

THE PROVISION AND DISTRIBUTION OF
LOCAL OPEN SPACE IN URBAN RESIDENTIAL AREAS

Part of a Group Thesis

"THE NODULAR METROPOLITAN CONCEPT"

by

ARTHUR ROBERT COWIE

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School of Community & Regional Planning
University of British Columbia
Vancouver 8, B.C.

Date April, 1968

ABSTRACT

This thesis is part of a comprehensive group study undertaken by five students in the School of Community and Regional Planning. Section I, which is a combined study, explores present trends and concepts of urban growth in North America. As a result of a preliminary investigation, a study concept, "The Nodular Metropolitan Concept," was derived. An hypothesis was formulated to serve as a study base for individual research by members of the group.

Section II of this thesis is the author's individual contribution which looks at one aspect, the provision and distribution of local open space within residential areas of the present city form and the Nodular Metropolitan form of development.

In Chapter I, present inadequacies within North American cities are pointed out and various current classifications and standards are outlined. It was indicated that they do not appear to meet present and future needs.

Chapter II looks at income as a variable of inequality in the distribution of local open space. The present system of distribution and the standards of local parks are examined in the cities of Vancouver and Montreal. Inequalities between high income areas and low income areas in respect to park quality were substantiated. Factors tested for park quality

included acreage, types of facilities, seclusion and annual expenditures. It was found that lower income areas had the least acreage, types of facilities, seclusion and annual park expenditure per capita.

The Nodular Metropolitan system of open space was examined in Chapter III to ascertain whether it offered a more equitable and functional distribution than the present grid system. A theoretical open space model that follows the principles of this concept was formulated and partly tested by use of a preliminary social behaviour activity survey. The model illustrates a radical change to the present open space system. Three forms of local open space are proposed for study: intensive activity open space, corridor open space and parkland open space. Due to limitations of time and survey data only the parkland category was tested as an illustration of methodology for further research. The results of the questionnaire used in the survey indicated that the present unco-ordinated system of local park distribution is not meeting basic human needs. The particular social economic group of persons interviewed expressed a need for large open spaces that offered a variety of activities but were predominately passive in character as illustrated by the parkland category within the theoretical open space model. The study indicated that the behaviour activity approach would be feasible for future use.

The results of the study to date indicate that the provision and distribution of open space within the city could be perhaps more adequately provided under a form of redevelopment such as that of the Nodular Metropolitan Concept.

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SECTION I

GROUP STUDY

THE NODULAR METROPOLITAN CONCEPT

A. BASIS OF STUDY

A review of the following literature emphasises the unco-ordinated state of city development. If it is possible for mankind to anticipate (plan for) the future, it is important to discover the kinds of changes that may occur. The purpose of this study is to identify underlying variables that are shaping urban society and structure; specifically to explore a form of development which is becoming evident in the city today. From this analysis it is apparent that specific functional nodes have formed naturally within the present urban system. This study assumes that present growth trends in the city can be recognized and analysed. Based on this analysis, it is believed that the most desirable trends can then be reinforced to shape future form and structure.

B. APPROACH

The approach to this study has been inter- and multidisciplinary. It is a postulate of this research that Community and Regional Planning must operate within a comprehensive and co-ordinated framework. In view of this, an attempt has been made to construct a preliminary model (see matrix, Figure 1). Because of the limitations of time and personnel, only selected components of the conceptual model are explored. A more complete identification and analysis of all the model's components would result in a better understanding of the larger continuing urban growth process. The topics of individual studies are arbitrarily selected on the basis of individual researcher's experience and interest. It is only on this basis that a significant contribution to the theory and practice of Community and Regional Planning can be made.

FIGURE 1

[illegible]

C. THE PROBLEM

By the year 2000, the urban population of the United States is expected to be double.¹ Moreover, people are expected to be more affluent as their personal income in constant dollars increases by fifty per cent.² While these anticipated changes have not yet been realized, the capacities of our cities are fast reaching their limits. For example, transportation facilities are already congested in the large metropolitan areas,³ conveniently located land for housing is becoming scarce, and costs of providing public services and utilities are becoming prohibitive. The crucial problem arising out of this is how to plan our metropolitan areas so that they can accommodate the anticipated growth and change.

It is estimated that by the 1980's or at least by the year 2000, we will have to rebuild our cities to accommodate the anticipated population increase and to satisfy the preferences of a more affluent society. By the year 2000, more urban homes, places of business and public facilities will have to be built than have been built since the first towns were started in North America. At least half of today's urban

¹Outdoor Recreation Resources Review Commission, Projections to Years 1976 and 2000: Economic Growth, Population, Labour Force, Leisure and Transportation, (Washington, D.C.: U.S. Government Printing Office, 1962), p.9

²Lowdon Wingo, Jr., Cities and Space, (Baltimore: Johns Hopkins Press, 1963), p.11.

³Wilfred Owen, The Metropolitan Transportation Problem, (New York: Doubleday & Co. Inc., 1966), p.1.

dwellings will probably require replacing because they will no longer serve the needs of families.⁴ In addition, half of today's urban business and industrial buildings will require replacing because they will no longer serve changing production and distribution methods.⁵

It is likely that our cities will have to be restructured to accommodate radically new means of transportation. High density cities like New York have already found the cost of automobile travel to the city core prohibitive. In low density cities, such as Los Angeles, the cost in money, time and space of relying solely on the automobile is equally prohibitive. For example, two-thirds of Los Angeles' downtown is given over to the automobile - about one-half of this to parking lots and garages and the rest to roadways and highways.⁶ Most of today's cities have grown with little planning. Although they urgently need rebuilding and restructuring, they have neither the money nor the authority. Our larger cities are beset with problems of slums, traffic congestion, sprawl, ugliness, housing; with the provision of inadequate open space; with air and water pollution; with outmoded forms of public administration and taxation. In addition, most cities have enormous problems with education, poverty and racial segregation.

⁴"What Kind of Cities Do We Want," Nations Cities, (Vol.5, No.4, April, 1967), p.18.

⁵Ibid.

⁶Los Angeles City Planning Department, "Major Issues for Los Angeles" May 2, 1966, p.4.

Outdated, inflexible political boundaries have helped to encourage people and industry into the lower tax suburbs and to make planning extremely difficult. The wealthier families have escaped to the suburbs leaving the central city to deteriorate. Our cities continue to use a tax system that penalizes improvements and subsidizes obsolescence which inevitably leads to blight, sprawl and spread of slums.⁷

In spite of all these problems, which vary in degree across North America, our metropolitan areas continue to grow and cry out for imaginative solutions to making our urban environment more livable.

Planners like William Wheaton and Victor Gruen believe that the essence of urbanism is variety, and that only a vibrant night-and-day "downtown" (city core) can support the variety of shopping, services, contacts, job opportunities, culture and recreation facilities needed to make a city an attraction.⁸ Any viable city core needs people living within and adjacent to the area - not just daytime commuters. The provision through urban renewal of a functional and livable habitat for these central city dwellers is the focus of the group research effort described in this thesis.

⁷W.R. Thompson, A Preface to Urban Economics, (Baltimore: Johns Hopkins Press, 1965), p.320.

⁸Nations Cities, *Op.cit.*, pp.26-27; and Victor Gruen, The Heart of our Cities, (New York: Simon and Schuster, 1964), pp.292-339.

D. URBAN GROWTH

1. Metropolitanization

Before discussing the central core area of the city, it is important to mention the general forces which have contributed to the growth of our metropolitan areas. Peter Hall describes such forces.⁹ The first is that total population has increased at a rapid rate and threatens to go on increasing. The second factor was the shift off the land into industry and service occupations in the cities. This, however, is no longer a major factor since over two-thirds of North Americans now live in urban areas. The third factor is that a large part of the urban growth is being concentrated in the already large metropolitan areas. This concentration probably is a reflection of the more diverse economic and social opportunities available in the large centres.

Metropolitan areas have grown faster than the rest of North America in every decade since the turn of the century, except for the depression years 1930-1940. By 1960 almost two-thirds of the population of the United States lived in the Standard Metropolitan Statistical Areas delineated by the census. In Canada 87.5 per cent were classified as urban (non-farm) population. This is a 109 per cent increase from 1921-1961.¹⁰

⁹Peter Hall, The World Cities, (New York: McGraw-Hill, 1967).

¹⁰Economic Council of Canada, Toward Sustained & Balanced Economic Growth: 2nd Annual Review, (Ottawa: Queen's Printer,

Growth within the metropolitan areas has not been distributed evenly. The central areas of cities have grown relatively little, while the suburban rings have grown at a much higher rate. Some of the larger cities' central areas have actually lost population during the last decade. Some of the many reasons for the loss of population include a lack of available space for further building, the obsolescence of housing and industrial plants in the core areas, and the unavailability of rapid, cheap methods of communication and transportation.

The losses of population in the central areas do not necessarily reflect economic decline but rather the decentralization of population and institutions to the suburbs. Historically the natural clustering of commercial, industrial and residential activities was due in part to the absence of a well developed transportation system. Mobility was limited since few people had a personal mode of transport. When mass production and ownership of automobiles became a reality, the form of the city began to change. Since people were now able to travel longer distances in a shorter period of time, they began to move to the outer fringes of the central city. Decentralization of the residence also brought with it many retail and service enterprises. In addition, there has been a trend towards the decentralization of manufacturing and wholesaling firms seeking to escape the congestion of the central core.¹¹

¹¹R. Vernon, Metropolis, 1985, (Cambridge: Harvard University Press, 1960), pp.116-120.

Another factor which has encouraged residential decentralization is the intervention of government in the housing market.¹² Through the U.S. and Canadian Housing Acts, long term, low interest loans made single family home ownership possible on a larger scale and encouraged the development of suburban subdivisions.

It appears that the primary implications of increased mobility and government housing policy on urban form is a dispersion of activities. But while the city is becoming more dispersed, specialized functional areas appear to be developing. The decentralization of retailing, wholesaling and industry has altered the function of the urban core. The core is evolving from a central business district to a central intelligence district.¹³ That is to say, tertiary and quaternary economic activities are becoming the predominate land uses. Financial and administrative offices, research and consultative firms, entertainment and cultural facilities are increasing in the core areas of cities. Those retail firms which remain downtown are becoming increasingly oriented to the daytime working population and to those people who live in or adjacent to downtown.¹⁴

¹²W.R. Thompson, Op.cit., p.355

¹³Personal Interview with Dr. Edward Higbee, Vancouver, B.C., November, 1967.

¹⁴Personal Interview with Dr. Walter Hardwick, Vancouver, B.C., April, 1967.

Within the core itself, specialized functional districts can be identified. For example, a financial district, a high order goods shopping district, and an entertainment strip may be easily observed. This clustering of like activities reflects the desire for face to face interaction or, as in the latter cases, the desire by consumers for comparisons.¹⁵

Urbanism - Perhaps the first thing that strikes an observer of our cities is the tremendous change of rural to urban population during the last few decades. Though change is constant it is the accelerating rate of change in the age of automation which has wrought havoc with the "good old times."¹⁶ Changing life styles are part and parcel of rapidly growing urban areas. The increasing acceptance of urbanism as a way of life has ushered in an urban society which exhibits an increasing affluence among the greater proportion of its members. The shorter work week, which is a consequence of automation, is making its appearance felt.¹⁶ Increasing leisure time and recreational pursuits are bywords of a more affluent society. The impact this has had so far on the urban scene is the increasing emphasis that is placed on the development of leisure time amenities and urban open spaces.¹⁷

¹⁵Walter Hardwick, The Vancouver Sun, July 8, 1967, p.6

¹⁶Proceedings of the International Conference on Automation, Full Employment and Balanced Economy, (Rome, Italy: British and American Foundations on Automation & Employment, 1967; and Economic Council of Canada, Op.cit., p.64

¹⁷N.P. Miller & D.M. Robinson, The Leisure Age: Its Challenge to Recreation, (Belmont, Cal: Wadsworth Publishing Co.Inc., 1963), pp.472-473

Another phenomenon of the age of automation is the increasing geographic mobility of the North American population. It is a fact that one out of five persons in the U.S. is now moving every year.¹⁸ This means that a working person in his life is likely to change his residence eight times and two or three of them would involve moves to an entirely different community. One consequence of this greater mobility is the loss of personal contacts with relatives and neighbours who are left behind.¹⁹

In addition to urbanism as a way of life and increased geographic mobility, differences in urban residential location are becoming more pronounced. The growth of the city under a free enterprise system, or under any non-centralized system, is leading to a high degree of differentiation of residential areas by type of structure, quality of housing and levels of rental values. Under a market system of allocating housing, where people live depends in large measure on the rent or sales price they pay. A considerable degree of residential segregation results between persons in various income brackets and between persons in various occupations. However, recent findings clearly indicate that racial and ethnic residential segregation are more than just economic discrimination. They also have led to the high degree of differentiation of resi-

¹⁸C. Abrams, The City is the Frontier, (New York: Harper & Row, 1965), p.17; and Economic Council of Canada, Op.cit., p.57

¹⁹M.B. Clinard, "Contributions of Sociology to Understanding Deviant Behavior" in Contemporary Social Problems, Merton & Nisbet (ed.), (New York: Harcourt, Brace & World Inc., 1961)

dential areas, because even where economic differentials are diminishing, racial residential segregation persists.²⁰

2. Megalopolis

The large scale movement of population into the outer rings of metropolitan areas is, according to Jean Gottmann, ushering in a new phase of metropolitan development which he calls Megalopolis.²¹

In regions such as the north eastern seaboard of the United States the outer rings of metropolitan areas have expanded to overlap with outer rings of other metropolitan areas. The result is a continuous band of urban and suburban development. This phenomenon is also called "strip city," "city region" and "super-metropolis."

The words megopolis and megalopolis are being heard with increasing frequency, usually applied to an almost continuous string of cities running from Washington, D.C. to Boston.....

The pattern does not consist of a string of metropolitan areas standing shoulder to shoulder, fighting for space like a crowd in a subway, but of metropolitan areas in a functioning group, interacting with each other. In the same manner that economic development has made the size of the typical nation inadequate and has called for super-nations, it seems that soon - at least in historical time - urban units will go beyond the scale of the metropolis to the scale of the megalopolis. And must as the metropolitan area is not made up of an accumulation of little cities complete in themselves but on a system of specialized and therefore dissimilar

²⁰K.E. Taeuber & A.F. Taeuber, Negroes in Cities, (Chicago: Aldine Publishing Co., 1965)

²¹Jean Gottmann, Megalopolis, (Cambridge: The M.I.T. Press, 1961), p.16.

areas, the various metropolitan units of megopolis will specialize and become more different from each other than they are today.²²

There are over a dozen areas in North America that could develop the same urban megalopolitan form as the north eastern seaboard. For example, in California most of the population is in the densely populated San Francisco Bay areas and in sprawling Los Angeles. Indications now are that people eventually will fill an almost solid population belt running between the two areas through the Central Valley of California.²³

E. URBAN FORM AND STRUCTURE

There have been many efforts to analyse the form and structure of cities. "Form" means the physical pattern of land use, population distribution and service networks, while "Structure" signifies the spatial organization of human activities and inter-relationships.²⁴ Ideas such as Ebenezer Howard's Garden City movement and Frank Lloyd Wright's Broad-acre Concept have had considerable influence in the decentralization argument while opposing views have reflected the "Save the Central Cities" movement. An example of a scheme developed for the retention of the central city was put forward

²²William Alonso, "Cities and City Planners" in Taming Megalopolis, Vol. II, H. Wentworth Eldredge (ed.), (New York, Washington and London: Frederick A. Praeger, 1967) pp.595-596.

²³C. Abrams, Op.cit., p.280.

²⁴Catherine Bauer Wurster, "The Form and Structure of the Future Urban Complex", Cities and Space, Lowdon Wingo (ed.) Resources for the Future Inc., (Baltimore: Johns Hopkins Press, 1966), p.75.

by L. Hilberseimer during the early 1940's, based on a "settlement unit."²⁵ Such a unit contains all the essentials of a small community within itself and each unit is in turn connected to other units to create an overall system of self-contained centres. Hilberseimer's study applies such a system to the City of Chicago. Recent efforts to analyze urban form and structure have focused attention on basic theories similar to Hilberseimer's approach instead of being largely intuitive as in earlier concepts. More scientific methods of analysis using computer techniques have been developed. With the use of models, many alternative forms of growth and change can be examined. Emphasis on transportation analysis has led to schemes such as the Year 2000 Plan for the National Capital Region²⁶ and more recently to the Penn-Jersey Transportation Study, where future growth possibilities have been presented with clear alternatives. In the Penn-Jersey Study, since transportation policy was the factor most directly under the influence of the study's policy committee, alternative transportation systems were taken as the starting point for investigating different possible regional growth patterns.²⁷

Many theoretical studies of transportation and urban form have been made by planning teams, such as the proposal

²⁵L. Hilberseimer, The Nature of Cities, (Chicago: Paul Theobald & Co., 1955), pp.192-193.

²⁶Gruen, Op.cit., p.262; and National Capital Regional Planning Council, The Regional Development Guide 1966-2000, (Washington, D.C.: June, 1966), pp.55-75; and interview with Alan Voohrees of Alan Voohrees & Associates Inc., Vancouver, B.C., March 22, 1968.

²⁷Penn-Jersey Transportation Study, Prospectus, Dec.11, 1959, p.14

for North Buckinghamshire in England,²⁸ and by architects such as J. Weber in his "Linear City Development" in 1965,²⁹ but few of these radical ideas have been implemented.

On a more academic basis there have been approaches to the theoretical studies of urban form and structure by use of models as exemplified by Melvin Webber and Kevin Lynch. Webber³⁰ suggests that most of the models used currently are based on "static descriptive" relationships such as density gradients of population, rates of decline of manufacturing and other relationships observed in existing spatial patterns. These models concentrate on the results rather than on the cause of urban form. He stresses the need for analysis of the "dynamic behaviour" aspects of urban structure. Lynch and Rodwin suggest in their model,³¹ which deals with physical form, that this approach should be followed by studies of the "activity pattern" and its effect on urban form. Recent studies for the New Town of Columbia in the State of Maryland takes this approach and offers a better understanding of models in integrating transportation and urban form.³²

²⁸Ministry of Housing and Local Government, England, Northampton, Bedford and Bucks Study, (London: Her Majesty's Stationery Office, 1965).

²⁹Brian Richards, New Movement in Cities, (London: Studio Vista and New York: Reinhold Publishing Corp., 1966), p.47.

³⁰M.V. Webber, "Transportation Planning Models", Traffic Quarterly, July, 1961, pp.373-390.

³¹K. Lynch and L. Rodwin, "A Theory of Urban Form, Journal of American Institute of Planners, Vol.XXIV, No.4, 1958, pp.201-214.

³²Voohrees, Op.cit.

1. Theoretical Concepts

There are many choices for future urban form and structure. Catherine Bauer Wurster outlined four broad alternative approaches:³³

- (a) Present trends projected. Region-wide specialization with most functions dispersed but with a push toward greater concentration of certain functions in the central cities. Perhaps unstable, likely to shift toward one of the other alternatives.....
- (b) General dispersion. Probably toward region-wide specialization of certain functions but a considerable degree of sub-regional integration might be induced.
- (c) Concentrated super-city. Probably with a strong tendency toward specialized sectors for different functions.
- (d) Constellation of relatively diversified and integrated cities. With cities of differing size and character, a range from moderate dispersion to moderate concentration would be feasible.

Any one of these four alternatives could probably apply in North America, depending on differing local conditions.

³³Wurster, Op.cit., pp.78-79

The city of Los Angeles has recently carried out a study on urban form and structure and the following four alternative concepts for urban growth were outlined:³⁴

- (a) Centres Concept. This concept envisions large regional concentrations of residence and employment, which would be the focal points for solidifying new growth in the metropolitan area. It proposes a city of a highly urban character, while preserving single-family residential areas and natural amenities. It attempts to minimize travel distances between home and places of daily occupation.....
- (b) Corridors Concept. This concept proposes a highly urbanized metropolis, with concentration of employment, commercial services, recreational facilities and high density apartments located in corridors extending outward from the..... metropolitan core. This concept would require a mass transit system.....
- (c) Dispersion Concept. This concept seeks an even distribution of activities, which would accommodate growth while preserving the characteristics that make Los Angeles unique among major cities; decentralization, owner occupied homes, and the automobile with its flexibility of movement. This concept attempts to keep travel distance from home to work and other daily activities at a minimum, by having jobs, consumer services, recreation and public facilities located close to the resident population.....

³⁴ Los Angeles Department of City Planning, Concepts for Los Angeles. (Summary Pamphlet, September, 1967).

- (d) Low Density Concept. This concept seeks to preserve the present residential patterns and life styles of Los Angeles. It emphasizes the single-family detached house with low rise apartments in about the same proportions as now. The automobile would continue as the predominant means of transportation

The four alternative concepts for the urban growth of Los Angeles are not unlike Catherine Bauer Wurster's four theoretical alternatives.

2. The Nodular Metropolitan Concept

The Nodular Metropolitan Concept is another alternative for urban growth and development. This concept, which is the basis of the group study, is found to combine elements of the Centres and Corridors Concepts as outlined in the Los Angeles Study.³⁵ For purposes of clarification at this stage of the study, the following assumptions are made:

- (a) Located in a large North American metropolitan region, containing a broad base of varied land use and widely diversified employment and offering a range of residential types.
- (b) A region of highly urban character with a concentrated central core.

³⁵Ibid.

- (c) Developed as a concentration of growth nodes at intervals along major transportation corridors. These nodes become centres for mixed usage or single uses of large proportions.
- (d) Preservation of outer single family residential areas and existing natural amenities.
- (e) Development of large areas between nodes as public recreation and open space.
- (f) Development through a comprehensive plan which co-ordinates the tools of capital budgeting, proper enabling legislation and programmed phasing.

It is envisaged that this system will bring about a higher standard of living, create more opportunities for the enjoyment of the city and provide an environment which will stimulate and support present and future generations.

To achieve this desirable urban condition for the city, the need for increased participation by public and private sectors has been acknowledged.³⁶ It is likely that totally new means of land use control and administration would be needed. The enormous problem of rebuilding our cities will most certainly require the most advanced technology, especially in transportation and building.

³⁶Nations Cities, Op.cit., p.19

3. Transportation Technology

There have been in recent years many innovations and research into modes of travel that, if implemented, could possibly play a significant role in making our cities more livable. Three recent innovations are:

- (a) Conveyors or moving sidewalks
- (b) Automated electric roads
- (c) Mini-cars

(a) Conveyors. The first proposal for implementing the moving sidewalk was in 1893 for the Columbia Exposition at Chicago and later at the Berlin Exposition in 1896 and Paris Exposition in 1900.³⁷ Because of the problem of low speed and other practical difficulties in its day to day use, the moving sidewalk has not come into extensive use as an integral part of the urban transportation system. Its application seems particularly suitable where large numbers of people have to move between two levels or along corridors, e.g. at big airports (Los Angeles, San Francisco, Montreal) to save the passengers from a long walk, and in department stores where it can be used conveniently by trollies and prams. Along with escalators, the conveyor has potential for use in high density nodular developments.

³⁷Brian Richards, Op.cit., pp.57-62

(b) Automated Roads. The General Motors Laboratories and Radio Corporation of America have been experimenting with automated roads with considerable success. A single cable is buried in a shallow trench just beneath the surface of the road and this cable, when energized, gives guidance through an electronic apparatus connected to the vehicles steering system. Secondary cables and detection loops adjust the speed of cars, keeping them at safe distance behind the one in front. General Motors estimate that vehicles could cruise in groups safely at a controlled speed of 70 m.p.h., giving a capacity of 9,000 vehicles per lane, per hour, the equivalent of building five additional lanes of motorway.³⁸ The cost of construction of such a system, would compete favourably with contemporary highway construction.³⁹

(c) Mini-cars. Mini-cars have come to the forefront only in recent years. Their sudden importance can be attributed to:

- i. A critical shortage of parking space in the central core.
- ii. The extremely high costs involved for providing additional parking.
- iii. An increasing concern for air pollution in our cities.

³⁸Brian Richards, Op.cit., p.77

³⁹Brian Richards, Op.cit., p.78

Although no "on the road" model has yet been developed, many companies have produced prototypes. The most widely known mini-car is the StaRRcar (for self transit rail and road) invented by William Alden. The StaRRcar can be driven along streets until the driver requires a faster speed in which case he merely drives up a ramp to an elevated track joining, say, a 60 m.p.h. train of vehicles. On pressing a dashboard button the vehicle is automatically ejected at its pre-selected exit. A mass shift to the use of StaRRcars would help alleviate the congestion on the road network and would also decrease the problem of inadequate parking spaces in the central core of the cities as three StaRRcars can fit into the space previously occupied by one conventional car.⁴⁰

Other modes of transportation include the mono-rail, cushion craft, vertical takeoff and landing, and helicopters. In recent years millions of dollars have been spent on development but their application has been limited to special purposes like the mini mono-rails for secondary transportation at Expo '67 and the helicopter service between Kennedy Airport and downtown Manhattan. For mass passenger transport they apparently still lack the economies necessary to provide a truly cost competitive corridor service.⁴¹

⁴⁰ Brian Richards, *Op.cit.*, p.73; and A.R. Wolf, Elements of a Future Integrated Highway Concept, presented at the Transportation Research Seminar, March 17-18, 1965 (Washington, D.C.: U.S. Department of Commerce).

⁴¹ A.R. Rice, Possibilities for Fast Surface Transport: The Case For Fast Rail Service, Planning 1966. Selected papers from A.S.P.O. National Planning Conference, Philadelphia, Pa., (April 17-21, 1966), pp.240.

4. Building Systems

There are numerous illustrations of advanced ideas in building systems that could possibly provide for high density core living for the future city dweller. Three recent illustrations are:

- (a) Habitat. With the advent of Canada's Expo '67, the development of Habitat became a possibility. Moshe Safdie, the designer of the project, has used a basic building unit in various combinations to develop a number of housing types. Habitat has developed vertical and horizontal circulation systems creating three-dimensional spaces.⁴²
- (b) Intropolis. A. Watty, the designer, has developed Intropolis as a system of multi-use blocks that can be connected in various ways to create higher or lower density of living spaces which are organized on a rational basis to give maximum flexibility and interaction. Three-dimensional spaces and circulation systems are evident as in Habitat.⁴³
- (c) Urbanisme Volumetrique. This system is based on expanding structures leaving the ground free. A three dimensional tubular structure with a series of slabs provides terraces for various builders to erect buildings, or to lay out roads and open spaces to create artificial landscapes.⁴⁴

⁴²Moshe Safdie and David Barott, "Habitat '67, Architectural Design, March 1967, pp.111-119.

⁴³Wolfgang Gerson, "Residential Environs in the Urban Area," Architecture Canada, (Vol.44 No.11, Nov., 1967)pp.39-41.

⁴⁴R. Anger and M. Heymann, "Urbanisme Volumetrique" L'Architecture d'Aujourd'hui No.132 (June-July, 1967), pp.36-37.

The detail description of any single land use and related building technique as it could be applied to the nodular metropolitan concept of urban growth is beyond the scope of this study (see matrix, Figure 1).

5. Urban Pattern

With few exceptions, the form of North American cities is based on the grid pattern.⁴⁵ Chicago, New York, San Francisco, Montreal and Vancouver are all examples of grid layout used to subdivide land and in providing services. It has been a quick solution to rapid development in any direction and a direct result of large scale surveying emphasis. Depending on local physiographic features, the access to all properties is nearly equal, and theoretically the only factor that affects a property's locational value is its relationship to the central core. The grid has been applied to such varied terrains as flat prairie and steep hillside. San Francisco is a good example of the latter.

F. SOCIAL AND SPATIAL SYSTEM⁴⁶

It appears that the changing urban form and structure is a process of continuous urban growth and development. This growth and development is an expression of the existing socio-

⁴⁵Paul D. Spreigregen, The Architecture of Towns and Cities, (New York: McGraw-Hill Book Co., 1965), pp.174-176.

⁴⁶Ernest Landauer. From his Seminar and Research into Urban Social Areas. Vancouver: University of British Columbia, 1965-1968.

cultural system.⁴⁷ There are certain social indicators which are not only demographic in nature, but also of a social behavioural nature. Demographic characteristics are generally an expression of the growth, size and age composition of a population. But underlying this are social behavioural characteristics, namely the practices of a society, which are expressed in activities and responses of the population. These practices of a society to some extent determine the spatial characteristics of the land.⁴⁸ Thus, a relationship between social and spatial characteristics exists.

When changes are introduced in the urban growth and development process, they usually have an impact on the internal social and spatial relationship of the urban system.⁴⁹ These incremental changes of the internal state of the urban system may range from "fixed" to "variable" states. Any shifts of the internal system from one state to another occur over time. These shifts represent incremental changes, depending on social reference structures and environmental manipulation. While there may be a number of external conditions which affect the urban system, there are at least two which should receive close attention in urban growth and development analysis; namely those as a result of planned change and those as a result of chance, where change is due to aggregate individual action.

⁴⁷ W. Firey. Man, Mind and Land: A Theory of Resource Use. (Illinois: Free Press of Glencoe, 1960), pp.207-241.

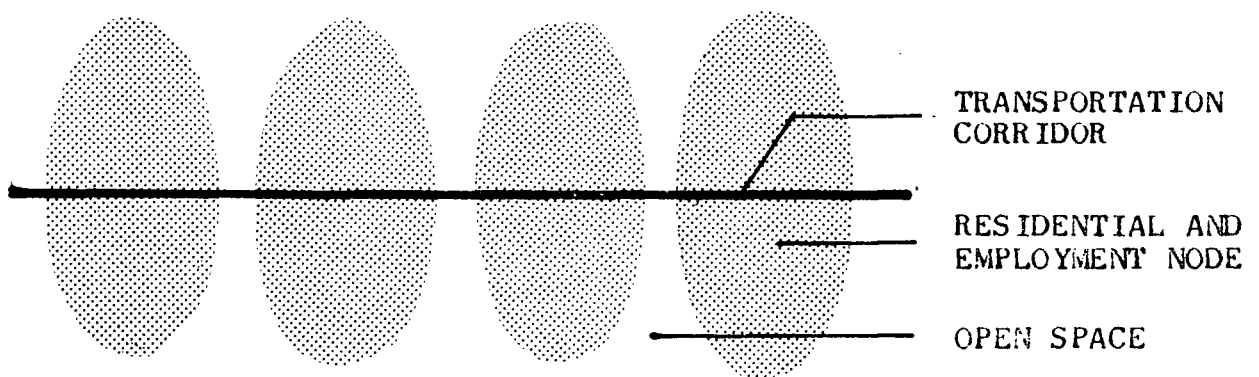
⁴⁸ Ibid., pp.207-245.

⁴⁹ W. Buckley. Sociology & Modern Systems Theory. (Englewood Cliffs: Prentice-Hall Inc., 1967); and L. Bertalanffy, "General Systems Theory: A Critical Review." General Systems. Vol.7, 1962, p.3

G. GROUP HYPOTHESIS

A review of the preceding urban growth concepts indicates that the nodular concept should be studied. Therefore the following hypothesis is formulated:

That the Nodular Metropolitan Concept provides a useful basis to initiate a study of urban living and planning.



Scale
Approx. 1m.

Figure 2

Nodular Metropolitan Concept

H. INDIVIDUAL THESIS TOPICS

The topics chosen for individual research are as follows:

1. Ian W. Chang - "The Problem of Private Investment in Urban Redevelopment."
2. Ashok G. Shahani - "The Nodular Metropolitan Concept: Some Transportation Aspects."
3. Monica H. Lindeman - "The Nodular Metropolitan Concept: Some Social and Spatial Aspects."
4. Ronald E. Mann - "The Role of the Time Element in the Urban Renewal Process."
5. Arthur R. Cowie - "The Provision and Distribution of Local Open Space in Urban Residential Areas." ⁵⁰

⁵⁰The author chose this aspect for research within the group study because of his background as a landscape architect and his particular interest in urban open spaces.

SECTION II - 5

INDIVIDUAL THESIS

THE PROVISION AND DISTRIBUTION OF
LOCAL OPEN SPACE IN URBAN RESIDENTIAL AREAS

CHAPTER I

INTRODUCTION

A. GENERAL

Within the context of the group study this enquiry examines some aspects of the provision and distribution of urban open space. The need for urban open space and recreational facilities is widely recognized. Few people today are against city parks, pedestrian shopping malls or playgrounds for children. But do we understand enough about peoples' needs for open space in city areas or are we still thinking of concepts largely in terms of rural values. It may be already too late in North America, with four out of five persons living in urban areas, to indulge in memories of the agrarian past and a free range of ample open space.¹ Are we making open space available to all people of the city? Many low income families are simply not mobile enough to reach other than nearby parks. In the larger cities in particular there is a pressing need by the poorer families living amid congestion, noise, drabness and unbroken monotony of asphalt, for green open space and recreational facilities.²

Radical new means of redevelopment within an urban context, and on a metropolitan wide basis, may be necessary

¹Edward Higbee, The Squeeze: Cities Without Space, (William Morrow & Co., 1965), p.29.

²Robert C. Weaver, "Recreation Needs in Urban Areas", National Parks Magazine, Vol.41, No.253, Dec. 1967, p.10.

to provide for their needs. How we solve these and other problems referred to in Section I, in terms of form and structure, will have much to do with the very making of us; for man is largely conditioned by the environment which he in turn creates.³ If the problem and opportunities of city open space and recreational facilities as part of this environment are to be properly understood, they must be seen in the terms of the whole society and whole economy.⁴

B. BACKGROUND

1. Open Space and Urban Development

In Section I it was suggested that the future urban scene may need to consider alternative patterns of form and structure. The group concept considers a concentrated nodular metropolitan core area with open space being an integral part of the urban development. There are many contemporary views that support such a spatial pattern including the following by Stanley Tankel:

The future use of urban space will tend toward a more dense, more nucleated, more clustered pattern than we are now building in our urban areas. Accompanying the tighter development and stronger centers, there will be less private open space (that is, we will have smaller lots) and at every scale of development, substantial continuous open space, commonly enjoyed and publicly or commonly owned.⁵

³Higbee, Op.cit.

⁴Marion Clawson and Jack L. Knetsch, Economics of Outdoor Recreation, (Baltimore: Johns Hopkins Press, 1966), p.3

⁵Stanley B. Tankel, "The Importance of Open Space in the Urban Pattern" in Cities and Space, Lowdon Wingo, Jr. (ed.), Resources for the Future Inc. (Baltimore: Johns Hopkins Press, 1963), p.58

The question that arises when examining this nodular metropolitan core of urban development, as in other alternatives, is not merely the quantity of open space but the location, deployment and use of open space as an essential consideration of urban spatial organization.⁶

2. Functions of Open Space

Understanding the nature and function of urban open space is a major issue. Mr. Tankel refers to Charles Eliot's distinction between open space for service and open space for structure and to Tunnard - Pushkarev's four functions served by open space: productive, protective, ornamental and recreational. He offers his interpretation of what kind of open space people are aware of:

....it is used - for the wide range of active and passive recreation activities, for circulation; it is viewed - from the home, the road or other vantage points and it is felt - it gives privacy insulation, or sense of spaciousness and scale...

He further describes urban open space that people are not necessarily aware of:

Open space that does urban work - protects water supply and prevents floods by soaking up runoff, acts as a safety zone in the path of aircraft takeoffs and landings; and open space which helps shape the development pattern - as space between buildings or communities, as space which channels development, as a land reserve for the future.⁷

⁶S.B. Zisman, "Open Spaces in Urban Growth" in Taming Megalopolis Vol.I, H. Wentworth Eldridge (ed.), (New York, Washington and London: Frederick A. Praeger by arrangement with Doubleday & Co. Inc., 1967), pp.287-288.

⁷Tankel, Op.cit., p.58

Marion Clawson⁸ refers to five major urban open space functions:

- (a) Open space surrounding public buildings,
- (b) Open space for recreation,
- (c) Open space for ecological protection or for the preservation of certain desirable natural characteristics,
- (d) Open space for urban structural and aesthetic purposes, and
- (e) Space provision for future urban growth.

Both statements by Tankel and Clawson illustrate the important functions open space has to play in the urban scene. A catalog of open space and the analysis of types of functions can help toward a better understanding of the role of open space in urban development.

Zisman⁹ has divided urban open space into three major functional types:

- (a) Open utility spaces: These are the surface spaces needed for water supply, for drainage and flood control, the air spaces for aircraft movement, and the space for production.
- (b) Open green spaces: Lands and areas used for parks and recreation, green belts and green ways, building entourage, and natural and scenic protection.
- (c) Corridor spaces: Rights-of-ways for movement, transportation and passage.

⁸Marion Clawson, "A Positive Approach to Open Space Preservation", A.I.P. Journal, Vol.28 (May, 1962)

⁹Zisman, Op.cit., p.289

These broad categories can be broken down into a multitude of open space forms and uses from the broader regional parks, water reserviors and waterways through to the smaller local parks, plazas and playgrounds. Appendices A and B are a sample of current attempts at categorizing for park use functional open space types within metropolitan areas.

3. "Given" and "Made" Form

On a broad scale it is interesting to note that where nature has provided a dominant natural landscape, there is a universal response to it.

San Francisco - beloved by dweller and visitor alike - in great part is defined by a magnificent open space system - the surrounding ocean and bay. Regardless of mistakes made in building, the city itself is a magnificent urban form.¹⁰

New York metropolitan area in its own natural identity has another open space system - more than 30 per cent of the regional area is taken up by river, sound, harbour and ocean. The same can be said for the metropolitan area of Vancouver with its harbour and mountains.

San Francisco, New York, Vancouver and other cities that are memorable, usually have a distinctive identity that depends on the exploitation rather than the obliteration of natural elements. The "made form", especially when concerned with open space, should take account of any unique

¹⁰Zisman, Op.cit., p.292

"given form", the "genius loci", the character of the place. "Given form" is defined briefly here as the natural landscape phenomenon and "made form" is defined as the historical adaptations by man.¹¹

This study does not dwell on the "given form" but it is recognized that any application of the general concept for development must first take this into account. A comprehensive ecological study would be required such as that carried out by Wallace, McHarg, Roberts and Todd for Washington, D.C.¹²

4. City Park as Part of Development

City planners over the last decades have been primarily concerned with a variety of isolated open spaces, rather than relating these open spaces to the surrounding development. There exists today in our cities, parks marked on maps which actually are no more than plain voids, or empty areas unrelated functionally or visually to nearby open spaces and surrounding development. They differ from other parks in that they have no given or made identity except perhaps that they are outlined by a grid road system and occasionally are used for group sport. More successful parks form identifiable spaces related to the form and structure of the surrounding development and change functionally and visually along with it over time. For example, a local park near the core of a city

¹¹Wallace, McHarg, Roberts and Todd, Toward a Comprehensive Landscape Plan for Washington, D.C., A Report prepared for the National Capital Planning Commission.(U.S. Government Printing Office, 1967).

¹²Ibid, p.2

may have gradually taken on a definite spatial form throughout the past century only to change in functional and visual identity by successive erection of taller buildings around it.

Being part of the ever changing socio-economic and technical conditions of the city, parks are never completed. Living organisms within the park such as trees, shrubs and flowers not only change visually throughout the year but grow, die and eventually may be replaced. Elements such as individual monuments, fountains and kiosks are also subject to the flux of time, some may disappear, others are destroyed, others may be replaced and still new ones may be added. Thus the park as one form of open space may undergo fundamental changes as part of its own identity, as well as part of the surrounding development.

5. Leisure Time and Outdoor Recreation

Mass leisure¹³ has appeared within the past few years in the industrial urban society¹⁴ as a result of an economical and technical revolution. At one time, six and even seven day work weeks were common; today, few work weeks are over five days. Once work days were ten and even twelve hours; today, they are only rarely over eight hours. Today the 40

¹³N.P. Miller and D.M. Robinson, The Leisure Age: Its Challenge to Recreation, (Belmont, Cal.: Wadsworth Publishing Co., Inc., 1963), p.4.

¹⁴N. Anderson, Dimensions of Work. (New York: David McKay Co., 1964), p.96.

hour work week is normal and most workers have paid vacations. In addition, the length of a typical paid vacation has been increasing from two, to three, and even to four, weeks.¹⁵ Man in industry theoretically has gained approximately 1,500 free hours per year since the turn of the century. What effect has this increased leisure time had on outdoor recreation and consequently the need for open space and recreation facilities in urban areas?

How much of this gained free time is actually leisure time for the individual and how much of this is regulated to a particular length of time or hour of the day? Most urban workers rise at a predetermined time, brought to attention by the alarm clock; eat, ride to work, begin the day's work, take a coffee break, eat lunch, quit work, ride home, eat dinner, look at T.V. and retire, all according to the clock.¹⁶

The time-oriented modern worker is left little freedom in deciding working hours in our industrial society. Likewise, leisure time is regulated to a little each day, some over the weekend, and some during vacation in a pattern that is largely determined by employers, fellow workers and society in general. The worker is not the only part of our social structure that is time oriented; self-employed persons, housewives, children and retired persons all have in varying degrees, their leisure time regulated. If, as seems probable, most people will have more leisure time in the future than

¹⁵ Marion Clawson, Land and Water for Recreation, for Resources for the Future Inc. (Chicago: Rand McNally & Co., 1963), p.5

¹⁶ Ibid., p.6

we have today, its form and timing will also be largely socially, rather than individually determined.¹⁷ It follows that if outdoor recreation, as part of leisure time, is to adequately meet the needs of our predominately time-oriented society, it seems the provision of open space and outdoor recreation facilities must be oriented in that direction.

6. Need for Urban-Oriented Recreation

Four out of five North Americans live today in urban areas, yet we still think of recreational outlets largely in terms of rural values. Most of our recreation budgets have been directed to rural oriented programs such as the National Parks, that do not necessarily serve the needs of all central city people. Excellent as the programs may be, Robert Weaver considers they omit consideration of the following facts:¹⁸

Conventional recreational facilities are not available to all the people of the city. Many low income families, particularly those in isolated and impacted urban ghettos, are simply not mobile enough to reach them.

Many people in cities are not interested in outlying recreation areas or the traditional rural concepts of recreation. Thus, we cannot restrict the development of recreation facilities to outlying areas. We must think of a pattern of living in which opportunity, rest, and relaxation is available to all citizens in every walk of life. We must consider the urban citizen who by choice wants his recreation within the city.

¹⁷Ibid., p.7

¹⁸Weaver, Op.cit.

In addition to low income people being restricted from using outlying parks and recreation facilities, a further substantial portion of our urban population at the ends of the age scale may be equally restricted. Small children and senior citizens need open spaces, especially parks and playgrounds within very short walking distances of their homes.¹⁹ For very small children the question of play space must first be solved in conjunction with the home, but as children begin to walk, open space adjacent to the home becomes essential.²⁰ Parts of our cities, particularly the older high density areas, lack the number of passive and recreational open spaces, no matter how small, to provide for these age groups.

Regardless of income or age, all people need open space for basic activity. Doctors, again and again, recommend exercise and deep breathing of fresh air as a remedy for many ailments as a prophylactic measure.²¹ Melvin M. Webber is quoted in the summary of the Outdoor Recreation Resources Review Commission Conference on Leisure-Outdoor Recreation and Mental and Physical Health:

It has long been understood that health, and particularly mental health, is not solely a characteristics of the individual's internal condition and makeup. But it is now becoming

¹⁹Final Report of the Park, Recreation and Open Space Project by the Regional Plan Association Inc., The Race for Open Space (New York: September, 1960), p.27.

²⁰Alfred Ledermann and Alfred Trachsel, Playgrounds and Recreation Spaces, trans. by Ernst Priefert (London: The Architectural Press, 1960), p.10.

²¹Paul Ritter, Planning for Man and Motor, (New York: Pergamon Press Inc., 1964), p.38.

clearer that health can best be understood as a characteristic of the interaction between an individual and the total physical and social environment in which he develops and lives. Approaches of public health programs designed to promote health rather than to prevent illness are therefore seeking to identify those conditions in the larger environment that would foster the well-being of individuals who will occupy it.

7. Open Space Standards

With increased concern in recent years for the visual and physical quality of public open space, planners, landscape architects, ecologists, recreation authorities, agencies and organizations throughout North America have attempted to set standards. Present standards are primarily based on acreage per capita and distance factors. Most of these standards have developed as a "rule of thumb" with little consideration given to social need and user behaviour factors. On a broad scale, long term procedures and standards, based on an understanding of the total environment, are necessary for preservation of open space. However, the majority of local open space as an integral part of the urban fabric, must continuously change. As the building systems and land uses change within the city so must the related local open spaces. Because of change, rigid standards for local open space set years ago are unlikely to be applicable today. Likewise, there is almost no way of knowing what exact standards would be needed several generations hence.²² A sample of present standards is listed in Appendices A and B.

²²A Procedure for Open Space Planning in an Urban County, (Urbana: University of Illinois, College of Fine and Applied Arts, Department of City Planning and Landscape Architecture, 1962), p.5

C. THE STUDY PROBLEM

Clawson and Knetch²³ classify local parks as part of their "user-oriented" classification of urban open space. It is generally agreed that the "user-oriented" classification means the whole of the open space system within the city. This meaning corresponds closely to the Outdoor Recreation Resources Review Commission's classification (Class 1 High-Density Recreation Areas: areas intensively developed and managed for mass use).²⁴

Local parks of various types make up a major part of this classification. What is meant specifically as a local park is described later for each study area separately. This is because there is no clear agreement from city to city as to what characteristics make up a local park. Various classifications of local parks in Appendices A and B illustrate the confusion that exists. If there was some agreement on a range of terminology and data recording, systematic comparisons between areas within cities and between cities could be made more easily. It is becoming increasingly important to be able to do this so that accumulated experience can be of service to those dealing with increasing complex scales of development. Generally the most important characteristic local parks have is their ready accessibility to local users. Their chief

²³Marion Clawson, Op.cit., p.36

²⁴Ibid.

time of use is after school for children, after work for adults, and during the day by retired people and mothers with small children. For these purposes, it is essential that such parks be close to users, both in order to reduce the travel time and to permit some users to go from the home to the park unaccompanied by adults. The use of local parks is closely correlated with the amount of free time available each day.²⁵ Such areas (as in the case of the study areas Vancouver and Montreal) are often small, frequently ranging from less than one acre to slightly over 30 acres (see Appendix C for Vancouver).

A review of park literature points out that the present practice in cities is to base local park provision primarily on standards relating to acres per 1000 population. To many, it has appeared that there are gross inequalities between various socio-economic groups of persons when local parks are provided on this standard. In particular, poorer areas within the city appear to have less acreage and poorer quality parks than more wealthy areas. Although we cannot be sure that there is a particular variable causing this inequality, differences in family incomes seem to be a primary variable. Age structure, education, occupation, leisure time, mobility and cultural background offer additional factors of comparison.

²⁵Ibid., p.38

It also seems from the review that there has been a change in the need for some types of parks. For example, the trend toward greater mobility has suggested that the community park (see Appendix B) is an outdated classification. Its acreage and functions could perhaps be more efficiently used if allocated to other types of open space. This is particularly evident when considering the Nodular Metropolitan Concept.

D. STUDY APPROACH

Chapter II first looks at park quality analysing exist- in local parks in the cities of Vancouver and Montreal to determine if there is a relationship between family income and park quality and if, in fact, people living in areas of low family income have less local park acreage and poorer quality parks than people living in areas of higher family income.

Chapter III looks at the open space system within the Nodular Metropolitan Concept to determine if this system offers a more equitable distribution of local public open space than the present grid system examined in Chapter II. A theoretical open space model is formulated based on implicit theory of basic human needs. The model is then partly tested by use of a social behaviour activity survey. Observations and interpretations are then made.

Finally, Chapter IV summarizes the results of findings in Chapters II and III and relates these to the general theory of open space needs as outlined in Chapter I. Conclusions are drawn regarding the need for further research.

CHAPTER II

ANALYSIS OF EXISTING QUALITY OF LOCAL
PARKS IN RESIDENTIAL AREAS

A. FORMULATION OF HYPOTHESIS

A review of park standards would seem to indicate that all groups of persons living in North American cities have supposedly equal access to local parks. But available literature on actual allocation of open space points out that there are major inequalities. The following working hypothesis is formulated after consideration of some of these inequalities.

- H 1 Residential areas with high family income
have higher quality local park acreage than
residential areas of lower family income.

B. CHOICE OF RESEARCH AREAS

The cities of Vancouver and Montreal were chosen as research areas.¹ In both cities, the available data for quantitative analysis pertaining to local parks has been minimal and has therefore limited the extent and quality of this research.

¹The author was particularly interested in the larger Canadian urban centres and these two cities were chosen to represent this type of centre.

C. DEFINITIONS

- Local Parks**
- For study purposes, local parks in Vancouver are defined as all parks administered by the Vancouver Board of Parks and Public Recreation within the city boundaries, except Stanley Park and Queen Elizabeth Park. Golf courses are also excluded.
 - For Montreal local parks are defined as all parks administered by the Montreal Parks Department within the city boundaries, except those designated as Metropolitan and Regional parks. Golf courses and botanical gardens are also excluded.

Factors Tested:

Average Family
Wage and Salary
Income

- From census tract data.²

Park Acres per
1000 Persons

- For Vancouver, park acreages were taken from the Board of Parks and Public Recreation Annual Report for 1961. The location of each park within census tracts was calculated from a land use map.³

²Census of Canada, Bulletin CT-22 for Vancouver and Bulletin CT-4 for Montreal (Ottawa: Dominion Bureau of Statistics, 1961)

³Vancouver Land Use Map, edition ASE-416-M-3 (Ottawa: Map Division of Federal Department of Mines and Technical Surveys, 1960).

Park Acres per
1000 Persons
(cont'd)

- For Montreal, park acreages were taken from a publication by Ville de Montreal.⁴

The location of each park within census tracts was calculated from a map dated 1966 supplied by Mr. W.S. Goshorn, chief landscape architect for the city of Montreal.

An emphasis is put on this factor in this study because present park standards are primarily based on it.

Number of Types
of Facilities
per 1000 Persons

- Calculated for Vancouver only, from Board of Parks and Public Recreation Annual Report for 1966 and checked with Park Board officials to relate to 1961.

Seclusion
Factor

- Calculated for Vancouver only, from transportation facilities map.⁵ Seclusion factors were calculated by measuring on the map to the nearest 100 feet, the distance to each park from the nearest major traffic arterial. Major traffic arterials in this study are defined as all roads of four or more lanes.⁶

⁴Ville de Montreal, Amenagement des Parcs (Des Travaux Publics, Division Technique, 1965).

⁵Vancouver Transportation Facilities Map, edition ASE-416-M-18, (Ottawa: Division of the Federal Department of Mines and Technical Surveys, 1964).

⁶Barry W. Mayhew, A Regional Atlas of Vancouver, United Services of the Greater Vancouver Area, 1967), Fig.14.

Park Expenditure - Annual expenditure for parks during
per 1000 Persons 1961, from Vancouver Board of Parks
and Public Recreation Annual Report.

D. LIMITATIONS

Measurement of park quality, except for the seclusion factor, have been limited to factors where quantifiable data were available from Vancouver and Montreal city publications. The writer recognizes the need to consider many other factors in determining the level of quality of open space, for example, visual factors; however these were not readily available within the restraints of this study.

E. DESCRIPTION OF METHOD AND PROCEDURE FOR TESTING STUDY HYPOTHESIS

For purposes of testing the hypothesis five income groupings were arbitrarily selected for comparison (see Table I). Census tracts in the metropolitan area were then ranked according to average family wage and salary income and divided into the following percentages: highest 16.66%, above average 16.66%, average 33.33%, below average 16.66% and lowest 16.66%.⁷ Only those census tracts that fell within the boundaries of the city were used for calculations.

⁷L.I. Bell, An Overview for Social Planners, (Vancouver: Community Chest and Council of the Greater Vancouver area, 1965), p.47; and personal interview with L.I. Bell, April, 1967.

Measurement of park quality (park acreage per 1000 persons, types of facilities per 1000 persons, average seclusion factor and expenditure per 1000 persons) were tabulated for each park and census tract (Appendix C) and then arranged in appropriate income groupings (Appendix D). Averages were calculated and summary tables compiled for comparison (see Tables II and III). The spearman rank correlation coefficient test was used to indicate degree of correlation.

TABLE I
CENSUS TRACT INCOME GROUPINGS⁸

<u>Group.</u>	<u>No. of Census Tracts</u>		<u>Percentage of Metro Area</u>
	<u>Vancouver</u>	<u>Montreal</u>	
Highest	20	58	16.66
Above Average	20	58	16.66
Average	40	119	33.33
Below Average	20	58	16.66
Lowest	20	58	16.66
	120	351	100.00

⁸Ibid.

9

F. SUMMARY OF FACTORS TESTED

TABLE II - VANCOUVER

	Average Family Wage & Salary Income	Park Acreage per 1000 Persons	No. of Types of Facilities per 1000 Persons	Average Seclusion Factor	Park Expendi- ture per 1000 Persons
	A	B	C	D	E
Highest	7,500	3.60	1.29	2.9	1,628
Above Average	5,711	2.73	1.50	2.4	1,068
Average	5,210	2.15	1.00	0.8	1,350
Below Average	4,753	2.22	1.22	1.2	874
Lowest	3,940	1.40	0.70	0.4	526

Highest	1	1	di 0	3	di +2	1	di 0	0
Above Average	2	2	0	1	-1	2	0	3 +1
Average	3	4	+1	4	+1	4	+1	2 -1
Below Average	4	3	-1	2	-2	3	-1	4 0
Lowest	5	5	0	5	0	5	0	5 0

Formula:

$$r_s = 1 - \frac{6 \sum_{i=1}^N di^2}{N^3 - N}$$

$$r_s = .90$$

$$r_s = .50$$

$$r_s = .90$$

$$r_s = .90$$

⁹See Appendix D.

TABLE III - MONTREAL

	Average Family Wage & Salary Income \$	Park Acreage per 1000 Persons
	A	B
Highest	7,530	2.07
Above Average	5,669	2.53
Average	4,610	1.07
Below Average	4,303	.73
Lowest	3,678	.48

Highest	1	2	di +1
Above Average	2	1	-1
Average	3	3	0
Below Average	4	4	0
Lowest	5	5	0

Formula:

$$r_s = 1 - \frac{6 \sum_{i=1}^N di}{N^3 - N}$$

$$r_s = .90$$

For Vancouver, the dependent variables of average family wage and salary income correlate with park acreage per 1000 persons; average seclusion factor; and park expenditure per 1000 persons; taken separately $r_s = .90$. This is at the 5% level of significance. For number of types of facilities per 1000 persons, $r_s = .50$ which is not at a significant level of probability. However, it is noted that the lowest income group has fewer types of facilities. For Vancouver, this indicates a significant correlation between local park quality and family income, thus substantiating the working hypothesis.

For Montreal, the dependent variables of average family wage and salary income correlate with park acreage per 1000 persons ($r_s = .90$) which is at the 5% level of significance. This further substantiates the working hypothesis.

G. OBSERVATIONS AND INTERPRETATIONS

The cases of Vancouver and Montreal illustrate that there are inequalities in provision of local public open spaces within cities. Present acreage standards for local parks range from 2.0 acres per 1000 persons to over 10 acres per 1000 persons (see Appendices A and B).

For purposes of comparison 3.0 acres per 1000 persons is considered an average figure. For Vancouver only areas with families earning the highest incomes meet this standard. The more wealthy ears of Vancouver have nearly three times the local park acreage per 1000 persons than the poorer areas which have only one half the 3.0 acre figure. For Montreal, not only are the wealthy areas below the 3.0 acre figure but the poorer areas have less than one sixth this standard. For Vancouver, other measures of park quality, including types of facilities, seclusion and park expenditure substantiate the acreage findings. The poorer areas within the city have the fewest types of facilities, the least seclusion and the lowest amount of money spent on parks.

If present public open space standards, which are theoretically applicable to all persons regardless of income, age, education and occupation, are set and not adhered to throughout the city then their uselessness is evident. It is implicit in considering the Nodular Metropolitan Concept that access to public open space be equally provided to all persons according to need. Any differences in quality of open space should take place within the private sector which would be above the agreed public standard.

It is beyond the scope of this study to determine in detail the reasons why present standards are not met or why linkages between income and park quality exist.

CHAPTER III

ANALYSIS OF THE OPEN SPACE SYSTEM WITHIN
THE NODULAR METROPOLITAN CONCEPT

A. FORMULATION OF OPEN SPACE MODEL

1. The Study Model Approach

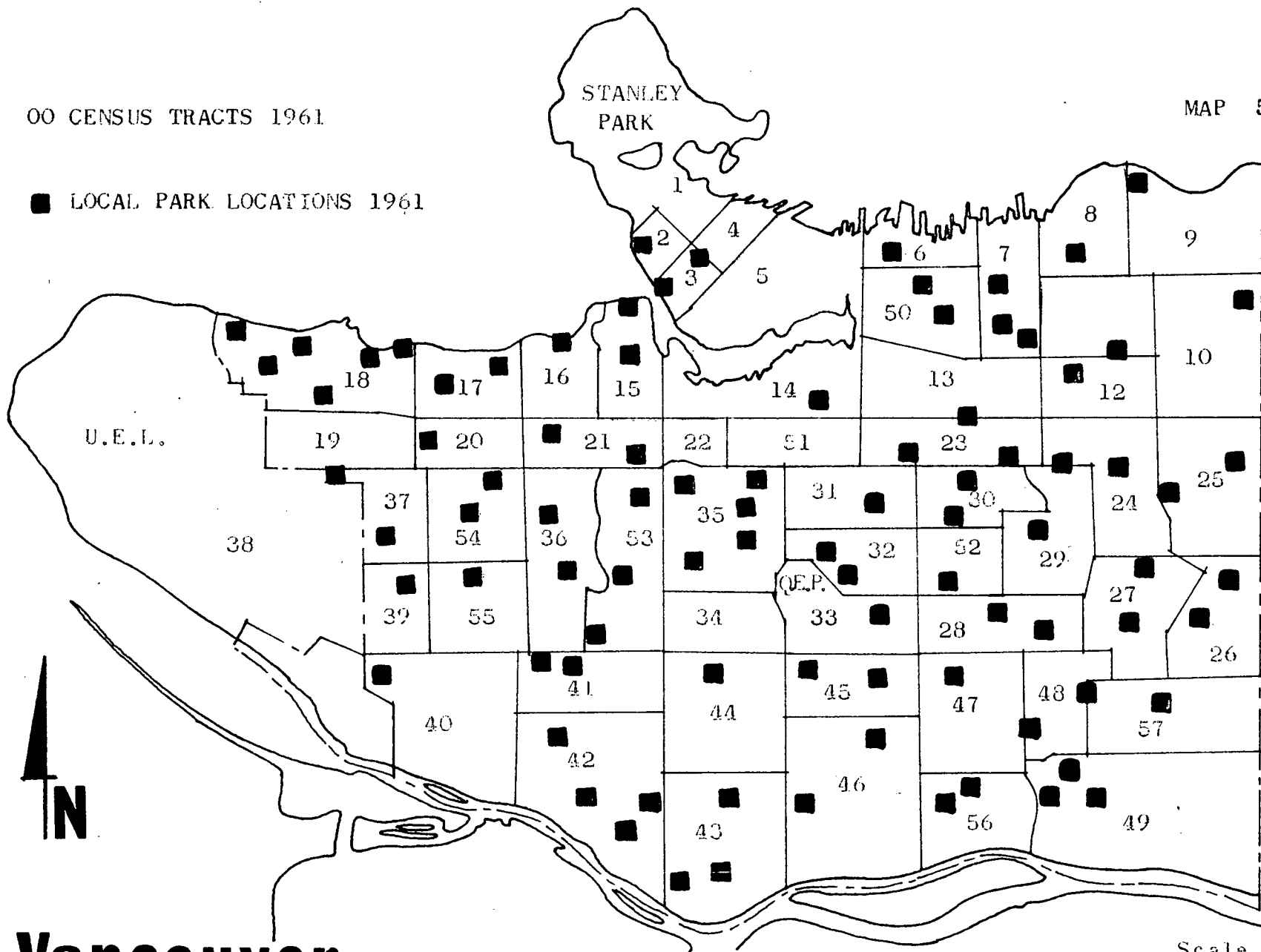
The lack of any agreement on a range of terminology to define local open space within North American cities is evident from background reading and examination of standards, (ss Appendix A). However, some common underlying implicit theory about urban local open space needs can be inferred.

Postulates (see below) were formulated and from these a theoretical open space model was drawn up that corresponds with the ideas already put forward in the Nodular Metropolitan Concept for urban redevelopment. The model is intended as a planning tool in helping to make more logical decisions in distribution of open space. The model illustrates only one combination of many possible arrangements of layout and location of facilities. For illustrative purposes only, the model could represent a residential population of, say, 30,000 persons.

00 CENSUS TRACTS 1961

MAP 5.1

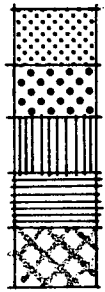
■ LOCAL PARK LOCATIONS 1961



Vancouver

Scale
0 1 2 Mi.

A.R.C. March 1968



HIGHEST
ABOVE AVERAGE
AVERAGE
BELOW AVERAGE
LOWEST

STANLEY
PARK

U.E.L.



Vancouver

AVERAGE FAMILY WAGE
AND SALARY INCOME



A.R.C. March, 1968

— 4 LANES

■ LOCAL PARKS

MAP 5.3

STANLEY
PARK

U.E.L.

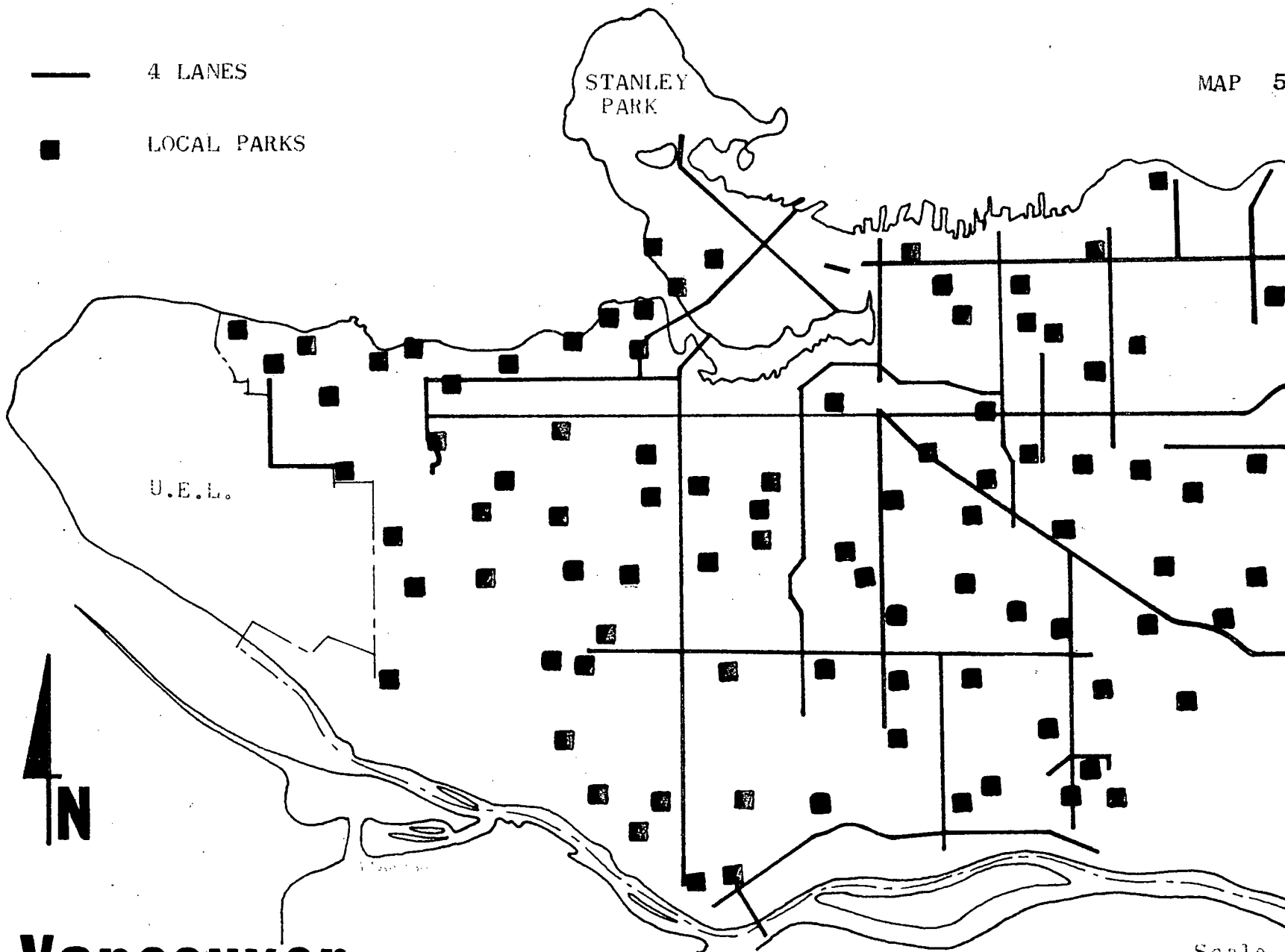


Vancouver

MAJOR TRAFFIC ARTERIALS

Scale
0 1 2 Mi.

A.R.C. March 1968



2. Postulates for Urban Local Open Space

The following postulates were formulated as a guide to constructing the theoretical open space model. Because of time limitations no attempt has been made at testing them.

- (a) Increasing amounts of leisure and income will increase the need for open space and related activity.
- (b) The majority of people need passive open space in which to sit, walk and observe life around them.
- (c) There is the need for a variety of small open spaces diffused throughout the urban structure and closely related to pedestrian movement.
- (d) The disposition of open space toward a more linear or ribbon-like form would best serve the function of improved linkages and general accessibility.
- (e) Residential areas designed with few or no private gardens needs a high level of small public open space within convenient range.
- (f) Particular groups of persons within society, including small children, mothers of small children, invalids and senior citizens need open spaces within very short walking distances of their homes.

- (g) The majority of small open spaces within the urban structure should be capable of change in use.
- (h) Shelter and comfort, in order that persons are able to dally and enjoy diversionary activity, are important requirements of urban open spaces.
- (i) Scenic qualities and opportunities for a sequence of activity of an incidental nature are important urban open space characteristics.
- (j) The increased need for public open space, paralleled with the growing need for school open space, indicates that where possible, for optimum use of space, the two should be integrated.
- (k) There is the need for large open spaces within the city, accessible without traffic danger or prohibitive transportation costs.

3. A Theoretical Open Space Model

A model (Figure 5.2) is formulated to represent graphically the urban local open space postulates and some of the ideas already put forward in Section I for the Nodular Metropolitan Concept (see page 17).

4. Open Space Categories

The present categories of recommended public open space for the Lower Mainland can be seen in Appendix B. The Vancouver Board of Parks and Public Recreation profess to use these categories as a guide.¹ In the theoretical open space model, the following three broad forms of public open space categories are distinguished.

- | | |
|---|--|
| <p>(a) Intensive Activity
Open Space</p> | <p><u>Typical use:</u> For organized recreation such as tennis, swimming and outdoor bowls; open shopping malls, outdoor cafes and sheltered sitting areas.</p> <p><u>Likely location:</u> Near neighbourhood shopping centre, secondary school and public transit stop. Would be within easy walking range of every household (say ¼ mile).</p> |
| <p>(b) Pedestrian
Corridor Open
Space</p> | <p><u>Typical use:</u> provides pedestrian linkage throughout the urban structure; incorporates small specialized play and sitting areas along its route; such specialized areas would be located within easy walking distance of every household (say 200 feet).</p> |

¹Personal interview with S.S. Lefeaux, Superintendent of Board of Parks and Public Recreation, Vancouver, February 7, 1968.

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| <p>(b) Pedestrian
Corridor Open
Space</p> | <p><u>Typical use:</u> provides pedestrian linkage throughout the urban structure; incorporates small specialized play and sitting areas along its route; such specialized areas would be located within easy walking distance of every household (say 200 feet).</p> |

¹Personal interview with S.S. Lefeaux, Superintendent of Board of Parks and Public Recreation, Vancouver, February 7, 1968.

(c) Parkland Open
Space

Typical use: Provides local natural areas for casual and non-organized group sport; could contain neighbourhood swimming areas and specialized city-wide facilities such as a zoo or botanic garden.

Likely location: Between dense residential and employment nodes. Would be located within convenient walking distance of every household (say $\frac{1}{2}$ mile). The acreage should probably be not less than 150 acres and preferably around 300 acres.

These three forms of urban open space are intended to give each person living within the Nodular Metropolitan core the opportunity of easy local access to a range of open spaces arranged so that both specialized and casual needs are adequately met. No detailed attempt at this stage of the study has been made to define the size of the various open spaces or the facilities provided. It is not possible either at this stage to define relationships between residential density and the intensity of use of open space or look into effective capacities of different types of open spaces. Future research into these aspects of open space could perhaps set more detailed guidelines for urban development.

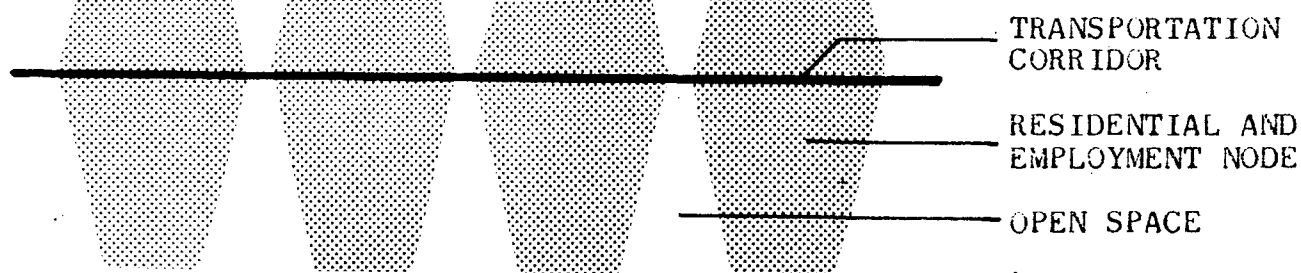
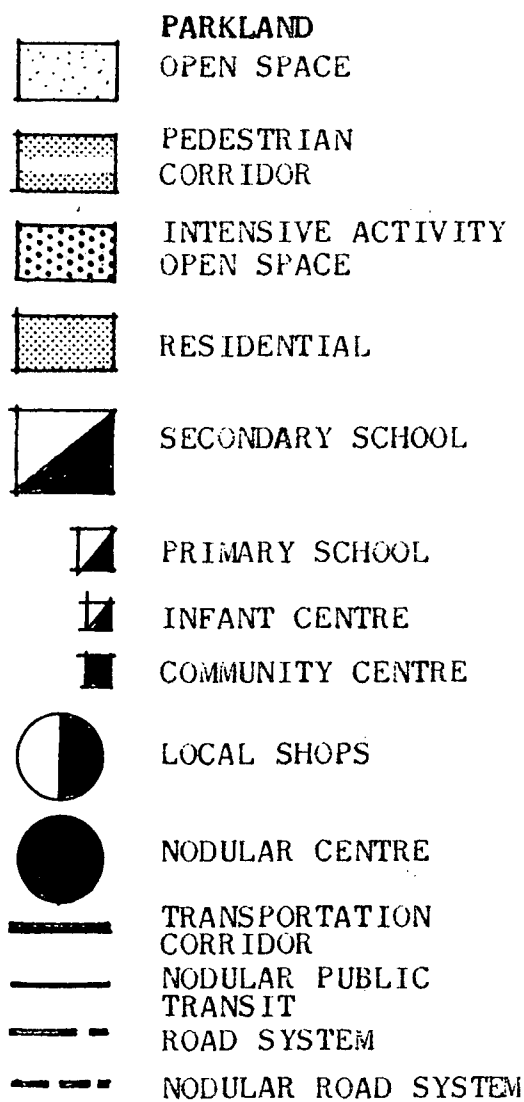


FIGURE 5.1

THEORETICAL OPEN SPACE MODEL



Scale: 1/4 m.

FIGURE 5.2

B. DESCRIPTION OF METHODS AND PROCEDURES FOR TESTING
THE THEORETICAL OPEN SPACE MODEL

1. Choice of Research Analysis

One aspect of the model (the parkland category of open space) is arbitrarily selected for analysis.

2. Test Used in Analysis

The test consists simply of correlating results of questions from a social behaviour activity survey² with the description of the Parkland Category of Open Space as described in Part A of this Chapter.

3. Choice of Questions Used for Analysis

From the exploratory questionnaire used for the social behaviour activity survey, a number of questions have been selected which appear to relate general behaviour activity with need for open space. The results (see Appendices F and G) from the cases surveyed have been submitted to computer frequency distribution tabulation utilizing the Multivariate Contingency Tabulation Program system available at University of British Columbia computer centre. The results have been evaluated and inferences have been drawn.

4. Limitations of Survey Data

- (a) Size of sample available to date (24 cases).
- (b) Limited area of the city.
- (c) Limited variety of age, education, income and occupation.
- (d) Limited to households of secondary school students.
- (e) Selection of respondents restricted to head of household or spouse.

C. SURVEY

1. Brief Description of Respondents' Social Characteristics

The exploratory investigation has been limited to households of secondary school students. The ages of respondents range from 25 to 64 years with 67% over 45 years. The predominate occupation of head of household was tradesman. Of the respondents, 75% were born in Canada and the remainder born in Europe. Approximately 30% of the respondents finished five to eight years of school, 42% finished nine to eleven years and 21% finished twelve and more years. Of the sample, 83% of the families owned their homes. Family incomes for 1960 were approximately 13% earning \$1,000 to \$4,000, 25% earning \$4,000 to \$4,999, 39% earning \$5,000 to \$6,999 and 8% earning \$7,000 and over (see Appendix F).

2. Summary of Survey Results

For places frequently visited, 33% of the respondents mentioned parks other than local, and for places regularly visited only 12½% mentioned parks other than local. For infrequent visits 50% of the respondents mentioned parks other than local. No respondents mentioned visiting local parks frequently, regularly or infrequently. (Note on Appendix C that except for John Hendry Park, there are no large parks in the study area.)

For activities that respondents like to engage in that do not cost anything, 33% mentioned walking and 12½% mentioned nature study.

When asked specifically about going to the park, 83% of the respondents stated that they visited parks. Also for the specific question about the beach, 75% responded positively. There is no beach locally so this must be interpreted as equivalent to going to a park other than local.

For regular and infrequent visits, the 45-65 age group mentioned visiting parks other than local, more than the 25-44 age group. The older age group mentioned walking more than the younger age group. Only the older age group mentioned nature study as an activity. Of the 12½% of respondents that regularly visited parks other than local, all were making incomes in the \$6,000 and more categories (see Appendix G).

D. OBSERVATIONS AND INTERPRETATIONS

1. Open Space Activity

Results from the survey (see Appendices F and G) indicate that the age group 25-65 years is not interested in small local parks but prefers the larger metropolitan and regional type of park. Although 83% of respondents mentioned the park as a place to visit when specifically asked, only 33% recognized the park as a place frequently visited and only 12½% recognized it as a place to visit regularly when not replying to a leading question. It could be inferred that the park is not recognized as an activity place for the majority of this particular social economic group. The lack of interest in local parks in this group could be due to the particular age, education and income characteristics. It is suspected that the 45-65 age group have, among other things, no young children to look after and have therefore more free time to travel to larger parks or indulge in other activities, rather than use the existing local parks which evidently do not satisfy their particular needs. The low participation of regular visits to parks could perhaps be explained by the relatively limited years of schooling of the majority of the respondents. Looking at education, it was the respondents with the greater number of years of school that mentioned regular visits to parks. Again for income, it was those respondents in the highest categories that regularly visited parks.

More detail observations regarding open space activity would be possible with more data related to a broader population within the sample area and within the city. Also if additional questions from the survey were included in the analysis, it would be perhaps possible to get a stronger measure of activities related to open space.

The responses to the questionnaire indicated that people did not generally recognize parks, as they presently exist, as a place of activity. More specific questions relating to local spaces and functions could result in more conclusive evidence than has been possible to date.

The use of general behaviour activity questions as in this approach is favoured rather than specific questions on parks. The danger of questions being too specific or referring to existing local parks, as in other types of surveys, has been that the results would reflect the past pattern of grid development and open space values, whereas this study is primarily interested in a future development pattern. The survey questionnaire was designed with the aim of getting at the respondent's categories rather than presenting the respondents in predetermined set of categories of situations. In the absence of an actual development for study that expresses the ideas of the Nodular Metropolitan Concept, the general social behaviour approach of indicating open space needs is preferred. In the absence of more data to date, this exploratory survey serves as an illustration of how to proceed with a comprehensive analysis.

2. Open Space Model

The survey illustrates that the present system of scattered local parks is not being used by this particular social economic group. It is suspected that continued study would indicate that these parks are outmoded for the majority of persons local needs. The respondents that mentioned using parks all favoured parks other than local, such as Stanley Park, which offers a wide range of activities.

The parkland category of open space as part of the open space model offers most of these wide range of activities with more convenient access (within $\frac{1}{2}$ mile).

The open space model indicates, say, 100 acres of parkland category of local open space at ground level. With a residential population of 30,000 persons (about 100 persons per gross acre) this category provides approximately 3.3 acres per 1,000 persons. Because of the layout, it is noted that this parkland open space would theoretically be accessible to the majority of persons within the Nodular Metropolitan core regardless of age, education, occupation, income or cultural background.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Chapter I outlined the need for open space within North American cities. It appears that the future form and distribution of open space within cities will largely depend on the concepts chosen for development and growth. As building systems change and land uses change, so must the related open spaces change. Inflexible open space standards, which are largely intuitive, must be reconsidered on a more scientific basis, to meet the needs of all persons in an ever-changing city environment.

It was postulated that not all persons in the city have access to the same quality of public open space and especially that the poorer residential areas are inadequately provided with local open spaces.

Chapter II examined some aspects of distribution and quality of local parks, as part of the existing open space pattern, in the cities of Vancouver and Montreal. An hypothesis was formulated and substantiated to the effect that wealthy residential areas in the city have higher quality local parks than poorer residential areas. In Vancouver, the more wealthy residential areas had in 1961 nearly three times the amount of local park acreage than the poorer areas within

the city. In Montreal the gap was even greater (four times). Poorer areas had fewer types of recreation facilities, less seclusion (parks were located near major traffic arterials) and had the least amount of money spent annually on local parks. It was found that only the wealthy areas came anywhere near meeting today's recognized local open space acreage standards.

Chapter III examined a theoretical local open space model as one possible pattern of public open space as suggested in the group Nodular Metropolitan Concept (Section I). Three broad forms of local open space were postulated. Only one of these, the parkland category, was partly tested by means of a social behaviour activity survey questionnaire. Results of the survey indicate that in the study area examined, respondents were not using the present scattered local park system. Respondents preferred the larger parks, such as Stanley Park, which generally fit into the parkland category proposed in the model. Because of time and, as yet, limited survey data, it was not possible to test the model further.

The model theoretically allows for a hierarchy of different sized public open spaces for a wide range of uses, from small sitting spaces to the large parkland category. The public open space system as indicated in the model would provide an equitable distribution of public open space for all

social economic groups of persons. The more mobile groups could still use the distant regional parks but the less mobile ones (the poor, young children, mothers, invalids and the elderly) would be provided for locally. All persons within the community would have greater choice than is possible presently within the city.

Any differences in quality between residential areas because of varying wealth or other social characteristics, would take place within the private spaces associated with the individual or group housing.

From this brief analysis it was possible to indicate that study of social behavioural activities would provide a satisfactory basis for distribution of open space. The present largely intuitive open space standards are not adequate to meet the emerging complex problems of the city. A whole new hierarchial concept of public local open space is needed. There is the need for criteria to define the roles of different types of space; then one open space could be functionally related to another. Further study could perhaps establish a standard code to define the function of characteristics of all forms of open spaces. This would permit comparisons to be made within different areas in the city and between cities.

If analysis of basic human open space needs as suggested in this study, can lead to more adequate open space standards, then it is perhaps possible to make better use of such economic tools as cost-benefit analysis, to further determine the optimum distribution of open spaces in relation to associated land uses.

If it is a community's policy, as it has been suggested for Vancouver,¹ that adequate public open space be provided on an equitable basis regardless of persons income, race, age or other social economic characteristics, then this policy should be reflected in the community's comprehensive plan. Analysis of existing open space, as outlined in Chapter II, would point out inequalities within a city's open space system and serve as a guide to setting up an open space acquisition program to correct any deviation with the community's policy.

In order to ensure adequate future provision of open space within a city, studies of land use regulations and land taxation policies together with other administrative planning aspects would have to be undertaken. In order to provide the categories of open space as outlined in Chapter III, it is suggested that new methods will have to be found in preserving, redesigning and redistributing existing open spaces in spite of economic pressures for other forms of development.

¹Personal Interview with S.S. Lefeaux, Superintendent of Board of Parks and Public Recreation, Vancouver, February 7, 1968.

Finally, it is noted that the Nodular Metropolitan Concept of urban redevelopment offers only one of many possible open space systems. As part of the total planning process, within a community, a planner would be involved in looking at a series of such alternatives. Other aspects of planning as suggested by the group approach (see Figure 1) would be taken into consideration in determining any proposals.

APPENDIX A

U.S. LOCAL AND METROPOLITAN PARK STANDARDS¹

Reference	Facility	Standard
Recreation and open space in the Onondaga Syracuse Metropolitan area ²	Park development for local areas	<p>Park development includes:</p> <ul style="list-style-type: none"> a. 5-6 acres per 1,000 people in multi-family communities; b. 8-9 acres per 1,000 people in one-family communities where lot sizes range from 5,000 to 50,000 sq.ft.; c. over 10 acres per 1,000 people in low density one-family areas; and d. 12 acres of county park per 1,000 people. A county park has a service radius of 15-30 minutes from users' homes.
Kentucky Outdoor Recreation Plan ³	Large urban recreation area	15 acres for each 1,000 people. Serves a large segment of the urban area. Minimum size of 100 acres.
G.D. Butler, Introduction to Community Recreation ⁴	Large parks	<p>2½ to 4 acres for each 1,000 people, or 40,000 to 50,000 people for each park.</p> <p>Park size of 100 to 300 acres. Service radius of 30 to 60 minutes.</p>
	Reservations	<p>A reservation is a large tract of land kept primarily in its natural state, with sections made available for activities such as hiking, camping, picnicking etc.</p> <p>Serves population of whole urban area and beyond. Size of 100 acres or more. Usually located near boundaries of the city or outside city limits.</p>

Reference	Facility	Standard
G.D. Butler (cont'd)	Neighbourhood Park	2 acres of park for each 1,000 people in neigh- bourhoods with multiple- family development. 10 acres for each 1,000 people in neighbourhoods with one or two-family dwellings. A neighbourhood park is primarily a landscape park providing a restful breathing spot. Each park serves a population of 4,000 to 7,000.
Dallas, Texas, Parks and Open Spaces ⁵	Recommended standards for a park system:	
	Playgrounds within urban developments	1 to 2 acres for each 1,000 population
	Playfields within urban developments	1 to 2 acres for each 1,000 population
	Large parks within urban developments	5 acres for each 1,000 population
	Special parks and parkways within urban developments	2 acres for each 1,000 population
	Reservations in outlying areas	10 acres for each 1,000 population
New Mexico, Comprehensive Plan for Outdoor Recreation ⁶	In-city recreation parks	Minimum of 16 acres for 1,000 people

Reference	Facility	Standard
Athletic Institute ⁷	Neighbourhood park-school	Minimum of 15 acres and includes 5 acres for educational purposes such as a school building, and 10 acres for community recreation.
	Large city parks	100 acres or more to serve 5,000 people living within walking distance or having access to public transportation
National Recreation and Park Association, Outdoor Recreation Space Standards, ⁸	Urban recreation areas	Minimum of 10 acres per 1,000 people located within an urban area. Includes neighbourhood recreation parks, district recreation parks, and large urban parks. Not more than half of neighbourhood and district park area should be for active recreation. The other half should be in shade trees and lawn.
P.H. Lewis, Recreation and Open Space in Illinois ⁹	Urban recreation areas	a. urban recreation area of 7 acres within walking distance
		b. city-wide recreation area of 13 acres with service radius of $\frac{1}{4}$ to $\frac{1}{2}$ hour
Planning Commission of Lackawana County, Pa. ¹⁰	Community recreation areas	7 acres per 1,000 people includes: <ul style="list-style-type: none"> a. totlots: .50 acres per 1,000 people; minimum area .13 acres; maximum of 2,000 persons per facility; service radius $\frac{1}{4}$ mile. b. playgrounds: 1.25 acres per 1,000 people; minimum area 3-6 acres; maximum of 4,000 persons per facility; service radius $\frac{1}{4}$ to $\frac{1}{2}$ mile. c. playfields: 1.25 acres

Reference	Facility	Standard
Lackawana County (cont'd)		<p>c. (cont'd) per 1,000 people; minimum area 6-15 acres; maximum of 10,000 persons per facility; service radius $\frac{1}{2}$ to 1 mile.</p> <p>d. neighbourhood parks: 1.25 acres per 1,000 people; minimum area 3-6 acres; maximum of 4,000 persons per facility; service radius $\frac{1}{4}$ to $\frac{1}{2}$ mile</p> <p>e. community-wide parks: 2.75 acres per 1,000 acres; maximum of 20,000 persons per facility; service radius 1 to 2 miles</p>
	Metropolitan recreation areas	<p>15 acres per 1,000 people. Includes:</p> <p>a. special use areas: 3 acres per 1,000 people; service radius 10 miles.</p> <p>b. county parks: 12 acres per 1,000 people; minimum area 200 acres; maximum of 50,000 persons per facility; service radius 10 miles.</p>

¹U.S. Department of the Interior, Bureau of Outdoor Recreation, Outdoor Recreation and Space Standards, Paril, 1967, pp.2-11

²Onondaga County Department of Planning and New York State Department of Commerce, Recreation and Open Space in the Onondaga-Syracuse Metropolitan Area, (New York, March, 1962), p.19.

³Kentucky Department of Finance, Preliminary Kentucky Outdoor Recreation Plan. (Frankfort, Ky. November, 1965), p.58.

⁴George D. Butler, Introduction to Community Recreation. Prepared for the National Recreation and Park Association. (New York: McGraw-Hill Book Co., 1959).

⁵Dallas Department of City Planning and Department of Parks and Recreation, Parks and Open Spaces, (Dallas, Texas, April, 1959), p.62.

- ⁶ New Mexico State Planning Office, New Mexico Comprehensive Plan for Outdoor Recreation. (Sante Fe, New Mex., August, 1965), p.66.
- ⁷ Athletic Institute, Planning Facilities for Health, Physical Education and Recreation, (Chicago, Ill. Revised edition 1965), pp.8-12.
- ⁸ National Recreation and Park Association, Outdoor Recreation Space Standards, (Washington, D.C., 1965), pp.20 and 24-25.
- ⁹ Philip H. Lewis, Recreation and Open Space in Illinois (Urbana, Ill.: University of Illinois, September, 1961), p.108.
- ¹⁰ Lackawana County Planning Commission, Recreation and Open Space Plan, Candeub, Cabot & Associates. (Lackawana County, Pa., 1963), p.20.

APPENDIX B

LOWER MAINLAND REGIONAL PLANNING BOARD
RECOMMENDED LOCAL AND METROPOLITAN PARK SYSTEM AND STANDARDS¹

Park Type	Park Function	Park Features
Play Lots	To provide pre-school children in a garden apartment, housing project, or other higher density residential area with a substitute for the "backyard"; day use.	<p>Location: at the focus of a "block", or housing development assuring access without street crossing.</p> <p>Size: one or two lots, as needed.</p> <p>Development: simple, safe apparatus at child's scale to instil a sense of self-discovery; paved area for wheeled toys.</p>
Neighbourhood Parks	<p>Mainly to provide <u>activity areas</u>² for pre-school and elementary school children in the residential "neighbourhood" (3,000-6,000 people) served by an elementary school; day use.</p> <p>May include play lot.</p>	<p>Location: at the centre of a "neighbourhood", preferably next to the elementary school grounds, facilitating access on foot avoiding major street crossings.</p> <p>Service radius: $\frac{1}{4}$ to $\frac{1}{2}$ mile depending on density.</p> <p>Current standard: 1.25 acres per 1,000 persons excluding school grounds, 2.5 acres per 1,000 including school grounds.</p> <p>Size: 4 acre minimum.</p> <p>Development: apparatus and fields for play and active games; may have seasonal supervision.</p>

Park Type	Park Function	Park Features
Community Parks	<p>Mainly to provide activity areas for high school adults in the "community" (15,000 - 40,000 people) served by a high school; day use.</p> <p>May include neighbourhood park.</p>	<p>Location: at the centre of a "community", preferably next to the high school grounds, facilitating access on foot and by bicycle.</p> <p>Service radius: $\frac{1}{2}$ to $1\frac{1}{2}$ miles, depending on density.</p> <p>Current standard: 1.25 acres per 1000 persons.</p> <p>Size: 20 acre minimum.</p> <p>Development: heavier apparatus; fields for team sports; specialized facilities for tennis, lacrosse, or swimming; indoor facilities; seasonal or year-round supervision for all age groups.</p>
Urban Parks	<p>To provide areas of special treatment or landscaping as a contrast to assure variety in a highly urbanized area such as a city or town centre, shopping area, office area, or industrial area; for working or shopping adults; day use.</p>	<p>Location: at the heart of a commercial core, an area of heavy pedestrian traffic, a parkway or boulevard, a localized focus in an industrial area.</p> <p>Size: small enough to fit into the urban texture; numerous enough to fulfill the function.</p> <p>Development: a small landscaped node at a key intersection, a special vantage point, a busy passageway for pedestrians between buildings to interconnect key areas.</p>
Town Parks	<p>To provide central natural areas and activity areas for residents in a "regional" town (over 50,000 people); for both active and casual use, also providing a</p>	<p>Location: one or more within each "regional" town, permitting access by transit and car.</p> <p>Service radius: 3 to 5 miles.</p>

Park Type	Park Function	Park Features
Town Parks (cont'd)	<p>focus for major civic facilities and civic pride; day use on an incidental stop or special trip basis.</p> <p>May include community park.</p>	<p>Current standard: 4.5 acres per 1000 persons.</p> <p>Size: 40 acres minimum.</p> <p>Development: natural areas and activity areas, as a single function or in combination; natural areas consisting of natural or developed open lawns, wooded areas, water areas, and vantage points; activity areas consisting of a unique sports area, fairgrounds, or building complex.</p>

¹Lower Mainland Regional Planning Board, A Regional Parks Plan for the Lower Mainland Region, A Report to the Regional Parks Committee of the Lower Mainland Municipal Association (New Westminster: L.M.R.P.B., 1966). (For all general purposes this park system, with standards, is the same as used by the Vancouver Board of Parks and Public Recreation.)

²Activity areas mean areas with natural features suited to one or several active outdoor sports activities on an intensive or extensive basis, which may include incidental or off-season casual activity.

VANCOUVER PARKS ACCORDING TO CENSUS TRACTS

Census Tract	Neighbour- hood Parks	Park Acreage	Total Park Acreage in C.T.	No. of Persons in C.T.	Types of Facilities in Park	No. of Types of Facilities for Park in C.T.	Secusion Factor for Parks in C.T.	Avg. Secusion Factor for Parks in C.T.	Park Expenditures 1961	Total Park Expenditure in C.T. 1961
A	B	C	D	E	F	G	H	I	J	K
1	Stanley (not considered)		1000.00	6,191					\$	\$
2	Alexander & English Bay		35.00	6,867		2		1.9		21,117.45
3	Sunset Beach, Community Park & Pool		6.00	6,940		6		.5		21,733.97
4	--			5,361						
5	--			8,218						
6	Oppenheimer		2.40	3,963		4		.2		3,352.55
7	Woodland Grandview Victoria (inc. square)	3.91 2.20 2.14		7,380	3 3 1		.7 .0 .0		682.81 3,015.61 5,232.99	8,931.41
8	Pandora Templeton	4.10 4.20	8.25 8.30	6,523	3 5	7 8	.0 .3	.2 .15	1,656.70 2,422.46	4,079.16
9	Burrard View New Brighton	4.14 8.25	12.39	8,616	3 5	1 8	1.1 1.1	1.1	2,742.00 9,312.28	12,054.28
10	Adanac Sunrise	10.73 7.80	18.53	7,846	4 5		.0 .0	.0	1,620.83 2,113.76	3,734.59
11	Clinton		7.53	8,382		6		1.1		3,473.84
12	Garden		2.40	6,379		2		.4		1,277.67
13	2/3 China Creek	(18.73)	12.48	7,001		3		.7		3,632.82
14	Jonathan Rogers		3.47	4,823		4		.3		1,699.68
15	Seaforth Kitsilano Res. Foreshore	1.83 14.46	16.29	5,122	- -	- -	.0 .5	.25	1,230.73 -	1,230.73
16	Kitsilano		31.14	9,725		6		1.4		50,521.57
17	Tatlow McBride	3.48 4.80	8.28	9,309	2 5	7	.3 .0	1.5	4,671.94 2,965.53	7,637.47
18	Jericho Beach Spanish Banks Locarno West Point Grey Westmount Pioneer	18.86 14.83 29.76 9.26 1.03 2.57		4,853	3 2 4 7 - 1		1.2 2.6 2.0 2.2 1.0 1.5		12,236.16 25,498.58 17,370.56 3,417.20 498.95 2,005.57	61,027.02

A	B	C	D	E	F	G	H	I	J	K
19	--			7,309						
20	Almond		3.43	5,383		2		.0		6,090.09
21	Connaught Granville	11.80 4.54	19.34	6,632	11 3		.4 1.2	.8	10,407.92 2,657.04	13,064.96
22	--			6,770						
23	Robson 1/3 China Creek Clark	3.90 (6.33) 10.19	20.33	10,033	6 1. 6		.0 .7 .0		3,046.64 1,816.40 2,560.57	7,423.61
24	1/2 John Hendry Beaconsfield	66.98) 28.49 10.00	38.49	6,996	7 6		1.5 1.8	1.65	(15,517.78) 7,758.89 2,206.45	9,965.34
25	Renfrew Com- munity Falaise	12.38 18.28	30.66	9,103	10 5		2.7 1.6	2.15	4,069.20 2,924.28	6,993.48
26	Carleton Collingwood	2.00 3.16	5.16	7,961	- 4		1.1 .5	.8	394.92 1,464.77	1,859.69
27	Slocan Norquay	10.09 5.50	15.59	8,019	7 5		1.5 .0	.75	1,996.30 3,764.42	5,760.72
28	Kensington Jones	15.80 4.00	19.80	9,416	6 5		1.5 .8	1.15	2,487.74 1,528.53	4,016.27
29	1/2 John Hendry Brewers	28.49 3.60	32.09	7,890	7 5		1.5 .3	.9	7,758.89 2,485.90	10,264.79
30	Sunnyside Glen	2.40 2.30	4.70	5,535	- 1		.5 .5	.5	1,011.60 948.96	1,960.56
31	Prince Edward		3.60	9,340		4		1.0		1,647.14
32	Hillcrest Riley	17.05 6.67	23.72	5,688	7 3		1.1 .5	.8	4,553.63 4,467.09	9,020.72
33	Queen Elizabeth (not considered) Cartier		.91	5,145		-		.0		701.70
34	--			1,924						
35	Shaughnessy Douglas Heather Braemar Devonshire	3.50 13.16 2.40 3.12 3.92	26.13	9,489	- 6 1 5 -		.6 .7 1.3 .7 1.1	.9	3,734.81 7,942.69 748.79 1,447.38 4,143.13	18,016.80
36	Trafalgar Ravine	12.02 2.32	14.34	6,810	9 -		1.8 1.5	1.65	2,387.86 1,148.98	3,536.84
37	Camosun Chaldecolt	11.00 8.50	19.50	6,620	1. 6		.0 3.0	1.5	212.92 2,015.21	2,228.13
38	U.E.L. (not considered)									
39	Memorial West		18.53	5,996		7		5.0		7,601.78
40	Musqueam		42.12	3,492		-		9.3		1,348.00

A	B	C	D	E	F	G	H	I	J	K
41	Elm	3.80			4		.0		1,499.87	
	Kerrisdale Community & Pool	2.13	5.93	6,031	3	7	1.0	.5	11,100.39	12,600.26
42	Maple Grove	11.29			5		4.0		6,949.55	
	Shannon	2.30			3		.5		811.59	
	Riverview	5.90			-		1.8		1,130.78	
	Arbutus	1.72	21.19	7,554	-	8	3.5	2.2	851.88	9,743.80
43	Oak & Pool	12.60			12		.0		13,123.49	
	Eburne	2.22			1		.0		1,093.09	
	Marpole	.66	15.48	10,390	-	13	1.4	.5	648.55	14,865.13
44	Montgomery		9.94	5,247		7		.2		2,002.06
45	Columbia	7.01			4		.8		1,344.80	
	MacDonald	2.60	9.61	6,795	1	5	1.2	1.0	658.28	2,003.08
46	Sunset Community & Pool	8.64			8		.0		12,146.47	
	Winona	11.15	19.79	9,800	5	13	1.6	.8	2,977.84	15,124.31
47	Memorial South		33.60	8,648		16		.0		12,740.48
48	Gordon	15.00			9		.8		2,363.68	
	Nanaimo	7.43	22.43	5,720	8	17	1.6	.8	2,168.91	4,532.59
49	Fraserview	2.43			3		.0		667.97	
	Humm	1.17			-		.3		587.90	
	Bobolink	9.45	13.05	7,395	7	10	1.8	.7	3,668.04	4,923.91
50	MacLean	3.03			2		.6		1,354.09	
	False Creek	22.01	25.04	8,493	7	9	1.4	1.0	4,463.87	5,817.96
51	--			7,593						
52	Grays		5.00	5,566		2		2.8		1,267.63
53	Angus	2.20			-		1.0		1,524.05	
	Kerrisdale	7.41			5		.5		3,098.26	
	Quilchena	19.25	28.86	4,938	2	7	1.8	1.1	317.77	4,940.08
54	Valdez	1.90			-		4.2		274.71	
	Carnarvon	9.30	11.20	4,596	6	6	2.4	3.3	1,623.54	1,898.25
55	Balaclava		10.41	4,135		7		7.0		3,783.21
56	Ross	3.76			5		2.0		1,230.73	
	Moberly	8.80	12.56	5,110	6	11	1.3	1.65	2,454.51	3,685.24
57	Killarney		33.10	7,461		14		4.2		4,126.18

VANCOUVER PARK QUALITY FACTORS ACCORDING TO
CENSUS TRACT INCOME GROUPINGS

HIGHEST

Census Tract	Avg. Family Wage & Salary Income \$	Population	Park Average	No. of Types of Facilities	Average Seclusion Factor for Parks	Park Expenditures
A	B	C	D	E	F	G
18	7,185	5,853	76.31	17	1.7	61,027
19	6,621	7,309	-	-	-	-
34	8,735	1,924	-	-	-	-
35	6,342	9,489	26.13	12	0.9	18,017
36	7,310	6,810	14.34	9	1.7	3,537
37	6,266	6,620	19.50	7	1.5	2,228
39	6,940	5,996	18.53	7	5.0	7,602
40	7,701	3,492	42.12	-	9.3	1,348
41	7,351	6,031	5.93	7	0.5	12,600
42	7,976	7,554	21.19	8	2.2	9,744
44	9,361	7,247	9.94	7	0.2	2,002
53	9,756	4,938	28.86	7	1.1	4,940
54	6,555	4,596	11.20	6	3.3	1,898
55	6,865	4,135	10.41	7	7.0	3,783
Total	104,964	78,994	284.46	94	34.4	128,726
Average	7,500				2.9	
Per 1000 Persons			3.60	1.2		1,628

ABOVE AVERAGE

A	B	C	D	E	F	G
43	5,771	10,390	15.48	13	0.5	14,865
57	5,651	7,461	33.10	14	4.2	4,126
Total	11,422	17,851	48.58	27	4.7	18,991
Average	5,711				2.4	
Per 1000 Persons			2.73	1.5		1,068

AVERAGE

A	B	C	D	E	F	G
1	5,316	6,191	-			
2	5,621	6,867	35.00	2	1.9	21,127
3	4,977	6,940	6.00	6	.5	21,734
10	4,991	7,846	18.53	9	0.0	3,735
16	5,006	9,725	31.14	6	1.4	50,522
20	5,453	5,383	3.43	2	0.0	6,090
21	5,354	6,632	19.34	14	0.8	13,065
22	5,559	6,770	-	-	-	-
24	5,048	6,996	38.49	13	1.7	9,965
26	5,043	7,961	5.16	4	.8	1,860
27	4,980	8,019	15.59	12	0.8	5,761
28	4,987	9,416	19.80	11	1.2	4,016
33	5,181	5,145	0.91	-	0.0	702
45	5,389	6,795	9.61	5	1.0	2,003
46	5,236	9,800	19.79	13	0.8	15,124
47	5,082	8,648	33.60	16	0.0	12,740
49	5,301	7,395	13.05	10	0.7	4,924
56	5,373	5,110	12.56	11	1.7	3,685
Total	93,897	131,339	232.00	134	13.3	176,953
Average	5,210				0.8	
Per 1000 Persons			2.15	1.0		1,350

BELOW AVERAGE

A	B	C	D	E	F	G
4	4,798	5,361	-	-	-	-
9	4,836	8,616	12.39	8	1.1	12,054
11	4,697	8,382	7.54	6	1.1	3,474
12	4,866	6,379	2.40	2	0.4	1,278
17	4,936	9,309	8.28	7	1.5	6,993
25	4,936	9,103	30.66	15	2.2	6,993
29	3,776	7,890	32.09	12	0.9	10,165
30	4,719	5,535	4.70	1	0.5	1,961
31	4,895	9,340	3.60	4	1.0	1,647
32	4,785	5,688	23.72	10	0.8	9,021
48	2,921	5,720	22.43	17	0.8	4,533
52	4,866	5,566	5.00	2	2.8	1,268
Total	57,031	68,889	152.81	84	13.1	60,131
Average	4,753				1.2	
Per 1000 Persons			2.22	1.22		874

LOWEST

A	B	C	D	E	F	G
5	3,376	8,218	-	-	-	-
6	3,052	3,963	2.40	4	0.2	3,353
7	4,034	7,380	8.25	7	0.2	8,931
8	4,282	6,523	8.30	8	0.2	4,079
13	4,270	7,001	12.48	3	0.7	3,633
14	3,682	4,823	3.47	4	0.3	1,700
15	4,597	5,122	16.29	-	0.3	1,231
23	4,378	10,033	20.33	13	0.2	7,424
50	3,024	8,493	25.04	9	1.0	5,818
51	4,675	7,593	-	-	-	-
Total	39,370	69,149	96.56	48	3.1	36,169
Average	3,940				0.4	
Per 1000 Persons			1.40	0.7		526

APPENDIX E

SOCIAL BEHAVIOUR ACTIVITY SURVEY

The survey undertaken for this open space study was part of a larger research project underway in metropolitan Vancouver. The project was initiated more than three years ago by Professor Ernest Landauer and several graduate students of the Sociology Department of the University of British Columbia. It enquires into indicators of a social reference structure which are expressed in social behaviour activities. The instrument of enquiry, an interview questionnaire, was formulated over a two year period. This was followed by a pilot testing of the instrument prior to exploratory investigation. The sample area for this exploratory investigation is the Templeton School District of Vancouver which is within D.B.S. census tracts, 7, 8, 9, 10, 11 and 12 (see Map. 5.1). The author joined this project in December, 1967 and, along with Miss Monica Lindeman, took part in the majority of the interviews used in this open space analysis.

APPENDIX F

SOCIAL BEHAVIOUR ACTIVITY SURVEY RESULTS

Sample Number f	%	Question Code
24	100.00	Sample number of households
		<u>Sex of Respondent</u>
11	45.83	1 Male
13	54.17	2 Female
		<u>Age of Respondent</u>
1	4.17	0 No response
7	29.17	1 25 - 44 years
16	66.67	2 45 - 64 years
0	.00	3 65 over
		<u>Occupation</u>
2	8.33	1 Clerical
9	37.50	2 Housewife
4	16.67	3 Laborer
9	37.50	4 Trades
0	.00	5 Other (retired, unemployed, on social assistance)
		<u>Years in School (Respondent)</u>
2	8.33	0 No response
0	.00	1 1 - 4 years
7	29.17	2 5 - 8 years
10	41.67	3 9 - 11 years
5	20.83	4 12 and more
		<u>Place of Birth (Respondent)</u>
0	.00	0 No response
18	75.00	1 Canada
6	25.00	2 Europe
0	.00	3 Japan and China
		<u>Home owned or rented</u>
1	4.17	0 No response
20	83.33	1 Owned
3	12.50	2 Rented

Sample Number f. %	Question Code
<u>What places do you frequently visit when you go out in the evening for entertainment, for example, movies, sports events, concerts and so on?</u>	
8 33.33	1 Parks, other than local
2 8.33	2 Local parks
14 58.33	3 Other places
<u>What places do you regularly go to other than entertainment and shopping, for example, visiting, work, business trips within the city, and so on?</u>	
1 4.17	0 No response
3 12.50	1 Parks, other than local
20 83.33	2 Other places
<u>What places do you visit frequently or on special occasions, or only at certain times of the year?</u>	
4 16.67	0 Response
12 50.00	1 Parks, other than local
8 33.33	2 Other places
<u>What kinds of things do you like to do that don't cost anything?</u>	
11 45.83	1 Other
8 33.33	2 Walking
3 12.50	3 Nature study
1 4.17	4 Fishing
1 4.17	5 Swimming
<u>What kinds of things do you like to do that do cost something?</u>	
22 91.67	1 Other
2 8.33	2 Fishing
<u>Go to the Park</u>	
4 16.67	0 Don't
20 83.33	1 Do
<u>Go to the Beach</u>	
6 25.00	0 Don't
18 75.00	1 Do

Sample
f %

Question Code

How much was the income of the household
in which you lived in 1960?

2	8.33
4	4.17
1	4.17
2	8.33
6	35.00
3	12.50
4	16.67
2	8.33

0	No response
1	Don't know
2	\$1,000-1,999
3	3,000-3,999
4	4,000-4,999
5	5,000-5,999
6	6,000-6,999
7	7,000 and over

APPENDIX G

SOCIAL BEHAVIOUR ACTIVITY SURVEY
BIVARIATE TABLES IN PERCENTAGES

REGULAR VISITS

		<u>No</u>	<u>Park</u>		
		<u>Response</u>	<u>Not Local</u>	<u>Not Park</u>	
Age	No response	-	-	4.17	4.17
	25-44 years	4.17	4.17	20.83	29.17
	45-65 years	-	8.33	58.33	66.67
		4.17	12.50	83.33	100.00

INFREQUENT VISITS

		<u>No</u>	<u>Park</u>		
		<u>Response</u>	<u>Not Local</u>	<u>Not Park</u>	
Age	No response	4.17	-	-	4.17
	25-44 years	4.17	16.67	8.33	29.17
	45-64 years	8.33	33.33	25.00	66.67
		16.67	58.00	33.33	100.00

INCOME 1960

		<u>N.R.</u>							
		<u>or</u>	<u>1,000-</u>	<u>3,000-</u>	<u>4,000-</u>	<u>5,000-</u>	<u>6,000-</u>	<u>7,000</u>	
		<u>D.K.</u>	<u>1,999</u>	<u>3,999</u>	<u>4,999</u>	<u>5,999</u>	<u>6,999</u>	<u>+</u>	
Regular Visits	No Response	4.17	-	-	-	-	-	-	4.17
	Park other than local	-	-	-	-	-	4.17	8.33	12.50
	Not Parks	20.84	4.17	8.33	25.00	12.50	12.50	-	83.33
		25.01	4.17	8.33	25.00	12.50	16.67	8.33	100.00

ACTIVITIES THAT DON'T COST ANYTHING

	<u>Nature</u>					
	<u>Other</u>	<u>Walking</u>	<u>Study</u>	<u>Fishing</u>	<u>Swimming</u>	
No Response	-	4.17	-	-	-	4.17
Age:						
25-44 years	16.67	12.50	-	-	-	29.17
45-64 years	29.17	16.67	12.58	4.17	4.17	66.67
	45.83	33.33	12.58	4.17	4.17	100.00

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