RECREATION AND OPEN SPACE IN URBAN WATERFRONT REDEVELOPMENTS

by

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ABSTRACT

This paper considers the problem of including recreation and open spaces in urban waterfront redevelopments. The major difficulty arises in providing recreation and open spaces that will be well used and therefore easily justified in an area of relatively scarce supply and high demand, such as commonly occurs in urban waterfront redevelopments.

The history and recent state of urban waterfronts was examined as were current waterfront redevelopments and their recreation and open spaces. The various types of recreation and open spaces, and the factors that commonly affect them in waterfront locations were also addressed. Case studies of San Antonio's Riverwalk, Toronto's Harbourfront, and Baltimore's Inner Harbour were discussed in detail.

Research was conducted and reported on the recreation and open spaces on Granville Island in Vancouver. Peak use periods on a variety of sunny days were studied to determine how well the spaces were used, and total users, users/sq. meter, and factors affecting use were examined.

The major conclusion was that on Granville Island and most other urban waterfront redevelopments, urban and marine oriented attractions serve as the most popular recreation and open spaces, and large, passive open spaces are neither in great demand or particularly well used. It was also concluded that passive forms of recreation such as walking, sitting, and viewing, were the most popular activities. It is however important to consider specific situations since they vary from site to site and local needs and conditions can alter this pattern.

Finally some suggestions were made as to types of recreation and open spaces that should be considered from inclusion in future Vancouver urban waterfront redevelopments.

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1. INTRODUCTION

There is a problem in designing facilities for people in that they often are not well used or not used for what they were designed for. The recent state of many urban waterfronts in North America is one of changing land uses and redevelopment. Some have completed redevelopments, some are in the process of redeveloping and others are being planned for redevelopment. Most of the redevelopments to date, in both completed or planned form, include various types of recreation and open spaces in a typically mixed-use development. The problem that this thesis addresses is what are the successful recreation and open spaces according to their rates of physical usage and what are the factors that influence their usage in urban waterfront redevelopments.

A critical analyses of existing literature as well as studies of rates of usage will be used to determine success in facility design. It is realized that success could also be measured on the basis of economic return, ease of implementation, environmental harmony, or other criteria. However, literary critiques of projects and usage rates are two of the more accessible and meaningful methods of evaluation.

1.1 HISTORY OF URBAN WATERFRONT DEVELOPMENT IN NORTH AMERICA

The history of urban waterfront development has commonly been ruled by response to trade and commerce. The original settlements of North America's leading cities were almost of necessity located on water bodies, as a good harbour provided security and accessibility. "Seventy percent of 415 U.S. cities with a population greater than 50,000 . . . are located on the edge of a river, lake, bay or ocean" (Heritage Conservation & Recreation Service, P. 1). In colonial ports the waterfront became an important meeting place and a symbol of community strength and prosperity (Urban Land Institute, 1983). "Cargo from the world changed hands at the docks. The structures then built to house goods, shops, assembly halls, houses and churches, still stand near the water's edge in many cities chronicling the development of the city's

waterfront section" (Harney, 1979, P. 7).

Spectacular early growth in Philadelphia was primarily due to building roads into the hinterland to capture trade (ULI, 1983). The introduction of the steamboat served to stimulate port growth in inland waterfront cities like Pittsburgh, Cincinnati, and St. Louis, as well as phenomenal growth in New Orleans. Rail transport gave a competitive edge to the first cities that obtained rail connections, but it also diminished a city's need for overland water access and handicapped ports whose original waterfronts could not accommodate it due to land restrictions, such as in St. Louis' LacLede's Landing (ULI, 1983). Railroads were advantageous transportation routes because they were usable year-round, the speed of delivery offset the relatively low cost of water transport and land routes could reach areas previously commercially unapproachable by water (ULI, 1983).

The Industrial Revolution with it's explosion of rail and truck transport, signalled the first withdrawal of dependency on waterfront trade. Cities began to expand away from the water's edge and to turn the their backs on the waterfront. The advent of air transportation further decreased the dependancy on the waterfront. As Harney (1980, P. 7) says, "Tourists who once flocked to the waterfront for ocean liner travel now use airports, and boat cruises have become a luxury mode of travel in warm climate ports."

Changing port technology from breakbulk methods to containerization shipping required that newer facilities be developed away from the traditional port to provide the necessary back-up space, deeper and wider shipping channels for larger ships, and improved transportation access. Containerization requires an estimated 30 to 50 acres of back-up space for each container berth (Moss, 1976). It also uses fewer but larger piers, and along with decreasing railroad volumes caused by competition with truck and air transport, this resulted in many waterfront facilities falling into disuse and eventual disrepair. This decline of -traditional port areas is reflected on the west side of

Manhattan where 36 city-owned piers still stand and over two-thirds are vacant or used for storage (Moss, 1976).

The advantages to containerized shipping are too great to ignore as it takes twelve days to load a 6,000 ton ship break-bulk style and it only takes one day to load the same ship container style (ULI, 1983). Expanding port facilities on older waterfronts is often difficult, as other industries using waterfront lands can be water dependant or too costly to relocate. The result is the construction of newer port facilities outside of the urban core.

The movement and temporary storage of vehicles are two functions that took the place of the displaced port activities. This was exemplified by the fact that during the 1950's low priced parking was the most profitable use of Boston's central waterfront (Farrell, 1980). A second and perhaps more important functional change in waterfront usage was the development of major commercial airports (ULI, 1983). This was due to the large sites that were available and needed for the larger aircraft after WW II. The result has been convenient airport access but severe long range impacts (noise, traffic, congestion, use conflicts, and limited waterfront access). Increased competition for waterfront land and concern for the environment has curtailed further airport expansion recently (ULI, 1983).

The environmental effects of the historical patterns of use include increased air pollution, greater noise, more congestion, destruction of fish habitats, and improper waste disposal (ULI, 1983). The motivational factors behind waterfront location of industries include: convenient goods handling, waste disposal, and water supply; low building costs due to relatively flat land; competitive options between land and water transportation; and speculation on rising land costs (Hankin, 1968). Hankin also claimed that these factors are partially responsible for the historically industrially oriented attitude towards the waterfront, and that few occupants genuinely require their location. This is partially because historical zoning of waterfronts has not been promotional of

uses other than industrial one and has therefore mininized the competition for industry. Filling and dumping for the accommodation of these industries resulted in the loss of aquatic life and serious pollution problems (Harney, 1979).

Waterfront evolution is significant because many of the incentives and constraints associated with contemporary development opportunities stem from changes that occurred in the past. Recreation, however, was historically a secondary function and often the waterfront was thought to provide adequate open space for the needs of the citizens just by the fact that the water was open space (ULI, 1983). Fortunately, this was not the case in every city. Washington has 80% of the Potomac and Anacostia rivershores under the jurisdiction of the National Park Service (National Capital Planning Commission, 1972). Nearly 24 of Chicago's 30 miles of shoreline consist of public parks and beaches (Heckscher, 1977). Vancouver had farsighted forefathers who reserved the majority of the shoreline for public use. But these examples tend to be exceptions to the rule as most North American cities have developed in the Miami style of uncontrolled hotel/residential development.

1.2 RECENT STATE OF URBAN WATERFRONTS

Harney (1979) stated it well when he said waterfronts which were once the hub of power and trade for most American cities, more recently have been considered the seamy side of America. Conomos (1979) pointed out that aboriginal Californians left little evidence of their several thousand years of habitation along San Francisco Bay, however modern man had caused major changes within 75 years. Conflicting uses of our waterways as transportation routes, food sources, water sources, and waste dumps has resulted in impacts ranging from trivial to dramatic with perhaps irreversible consequences. One impact is that natural eutrophication processes can be sped up immensely (McLusky, 1981). Human built impacts promoted by land speculation include reclamation, diking, and filling of the shoreline (Conomos, 1979). The National Estuary Study (1970) estimated that in the continental U.S. 23% of estuaries were severely modified, 50% were moderately modified, and only 27% were slightly modified.

In San Francisco Bay over one-half of the bay was in private ownership and water lots were selling for \$600,000 (Reynolds, 1970) Land filling had decreased the water surface area from 680 square miles in 1850 to 400 square miles in 1968 (President's Council on Recreation and Natural Beauty, 1968). Marshlands have fared even worse, decreasing from 128 million acres to 70 million acres in the continental U.S. (Niering, 1970).

Disease carrying pathogens can be introduced to the aquatic environment through the discharge of raw sewage. The introduction of chemical wastes from industrial sites can have even more dramatic effects depending upon the toxicity of the waste materials to the life forms present. Discharge of oil and gas from ships, seaplanes, and pleasure craft can have the same results when in sufficient quantity or in an enclosed or small water body. (US Department of the Interior, 1970). When not overtaxed, estuaries have the capacity to assimulate and dissipate wastes; but when heavily stressed, these systems suport fewer and more adaptable species, frequently in great abundance but of little value to man (USDI, 1970).

Shipping, fishing, and industrial concerns had been left alone on the waterfront with the result that few people ventured down to or were concerned with the plight of the urban waterfront. Poor management and environmental abuses increased environmental decline into a state of decay. The recent condition of the waterfront was brought to the public's attention through a number of dramatic events. An examination of Lake Erie in 1966 made the shocking discovery that the lake was almost totally anoxic and incapable of the supporting anything but "sludgeworms" and other primitive forms of life (Nelson, 1970). The Cuyohoga River flowing through Cleveland is so polluted with oil that structures called "fire breaks" were built out into the water to help in fighting fires (Nelson, 1970). Nelson also stated that scientists estimate that it would take 100 years to recover the polluted waters of southern Lake Michigan. The Mississippi River at St. Louis was so polluted in 1968 that a fish placed in 1 part river water and 10 parts clean water died within minutes (PCRNB, 1968).

It was evident that many forms of pollution were present along waterfronts including sewage disposal, septic tank seepage, industrial waste discharge, shipping discharge, pesticides, detergents, and roadway runoff. In 1965 the U.S. Water Quality Act authorized a nationwide attack on water pollution. In 1966 the Clean Water Restoration Act authorized a total of \$3.5 billion in federal grants for sewage treatment plant construction. In 1968 the U.S. Federal Water Pollution Control Administration estimated the costs of cleaning up the waterways as ranging from \$50 – \$100 billion over the next ten years (Nelson, 1970).

Efforts at recovering waterways had been occurring since the 1950's at which time the Thames River in London was anoxic and sewage treatment plants were constructed. By 1975 the water had returned to pre-1875 cleanliness levels and fish not seen in twenty years had returned (McLusky, 1981). In Detroit, a \$355 million program begun in 1968 has resulted in fish returning to urban waterways (Leedy, 1981). The Mohawk River has had 75% of the discharge controlled and fish have returned. Pensacola Bay in Florida has had a recovery of the shellfish industry to pre-pollution levels (Leedy, 1981).

There is a question however, of whether sub-lethal but chronic contamination may effect animal populations in equally dangerous ways. A recent article in the Vancouver Sun newspaper stated that in Vancouver Harbour and Seattle Harbour, half of the sole examined were found to have skin cancer, liver disease, or tumors (Munro, 1983). The effects of feeding fish caught in these waters to rats is rather ominous as all developed thyroid disorders and many showed liver and immune system dysfunction (Munro, 1983). John Harshborger of the Smithsonian Institute says that 60,000

chemicals commonly used have never been tested for their effects on animal populations (Munro, 1983).

This information leads to the question of whether fishing should be allowed in urban areas. This is a sensitive point since most "urban" fishermen are recreational or subsistence level (Munro, 1983).

Harney (1979) outlined some issues facing urban waterfronts. These include:

CINDERELLA SYNDROME - typified by a run-down environment and poor public perception.

AESTHETIC AND CULTURAL POTENTIAL - of man-made and natural features of the area.

ENVIRONMENTAL CONCERNS - water and air quality, shoreline maintenance, etc.

COMPETITION OF USES – residential, recreational, industrial, commercial, transportation, etc.

LEGAL AND INSTITUTIONAL CONSTRAINTS – Riparian rights, multi-level jurisdictions (local/regional/federal).

ECONOMIC CONSIDERATIONS - tax issues, funding, money market conditions.

Leedy (1981) summarized the current condition of most non-redeveloped urban waterfronts as being: under-utilized; of high economic, esthetic and cultural potential; environmentally sensitive; in demand when cleaned up restricted by multiple legal and institutional constraints; and poorly accessible due to restrictive barriers.

1.3 IMPETUS FOR REDEVELOPMENT

Due to increasing pressures on downtown cores to revitalize and expand, urban waterfronts have recently been noticed again. Clean water programs have increased the opportunity for urban recreation as well as other land uses. With the present condition of many waterfronts, it is seen as an opportunity to redevelop an abused, under-utilized, and potentially valuable area of the urban core. Chris Therral Delaporte, the director of the U.S. Heritage Conservation and Recreation Service has stated (HCRS, 1980, Preface):

Urban waterfronts are important because their sound and sensitve revitalization, incorporating recreational and heritage resources, provides an opportunity to help support community and economic development goals, reduce the impact of natural hazards and to demonstrate excellence in environmental planning and design.

Revitalization of urban waterfronts also encourage energy conservation through providing easily accessible water recreation and through re-using existing structures. It also provides area for growth since few cities can expand their boundaries and the redevelopment of the waterfront represents the most viable alternative for the enlargement of a city (Moss, 1976).

Darling (1973) estimated that when cleaned up, the value on an urban water resource is large. Hankin (1968) stated that:

1. Past use of waterfronts has been careless and wasteful.

- 2. Current development and zoning does not fully acknowledge the diverse potential value of waterfronts.
- Waterfronts of good quality and accessibility is a limited resource under substantial pressure from many types of users.

4. Waterfronts have valuable potential for multiple uses.

This may result in redevelopment decisions based solely on values derived from benefit-cost analysis and a disregard of intangible values as derived from social or cultural amenities.

Cowey and Rigby (1979), P. 11) outlined some plus and minus factors in the redevelopment of urban waterfronts in the U.S.:

PLUS

-	the nations's gradual success in cleaning up it's rivers and shore waters.
-	the new economic attractiveness of re-using older structures.
-	the "back to the city" movement.
-	the new urban emphasis on national recreation policy.
-	the establishment of the Maritime Heritage Preservation Program.
MINU	JS
~	public investment skepticism.
-	derelict conditions.
-	undesirable uses.
-	access to and along the shore.
-	water pollution.

- multiple owners and confused titles.
- fragmented government jurisdiction.

1.4 INCLUSION OF RECREATION AND OPEN SPACE IN WATERFRONT REDEVELOPMENTS

The answer to the problem of under-utilized urban waterfronts lies not only in the recovery of them to a usable state, but "The advent of cleaner waters, at public expense, raises a basic question: Who should reap the benefits, private development interests, the public at large, or some mixture of the two?" (National Oceanic and Atmospheric Administration, 1980, P. 12). If left entirely to the private sector, it may redevelop in the most profitable way, but not necessarily the most environmentally sound or democratic way. The provision of recreation and open space is one of the least environmentally disruptive and most publicly satisfying forms of redevelopment. However, the uses that commonly have the highest rent potential are in declining order 1. retail 2. hotel/office 3. residential 4. industrial 5. recreational (London, 1976).

In the past, commercial association with waterfront activity has been both considerable and profitable, and it has been used to induce local communities to develop for that purpose while ignoring the social costs. In a waterfront redevelopment the advantages of constructing office facilities are that it generates steady activity, supports services, provides employment, represents a large tax base, and pays high rent (London, 1976). The disadvantages are that it derives little benefit from a waterfront location, many people disapprove of commercializing public amenities (i.e., the water), offices are boring and few areas are provided for people to relax in an often hectic city situation (London, 1976). In Halifax an attempt is being made to solve part of the problem by restricting offices to upper floors and having retail on the ground floor. This is an effort to mix land uses in order to suit multiple interests. It is commonly termed mixed-use development. The basic advantage of this technique is that it allows us to mix high rent producers (office, retail, and residential) with high amenity producers (recreation and open space). The result can be an exciting urban environment with a high level of activity, both day and night, and with opportunities for active and passive recreation in the urban core.

Witherspoon (1976) has outlined a rationale for practicing mixed-uses in urban core redevelopments that include recreation and open space by arguing:

- the areas are currently under-utilized and this trend is increasing.

- the public has a right to access to land and water.

- open space in CBD's are limited and water access is usually nil.

- mixed-use development increases vitality through round the clock usage.

- inclusion of recreation and open space provides identity and a healthy environment.

- walking access decreases pressure on the transportation system.

- the urban waterfront is a unique attraction.
- mixed use has already met with success in many projects.
- mixed use provides comparatively low cost opportunity for increasing CBD recreation and open space.

Recreational use along with commercial fishing have the least damaging effects on the natural estuarine environment when not excessive in form (U.S. Department of the Interior, 1970). Undesirable consequences that could result from uncontrolled development include; "haphazard growth and unrelated developments, limited public access over private developments, loss of public benefits that should be accrued from public expenditures on cleaning up waterways, and increased pollution from indiscriminate and insensitive developments" (Environmental Protection Agency, 1980, P. 1).

Gold (1980) made a number of statements regarding the importance of recreation and open space in urban areas, including:

1. Leisure services can improve the quality of urban form, function and life.

2. Preferences for leisure activities and facilities can be measured.

3. These preferences can be translated into built form with both professional and citizen input.

Dhar (1975) determined in a thesis on the factors influencing recreation usage that the amount of available leisure time had doubled from 1920 - 1960 due to shorter work weeks, more holidays, early retirement, mandatory schooling, and labour saving devices (Dhar, 1975, P. 3). Because half of all leisure time is for short periods (2 -4 hours) it is evident that this must be served by facilities close to home.

The shift from rural to urban population concentration has decreased the availability of open space close to home. The people that live in the worst serviced areas recreationally (inner cities) are often the ones with little ability to change this (Dunn, 1974). The public also may have differing views on leisure time activity than in the past, with increasing emphasis on esthetics, environment, cultural and historical enrichment, and spiritual renewal (NOAA, 1976).

It is therefore obvious that; waterfront redevelopers have an obligation to help meet needs for more recreation and open space in inner cities in return for public investments, public access should be built into the design while minimizing impacts and conflicts, recreation and open space inclusion can be a cost-effective means of satisfying demands, and currently the recreation and open space component of may projects is often marginal (HCRS, 1980).

1.5 THE NEED FOR THE STUDY

The need for the study is based in the attitude of early 20th century municipal governments who attempted to place large bucolic parks widely spaced throughout cities which were meant primarily for weekend use. Recently, due to increased mobility, there has been an exodus out of the city for the countryside instead of facsimiles of it (Dhar, 1975). There is a need for changing park design to meet changing public demands.

Gold (1980) maintains that public preference has swung full circle recently even though most urban parks are still under-utilized. Reduced speed limits, higher energy costs, traffic congestion on freeways, and the decrease in freeway construction will limit access to regional parks. Decreased disposable income, increased unemployment, and increased inflation will limit demand for high cost activities. It is therefore necessary that we find out what sort of activities will be well used in urban areas especially since development and maintenance costs are around \$10,000/acre (Gold, 1980).

The 1975 U.S. National Assessment projected an increase in demand for water oriented recreation and a corresponding decrease in recreation surface water area (cited in HCRS, 1980). The National Urban Recreational Study concluded that most of this unmet need could be satisfied by increasing access to and making better use of existing urban waterfronts (HCRS, 1980)

The opposition to recreation and open space provision is often based on the spectre of under-utilization. As McHarg said "Useless open space is generally over-provided, but valuable open space is seldom created." (Cited in Wright, Braithewaite, and Forster, 1976, P. iv). This results in the attitude of those such as Arthur Cotton Moore who when referring to recreation provision on Washington's riverfronts said, "There is already enough for the entire population of the east coast to picnic there at once" (cited in Morton, 1975, P. 60). It is in this attitude that one can see the necessity for planning and designing for well-used recreation and open space in areas as potentially valuable and relatively scarce as urban waterfronts.

1.6 DEFINITIONS

LEISURE - time beyond that which is required for existence and subsistence.

RECREATION - leisure behaviour with a maximum of descretionary behaviour.

OUTDOOR RECREATION - recreation in which "uncovered space" is an important element.

LOCAL AREA - arbitrarily assumed as an area of between 1 and 3 kms. in radius.

LOCAL PARK - primarily used by local residents who travel to it on foot or bicycle and which lacks public parking.

RECREATIONAL PLANNING – the use of information for the allocation of resources to accommodate the current and future leisure needs of a population.

RECREATION DESIGN – the use of information to create designs for recreational spaces that will relate to existing or potential users.

RECREATION RESOURCE - land, water, or facility that provides recreation.

RECREATION SITE - a specific tract within an area that is used for recreation.

RECREATION FACILITY - a man-made improvement of a recreation site.

RECREATION COMPLEX – an area containing a variety of recreational opportunities and facilities.

RECREATION CARRYING CAPABILITY – the capability of natural resources of facilities to withstand recreational use at a desired level of quality.

GOAL - an ideal that cannot be measured.

OBJECTIVE - a point that is measurable.

OPEN SPACE - land and water not covered by buildings and used primarily for passive recreation.

RECREATION SPACE – land and water that may be covered buildings and is used primarily for active recreation.

RECREATION DEMAND – an activity demand that is calculated through the measurement and projection of recreation occasions.

1.7 OBJECTIVES OF THE STUDY

The main objective of this study is to determine what factors influence recreation and open space usage in urban waterfront redevelopments, and what types of recreation and open spaces are best suited to these projects. Relevant local needs and site considerations will be determined through examining case studies of completed urban waterfront projects. These results will be compared with the local needs and site considerations of Granville Island and the rates of usage for its various recreation and open spaces. The final objective of the thesis is to determine what types of recreation and open space are successful on Granville Island, with the goal that this information may be useful when planning recreation and open spaces for future waterfront redevelopments in Vancouver.

1.8 METHODOLOGY

Case studies and critical reviews of urban waterfront redevelopment projects across North America will be described in Chapter 2 and factors affecting the success of recreation and open space will be discussed. Rates of usage will be studied where available, but particularly for Baltimore's Inner Harbour facilities as they are readily available. Relevant factors affecting the success of these spaces such as topography, climate, local needs, and existing land used can be used to predict success of recreation and open space in other sites.

Chapter 3 will examine the usage of recreation and open space in the Granville Island mixed-use waterfront redevelopment. A study was conducted determining rates of usage/square meter of a variety of recreation and open spaces on the Island. Information from personal interviews with individuals associated with the project will also be used in determining factors affecting success of Granville Island recreation and open space.

In the concluding chapter, successful waterfront recreation and open spaces will be identified along with the factors influencing their success and suggestions will be made for types of recreation and open spaces that should be considered for future waterfront redevelopments in Vancouver.

1.9 LIMITATIONS OF THE STUDY

Comparing the needs of competing sectors is obviously an important aspect of a comprehensive waterfront redevelopment plan, as is cost-benefit analysis of proposed uses. Ease of implementation as well as ease of incorporation with exising or planned uses are also consideration. While these are important factors and will be recognized as such, the scope of this thesis will be restricted to identifying successful recreation and open space along with site characteristics and user needs associated with them, in a variety of urban waterfront redevelopment projects. The data from Granville Island is subject to variables arising from limited time and resources for conducting the study. It is also recognized that potentially successful recreation and open spaces are subject to site specific conditions and needs that are difficult to predict at times.

The success of recreational facilities is a complex area determined by people's recreational behaviour and preferences both of which are easily shifted by a number of factors (NOAA, 1976). Data is not often available and if it is, it may need to be conceptually organized in order to determine needs. It is also recognized that data from participation rates can be misleading for projecting future demand in that what is observed is not demand but consumption (Wright, Braithewaite & Forster, 1976). A wide range of demographic variables influence recreational patterns of which Pincombe determined age, sex, and income seem to be the most important (cited in Wright et al, 1976).

Collection and analysis of data has proven to be a difficult job. Felt need can tell us much but it can be biased by inexperience with activities or status level of activities (U.S. Outdoor Recreation Resources Review Commission, 1983). As well, different activities or mix of activities at a given site will produce different participation rates therefore confusing the issue further (McLellan & Medrich, 1969). It should also be stated that the total worth of a space cannot be judged solely on its physical use. The visual or ecological use of a space may also be valuable to individuals and society. Therefore opinion surveys would be useful in addition to usage surveys in order to attempt to determine a space's total worth, but time and resources do not allow for it in this study. For these reasons this thesis shall concentrate on determining success of existing recreation and open spaces and suggesting possibilities for future redevelopments in Vancouver as opposed to predicting success of future

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2. INCLUSION OF RECREATION AND OPEN SPACE IN URBAN WATERFRONT REDEVELOPMENT

2.1 FACTORS AFFECTING SUCCESS

The inclusion of recreation and open spaces in urban waterfront redevelopment is an important aspect for the enhancement of each waterfront. Harney (1979, P. 2) stated "waterfront areas can be centres of tourism, trade, and urban recreation." However, we have little understanding of the types and design of recreation facilities that might be successful in these projects (HCRS, 1980). For example, most waterfront recreation and open spaces do not consider the very young, handicapped, elderly, minorities, or low income groups, with the provision of recreation facilities such as boat launches and marinas. These groups may be those who have the most time available to use the facilities but lack the money or ability necessary to do so.

Most cities tend to develop park and recreation facilities of a traditional nature, that is, pastoral and passive. This is reminiscent of the urban parks environment of the late 1800's and is not always suitable today. Night-time use is not often encouraged and the underprivileged are seldom designed for. Variations in recreation and open spaces can be attributed to many interrelated factors; city age and size, location, climate, surrounding uses, and government intervention are just a few of these.

Public access to waterfronts is important because of the transportation facilities often present, and public ownership of the water and adjacent land; but many physical, institutional and psychological barriers exist (ULI, 1983). The ultimate success of a waterfront redevelopment will depend upon many things, among which how responsive the design is to the unique qualities of each specific waterfront is of major importance. This includes providing recreation and open space that is sensitive to both the site and local needs.

2.1.1 SITE CONDITIONS

There are many general site conditions that are problems when redeveloping an urban waterfront. These include; bad area reputation, deteriorated facilities, conflicting land uses, inhabitation by underprivileged groups, variety of government agency involvement, variety of regulations, facilities that are hazardous, pollution of the area, and multiple ownership (NOAA, 1980). There are also barriers to access including: natural (cliffs, etc.), private property, and transportation routes.

There was only 25% of surface water area available for recreation use in a clean and accessible state in the U.S. in 1978 (USDI, 1979). For this reason fishing, swimming, and non-power boating are rarely found in urban watefront redevelopments. In some urban waterfront redevelopments, the HCRS has learned that site specific problems such as these are not resolved or only partially resolved (HCRS, 1980). This is mostly because the use and condition of the waterfront can dramatically add to the up-front costs if much needs to be done (ULI, 1983).

The waterfront geography and climate are important factors in affecting demand for outdoor recreation and open spaces but since they are difficult to quantify meaningfully, they are usually disregarded (McLellan & Medrich, 1969).

Climatic variations will cause usage fluctuations and are therefore necessary to consider. Onshore and offshore breezes are often present in waterfront locations and can be caused by large water bodies gaining and losing heat faster than land masses. The temperature imbalances result in colder air rushing in to fill voids left by rising warmer air. Waterfronts also have more instances of fog mist than Central Business Districts (CBD) because the heat of the city evaporates moisture and onshore breezes bring in moisture laden air from the ocean (ULI, 1983). Waterfronts are also more susceptible to winds due to their unsheltered location adjacent to water bodies, and can be affected by winter ice and cold water in northern latitudes and high rainfall in wet climates.

Geographical characteristics are also key factors in the overall success of recreation and open spaces in a waterfront redevelopment project. Most often shallow water is a hindrance to usage but in the case of Seattle, it is a steeply sloping bottom and overly deep port that is the problem, to the point that piers must be built on an angle to reach sufficient length. Another water restriction is caused by tides, as large fluctuation in high and low tide water levels may necessitate floating pier construction and high sea walls, as well as cause dangerous rip tides (ULI, 1983). Sedimentation, salt water corrosion, and marine organism deposits must be taken into account, and the presence and size of waves may necessitate breakwaters and limit ability to build close to the shoreline (ULI, 1983).

Access to the water may be limited by rugged terrain or steep bluffs and the waterfront may be therefore limited in the range of its development potential. Flood plains adjacent to waterways are also limited in development potential due to the hazardous situation and generally unstable soil conditions. In both of these examples recreation and open spaces may be a particularly suitable land use where most others are not (ULI, 1983).

The amount of land available in an urban waterfront redevelopment situation is a key factor in the types and amount of recreation and open spaces included. Configuration of the land is also important in that a bay shape differs from a point shape in amount of water area available (ULI, 1983). The same thing commonly is the case between oceanside, lakeshore, and riverside waterfronts with not only water area but water depth varying greatly.

Waterfront lands often have poor load-bearing capacity due to water table levels, deltaic soils, and compacted fill material. There may also be erosion due to seawall damage or poor management practices.

There are also urban variables affecting waterfronts that unlike geographical and climatic variables can often be altered. Waterfront land use varies greatly with some

uses being water-dependant but most being only water-related or water-independant (ULI, 1983). This means that many uses can be relocated away from the waterfront if financially feasible. This is especially desirable with restrictive land uses such as waterfront freeways which proliferated because of, among other things, cheap available land, to the point that 94% of Manhattan's waterfront has major highway development (Wagner, 1980).

Other restrictive access land uses may not have hazardous conditions but may have trespassing restrictions that limit recreation and open space usage along waterfronts. This may necessitate grants of immunity to tort liability in exchange for grants of access easements across private lands (NOAA, 1976). Environmental and perceptual restrictions as discussed earlier are also urban variables that are subject to alteration.

An extensive site analysis should be undertaken to reveal (ULI, 1983, P. 82): - neighboring land and water uses

- access to the site by highways or railroads

- shoreline configuration and erosion potential

- water resource characteristics (water quality, water depth, flow dynamics, flood potential, etc.).
- soil and subsoil conditions and depth of bedrock
- extreme climatic variations

- exceptional views of and from the site

- pedestrian circulation

- the relationship at ground level with surrounding buildings and open spaces

- the type and location of utility services

- easements, covenants, and deed restrictions

- distinctive cultural or natural features

2.1.2 USER CHARACTERISTICS AND LOCAL NEEDS

Demand is the key issue in determining whether or not private development, which is so necessary in large scale development, will occur. In some cases the amenity of the water is not enough to cover the costs of waterfront development for private developers and other situations must be present for it to occur (ULI, 1983). Presently, many factors exist that favor redevelopment. These include general demographic trends such as increasing population average age, decreasing family size, increasing divorce rates, and increasing single parent families. These all add up to more inner city residents with special demands for recreation and open spaces (Outdoor Recreation Policy Review Group, 1983). Almost 47% of adults in a 1978 Gallup poll participated in physical fitness activities as compared to 24% in 1961 (USORRRC, 1983). The age group 25–34 had the largest growth rate and was the prime recreation market because of high levels of disposable income, personal interest, and mobility in 1979 (USORRRC, 1979). On top of this, good retirement plans and earlier retirement is increasing the recreation market for the elderly (USORRC, 1979).

Recreation activity participation rates as reported by the USORRRC (1983) were as follows:

TABLE 1 - RECREATION ACTIVITY PARTICIPATION RATES

Picknicking	73%
Swimming	70%
Driving for Pleasure	69%
Walking for Pleasure	68%
Sightseeing	62%
Attending Outdoor Sports	61%
Fishing	55%
Nature Walks	49%
Bicycling	47%
Attending Outdoor Culture	40%
Camping	37%
Power Boating	35%
Hiking	28%
Hunting	20%
Water Skiing	17%
Horseback Riding	15%

It should be noted though that participation in many forms of recreation increases and decreases in cyclical fashion (USORRRC, 1983). This can be for a variety of reasons ranging from economic conditions to technological changes to fadish popularity. The amount of leisure time can also influence participation in recreational activity but this does not appear to be due to the number of free hours but rather to the size of free time blocks (USDI, 1979). Cultural factors can also influence participation rates with certain ethnic, age, or sex groups participating more in certain activities than others (Burke & Silverman, 1977). As Gold (1979) points out, this is affected by individual or group recreation desires which can be resource directed (dependant on contact with high quality natural resources) image directed (dependant on the fulfillment of a desired image), or leisure directed (dependant upon the pleasurable consumption of leisure time).

Local needs and availability are also key factors in participation in recreation activities and according to the 1977 Nationwide Outdoor Recreation Survey (USDI, 1979) 1/3 of city residents have to go outside their own neighborhoods to find a public recreation facility. With the recent increases in transportation costs it is even more critical that close-to-home recreation opportunities be provided (US Department of Housing and Urban Development, 1972). Other factors that influence participation include entrance fees, lack of knowledge, lack of experience, satisfaction levels, life cycle stage, income, and perception of resource characteristics (Burke & Silverman, 1977).

Local groups are also conscious of employment opportunities and the importance of ports are generally considered of high economic value to the residents of cities within which they are found (Ministry of State and Urban Affairs, 1978). This naturally leads to conflicts of uses that are difficult to resolve and the greater the range of potential uses of a waterfront, the greater the potential competition and conflict between uses. Access is also a critical factor to both resident and non-resident participation. Even though 70% of Americans live within 1/2 mile of public busline, these systems are infrequently used for access to public recreation areas and automobiles remain the chief form of transportation (USORRRC, 1979).

Public perception can be improved through public investment in an area and private investment will follow once people are attracted to an area (ULI, 1983). However, public investment does not guarantee that an area will be or will continue to be well-used. The USDI reported in the 1977 Nationwide Outdoor Recreation Survey that perceived deterrants to using outdoor recreation facilities included:

- Lack of time

- Areas too crowded

- Lack of money

- Lack of information about opportunity

- Recreate mostly at residence

- Interesting areas not convenient

- Areas had pollution problems

- Lack of interest

- Personal health reasons

- Lack of transportation

- Area is poorly maintained

- Personal safety reasons at area

The USORRRC reported in 1983 on low-income inner city residents percieved deterrants and they included lack of facilities #2, health #4, different family interests #6, young children to care for #8, no friends to participate with #10, and too tired #12 (USORRRC, 1983). Although personal safety was rated low on the list it is still perceived as a violent crime problem. However, larceny, vandalism, and drug abuse statistically occur much more frequently than violent crime in parks and this can be

addressed by designing facilities that discourage this behaviour, staffing the areas, providing adequate programs, and practicing proper maintenance USORRRC, 1979).

In order to have positive perceptions of public recreation and open spaces, they must be both interesting and inviting (ULI, 1983). This is a design problem but first it must be determined what the public wants. A citizen survey in Marquette showed that 48% wanted a multi-use redevelopment, 52% wanted a "Fisherman's Wharf" type development, and 29% wanted it strictly recreational. Citizen input such as this has many flaws but at least it solves the problems caused by using secondary data based on socio-economic factors to determine public demand (Burke & Silverman, 1977). However, we are still left with the problem of changing preference patterns to the point that the San Francisco Bay Conservation and Development Commission does not keep user statistics for recreation and open spaces. They feel that general guidelines are not very helpful as each site must be examined individually, plus, changes causing the increase in windsurfing participation and decrease in boat sales in the San Francisco area would have been very difficult to predict from studying user rates as they were primarily caused by declining personal incomes due to high unemployment (Pendleton, 1983).

Three major findings of the ORPRG (1983) were: 1. outdoor recreation is urgently needed near metropolitan areas 2. although considerable land is available it does not effectively meet demand 3. to meet this demand more funding is necessary.

2.2 TYPES OF RECREATION AND OPEN SPACES

Recreation and open spaces vary greatly in both form and function. Both the activity oriented and relaxation oriented individual should be accommodated. This may mean a multitude of choices are present when designing a recreation and open space system for an urban waterfront redevelopment. Some forms may be purely functional and suited to specific activities, others may be flexible in purpose or merely for aesthetics or visual access to the water.

2.2.1 ACTIVE RECREATION AND OPEN SPACES

The recreation potential of an urban waterfront is larger than the traditional water-based activities in that it encompasses activities which are more urban in nature (ULI, 1983). The facilities for these activities can range from; ballfields, golf courses, skating rinks, tennis courts, pools, shooting ranges, skateboard parks, ball courts, playgrounds, etc. These types of facilities typically are characterized by seasonal use, weather dependancy, equipment need, specific designs, limited adaptability, skill orientation, intensive use, and often indoor settings

Because something is specifically designed for a certain activity does not assure usage or necessarily satisfy demand as can be seen by the fact that 47% of a nationwide sample cycled regularly but only 6% used federal bikeways in the 1977 U.S. Nationwide Outdoor Recreation Survey (USORRRC, 1979). Trends are also difficult to predict as many people are currently taking up indoor activity to ensure year-round fitness (ORPRG, 1983). In 1979, racquetball and soccer were the fastest growing sports (USDI, 1979). Since then, racquetball has slowed to a certain extent with aerobic exercise and weight training increasing in popularity.

The market for female recreational activities has recently boomed (USDI, 1979) but several other group markets remain virtually untapped. Recreational facilities for the disabled, elderly, and lower income groups have yet to be firmly established, especially along urban waterfronts (HCRS, 1980). Where they have been established, such as free sailing lessons for low income youth in Boston, response has been strong (HCRS, 1980).

The Bronx River Restoration is an example of a mixed-use waterfront redevelopment with a strong recreational component. It is modelled after Riverwalk in San Antonio and includes walkways, bikeways, boat launches, playgrounds, picnic areas, as well as more passive recreation facilities. A non-waterfront development, but of interest anyway is an inner city apartment development in San Jose, California which has 4 major courts, each alloted to a specific age group as well as communal facilities shared by all (Schmertz, 1970). For example, the pre-school courtyard contains climbing apparatus, play decks, tunnels, bridges, sand boxes, hills, etc. The 5–12 year old courtyard contains a tower and slide, net climber, swings, merry-go-round, log climb, etc. The 10–14 year old courtyard contains game tables, a geodesic dome, seating areas, etc. The 14+ year old courtyard contains badminton courts, shuffleboards, a horseshoe pitch, tetherball pole, volleyball net, etc. Shared facilities include tennis courts, a pool, and playfields.

There have also been some unique recreational spaces developed for either non-traditional recreation activities with non-traditional materials and labour. One example of non-traditional material and labour is "The Park" in the "Hell's Kitchen" area of New York. It was a vacant lot used for stripping stolen cars and with volunteer labour was rebuilt using scrap materials such as a cargo net and cable spools for a climbing apparatus (Schmertz, 1970). An example of non-traditional public recreational activities is a USDA funded project in 6 U.S. inner cities where garden plots are grown by local residents (mainly seniors and children) for both recreation and as source of free fresh vegetables (Lopez, 1983). It has been found to be therapeutic for the participants which include alchohol and drug rehabilitation patients, environmentally positive in cleaning up vacant lots, and aesthetically pleasing to the neighborhood.

2.2.2 PASSIVE RECREATION AND OPEN SPACES

Although the fastest growing recreational activities are active ones such as tennis and jogging, passive recreation continues to dominate in total hours in participation and this is projected to increase as the Baby Boom ages (USDI, 1979). The types of

recreation and open spaces that are commonly referred to as passive areas include, trails, gardens, landscaped parks, picnic areas, beaches, nature centers, museums, historic attractions, viewpoints, galleries, and libraries. These areas are characterized by often having; the ability to accommodate multiple uses, possible historic value, importance as elements in urban design, ability to reclaim derelict facilities, possibility for year-round use, accessibility to the handicapped, and comparatively steady flow of use (USORRRC, 1979).

These spaces can be provided in a number of key ways. For example, street ends allow for the opportunity to provide view corridors if left as unbuilt recreation or open space (ULI, 1983). This can be active recreation space but it is best suited as unobstructed passive open space. Allowing for changes in topography, orientation, and facility, (such as in undulating and windy walkways punctuated with different attractions), can provide a variety of visual and physical experiences rather than having a boring flat plane of homogenous open space.

The inclusion of passive recreation and open spaces along waterways provides vegetative buffers to filter out pollutants before they reach the water and these need not be capricious in width (EPA, 1977). In New Orleans, an esplanade is under construction and will stretch along the river grade when possible and over port facilities when necessary (Dixon, 1975). Davenport, Iowa is using it's river levees to locate roads and trails on top and overlooking the river (HCRS, 1979).

An emphasis on atmosphere is especially important when building passive recreation and open space since so many people use them for their aesthetic and cultural value. Greenwich, Connecticutt has outdoor lighting in brass and copper marine lanterns in their Palmer Point waterfront redevelopment (ULI, 1983). The South St. Seaport in New York has located 5 historic vessels as well as maritime museum and galleries to develop the atmosphere (NOAA, 1980). The previously mentioned Bronx River Restoration has future designs on incorporating an amphitheatre/arts building and
a reconstructed watermill (NOAA, 1980).

2.2.3 COMMERCIAL RECREATION AND OPEN SPACES

It must be recognized that private concerns supply a significant portion of our recreation and open space opportunities in North Anmerica. In 1965, the U.S. Bureau of Outdoor Recreation reported 132,000 private recreational enterprises owning 39 M. acres of land and attracting 1.2 B. patrons (cited in Smith, 1973). It was also estimated that 62.4% were under-utilized, 24.1% were at capacity, and 13.5% were over-used. It would appear then that there is no lack of entrepreneurs but there may be a lack of direction. In fact, the ORPRG (1983) has reported an increase in private recreation goods and services over the last 20 years due to imporved incentives for the private sector in the U.S. The largest commercial recreation interests lie in specatator sports facilities, travel and resorts, vacation homes, theatre, movies, television, and radio (Smith, 1973).

Corporations are becoming much more actively involved in providing recreation and open space not only for employees but the public at large. An example of this would be the Atlantic-Richfield Oil Company which has converted 14 defunct service stations into mini-parks (USDI, 1979). A number of private plants have built on-site recreational facilities such as tennis courts on the roofs of buildings (USDI, 1979). The Reynolds Metal Co. has provided recreation and open space in a waterfront setting by restoring locks, and building an urban waterway park in its new plant that spans the James River in Richmond, Va. This has resulted in waterfront access to employees, tour groups, residents, and visitors along a walkway that includes benches, viewpoints, educational/historic signs, and plantings (Ferebee, 1977).

It has been suggested that in an urban waterfront redevelopment, off-shore facilities should be leased to private concerns for both operational efficiency and liability concerns (ULI, 1983). Onshore facilities can be leased depending upon whether they are profitable and if there are operational advantages to doing so. Newport, Rhode Island, always had a private fish market of some kind and now has had it refurbished as part of the waterfront redevelopment to act as a heritage and tourist attraction, while leaving it in control of the perfectly capable private entrepreneurs.

2.2.4 PUBLIC RECREATION AND OPEN SPACES

The provision of public recreation and open spaces in urban waterfront development is by necessity turning to compromise solutions of mixed-use developments due to the financial feasibility of involving the private sector (NOAA, 1979). This often means the inclusion of facilities adjacent to non-traditional uses such as in Baltimore where the new aquarium is beside a converted generating plant/hotel and existing port facilities (NOAA, 1979).

Transportation routes provide a frequent opportunity for converting to recreation and open spaces. They can be converted to trails if not used or decked over if still in use. Relocation is a third but very costly alternative (HCRS, 1980). Illinois Center in Chicago has decked over transportation routes and linked the waterfront and CBD with walkways, cultural facilities, shops, and landscaped open space on the top (Witherspoon, 1976). Scattle is planning to turn the ground level Alaskan Highway into a public garden with pedestrian level lighting and pathways, as well as widening the sidewalk into a promenade (City of Seattle, 1983). This is in keeping with public demand where more pedestrian trail systems need to be emphasized in urban areas (USDI, 1979).

The re-use of historic buildings present along urban waterfronts is another popular method of gaining recreation and open space. Many of them have become abandoned and it is often more efficient to rehabilitate them than to demolish and rebuild indoor facilities which are convenient, in great demand, independent of weather, but very expensive to build (USDI, 1979). The conversion of garbage dumps and sanitary landfills can be another oportunity along urban waterfronts for increased recreation and open spaces. It must be noted however that strict controls must be applied to check the condition of the site. Gasworks Park in Seattle, a converted gas plant, is currently closed and under E.P.A. investigation for dangerous levels of soil contamination.

Many by-products and materials from other public or private agencies can be utilized for the construction and maintenance of public recration and open space in order to cut costs. For instance, parklands can be irrigated with treated sewage effluent, thereby conserving both water and fertilizer. Burnt coal by-product can be used for ash along bike or pedestrian pathways (USDI, 1979).

Decking over water and land filling has been used extensively in Manhattan to obtain open space for 1/4 – 1/2 the onshore land prices (Dixon, 1975). This decking is designed in over-hang fashion to provide covered area in arcade fashion (Dixon, 1975). Because of the possibility of multiple levels, escalators and elevators are sometimes necessary as was the case in the Midtown Manhattan project (Progressive Architecture, 1975). Isolation from ground level inhibits use to a point in these projects but it is argued that the solitude is beneficial in such an urban environment (P.A., 1975). Manhattan Landing has provided a single level deck which steps down to the river's edge and results in a 2.6 acre park that links up with a pedestrian promenade (P.A., 1975) Seattle is proposing partially covered pavillions on unused piers that also will descend by steps directly into the water (City of Seattle, 1983).

Landscaping and terracing has been used to screen the railway running along the waterfront from the recreation facility in Little Rock, Arkansas (HCRS, 1980). As well, pedestrian pathways are recessed into the riverbank to divorce them from the CBD and a pedestrian bridge linking the waterfront and the CBD is covered and heated (HCRS, 1980). Toledo, Ohio has begun redeveloping their urban waterfront and are including such innovative recreational facilities as trolley rides, a lagoon, an international village and festival grounds, as well as more common recreation and open spaces. It should be noted however, that they are having difficulty funding it to completion (HCRS, 1980). Savannah, Georgia is having similar problems and is leaving out public restrooms in order to minimize cost, vandalism, and maintenance (HCRS, 1980).

San Francisco's Embarcadero Gardens will incorporate a showboat theatre, a "boatel", historic shops, floating restaurants fountains, food fair, carousel, covered play area, and a public fishing pier (HCRS, 1980).

Due to severe winter weather, a hard-edged redevelopment is occurring in Le Vieux-Port de Montreal. Plazas, planters, benches and walkways are surrounding heritage features such as the Sailor's Memorial Clock Tower, locks, a drawbridge, and historic buildings. A large marina and sailing school is planned and bars and restaurants will be included but much of the design will be dictated by weather considerations (Port de Montreal, 1983). Although not totally necessary due to a more moderate climate, Seattle's waterfront park has a similar hard-edged appearance with unadorned concrete and creosote-soaked planks (P.A., 1975). An aquarium with underwater viewing into Puget Sound, a fish hatchery, and fishing holes in piers (simulating ice fishing) serve as unique attractions to the area (NOAA, 1979).

Denver's South Platte Riverway is a more soft-edged example with a 17 mile greenway containing both passive and active public open spaces. Facilities such as archery and gun clubs, kayak runs, golf courses, beaches, and nature trails are included but at present operating costs are a problem (HCRS, 1980).

Maintenance costs are also a problem in San Diego where the 3.5 mile Embarcadero includes large landscaped areas and beaches separating hotels and retail facilities (ULI, 1983). Undulating berms serve as physical and visual separation of uses as well as providing seating walls along the waterside. Portland's Williamette Park has made an important step by making everything fully accessible to the handicapped. They have also provided tennis courts on top of buildings in the residential sector (ULI, 1983).

The inclusion of local ethnic and heritage themes was important to Tulsa, Oklahoma River Park's success. An "old west" playground and an American Indian Heritage center were imaginative additions to the project and the programming of special events has aided in a steady growth of visitors which was at 2 M. in 1980 with the project not yet complete (HCRS, 1980).

Norfolk, Virginia has included such innovative attractions as a people mover that doubles as a fun ride and a Jacques Cousteau oceans center, as well as funding an organization called "Festevents" that is responsible for programming any events for the waterfront park.

Boston has combined historical preservation, recreation, retail and industry through the redevelopment of it's waterfront. Navy Pier has maintained it's shipping function while restoring historical structures and adding recreational facilities. A dry dock has been permanently flooded with a promenade encircling it and the adjacent 16 acre Shipyard Park has included marine oriented plantings and design in an attempt to improve the area image (ULI, 1983). Faneuil Hall Marketplace, developed by the Rouse Company has been a booming success due to a large extent the fact that it has both day and night activity businesses such as flower sellers open 24 hours a day, and good pedestrian links to both the waterfront park and the CBD (Ferebee, 1977). Walsh (1968) feels that the construction of the adjacent waterfront park was the key to providing an attractive setting and reinforcing the credibility of the overall project.

2.3 CASE STUDIES OF RECREATION AND OPEN SPACES IN NORTH AMERICAN URBAN WATERFRONTS

2.3.1 SAN ANTONIO'S RIVERWALK

Due to conservation status since 1924 the San Antonio River has always been a mixture of plant and floral species (Gunn, 1974). The development of the central city portion of the river has progressed over 50 years and resulted in "... the most outstanding example of an urban greenway, a tribute to this far-sighted city..." (EPA, 1980, P. 35).

The Riverwalk is broken up into four distinct areas. Area A (FIG. 1) has landscaped walkways with no shops. Area B has the walkway flanked by hotels, a hospital, and a library. Area C includes shops, restaurants, hotels, and entertainment facilities flanking the walkway. Area D is a man made landscaped link between the Riverwalk and the civic center. The location of the Riverwalk is one level down from the city and the same level as the river, therefore providing a distinctive character change from the city.

Exising adjacent uses have been inventoried and attempts are made for matching similar activity levels along the Riverwalk (P.A., 1975). Previously street oriented businesses have inverted to face the river or added entrances along the river (Gunn, 1974). A variety of links and connections go through buildings, down spiral staircases and beside bridges. It is patrolled and well-lit, and all of this adds up to the perception of it as safe, accessible, unique, urbane, and offering a variety of activities from restful to exciting (P.A., 1975).

A 1971 Texas A & M University user survey (Gunn, 974) found that although 74% of users were visitors, no conflicts were reported or observed with local or ethnic groups. A wide range of user age was found and although there are 2.5 million visitors/year, many commented that they came to relax in a peaceful setting away

- Area A landscaped walkways along the river, open space, footpath linkage with the core and upper San Antonio, no commercial outlets.
- Area B destination greenspace area with hotels, a library, and a hospital; both sections are heavily verdant.



- Area C landscaped setting featuring many shops, restaurants, hotels, and places of entertainment.
 - Area C man-made excavated area that links the Riverwalk with the civic center theatre, exhibition, and arena.

FIGURE 1 – San Antonio's Riverwalk

from the city. In addition, a survey of voters (Gunn, 1974) found that 98% had visited the Riverwalk, 97% said it was of value to the tourists, 81% said it was of value to the city, and 75% said it was of value to them. San Antonio's small size has probably helped generate community response, and development pressures have been low therefore allowing uninterrupted growth (Papademetriou, 1975). However, Gunn (1974) feels the success has been due to its diversity of activity combined with a compatability of adjacent land uses.

2.3.2 TORONTO'S HARBOURFRONT

The city of Toronto has a history of land-filling in it's water harbour area and building rail lines and roadways along it's waterfront. The original redevelopment idea in the 1970's for this area was to create a large urban park but this would only have been usable 6 months/year. Instead, what happened is that 'Harbourfront' was developed with climate in mind, as the summer is pleasant with lake breezes but the winter is severe. (FIG. 2) Buildings, trees, and landscaping are used to block winds and walkways can be enclosed in in glass in winter. A glass covered garden called "Winter Gardens" is in full bloom year round and provides a well needed respite from the bleak Toronto winters.

The positive features of the site upon redevelopment were; single ownership (Federal Government), southern exposure, large amount of shoreline, water views, and proximity to CBD (ULI, 1983). The negative features were; physical and visual barriers, poor infrastructure, incompatible land uses, restricted access, and wind exposure (ULI, 1983).

Visual access was maintained wherever possible with downtown by leaving major street ends open that connected the waterfront to the CBD. Trees and plantings were not only used as windbreaks but also to enclose open space and orient it to the water (ULI, 1983).

- A. QUEEN'S QUAY TERMINAL
- B. ICE HOUSE
- C. YORKQUAY CENTER
- D. PIER & RESTAURANT E. QUEEN'S QUAY WEST
- FRANCOPHONE CENTER F.
- G. PRODUCE BUILDING H. TELEVISION STATION-MULTICULTURAL CENTER
- I. CANADA MALTING
- J. SOCLER FIELD
- Κ. PLAYGROUNDS
- L. HARBOUR POLICE M. RAILWAY MUSEUM



- 'N. PROPOSED MARINA
- 0. PUBLIC OPEN SPACE
- P. UNDERWATER TRAINING CENTER
- Q. TORONITO BRIGANTINE
- R. SAILING SCHOOL
- S. ANTIQUE MARKET
- T. WALLY MAGOO'S MARINEBAR
- U. OUT DOOR STAGE
- V. POND
- W. CANADIAN OPERA CENTER
- X. PERFORMING ARTS TENT
- Y. TOUR BOATS
- Z. WATERFRONT PROMENADE

200 400 METERS

Of the 92 acres that is Harbourfront Park, 43% is devoted to open space, 27% is mixed use buildings, 22% is in water lots, and 8% is for circulation (ULI, 1983). New canals are being constructed on old quays and open space is being left at the head of slips. A 16' 4" promenade will extend uninterrupted the length of the project and will have street furniture, plantings, pedestrian lighting, uniform signage, decorative paving, sheltered alcoves, and pergolas on the land side, and lighting alont the water's edge. Portions of the walkway will be covered and some open space will be sheltered and covered. All ground level use is public oriented and special features such as ornamental fountains are provided to heighten the sense of place (ULI, 1983).

Recreational facilities that are provided include (Harbourfront Corp., 1983):

- atrium (Winter Gardens)
- art gallery
- restaurants/bars
- outdoor dance floor
- learn to sail/canoe schools
- railroad museum
- tour boats and Brigantine sailing trips
- underwater training center
- pond for skating and model boat sailing
- Francophone center
- ice rink
- shoe museum
- antique market
- trim trail
- picnic areas
- sports fields
- marina
- dance theatre

An adventure playground is modelled after post WW II bombed out city block playgrounds where children have scrap material to make their own play equipment with. A creative playground is for younger children where movable, interchangable components are supplied and the children arrange them at will. Both playgrounds are continually evolving and have been very successful but they require supervision.

In 1974 there were 15,000 visitors to Harbourfront and by 1983 that had grown to 2 million (Harbourfront Corp., 1983). An important part of this success has been not only the variety of activities but the programming. Harbourfront started off with special events to reintroduce the waterfront to the residents and has continued to provide a postive image with continuing programs co-ordinated by the Harbourfront Corporation (ULI, 1983).

2.3.3 BALTIMORE'S INNER HARBOUR

Inner Harbour is a 250 acre area surrounding the harbour basin. It has a wide promenade encircling the water and connecting a number of recreation and open spaces. (refer to FIG. 3) An elevated walkway will connect the Inner Harbour to Charles Center in the downtown core (P.A., 1975). Open spaces were first obtained when deteriorated waterfront structures were demolished. The positive features of the site were it's proximity to the CBD, little competing demand at the time of redevelopment, access to the Atlantic Ocean, and the tight horseshoe shape conducive to establishing an identity (ULI, 1983). The negative features of the site were it's rundown appearance, poor public perception, and physical barriers (roads) separating it from the CBD (ULI, 1983).

Harbourplace is the central showpiece mixed-use development of the Inner Harbour. Rouse and Company designed the buildings to frame the view from the CBD to the center of the waterfront and the flagship "Constellation". A 200 foot plaza/amphitheatre was constructed between the two buildings that is Harbourplace to allow for visual access and to break up the mass of the project (ULI, 1983). Public viewing from Harbourplace itself was accomplished by designing roll-up exterior doors and covered outdoor porches and terraces (ULI, 1983). Recreation and open space is varied and includes (Charles Center Inner Harbour Management Inc., 1983):

- aquarium
- "Nobska" steamer/restaurant
- Top of the World Exhibit Center and Observatory Deck
- sailboat/pedalboat rentals
- U.S. Frigate Constellation



- A. AQUARIUM
- B. WORLD TRADE CENTER
- C. SMALL BOAT RENTAL
- D. CONSTELLATION MUSEUM
- E. CEREMONIAL LANDING
- F. MCKELDIN SQUARE
- G. WATERFRONT PROMENADE
- H. PUBLIC OPEN SPACE
- I. FINGER PIERS
- J. WATER STAGE
- K. INNER HARBOUR MARINA
- L. PLAYING FIELDS
- M. FEDERAL HILL

- N. INTERNATIONAL PAVILION
- O. MARYLAND SCIENCE CENTER
- P. PUBLIC PARKING
- Q. APARTMENTS
- R. HARBORPLACE
- 5. CONSTELLATION PLACE
- T. HYATT REGENCY HOTEL
- U. CHART HOUSE RESTAURANT
- V. NOBSKA FLOATING RESTAURANT
- W. SUBMARINE TORSK
- X. LIGHTSHIP CHESAPEAKE
- Y. PIER & CONCERT PAVILION
- Z. PUBLIC WORKS MUSEUM

- Constellation dock concerts and tour boats
- McKeldin Square (fountain and park)
- brick promenade (walkway, plazas, sculptures, kiosks)
- public wharf
- Baltimore Clipper
- Fort McHenry (birthplace of the "Star Spangle Banner")
- floating stage/bandstand
- marina
- restaurant/bars
- sports fields/stands
- Federal Hill (historic lookout and park)
- art gallery
- zoo
- street car/railway museums
- historic houses
- International Pavilion (open-air shelter)
- picnic area
- wooden sculpture playground
- Maryland Science Center (museum/planetarium)
- pedestrian bridges
- specialty shops
- tea museum
- night club
- Civil War Museum (planned)
- submarine "Torsk"
- lightship "Chesapeake"
- industrial museum
- antique carousel
- Harbourplace Plaza/amphitheatre/fountain
- performing arts tent
- movie theatre
- public works museum

Attendance at Inner Harbour attractions was prompted with an aggressive program of activities in the early 70's and in 1973 the Baltimore City Fair moved to the waterfront and attracted 1.5 million visitors on the Labour Day long weekend (ULI, 1983). New activities and facilities continued to be added, such as the performing arts tent, Harbourplace, and the aquarium in 1981. The aquarium was projected to draw 400,000 - 600,000 visitors/year but drew 1 million in the first 7 mos.(ULI, 1983). Harbourplace (which is a fair-like marketplace with street performers, musicians, and vendors) drew 18 million visitors in its first year and had double the sales of conventional regional shopping centers (ULI, 1983).

Currently the Inner Harbour attracts 20.6 million visitors/year. It is estimated that 14.4 million are from the Baltimore SMSA and 6.2 million are from outside the

area (Rouse, 1982). The Inner Harbour is largely a day trip visitor destination and it is recognized that there is a limit for visitation from the Baltimore market (CCIHM, 1983). Attendence patterns are fairly typical with lighter but steady attendance through the week and heavy attendance on the weekend, especially Saturday. The same typicality applies to monthly attendance with lighter attendance from November – March and heavier attendance from April – October (CCIHM,1983).

Annual attendance at selected attractions are:

TABLE 2 - Inner Harbour Attractions Attendance

ATTENDANCE IN 000'S

	1979	1980	<i>19</i> 81	1982
Harbourplace	N.O.	N.O.	13000	16100
National Aquarium	N.O.	N.O.	713	1600
Top of the World	N.A.	250	315	312
Science Center	173	180	214	269
Constellation	N.A.	92a	254a	363
Torsk/Chesapeke	N.A.	48	103	125
Pier 6 Pavillion	N.O.	60a	N.A.	N.A.
Ethnic Festivals	N.A.	3463	4093	N.A.
Zoo	300	351	320	N.A.
Fort McHenry	544	615	673	N.A.
Flag House	12	15	18	N.A.
Walters Art Gallery	N.A.	174	158	N.A.
Carroll Mansion	13	18	19	N.A.
Mt. Clare Mansion	4	4	4	N.A.
Baltimore City Fair	N.A.	1800	1800	N.A.
Babe Ruth House	5	5	5	N.A.
Edgar Allan Poe House	N.A.	N.A.	5	N.A.
Peace Museum	N.A.	N.A.	8a	N.A.
Street Car Museum	16	10a	14	N.A.
B & O Railroad Museum	71	75	87	N.A.

a. Partial Year; N.A. Not Available; N.O. Not Open

3. VANCOUVER WATERFRONT REDEVELOPMENT - A CASE STUDY OF GRANVILLE ISLAND RECREATION AND OPEN SPACE

The city of Vancouver has recently undergone some redevelopment of urban waterfront areas and more are planned or in the process of construction. Vancouver has had a classic North American port settlement and growth pattern with its naturally protected harbour and trading center role (Burke & Silverman, 1970). Vancouver has developed as Canada's major port with the vast majority of Canadian commodities traded with Asia passing through the area. However, terminal capacity and rail capacity within the Vancouver urban core area are inadequate to handle future forecasted volumes. The United Nations Food and Agriculture Organization forecasts a 100% increase in Far East population by the year 2000, bringing it to 60% of the world's population (Burke & Silverman, 1970) and Vancouver will continue it's major role in Pacific Rim trade if it can adapt to the resulting increase in trading volumes.

In Greater Vancouver, industrial uses are not able to pay as high a rent or produce as high a return for land as most uses can, especially commerical uses (Burke & Silverman, 1978). The trend has therefore been in Vancouver, as in other port cities, to have a steady relocation of port facilities outside of the urban core area (such as at Roberts Bank).

The supply of recreational waterfront land in Vancouver looks ideal when compared to other North American cities and it has increased 2.8 miles during the 1961–1981 period to a total of 10 miles out of approximately 40 miles of waterfront. (Vancouver City Planning Department, 1983). But on closer inspection it is evident that some areas are inaccessible (West Point Grey, western Burrard Inlet) and others are underdeveloped (eastern Burrard Inlet). So although Vancouver has a comparatively large supply of recreational waterfront land part of this is because it is blessed with a large supply of waterfront land in total.

FIGURE 4 - Vancouver Region



The city has its largest population concentrations in the 25-34 and 65 and over age groups. Renters account for 53% of the population, 46% are childless, 51% (over 15) are married and 32% (over 15) are single. (Vancouver City Planning Commission, 1980). The 35-49 age group is expected to increase by 70% and the 50-64 age group by 47% by the year 2000. (Vancouver Board of Parks and Recreation, 1982). The most important age structural change will be the increase in mean age from 29.6 to 36.6. Along with increasing age, increased population density in the innner city and the multcultural nature of the city are trends that will affect leisure activities (VBPR, 1982).

3.1 URBAN CORE AREA DESCRIPTION

The urban core area encompasses a number of local areas as illustrated in FIG. 5, and 34% of the city population (140,657) live in the core area (VCPD, 1983). All local areas that increased in population between 1976-1981 were in the core or on the east side. Overall the core grew by 5400 or 4%, primarily due to increased housing stock in False Creek South and Fairview Slopes (VCPD, 1982). Local growth rates within the core are as follows:

TABLE 3 - Vancouver Urban Core Growth Rate: 1976-1981

	1981 Population	Population %
CBD	6.256	5.41%
Fairview	17,489	14.68%
West End	36,950	1.37%
Strathcona	10,577	7.76%
Mt. Pleasant	20,665	7.69%
Grandview-Woodlands	24,982	4.18%
Vancouver City	415,549	1.12%

SOURCE: Vancouver City Planning Department, 1982

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Increase

Core area demographics are skewed towards the 20-35 and 55 and over age groups. The 1976 area distribution comparison between the core and the rest of the Census Metropolitan Area (CMA) illustrates this: TABLE 4 - Core Area and CMA Demographics

AGE	CORE AREA (1976)	C.M.A. (1976)
0-19	18%	31%
20-34	33%	26%
35-54	21%	23%
55+	27%	20%

SOURCE: Vancouver City Planning Department (1976)

3.2 RECREATION AND OPEN SPACES IN THE CORE AREA

Park space in the urban core area has increased from 1.19 acres/ 1000 residents to 1.36 acres/1000 residents during the period 1961–1981 (VCPD, 1983). However this is still below the Vancouver Board of Parks and Recreation recommendations of 2.5 – 3.0 acres/1000 residents and the city average of 6.2 acres/1000. This is well below the nationally recommended ideal of 10 acres/1000. Edmonton has a city average of 14.8 acres/1000 and Kitchener has a city average of 8.7 acres/1000 (Burton et al, 1977). Community centers have increased in supply from 1/120,000 residents to 1/20,000 residents during the 1961–1981 period (VCPD, 1983), which is at the recommended Parks Board level.

Recently, development of neighborhood parks, street end parks, and port-a-parks (temporary parks) has been undertaken in the West End and CBD to service local residents (VBPR, 1982). While playing fields are also greatly needed in these areas and other core areas such as Fairview, Mt. Pleasant, and Grandview Woodlands, the limited amount of parkland or open space precludes it (VBPR, 1982).

The core area has a large amount of waterfront because of its peninsular configuration. All areas have some form of waterfront access (refer to FIG. 5). Unfortunately the West End, Kitsilano, and Fairview are the only areas that have



recreational waterfront land uses (excluding Stanley Park, as it is regional in nature). Restrictive access industrial uses are present along the Central Waterfront and False Creek shorelines. This is changing rapidly though as False Creek South and Granville Island have been redeveloped in the past decade, the north shore of False Creek and the Central Waterfront are in the process of redevelopment and recreational waterfront lands will be included in these projects.

In Vancouver, as in Canada and North America in general, there has been a marked increase in fitness activities (VBPR, 1982). Female participation in recreational pursuits has increased substantially and is continuing to do so (VBPR, 1982). Although the senior citizen population in Vancouver is large, it has not increased recreational participation significantly and this is thought to be a problem of access more than lack of desire (VBPR, 1982).

Activity preferences in Vancouver were found by Joardar (1975) to be correlated with several demographic characteristics. Active recreation was high for 16–20 year olds and this was found to decrease with increasing age. No relationship was found between age and passive recreation participation. Joardar did find that visits decreased significantly as distance from neighborhood parks became greater than 900'. This was especially true for sub-teenage groups, therefore giving credence to neighborhood tot-lots.

Dhar (1975) found that children and mothers were the most frequent users of neighborhood parks in Vancouver, and that seniors were not frequent users. He also agreed with Joardar in the fact that teens use active recreation facilities and that distribution is not as critical as access to them.

The Vancouver Board of Parks and Recreation (1982) found that 13% of neighborhood park users jog or exercise; 10% that are involved in organized recreation participated in fitness programs; and walking, unorganized sports, children's play, and sitting were the most popular activities.

3.2.1 USAGE OF RECREATION AND OPEN SPACES

From 1960 – 1980 the core area of Vancouver underwent many changes physically, socially, and culturally. It grew from a small town orientation to a cosmopolitan city. With this, "city amenities" such as restaurants and cabarets have increased/100,000 residents but more "small town amenities" such as pubs have just kept pace (VCPD, 1983).

Professional sports teams have increased in numbers as has participation in many sports. Softball, gymnasium, and soccer facilities in the core area are limited and strained to capacity use (VBPR, 1982). Tennis and boating facilities have excess demand, especially for small boat sailing and night or indoor tennis (VBPR, 1982). In the Vancouver Residents Survey, 37% of respondents participated in tennis and 31% were more than once/year participants.

Participation in organized hockey has been declining but there is evidence that this trend may be reversing with ice usage at capacity in the West End Ice Rink and adult hockey participation increasing (VBPR, 1982). Football has also experienced a decline in participation throughout the city, but touch football participation has grown dramatically in the core area and city in general (VBPR, 1982). Increased numbers of adult swimmers have kept core area swim facilities up to capacity despite a decline in children's participation (VBPR, 1982). Golf participation has been fairly stable with a slight decrease experienced in pitch and putt participation. A total of 17.4% of respondents in the Vancouver Resident's Survey participated in golf, and facilities are considered adequate at present (VBPR, 1982). However, it should be noted that golfers have an age profile that closely approximates forecasted population age distributions in Vancouver (large participation from 25–39 and 65 age groups).

Cultural events in parks and outdoor settings are well attended and actively encouraged (VBPR, 1982). The supply and use of art galleries and libraries has grown substantially whereas museum usage has been fairly steady (VCPD, 1983). Movie

theatres and stage plays have increased in number and in usage in the core area (VCPD, 1983).

3.2.2 RESIDENT OPINIONS OF RECREATION AND OPEN SPACE

In the city-wide Vancouver Residents Survey 60-70% of respondents declared waterfront access to be important and the age groups from 30-65 found it the most important (VCPC, 1980). Although the public widely supported increasing waterfront access and extending park space, only 33% favoured an increased in the parks and recreation budget (VCPD, 1983). Some other key findings of the Vancouver City Planning Commission (1980) were that respondents:

- placed a high value on landscape and greenery
- felt there was a lack of playing fields
- wanted more access to Burrard Inlet
- wanted a separation of pedestrians, cyclists and motorists
- felt that natural amenities and heritage features should be protected and preserved

Joardar (1975) found that passive recreational activities were favored over active and that walking for pleasure was the most preferred of six active and passive activities measured, with indoor games the least preferred. Scenic value of parks and a quiet environment was found to be very important; privacy was found to be least important (due to safety concerns).

The Vancouver Residents Survey also determined that although activities such as cards, bingo, and carpet bowling were popular with seniors, more stimulating and challenging programs were desired (VBPR, 1982). The survey showed a desire for more activities that appeal to large numbers of youths. The expansion of West End and Kitsilano Community Centers were one of the most often mentioned desired core area improvements by survey respondents. Dance, music, and theatre facilities were felt to

be adequate as 66% of respondents did not favour more facilities and nearly all of the desired additional facilities (85% of the 33% mentioned) were already present (VBPR, 1982). The survey also showed that 38.5% of downtown workers would be interested in participating in fitness classes, racquet sports, swimming, and jogging (VBPR, 1982).

3.2.3 RECREATION AND OPEN SPACE NEEDS

Neighborhoods in the core area that have been identified as "parkpoor" include Grandview Woodlands, Mt. Pleasant, Fairview Slopes, Broadway – VGH, and the CBD (VCPD, 1983). The Vancouver Board of Parks and Recreation (1982) determined that cycling and walking paths are both desired and needed if pressure is to be taken off the transportation system in the core. Heritage attractions and nature interpretation/ecology centers are in short supply and have been popular when incorporated in redevelopments in other North American cities (VBPR, 1982) and are therefore recommended by the Parks Board for inclusion in the core. Additional gym facilities are needed but the improvement of existing facilities are seen as more cost effective (VBPR, 1982). Although 20% of the playing fields in Vancouver are over-used to the point of deterioration and the Vancouver core area has very few playing fields, it may be difficult to justify additional fields when only 5–6% of respondents in the Vancouver Residents Survey made use of them (VBPR, 1982).

Over-crowded conditions exist at the Vancouver Aquatic Center but since swimming participation has levelled off, the Parks Board feels any increase in patronage will depend on new ideas and programs. An indoor pool is planned for the B.C. Place development and this should satisfy any increase in core area demand (VBPR, 1982).

The CBD is the area of the city with the highest potential for population growth (VBPR, 1982). Combine this with the lowest parkland/1000 residents, and it is

evident that recreation and open space needs will be dependent on future residential development in the area. B.C. Place and Central Waterfront developments will be important factors in the meeting of future core area recreation and open space needs.

3.3 CASE STUDY - GRANVILLE ISLAND, VANCOUVER, B.C.

3.3.1 AREA DESCRIPTION AND CHARACTERISTICS

Granville Island lies in the False Creek basin which is south of the CBD in Vancouver (refer to FIG. 6). It is connected to the False Creek South neighborhood by a neck of land and has the Granville Street Bridge running over it connecting Fairview Slopes and the CBD. It is 38 acres in size and in 1975 was redeveloped from an industrial area by the owners, the federal government, with the objective being to create a people place. Public recreation spaces were to be woven around existing industry and streets. Revenues generated by the leases pay the project's operating costs on the criterion that there be no deficit (ULI, 1983). As an attraction, it is regional in nature although it serves the recreation and open space needs of local area residents as well.

The Granville Island open space objective is to allow for multiple use of areas (ULI, 1983). A key design consideration was the definition of street edges by trees, poles, and lights. This along with continuous uniform brick paving allows for equal emphasis between pedestrian and vehicular traffic. A total of 15 acres is open space but this includes roads and parking.

One of the project designers, Norm Hotson, claims that although nearly all waterfront users benefit from their location, only a few genuinely need them. One of these is Ocean Cement Co. whose docks and plant along the waterfront effectively preclude a continuous waterfront walkway around the island.



FIGURE 6 - Fairview Local Area (Source: V.B.P.R., 1982)

The greenspace and active recreation areas are oriented to the southern part of the island for both favourable sun and proximity to the adjacent False Creek South and Fairview Slopes neighborhoods. False Creek South was known to have a disproportionate number of low income families with young children due to rent subsidies in the project. The Fairview area in general (which includes Granville Island, False Creek South, Fairview Slopes and Broadway – Vancouver General Hospital (VGH) neighborhoods), has resident ages concentrated in the 20–34 and 55+ age groups. Females make up 62.4% of the area population (by far the largest area percentage in the city which is 51.4% female overall) (VCPD, 1979). Of the total area population, 78% were childless, 88% were renters, 63% were in the labour force, 39% were single, and 35% renters, 60% in the labour force, 32% single, and 51% married (VCPD, 1979).

The recreation and open space of the area is .8 hec./1000 population as compared to a city average of 1.5 hec./1000 population (VBPR, 1982). This is including the large parks in False Creek South and Granville Island, and even with these the Parks Board considers the areas as open space deficient. Fairview Slopes has only one street end park that was developed privately for community use. There are 7 racquet courts and 6 indoor tennis courts in the area as well as a dance studio, bowling alley and several movie theatres and lounges all supplied by the private sector, mostly in the Broadway – VGH neighborhood (VBPR, 1982).

False Creek South has good recreation and open space but it is poorly distributed (mostly one large open space – Charleson Park) and psychologically and physically inaccessible to many area residents (due to traffic barriers and steep slopes). However, the one playing field in the area in Charlson Park is extensively used by the local school and the community (VBPR, 1982). The Parks Board concluded that the total number of children in the area was relatively low (0-14 = 3.8%) of the

area population compared to 16.4% of city population) and therefore the play facilities present were adequate. It was also concluded that a good range of recreational amenities (private sectors supply, shopping areas, views, etc.) were available to adult residents that could compensate for the lack of open space.

3.3.2 GRANVILLE ISLAND RECREATION AND OPEN SPACES

The types of recreation and open spaces incorporated in the Granville Island redevelopment range from passive greenspace to active recreation facilities. Roadways, the public market and numerous restaurants and bars can also be considered recreation spaces but were not studied as such in the survey. The False Creek Community Center was also not included, although some figures typifying the usage rates and recreation trends are presented (Appendix 1).

1. A large pond surrounded by greenspace with benches and pathways encircling the pond and a bridge crossing over it. It is primarily used by pedestrians, joggers, and cyclists quite a few of which are commuting from False Creek South residential areas.





FIGURE 7 - Granville Island Recreation and Open Spaces

This is called the Waterpark and includes an adventure playground with a variety of climbing apparatus and play devices, as well as a patrolled water playground that has water slides, fire hydrants, hoses and pump spray guns. It is used by children of all ages and has a seating around the edges for parents and observers.

2.



3. This is the main portion of Sutcliffe Park with a large greenspace that is surrounded by trees, landscaping and a pathway. Most people use the pathway for walking, jogging or cycling and a small minority use the central greenspace for things such as frisbee or playing catch.



Both a fishing dock and a boardwalk/viewing platform are included in this space. The fishing dock is used for fishing, sailing school and for tying up small boats. Both facilities are used for viewing.



5. These are the community center tennis courts and are open to the public except during hours when lessons are booked (which are minimal). The facility consists of 3 tennis courts.



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4.

. This is a small greenspace that includes 2 horseshoe pitches and is flanked by tennis courts on one side, a building on another and the community center on a third side.



7. The boardwalk that extends around most of the island begins here and is flanked on one side by grass and trees and the other side by grass, trees and the seawall.



6.

This is the grass amphitheatre and it not only has the boardwalk on two sides but a pathway system up to the peak of a pyramid shaped hill. A stage area is on the S.E. point and benches are provided regularly.



9. The boardwalk here has two small seating areas with grass and benches that look out over the adjacent marina area. It extends around the Granville Hotel and continues past the houseboat community where it ends and users must detour onto Johnston St. to continue around the island.



8.

10. This is a small playround in the center of buildings with swings, teeter-totters, benches and grass. It is used by children to play and adults to sit and relax or eat lunch if they are employed in the surrounding buildings.



11. Waterfront seating and a tie-up dock for small boats are present in this area. The boardwalk also starts up here again and it is used primarily by people going to or coming out of the public market.



12. This is the seating area directly adjacent to the public market and is used by shoppers to relax or eat items bought at the food stalls inside. Entertainers sometimes perform here and can draw large crowds.



13. The boardwalk continues around a parking lot here towards the ferry dock which provides a shuttle service across False Creek. It is used by strollers and people waiting for the ferry primarily.



14. This is a sand tot lot directly behind a restaurant/wine bar and it includes swings and teeter-totters.



15. This small triangular greenspace has benches around it and it is between a parking lot and a bakery which has glass windows for public viewing.



16. The wine bar uses this wooden deck for an outdoor licensed drinking area on nice days, but leaves room enough for the boardwalk around the edge.



17. A marine repair yard is located in this area and the public is free to walk through and observe the work that is going on. However, there is no clear continuation of the public walkway from area 16 or through the yard itself.


18. This is a greenspace with a pathway running through it which is being extended by a boardwalk that is under construction. The boardwalk will link up with he island's access street. The area also has a ramp leading to a marina and a seawall separating it from the marina.



3.3.3 CASE STUDY METHODOLOGY

The recreation and open spaces were studied during March and April, 1984. This period was chosen because it was neither the busy nor the slow season. Dry, sunny days were selected and no holidays or special events days were used. Two weekdays (Tuesday, March 27 and Thursday, March 29) and 2 weekend days (Saturday, April 14, and Sunday, April 29) were the actual days of observation.

The peak periods of use according to the community center staff are noon hour, right after school, and right after work. For this reason 12-1 P.M., 3-4 P.M., and 5-6 P.M. were the hours studied on each observational day. The method of study was counting the individuals using the area during a 1 or 2 minute period that it took to walk through the area and count.

The results were totalled, averaged out for the three time periods, and then compared to the area of the space in square meters (refer to Appendix 2 and 3). This resulted in a figure for the average number of users/square meter for each space.

3.3.4 RESULTS OF THE STUDY

The total numbers show that area 12, the seating area adjacent to the public market, is by far the most often used during the periods studied. Intuitively, the only area that may have come close to it is area 16, the deck outside of the wine bar. It placed second in total numbers but could have been much higher if it had been observed on a sunny summer evening. The waterpark, area 2, could also have had much higher numbers had it been observed on a sunny summer day. This is a recognized weakness of the study and due strictly to limited time available for research. However, it must also be noted that these areas could have fared much worse had they been observed on a cold, rainy winter day.

Areas 11, 13, and 9 are all boardwalk viewing areas on the north shore of the island with views of False Creek and downtown and placed 3rd, 4th, and 5th respectively in total numbers. The waterpark was next in sixth place in total numbers.

Perhaps even more revealing and meaningful is Appendix 2 and the average users/square meter. From this it is evident that area 12 is also the best used per square meter. Far behind in 2nd, 3rd, 4th, and 5th places are areas 13, 9, 16, and 11. These areas are even closer bunched in user/square meter than they are in total numbers. The waterpark which placed 6th in total numbers, placed 15th in users/ square meter but as noted earlier this area's use can vary dramatically with the weather.

The worst used areas/square meter are area 6, the greenspace with the horseshoe pitches, and area 3, the greenspace part of Sutcliffe Park. These areas are far behind all other areas, but area 1 (the pond portion of Sutcliffe Park), area 2 (the waterpark) and area 8 (amphithreatre) are fairly low as well.

It is interesting to note that area 14 (the sand tot lot) appears to be fairly well used but this is due mainly to it's extremely small size (only 50 square meters). When the total numbers are studied only 12 people were seen using the area on 12 separate observation occasions.

3.3.5 CONCLUSIONS

When talking with Norm Hotson of the Granville Island Trust Association it was noted that the two biggest complaints were lack of parking, and the recessed rail tracks that hinder cyclists. These are not major problems in terms of the recreation and open space system on the island as the tracks can be filled in with a bituminous substance and the parking limitations can provide a method for restricting over-use (although to do so roadways must be congested). One of the biggest problems with the recreation and open space system as perceived by Hotson and other members of

the Granville Island Trust Association is the lack of use of the amphithreatre area. Most of this however, may be due to lack of coordinated events programming and advertising as compared to lack of public interest since there is nobody formally controlling it.

The community center statistics support the idea that area 2 (waterpark/adventure playground) is popular, as well as tennis lessons and sailing courses (which were not underway during the observation period). However, a decrease in total attendance had been experienced between the years 1982 (66,840) and 1983 (5,826). (False Creek Community Center, 1984). At 17% this must be considered a substantial decrease. This is apparently due to groups moving elsewhere to their own facility or a cheaper facility, and to poor attendance in special events and workshops. Perhaps a partial solution would be to allow the community center to coordinate special events for the amphitheatre.

As far as the survey goes it is apparent that there is not only a wide range of use in total numbers but also in users/square meter in the 18 recreation and open spaces. Generally, the area that had more urban-marine settings or specific attractions seemed to fare better than areas which were more "greenspace" oriented. An exception to this would be area 6, which is a small greenspace with horsehoe pitches as an attraction, but which apparently does not have enough programming or public interest for it to draw people. Area 1 is fairly well used in terms of total numbers, but poorly used per square meter. This may be due to the fact that the major portion of the area is water and although a visual attraction, it is not physically used for swimming or boating. A possibility does exist (with proper programming) to encourage activities such as model boating.

Area 14 (sand tot-lot) might be better used if it were in a location that was more child oriented. As it is, in between a wine bar and a parking lot, parents are probably not too keen on leaving children unattended. Another option would be to

have it closer to an area where adults would sit and could monitor their children's activities at the same time.

Area 17 (the marine workyard) and area 18 (greenspace, pathway, and seawall) are fairly well used but are somewhat cut-off visually from the surrounding attractions. Part of this is due to the appearance of the marineyard as a place of work and the separating of area 18 from the remainder of the boardwalk, but this may be solved with the extension of the boardwalk on the other side of area 18 to link up with the main entrance to Granville Island. It could also be made more accessible by providing a more visually inviting and clear-cut pathway through the area.

When comparing the use of the boardwalk in area 7 and area 9 it is apparent that although area 7 is fairly well used it is not as well used as in area 9 which has less greenspace around it and has a northern exposure (although building height restrictions limit shading). Area 9, however, has a city view and attractions such as the houseboat community and tour boat moorage. The same is true when comparing area 18 to areas 11 and 13, as area 18's pathway is substantially less used than the boardwald in either area 11 or 13.

The two greenspaces that are the most centrally located, areas 10 and 15, are fairly well used but probably for different reasons. Area 10 has benches and grass and is used as a sitting spot for people-watching in a very busy location directly across the street from the main entrance to the public market. In both cases the attractions seem to work in ensuring use of the facilities.

The tennis courts (area 5) are fairly well used when considering their capacity. This would naturally be another weather dependent facility but it appears that there are enough local area residents to keep them well-used most of the time.

Sutcliffe Park greenspace (area 3) is the best example of a large open spce that is poorly used. It is passive in nature and one could argue that the greenspace is a visual attraction to those using the pathways around it or simply looking from their condominium over it towards Granville Island. However, it must be noted that very few people used the central grass area and not nearly as many use the pathways around it as they do in the much smaller boardwalk areas. If the central area had an attraction it might be better used, or for pure aesthetics the pond could be here, therefore freeing the pond's present location for badly needed parking.

Finally, it was observed that the use of area 4 (the fishing dock and lookout) was as great as area 7 (the boardwalk and greenspace) even though much smaller in size. This would be due partially to the location of area 4 at the intersection of two pedestrian routes, but it also indicates that the special facilities in area 4 acted as attractions and a place of congregation (ie., people using the lookout for viewing or the dock for fishing or boating).

The geographic factors affecting the recreation and open spaces on Granville Island are relatively minimal (refer to FIG. 8). The Island's terrain is flat and the water surrounding it is calm and deep enough for small boats on all sides. It is sheltered in the False Creek Basin and winds are normally restricted to mild breezes. Sunlight can be affected by building shadowing or bridge shadows, although buildings are restricted to two stories in height and therefore do not shadow areas for the majority of daylight periods. Soils are stable and present no problems in development or use of areas. Climatic variations within the site are minimal because of the island's fairly small size and geographic uniformity. The shoreline is also stable due to the construction of a loose rock seawall encircling the island. However, generally poor water quality in False Creek limits recreational activities such as swimming and fishing. This may be rectified in the future with careful redevelopment and recovery of the remainder of the False Creek Basin.

Other factors influencing recreation and open space usage include pedestrian access, with heavy flow from the nearby False Creek South and Fairview Slopes residential areas (refer to FIG. 8). There is a lighter flow of pedestrians over the



FIGURE 8 - Physical Characteristics

Granville Bridge and across False Creek (via the ferry) from the downtown core. The location of the pathways on the south side of the island connecting the False Creek South neighborhood with the recreation and open spaces there no doubt influence the usage of these facilities by the local residents. Automobile access also affects the recreation and open space usage as most regional visitors and tourists come by car or bus. With only one access road and mainly one-way streets, most recreation and open spaces are equally accessible. However, some of the spaces are more visible than others and therefore more often used by automobile users. The exceptional views of the CBD and West End, False Creek South, and the potential views of B.C. Place are all positive effects on the recreation and open spaces on the island that take advantage of these amenities.

Appendix 4 summarizes recreation and open space characteristics, survey results, and factors influencing usage.

4. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

4.1 SUMMARY

The first chapter illustrated how the original settlements of North America were almost of necessity located on waterbodies and how the changing technologies sparked by the industrial revolution caused an expansion of cities away from the waterfront. Over the years the old ports lost their usefulness and private developers and city governments were faced with a relatively inexpensive supply of waterfront land that was under-utilized, in disrepair, and ripe for redevelopment (ULI, 1983). It was also desireable to relocate many of the remaining port facilities due to changing technologies and site demands.

Before these potential redevelopment sites were to become viable location, for development activity, much cleaning up and restoration was necessary to combat the many years of abuse and neglect. In most cases this has involved public funds and therefore the public has a stake in the redevelopment of such areas. However, pressures exist to redevelop in profit-maximizing sectors and since higher economic returns can generally be obtained from sectors other than recreation, and increased public access is the major need of urban waterfronts according to public opinion surveys, the question becomes how to effectively include recreation and open spaces in order to meet access demands, ensure they are well-used, and increase enjoyment of the waterfront. The need for public access to recreation facilities in general is illustrated by the fact that in urban America where 75% of the population lives, only 25% of recreational facilities and 3% of recreational lands are reasonably accessible (Smith, 1973).

The urban waterfronts of North America are becoming the locus of the most extensive and imaginative redevelopment projects currently underway. The need for this

study is based upon the spectre of providing recreation and open space in these projects that are arbitrarily decided upon and may result in under-utilized, costly facilities. It is of paramount importance that the facilities provided are efficiently used because of the cost of providing them. The scope of the thesis was restricted to identifying successful recreation and open spaces along with site characteristics and user needs associated with them. Limitations included a study of restricted time and length as well as the multitude of variables that affect the use of the spaces studied. For these reasons, identifying successful recreation and open space in existing projects was the main purpose of the thesis as opposed to predicting success of future facilities in waterfront projects.

Chapter 2 dealt with recreation and open space currently supplied in urban waterfront redevelopments across North America. Three major findings of the ORPRG (1983) concerning urban recreation in general were: 1. outdoor recreation is urgently needed near metropolitan areas 2. although considerable land is available it did not effectively meet demand 3. to meet this demand more funding was necessary.

A variety of site conditions affect the use and success of recreation and open space in urban waterfronts. These include things such as; condition of facilities, conflicting land uses, area reputation, multiple ownership, surrounding land uses, pollution, barriers to access, climatic variations, geographic characteristics, waterfront configuration, soil conditions, views, pedestrian circulation and services. It should be noted that certain mixtures of uses encourage efficient use of facilities by complementing each other and having peak demands at different times.

Recreation demand in urban environments across North America is the key issue when determining supply. Almost 47% of adults in a 1978 Gallup poll participated in physical fitness activities as compared to 24% in 1961 (USORRRC, 1983). Recently health maintenance programs have become more prevalent, mental fatigue has replaced physical fatigue in many jobs, and there has been an increase in education levels. All of these have resulted in greater importance of, and an increased willingness to participate in, a variety of recreation activities. The most popular activities as reported by the USORRRC (1983) were picknicking, swimming, driving for pleasure, and walking for pleasure. Participation is influenced by a number of other factors such as user goals, skill level necessary, costs, access, maintenance of facilities, uniqueness of facilities, and characteristics of participants (Gold, 1980). A number of studies have shown a wide range of demographic variables to be influential upon recreation patterns. Pincombe (cited in Wright, 1976) determined age, sex, and income to be the three most important.

The types of recreation and open space that can be provided in an urban waterfront can be divided firstly into active or passive spaces and secondly into publicly or privately developed spaces. Active spaces include recreation facilities such as tennis courts, etc., whereas passive spaces include open spaces such as gardens or plazas. Privately developed spaces are usually profit induced and therefore commonly have fees associated with them (although some are benevolently supplied) whereas publicly developed spaces are usually free to use or have subsidized user fees. It should be noted that in spite of the fees associated with many private spaces, exclusivity of them is marketed and households are willing to substitute for public spaces, with higher income households being more able to do this (Cordell, 1976).

A variety of North American urban waterfront redevelopments discussed in CH. 2 have shown that, in Harney's (1979) words, "waterfront areas can be centers or tourism, trade and urban recreation". Three waterfronts that were looked at in detail were San Antonio's Riverwalk, Toronto's Harbourfront, and Baltimore's Inner Harbour. San Antonio's Riverwalk is the oldest and has evolved into a greenstrip with a variety of mixed uses lining the riverway in a heavily verdant atmosphere. It has proven to be highly successful in surveys with residents and visitors alike. It is also one of the most critically acclaimed urban waterfront redevelopments in North America. Toronto's

Harbourfront is a recent redevelopment of port land-fill areas which has resulted in facilities that can be used year-round. Many sheltered or covered recreational and commercial facilities were included, along with co-ordinated recreation programming to help in its success. Baltimore's Inner Harbour is the basin surrounding the original port. Old structures have been demolished and a mixed-use redevelopment with a lively commercial marketplace (Harbourplace) as its showpiece has been constructed. An imaginative variety of historical and marine oriented recreation facilities as well as some open spaces have been included. Attendance is extremely large (20.6 M. in 1982) and it is both a recreational and commercial success.

Chapter 3 is concerned with the Vancouver waterfront situation and includes research of the recreation and open space on Granville Island. Vancouver has had the classic North American port settlement and growth pattern and areas of the waterfront and now ripe for redevelopment. It has more public access to the waterfront than most cities but it also has more total waterfront, with the urban port areas just as restrictive in access as most. Park space in general in the urban core is substantially less than surrounding areas of the city.

Resident opinion surveys found increased waterfront access to be one of the foremost concerns of residents. A study of Joardar (1975) revealed that passive recreational activities were the most preferred with walking for pleasure as the most preferred activity measured. The urban core was found to be in short supply of playing fields, public swim facilities, and public gym facilities as well as maritime heritage features.

Granville Island was developed from an industrial site by the federal government with the goal that it become a "people place". A mixed-use environment resulted with a variety of recreation and open space included. It lies adjacent to a residential redevelopment area known as False Creek South which includes a strong recreational component. The local area, Fairview, in which it is located is characterized by a high proportion of females, singles, renters, and residents in the 20-34 and 55+ age groups. It also has a low proportion of children, and recreation and open space as compared to city averages. These characteristics are influenced by the atypical Fairview Slopes neighborhood rather than the more typical False Creek South neighborhood. Commerical recreational amenities are well supplied and public recreation and open space are poorly distributed.

The recreation and open spaces of Granville Island were studied to determine how well they were used and what factors affected their rates of use. Descriptions of the 18 areas were provided as was data in the number of users and the users/square meter. The results show that large greenspaces on the island are not particularly well used and smaller waterside spaces with specific attractions were the best used. A problem in programming was evident in a couple of spaces and a problem in visual access in a few others. Marine or urban oriented attractions seemed to be the most successful.

Geographic factors affecting use were relatively minimal except for the quality of the water in False Creek which limited swimming and fishing. Heavy pedestrian flows from surrounding neighborhoods, as well as heavy automobile traffic, no doubt had some positive effects on recreation and open space use as well as providing some congestion problems. Exceptional views of surrounding areas also seemed to be a strong influence on rates of usage, as were surrounding activities.

4.2 CONCLUSIONS

The urban waterfront is a unique case deserving of special consideration for a number of reasons. Firstly it is scarcely relative to the total landmass of any city, moreso in some than in others. Because of this scarcity, competition for space will be rigorous when a redevelopment is proposed. Secondly, it represents an opportunity to redevelop a currently under-utilized and often derelict area of the urban core that has

existed in a blighted state recently due to neglect. In addition to this, other conditions such as environmental pollution and disruption may be present due to the activities of the traditional facilities. Thirdly, it is a highly valued resource both historically and environmentally, as many North American cities have their original settlement sites there. The natural amenities of the waterfront are also highly valued when free of pollution. Fourthly, the urban waterfront is commonly located adjacent to the CBD and this relative close proximity provides an opportunity to help relieve the shortage of useful recreation and open space in many downtown cores. It also allows for public access to the water from the CBD which has traditionally been restricted because of port operations.

Recreation has been a growth industry for the past 2 decades with estimates of \$58 billion spent in 1965 and \$244 billion spent in 1981 (USORRRC, 1983). That adjusts to a 47% increase after inflation or roughtly 3% annually. A study in Pennsylvania showed that families spent more on recreation than transportation or medical care (USORRRC, 1983). According to the USORRRC (1979), the outlook for urban recreation is that:

1. demand will continue to grow, especially for close to home facilities.

2. the future of remaining open space is being rapidly determined.

 energy costs will continue to increase and remain in short supply until new sources become feasible.

4. tax revenues that support local public services will decrease.

The ULI (1983) adds that the demand for urban waterfronts to provide recreation opportunities will continue to grow. However, they feel the orientation of this demand is shifting from primarily water-based sports to more urban oriented leisure activities. It is essential that certain conditions exist for waterfront facilities to be well used. London (1976) outlined good access, activities that attract people, and dissemination of knowledge that these activities exist, as being vital to is success. Marcou (1970) said that flexibility of use is a key issue and that open space must be physically, pschologically, and socially accessible. It is also essential to provide recreation opportunities close to both home and work which means that downtown cores with their high density of workers and visitors is of prime importance in this regard.

Gold (1980) felt that space alone does not constitute service or opportunity and this is clearly of prime importance in an urban waterfront redevelopment. Open spaces that are not well used in a visual or functional sense will be difficult to justify economically whereas spaces used for mutiple recreation activities will be cost-effective and easily justified. The types of activities stressed should be ones that complement and highlight urban living as opposed to providing an artificial escape from the city. Also, citizens should have a say in what kinds of spaces and activities they prefer and participate in their development.

Climbing costs and budget cuts in most areas mean that new, more cost-effective ways to develop and manage recreation and open space must be found. Parks, public piers, marina facilities, etc., can be incorporated into private ventures in return for public investment in site recovery and servicing. The ULI (1983) suggested that it may be better to have a limited number of access points to the water complete with a variety of recreation and open spaces rather than a continous waterfront park that has these facilities spread out in it. These access points would probably be best used with waterfront walkways linking them, which are in demand and compared to a park, minimal in cost and space requirements. However, Sydney, Adelaide, Hobart, and Perth in Australia have shown that a high proportion of waterfront land can be devoted to recreation (around 50% in each case) while maintaining a viable port economy (Forward, 1970).

Besides being flexible in activity use, these facilities should be usable year round if at all possible. Protection from wind, rain, and sun should be available, and lighting and security should be present to encourage night use. Since it has been

observed by numerous researchers that people prefer sitting on ledges, etc., numerous level changes provide both form and function when designed with this in mind. Lehmann (1966) suggested designing buildings on stilts to allow for pedestrian views while retaining high density potential.

Disadvantaged groups have the highest unmet needs and they also are the most dependant on public recreation facilities according to the National League of Cities (1968). This makes them a high priority group but they also have a problem of poor. representation in the planning and design process. Concentrated efforts should be made to determine what types of recreation and open spaces are in demand in these groups.

It should be noted that no single set of guidelines have been found to be adequate and site specific designs should be strongly encouraged (Dunn, 1974). These designs should also be based on current demands and forecasts. Caution should be used when dealing with fadish recreation booms such as skateboarding which prompted the building of costly skateboard parks only to see a decline in participation. Changing technologies should also be considered, as was evident with the increase in snowmobiling due to light weight designs and powerful engines in the sixties (Smith, 1973). The state of the economy is also a major consideration as is indicated by the increase in windsurfing and decrease in boating in the San Francisco Bay area that may be attributed to declining disposable income in younger age groups (Pendleton, 1983). The carbon copying of successful waterfront redevelopments such as Boston's Faneuil market should be discouraged not only for reasons of lack of individuality but also the lack of site specific design. (Breen & Rigby, 1984). The borrowing of proven ideas from other redevelopments should be encouraged if they are sensitive to the particular conditions of each site. Vancouver's urban waterfront is largely publicly owned, with the National Harbour Board as the largest landholder, but due to leasing, public access is as restricted as if it was privately owned (Burke & Silverman, 1971). Because rail networks developed along the waterfront to service port activities they

both restricted access and provided few overpasses or underpasses, but they also took up space and retarded growth of non-port activities. The MSUA (1978) recommended the continuation of break-bulk handling of goods in the urban port area and relocation of bulk goods to other areas. This is in keeping with public demand to keep a working maritime port environment while allowing for public access.

Most core area amenities currently being provided are privately run, active recreation spaces with fees and peak use periods. The majority of Vancouver core area users are employees and day visitors and should be considered when planning recreation and open space inclusions along the waterfront. Facilities that are short supply in the core area, are in demand, and need to be addressed, include playfields, court games areas, tennis courts (covered and lighted), swim and fitness facilities, ice rinks, walkways, bikeways, viewpoints, greenspace, heritage facilities, boat launches, marinas, lighting, and street activities. Facilities that are not in short supply or high demand include racquet clubs, playgrounds, cultural facilities, restaurants, night clubs, underground malls, and movie theatres (VCPD, 1982).

Granville Island recreation and open spaces were found to be well designed and distributed, but some are less well used than others. Here, as in other urban waterfront redevelopments across North America it was evident that marine oriented and urban attractions were the best used. In Baltimore, Harbourplace marketplace, ethnic festivals, and the aquarium were the biggest draw in total numbers. Other successful Baltimore Inner Harbour attractions were the Science/Ecology Center, marine and railroad museums, sailing ship museums and tours, and the Performing Arts tent where much of the ethnic festivals take place. Seattle's aquarium with underwater viewing facilities of Puget Sound is extremely successful. Tulsa has drawn large numbers of people to their River Parks which feature an Indian Heritage Center and trolley rides. Pedestrian links from San Antonio's CBD are widely used to reach the Riverwalk and go through shops that back on to the river and down spiral staircases

from bridges. Decking over rail lines or water has proven successful in Chicago, New York, and Portland, with well-used recreation and open space on top (such as tennis courts, walkways, gardens and plazas).

Other marine or urban oriented recreation and open spaces that are popular in a variety of urban waterfront redevelopments include; floating stages, pedalboats, fish markets, steps down to the water, showboats, small boat schools and rentals, flooded dry docks, and waterfront exercise circuits.

The recreation and open spaces that were the most well-used on Granville Island were the boardwalks and sitting areas on the north side of the island that had attractions such as views of downtown, the West End, houseboats, and marinas, as well as adjacent uses of restaurants, bars, theatres, and the public market. Also popular were the public docks, the ferry dock, and the waterpark during the summer.

The most popular form of recreation observed on Granville Island was walking for pleasure. Other passive activities such as viewing, sunning, sitting, and eating were close behind. It would therefore appear that the facilities that are the most in demand in the urban core are also the facilities that are the most well used. It should be noted that these facilities are not large green spaces, but smaller more urban facilities with marine or special attractions.

Due to the necessity of site specific analysis for the proper implementation of recreation and open space in an urban waterfront redevelopment, it is beyond the scope of this thesis to recommend facilities to be included in future Vancouver waterfront redevelopments. However on the basis of research in this thesis, it is possible to suggest what merits consideration.

The general qualities that are desirable for the recreation and open spaces to possess include:

- good access (pedestrian, motorist, cyclist)
- activities that attract people
- multiple-use potential

- year round usability
- evening usability
- marine and urban orientations
- view exploitation
- access to shelter (landscaping, plantings, and shelters)
- multiple levels
- good lighting

The types of recreation and open spaces that should be considered due to

public demand and current supply in Vancouver include:

Active facilities

- multi-purpose playfields
- lighted and covered tennis courts
- exercise circuits
- cycle paths
- swim/fitness facilities
- boat launches
- marinas

Passive facilities

- waterfront promenades
- watersteps
- viewpoints
- glass garden atriums

Entertainment facilities

- ethnic performing arts tent
- ecology center (with underwater viewing)
- maritime museum (with sailing ships)
- trolley rides
- pedalboat rentals

4.3 RECOMMENDATIONS FOR FURTHER RESEARCH

There are many areas of recreation and open spaces that need research in general. Optimum use is very difficult to predict through carrying capacity methods which are commonly used. A more objective method needs to be developed to determine the most cost-efficient levels, where facilities would be well used without incurring large maintenance costs and repairs.

Another key area in need of further research is to determine the latent demand for facilities that are not available as opposed to the consumption of facilities that are available. Recreation behavioural studies would help in predicting latent demand and potential future demands.

Cost-benefit analysis of proposed uses is also vital to the implementation of many projects. In order to achieve a fair analysis, both the tangible and intangible impacts need to be considered.

The effect of different and sometimes conflicting activities, as well as the mix of activities, is important to the success of an urban waterfront redevelopment and also needs further research.

Opinion surveys of recreation and open space visual use would be helpful in addition to studies of physical use to more fairly determine total value of an area. Also, studies of usage rates of facilities such as theatres, restaurants, bars and other commercially supplied recreation and open spaces would be helpful in determining the private sector influence.

Finally it should be noted that the time involved in studies such as these are minimal compared to their potential value and they are therefore recommended to be undertaken by local planning departments before committing to costly projects with unknown chances of success.

APPENDIX 1. FALSE CREEK COMMUNITY CENTER STATISTICAL SUMMARY -

1983

QUA	(1000 - (300 - 1	517 1A31 1				
	· · ·	Total This Quarter	Total To Date	Total This Quarter	Total To Date	
1.	Sports/Fitness/ Outdoor Recreation	3068	18,901	4879	21,629	
_2.	Arts	1248	3,307	1168	2,939	
3.	Affiliated Groups/ Social	3271	14,916	5322	19,317	
4.	Meetings	838	2,144	948	2,787	
5.	Special Events/ Workshops	1032	4,049	2216	7,541	
6.	Casual	1367	5,962	908	2,325	
7.	Rentals	2336	6,125	3,089	6,936	
8.	Recreation/Education	1331	3,422	1,012	3,366	
9.	Fund Raising	_	_	-	_	
10.	Health/Fitness Club	_		-	_	
<u> </u>	Courts	_	_	-	-	
	Total Participation	14,491	58,826	19,542	66,840	

OUARTER - (SEPT. 1 - DEC. 31) PAST YEAR (1982)

CURRENT YEAR

Comments/Analysis - There has been a decrease in participation this fall quarter by 1811 and an overall yearly decrease of 8014. The main reason for this decrease has been the change in status of Affiliated Groups such as the Arts Umbrella moving to their own building and Minor Soccer practice not using our gym space at the school since rental fees charged.

Another area which has not been well attended is Special Events and various workshops.

Outdoor programs such as tennis lessons, sailing courses and the playround program are most popular. The Waterpark alone attracted over 26,935 participants (children, teens, adults). The total for the Water, Adventure (9505) and Traditional (6540) playgrounds is 42,980.

APPENDIX 2. USAGE RATES

GRANVILLE ISLAND RECREATION & OPEN SPACES

#	12-1 P.M.	3-4 P.M.	5-6 P.M.	TOTAL
	Tue Thur Sat Sun 10 / 12 / 9 / 18	Tue Thur Sat Sun 4 / 3 / 15 / 16	Tue Thur Sat Sun 4 / 6 / 15 / 17	129
2	12 / 15 / 15 / 14	11 / 10 / 18 / 20	8 / 7 / 18 / 22	170
:3	4 / 1 / 3 / 12	6 / 8 / 9 / 11	4/3/6/8	75
4	8 / 7 / 10 / 5	3 / 1 / 8 / 12	6 / 4 / 10 / 7	81
5	4 / 4 / 6 / 14	6 / 6 / 10 / 7	8 / 13 / 15 / 11	104
6	0/0/0/0	0/0/0/0	0/2/0/0	2
7	3 / 4 / 7 /10	4 / 4 / 8 / 20	4 / 6 / 8 / 9	87
8	5 / 7 / 23 / 22	6 / 3 / 28 / 24	4 / 10 / 12 / 9	153
9	30 / 33 / 24 / 42	20 / 17 / 25 / 22	1/3/5/7	229
10	2 / 6 / 27 / 6	5 / 3 / 4 / 5	0/1/5/3	67
11	32 / 28 / 33 / 85	14 / 7 / 20 / 22	3 / 1 / 10 / 20	275
12	115 /125 /169 /469	75 / 81 /180 /210	10 / 9 / 25 / 70	1538
13	20 / 17 / 40 / 33	12 / 19 / 22 / 27	4 / 1 / 25 / 39	259
14	0/0/0/3	0 / 0 / 3 / 2	0/0/2/2	12
15	2 / 3 / 7 / 13	2/4/6/3	0/0/2/0	42
16	2 / 1 / 6 /115	4 / 6 / 51 /145	1/2/8/6	347
17	3 / 4 / 8 / 10	3 / 9 / 10 / 9	4 / 3 / 4 / 5	72
18	12 / 15 / 17 / 23	11 / 13 / 18 / 20	3 / 2 / 8 / 6	148

APPENDIX 3. USE/SQ. METER

the second s					
# .	SQ. M.	AVERAGE NUMBER OF USERS 12-1 P.M. 3-4 P.M. 5-6 P.M.			AVERAGE USERS/SQ. M.
]	5200	12.25	9.5	10.5	.0026
2	3000	14.0	14.75	13.75	. 0047
3	7400	5.0	8.5	5.25	.0008
4	350	7.5	6.0	6.75	.0578
5	2000	7.0	7.25	11.75	.0130
6	600	0.0	0.0	.5	. 0003
7	1500	6.0	9.0	6.75	.0145
8	6300	14.25	12.75	8.75	.0057
9	480	32.25	21.0	4.0	.1192
10	700	10.25	4.25	2.25	.0239
11	750	44.5	15.75	8.5	.0916
12	1100	219.5	136.5	28.5	. 3495
13	500	27.5	20.0	17.25	. 1295
14	50	.75	1.25	1.0	.0600
15	200	6.25	3.75	.5	.0525
16	750	31.0	51.5	4.25	.1153
17	1000	6.25	7.75	4.0	.0180
18	1300	16.75	15.5	4.75	.0285

GRANVILLE ISLAND RECREATION & OPEN SPACES

18	(1) (1)	PAtisive Greed- Since	.0285 (q)	GRASS, TATHLUN, SEAUALL	Access	Sitting, Jiegang, Vieund, Wiking	CONVIEN	KITSILAND
17	(6) (6)	ALTIVE	0810 (11)	MARINE WORK YARD	LACK OF CLEAR ACCESS	MARINE HARINE VIENINS, VIENINS,	INRVING CONNERAN MARINA	Kusilauk
16	750 (10)	RASSIVE CPEN SPACE	.1153 (4)	BOARD- WALK, WINE BAR	Contruction DeF LACK	SITTING, VIEWING, EATING, DRINKING,	MARINA, WINGE BAR/PUZ	WEST END + Kitsilano
15	200 ((6)	PASSIVE GRAN- STACE	.0525 (B)	Girnes, Seatinea		SITTINCO	PUBLIC HARKET, COMMERKA, BAKERY	1
14	50 (17)	Active Rec. Space	(9) 00700	SAND, Tot- Lot	Pook CHILD ENVIDUU-	HAJA PLAN	TNRKING, WIJE BAR/PUB RESSUMANT	(
13	500 (13)	PASSIVE OPEN SPACE	.1295 (2)	BOARD- WALK, FEERY DOCK	l	ואראויאלא בוו דויאנק, לופעוויאל, דפגואיויאק	FERRY, Wine RW, Threader, Dublic	WEST END KITSILAND
12	(8)	Passive oden Stake	.3495 (I)	FLAZA, SENTING, ISOARD- UALK	-	VIEWNG, LALKING SITYING PERFIDING EATING	PUBLIC HANKET, BOAT DUCK	DXMTALN L L E S U D E S D
11	750 (10)	PASSIVE OPEN SPACE	.0916 (5)	BRARD- WALK, DOCK,	l	WALKING SITTING BOATING YIENING	THEATRE, PUBLIC MARVET, RESAMANY	Dountoux Lest END
10	700 (11)	ACTIVE GREEN SPACE	,0239 (10)	PLAY- GROUND, GROSS	-	CHILINGUS PLAY, SITTIMAG	Contracticua Instantian	I
۰. ه	480 (14)	Passite Open Space	.1192 (3)	POARD- WALK, SEATING	l	WALKING, Togginkg, Sitting, Viewng	HOTEL, PESTINDAS MARWAS HOUSEBOUS	Lownoul F False CREEK N.
80	6300 (2)	Passine GREEN- SPACE	.0057 (14)	אאיזאון- דוובאנצל, נישענל-	LACK CF PROCRAH MING	HINKINKI, TOLGING, SITTING, VIEJING,	אסדבר:, ארייזק אועויזין	FALSE CREEK S,E.AN.
~~	1500 (6)	Passive Green- Space	.0145 (12)	GIRASS, SEQUAL, BONDYUNU	1	LANKING John King John NG	TENJUIS COURTS, CONNERCAY INDUSTRIAL	FALSE CREEK S + E.
9	(12) (12)	ACTIVE GREEN- SPACE	.0003 (18)	GRASS, HORSE - SHOE FTCH	LACK OF RIOCRAH HING)	TENNIS COURTS, CONMUNT	l
2	2000 (5)	ACTIVE REC. SPACE	.0130 (13)	TENNIS COURTS	l	TENNIS, Viewiny	CENTER	1
4	350 (15)	Active Rec. Space	о570 (7)	Dock, Look- OUT	Dock USE Restrictions	SAILING, BONTING, VIENING, WALKING	Residenty Contruinty Centrer	FALSE CREEK
М	7400 (1)	PASSIVE GREEN- STRCE	(11)	GRASS, WALK-	PUORLY USED CENTRN AREA	CYCLING JOGGINS, JOGGINS, JOGGINS,	LUATERARY Community CENTER,	FALSE CREEK
7	3000 (4)	Active Rec. Space	.0047 (15)	WATER- PARK, PLAY- GROUD	l	CHILDREIS PLAY, SITTING	CCHMWITY CENTER,	FALSE CREFK SOUTH
~	52 <i>c</i> o (3)	Passive Pand GREEN- SPACE	.0026 (16)	POND, GRASS, LIALKY	LACK OF PHNSICAL POND USE	SITTING, SITTING, Jobenk, Jobenke,	THEATRE, RESTAURANT RESIDARIA	FALSE CREEK SOUTH
AREA #	SIZE- 50.M. (RANK)	TYPE OF SPACE	USE/ 59 M: ((M.N.K)	ATTRACTIONS	DETRACTIONS	OBSERVED ACTIVITIES	ADTALENT USES	VIEWS

APPENDIX 4. SUMMARY OF RESULTS

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