.

- **Wading pools and protected areas to float toy boats** are recommended for children to get close to the waterfront and engage in water-related activities.

- **Public fountains** of all shapes and sizes may be located within the site either as focal points or as delightful surprises in quiet courtyards. These reiterate the water theme for Marina Bay and celebrate the use of water on the site.

Other water-related uses that could be developed are:

- **Floating restaurants**

- **Marinas and community boat houses**

- **Facilities for paddle boats and row boats**

- **Fishing piers**

- **Annual dragon boat races and power boat races**
Building Heights

Building heights at Marina Bay should decrease in two directions: towards the northern end of the site and towards the waterfront.

The tallest buildings should be located in the commercial precinct adjacent to the CBD and continue as a high spine along the eastern edge of the site. This high spine should gradually decrease in height to become mid-rise buildings at the northern tip of the site. (Fig 5.6)

CONCEPTS AND DESIGN GUIDELINES

The urban design principles for the Singapore waterfront, have been divided into two categories. Some will remain constant over time, such as:

1) Hierarchy of Streets
2) Size of Building Blocks
3) Location and Quality of Open Spaces
4) Visual and Physical Access

Others are influenced by changes in certain variables such as time, economic stability, market forces, demographics, social values and tastes. The urban design principles which are vulnerable to such external forces are:

5) Types of land Uses
6) Building Mass and Heights
7) Architectural Design

Together, these seven principles represent the planning and designing framework for the Singapore waterfront.

Under each of the urban design principles, I have listed my objectives and concepts followed by design guidelines that will help transform these concepts into reality. In order to develop these design guidelines, I have also examined the desirable qualities in traditional Singaporean architecture such as the use of arcades, and also referred to successful urban environments such as Orchard Road in the shopping district and Shenton Way in the financial District to study the
ways in which pedestrian routes, outdoor spaces, circulation and landscaping has been employed in creating an interesting and diverse urban pattern.

The design guidelines for the Singapore waterfront has incorporated some of these ideas about urban spaces and building design in order to bring back some of the time tested traditions of Singapore and architectural elements which are familiar to Singaporeans.

In establishing the urban design and preferred architectural styles, it may also be useful to show examples of what I would not like to see repeated, such as I.M.Pei’s OCBC Building.

The OCBC Building in Singapore exemplifies the high-rise that is freestanding in space with its vertical form disappearing into the ground without acknowledging its surroundings, exterior spaces or streetscape. It does not even provide shelter or a continuous sidewalk for the comfort of pedestrians. Furthermore, the building facade is not articulated by a hierarchy of window openings, columns, and setbacks to provide some suggestion of human scale. Even the building entrance does not address activities along the street and is monumental and out of scale.

The purpose of the design guidelines is therefore aimed at preventing buildings such as the OCBC Building from reoccurring and to direct development towards a more responsible and sensitive approach to design.
Urban Design Principle 1: Hierarchy of Streets

Concepts
Similar to the network of streets in Mission Bay and Battery Park City, a hierarchy of streets should be created as a development framework. Continuation of existing streets from the CBD into the site will work to tie the site back into the city fabric and reduce the isolation caused by the East Coast Parkway.

Design Guidelines
- The major arterial that provides access through the site should be a continuation of the existing Boon Tat Street within the adjacent CBD.
- Parking lanes should be permitted along two way arterial streets unlike existing arterial streets in the CBD such as Shenton Way which is a one way 6-lane street without on street parking.
- Narrower side streets should provide access within the site to new buildings and to the waterfront.
- These side streets should either be loop roads which enable vehicular access to the water's edge from major arterials or streets that terminate at the waterfront to prohibit excessive through traffic from penetrating the site. (Fig 5.2)
- Drop-off areas and taxi-stands along major one way streets may be accessed via side streets. Curb cuts for these purposes should be discouraged along major arterial streets. Also, the provision of these activities should not interrupt pedestrian flow. (Fig 5.7)
In order to provide drop-off areas, buildings must be set-back far enough to maintain the width and continuation of the sidewalks. Should drop-off areas be created, additional landscaping is required to screen these activities from the sidewalks. (Fig 5.8)

Urban Design Principle 2:
Size of Building Blocks

Concepts
An important element in the composition of public spaces is the size, pattern and orientation of the urban block. Although the ideal block size is difficult to determine, the site should be organized by a repetition of patterns of parcels which are related to uses such as residential, office, retail, industrial and spaces requirements, bulk and vertical dimensions appropriate for these spaces. (Fig 5.4) By doing so, planners can achieve a better utilization of land as well as avoid the creation of left over spaces created by outdoor spaces which are either too narrow to function as open spaces or too large and unplanned to serve as public plazas.

Block sizes should vary at Marina Bay. The typical 50m wide blocks in the CBD should be repeated along the commercial spine of the site. Residential blocks should have a finer grain while the civic center should consist of much wider and larger blocks to contain convention and auditorium facilities.

Another important consideration in the design of street blocks is to make them as small as possible so as to maximize the length of commercial facade, public frontage.
and accessibility. According to Leon Krier, the problem lies not in the length of the street but in the length of the block. He recommends that oversized blocks should be subdivided into smaller blocks by squares and pedestrian streets.

In Singapore, where the involvement of only a few developers and the parceling of land into large lots are common practice, the Mission Bay Plan is specially useful in providing an example of a development approach which utilizes the small parceling of land as a device to overcome the issues of scale and diversity. Creative parceling of land and sub-division of large blocks will provide the opportunity for smaller developers to participate or large developers to undertake development but having each parcel designed by a different architect to provide diversity.

**Design guidelines**

- A variety of block sizes should be developed which emphasizes the use of rectangular blocks. Continuous blocks greater than 120m (365ft) in length should be sub-divided by mid-block lanes.
- Block sizes should be responsive to the types and land use it will accommodate and should be designed to cater to these uses to avoid unplanned left over outdoor spaces that are underutilized.
- Block sizes should be kept as small as typologically possible to ensure that super blocks such as those proposed in the URA master plan will be avoided.
- The use of mid-block lanes should be similar in purpose as those in the Mission Bay Plan. These lanes work to break down the blocks sizes which are greater than the specified maximum size by providing service access and additional street frontage for interior parcels. (Fig 5.9)
- When mid-block lanes are not appropriate, creative parceling of land into smaller lots for development is encouraged to ensure that the entire block will not be developed as one large-scale development that will eventually dominate the entire site and disrupt the human scale of the street. (Fig 5.10)
- Subdivision of blocks into smaller lots for development should encourage greater variety and to invite a greater number of developers to participate in the development process.
- Parceling of land into smaller lots should prevent the occurrence of mega-structures that would occupy the entire city block.
Urban Design Principle 3: 
Location and Quality of Open Spaces

Concept
A variety of open spaces will be developed that differ in use and in size. The success of the open spaces in Battery Park City can be attributed to the fact that they have been well planned as part of the master plan and therefore not treated as arbitrary left over open spaces from development. Similarly, in the design of the Singapore waterfront, open spaces will form the organizational framework around which development will occur. Furthermore, open spaces will connect with other planned and existing city wide open spaces and plazas in order to create a continuous system of public open spaces. (Fig 5.2)

Design Guidelines
• Large areas of public open spaces with planned activities are encouraged. These spaces if surrounded by streets must provide clear and easy pedestrian access.
• Smaller and more intimate open spaces should allow for passive use and integrated with the adjacent larger open spaces.
- All public open spaces should be easily accessible and visible from pedestrian paths.
- A continuous waterfront park or esplanade should be created that connects Marina Bay to Marina Center linking other public spaces and a variety of waterfront activities along its length. (Fig 5.2)
- Ground floor uses and spaces in new buildings should be required to be integrated with these open spaces. Building plazas provided by the developer should respond to the system of open spaces and enhance the continuity of these spaces. (Fig 5.11)
- Public open spaces should provide some form of shelter especially in gathering areas and landscaping should provide sufficient shade for the comfort of pedestrians. (Fig 5.12)
- Night lighting in open spaces should promote security and be designed to fit within the landscaping or paving patterns.
Pedestrian routes landscaped on both sides provide pleasant walkways.

Although the building provides a two-tier arcaded walkway, pedestrian activity is taken off the major boulevard on the left.

Stairs can become physical barriers to pedestrian flow and separate ground floor uses from activity below.

Building entrance is insensitive to the scale of the streetscape.
Urban Design Principle 4: Visual and Pedestrian Access

Concepts
In Singapore as in many modern cities, the function of streets have been reduced to facilitate auto access, therefore, in order to reintroduce the street as a place of social and economic activity and as a means of gathering, dispersion and orientation, a strong relationship must be developed between the street, building type, form of property and public open space.

At a waterfront site such as Marina Bay, visual and pedestrian access must be provided to the waterfront and to all public open spaces. In Mission Bay, an elaborate system of visual and pedestrian access is created by the landscaped radial axes and the strong water feature that lead pedestrians to the waterfront.

Battery Park City too has strong visual and physical cues that attract the public to the waterfront. The street end parks with its public art located at the termination of side streets visually prompts pedestrians to engage with the water's edge.
Similarly, in Marina Bay, the same sense of connection and continuity is desired. The continuity of experience is enhanced by the nature of the spaces and the building forms through which people move. The idea of the continuity of experience is best expressed in Gordon Cullen's sequential movements in space where light and shade, openness and enclosure, deviation in alignment and variation in projections all contribute to the richness of experience. (Fig 5.13)

Thus, in Marina Bay, the experience of moving through space should be enhanced by spatial configurations, focal points and a series of events, destination points and gathering spaces that are connected by pedestrian paths and visual corridors.

**Design Guidelines**

- Views corridors from side streets and major pedestrian paths to the waterfront and across the Bay should be maximized. Maintenance of these views should require that building heights and mass be regulated and minimized at the water's edge.
- Visual cues such as towers, gateways, landscaping, public art and fountains should lure pedestrian to the waterfront and public open spaces. (Fig 5.14)
- Continuous major pedestrian routes must be established from different points of entry to the site. Pedestrian paths from parking structures, future MRT stations and bus stops must be interconnected with the larger pedestrian network.
- Landscaping, paving and lighting of sidewalks should enhance the walking experience.
- Landscaping should also provide a buffer between auto traffic and sidewalks. (Fig 5.15)
- The widening of the sidewalks at intersections of streets should be attempted in order to ease the crossing of major streets and to allow for increased landscaping at street corners. (Fig 5.16)
- Crossing of major streets should be minimized in the design of pedestrian routes. Also, curb cuts that interrupt the flow of pedestrian traffic should be restricted.

Fig 5.15: Continuous landscaping to provide buffer from auto traffic.

Fig 5.16: Widening of sidewalks at the intersection of streets
Skywalks are permitted in crossing of major arterials. These should be located at the second level of buildings and encouraged to also have access from pedestrian sidewalks via escalators as well as from the interior of buildings. Direct access from pedestrian sidewalks is essential since this would prevent the skywalks from being purely internalized functions that could lead to the creation of mega-structures. (Fig 5.17)

These skywalks may vary in size and may even have retail functions within them such as the skybridge across Shenton Way which has a row of retail along its length. (Fig 5.18)
Urban Design Principle 5: Types of Land Uses and Zoning

Concepts
To prevent the domination of a single use and to ensure mixed-uses, planning of the waterfront should not be solely dependent on market forces and economic development in order to determine desirable uses. Instead, a comprehensive land use masterplan needs to be developed to make sure that land is available and set aside for different uses in the future, ready for blossom when the opportunity is ripe.

The urban waterfront should have the characteristics of a mixed-use neighborhood that accommodates a variety of uses for all ages and interest groups such as office, residential, recreational, maritime, industrial, retail, and public open space. These uses should encourage both day and night time use.

In many modern cities, the place of work is often separated from residential districts and as a result has created the problems of traffic congestion in and out of the CBD especially during peak hours and also a deserted downtown area after peak hours. Thus, by integrating housing within the CBD these problems could be slowly alleviated or controlled.

Design Guidelines
• The development of public uses along the waterfront are strongly encouraged. These should promote the rediscovery of the water's edge as a destination point as well as enhance the experience of civic and urban life.
• Part of the water's edge should be reserved for water-related uses and activities that directly engage the water such as water taxi terminals, marinas, piers of fishing, a maritime museum and floating amphitheater. (Fig 5.5)
• Housing should be considered along the waterfront to ensure 24 hour activities and frequent use of public spaces. At least 30% of the site area should be dedicated to residential uses. The over concentration of commercial and office uses will run the risk of the waterfront 'shutting down' after office hours.
• Ground level retail should be encouraged to open directly onto pedestrian paths. Retail spaces should be as open as possible and allowed to spill into arcaded spaces. In Singapore, traditional ground level retail has
always been very open to the sidewalk and often do not have doors as entrances. (Fig 5.19)
- Building entrances to office spaces should be located next to commercial and retail uses along major streets to add to street level activity and liveliness. (Fig 5.20)
- Lobbies for residential uses on the other hand should be located along quieter side streets away from major pedestrian traffic for privacy. (Fig 5.20)
- Both entrances to offices and residential buildings should be treated differently and distinguished from each other.
Urban Design Principle 6: Building Mass and Heights

Concepts
A variety of building heights should exist ranging from low to high rise buildings. Viewing the Singapore skyline from the waterfront indicates that there is a lack of mid-rise buildings that are needed to provide a transition between the three to four story shop houses and the 40 story office towers. (Fig 5.21) Thus mid-rise buildings with commercial and retail uses at the ground level and residential, office or light-industrial uses on upper floors should be designed among low and high rise buildings to create a gradual scaling up of building heights.

The issue of massing is most important in high-rise buildings. Towers are usually located above 4 story podiums that cover the entire lot. Since these podiums often house parking uses and usually consist of horizontal bands devoid of architectural expression to breakdown its linear facade, design guidelines must be created to ensure that these podiums are designed to maintain the human scale at street level. (Fig 5.22)
Design Guidelines

- A continuous street wall is not required but buildings which are setback from the street should provide landscaping and or paving that connects with the continuous pedestrian path along its edge. The buildings along Orchard Road in Singapore illustrate how this can be creatively achieved by designing outdoor restaurants and play areas within the setback zone. (Fig 5.23)

- Building mass should be sculptured to frame views and maintain view corridors towards the waterfront and open spaces.
- Building heights and mass should decrease with proximity to the water’s edge and towards the northern tip of the site in order to maintain view corridors to the waterfront and to create a low-rise human scale waterfront environment. (Fig 5.24)

Fig 5.23: Orchard Road, Singapore, building setbacks create outdoor areas for restaurants or recreation

Fig 5.24: Building heights and mass should decrease towards the water’s edge
• Should the option of creating high-rise instead of low-rise buildings along the water's edge be pursued, lower floors of high-rise buildings should spread out at the base to define the streets and outdoor spaces and enhance the human scale.
• Towers should be discouraged from disappearing into the ground as one monolithic structure.
• Towers should step back before they ascend and should be set back from the street edge to lessen its impact and imposition on the street scale.
• Low-rise buildings should be three to four story row houses broken down into 6m modules typical of traditional Singapore shop houses. This will comply with the existing building code which requires residential row houses to be a minimum of 6m wide. (Appendix 1)
• Mid-rise buildings should respond to this 6m module in the articulation of their facades and by possessing building widths of 6m increments. (Fig 5.23)
• Towers without set backs should be discouraged along the waterfront except when developed as symbolic structures and special landmarks.

• Location of lowers should be sensitive to views from adjacent towers and should not block views to the waterfront.
• Building heights may be increased at corners of blocks to indicate the intersection of streets. The increase in the width of sidewalks and landscaping will also support the scale of the taller buildings at street corners.
• Buildings with little or no variation in building facades and mass are discouraged. Building bulk should be broken down by vertical architectural elements such as columns, and by balconies, a hierarchy of window openings and ornamentation to enhance human scale and to prevent continuous, monotonous building facades. (Fig 5.26)
Fig 5.25: Medium and low-rise buildings should be broken down into 6m modules

Fig 5.26: Building facades treated as repeated modules to provide scale and rhythm to the streets and to avoid monotonous building forms
Urban Design Principle 7: Architectural Design

Concepts
Architectural detail, spatial configuration, location and characteristic forms of articulation are important in creating the 'identity' of a place.

Together with site design and an urban pattern, they give meaning and convey the 'spirit' of the place. But in order to achieve cohesiveness and a sense of completeness, architectural design must have an "obligation to the whole", by each architectural element always expressing a meaning beyond themselves and towards the enrichment of the whole. ¹⁰

Thus, in order to establish a vocabulary for architectural design in Singapore, I have referred to examples of architectural design within the city that have been successful over time, such as arcades, overhangs, rhythm of columns, treatment of podiums and location of signage.

In the design guidelines for Singapore, I will strongly advocate the use of arcades in building design. Given the warm and humid equatorial climate in Singapore, arcades and overhangs have been traditionally used to provide shade and shelter for pedestrians. Also, incorporating arcades will help define the street edge and provide an area for activity and transition between the ground level shops and the uncovered sidewalks. (Fig 5.27)

Design Guidelines
- International style buildings characterized by a continuous, undifferentiated stretches of slick curtain wall should be avoided.
- The repeated use of horizontal ribbons of glass and reflective glass in any amount should be strongly discouraged.
- All buildings fronting major roads should provide sheltered walkways along its edge. These may be in the form of arcades, awnings or overhangs created by building podiums.
- Mid-rise and low-rise buildings without podiums should have arcades of at least 1 story high and incorporated into the design of the building facade.
Fig 5.27: High priority area for the location of arcades
Arcades can provide a transition zone between building functions and sidewalk activity.

Arcades incorporated as part of building design.

Covered pedestrian walkways detached from the building and not incorporated into the building design can be awkward spaces.

Parking uses that front major streets are screened without using horizontal banding.
Fig 5.28: Typical 7.5 ft wide arcade with columns spaced close enough to create a rhythm

- Column spacing should be regular and positioned close enough to create a rhythm of repeating modules. (Fig 5.28)
- Where applicable, columns of the arcades should continue vertically for at least two to three stories and designed as part of the articulation of the building facade on mid-rise buildings and on podiums of high-rise buildings.

- Arcades should be continuous and the height of the arcade should be consistent for the entire length of the block except to indicate building entrances. Floor levels need not be consistent and may vary along the length of the arcade.
- Arcades should be either deep enough or low enough to provide sufficient shade and shelter for the comfort of pedestrians.
- In low and mid-rise buildings, the minimum depth of arcaded spaces will be 7.5 ft similar to traditional arcades in Singapore.
- Arcades or overhangs created by podiums of high-rise buildings are required to be a minimum of 3.7m deep and a minimum 3.7m soffit height. (Appendix 1) This is consistent with building regulations already in practice in Singapore. (Fig 5.29)
- Pedestrian walkways along the side of arcades need not be treated as a continuation of the arcaded space. A variety of different sidewalk treatment can be found in Singapore and should be encouraged to create a diversity of walking experience. (Fig 5.30)
- Parking uses should be discouraged from fronting the major pedestrian streets and should be screened from being visible at street level.
- Signage is allowed inside and outside of arcaded areas but its location should be limited to the first story. Traditional placement of signage on building columns are permitted. (Fig 5.31)

Fig 5.29: Arcades for high-rise buildings. 3.7m Minimum width and height

Fig 5.30: Pedestrian sidewalks need not be continuations of the arcaded space. They may be higher, lower or at the same level

Fig 5.31: Traditional signage on building columns


4 ibid.


6 ibid.


CHAPTER VI
RECOMMENDATIONS FOR IMPLEMENTATION
Having outlined the urban design principles, concepts and design guidelines for the Singapore waterfront, it is also necessary to offer methods for implementation.

In order to put the guidelines into effect, some changes and improvements must occur in the present development strategies employed in Singapore. The task of fine-tuning these development strategies includes (but is not limited to): strengthening the tools used to exert control over development; increasing government intervention in the development process (but avoiding total control); encouraging citizen participation in decision making; strengthening the City's bargaining position with the developer; and educating professionals and citizens about the planning process.

There are varying degrees of government intervention that may be applied to enforce the use of design guidelines and it is important to discuss some of these methods in terms of their appropriateness and applicability to Singapore. The various methods of implementation differ in the amount of control each provides as a planning tool and are listed in order of increasing government intervention.

a) **Prescriptions, recommendations and instructions.** These provide developers with suggestions as to the direction that the form of development should take. They have the advantage of greater design flexibility but also rely on the review board to exercise greater discretion.  

b) **Incentives and disincentives.** The City can offer incentives or impose disincentives to encourage or discourage developers to respond to the objectives established by the City. Incentives are usually in the form of tax-benefits, lower interest-rate loans and incentive zoning. These design incentives are useful in "extracting payments in kind from a reluctant developer in exchange for his permit", and these trade-off are beneficial only if the public receives something equal in value.

c) **Regulations.** These are specific rules that require the developer to build in a certain way. These regulations are usually mandatory and pre-described in the form of building and planning codes and specifications that the developer must meet in order for the project to be approved.

d) **Complete control of development.** In some instances, total control is in the hands of the City whereby the City is the owner of the land and the sole operator of development functions without any interaction with the private sector.
Methods of Implementations in Singapore

So far, a combination of these methods has already been put into practice by the Urban Redevelopment Authority (URA) of Singapore in the form of prescriptive measures that suggest how development should take place, tax incentives to entice developers to build what the City wants, regulations through the use of building codes, and even in the form of a complete take-over of the development process as seen in its urban renewal and housing efforts.

Though these methods have existed for almost three decades in the planning strategies of the Singapore government, the results have not been too favorable in achieving the level of design quality desired in the physical environment. The failure of these methods may be attributed to both the lack of a set of detailed design guidelines and to the weakness of the implementation procedures.

In Singapore, prescriptions and recommendations to developers have been weak and insufficient in drawing any response from the developer. In fact, the developer has often taken advantage of the lack of strong direction provided by these suggestions and even disregarded them in some instances.

Thus, there is a need to take these recommendations a step further in order to realize their potential. The next step could be the transformation of these prescriptions into enforceable policy as in the case of Mission Bay, San Francisco.

Also, providing incentives to developers in order to 'trade' between the different interests of the City and the developer has often left the City short-changed. The City agencies in Singapore need to take a more aggressive stance in terms of their dealings with the developer especially now when economic development has stabilized and the City is no longer desperate for local and foreign investment in the development market. Moving from a position of strength, the City can now exert greater control over developments and has the bargaining power to strike agreements with developers that will commit developers instead of loosely bind them to the objectives outlined in the design guidelines.

In the case of Marina Bay, where the URA owns the land, implementation of the design guidelines can take a similar approach to Battery Park City where the design guidelines are packaged as part of the land lease and development agreement.
Lastly, the buildings codes merely touch on quantitative issues such as height limits, minimum square footage required for different uses and amount of fire-proofing, and therefore need to be expanded to include qualitative intentions as provided in the design guidelines.

But the degree of how binding these design guidelines should be depends on the level of commitment of the City to the objectives of the guidelines, the economic power and authority the City possesses over development and the social and political climate that would allow for increased government intervention in the planning and development process in Singapore.

**Design Guidelines vs. Artistic Expression**

At present, the social and political climate is in a delicate situation. Politically, there has been a 'loosening of the reins' by the government in terms of meeting the demands of Singaporeans for greater social freedom in expression and in lifestyles. Therefore, the act of converting design guidelines into policy may be misinterpreted as an act of restraining artistic expression and lead to animosity between citizens and the City.

Many design professionals also feel that they should be given the freedom to do their work as they see fit without "arbitrary acts of the government that would impair freedom of personal expression, mobility or lifestyle." However, without greater control over development and a set of design guidelines to direct development, sterile places devoid of meaning and disorder in the built environment will eventually result, the very outcome that Singaporeans are trying to prevent.

With such social and political implications, the establishment of a set of design guidelines and methods of implementation must involve citizen participation in order to promote goodwill and to gain public support for these well intentioned strategies.

Singaporeans must be made to understand that increased control over development in the form of design guidelines and design review does not necessarily mean a loss of artistic expression and freedom. This understanding can be fostered through citizen participation in the planning process and especially in the creation of the design guidelines. This level of involvement will assure the public that their interests, concerns and needs are being represented and incorporated.
Citizen Participation
In Mission Bay, the degree of public involvement in the planning process can be contrasted to Singapore where planning has solely been in the hands of city agencies, and where citizen participation has not been encouraged or considered in the planning process until recently. This is in part due to the view taken by the City that planning is best left to politicians and experts. But since Singapore in the past did not have many trained professionals, much of its planning was performed by city agencies with the help of experts from abroad. This has at times produced misguided decisions about the direction of planning in Singapore such as the urban renewal efforts which lead to massive demolition of historic neighborhoods and the loss of the urban fabric and a traditional way of life.

However, in the past two years, the public has been encouraged to participate in the planning process of three major developments. Since then, attempts to involve the public in the large-scale planning of projects have been arranged by the Ministry of National Development via public exhibitions and debates accompanied by questionnaires.

It is therefore important to note from the Mission Bay Plan the advantages that active citizen participation has to offer as a planning tool to incorporate public opinion, needs and interests. By involving the public in the planning process, Singapore will be making a positive step towards creating environments that are humane, responsive and sensitive to what the people really need and want.

Resistance Against Total Control
The apprehensiveness of Singaporeans with regards to increased government intervention has also been in part due to the mixed feelings about the level of competence of the City to exercise increased control over the development process. Complete control was exercised by the government under the URA in the early years of Singapore's development between 1965-1972 in the name of urban renewal, where large-scale redevelopment efforts, though well intentioned, resulted in the destruction of historic neighborhoods, urban patterns and lifestyles which are critical to Singaporeans' sense of cultural identity, time and place.

Many Singaporeans now frown upon the days of urban renewal as being short-sighted, rash and misguided and therefore harbor doubts about the decision making abilities and good judgment of the City agencies. The lack of faith in the ability of City agencies to make sound decisions has also lead to questions about their credibility. In fact, architects, planners and related professionals in the private sector have
even challenged the City's skills to analyze, evaluate, plan and direct growth.

Thus, complete control by the City over the development process is one that is least welcomed and even feared by Singaporeans at large since the wounds of past mistakes have yet to heal.

The method that may be most beneficial, appropriate and acceptable to Singaporeans and which requires greater exploration is the implementation of design guidelines through a design review process. This offers a happy medium between total control and less interventionist strategies and therefore may provide the solution to the perils of alternative strategies.

**Design Review Process in Singapore**

The design review process is not new to Singapore. Over the past five years, the URA has attempted to conduct such reviews on a parcel by parcel basis and has limited its use to sites that are strategically located in the City which possess symbolic functions or are considered 'prestigious buildings', for instance 'the tallest building in Southeast Asia'.

Unfortunately, the design review process has been purely a subjective criticism of design aesthetics and functions only as a means for the City to review and comment on the design status of these buildings. Rejection or acceptance of the project is based on the opinions of the design review panel and not based on a concrete set of written design guidelines that the developer and architect are obligated to follow.

As a result, design reviews are often looked upon as negative experiences where the design panel imposes their tastes and biases upon the developer and where the developer in turn questions the legitimacy of such a review process.

In a system that is entirely dependent on the discretion of the review panel, the issue of procedural fairness always arises. At times even general guidelines are insufficient since they require judgement on a case by case basis and still leaves room for random and unpredictable decisions and favoritism.6

Without specific objectives as a reference, it is difficult for the review board to evaluate a proposal's success.7 Moreover, it makes long-term planning very difficult since it relies on the board members to remember to bring up the issue over the years.8
Design review is specially important in the long-range planning of large sites such that the individual parcels possess a strong relationship with the future development of the whole site. Finally, having no design guidelines implies that the board has to rely on the memory of long-term members to provide continuity of decision making.

It is therefore crucial that the design review be based upon a pre-established set of design guidelines that the developer has agreed to follow as part of the development contract with the City. Without such a firm basis for design review the process of implementation will be futile and meaningless.

It may be helpful to return to the two case studies presented in my thesis to highlight the method of implementation employed and the development conditions that affected the choice of method in each case. In Mission Bay, San Francisco, there is only one developer who also owns the land. Design guidelines were established through an elaborate citizen participation process that facilitated the incorporation of their interests and needs into the design guidelines. The guidelines were then adopted as policies in the City Planning Code which in turn added legality and permanence to these design objectives. The design review process will then be arranged prior to construction to review the progress of the development and to ensure that each stage of development has fulfilled the requirements of the guidelines.

In Battery Park City, New York, though the purpose of the design review process is similar to Mission Bay, the land is owned by the City and many developers are involved. Thus, the design guidelines are made part of the information package to potential developers who would proceed to offer bids based on the assumption that these guidelines will be met. This allows the City to select the highest bidder knowing that compliance to the design guidelines has already been accepted as part of the development agreement.

In both these case studies, the design review process was introduced for the purpose of making sure that development complies with the set of design guidelines that the developer had previously agreed upon either as part of the development contract or as part of the City Planning Code.

This is important since developers may be insensitive to off-site considerations. Thus, the review board can make developers provide a minimum standard of urban design. This task of the review board is important in cities such as Singapore where the review board is the only spokesperson that the public has.
Composition of the Design Review Panel
Contributing to the success of the design review process is also the composition of the review panel. In Singapore, the present members of the panel consists of architects and planners from City agencies such as the URA and similar professionals from the Singapore Institute of Architects (SIA) who represent the private sector body of architects. There is no inclusion of representatives from the real estate sector and least of all the general public.

Ideally, the composition of the design review panel should consist of individuals representing professionals in development-related fields as well as laymen. The inclusion of the general public is to introduce the participation of an impartial and independent group to balance the architects, landscape architects, engineers and developers who may bring with them the biases of their profession.

Bender and Bressi caution that professionals should be carefully selected on the basis of their professional judgement since "design review board meetings have a built-in potential to become forums for the personal agenda of their members ....... when the 'revolutionaries' become members of the board, they quickly find themselves part of the 'old guard', defending their stylistic biases against those of the 'next generation'." 12

The size of the design review panel is also important. The recommended size is seven to nine member since this will be large enough to provide diverse view points and not too large to manage. Also, an odd number can prevent ties that could occur from opposing view points. 13

Conclusion
Thus, a concrete set of design guidelines for the basis of design review and a diverse representation in the members of the design review panel are the two important pieces that are missing in the design review process in Singapore.

These two missing elements contribute to the legitimacy of the design review process and must be included in order to make the design review process function as an effective planning tool that is based on objectivity and fairness.

To conclude, regardless of which approach is taken as a means of implementing design guidelines for the Singapore waterfront, there are improvements that first need to be made to the current development strategies in order to increase the effectiveness of implementation methods and to achieve the desired results.

Leaving the design review process in Singapore at status quo would in the long-run be harmful to future development. Not
only will the negative experience with the current design review process leave a bitter taste in the developer's mouth but potential developers and investors will choose to operate in other countries that can offer a sweeter fruit.

While the search continues for the appropriate implementation tool, the City must not lose sight of their original objectives and their commitment to creating a better physical environment for its people. In the process of fulfilling their vision of Singapore as a 'Global City', the City must also fulfill the citizens' vision of Singapore as a "HOME".


2 Delafons, John, Aesthetic Control, Institute of Urban and Regional Development, University of California at Berkeley, December 1990. (p. 85-86)


7 Delafons, John, Aesthetic Control, Institute of Urban and Regional Development, University of California at Berkeley, December 1990. (p. 84)

8 Zotti, Ed, Design by Committee, Planning, May 1987. (p. 27)


11 ibid. (p. 27)


7. **GENERAL REQUIREMENTS – POLICIES & PROCEDURES AFFECTING LAYOUT SUBMISSIONS**

7.1 **Setback requirements**

7.1.1 Where a building line is imposed by the Roads Division, PWD, this building line will control development along that particular street or road. Projections beyond the building line are not normally permitted.

7.1.2 No basement should be allowed to protrude outwards beyond the building line either above or below ground level at the front of the building or on any side of the building which faces or abuts a road or road reserve line including an access or service road or back lane.

7.1.3 Where any side of the building does not abut any road or road reserve line including an access or service road or back lane, extension of the basement of the building to the lot boundary may be allowed at the basement levels, provided that there is a minimum clearance of 1.1 m between the basement building and the lot boundary instead of the 2.3 m clear space required under Regulation 5(1) of the Building Control (Space, Light & Ventilation) Regulations, 1979. Waiver of the 2.3 m boundary clearance is subject to special consideration. However, for terrace development where buildings are allowed to abut one another basements can also be allowed up to the common lot boundary.

7.1.4 For detached buildings a statutory clearance of 2.3 m minimum is required under the Building Regulation for common lot boundary. However, greater clearances from boundaries may be required on planning consideration. These vary with particular cases depending on the height, scale, intensity and type of development.

7.1.5 For residential developments such as terrace, semi-detached houses and bungalows, a 3 m clearance is usually required at the 1st storey from the side and rear boundary and 7.6 m from the front. The 2nd storey boundary setbacks required are 7.6 m at the front, 6.1 m at the rear and 3 m at the side. Variation may be allowed on individual merit. These guidelines on setbacks are subject to review from time to time.

7.2 **Plot sizes for residential developments**

7.2.1 The following are the standard plot sizes currently in application:

- **a** Terrace houses: plot size 150 sq m, minimum width 6 m, minimum depth 25 m
- **b** Semi-detached dwellings: plot size 300 sq m, minimum width 10 m, minimum depth 30 m
- **c** Bungalows: plot size 555 sq m, minimum width 18.5 m, minimum depth 30 m

In certain localities designated as Good Class Bungalow Areas a minimum plot size of 1,400 sq m per dwelling unit should be provided. The Good Class Bungalow areas are shown in Map 5 of the Revised Master Plan Written Statement 1980.
The minimum setback of medium-rise buildings from the boundary of bungalow development zones should be 75 m for 10-storey buildings (with a 7.5 m reduction for every storey less).

7.7 Provision of Covered Footway

For development proposals fronting major and subsidiary roads, covered footways of 3.7m/3m respectively are required. The current standards adopted for footways to ensure effective weather protection are as follows and must be provided where possible:

<table>
<thead>
<tr>
<th>Effective Depth</th>
<th>Effective Soffit Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.7 m</td>
<td>3.7 m</td>
</tr>
<tr>
<td>3.0 m</td>
<td>3.7 m</td>
</tr>
<tr>
<td>2.5 m</td>
<td>3.7 m</td>
</tr>
</tbody>
</table>

It is desirable that the effective cover be continuous throughout the extent of the footway. Nevertheless, breaks in the continuity of the effective cover are permitted at points where it is aesthetically justifiable such as over the main entrance, etc.

7.8 Industrial/Warehouse Buildings

7.8.1 Plot ratio and quantum

As provided in The Revised Master Plan Written Statement 1980, the quantum of floor space for industrial purposes and warehouse purposes shall not be less than 60% of the total floor space in the respective types of development. The plot ratio for such developments shall not exceed 2.5 (gross). The guidelines on the quantum of floor space by percentage on industrial and warehouse developments are as follows:

i Industrial Development

i A minimum of 60% pure industrial floor space be consistently applied.

ii The remaining 40% floor space to be distributed among other uses being ancillary stores and offices, non-ancillary uses (namely warehousing and showroom), natural areas and communal facilities.

iii The quantum of ancillary offices shall however not exceed 25% of the overall floor area in the development.

iv Intrusion of commercial offices unrelated to the industrial building is not permitted.
THE SALE OF SITES PROGRAMME

The Sale of Sites Programme is a major means of bringing about urban redevelopment. In land-scarce Singapore, redevelopment of the valuable city land is constrained by the fragmented private ownership of land, which is sub-divided into small plots not feasible for comprehensive development.

Through the Sale of Sites Programme, the URA releases for comprehensive redevelopment land assembled from small plots. The parcels are sold to the private sector by a tender system offering a combination of conditions and concessions tailored to achieve planning objectives within the framework of a free market economy.

It was realised and accepted from the start that urban redevelopment had to be a joint effort by the Government and the private sector. The Government would plan redevelopment in accordance with national goals and economic strategies. It would also provide the basic infrastructure and other urban services to facilitate private development. The private sector would contribute its financial resources and expertise and exercise the vital entrepreneurial role. In concert, the Government embarked on a massive public housing programme and in the process freed valuable urban land for development.

A SHORT HISTORY OF THE SALE OF SITES

The First Sale was launched in June 1967 after the establishment of the Urban Renewal Department within the Housing and Development Board. The Second Sale followed in November 1968 and the Third Sale in November 1969. In the wake of the Third Sale, Singapore experienced a boom in the building construction industry encountering a serious shortage of labour and materials. No major sales were therefore launched between 1970 and April 1974. The Fourth Sale in April 1974 coincided with the setting up of the Urban Redevelopment Authority.

How the Sales Work

The identification of sites suitable for redevelopment is an on-going process involving consideration of several factors:

- Overall land use and development plans
- Acquisition and clearance programmes
- Supply and demand projections for various types of development
- Feedback from private developers
- Policy directives from the Ministry of National Development

Most sites for sale within the Central Area are planned for redevelopment several years ahead. This is necessary because of the time required for clearance and resettlement. The process is on-going with long and short range plans defining acquisition, clearance and development phases.

Market analyses and government policy decide when a sale is to be launched, the kind of sites offered and their use and intensity of development.

After a decision for a sale is made, a tentative list of sites is drawn up. Each site is checked for its infrastructural facilities, such as roads and sewers — and consideration is given as to whether these services would need to be built anew or diverted from other areas. All this has a bearing on the project cost.

The URA next determines the concept plans for each site. These plans set out the basic urban design concept: the types of development and their intensity, access arrangements and traffic circulation; the heights and massing of buildings.

Simulated Plans

When the concept has been approved in principle by the Government, simulated plans are prepared for the developers and their architects.

These plans carry important urban design guidelines and indicate the type of development, plot ratio, building setbacks, height controls and any other determinants.

Although the URA decides the broad configuration of development, architects are, within the prescribed conditions, free to express themselves in the detailed building design. This balance between control and flexibility is both useful and necessary between the public and private sectors.

Terms and Conditions

Closely related to the preparation of these simulated plans is the drawing up of terms and conditions of tender pertaining to the...
<table>
<thead>
<tr>
<th>Year</th>
<th>No.</th>
<th>Area</th>
<th>Total</th>
<th>Value</th>
<th>Car Parks/Recreation</th>
<th>Total</th>
<th>Recreation</th>
<th>Godowns/Clinic/Recreation</th>
<th>Total</th>
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<td>1,000</td>
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<td>1978</td>
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<td>183,816</td>
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<td>1981</td>
<td>16</td>
<td>15</td>
<td>53.63</td>
<td>-</td>
<td>2,975</td>
<td>3,549</td>
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<td>-</td>
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<td>1982</td>
<td>19</td>
<td>17</td>
<td>8.90</td>
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<td>-</td>
<td>494</td>
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<td>66,194</td>
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<td>143</td>
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<td>6,910</td>
<td>11,027</td>
<td>16,648</td>
<td>291,112</td>
</tr>
</tbody>
</table>

*All figures are as at December 1983*
planning and technical aspects of developments. This includes a description of the type of development, plot ratio, land to be surrendered for road widening, pedestrian connections and the extent to which developers must pay for related construction and maintenance.

Planning and technical aspects, general terms and conditions such as mode of tender, mode of payment of land price, anti-speculation controls and financial controls are also drawn up.

Developers' packets are made up comprising all necessary plans, documents and information needed by a developer to brief his architect and to prepare a tender — including soil test reports, surveys and aerial photographs. The final step is the public announcement of the Sale in the press. Overseas developers on URA's mailing list are informed by mail.

**Time Available**

In earlier Sales, the time available to tenderers to prepare plans, documents and bids was usually three months. In response to feedback, a longer period of time is now allowed — particularly for large scale projects.

The longer period allows for the preparation of better quality schemes. It also permits foreign developers time to organize and tender more effectively.

Tenders for warehousing and industrial sites, however, are normally required to be submitted within one month and tenderers need not submit plans as these are fairly standard.

A two tier evaluation system is used to assess tenders. A panel of architects first evaluates design and architectural merits and shortlists them for subsequent assessment by a Tender Committee comprising the General Manager, URA and other senior government officials.

**CONCESSIONS AND CONSTRAINTS**

The conditions attached to the tender and purchase of URA Sales of Sites are intended to prevent land speculation and to ensure development takes place within a specified time frame. Incentives and concessions
centre around the fact that the URA is behind the development of each site sold.

Basic approval of land use and intensity of development is implicit with the sites offered for sale. Developers who do not propose deviation from the guidelines need only obtain approval on detailed aspects of construction and development. Sites are sold free of encumbrances and are ready for immediate development. Concessions include exemption from development charges and instalment payment of tendered prices.

An important feature of the Sale, which is simultaneously an incentive and a constraint, is that the URA monitors site development. This acts to provide 'after-sales service', assisting developers in liaising with other government departments and ensuring that every effort is put into completing the building as scheduled.

Major constraints are: no assignment of the land and building is permitted until the project is completed, with penalties for failing to complete by the prescribed time; the need to achieve a specified minimum paid-up share capital within a year of the award of tender; design and planning controls; the retention of ownership of 30% of office, shops and flatted factory space; the successful tenderer is to maintain a controlling interest in the company formed to undertake the project, and approval of the company's Memorandum and Articles of Association. The URA also insists on a certain minimum level of building finishes for the project.

RESULTS

Results of the Sale of Sites Programme have shown that it achieved both its social and economic objectives.

To date, 166 parcels of land totalling 158 hectares have been tendered. A total of 143 projects have been built or are in various stages of construction. These comprise shopping, hotel, office, residential, entertainment, industrial and warehousing projects totalling an investment of approximately S$8.94 billion in foreign as well as local capital.

Results have also demonstrated the effectiveness of the programme in as far as it has provided much needed land for various types of private developments.

In terms of supply of completed commercial floor area in the Central Area, the programme has contributed 25% of office space, 68% of
shopping floor space and 22% of hotel rooms. The percentages are expected to increase steadily with the completion of projects currently under construction.

The Sale of Sites Programme has, by providing more and better amenities, undoubtedly enhanced Singapore's position as a financial, commercial and tourist centre in the region as it has also helped bring about a marked change to our skyline and a vast improvement to the cityscape.

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### COMPLETED SALE PROJECTS & PROJECTS UNDER CONSTRUCTION

| No of Projects | 51 | 65 |
| No of Sites    | 53 | 71 |
| Total Site Area (ha) | 24.87 | 42.86 |

**Floor Areas (m²)**

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Completed</th>
<th>Under Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>400,000</td>
<td>412,700</td>
</tr>
<tr>
<td>Shopping</td>
<td>351,000</td>
<td>396,400</td>
</tr>
<tr>
<td>Residential</td>
<td>1,600 units</td>
<td>2,140 units</td>
</tr>
<tr>
<td>Hotel</td>
<td>1,930 rooms</td>
<td>1,930 rooms</td>
</tr>
<tr>
<td>Warehousing</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Industrial</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Others</td>
<td>55,300</td>
<td>110,000</td>
</tr>
</tbody>
</table>

| No. of Projects    | 36 | 78 |
| No. of Sites       | 39 | 95 |
| Total Site Area (ha) | 23.04 | 118.93 |

**Floor Areas (m²)**

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Completed</th>
<th>Under Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>277,500</td>
<td>306,400</td>
</tr>
<tr>
<td>Shopping</td>
<td>225,800</td>
<td>434,200</td>
</tr>
<tr>
<td>Residential</td>
<td>690 units</td>
<td>4,770 units</td>
</tr>
<tr>
<td>Hotel</td>
<td>3,750 rooms</td>
<td>9,100 rooms</td>
</tr>
<tr>
<td>Warehousing</td>
<td>—</td>
<td>291,100</td>
</tr>
<tr>
<td>Industrial</td>
<td>—</td>
<td>99,400</td>
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<tr>
<td>Others</td>
<td>12,200</td>
<td>57,600</td>
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</table>

*All figures are as at December 1983*

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