

RELATIVE CONCENTRATION AND LOCATIONAL CHARACTERISTICS OF
SENIOR CITIZEN APARTMENT UNITS IN WINNIPEG, 1981-1993

BY

HELEN M. ANDERSON RAMSAY

A Thesis
Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of

MASTER OF ARTS

Department of Geography
University of Manitoba
Winnipeg, Manitoba

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ABSTRACT

The main objective of this thesis is to analyze locational characteristics of Senior Citizen Apartment (SCA) units in the City of Winnipeg in 1981 and 1993. Attention is focussed on the determination of the structural compositions of Winnipeg's SCA market in 1981 and 1993; change in the spatial congregation and relative concentration of all categories of SCA units in Winnipeg between 1981 and 1993; the origins of moves to public SCA projects in Winnipeg; and the local neighbourhood characteristics of a sample of public and private SCA projects located in different areas of the City.

Two main methods of data analysis are used, Image Differencing and Location Quotients. Both analyses are carried out using Geographic System Technology. Results of the study indicate that SCA units are not always located in "high need" areas or in neighbourhoods with adequate service environments, and that the service outlet type most often missing from the local area is a grocery store or supermarket. In addition, results of the "origins of moves" into public SCAs analysis revealed a distinct 'distance bias.' On the basis of the results of this study, it is recommended that any new SCA projects should be built in "high need" areas that provide an appropriate neighbourhood environment.

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I would like to dedicate this thesis to my husband, Dave, and my four children. Their continuing love, support and unflinching belief in me have inspired me to keep on going even when finishing this thesis seemed to be an impossible task.

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

The objectives of this thesis are twofold. The main objective is to analyze the distribution of senior citizen apartment (SCA) units at both the macro (city) level, and the micro (neighbourhood) level. Attention is focussed on the determination of the structural compositions of Winnipeg's SCA market in 1981 and 1993; change in the spatial concentration of all categories of SCA units in Winnipeg between 1981 and 1993; the origins of moves to public SCA projects in Winnipeg; and the local neighbourhood characteristics of a sample of public and private SCA projects located in different areas of the City. A secondary methodological objective of this thesis is to demonstrate the application of the relatively new Geographic Information System (GIS) technology in an urban socio-geographical analysis.

It is intended that the findings of this research will contribute a greater understanding of (i) the changing structural composition of the elderly congregate housing market, (ii) the changing distribution of elderly people and SCA units within the City of Winnipeg, (iii) the origins of moves into public SCA projects, and (iv) the physical,

demographic, and service characteristics of neighbourhoods in which SCAs are located.

1.1 ORGANIZATION OF THE THESIS

This thesis is organized into five chapters. In the remainder of this chapter the background and research objectives are discussed, the field of gerontological geography is reviewed, and the contribution that this thesis makes to the existing literature is outlined. Chapter 2 presents a review of literature relevant to the study. Literature on human needs in housing is first discussed, followed by a discussion of literature on elderly housing options and housing preferences. This is followed by a discussion of literature on intraurban relocation moves, territorial equality and service delivery, and the relationship of location on life satisfaction of the elderly. A discussion of the spatial activities of the elderly concludes the Chapter.

Chapter 3 offers a detailed discussion of the research questions and data sources. In Chapter 4, the data analysis is presented. The first part presents a descriptive analysis of the spatial distributions of elderly population and SCAs in Winnipeg. This is followed by an analysis of origins of moves to SCA (public) projects. The analysis of neighbourhood

characteristics of sample public and private projects concludes Chapter 4. Finally, Chapter 5 of the thesis offers a summary and interpretation of results. This Chapter also considers the policy implications of the findings and suggests directions for future related research.

1.2 BACKGROUND AND RESEARCH OBJECTIVES

Smith (1977) introduced the concept of *spatial injustice* to refer to discrimination by place of residence. That is to say, spatial injustice results when there is an unjust distribution of some good. The concept of spatial justice is part of a larger concept, social justice, a concern that is grounded in the welfare approach to geography. The term social justice implies that all people receive a fair share of society's goods. This term can include a region or territory receiving a fair or just share of some particular good or service. Geographers refer to this as *territorial justice* (e.g. Pinch, 1979).

It is often difficult to determine what is fair or equitable in the distribution of society's goods. Should distribution be based on the *equal share* concept whereby an area or region receives an equal share of some good, or should the distribution be based on an area's *assessed need* for that good? If the second approach to equity in distribution is

taken, a method of assessing need has to be developed. The determination of what is fair or equitable on a spatial scale, therefore, requires that the spatial need for the good or service under consideration be established. Pinch states that, while "geographers have devoted considerable efforts towards defining and measuring spatial variations in needs...they have paid less attention to the relationships between needs and the spatial patterning of resources" (Pinch, 1979: 201).

There has been some effort by geographers to relate measures of need to the spatial patterning of resources. Mercer (1979), Bebbington and Davies (1982), and Bochel (1988) have all included various measures of need when addressing the issue of territorial justice in their work on the geography of the elderly. Bochel (1988), for example, used personal and environmental variables as indicators of need including: percent of population aged seventy-five and over; percent of pensioners living alone; population density; percent of women economically active; and rate of meals provided per one thousand population. Bebbington and Davies (1982) used the estimated number of elderly in three 'target groups' - the moderate need group, the considerable need group and the severe need group. Mercer (1979) used a needs indicator that included both potential demand (i.e. those households that are eligible for government programs) and supply (i.e. those units already built in each municipality).

In this study, territorial equality is determined by the location quotient (Smith, 1975), which will be described in detail in Chapter 4. The need for SCA units is based on the total number of elderly persons in different regions of the city. No attempt is made to target a sub-population within the elderly population. The good that is distributed is all apartment units dedicated to the elderly, regardless of the sector of the market providing the housing. SCAs in Winnipeg are provided by both the public and private sectors and there are different types of projects within each sector. While there are only two types of projects provided by the public sector, sponsored and nonsponsored, there are four types of private projects: non-profit; co-operative; private-for-profit; and lifelease.

However, this good, a housing project is complicated by the fact that, in addition to providing shelter and security, it also provides other goods through the surrounding environment or neighbourhood. Rossi (1980: 22) refers to the dwelling unit and surrounding neighbourhood environment as the *housing bundle* and describes it as including "the physical structure involved..., the costs involved, the surrounding matrix of structures and their inhabitants, the locational characteristics of the dwelling and the symbolic meanings attached to the dwelling by the inhabitants and significant others...." It is necessary, therefore, when analyzing

locational characteristics of housing, to also analyze the neighbourhood environment that is included in the housing bundle. In this thesis, physical and service environmental characteristics for sample public and private projects are analyzed.

The specific objectives of this thesis are:

1. to investigate the changing structural composition of the SCA market in the City between 1981 and 1993;
2. to determine the equity of distribution of SCA units in the city;
3. to investigate the origins of moves into public SCA projects;
4. to investigate the locational characteristics of sample SCA projects located in the city.

The following four research questions are proposed in relation to these objectives:

The research question concerning the changing composition of the SCA market in the City between 1981 and 1993 is:

Research question 1: Has there been a change in the structural composition of the SCA market between 1981 and 1993 and has this change resulted in changes in the locational concentration of different types of SCA projects?

The research question concerning equity of distribution of SCA units within the city is:

Research question 2: Is the distribution of SCA units in the city in each of 1981 and 1993 which related to the distribution of elderly in the city?

The research question concerning the origin of moves into public SCA projects is:

Research question 3: What are the origins of elderly persons moving into public SCA projects?

The research question concerning the locational characteristics of sample SCA projects located in the City is:

Research question 4: Are the SCA projects located in neighbourhoods with similar physical, demographic, and service environment characteristics? If not, is the pattern

of physical, demographic, and service environmental characteristics related to (i) the zone of the city where the project is located, and (ii) the type of housing (private v public)?

1.3 GERONTOLOGICAL GEOGRAPHY

The study of aging and the elderly has long been the purview of gerontologists and sociologists. Until relatively recently, few geographers had contributed to the rapidly growing literature on the elderly. Since the 1970s, however, there has been an increasing recognition that geographical research, with its emphasis on spatial analysis, can make a significant and unique contribution to the study of aging and the elderly. There have been various attempts to classify the contribution that geographers have made to the research area (Warnes, 1981, 1982 & 1990; Rowles, 1986). The organization of literature in this section is based on Rowles' classification scheme. In general, Rowles divides geographical studies of the elderly into four main areas: (i) geographic distribution of the elderly; (ii) relocation studies; (iii) geographic context of aging; and (iv) geographic experience of the aging individual.

1.3.1 GEOGRAPHIC DISTRIBUTION OF THE ELDERLY

The aging of industrialised countries, including Canada, has been well documented (McDaniel, 1986; Minister of Supply and Services Canada, 1983; Stone and Frenkan, 1988; Carter, 1990; Chappell, 1990). Geographic literature on the demographic aspects of aging is quite extensive. Some studies document the changing elderly population on a national or regional level (Rosenberg et al., 1989; Graff and Wiseman, 1978; Golant, 1975; Warnes, 1994). These studies show that while "the aged have increasingly become metropolitanized" (Golant, 1975: 17), there are regional disparities in the numbers of elderly due to five processes: aging-in-place, dying-in-place, in-migration of elderly, and both in-migration and out-migration of younger persons (Graff and Wiseman, 1978: 390). Other studies investigate changing concentrations of the elderly in urban environments, especially the more recent trend towards the suburbanization of the elderly (Lichter et al., 1981; Hare and Hollis, 1983; Golant, 1990 & 1992; Kimmich and Gutowski, 1983; Logan, 1984). This increase in numbers of elderly in suburban areas of cities is attributed mainly to the aging-in-place process (Hare and Hollis, 1983; Kimmich and Gutowski, 1983).

1.3.2 RELOCATION STUDIES

Geographers have traditionally studied the movement patterns of people. The study of the relocation of elderly people is a specialized sub-area of movement studies and the body of literature pertaining to the geographic mobility of the elderly has been steadily increasing since the mid-1970s (Concord, 1984: 99). Investigations have been carried out at all scales of analysis, from the local intraurban relocation to long distance migration movements. Elderly moves can be placed in a development perspective: (i) amenity moves; (ii) assistance moves, and (iii) institutional moves (Litwak and Longino, 1987).

Literature on local relocation is relatively sparse (Wiseman and Virden, 1977, Concord, 1984; Haque and Halli, 1992). Wiseman and Virden (1977) examine the movement of migrants in relation to the central business district and the suburbs while Concord (1984) and Haque and Halli (1992) examine the causal factors influencing intraurban relocation moves.

Studies on elderly migration, i.e. long distance moves at a national scale (Law & Warnes, 1982; Northcott, 1984 & 1988; Rogers, 1989; Watkins, 1990; Rogers et al., 1990) or international scale (McHugh and Mings, 1991; Longino and

Marshall, 1990), are more numerous. Rogers (1989) states that elderly mobility can be thought of as passing through different phases and presents an 'Elderly Mobility Transition' Theory using three measures that could depict the evolution of the transition: growth, concentration, and tempo. Law and Warnes (1982) investigate the influences upon the volume and geographical patterns of retirement migration; Northcott (1984) and Rogers et al. (1990) examine the effect of interregional migration on local concentrations of the elderly; while Watkins (1990) looks at the effect of interregional elderly migration on local economies.

At the international scale, there has been an emphasis on retirement moves to specialized retirement communities, sunbelt cities, and seasonal 'snowbird' migration (Longino and Marshall, 1990; Marshall and Tucker, 1990; McHugh and Mings, 1991; Tucker et. al, 1988). For instance, McHugh and Mings (1991) investigated the geographical and temporal patterns of Canadian seasonal migration to sunbelt locales in recreational vehicles, while Marshall and Tucker (1990) examined the positive economic impact of seasonal Canadian migrants to their host society. In addition, Tucker et al. (1988) documented the socio-demographic characteristics, migration patterns, health service utilization and social support networks of Canadian "snowbirds" in Florida.

1.3.3 GEOGRAPHICAL CONTEXT OF AGING

Another area of geographical research on the elderly is based on the environmental context of aging. This area of research is ecologically oriented and investigates the impact of community residence on the lifestyle of the elderly. Studies on the geographical aspects of aging by Herbert and Peace (1980); Swartz (1979); Yeates (1979); Bohland and Davis (1979); Meyer (1981 & 1990); Bohland and Herbert (1983); Hodge (1987); Mercer (1979); Smith (1991 & 1992) and Gauthier (1993) demonstrate that service provision varies with location and that location has an effect on the well-being and morale of the elderly.

1.3.4 GEOGRAPHICAL EXPERIENCE OF THE AGING INDIVIDUAL

Geographical contributions to research on the elderly person's experience of his/her environment are numerous (Golant, 1972; Hanson, 1977; Smith, 1984, 1988, 1992; and Meyer, 1981). This area of research examines the daily activity spheres of the elderly, including the type and frequency of trips, and transportation modes for different trip types. Research by Carp (1971), Hanson (1977), Rowles (1978), Cantor (1979), Robson (1982), Rollinson (1990, 1991), Smith (1984, 1988, 1992) and others, shows that the elderly experience environmental constraints on mobility and so have

a decreased activity sphere in relation to younger age cohorts.

1.4 CONTRIBUTION OF THIS STUDY TO GERONTOLOGICAL GEOGRAPHY

This study will offer three contributions to the field of gerontological geography. First, there are few existing studies (e.g. Phillips et. al., 1987; Hamnett and Mullings, 1992a) that examine changes in the structural composition and spatial concentration of all sectors of a specialized seniors housing market. Phillips and Vincent (1986) and Corden (1992) examine private residential accommodation for the elderly, while Mercer (1979) and Hodge (1987) examine public housing projects. In addition, previous studies have not examined the types of neighbourhoods in which different categories of elderly apartments are located. This study will contribute to the existing body of literature on the provision of elderly housing by examining changes in all sectors of the SCA market (research question 1). In addition to this cross-sectoral analysis, this thesis will examine the neighbourhood environments surrounding different categories of SCA apartments (research questions 4).

Second, there is a dearth of information on the question of equity of location of senior citizen apartments in an urban environment. Previous research has investigated the changing

distribution of the elderly population, especially the increasing concentration of the elderly in suburban areas (e.g. Logan, 1984; Golant, 1990, 1992). There has been little research conducted, however, on the integration of these two research areas i.e. the changing congregation of elderly people in relation to the changing congregation of senior citizen apartments in urban areas (Mercer, 1979; Phillips et al, 1987). Therefore, the present study will add to the scant literature in this area by examining the location of senior citizen apartments in relation to elderly population (research question 2). In addition, much of the work on elderly housing has used United States or European data. While it is accepted that North American cities are very different from European cities, it is sometimes less obvious that there are some significant differences between Canadian cities and US cities. In fact, Canadian cities can be seen as "juxtaposed between European and US urban forms" (Filion and Bunting, 1991:2). The Canadian focus of this study will contribute to the relatively small geographical literature on Canadian urban elderly (e.g. Mercer, 1979; Hodge, 1987; Smith, 1984, 1988, 1991, 1992; Everitt and Gfellner, 1994).

Finally, while there is a growing body of literature on national and long distance seasonal migration, there is less known about the intraurban moves of elderly people. Previous literature on intraurban moves documents the relocation

destinations of all elderly movers (Everitt and Gfellner, 1994; Wiseman and Virden, 1977; Concord, 1984). This study expands research on elderly movers within an urban area by examining the relocations of a special sub-section of elderly movers, those moving into income-g geared, publicly owned and operated senior citizen apartments (research question 3).

From a policy point of view, the results of this study will assist geographers and social planners in appreciating the locational consequences of siting senior citizen projects. Senior apartment projects that are located inequitably in terms of the elderly population can result in a situation where there are an insufficient number of apartment units available within a neighbourhood. In addition, relative inequities in the spatial distributions of different categories of apartment projects provided by the different sectors of the housing market can result in less choice for movers within the local neighbourhood. The above two conditions may necessitate a move by seniors to another neighbourhood that has a better selection of SCA projects. Results from a number of studies (Gonyea et. al., 1990; Baker and Prince, 1990; Groves and Wilson, 1992), however, show that the elderly prefer to remain in their own neighbourhood. Site selection for senior citizen apartments should, therefore, take into account the changing concentrations of

the elderly population, and the existing numbers and spatial locations of the various types of senior apartments within an urban area.

Finally, the effect of the environment on life satisfaction of the elderly has been fairly well documented (Bohland and Herbert, 1983; Yeates, 1979; Reitzes et al., 1991). As Berghorn et al. state (1978:99), "beyond the individual and his personal set of attributes and attitudes lies the environment. Because we interact with our environment, it can present us with opportunities for enhancing levels of morale or with stressful situations and barriers to obtaining a satisfying life". Lawton et. al. (1978) document that physical attributes of the neighbourhood, such as apparent economic condition, cleanliness and age composition, are related to well-being, while other authors (Ward et al., 1988; Bohland and Davis, 1979; La Gory et. al., 1985) found that the physical condition of the neighbourhood and convenience to shopping had some effect on life satisfaction. In addition, seniors overwhelmingly state that they want access to a rich service environment that is within walking distance of their dwelling (Epstein, 1976; Wilson, 1982; Carp and Carp, 1982). The siting of SCAs in suitable neighbourhood environments is, therefore, important, and care should be made to locate SCA projects in neighbourhoods that are well maintained and on sites that are within easy walking

distance of basic services outlets, such as a grocery, bank and pharmacy.

1.5 SUMMARY

The general objective of this thesis is the analysis of the distribution of SCA units at both the macro (city) and the micro (neighbourhood) level. A secondary methodological objective is the application of geographic information system technology in an urban socio-geographical analysis. In particular, the study attempts:

1. to investigate the changing structural composition of the SCA market in the city between 1981 and 1993;
2. to determine the equity of distribution of SCA units within the city;
3. to investigate the origins of moves into public SCA projects;
4. to investigate the locational characteristics of sample SCA projects located in the city.

The organization of the thesis is outlined and the contributions of gerontological geography are discussed. Finally, the intended contributions of the thesis to existing

knowledge and the potential policy implications of the relevant findings are explained.

CHAPTER 2

REVIEW OF THE LITERATURE

2.0 INTRODUCTION

Location has always played a central role in geographical analysis. Some of the questions asked by geographers are: where is something located, in what type of area is it located, and what shares the same location with it? Other disciplines, however, also conduct research in the spatial dimension - disciplines such as city planning, sociology and economics. This chapter will examine the relevant work that geographers and other researchers have conducted concerning the locational characteristics of housing for the elderly, both at the macro (city) and micro (neighbourhood) scale.

The first section of this chapter examines literature pertinent to the housing of the elderly on both the local and metropolitan scale. The first sub-section establishes the fact that housing is a basic need which serves to fulfill or frustrate the satisfaction of other basic needs. This is followed by discussions of elderly housing options and housing preferences. Literature on intraurban relocation moves of the elderly is then discussed and is followed by an outline of work on geographical aspects of service delivery for the

elderly. The final sub-section in section one of this chapter discusses the relationship of location on life satisfaction of the elderly.

An important consideration when locating senior apartments in an existing neighbourhood is the spatial activity of the elderly. The second section of this chapter, therefore, reviews current literature on the spatial activity of the elderly. The first sub-section covers the activity spheres, modes of transportation, and shopping activities of the elderly. The concluding section summarises the pertinent contributions of current literature to issues of elderly housing location and establishes the contribution of this work to the existing body of knowledge on locational aspects of elderly housing.

2.1 HOUSING FOR THE ELDERLY

2.1.1 HUMAN NEEDS IN HOUSING

Shelter is classified by Maslow (1973) as a basic human need. According to Maslow's theory of human motivation, basic needs arrange themselves in hierarchies of prepotency. That is to say, needs higher in the list are not felt until those lower in the list are satisfied. Humans, therefore, are not able to move on to higher levels of needs such as love, esteem

and self-actualization until the more basic needs are met. The two most basic needs are the physiological needs, e.g. the need for air, water, food; and security needs, e.g. the need for shelter and a safe neighbourhood environment.

Nattrass and Maas Morrison (1976) have described housing from an ecological approach, an approach "which gives definition to two structural components: the organism and the environment." (1976:i) They state that:

Humans are dependent upon their environment for supports to fulfill their needs. Each environment, depending on its resources, is capable of satisfying or frustrating human needs. To the extent that any environment provides or fails to provide the necessary and expected supports, it will impact on the quality of human life. (Nattrass and Maas Morrison, 1976: i)

Carp (1976) states that housing and the neighbourhood environment should satisfy many of the basic needs that are found across all age-cohorts. While housing provides shelter and security, its location within the urban environment is important when it comes to satisfying other basic needs such as food and safety. The neighbourhood environment should provide opportunities for the elderly to obtain adequate food supplies within a manageable distance from the elderly

person's residence and should provide a safe walking environment and adequate access to public transit.

Spivak (1976: 57) describes the importance of houses and neighbourhoods in providing "all of the components or behaviour places necessary for the fullest kind of human existence." Setting deprivation results when there are insufficient opportunities in an environment to satisfy residents' needs. Deprivation can also result when the spatial distribution of functional places within the community is in conflict with the desires and capabilities of the population. Opportunities may be too far away for walking, yet walking may be the chosen or only way to get there.

2.1.2 ELDERLY HOUSING OPTIONS

The difficulty of developing a typology of elderly housing is a reflection of the heterogenous group of people who make up the 65+ age cohort. There are numerous attempts to devise a classification scheme that adequately takes into account all of the housing options available to the elderly (Mangum, 1982; McPherson, 1990; Golant, 1992; Filion et al., 1992). The different types of housing options available to the elderly can be classified along a number of different dimensions. McPherson (1990: 278) presents a system of classifying elderly housing along two of these dimensions: age

integrated to age segregated, and independent to dependent. He acknowledges, however, that other dimensions, such as housing quality, may be used. His typology of housing alternatives for the elderly ranges from age-integrated/independent accommodations, such as apartments and single family homes, to age-segregated/dependent housing, such as long-term care facilities. In between these two extremes fall the age-integrated and age-segregated apartments for seniors that form the subject of this thesis.

Mangum (1982) classified non-institutional housing for the elderly along one direction: a continuum from least supportive to most supportive. In addition, the housing was classified into two groups: conventional housing and retirement housing. On a continuum from least supportive to most supportive housing options were the conventional housing options (houses, condominiums and apartments), and retirement housing options (mobile home parks, retirement villages, retirement apartments. (high-rise and garden), retirement hotels, and life-care facilities.

Phillips and Vincent (1986) developed a five-category housing classification system for British residential care homes for the elderly. Their classification scheme incorporates the supply side of the housing market as well as

the level of care offered by elderly housing facilities. The five categories are:

- ▶ sheltered accommodation for the more active elderly provided by all sectors of the housing market;
- ▶ local authority homes for the more dependent elderly
- ▶ private residential care homes;
- ▶ nursing homes which provide higher levels of care than the private residential homes and which are provided by the private and voluntary sectors;
- ▶ voluntary homes run by religious or charitable organizations which provide different levels of care.

Filion et al. (1992) present a *continuum of adjustment* perspective in classifying housing for the elderly. This perspective recognizes the continuous changes that occur as people age and their housing requirements change. The continuum of change begins with the independent living stage, where seniors are sufficiently autonomous to live in their own house or apartment without requiring special services. With declining competency, seniors then move into adapted housing (or have their existing home adapted to their special needs). Housing at this stage includes congregate housing and granny flats. The last stage is a move into an institution such as a nursing home, chronic care hospital, or a geriatric unit within a hospital, where a large range of supportive services is offered.

Golant (1992:6-9) presents a different type of classification system. His options are various housing strategies rather than housing types. He classifies elderly housing options into two broad categories: (i) options that allow the elderly to stay in their current dwelling e.g. financial strategies such as reverse mortgages, caregiving assistance, or home modification and repair programs; and (ii) options that require residential relocation of the elderly e.g. retirement communities, low rent government-subsidized rental accommodations, or residence sharing with a child or sibling.

2.1.3 HOUSING PREFERENCES OF THE ELDERLY

While there are many different types of housing available to meet the varying needs of the elderly, there are some special characteristics of the elderly that housing specifically targeted to the elderly should address. Many elderly people, for example, have reduced incomes, are single and are suffering from deteriorating health. In addition, there are a number of factors that should be taken into consideration when locating new housing for the elderly. Many elderly desire to remain in their own neighbourhood (Gonyea et al., 1990; Baker and Prince, 1990; Groves and Wilson, 1992) and prefer certain types of housing and certain neighbourhood environments (Carp and Carp, 1982; Carroll and Gray, 1985;

Epstein, 1976).

Gonyea, Hudson and Seltzer (1990) looked at the housing preferences of vulnerable¹ elderly in suburbia. They found that all seniors expressed a satisfaction with their homes, and that between a quarter and a third would only move within their current neighbourhood. They would also choose housing that reflected their strong desire to maintain or increase their independence, personal privacy, and social relationships. Similarly, Baker and Prince (1990) found that most seniors that they interviewed in Greater Vancouver said that they would prefer to stay in their own home with assistance from community services. If they were unable to manage on their own, they would prefer to move into some form of supportive housing. Their findings also showed that the most important component of housing for the elderly living in supportive housing was the provision of personal alarm systems, the presence of resident managers or caretakers, and the provision of meal services. Those most interested in these features were the poor elderly, those who were 75 years or older and those who were living alone. Similarly, Groves and Wilson (1982) interviewed a sample of independent elderly men and women between the ages of 60 and 93 to determine their housing choice. They found that the majority of the

¹Those elderly with diminished economic, physical and social resources (79)

respondents would prefer to remain in their own homes in the suburb in which they resided. If relocation were necessary, they would prefer to stay in a hostel² in their current suburb, then in their own home in another suburb, and, lastly, in a hostel in another suburb.

A study conducted by Carroll and Gray (1985) to evaluate the market for middle income projects for the elderly showed that in the three study areas, renting was stated as the most preferred form of tenure, one bedroom apartments were the units most desired by the elderly, and over half the respondents preferred to have meals served. Preferred sites for the projects varied with the study area. The site chosen by most elderly in two of the areas was near transportation, shopping, and other services, while the site chosen by respondents in the third study area was near an existing housing and nursing home project that provided a number of services for the elderly.

In a study of elderly people aged fifty-five and over residing in Winnipeg, Epstein (1976) found that the medium rise apartment block (chosen by 34% of respondents) was the most preferred type of housing, followed by the single detached dwelling (chosen by 28% of respondents), and row

²A hostel is here described as a community building, with a private flat for each resident, as well as common areas such as lounges, barbecues, etc.

housing (chosen by 20% of respondents). An interesting finding of this study was that there was an overwhelming rejection of the high-rise apartment block and a polarization of feeling about single detached homes. For those contemplating moving, the location of housing was found to be very important. "In fact, there seems to be considerable evidence that prime land in the minds of the elderly most often means space within or adjacent to their existing neighbourhood" (Epstein, 1976:45). Few elderly thought it important to live among people with the same ethnic background, religion or income, but fifty percent of the respondents thought it important to live in age segregated neighbourhoods. Finally, the majority of respondents wanted to be located close to a food outlet, a public transit stop, a safe street crossing and a laundry facility. Beyond these basic services, the elderly also desired to be close to a pharmacy, a bank, a church and a doctor's office.

Carp and Carp's (1982) study, *The Ideal Residential Area*, demonstrates the importance of proximity of services and facilities to the elderly. In their study, elderly women living in a variety of neighbourhoods in Oakland, California, were asked which of a number of basic services or facilities they would like to have located within walking distance of their homes. Seventy-nine percent of the respondents selected "their favourite grocery store", while 68% wanted their own

banks and 62% wanted their own pharmacy be located within walking distance of their home. One service that was chosen by almost all respondents (91%) was "a stop for the bus that takes you where you want to go" (Carp and Carp, 1982:429) with 72% wanting such a stop within their own block.

Literature on elderly housing preferences, therefore, indicates that location of housing is of primary importance with most elderly preferring to remain in their own neighbourhood. Also of importance to them is the availability of supportive services in the community or supportive housing options within their own neighbourhood - options that would allow them to remain in familiar surroundings.

2.1.4 INTRAURBAN RELOCATION

Several types of elderly moves have been documented. One way of classifying elderly moves is to place them into three categories based on a developmental perspective: (i) amenity moves, (ii) assistance moves, and (iii) institutional moves (Litwak and Longino, 1987). Elderly migrants moving for amenity reasons "tend to be younger, healthier, wealthier, and more often have intact marriages" than the other types of elderly migrants (Litwak and Longino, 1987:267). These types of moves tend to be long-distance moves and are not necessarily towards kin. On the other hand, seniors moving for

assistance reasons tend to move nearer to a primary caretaker because of chronic disabilities or because of a major life change such as widowhood (Litwak and Longino, 1987). This type of elderly mover tends to be older, unmarried and be previous renters (Meyer and Speare, 1985; Everitt and Gfellner, 1994). Similar characteristics were revealed for those seniors moving into SCA projects, except that those seniors also had more health problems and functional disabilities, and lower levels of car ownership than community elderly (Gutman, 1980; Kanaroglou and Diegel, 1990). The last type of elderly move is to a personal care institution.

There is scant literature on the relocation of elderly people within an urban area and most of this research is based on conditions in American cities (Rudzitis, 1979; Concord, 1984; Wiseman and Virden, 1977; Golant, 1979). Concord (1984) examined the relationships between selective factors and types of moves of the elderly using data drawn from the U. S. Bureau of the Census. Results from her research showed that, when unearned income is low and the head of household is not in the labour force, movements in the same area of the city are much less likely than moves from the suburbs to the central city area. Households where the head is relatively young, married, and a labour force participant tend to dominate the stream of aged movers out of the central city. The reverse is the case, however, for elderly women who live alone.

Rudzitis (1979) used data from 280 central cities in the United States to evaluate the determinants underlying the variation in central city net migration rates of the total elderly population, and of white and nonwhite older populations. Twelve explanatory variables were selected to measure various influences on the decision to migrate, and to evaluate the relative attractiveness of central cities. Results showed that, as the percentage of older people in the central city area increases, the net migration of elderly into the central city increases. The elderly are also more likely to move into younger cities with relatively stable populations. Older white people avoid central cities with large concentrations of black population and high crime rates. In contrast to elderly white migrants, older blacks migrate to cities where government expenditures increase, indicating a greater need for public services.

Golant (1979), in a national study of the migratory patterns of the elderly in the United States, found that, overall, most elderly relocate within their same central city or suburban place of residence. Over half of all elderly movers were from the central city (53%) and, of these, the majority chose suburban locations. Moves from suburban to central city locations represented only twelve percent of all residential category shifts by the elderly. A small flow of elderly migrants moved from nonmetropolitan to metropolitan

areas (15% of all shifts), and primarily to their suburban areas.

Wiseman and Virden (1977) and Haque and Halli (1992) examined elderly intraurban migration patterns within selected cities. Wiseman and Virden (1977) analyzed the movement of people aged sixty and over within Kansas City, Kansas. Migrants were classified into two spatially defined groups, those moving toward and those away from the central business district. Their findings revealed that there were two significant spatial patterns. The predominant pattern was composed of those moving from central city locations toward but seldom terminating in recent suburban areas. These elderly were wealthier, more active socially, more stable residentially, more apt to be found at home, and auto owners. The second pattern consisted of relocations within similar neighbourhoods only slightly closer to the CBD. These elderly exhibited greater socioeconomic diversity, but generally had smaller disposable incomes and thus appeared to be most in need of social services. Haque and Halli (1992) examined intraurban migrants in Winnipeg. Their findings suggest that elderly moves were not significantly associated with demographic variables, such as age, or sex. However, marital status did affect the decision to move or stay. Elderly who make multiple moves do so to be close to family and friends or to relocate in a preferred environment. Moreover, physical

weakness and disability related factors consistently appeared to be important causes for multiple relocations.

2.1.5 SERVICE DELIVERY AND TERRITORIAL EQUALITY

Service provision for the elderly is usually associated with the concept of territorial justice (p.3). A number of geographers have studied the spatial variation in the distribution of goods and services to the elderly population within defined political boundaries (Mercer, 1979; Pinch, 1980 & 1991; Bebbington and Davies, 1982; Hodge, 1987; Bochel, 1988; Corden, 1992). The scale of analysis may range from neighbourhoods within a city or town, to regions within a country.

Canadian literature on distributional equity of elderly services is scant (Mercer, 1979; Hodge, 1987). Mercer (1979) examined the consequences of the government's construction approach to housing the low-income elderly in British Columbia. He found that at the metropolitan scale of analysis, "the spatial pattern of senior citizen's projects follows from the locational decisions of those responsible for initiating project development and those public officials who approve sites" (Mercer, 1979:115). This resulted in an uneven distribution of projects in the City of Vancouver. Mercer (1979) notes that the most powerful determinant for choosing

a project site was the availability of cheap land, which in many instances was already owned by the municipality.

Similarly, Hodge (1987) examined the location of nine different housing projects in nine Ontario small towns. He looked at the locational aspects of the projects to determine their location in regards to frequently used services. Results showed that, while there may be several alternative sites available for construction of senior projects, the choice of location is often determined by various local and land interests and not by the needs of the seniors. Although most of the community resources of small towns are clustered on or close to the main streets, five of the nine projects were located on the very edge of town. In addition, two of them were separated from the town centre by imposing barriers such as highways and railways.

Pinch (1980) investigated the provision of a number of different services to the elderly in London, England. The services included residential accommodation, home-helps service, meals-on-wheels service and home nursing. He found that home-helps services and meals-on-wheels services showed a fairly high positive correlation with a social conditions index (needs indicator), while residential accommodation showed a moderately high correlation, and home nursing a small positive or negative correlation, with the needs index.

In a later study, Pinch (1991) examined the extent to which centralisation affects service allocation by comparing variations in community-based service provision for the aged in two Australian cities, Melbourne and Adelaide. In particular, he investigated the variation in provision of meals-on-wheels and residential accommodation for the elderly in the two cities. Research findings revealed that, at the local level of government, there were greater variations in service provision levels in the relatively centralised administrative structure of Adelaide than in Melbourne which had a relatively decentralised administrative structure. However, in contrast to Melbourne, where these variations showed little or no correlation with estimates of the need for services, in the Adelaide case there were relatively strong associations between indices of need and the provision of meals-on-wheels services and residential accommodation. Pinch points out that, "while correlation does not prove or imply causality, the greater association of services with areas of need in the centralised system of south Australia contrasts with the lack of association of aged care services with area of need in the decentralised system of Victoria" (Pinch, 1991: 38). It would seem, therefore, that some centralization of government is essential for redistributive policies.

Bebbington and Davies (1982) examined the geographical distributions of a group of services for the elderly that were

provided by social services departments of local authorities in Britain. The services were residential homes, domestic help, day centres and meals-on-wheels. They first created a needs indicator - the number of elderly persons living in each local authority in each target group. The target groups were defined by having broadly similar needs for social services and consisted of 'the moderate need group', 'the considerable need group' and 'the severe need group'. The needs indicator enabled a detailed analysis of the relationship between apparent need and actual spending on the elderly by local authority social service departments. They found that there was a relatively strong and approximately linear relationship between the needs indicator per elderly capita and actual spending per capita, with residential provision being the most highly correlated with the needs indicator.

Corden (1992), however, found that the geographic distribution of private residential care and nursing homes for the elderly in North Yorkshire did not correlate with the spatial distribution of the target population. She found that proprietors did not give serious thought to whether or not their choice of location fitted demand for places or avoided competition from other homes. Locations were chosen, instead, for a variety of other reasons, such as proximity to the proprietor's home, proximity to a large pool of qualified staff or for various economic reasons. Phillips and Vincent

(1986) found similar patterns of inequality of distribution in private retirement homes for the elderly in Devon. They found that there was a spatial concentration of homes in the traditional retirement areas of the South and East of the county. Bochel (1988), and Hamnett and Mullings (1992a) found that there were regional variations in the supply of public, voluntary and private sector housing for the elderly in Britain. This variation results in "substantial inequalities in terms of choice of types of provision for the elderly population" (Bochel: 1988:474). However, Hamnett and Mullings' (1992a) analysis of the changing spatial concentration of residential care homes in Britain between 1978 and 1988 discloses that, "even though the bias towards independent provision in the South and public provision in the North still exists, there is a trend towards the spatial equalisation of independent residential care provision" (Hamnett and Mullings: 1992a:140).

2.1.6 GEOGRAPHICAL PERSPECTIVES ON LIFE SATISFACTION OF THE ELDERLY

The effect of the local environment on the well being of the elderly is of considerable importance to everyone making decisions on the siting of senior citizen housing. "Beyond the individual and his personal set of attributes and attitudes lies the environment. Because we interact with our

environment, it can present us with opportunities for enhancing levels of morale or with stressful situations and barriers to obtaining a satisfying life" (Berghorn et al., 1978: 99). The effect of the environment on life satisfaction of the elderly has been fairly well documented (Cutler, 1972; Berghorn et al., 1978; Bohland and Davis, 1979; Yeates, 1979; Lawton et al., 1978, 1980; Bohland and Herbert, 1983; La Gory et al., 1985; Reitzes et al., 1991).

Lawton et al. (1978) assessed changes in measures of well-being of subjects of a community housing study as a function of change in environment. The environmental characteristics that they used were attributes of the home itself as well as attributes of the neighbourhood, such as apparent economic condition, cleanliness and age composition. Their results showed that there were twenty-two significant relationships between environmental characteristics and well-being, more than four times as many as would have been predicted on the basis of chance alone. In addition, they found that physical attributes of the neighbourhood were more related to well-being than perceived similarity of near neighbours.

Similarly, Lawton et al. (1980), in a study of elderly tenants in planned housing, found that neighbourhood environmental factors accounted for a significant proportion

of the residual variance in every index of well-being. In general, quiet neighbourhoods in small or middle sized communities where the risk of crime was low were conducive to active and satisfying lives for older people.

Bohland and Davis (1979), Ward et al. (1988), and Bohland and Herbert (1983) all examined similar neighbourhood variables for their effect on life satisfaction: friendliness of neighbours, the physical environment and convenience. Most of the studies also included neighbourhood safety as a fourth variable. All of the studies found that neighbourhood friendliness had the greatest effect on life satisfaction. In addition, Ward et al. (1988), Bohland and Davis (1979) and La Gory et al. (1985) found that the physical condition of the neighbourhood and convenience to shopping also had some effect on life satisfaction. In general, their findings disclose that "neighbourhood satisfaction contributes significantly to general feelings of well-being...(i.e.) overall morale is correlated with general neighbourhood satisfaction" (Ward et al., 1988: 45).

La Gory et al (1985) and Berghorn et al. (1978) used different environmental variables in their analysis of neighbourhood satisfaction. La Gory et al. (1985) used a measure of age concentration (60 and over) while Berghorn et al. (1978) used the percent of persons in each census tract

that are elderly. Berghorn et al. (1978) found that the measure of age concentration used was significantly related to morale. This result can be explained by the fact that the broad spectrum of activities that arises in age-heterogeneous environments can be burdensome to the elderly (Berghorn et al., 1978: 106). On the other hand, La Gory et al. (1985) found that there was a negative relation between neighbourhood age density (60 plus in the census tract) and satisfaction. This could be partly due to the fact that older people tend to be concentrated in central-city neighbourhoods where fear of crime is higher (La Gory et al., 1985: 412).

A number of studies have investigated the relationship between location within a city and life satisfaction (Kuller, 1984; Reitzes, 1991; LaGory et al., 1985). Kuller (1984) found that elderly living in the an inner city residential area of Malmo, Sweden, were more satisfied with their neighbourhood than elderly living in a suburban neighbourhood. He surmised that "compared to the suburb the inner city obviously offers opportunities for a much greater range of activities and social contacts" (Kuller, 1984, 63). In addition, suburban elderly reported feeling isolated and lonely and that they had little contact with their neighbours. On the other hand, other studies have disclosed that the North American central city elderly are less satisfied with their area of residence than suburbanites and ruralites (Reitzes,

1991; La Gory et al., 1985). Reitzes (1991) found that retired suburban men had the highest mean well-being scores. However, poor health reduced the well-being of retired men in the suburbs to a greater extent than was the case for retired men in central city areas. This is probably due to the fact that loss of physical mobility associated with poor health makes the use of automobiles more difficult and makes the distance between suburban places and activities more problematic. He also found that personal and social characteristics, as well as involvement in activities, were important factors in influencing well-being. His research found that retired suburban men were wealthier than retired central city men and more involved in informal activities.

2.2.SPATIAL ACTIVITIES OF THE ELDERLY

2.2.1 ACTIVITY SPHERES OF THE ELDERLY

A number of articles have been written on the spatial activity of the elderly (Golant, 1972; Rowles, 1978; Carp, 1979b; Herbert and Peace, 1980; Robson, 1982; Smith, 1984). Rowles (1978) in his discussion of the elderly's interaction with the environment, classifies routine social, service and recreational trips as types of everyday activity. He notes that "changes in individual capability are reflected on a larger scale in patterns of everyday activity" (Rowles, 1978:

161). Decreasing capability is thus reflected in decreasing activity spheres or spatial withdrawal. Rowles notes that "this spatial constriction can be viewed from two complementary perspectives: increasing *personal restriction*, and progressive environmental constraint" (Rowles, 1978:22).

While a number of studies (Cantor, 1979; Smith, 1984; Rollinson, 1990), show that the elderly do suffer from a more constrained activity space than do younger people, others (Hanson, 1977) reveal that this is not necessarily the case. Hanson (1977) found that, when all modes of intraurban travel of elderly in Uppsala, Sweden, were examined, "the lower level of trip frequency among the elderly is attributable entirely to the diminished importance of the work trip; the elderly participate in all other out-of-home activities as frequently as do younger persons" (Hanson, 1977: 109).

There appears to be a relationship between location within a city and activity spheres. Carp(1979b), in her investigation of the life-styles of residents in San Antonio, Texas, found that residents of central areas made more trips into the community outside their homes than suburban elderly and went to a wider variety of places. Moreover, centrality was associated with a high percentage of leisure activities involving other people, a large number of friends, frequent visits to friends and children, and frequent attendance at

meetings and places of recreation.

Wilson (1982) found that the neighbourhood environment also had an effect on activity levels of the elderly. The most important finding from his assessment of the walking environment of elderly in the Greater Vancouver area, was that older people are stimulated to walk more if there are "places to go to", especially centres of human activity, and potential companionship. Moreover, a great deal of potential walking is aborted if the attractive destination is more than a block or two away from the home. He concludes, then, that housing for the elderly should be ideally situated no more than two blocks from activity centres.

A number of studies show that walking is a primary mode of transportation for the elderly, especially the inner city elderly (Carp, 1971; Rollinson, 1990; Sherman and Brittan, 1973; Paaswell et al., 1982; Smith, 1991). Carp (1971,) in her study of 709 retired people in San Antonio, Texas, found that 44% of those interviewed used their feet as a means of transportation several times a week. This figure excluded walking for pleasure, exercise, or with a pet. She states that many retired people are unable to own an automobile. There may be a number of reasons for this, but economic considerations are the most important.

A study of elderly residents of single room occupancy hotels (SROs) in Chicago (Rollinson, 1990) revealed that walking was the primary means of transportation and that only seven percent of the participants in the study used public transportation. Rollinson attributes this to the fact that boarding and negotiating the steep steps of the rapid transit system in Chicago was too difficult for many of the elderly and that the cost of public transit was too high to allow regular use. Results of other studies (Sherman and Brittan, 1973; Smith, 1991; Cutler and Coward, 1992) agree that the old-old (age 75 years and over), and the poor living in central city areas are the most likely to suffer from transportation constraints and are the most likely to walk or take a bus in order to shop or carry on their personal business. The young-old (age 65-74 years), the wealthy and the suburban elderly are more likely to either drive themselves to their various activities or to get a ride from a friend or relative.

Wachs (1988) acknowledges that this dependency on automobile transportation found in suburban seniors could have serious disadvantages. As the suburban elderly age, deteriorating health may result in the end of their driving career. The low density, poorer service environment and less dense public transit network of the typical suburb, as compared with inner city areas, could leave older suburban

seniors isolated and dependent on others to satisfy their transportation needs.

2.2.2 SHOPPING ACTIVITIES OF ELDERLY

The shopping behaviour of the elderly population has received increasing attention from researchers in a variety of disciplines including geography (Mason, 1974; Swartz, 1979; Smith, 1984, 1988, 1991; Rollinson, 1990). While some researchers investigate shopping patterns in general, others (Smith, 1991; Sherman & Brittan, 1973; Shannon et al., 1985) focus on one type of shopping trip, such as grocery shopping or pharmacy patronage.

Despite the obvious constraints that many seniors face when venturing out of their dwelling, some researchers have pointed out that the shopping trip may be a source of pleasure for some elderly. In researching the shopping activities of the elderly, MacLean et al. (1985) found that some presumed shopping trips seem to be related more to leisure than to the actual purchase of goods or services. They found that the elderly in one shopping centre seemed "to be spending a considerable amount of time doing relatively little...." (MacLean et al., 1985: 118). More specifically, the elderly seemed to spend their time in the centre sitting and relaxing or strolling around the complex. Mason and Smith (1974) also

note that shopping seemed to be a major part of the life-style of the respondents and perhaps more a source of pleasure than a necessary utilitarian chore.

Grocery shopping is an important activity in the daily lives of the urban elderly because the ability to purchase their own groceries allows seniors to remain independent and so contributes to higher levels of life satisfaction (Smith, 1991: 86-7). Carp (1971) found that for those who used walking as a means of transportation, the most frequent trip purpose (26%) was to purchase groceries. Rollinson (1990) found that one of the main reasons for elderly SRO tenants leaving their hotels was to shop for groceries.

While grocery shopping is an important activity for all elderly, there seem to be locationally based differences in the modes of transport that the elderly use to purchase groceries. Sherman and Brittan's study (1973) of food shopping habits of elderly people in Denver showed that a little over a half (53%) of the elderly residents of the core area lived within 4 blocks of the grocery store they frequented, and that the majority (79%) walked to purchase groceries. Conversely, only 16% of those living in the upper- and middle-class suburban neighbourhoods shopped at a grocery store within 4 blocks of their homes, and the majority (73%) of these suburban elderly drove to purchase groceries.

Smith (1991), in his study of elderly domiciled in three areas of Winnipeg (inner city, inner suburb, outer suburb), found that all of the respondents patronized a grocery store at least once during a 2-week period, with over two thirds undertaking a minimum of two food shopping trips a week. An analysis of the relationships between age, residential area and mean distance travelled to shop showed that the average distances travelled to food stores did not systematically vary among the elderly consumer subgroups. However, transport modes similar to those reported by Sherman and Brittan (1973) were observed in Smith's (1991) study. Respondents in the inner city were more likely to walk to purchase food, while those in the outer suburbs were more likely to drive to the food store.

There is very limited literature available on the spatial aspects of pharmacy patronage among the elderly. Shannon, et al. (1985) examined the effect of race and geographical location on patterns of pharmacy patronage. The importance of pharmacy shopping to the elderly is highlighted by the fact that 88% of the respondents rated having a pharmacy in the neighbourhood as being important or very important. This was higher even than grocery shopping (86%). While the majority of respondents felt that a neighbourhood pharmacy was important to them, only a relatively small percentage of respondents were actually patronizing the geographically most convenient pharmacy. Twenty percent of those purchasing

prescriptions patronized the pharmacy nearest their home (on average less than 0.5 mile) while the average distance travelled by all respondents was 1.9 miles.

2.3 SUMMARY AND PLACE OF PRESENT STUDY WITHIN THE LITERATURE

Previous work clearly indicates the importance of housing location to the well-being of elderly people. Firstly, location within a community or location within a region is closely related to issues of equity in choice. The elderly do not form a homogeneous group but consist of people with different needs and preferences. In addition, elderly people are concentrated in different areas of a city. There should, therefore, be (proportionately) an equitable distribution of elderly housing in terms of both numbers and types.

Secondly, the location of housing in relation to services and facilities within a neighbourhood is also important. As walking is the most commonly used mode of transportation for many elderly people (Carp, 1971; Sherman and Brittan, 1973; Paaswell et al., 1982; Rollinson, 1990; Smith, 1991), especially the poor and old-old living in central city areas, needed services should be located within a short distance of elderly housing projects. Since many elderly also rely on some form of public transit (Smith, 1984, 1991; Carp, 1980), the location of housing in relation to major bus routes is

also important. Good access to public transit allows the elderly person access to higher order goods and services that are located outside of a comfortable walking distance. As a result, the elderly person is provided with more life opportunities.

The preceding review of literature shows that while many of these issues have been addressed individually, there has been little integration of geographical analysis of the elderly at both the macro (city) and micro (neighbourhood) scales. Moreover, most studies on SCAs are restricted to the provision of SCAs by one sector of the market (e.g. the public sector), and that there has been little use of a "needs indicator" in assessing locational characteristics of SCA projects, especially in the Canadian context. A major goal of this study is to integrate macro (city) and micro (neighbourhood) scale locational analysis with a needs indicator - the number of elderly living in various areas of the City of Winnipeg. This thesis will analyze the locational equity of the supply of all SCA units provided by the public and private sectors in relation to the distribution of elderly people in the city. It will also analyze the local service and neighbourhood environments of a sample of private and public projects in the inner city and suburban areas of the city. Thus, relationships between location, housing supply and neighbourhood environment will be investigated and

evaluated.

CHAPTER 3

STUDY AREA, RESEARCH QUESTIONS, AND DATA SOURCES

3.0 INTRODUCTION

This chapter introduces the study area, discusses the four research questions that were introduced in Chapter 1, and describes the data sources and data collection methods. The study area, Winnipeg, is first introduced and the method of choosing the sixteen sample projects outlined. This is followed by a detailed discussion of the four research questions. The data sources and data collection methods are presented, and, finally, the tools used in the analysis of data are then described, with special emphasis on Geographic Information System (GIS) technology.

3.1 STUDY AREA

This section introduces the macro-level study area, the City of Winnipeg, and describes the selection of the sixteen sample projects from four zones of the city for the micro or neighbourhood level analysis.

3.1.1 THE MACRO-LEVEL STUDY AREA

The study area for this thesis is the City of Winnipeg, Manitoba, the provincial capital and largest settlement (Fig 1). Total population for the City was 616,790 in 1991 (Statistics Canada, 1993) of which 81,265, or 13.18% were aged 65 years or over. This is higher than the national average of 11.61% of people 65 years or over (Statistics Canada, 1992a). Data were analyzed at the city scale using the Forward Sortation Unit (FSU) level of resolution (see Figure 2). The FSUs, of which there are 34 in Winnipeg, are areal units defined by Canada Post Corporation for use in sorting mail. They are given alpha-numeric names such as R2M, R2H, etc. and are the first half of a postal code address. This level of resolution was used because the units were larger in area than census tracts and so suited the type of analysis used in this study. In addition, Manitoba Housing Authority uses the FSU level of resolution to compile information on public SCA projects.

3.1.2 SELECTION OF PROJECTS FOR MICRO LEVEL ANALYSIS

Sixteen projects, eight publicly owned, and eight privately owned and managed housing projects, were selected from four zones of the city for the neighbourhood analysis. First of all, the city was divided into four zones, two

Fig. 1: City of Winnipeg Showing City Zones and City Areas

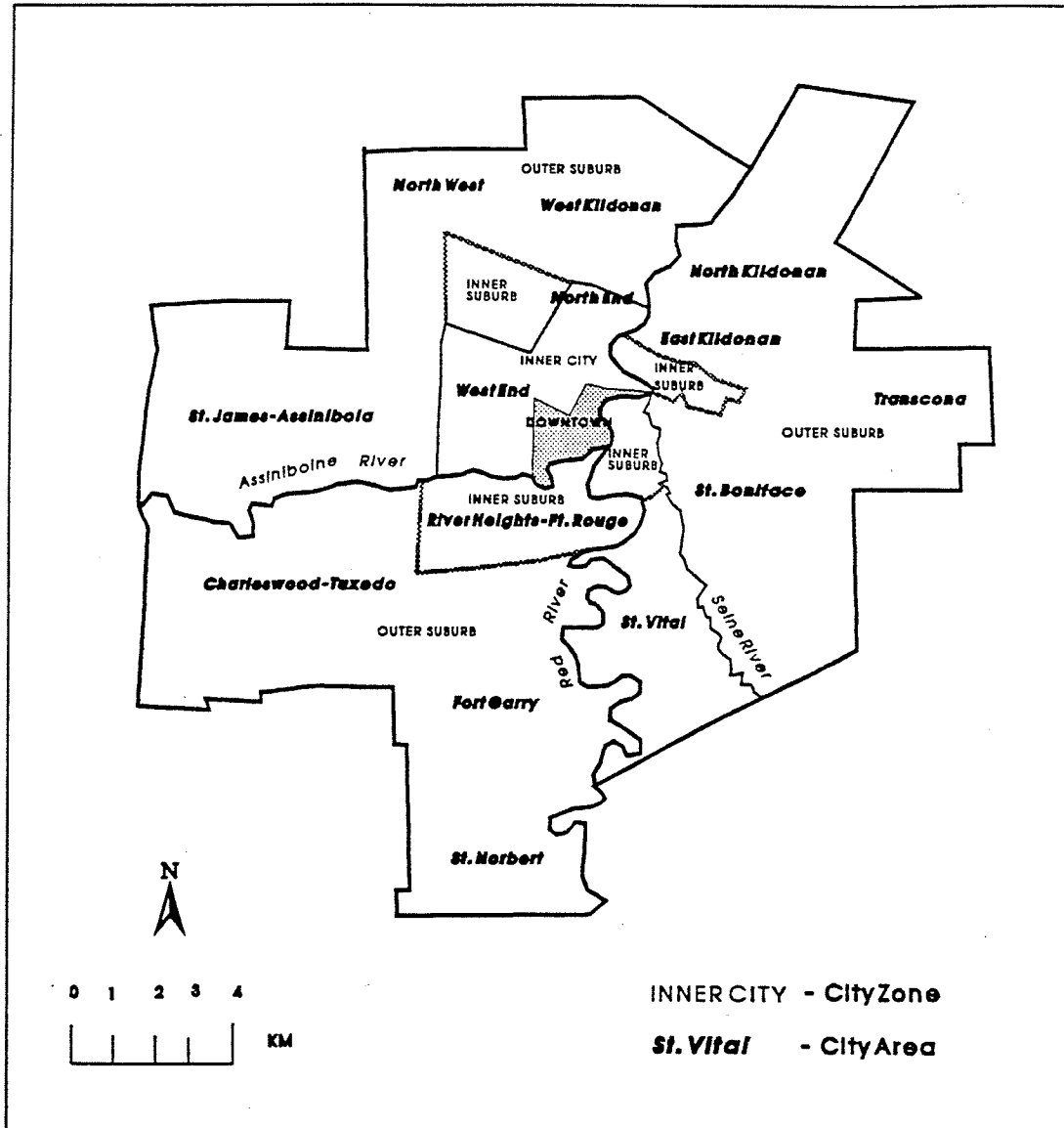
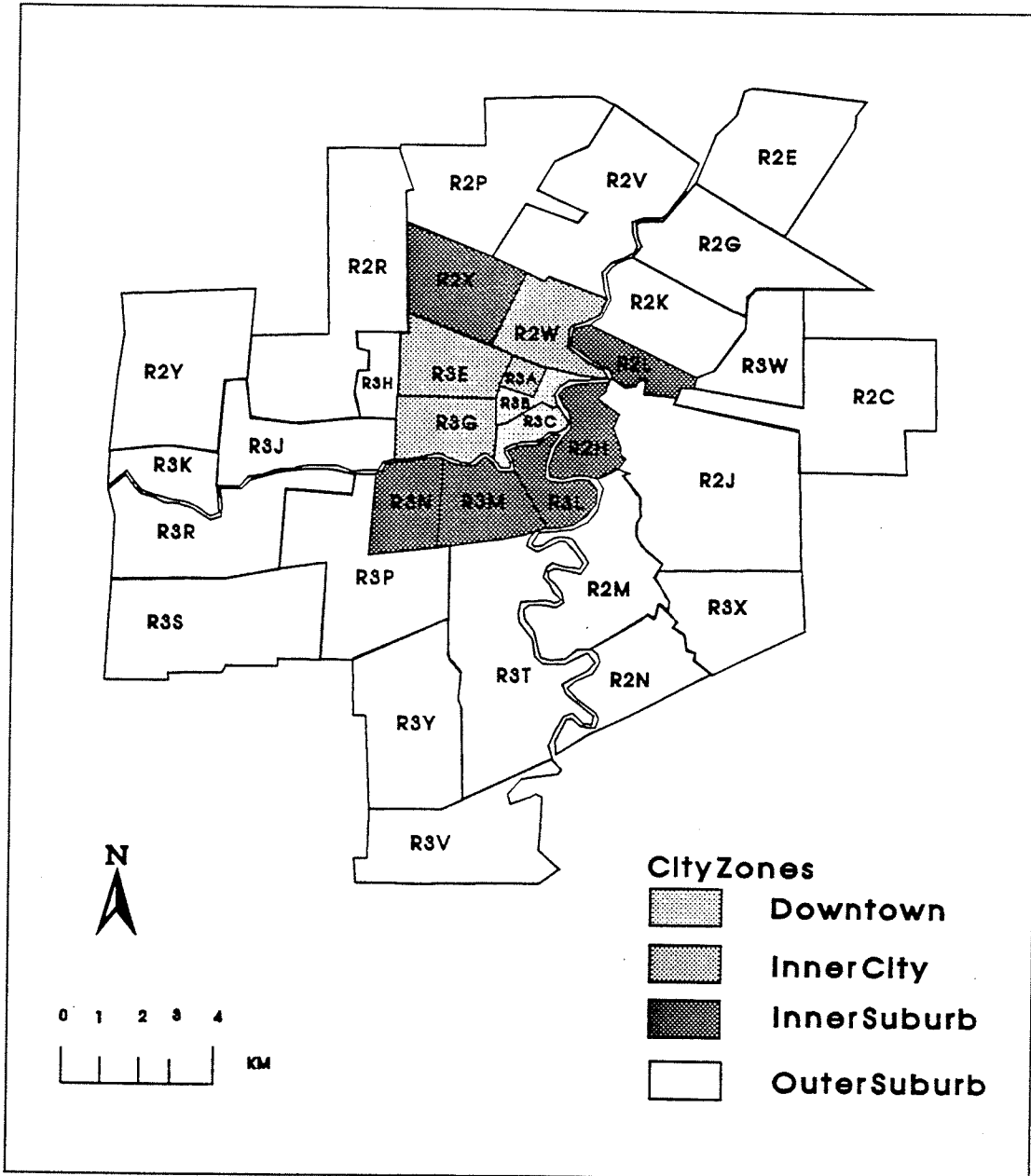


Fig. 2: City of Winnipeg Showing Forward Sortation Units



central area zones and two suburban zones as follows (Figs.1 &2):

Central Area zones:

- i) downtown neighbourhoods
- ii) inner city neighbourhoods

Suburban zones:

- (i) inner suburban neighbourhoods
- ii) outer suburban neighbourhoods

There was no existing single source defining these four zones in Winnipeg, so boundary selection was based on a number of different sources. The boundary of the downtown was based on the City of Winnipeg Planning Department's definition of Downtown Neighbourhoods (Winnipeg [City], 1993). The boundary of the inner city neighbourhoods was based on Brown and Burkes's (1979) *The Canadian Inner City: 1971-1976. A Statistical Handbook*. The boundary for the inner suburban neighbourhoods was based on Manitoba Department of Health (1991) boundaries for inner city FSUs³ (Manitoba Department of Health, 1991). The remaining outer areas of Winnipeg were designated as outer suburban neighbourhoods (Figs. 1 & 2).

³I have included the St. Boniface FSU (R2H) in this boundary even though it is not included by Manitoba Health because this is an older area that was target for neighbourhood and community development by the Winnipeg Core Area Initiative program (Winnipeg Core Area Initiative, no date, 10).

The sixteen public and private projects were then selected from the 223 neighbourhoods in Winnipeg (as defined by the City of Winnipeg Planning Department in 1993). Neighbourhoods are much smaller than either FSUs or Census Tracts and are "small areas based on a common set of criteria" (Winnipeg [City] 1978: 4), such as physical condition and population trends.

The actual number of projects chosen from each of the four zones of the City was broadly representative of the actual distribution of the various types of projects in each of these zones. For example, as 57.4% of the private projects (Table 6) were located in the outer suburbs, four of the eight private projects (50%) were selected from outer suburban locations. In addition, the projects were chosen from different neighbourhoods and distributed fairly evenly across Winnipeg (Fig. 3). Choice of projects was based, as much as possible, on representative samples of each type of public and private housing category in each of the zones of the city, using average size, in terms of number of residential units, and choosing segregated elderly housing whenever possible (Table 1)⁴.

⁴This was not always possible because of the increasing number of non-elderly housed in elderly public projects (McGavin, 1994).

Fig 3: Location of Sample Housing Projects

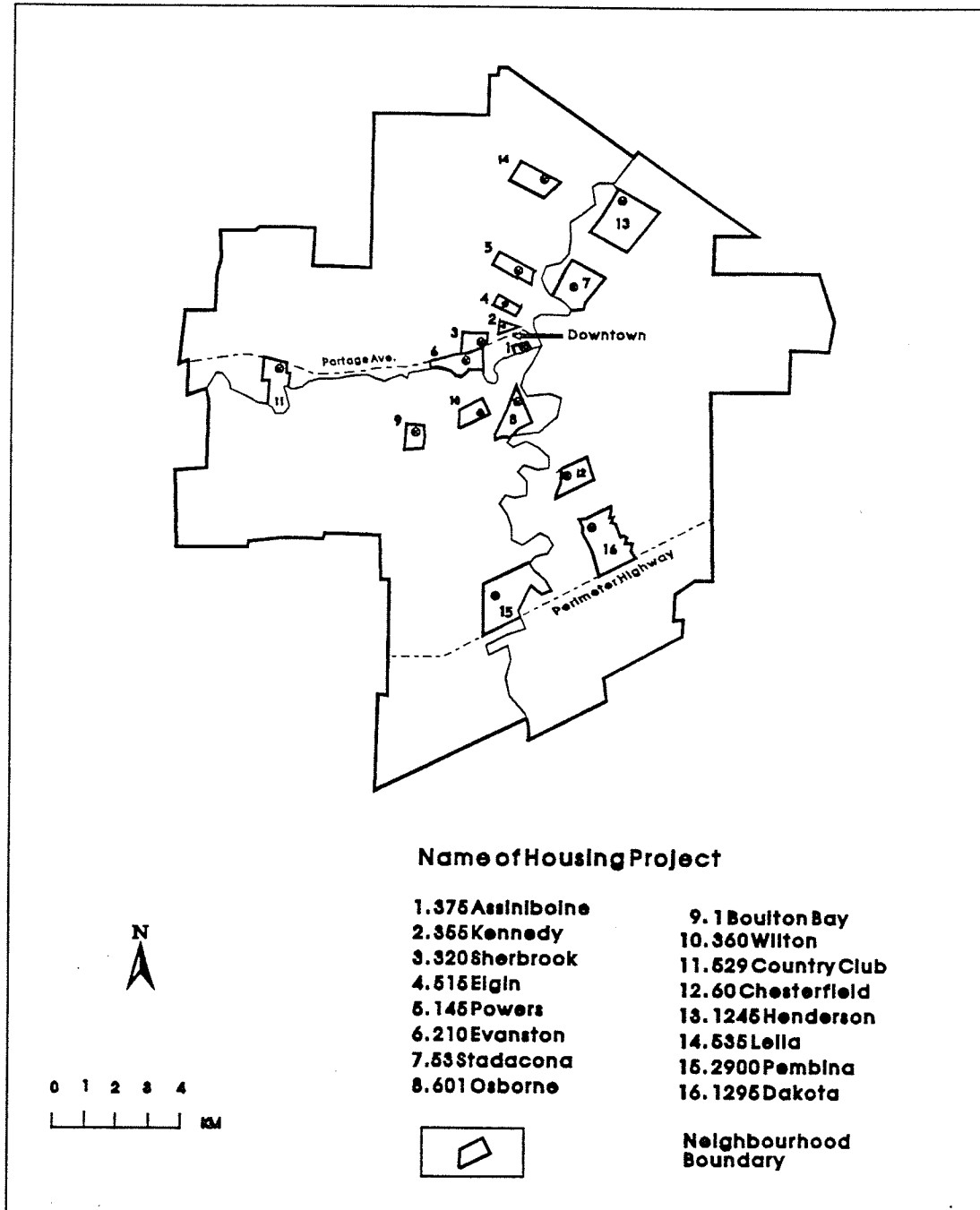


Table 1: LIST OF PROJECTS USED IN THE NEIGHBOURHOOD ANALYSIS

Project Address	Area	Type	Number of Units
375 Assiniboine Avenue	Downtown	Public	89
355-7 Kennedy Street	Downtown	Public	95
320 Sherbrook Street	Downtown	Private	259
515 Elgin Avenue	Inner City	Public	101
145 Powers Street	Inner City	Public	100
210 Evanson Street	Inner City	Private	89
53-5 Stadacona Street	Inner Suburb	Public	32
601 Osborne Street	Inner Suburb	Public	205
1 Boulton Bay	Inner Suburb	Private	94
360 Wilton Street	Inner Suburb	Private	49
529 Country Club	Outer Suburb	Public	107
60 Chesterfield Road	Outer Suburb	Public	107
1245 Henderson Highway	Outer Suburb	Private	104
535 Leila Avenue	Outer Suburb	Private	100
2900 Pembina Highway	Outer Suburb	Private	97
1295 Dakota Street	Outer Suburb	Private	96

3.2 RESEARCH QUESTIONS

In accordance with the thesis objectives, four research questions are proposed. This section describes the four research questions. The first three of these questions are proposed at the macro-level (city) scale while the last question is proposed at the micro-level (neighbourhood) scale.

3.2.1 RESEARCH QUESTIONS AT THE MACRO (CITY) SCALE

The aging of the population and the "greying" of the suburbs in North American cities has been well documented in the literature on aging (Chappell, 1990; Logan, 1984; Kimmich and Gutowski, 1983; Hare and Hollis, 1983; Golant, 1975 & 1990; Graff and Wiseman, 1978; Stone and Frenkan, 1988). Changes in age structure and shifts in the geographic distribution of different age cohorts directly influences the level and types of housing demand (Newman, 1986, 21). An increasing concentration of elderly population in suburban areas, due mainly to aging in place, will change the demand for housing in the suburbs. While previous suburban housing demand was for single family homes on large lots, the increasing concentration of elderly in suburban neighbourhoods will create a demand for housing more suited to their needs. Any housing programs geared to the elderly, especially those involving new construction programs, must take these factors into consideration.

As the majority of elderly state that they prefer to remain in their own neighbourhoods as they age (Gonyea et al., 1990; Baker and Prince, 1990; Groves and Wilson, 1992), the location of existing and planned housing dedicated to the elderly becomes an important issue. In order for all elderly to have equity in choice, regardless of where they live within

the city, the location of new elderly housing should reflect the varying concentration and needs of the elderly in the city.

Another trend has been a shift to the private provision of social housing. The trend towards privatization in Britain under the Thatcher administration has been well documented in the literature on elderly housing (Phillips and Vincent, 1986; Bochel, 1988; Corden, 1992; Hamnett and Mullings, 1992a). There has also been a similar trend away from the public provision of social housing in Canada since the end of the 1970s along with a trend towards more provincial involvement in the shared responsibility for housing (Warne, 1989; Flichel, 1989). This trend has resulted in a change in the structural composition of the elderly housing market.

The following research questions are therefore proposed in order to provide the necessary information on equity of distribution and change in structural composition of the SCA housing supply.

Research question 1:

Has there been a change in the structural composition of the SCA market between 1981 and 1993 and has this change resulted in changes in the locational concentration of

different types of SCA projects?

Research Question 2:

Is the distribution of SCA units in the city in each of 1981 and 1993 related to the distribution of elderly in the city?

Research Question 3:

What are the origins of elderly persons moving into public SCA projects?

3.2.2 RESEARCH QUESTION AT THE MICRO (NEIGHBOURHOOD) SCALE

The trend toward suburbanization of the elderly, as noted in the preceding section, suggests that the existing location of elderly housing projects may not reflect local concentrations of elderly population. In addition, research shows that the elderly have special environmental needs due to such factors as declining health and mobility (Lawton, 1978; Carp and Carp, 1982; Wilson, 1982). The following research question, therefore, addresses the physical and service environment characteristics of the neighbourhoods in which the sixteen sample projects are located.

Research Question 4:

Are the SCA projects located in neighbourhoods with similar physical, demographic and service environment characteristics? If not, is the observed pattern of physical, demographic and service environment characteristics related to (i) the area of the city where the project is located, and (ii) the type of housing (private vs public)?

3.3 DATA SOURCES, FIELD RESEARCH, AND ANALYTICAL TOOLS

In the next sub-section, the data sources for each of the macro and micro levels of analysis are outlined. This is followed by a detailed discussion of the field research that was conducted to collect data on the service environments of the sixteen sample projects. The final sub-section describes the tools and steps used for data entry, analysis, and display of results in this thesis.

3.3.1 DATA SOURCES FOR THE MACRO SCALE

The macro level analysis of the location and structural compositions of SCA units in 1981 and 1991 uses data from a variety of secondary sources: (i) population values by FSU for 1981 and 1991 were obtained from the Manitoba Department of Health; (ii) listings of public and private SCAs in Winnipeg

were obtained from the Manitoba Housing Authority (1992) and the Age and Opportunity Centre (1980, 1993). Missing data were obtained by telephoning the managers of the appropriate projects. In addition, the previous postal code address of current residents of the public SCAs were obtained from the relevant section of the "Manitoba Housing and Renewal Corporation Application for Family Housing" form that incoming tenants of all public housing must complete.

3.3.2 DATA SOURCES FOR THE MICRO SCALE

The micro level analysis of sixteen elderly housing projects in Winnipeg uses data from a variety of sources. Data related to the physical characteristics of the Winnipeg neighbourhoods for 1991 were obtained from Statistics Canada (no date). Physical and demographic characteristics of the neighbourhood selected for analysis were (i) Winnipeg Area Characterization Life Cycle Stage; (ii) the need for major repairs on private dwellings; (iii) percent of population 65 years and over; and (iv) stage of neighbourhood in the life cycle index. Service environment data were collected from a field survey of neighbourhoods in which the projects were located. A discussion of the field survey appears in the following section.

3.3.3 THE SERVICE ENVIRONMENT FIELD SURVEY

The importance of the neighbourhood environment has been well documented (Lawton et al., 1976; Lawton, et al., 1978; Ward, 1984;). The 'ideal residential area' for the elderly, according to Carp and Carp (1982) is one that has a number of basic services and facilities located within walking distance of the elderly person's dwelling. Heading the list of these services are grocery stores, banks and pharmacies. In addition, almost all of the elderly respondents in their study expressed the desire for a bus stop to be located within one block of their home.

The location of the above services and facilities should be within easy walking distance of the elderly as research has shown that walking is an important mode of transportation for the elderly, especially the old-old and the poor elderly living in central city areas (Carp, 1971; Sherman and Brittan, 1973; Carp, 1980; Rollinson, 1990; Smith, 1991). As the elderly form a heterogenous group, there can be no way of determining a distance that all elderly people can comfortably walk. There is some agreement, however, that a comfortable walking distance for the elderly ranges from approximately 0.4-0.8 kilometres (one-quarter to one-half of a mile), i.e. a walking time of about five to ten minutes (Golant, 1972; Mason and Smith, 1974; Zilver, 1976).

Data concerning the location of the following services were collected by visiting each of neighbourhoods surrounding the sample projects. The walking service environment around each project was determined by drawing a circle of radius of 0.4 kilometre or 0.25 mile on a map of the area. The following services outlets were located on the maps:

- i) a chain grocery/supermarket store⁵
- ii) a bank or credit union
- iii) a pharmacy

In addition, information was recorded concerning the location of the nearest bus stop; the number of different routes which are served by the stop; the nature of those routes (i.e. whether they are crosstown or downtown routes or feeder routes); and the distance (in kilometres) from the project to the nearest community shopping centre and the nearest regional shopping centre.

The field survey produced data listing characteristics on each of the specified characteristics of the local service environment around each of the sample projects. In addition, a summary variable, 'range of services', was formulated. This variable is based on the presence of at least one outlet of

⁵ Supervalu, Safeway, IGA, Penners or Payfair

each of the service outlet types as follows:

The presence of none of the service outlet types = 0

The presence of one of the service outlet types = 1

The presence of two of the service outlet types = 2

The presence of three of the service outlet types = 3

3.4 DATA ENTRY, ANALYSIS AND DISPLAY

One of the secondary methodological objectives of this thesis is to demonstrate the use of modern technology, especially GIS technology, to analyze social urban data. Analytically, three steps may be required:

- i) data entry
- ii) data analysis
- iii) data/results display (map creation)

The first sub-section describes in some detail Geographic Information System technology and its usefulness in urban social research. It is the most important of the tools used in this study and is involved in all of the areas of data entry, data analysis and map creation. The following three sub-sections describe the data entry methods, the data analysis tools, and the map creation processes respectively.

3.4.1 GEOGRAPHIC INFORMATION SYSTEM TECHNOLOGY

"A Geographic Information System is a computer-assisted system for the acquisition, storage, analysis and display of geographic data" (Eastman, 1993: 11). Map data in a GIS can be represented in one of two ways - vector format or raster format. The system used for this thesis is *IDRISI*, which uses raster format to represent data but has the capability for vectors as well. In a raster based GIS, the image is divided into pixels (picture element), which are "...small (usually rectangular or square) portion(s) of a raster display device..."(Eastman, 1993: 162). The attribute data is represented by a integer value in each pixel or raster cell. For example, in a raster layer showing land use, "1" may represent forests; "2" may represent grasslands; and "3" may represent water bodies.

Data sets are divided into unitary layers in a raster based GIS, with each layer containing all the data for a single attribute or theme, such as soil type or land use. Layers can then be overlaid in order to show the occurrences of different attributes at a particular location. As an example, the combination of layers showing low-income status in census tracts in a city, and incidence of a particular disease in the city can demonstrate the joint occurrences of these two factors and the possible relationship between them.

Another value of layering images (maps) is that mathematical, statistical/time series operations can be carried out in a spatial environment using map algebra and statistical/time series tools. For example, raster cell values in two maps can be added together or all the raster cell values in one map can be multiplied by a constant value. Output maps from these operations will contain pixels with values that are the results of the mathematical operations.

The usefulness of GIS has been amply demonstrated in the physical geography and resource management fields (most examples in GIS tutorials are taken from these areas). However, its utility as a research tool in the socio-economic area is slowly being recognized. Two of these areas are urban social geography and urban planning (Marble, 1990; Huxhold, 1991; Martin, 1991; Foust and Botts, 1992; Wong and Meyer, 1993; Sussman and Hall, 1993; Grothe and Scholten, 1993; Simkowitz, 1993; Vachon, 1993). Martin (1991:28-43), for instance, outlined the application of GIS technology for the analysis and display of urban data (e.g. utility mapping using digital map data and thematic map production using digital maps and census data). Huxhold (1991) provided examples of the use of GIS for: updating city plat and land use maps, identifying areas where "slum landlords" are in operation, planning solid waste collection routes, and planning the service areas of library facilities. Foust and Botts (1992),

and Grothe and Scholten (1993) examined the use of GIS technology for modelling catchment areas for franchise operations and other facilities, while Wong and Meyer (1993) used it to evaluate the efficiency of a meals-on-wheels program. Vachon (1993) examined the potential use of GIS to human service organizations, and Simkowitz (1993) demonstrated the use of GIS with census transportation planning data.

This thesis shows that GIS can be used for many of the social data analyses that were previously performed using standard statistical packages that have no spatial capabilities. Using GIS, instead of these packages, allows for the overlaying of different physical features and attributes so that 'data query' questions such as "where is something located?" and "what else is located there?" can be answered.

3.4.2 DATA ENTRY

Data must first be entered into a software package before they can be manipulated. Text and numbers can usually be entered easily by using a keyboard, but raster images (the kind used by *IDRISI*), require another method of data entry. In this thesis, an image of Winnipeg showing the FSU boundaries was scanned into the *FotoTouchColor* image package where it was "cleaned" before being converted into a tiff file

for exportation into the *IDRISI* package. Once imported into *IDRISI*, a 'GROUP' operation was carried out in order to have each FSU assigned a unique identifier. The 'GROUP' operation determines contiguous groupings of identically valued integer cells in an image. Cells belonging to the same contiguous groupings are given a unique integer identifier and numbered consecutively in the order found. Before this operation is carried out, every raster cell within the boundaries of each FSU has the same colour and the same value assigned to it. In other words, the image would have been useless for the required analysis because the GIS program would not have been able to recognize each FSU as a discrete area and so would not have been able to assign attribute values (such as number of people 65 years and over) to each FSU. After the operation, each FSU appears as a discrete grouping of similarly valued raster cells and each FSU has a different colour or shading of grey. *IDRISI* vector digitizing capability was also used to digitize point data (elderly housing projects) and line data (inner-city and suburban zones) on the existing *IDRISI* image of Winnipeg.

Another method of data entry used in this thesis was that provided by the C91 software package developed by Statistics Canada for use with their census data. Using this package, 1991 Winnipeg Neighbourhood Census variables were selected and simple mathematical operations (such as percentages) were

performed on these variables. This avoided the tedious and error-prone method of manually entering census data into spreadsheet programs for data manipulation. The **Works for Windows Spreadsheet Program** was also used extensively for keyboard entry and manipulation of SCA data.

3.4.3 DATA ANALYSIS

As mentioned in the previous sections, the GIS software package, *IDRISI*, was used for analyzing data on a spatial and temporal scale. In addition, the Statistics Canada C91 program and the Works for Windows Spreadsheet program were also used for analysis of non-spatial data. The three methods of data analysis used in this thesis are (i) image differencing; (ii) location Quotients; and (iii) coefficient of localization. Image differencing is a pairwise comparison of two images containing quantitative data at different time periods in order to show change. The location quotient is used to calculate relative concentration of a particular attribute (SCA units) in reference to the base magnitude (65+ population). The coefficient of localization is "a type of gini coefficient and provides a means of summarizing the overall localization (spatial concentration) of facilities relative to the regional distribution of population" (Joseph and Hall, 1985: 151-2).

3.4.4 MAP CREATION

The first step in the creation of maps to show the results of the data analysis was carried out by scanning a map of Winnipeg showing FSU boundaries into a scanning software package and then exporting it into *IDRISI* as described in the data entry section. Once the *IDRISI* operation was run on the image, the resulting new image was "cleaned"⁶ and then converted into a tiff file for exportation to a graphics bitmap package, *CorelPHOTO-PAINT*. The tiff images imported into *CorelPHOTO-PAINT* were then exported into the vector graphics package, *CorelDRAW*. They were then used as base maps to create the final maps, complete with symbols, text, and area fills.

3.5 SUMMARY

This chapter has described the study area, the four research questions, and the data sources and data analysis tools used in this study. The study area, Winnipeg, was introduced and the four research questions discussed. The data sources for the two levels of analysis were outlined and the collection of data by field research was described. Finally, the computer based data analysis tools were

⁶Cleaning of the *IDRISI* image involved mainly adjusting the colour of the FSUs to show a good contrast in order for patterns in the results to show up more easily.

discussed, with special emphasis on the use of GIS technology for the macro level analysis.

CHAPTER 4

THE ANALYSIS

4.0 INTRODUCTION

This chapter presents the results of the data analysis. The first section presents the results of the macro level (city) analysis of the distribution of Senior Citizen Apartments (SCAs) in Winnipeg in 1981 and 1993 while the second section describes the results of the micro level (neighbourhood) analysis.

4.1 ANALYSIS OF SPATIAL DISTRIBUTIONS OF ELDERLY POPULATION IN WINNIPEG, 1981 , 1991

The distribution of elderly people can be described in two ways: 'congregation' refers to the spatial distribution of absolute numbers of elderly without reference to the remainder of the population, while 'concentration' refers to the number of elderly as a proportion of the total population by sub-area (Hall et al., 1986: 46), The first section offers a description of the method used in the analysis of change in distribution of elderly population in Winnipeg between 1981 and 1991, and SCAs in Winnipeg between 1981 and 1993. This

method is called image differencing. The following sections present a descriptive analysis of (i) the congregation and concentration of elderly population in Winnipeg in 1981 and 1991, and (ii) the change in congregation and concentration of elderly during this period.

4.1.1 IMAGE DIFFERENCING

Image differencing is used to quantify the change in numbers of elderly people and SCA units in each of Winnipeg's Forward Sortation Units (FSUs) for the two time periods. It is also the method used to show the difference in Location Quotients for each FSU between the two time periods. The results of the latter analysis will be described in Section 4 of this chapter. Image differencing is a pairwise comparison of two images containing quantitative data at different time periods in order to show change and is carried using GIS technology. With the method, "each cell in the output image is computed as the subtraction of the corresponding cell for one of the input images from the other" (Eastman and McKendry, 1991: 6). That is to say, the value of each raster cell (or pixel) in the image of the earlier time period is subtracted from the value of the corresponding raster cell in the image of the later time period to produce a new image, one showing the change in value between the two time periods. The result from a differencing operation will be a continuum of

difference values that may be either negative or positive in form, with a value of zero for cases of no change.

The first step in the analysis of (i) elderly congregation and concentration, (ii) the congregation of SCAs, and (iii) LQ values is the creation of images showing the FSUs in Winnipeg with various attribute values assigned to each FSU. The attribute values computed for the FSUs are:

- i) elderly population (age 65 years and over) in 1981 and 1991;
- ii) percent of total population comprised of elderly persons for 1981 and 1991;
- iii) the number of SCA units supplied by each sector of the market in 1981 and 1993: public (including public and public sponsored), and private (including non-profit, co-operative, lifelease, and private-for-profit)⁷;
- iv) total SCA units (i.e. in all sectors of the market) in 1981 and 1993;
- v) location quotient indicating spatial concentration of SCA units in 1981 and 1993.

The paired images are then subtracted one from the other (earlier date from later date) to show respectively: changes in the absolute number of elderly in each FSU; changes in the

⁷SCA project types are described in a later section (p.88-92)

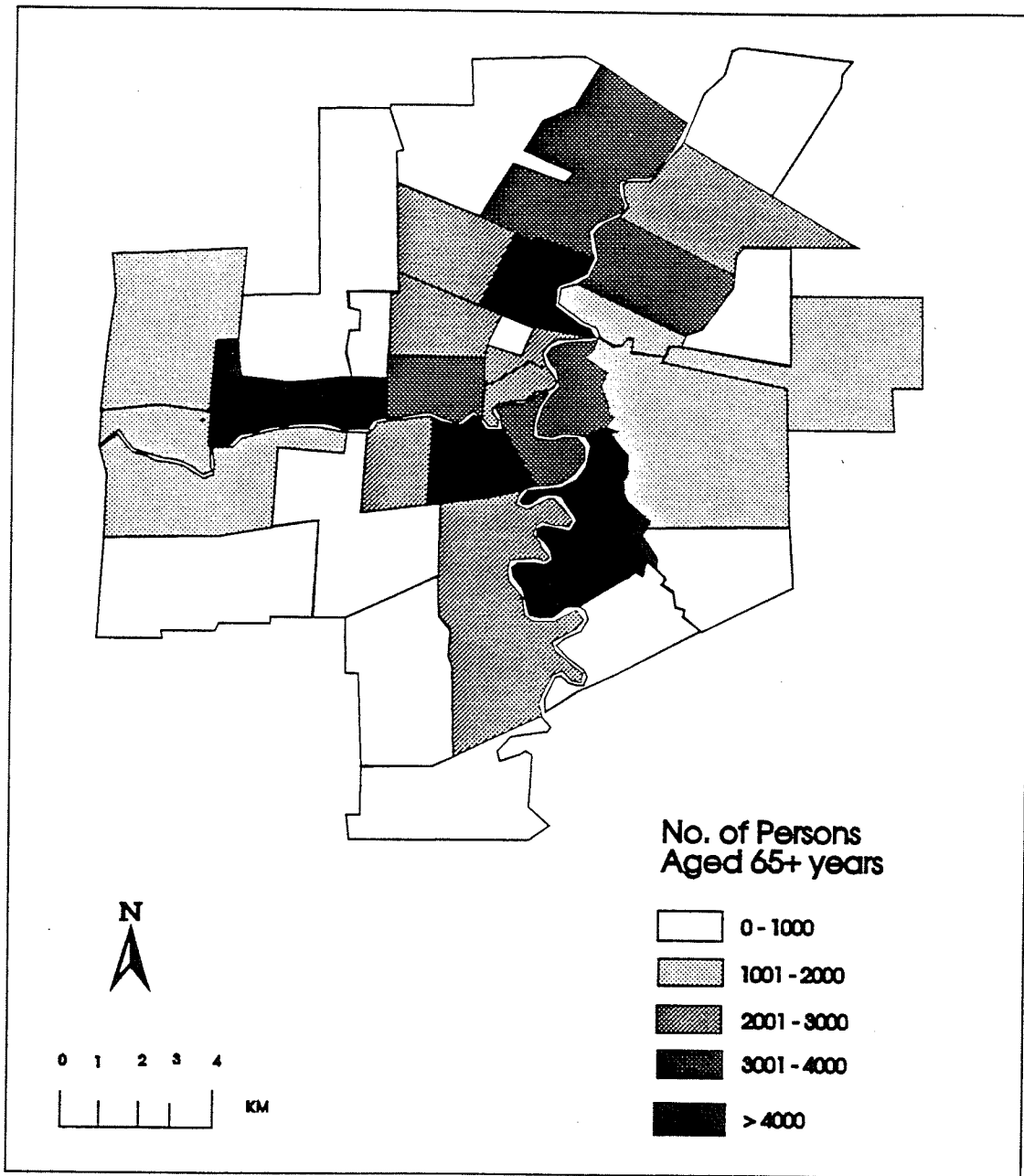
percent of elderly in each FSU; changes in the absolute number of elderly housing units in each FSU; changes in the supply of elderly housing units by the public and private sectors for each FSU, and changes in the location quotient for each FSU. Using GIS technology, not only are all the calculations computed by the software package, *IDRISIS*, but the results appear as images (maps) so that patterns in the changes can be observed.

4.1.2 CONGREGATION AND CONCENTRATION OF ELDERLY POPULATION IN WINNIPEG: 1981

The distribution of elderly (65+) population in the City of Winnipeg in 1981 (Fig.4) shows a congregation of the elderly in the older neighbourhoods of the inner city and inner suburbs with north-south/east-west trends along the City's two major rivers: the Red and the Assiniboine Rivers. The higher numbers of elderly in these areas can be explained by the aging-in-situ process.

Rivers were the main foci of growth for the emerging settlement of Winnipeg during the late 1800s and early 1900s and the junction of these two main rivers eventually became the core of the new city. Initial subdivision of the land was by the long lot system which involved the subdivision of land into long narrow lots running back from the rivers for

**Fig. 4: Spatial Congregation of 65+ Population
In the City of Winnipeg by FSU: 1981**



about four miles.

This survey system continued to determine the appearance of the urban cadastre and to influence future development even when the sectional grid system of subdivision was adopted in late 1800s. As the City continued to grow, development was focused on existing built-up areas along the rivers and tended to follow the main lines of transportation - first the rivers then the roads and streetcar lines (Selwood, 1977). The influence of the rivers on the spread of growth can still be seen in 1981. Relatively distant areas, which were developed more recently, have a relatively young population profile while the older neighbourhoods in the inner city and bordering the rivers are characterized by more pronounced congregations of older persons.

The relative concentration of elderly persons is measured by the number of elderly in each FSU as a proportion of the total population in each FSU. "An increasing concentration (of elderly people) can be the result ...of aging in place or elderly immigration. Additionally, demographic processes including changing fertility, mortality and particularly outmigration patterns of younger populations will influence significantly elderly population concentrations" (Hall et al., 1986: 46). All of the older inner-city and inner-suburban FSUs had elderly populations comprising more than 10% of the

total populations. The majority of the outer suburban FSUs (17 out of 22), however, had 10% or less of their populations comprised of elderly persons (Fig.5).

4.1.3 CONGREGATION AND CONCENTRATION OF ELDERLY POPULATION IN WINNIPEG: 1991

Although the spatial congregation of elderly in the City in 1991 (Fig.6) is broadly similar in pattern to that of 1981, there are increasing numbers of older persons living in the outlying suburbs. These elderly congregations are especially pronounced in the northern suburban neighbourhoods and the southern suburban neighbourhoods bordering the Red River. However, outlying areas near the city limits continue to have low numbers of elderly.

The pattern of concentration of elderly people in 1991 remains broadly similar (Fig.7), especially in the inner-city and inner suburbs. The "greying" of the outer suburbs is reflected by the decrease in the number of FSUs (17 to 15) with less than 10% of their populations comprised of the elderly.

Fig. 5: Spatial Concentration of 65+ Population In the City of Winnipeg by FSU: 1981

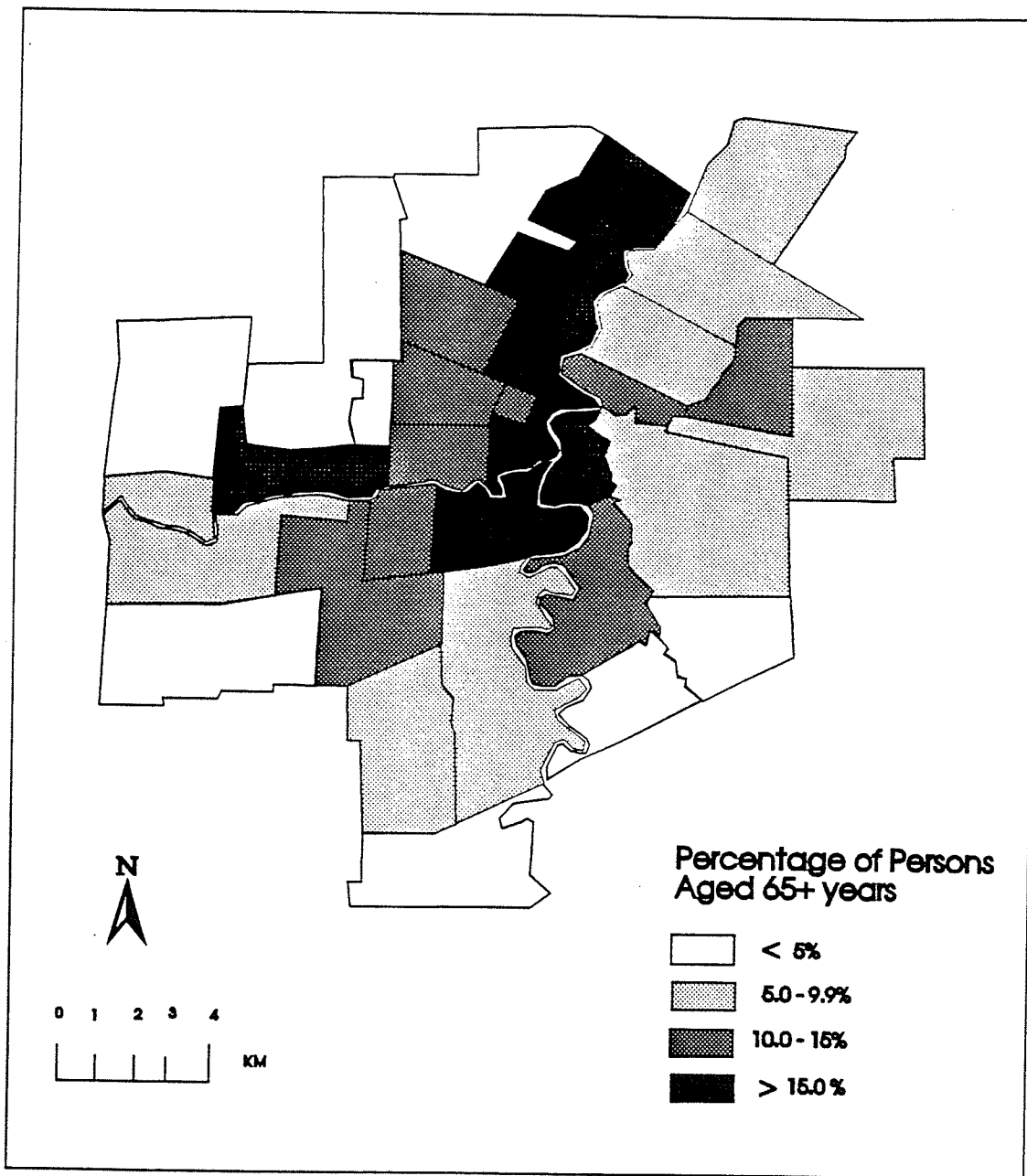


Fig. 6: Spatial Congregation of 65+ Population
In the City of Winnipeg by FSU: 1991

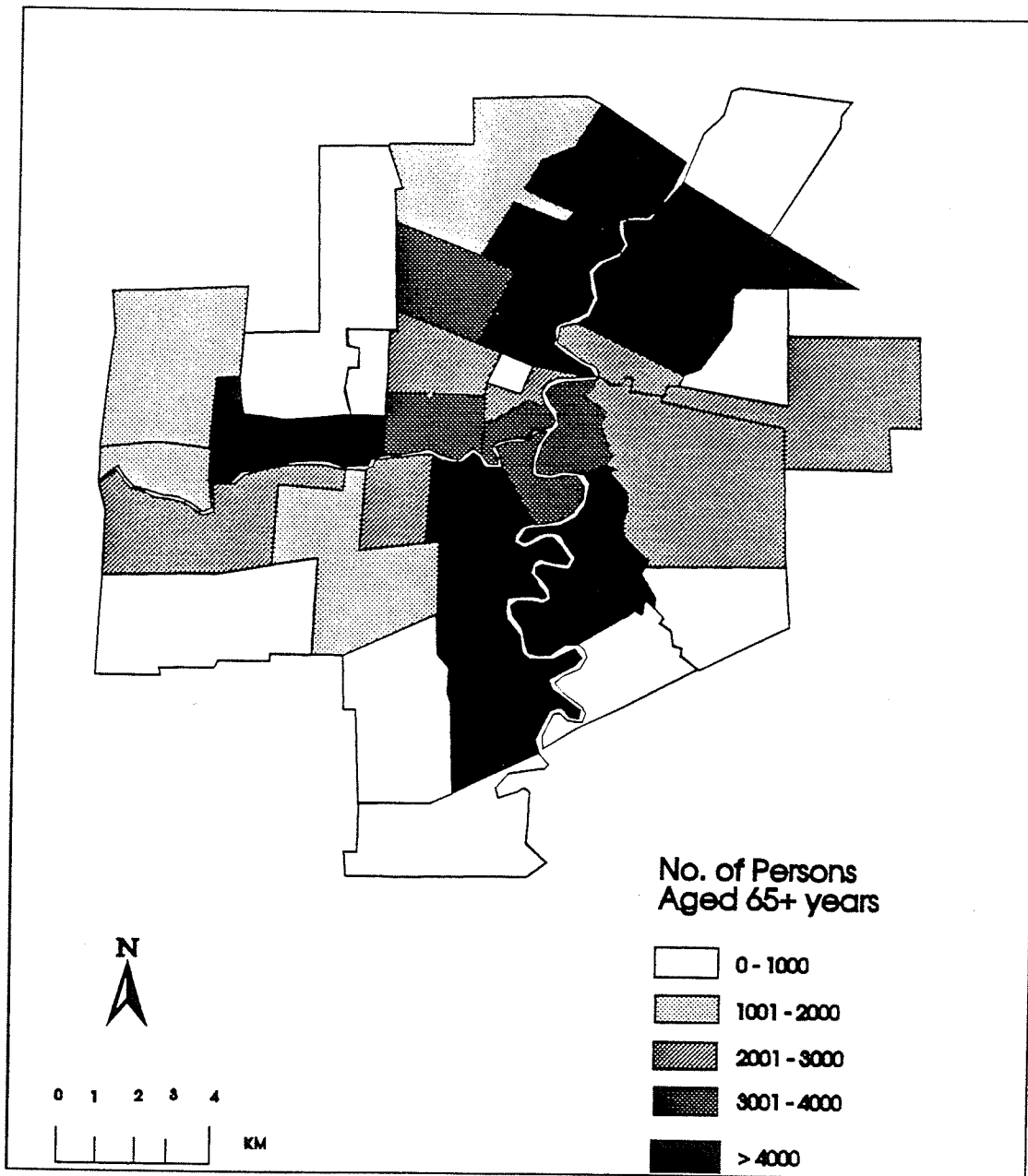
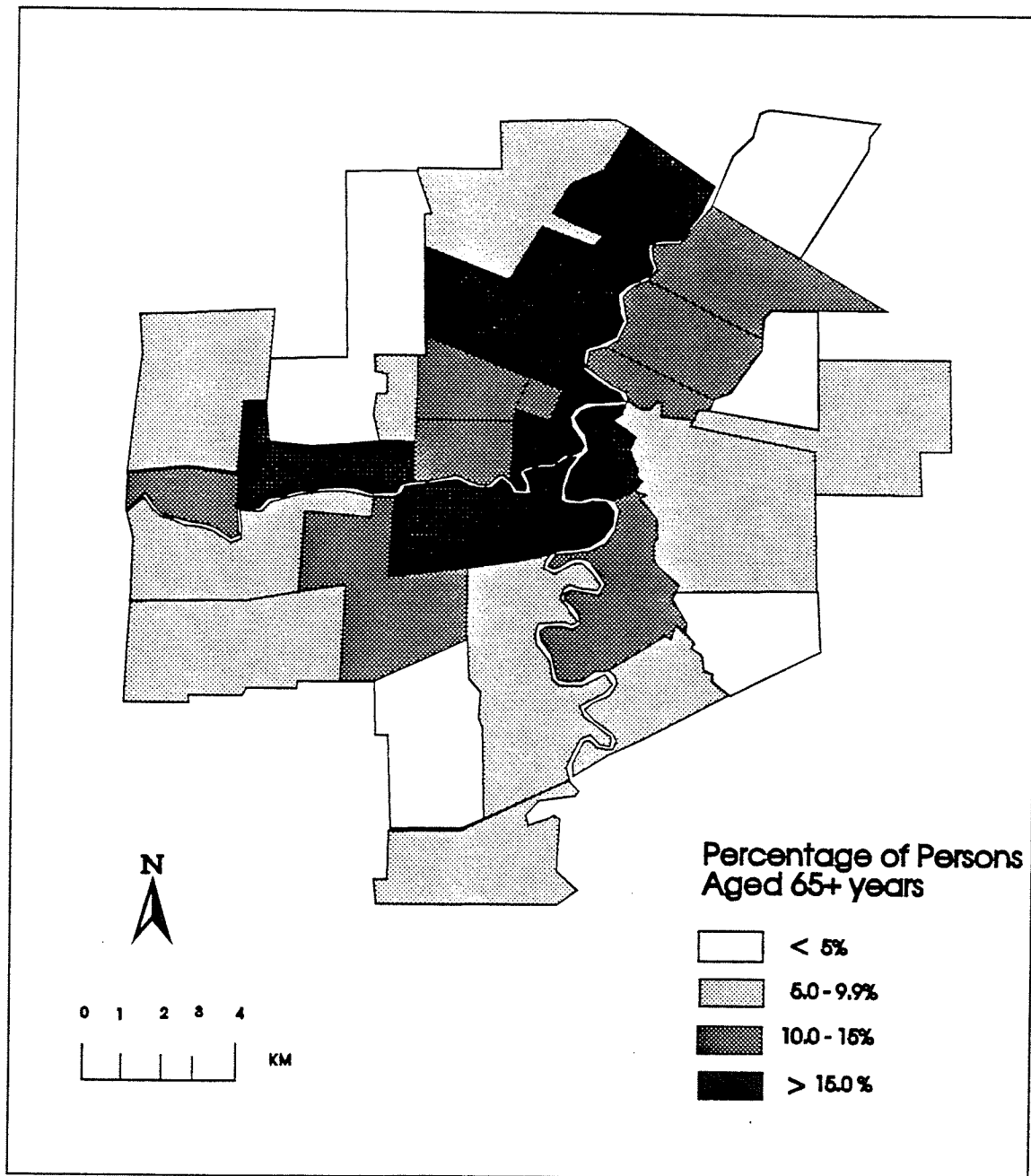


Fig.7: Spatial Concentration of 65+ population In the City of Winnipeg by FSU: 1991



4.1.4 SPATIAL CHANGES IN ELDERLY CONCENTRATION AND CONGREGATION: 1981-1991

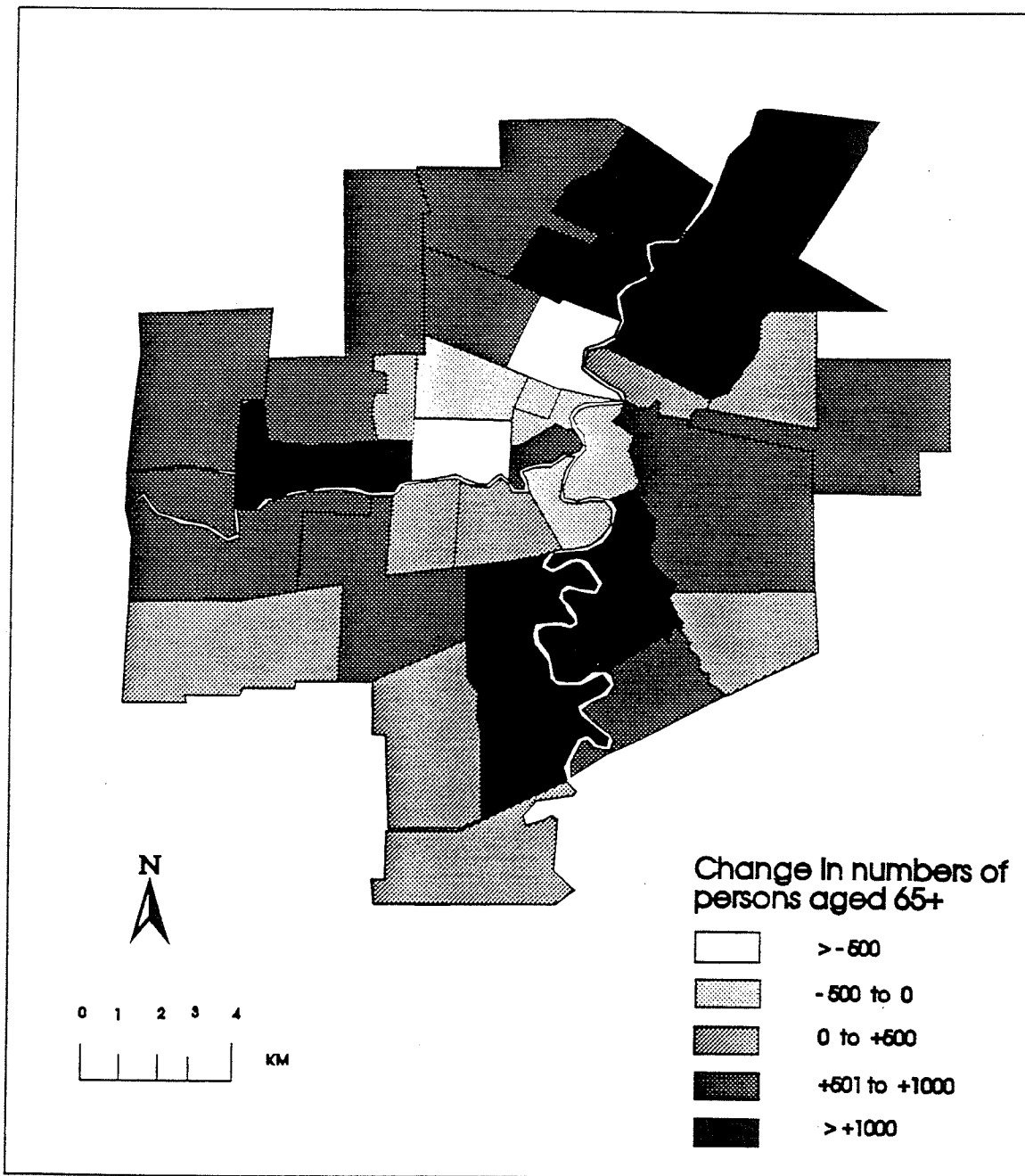
Although the central area neighbourhoods retained a large number of elderly in 1991, a map showing the change in congregation of elderly between 1981 and 1991 (Fig. 8) highlights the slow-down in the aging of the central area population. Only one of the six central area FSUs (R3C)^a had a substantial increase in elderly population. The other five central area FSUs showed a net loss in elderly population (Appendix 1).

Inner suburban FSUs showed a mixture of small net gain or loss in numbers of elderly people, except for the north end^b FSU (R2X), where there was a substantial increase in the number of elderly people (Appendix 1). There were increases in numbers of elderly in all FSUs in the outer suburbs with substantial increases occurring in the newer outlying suburbs of St. Vital and Ft. Garry in the south (R2M and R2J), St. James-Assiniboia in the west (R3J), and the Kildonans in the north (R2V, R2E, R2G, R2K).

^a Names of FSUs are shown in Fig. 2.

^b Location of city areas used in the discussion of the results of the analysis are shown in Fig. 1.

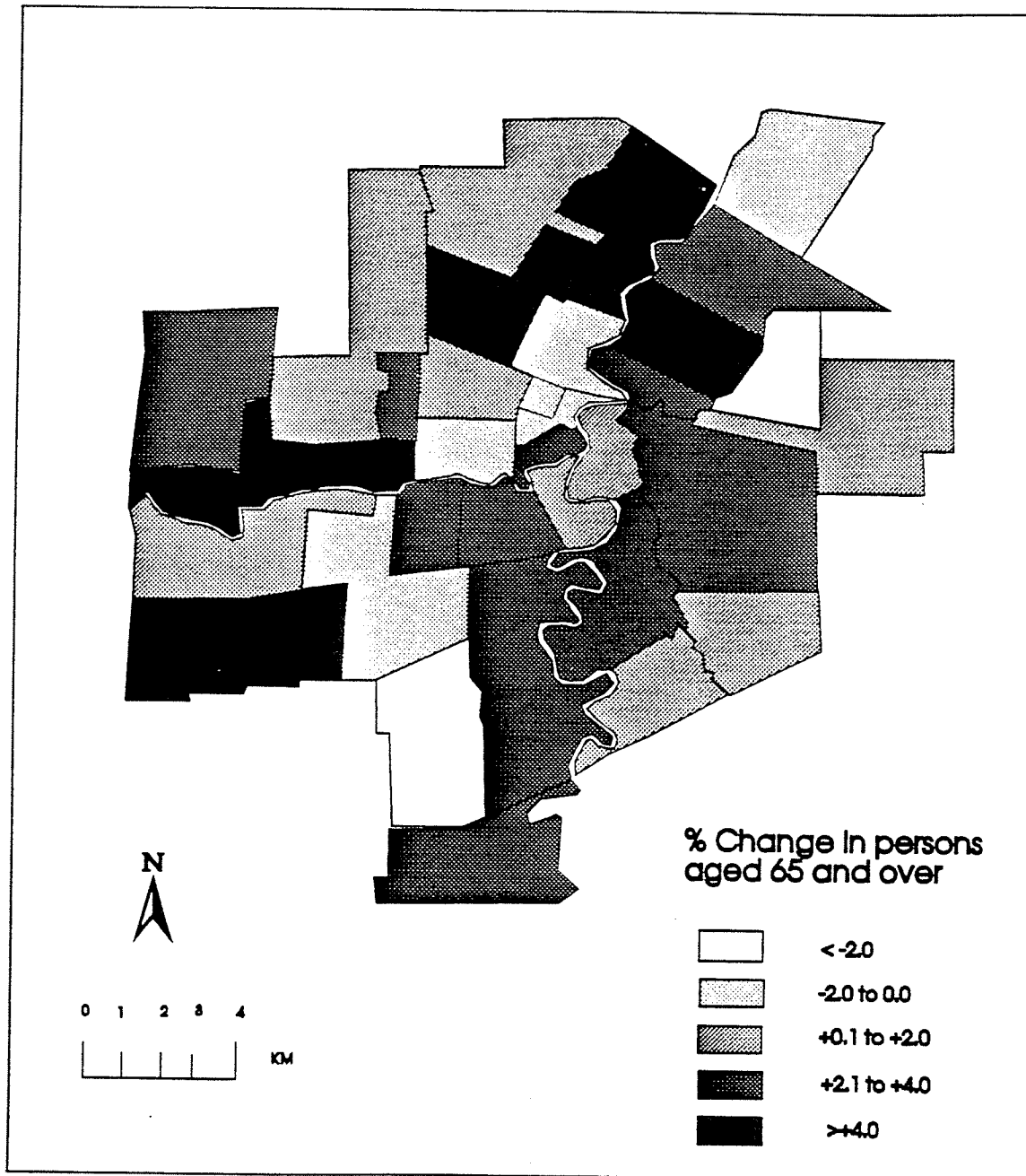
Fig.8: Spatial Change In congregation 65+ Population
In Winnipeg by FSU: 1981-1991



There was a similar change in concentration of elderly between 1981 and 1993 (Fig. 9). Overall, 25 of the 28 (89.3%) suburban FSUs recorded a positive change in elderly population, while only 2 of the 6 (33%) central area FSUs recorded a positive change. The largest positive change in percent of elderly (>4%) for the period occurred in five outer suburban FSUs and one inner suburban FSU. In the central area, the largest positive change in concentration of elderly was recorded in the same downtown FSU (R3C) that registered the largest increase in absolute numbers of elderly people.

The changing intraurban pattern of spatial congregation and concentration of elderly people highlights the decline in absolute numbers of elderly in most central city FSUs. This decline in central area elderly can be partly attributed to outmigration of the elderly or in-migration of younger age-cohorts, but is more likely due to the process of dying-in-place. Increase in number of elderly in the one downtown FSU (R3C) is likely due more to immigration of elderly people into this neighbourhood than to aging-in-place. This area, sandwiched between the main downtown retail street, Portage Avenue, and the Assiniboine River (Fig. 2) is primarily an upscale commercial district centred on the financial firms along Broadway Avenue East. Also located in the southern part of this area, however, is a picturesque and well maintained residential area bordering the Assiniboine River. This area,

Fig.9: Spatial Change In the Concentration of 65+ Population In Winnipeg by FSU: 1981-1991



with high amenity value and close to the shopping and cultural life of the downtown area, may be attractive to elderly intraurban relocators.

The second major pattern of change in elderly congregation and concentration observed in Winnipeg is the increasing congregation of the elderly in a number of outer suburban neighbourhoods. The suburbanization of the elderly has been commented upon by a number of researchers (see p. 9). This increase in numbers of suburban elderly can be attributed to the processes of aging-in-place and to in-migration of elderly from central city areas to the suburbs, possibly to be close to children.

4.2 ANALYSIS OF THE SPATIAL CONGREGATION OF SENIOR CITIZEN APARTMENTS: 1981, 1993

This section first describes the structural composition of the SCA market in Winnipeg in 1981 and 1993. This is followed by an analysis of the distribution (congregation) of all types of SCA units in Winnipeg in 1981 and 1993, and the analysis of the relative concentration of SCAs in those two periods using location quotient and coefficient of localization values.

4.2.1 STRUCTURAL COMPOSITION OF THE SENIOR CITIZEN MARKET IN WINNIPEG: 1981 AND 1993

This section first describes the structural composition of the SCA market in Winnipeg in 1981 and 1993, and the changes over the twelve year period. This is followed by a description of the location of the various types of SCA projects in the different zones of the city.

4.2.1.1 DESCRIPTION OF DIFFERENT TYPES OF SCA PROJECTS IN WINNIPEG

There were a number of different types of SCA projects provided by the two main sectors (private and public) of the housing market in 1981 and 1993. There were 44 public and 50 private projects in the City in 1981 providing a total of 5030 public SCA units and 4495 private SCA units. By 1993, there were 46 public and 82 private projects providing a total of 5073 public and 7631 private units (Tables 2, 3 & 4).

In 1981 and 1993, there were two types of publicly owned senior apartments: (i) publicly owned and managed projects, and (ii) publicly owned projects managed by sponsor groups. Both types were designed to provide adequate and affordable housing for low-income seniors. The projects are owned and funded by the Manitoba Housing and Renewal Corporation and the

Table 2: STRUCTURAL COMPOSITION OF SENIOR CITIZEN APARTMENT MARKET:1981 AND 199 (percentages of toatal units in brackets)

	1981 No. Of Units	1993 No. Of Units	Change in No. Of Units	
			Unit Change 1981-1993	% Change 1981-1993
PUBLIC				
NONSPONSORED	2786 (29.24%)	2750 (21.64%)	-36	-7.6
SPONSORED	2244 (23.55%)	2323 (18.28%)	79	-5.27
TOTAL PUBLIC	5030 (52.79%)	5073 (39.92%)	43	-12.87
PRIVATE				
NON-PROFIT	932 (9.78%)	1630 (12.83%)	698	3.05
CO-OP	104 (1.09%)	360 (2.83%)	256	1.74
LIFELEASE	0 (0.00%)	575 (4.52%)	575	4.52
PRIVATE-FOR- PROFIT	3459 (36.31%)	5066 (39.87%)	1607	3.56
TOTAL PRIVate	4495 (47.18%)	7631 (60.05%)	3136	12.87
TOTAL PUBLIC AND PRIVATE	9525	12704	3179	

need for these projects is determined by waiting lists and through need and demand surveys. Subsidies are provided in

one of two ways. First, ongoing net operating costs, including loan repayment, are shared on a 75-25 percent basis by the federal and provincial governments. Secondly, mortgages are written down to two percent interest for purposes of repayment (Manitoba Housing and Renewal Corporation, 1992).

There were three types of privately owned senior apartments in 1981: (i) non-profit; (ii) co-operative; and (iii) private-for-profit projects. The private non-profit housing program for seniors was developed to assist households unable to obtain affordable, adequate and suitable housing on the private market. In order to obtain funding under this program, a sponsor must be a non-profit corporation whose primary objective is to provide housing for low-income households. Tenants are charged rents according to a rent-to-income scale based on the household's adjusted income. Households must have incomes below a specified threshold and be unable to afford private accommodation without having to pay thirty percent or more of their income for housing. (Canadian Government, 1991).

The cooperative housing program is a housing arrangement between home ownership and rental. The co-op members collectively own their homes and can remain in their dwellings indefinitely. However, when they choose to leave, none of the

capital invested in the unit goes with them. The member also makes a commitment to share responsibility for the management and operation of the co-op. Communal areas are shared and privacy is limited to the individual or family dwelling unit. The rent is set at the low end of market rents with up to fifty percent of the units potentially allocatable to those individuals who can only afford to pay 25%-30% of their income as rent (Goldblatt et al., 1986: 6-7).

The third type of housing provided by the private sector in 1981 is the private-for-profit SCA. As the name implies, this type of SCA is owned and operated by the private sector and is operated as a profit making business.

The types of SCAs provided by the private sector in 1993 were the same, except for the development of a new type of senior apartment - the lifelease apartment. The lifelease program is part of the Seniors RentalStart Program, which helps non-profit groups develop rental housing for seniors. Manitoba Housing and Renewal Corporation provides up to 80% mortgage financing of the total cost of the project, with 5% of total eligible costs normally forgivable. Sponsor and/or tenant equity provides the remaining 20% financing. This has become a popular method of financing housing for seniors in Manitoba and, since its inception in 1986, the program has accounted for 563 new suites in Winnipeg. Prospective tenants

pay a cash sum in advance (normally from \$14,000 to \$40,000) to help make the project feasible and to guarantee them security of tenure. When a tenant moves, the equity contribution is refunded.

4.2.1.2 UNIT SHARE OF THE SCA MARKET BY EACH SECTOR IN 1981 AND 1993

The majority of SCA units (52.79%) were provided by the public sector in 1981. In 1993, however, the situation had changed and the majority of SCA units (60.05%) were provided by the private sector (Table 2). There was only a slight increase in absolute numbers of public sponsored units by 1993 (79 units) and an absolute decrease in numbers of public non-sponsored units (36 units). On the other hand, there was a substantial increase in absolute numbers of total private units (3,136). The largest increase in absolute numbers of private SCA units between the two years was in the private-for-profit sector (1,607 units), but the non-profit sector also showed a sizable increase (698 units). Additionally, there were 575 lifelease units created in the eight years between 1986 and 1993.

4.2.1.3 SENIOR CITIZEN APARTMENT PROJECTS AND THEIR LOCATION WITHIN WINNIPEG IN 1981 AND 1993

Of 94 projects in the City of Winnipeg in 1981, 29 (30.85%) were located in the central city area while 65 projects (69.15%) were located in suburban neighbourhoods (Table 3). Twenty-one of the 29 central area projects were publicly owned (72.41%) while only 23 of the 65 suburban projects (35.38%) were publicly owned. In other words, the vast majority of projects in the central area were public while the vast majority of projects in the suburbs were private.

There was an increase in number of projects between 1981 and 1993 (34 projects), and the majority (24) were built by the private sector in the suburbs (Table 4). Public projects made up 57.89% of the projects in the central area in 1993, as compared to 72.41% in 1981, while private projects made up 73.33% of the projects in the suburbs in 1993 as compared to 64.62% in 1981. These changes in percentages of public and private SCA projects were due to the construction of private projects in both the central area and the suburbs.

A further breakdown of private and public projects into sector types and city zones for 1981 (see Table 5) shows that there was a fairly even spread of all public projects across

the four zones of the city. There was a moderate tendency for public, non-sponsored projects to concentrate in the downtown area, while public sponsored projects were more strongly orientated to the suburbs.

Table 3: LOCATION OF TOTAL PUBLIC AND PRIVATE PROJECTS: 1981

	No.in Central Area	% of Projects in Central Area	No.in Suburbs	% of Projects in Suburbs	Total No.of Projects
PUBLIC	21	72.41	23	35.38	44
PRIVATE	8	27.59	42	64.62	50
TOTAL	29	30.85	65	69.15	94

Table 4: LOCATION OF TOTAL PUBLIC AND PRIVATE PROJECTS: 1993

	No.in Central Area	% of Projects in Central Area	No. in Suburbs	% of Projects in Suburbs	Total No.Of Projects
PUBLIC	22	57.89	24	26.67	46
PRIVATE	16	42.11	66	73.33	82
TOTAL	38	29.69	90	70.31	128

Table 5: NUMBER OF SENIOR CITIZEN APARTMENT PROJECTS WITHIN WINNIPEG BY FOUR ZONES: 1981 (percentages of total public or private projects in each zone in brackets)

	Downtown	Inner City	Inner Suburb	Outer Suburb	Total
PUBLIC					
PUBLIC SPONSORED	8	5	4	6	23
PUBLIC NON-SPONSORED	3	5	6	7	21
TOTAL PUBLIC	11(25.0)	10(22.7)	10(22.7)	13(29.6)	44(100)
PRIVATE					
NON-PROFIT	3	1	2	5	11
CO-OP	0	0	0	1	1
LIFELEASE	0	0	0	0	0
PRIVATE-FOR-PROFIT	0	4	13	21	38
TOTAL PRIVATE	3(6.0)	5(10.0)	15(30.0)	27(54.0)	50(100)
TOTAL OF ALL PROJECTS	14(14.9)	15(15.9)	25(26.6)	40(42.6)	94(100)

Private projects, however, were more typically located in the suburbs and showed a more concentrated distribution than public projects. Over 54% of all private projects were located in the outer suburbs while 30% were located in the inner suburbs. There were no co-op or private-for profit projects in the downtown zone. The only co-op project was

located in the outer suburbs together with the majority of non-profit and private-for-profit projects.

Table 6: NUMBER OF SENIOR CITIZEN APARTMENT PROJECTS WITHIN WINNIPEG BY FOUR ZONES: 1993 (percentages in brackets)

	Down- Town	Inner City	Inner Suburb	Outer Suburb	Total
PUBLIC					
PUBLIC	8	5	5	6	24
SPONSORED					
PUBLIC	3	6	6	7	22
NON- SPONSORED					
TOTAL	11(23.9)	11(23.9)	11(23.9)	13(28.3)	46(100)
PUBLIC					
PRIVATE					
NON-PROFIT	4	1	3	8	16
CO-OP	0	2	2	1	5
LIFELEASE	2	0	2	3	7
PRIVATE- FOR-PROFIT	2	5	16	31	54
TOTAL	8(9.8)	8(9.8)	23(28.0)	43(52.4)	82(100)
PRIVATE					
TOTAL OF	19(14.8)	19(14.8)	34(26.6)	56(43.8)	128(100)
ALL PROJECTS					

The most significant changes in 1993 (Table 6) were the introduction of private-for-profit SCAs in the downtown area, construction of two co-op projects in the inner city and inner suburban areas, and the initiation of the lifelease program. Lifelease projects were built in all but one of the four zones, with five of the seven projects located in the inner and outer suburbs.

Finally, an examination of the percentage of public and private projects in each zone of the city for 1981 and 1993 (Tables 7 and 8) reveals that public projects represented a very large percentage of all central area projects in 1981 but its share of the central area supply of SCA projects had dropped significantly by 1993. In addition, in 1993, private projects represented a larger percent of projects in each zone with a substantial increase in the downtown zone.

TABLE 7: PERCENT OF PUBLIC AND PRIVATE PROJECTS IN EACH CITY ZONE: 1981

	Downtown	Inner City	Inner Suburb	Outer Suburb
PUBLIC	78.57	66.67	40.00	32.50
PRIVATE	21.43	33.33	60.00	67.50
TOTAL	100.00	100.00	100.00	100.00

TABLE 8: PERCENT OF PUBLIC AND PRIVATE PROJECTS IN EACH CITY ZONE: 1993

	Down- Town	Inner City	Inner Suburb	Outer Suburb
PUBLIC	57.89	57.89	32.35	23.21
PRIVATE	42.11	42.11	67.65	76.79
TOTAL	100.00	100.00	100.00	100.00

4.2.2 SPATIAL DISTRIBUTION OF ALL SCA UNITS IN WINNIPEG, 1981, 1993

The distribution of all SCA units (individual dwelling units in SCA projects) by FSU for both 1981 and 1993 (Figs. 10 & 11 and Appendix 2-3) reveals north-south and east-west axes of congregation similar to those characterizing the distributions of elderly population in Winnipeg for 1981 and 1991. In 1981, SCA units were congregated in the downtown area and the older inner-city neighbourhoods at the junction of the rivers, with a secondary congregation in North (R2G). By 1993, however, there was an increase in number of SCA units in the outer suburban areas north and south of the junction of Red and Assiniboine Rivers due almost entirely to private sector construction of SCA projects between 1981 and 1993 (Tables 3 & 4).

Fig. 10: Congregation of Senior Citizen
Apartment Units: 1981

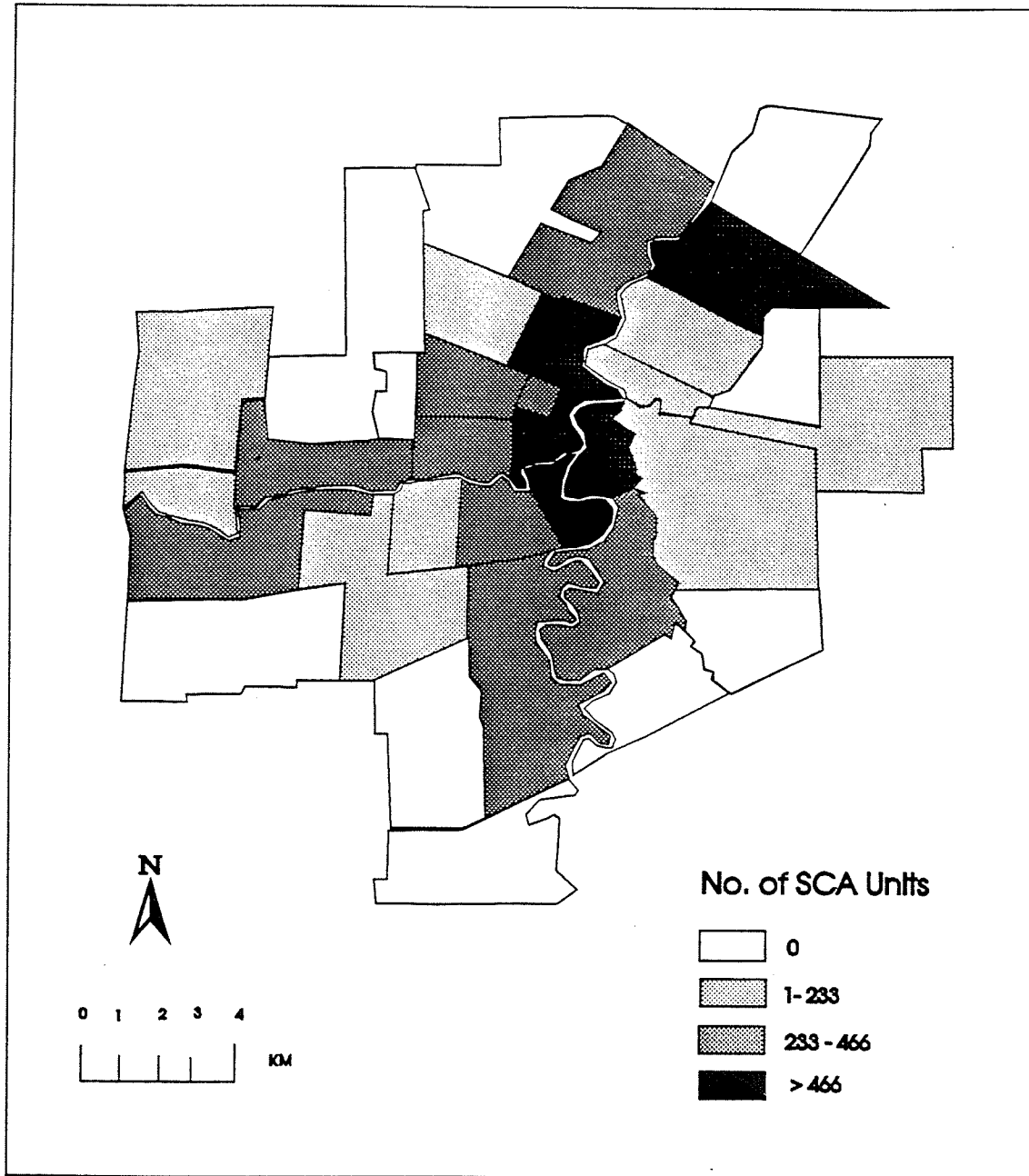
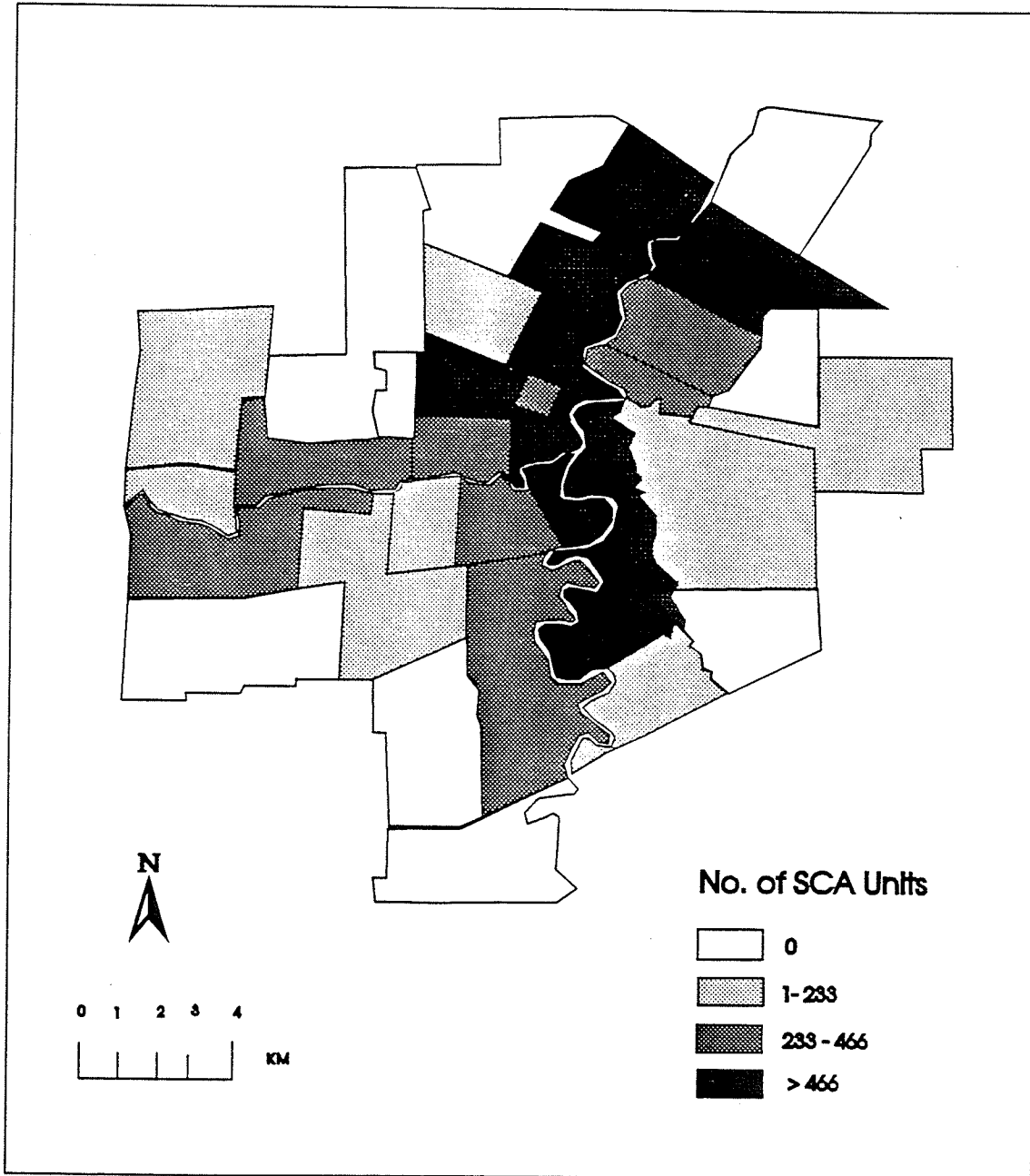


Fig. 11: Congregation of Senior Citizen
Apartment Units: 1993



4.2.3 SPATIAL DISTRIBUTION OF PUBLIC AND PRIVATE SCA UNITS IN WINNIPEG:1981, 1993

The congregations of public SCA units and private SCA units assumed different patterns in 1981 (Figs. 12 & 13). Public SCA units were congregated almost overwhelmingly in the downtown, inner-city, and older inner suburban neighbourhoods, while private SCA units were congregated mostly in suburban neighbourhoods, especially the North Kildonan FSU (R2G). This pattern does not change significantly for public SCA units in 1993 because there is only a net gain of 43 public SCA units over the twelve year period (Table 2). Private SCA units continued to be congregated in the outer suburban areas in 1993 (Fig. 14), especially in North Kildonan (R2G) and St. Vital (R2M), but there was a considerable increase in the number of private units in the Downtown (R3B) as well. The largest increase in numbers of private SCA units over the twelve year period (Fig. 15) was in the downtown (R3B) and St. Vital (R2M). There were also significant increases in private units in the St. Boniface (R2H), North Kildonan (R2G) and Charleswood-Tuxedo (R3R) areas.

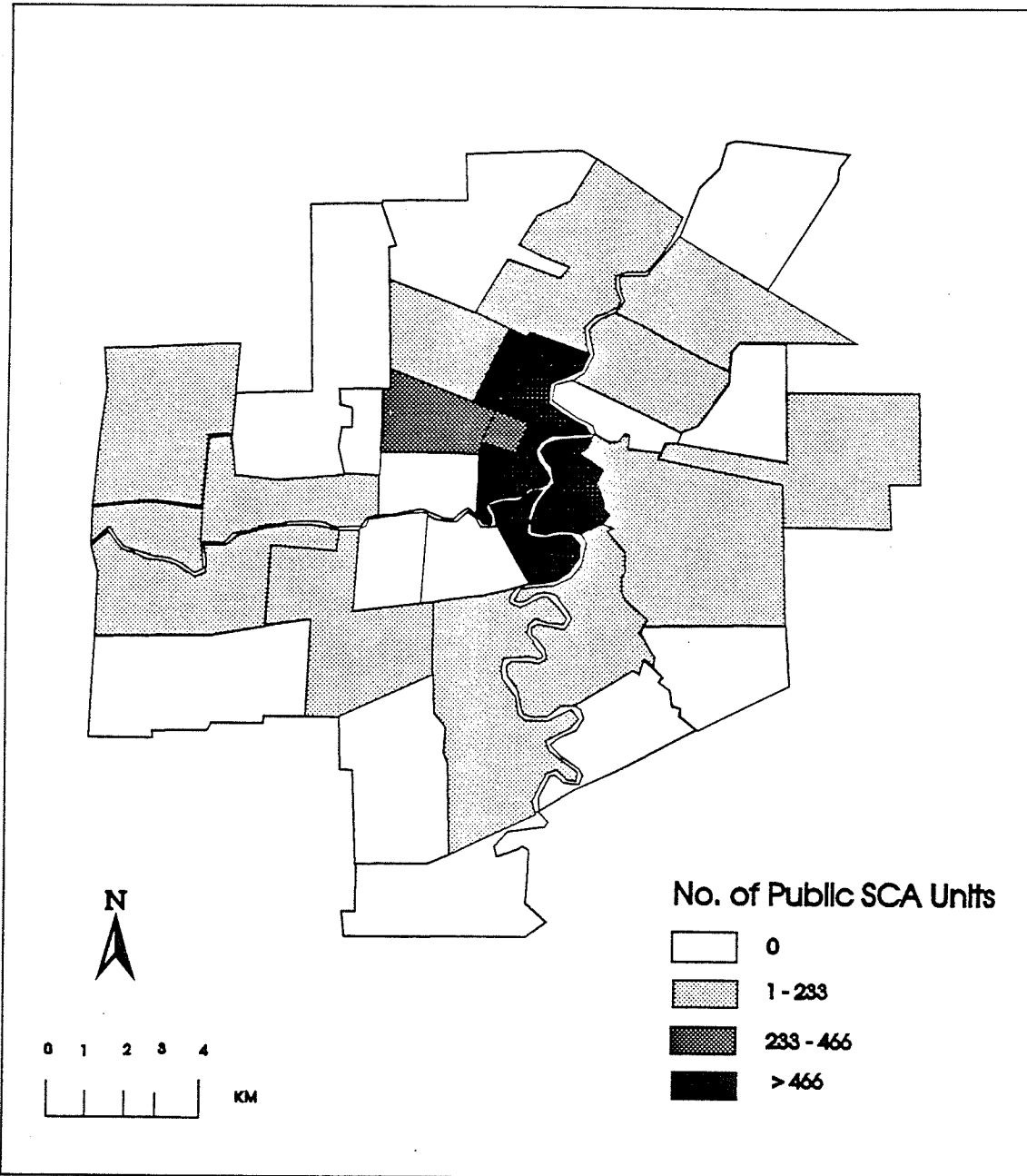
Fig. 12: Congregation of Public SCA Units: 1981

Fig. 13: Congregation of Private SCA Units: 1981

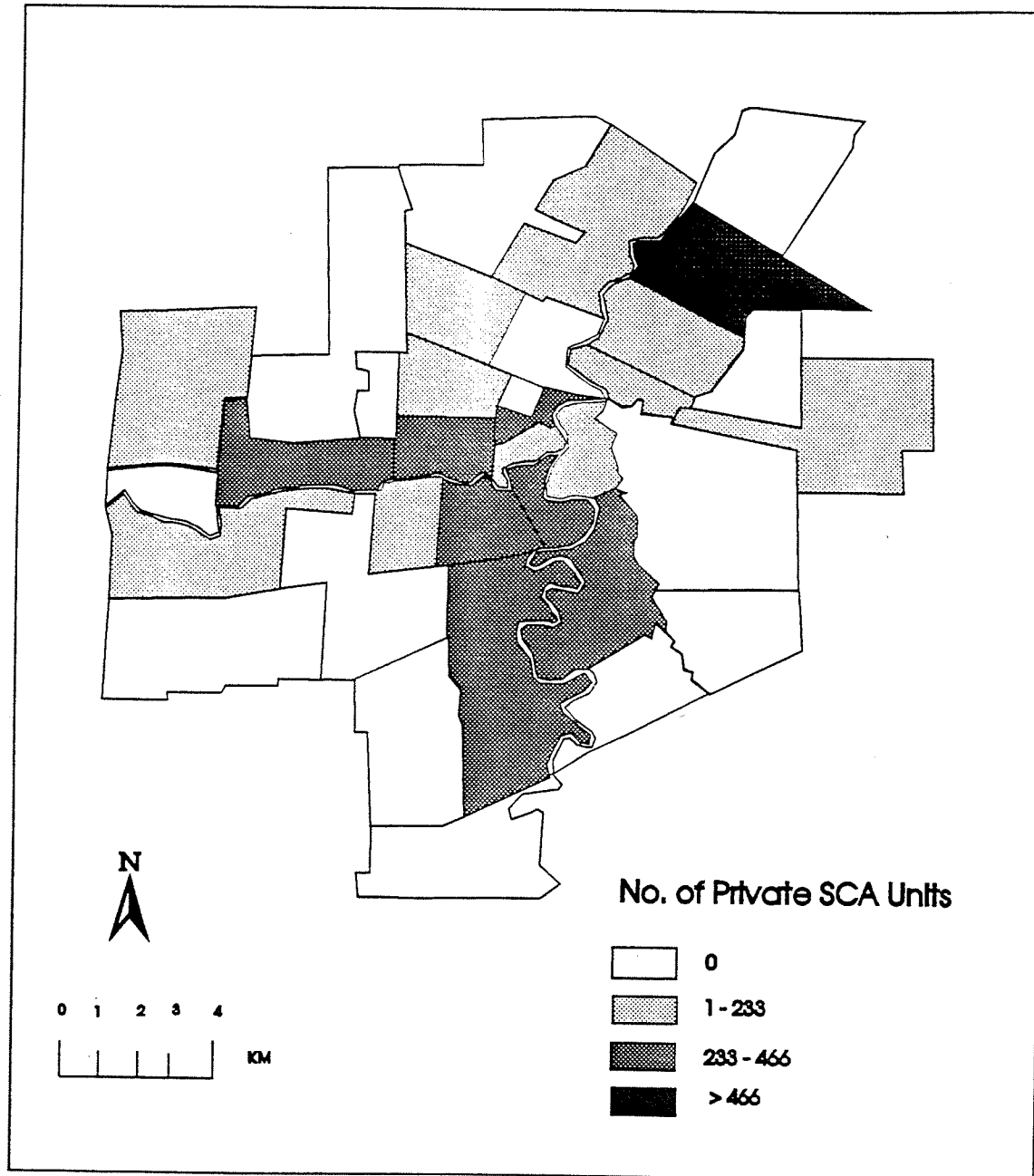
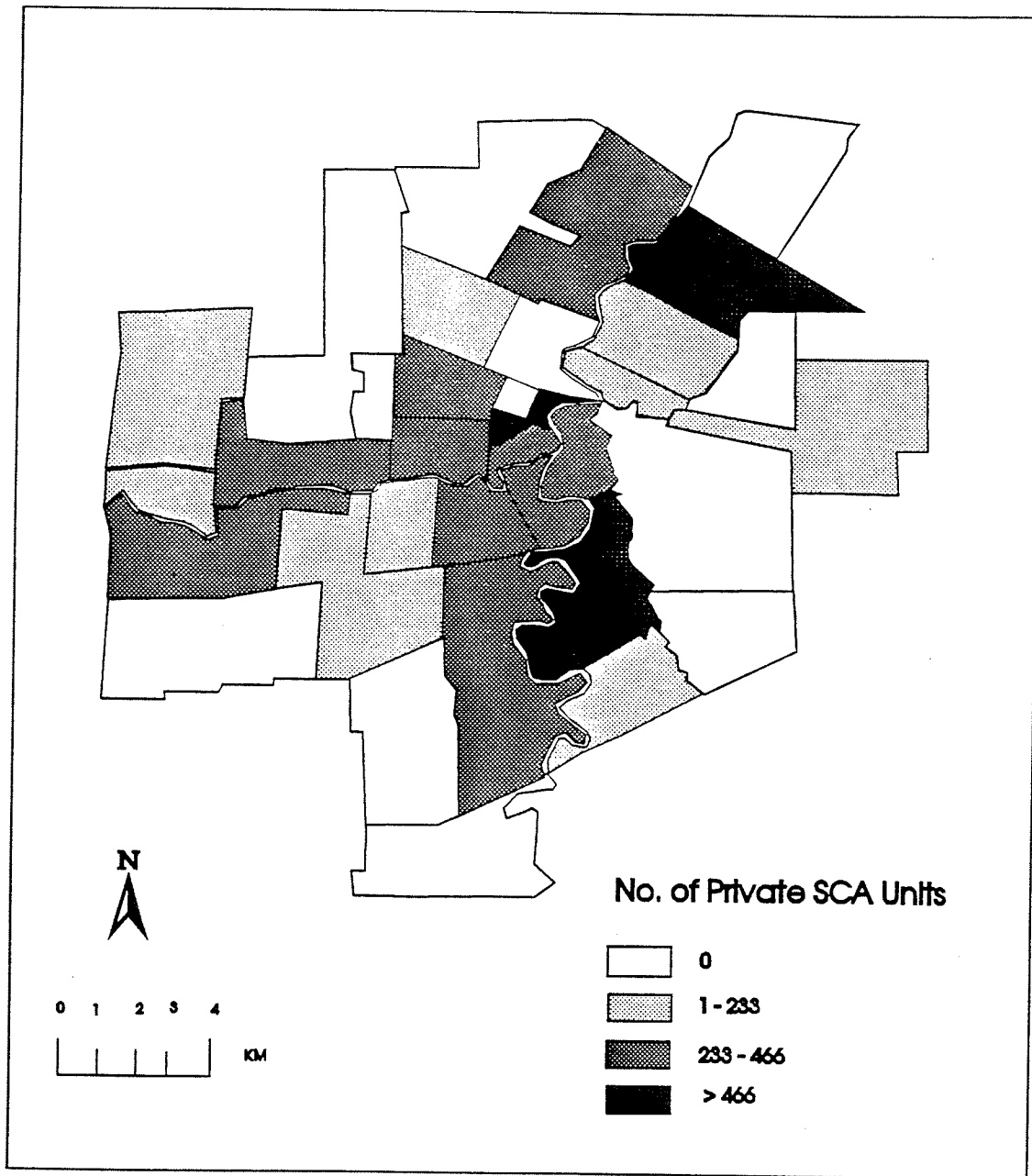
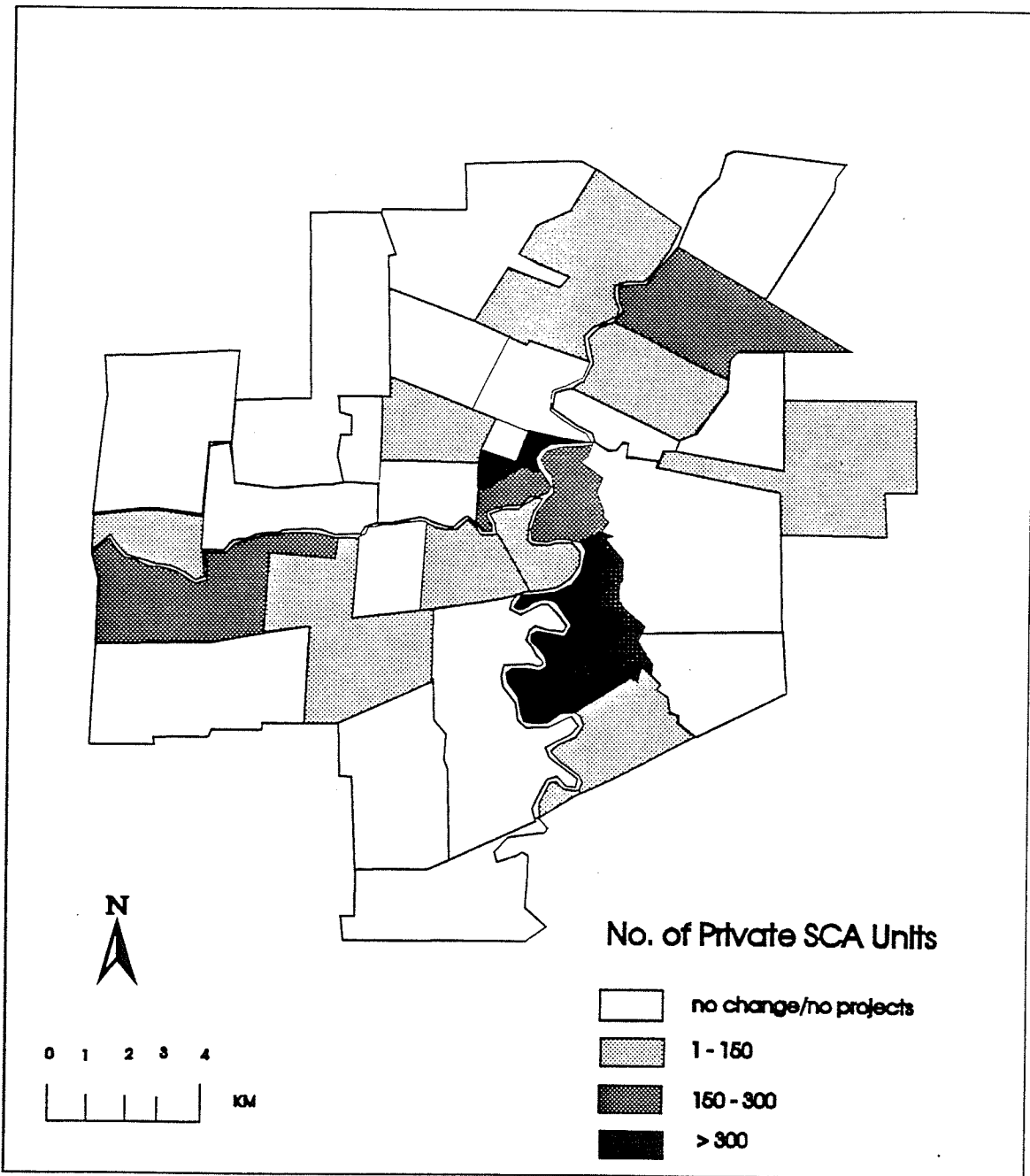


Fig. 14: Congregation of Private SCA Units: 1993



**Fig. 15: Change In Congregation
of Private SCA Units: 1981-1993**



4.3. ANALYSIS OF THE RELATIVE CONCENTRATION OF SENIOR CITIZEN APARTMENT UNITS IN WINNIPEG: 1981 and 1993

This section presents the analysis of the relative spatial concentration of SCA units in Winnipeg for the two study years. The first sub-section explains the two methods used for the analysis of the data. The first, the location quotient, is used to calculate relative concentration of SCA units in the City of Winnipeg in 1981 and 1993. The complementary measure, the coefficient of localization, is calculated to provide a single measure of concentration of SCA units in the City of Winnipeg between 1981 and 1993. The analysis involving location quotients is carried out using GIS technology. The results of the analysis are then presented in the subsequent sections.

4.3.1 LOCATION QUOTIENT

Analysis of social data from a geographical perspective has addressed the question of equity of spatial distribution of various social goods and services at different levels of resolution (Mercer, 1979; Pinch, 1980 & 1991; Bebbington and Davies, 1982; Hodge, 1987; Corden, 1992). It is not sufficient to know that "x" number of hospital beds are located in a particular region. The goal of equity of distribution requires that these beds be located so that all

people in a region have fair or equitable access to them. Arithmetic equality occurs when everyone (or every region) receives the same amount of some good or service, while proportional equality occurs when a good or service is distributed according to the needs or desert of a person or region. As people are never distributed equally across a region, but tend to be clustered in some areas and to be more scattered in others, proportional equality is usually of more relevance when dealing with the distribution of a good or service in relation to a particular target population.

One method of analyzing the proportional equality or fairness of distribution of a particular good or service is to use the location quotient. The location quotient has a long history in economic geography (Joseph and Hall, 1985: 146) and continues to be used by geographers interested in regional patterns of social and economic well-being as a standard measure of concentration across a region (Phillips et al., 1987; Joseph and Hall, 1985). The location quotient shows the extent to which "each of a set of areas departs from some norm" (Smith, 1975: 161). In this instance, the norm is the average degree of locational concentration of SCA units in Winnipeg FSUs. The location quotient, then, is used to calculate the relative concentration of all categories of senior citizen apartment units for the elderly in FSUs of Winnipeg in relation to the numbers of elderly people in those

sub-regions.

To calculate the LQs for SCA units in Winnipeg, in either 1981 or 1993, each FSU's share of the total pool of SCA units in the City was divided by its share of the City's elderly (65+) population¹⁰:

$$LQ_i = \frac{X_i}{X} \bigg/ \frac{Y_i}{Y} \quad (1)$$

where

- X_i = the number of SCA units in the FSU
- X = the number of SCA units in Winnipeg
- Y_i = the elderly population (65+) of the FSU
- Y = the elderly population (65+) of Winnipeg

SCA data from the Manitoba Housing Authority (1992) and the Age and Opportunity, Inc., (1980, 1993) and FSU population figures (Manitoba Department of Health, 1981 and 1991) were used in the analysis. An LQ of 1.0 indicates that the number of senior citizen apartment units in a FSU is exactly proportional to its share of the City's elderly population. Values of less than 1.0 show under-representation, while values over 1.0 indicate that the FSU has more than its 'fair share' of SCA units compared to its share of the elderly population. As the scale is arranged around unity, values denoting under-representation are compressed into the range 0

¹⁰Equation 1 is based on Phillips et al., 1987:77, and Smith, 1975:161.

to 1.0 while above the norm the range is much wider (Phillips et al., 1987).¹¹

4.3.2 RELATIVE SPATIAL CONCENTRATION OF SCA UNITS IN 1981: LOCATION QUOTIENTS

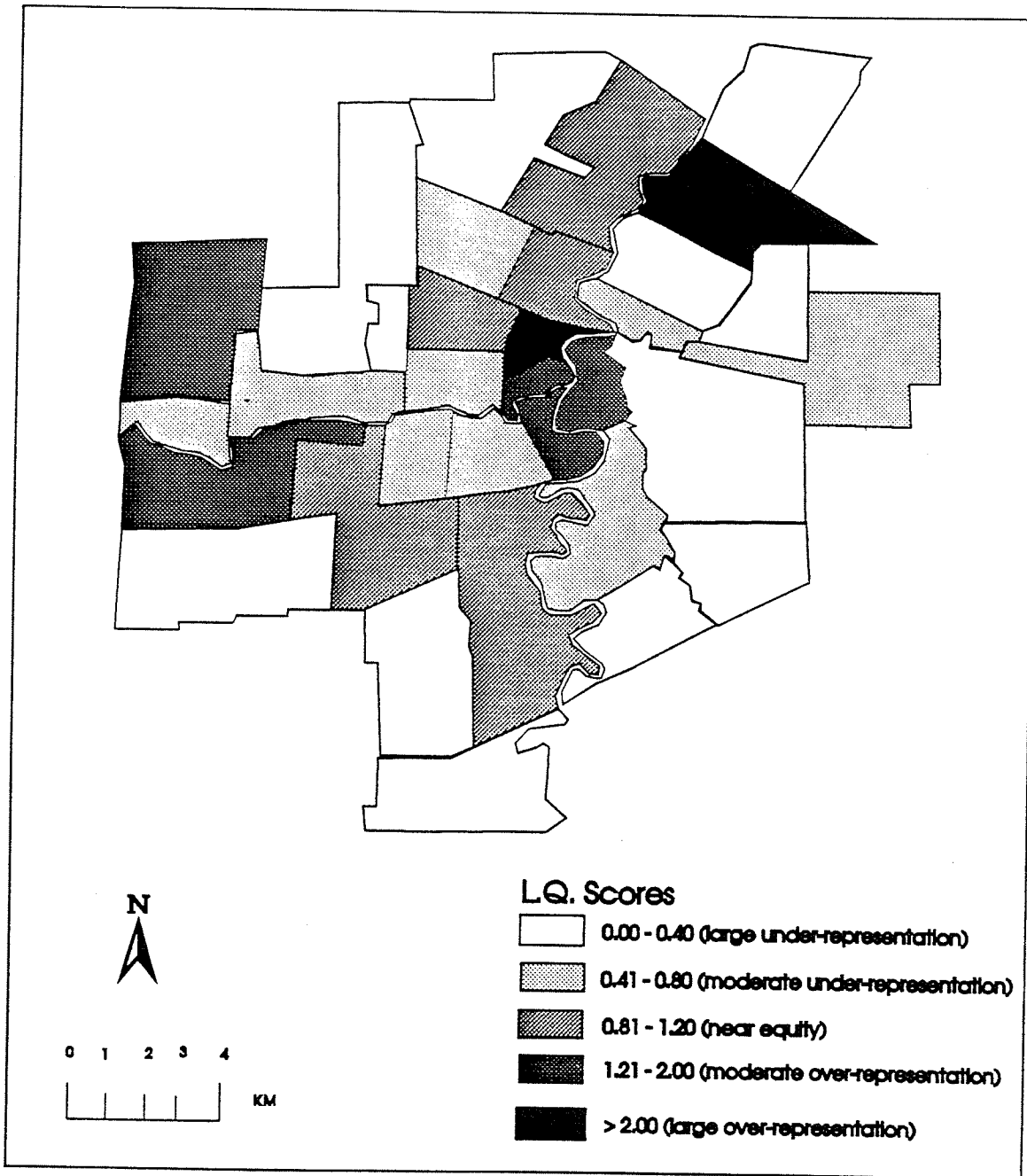
The results of the LQ analysis for 1981 for all categories of SCA units (Fig.16) shows that FSUs with either no SCA units or with a substantial underrepresentation of SCA units were restricted to certain outer suburban areas¹². Downtown FSUs had moderate to substantial overrepresentation of SCA units while some older inner suburban FSUs in St. Boniface and Ft. Rouge also exhibited moderate overrepresentation of SCA units. These areas had relatively moderate absolute numbers of elderly people in 1981 (Fig. 4), yet had some of the highest numbers of SCA units (Fig. 11). These high numbers of SCA units were due mainly to public sector provision of SCA units in those areas (Fig. 12).

Surprisingly, a few outer suburban FSUs located on the periphery of the City displayed some of the highest LQ values. Not surprisingly, the North Kildonan FSU (R2G) showed the highest relative concentration of SCA units in 1981. This FSU

¹¹ See Appendix 4-1 for a discussion of the calculation of the Location Quotient.

¹² Location quotient class values are based on Phillips et al. 1987: 79.

Fig. 16: Relative Concentration of SCA Units, 1981: Location Quotients

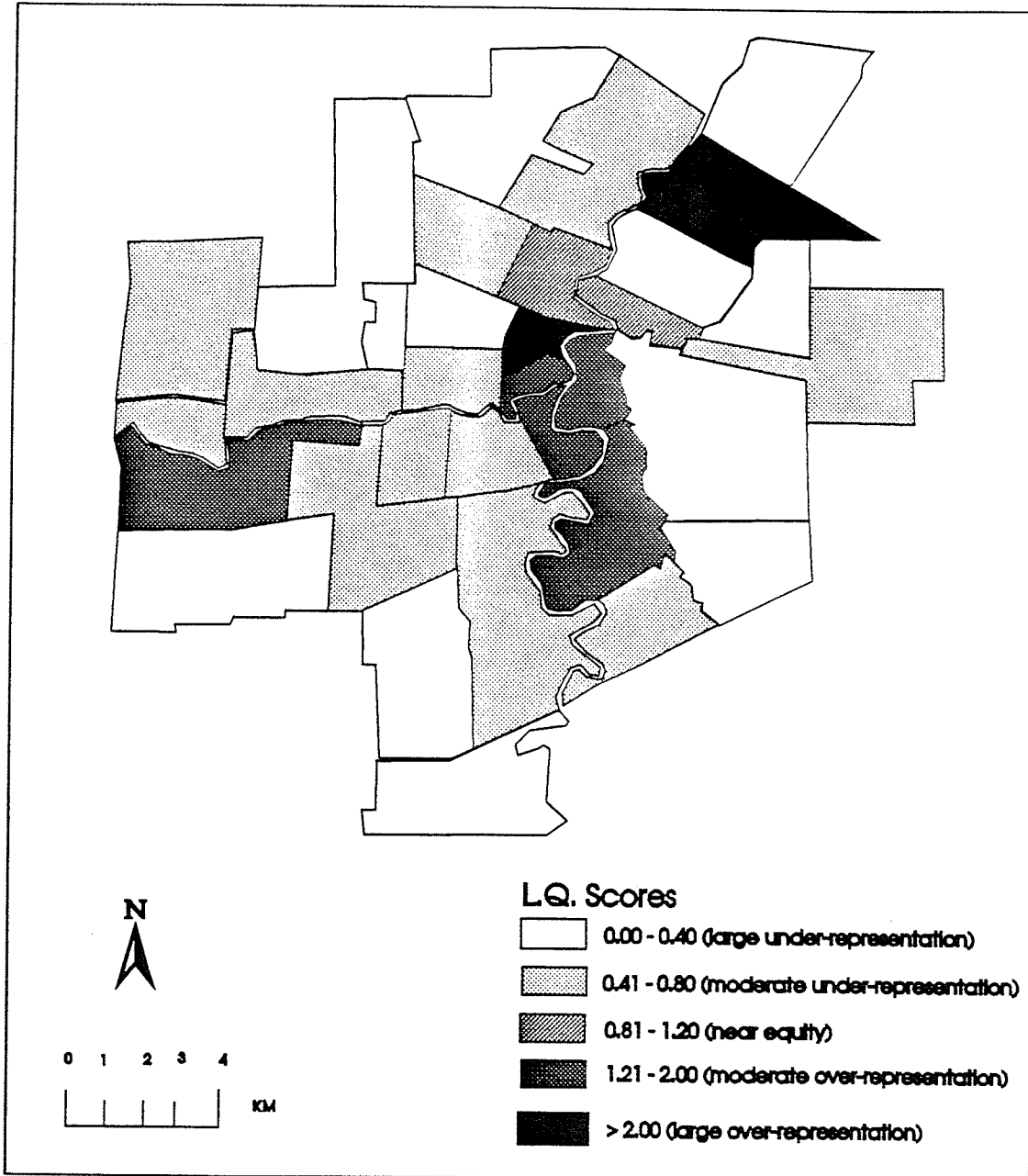


did not have relatively high absolute numbers of elderly people in 1981, yet it had the one of the highest number of SCA units in that year, due mainly to private sector provision of SCA units (Figs. 4, 10, & 13).

4.3.3 RELATIVE SPATIAL CONCENTRATION OF SCA UNITS IN 1993: LOCATION QUOTIENTS

The pattern of Location Quotients in 1993 was broadly similar to 1981 with a few changes (see Fig. 17). The only change in the central area was the decline in relative concentration of SCA units in some of the inner city FSUs, especially in the West End (R3E). The suburban situation remains much the same except for the decline in LQ value for the St. James-Assiniboia FSU (R2Y) and the increase in LQ value in St. Vital (R2M). In addition, there was a general decline in LQ values in many of the other outer suburban FSUs, especially in Ft. Garry and Tuxedo in the south-west, and West Kildonan in the North. The reason for the decline in LQ values for these areas is that, while they displayed fairly substantial increases in elderly population numbers between 1981 and 1991, there was very little increase in the number of SCA units in these areas during that time (Appendix 1 & Appendix 2-3). This increase in numbers of elderly people in the suburbs, i.e. "the suburbanization of the elderly" is due

Fig. 17: Relative Concentration of SCA Units,
1993: Location Quotients



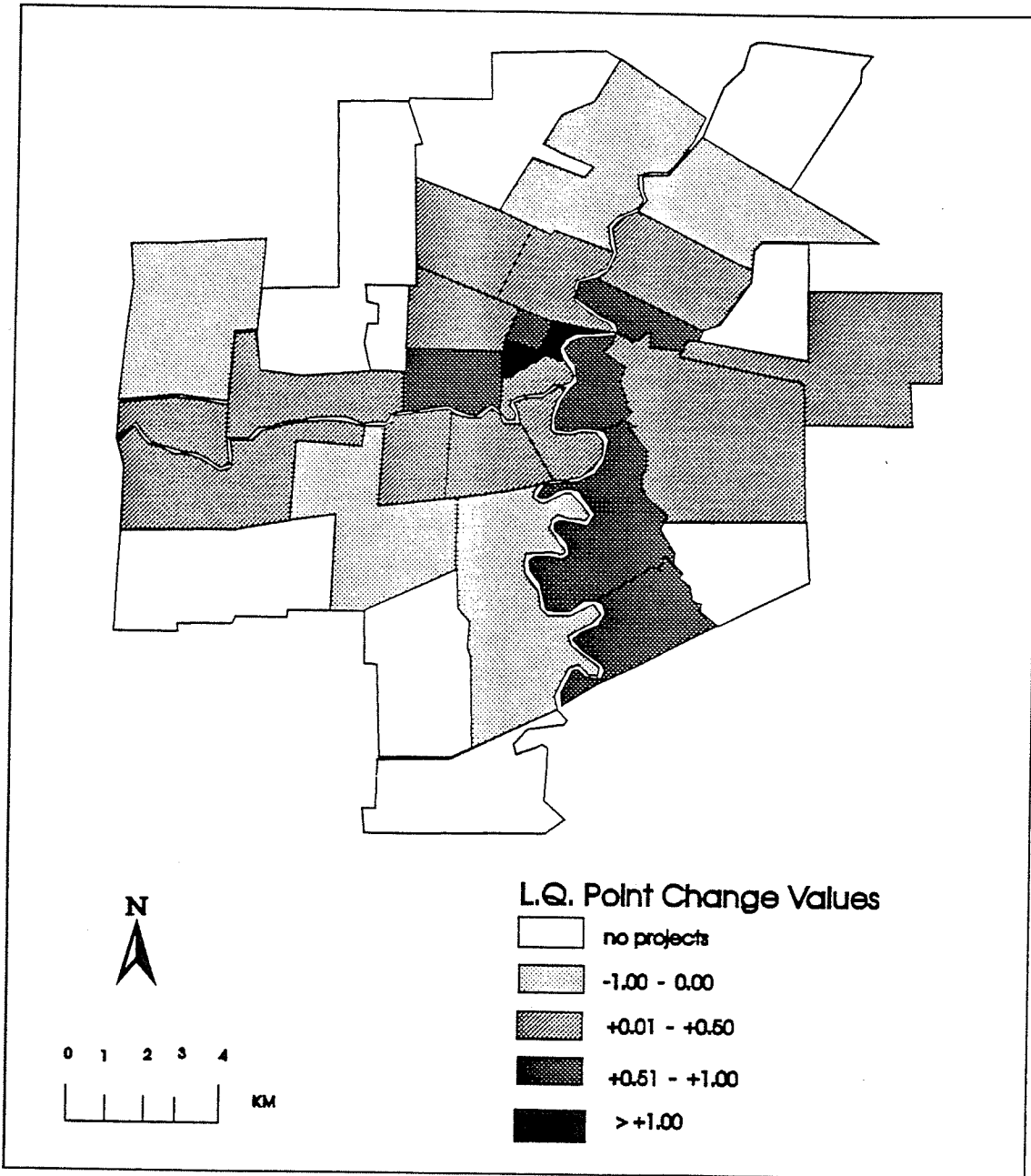
in most part to the demographic process of aging-in-place (Graff and Wiseman, 1978),

4.3.4 LOCATION QUOTIENT POINT CHANGE: 1981-1993

An examination of point changes in LQ values for the period 1981-1993 (Fig. 18, Appendix 3) shows that the Downtown and Inner City FSUs all showed increases in LQ values, especially the area north of Portage Avenue (R3B). While this area had a decline in absolute numbers of elderly people during the twelve year period it actually had the second highest increase in number of SCA units. The decline in numbers of elderly in the central area is due most likely to the process of dying-in-place (Graff and Wiseman, 1978).

Areas outside the central area showing large increases in LQ values were all located east of the Red River in the East Kildonan (R2L), St. Boniface (R2H), and St. Vital (R2M & R2N) areas. The reason for the relatively large increases in LQ values in three of these four FSUs is that they all had relatively large increases (between 134 and 737) in SCA units over the period (Appendix 2-3). The fourth FSU (R2N) had a more moderate increase in number of units (94) but also had a much lower absolute number of elderly people living there in 1991.

Fig. 18: Change In Location Quotient: 1981 - 1993



Areas displaying a decrease in LQ value over the twelve year period were all located in the outer suburban areas that were at the edge of the City. Although these areas all had fairly substantial increases in number of elderly people due to aging-in-place (Graff and Wiseman, 1978), all but one had fairly modest increases in number of SCA units (Appendix 2-3). The exceptional FSU was in North Kildonan FSUs (R2G). This FSU had a relatively large increase in number of SCA units (290) but also had a relatively large increase (1428) in number of elderly people.

4.3.5 COEFFICIENT OF LOCALIZATION

The coefficient of localization is used as a single standard measure of overall geographical concentration across a region. It is "a type of gini coefficient and provides a means of summarizing the overall localization (spatial concentration) of facilities relative to the regional distribution of population" (Joseph and Hall, 1985: 151-2).

The equation for the coefficient of localization¹³ is:

$$CL_k = \frac{1}{2} \sum_i \left(\frac{F_i^k}{\sum_i F_i^k} - \frac{P_i}{\sum_i P_i} \right) \quad (2)$$

¹³ The equation is based on Joseph, 1982, 444.

Were in this study, CL_k = coefficient of localization
for SCA units in Winnipeg

F_i = number of SCA units in FSU_i

P_i = number of elderly people in FSU_i

$\sum F_i$ = number of SCA units in Winnipeg

$\sum P_i$ = number of elderly people in
Winnipeg

The coefficient of localization (CL) ranges from 0 to 1. If the CL is equal to 0, the percentage distribution of SCA units is evenly spaced over the region in exact accordance with the base population (65+). The only numerical way this can occur is if the areal percentages for SCA units are exactly equal to the areal percentages for elderly population. As the CL approaches 1, SCA units become increasingly concentrated in one region (Barber, 1988:89). Joseph (1982) has noted the ambiguity associated with the upper bound of the coefficient of localization. He has shown that "the upper limit of the coefficient to be highly sensitive to the underlying distribution of population (Joseph and Hall, 1985: 152).¹⁴

¹⁴ See Appendix 4-2 for a discussion of the calculation of the coefficient of localization values.

4.3.5.1 COEFFICIENT OF LOCALIZATION: 1981 AND 1993

The CL values for the City of Winnipeg were 0.27 in 1981 and 0.30 in 1991. The increase in the CL value between 1981 and 1993 means that SCA units became more concentrated over the twelve year period in relation to the distribution of elderly people in that same period. In other words, the location of SCA units in the City became increasingly inequitable over the ten year period suggesting that there was a market lag in response to changing concentrations of elderly people in the City. Almost all of the growth in numbers of SCA units in the City was due to construction by the private sector (Table 2). The increase in CL value is thus due almost entirely to the choice of location for construction of new private sector SCAs.

4.4 ANALYSIS OF ORIGINS OF MOVES TO PUBLIC SCA PROJECTS IN WINNIPEG: 1993

This section will present the results of the analysis of origins of relocations to the eight sample public SCAs (Figs. 19-26). First, the overall pattern of origins for all eight projects will be presented. This will be followed by a summary of origins within the four zones of the city (two central area and two suburban). Finally, the origins are classified into the entire central area and entire suburbs.

4.4.1 OVERALL PATTERNS OF ORIGINS OF MOVES TO PUBLIC SCA PROJECTS

The most striking result of the relocation analysis is that, for seven of the eight projects, the highest number of origins of moves into the public SCA projects were registered for the FSU in which the project was located (Appendix 5-1 & 5-2, and Figs. 19-26). The exception was the Country Club Boulevard project (Fig. 26) located in the outer suburbs of St. James-Assiniboia. Only 8.54% of the tenants of this project in 1993 were previously domiciled in the local FSU. However, 28.01% were previously living in the adjacent FSU, (R2J) which had a much higher congregation of elderly people than the local FSU (5,762 and 1,828 respectively). In addition, the Country Club project is also located fairly close to the boundary of R3J.

The second spatial pattern revealed was that, for all the projects but one (the Country Club Boulevard project), the FSU registering the second highest number of tenants was adjacent to the local FSU. Interestingly, in two of these cases, the Osborne Street project in Ft. Rouge and the Chesterfield project in St. Vital, the adjacent FSUs were across the river from the projects. Also of interest is the fact that the FSU registering the second highest number of origins of tenants for the Country Club Boulevard project, was a Downtown FSU

Figs. 19-22: Origins of Moves to Central Area Projects

Fig. 19: Origins of Moves to 375 Assiniboine Ave (R3C), 1993

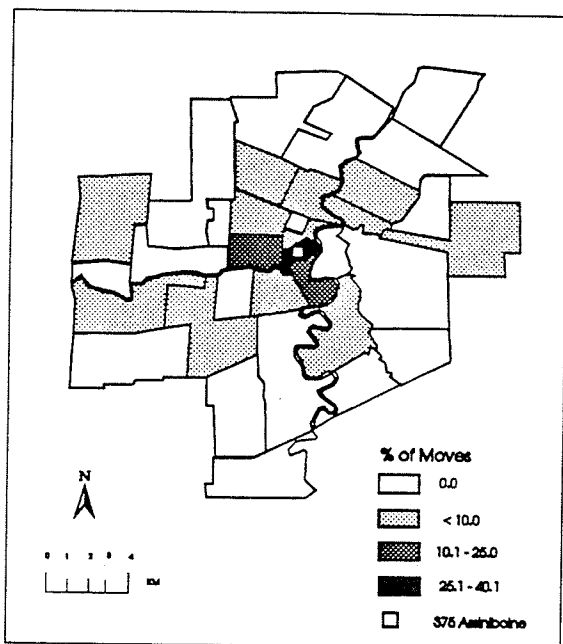


Fig. 20: Origins of Moves to 355 Kennedy Ave (R3B), 1993

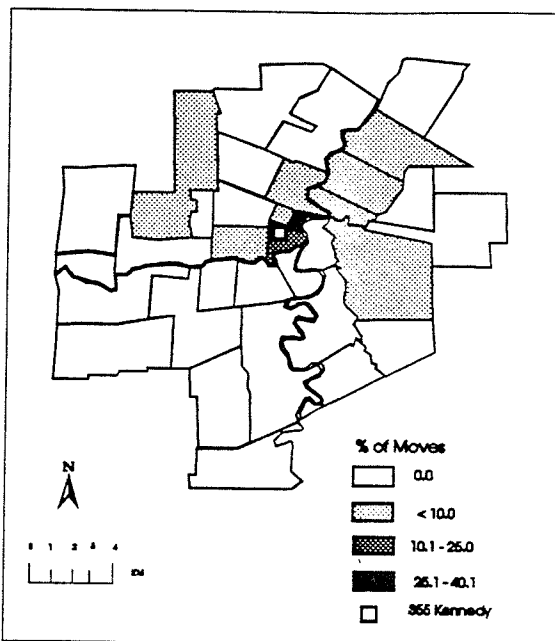


Fig. 21: Origins of Moves to 515 Elgin Ave (R3A), 1993

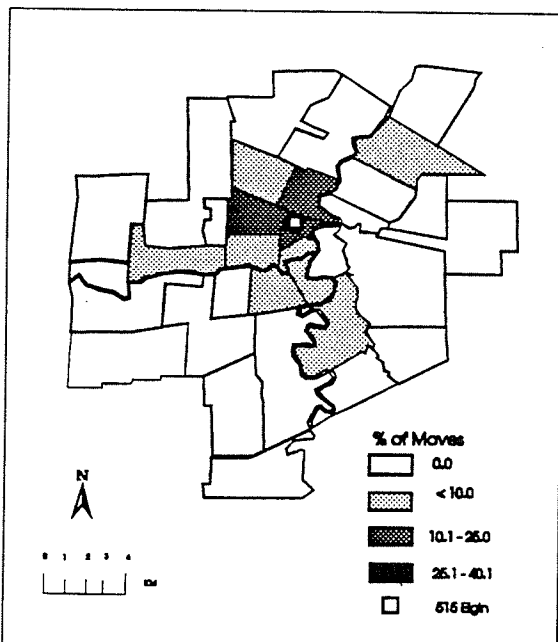
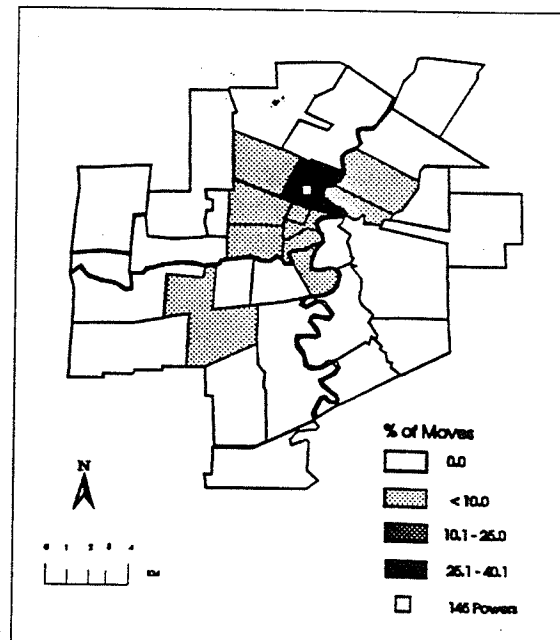


Fig. 22: Origins of Moves to 145 Powers Ave (R2W), 1993



Figs. 23-26: Origins of Moves to Suburban Projects

Fig. 23: Origins of Moves to 601 Osborne (R3L), 1993

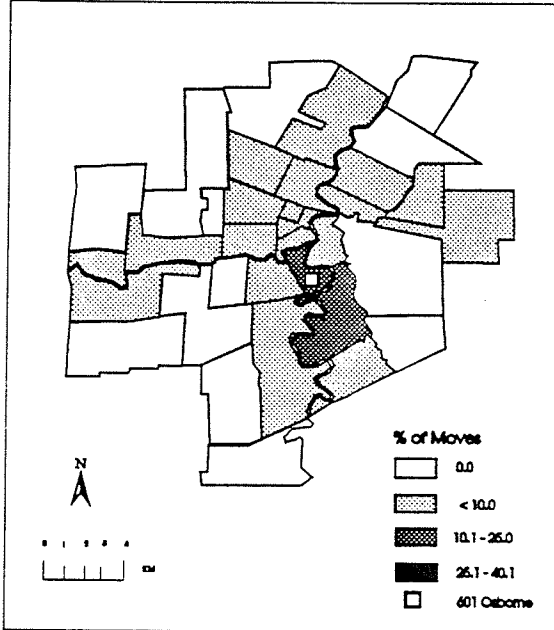


Fig. 24: Origins of Moves to 53 Stadacona (R2L), 1993

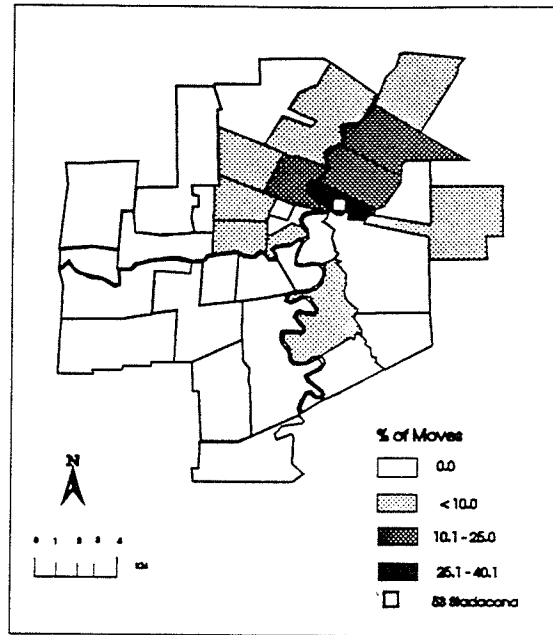


Fig. 25: Origins of Moves to 60 Chesterfield Ave. (R2M), 1993

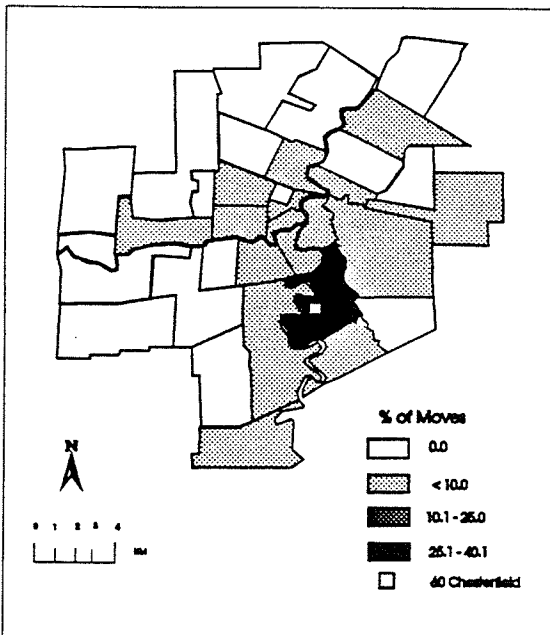
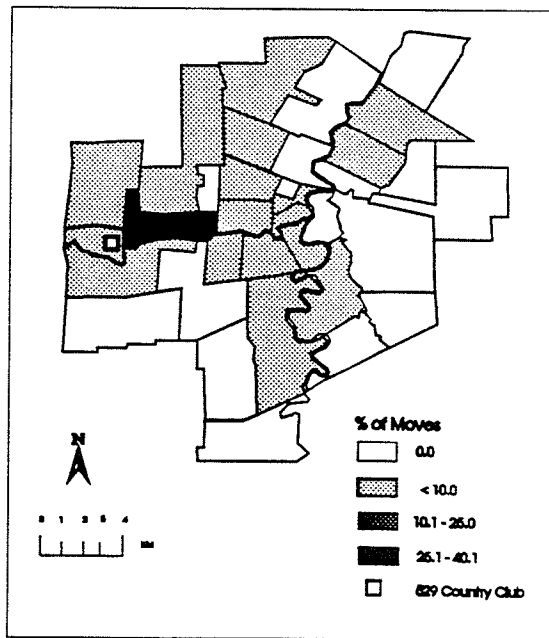


Fig. 26: Origins of Moves to 529 Country Club Blvd. (R3K), 1993



(R3C) but this FSU only registered a value below 10% (Fig. 26). This FSU was the only inner city FSU to exhibit a net increase in elderly people.

A small percentage of origins of moves were from out-of-town area and most of these (26 out of 29) were from within the Province of Manitoba. In all, three of the central area projects and three of the suburban projects had tenants who previously lived outside the city. Overall, the two outer suburban (public) projects, Chesterfield in St. Vital (Fig 25) and Country Club in St. James-Assiniboia (Fig. 26), had the highest percentages of out-of-town residents (8.97% and 9.76% respectively). This is likely the result of the location of these two projects on the periphery of the City. In the other areas, out-of-town residents constituted between 4.48% and 5.75% of the resident population.

4.4.2 ZONAL ANALYSIS OF ORIGINS OF MOVES TO PUBLIC SCA PROJECTS: 1993

When the City is divided into two zones, central area and suburban (Tables 9 and 10), the results disclose that 79.40% of the residents of central area projects originated from central area neighbourhoods and 77.05% of the residents of suburban projects originated from suburban neighbourhoods.

An examination of origins of moves into the eight projects by the four city zones (Tables 11-14) reveals that, in general, the highest percent of tenants relocated from dwellings in the same zone of the city. This "distance bias effect" was particularly pronounced for the two inner city projects, 515 Elgin and 145 Powers (Table 12), and the two outer suburban projects, 60 Chesterfield and 529 Country Club (Table 14). Only the inner suburban projects had the highest percent of current tenants originating from a different zone (42.1% from outer suburban FSUs).

Table 9: PERCENTAGES OF MOVES TO CENTRAL AREA PROJECTS ORIGINATING FROM THE CENTRAL AREA AND SUBURBS

Zone of Origin	Downtown Projects		Inner City Projects	
	375 Assiniboine	355 Kennedy	515 Elgin	145 Powers
CENTRAL AREA	65.12	82.05	84.32	85.94
SUBURBS	34.88	17.95	15.68	14.06

Table 10: PERCENTAGES OF MOVES TO SUBURBAN PROJECTS ORIGINATING FROM THE CENTRAL AREA AND SUBURBS

Zone of Origin	Inner Suburban Projects		Outer Suburban Projects	
	601 Osborne	53 Stadacona	60 Chesterfield	529 Country Club
CENTRAL AREA	28.05	24	14.09	25.68
SUBURBS	71.95	76	85.91	74.32

Table 11: NUMBERS OF MOVES TO DOWNTOWN SCA PROJECTS ORIGINATING FROM FOUR CITY ZONES (percentages in brackets)

Zone of Origin	275 Assiniboine	355 Kennedy	Total Downtown
DOWNTOWN	18(41.9)	21(53.9)	39(47.6)
CENTRAL AREA	10(23.3)	11(28.2)	21(25.6)
INNER SUBURB	8(18.6)	1(2.6)	9(10.9)
OUTER SUBURB	7(16.3)	6(15.4)	13(15.9)
TOTAL MOVES	43(100.0)	394(100.0)	82(100.0)

Table 12: NUMBERS OF MOVES TO INNER CITY SCA PROJECTS ORIGINATING FROM FOUR CITY ZONES (percentages in brackets)

Zone of Origin	515 Elgin	145 Powers	Total Inner City
Downtown	9(17.6)	4(6.3)	13(11.3)
Central Area	34(66.7)	51(79.7)	85(73.9)
Inner Suburb	5(9.8)	6(9.4)	11(9.6)
Outer Suburb	3(5.9)	3(4.7)	6(5.2)
Total Moves	51(100.0)	209(100.0)	115(100.0)

Table 13: NUMBERS OF MOVES TO INNER SUBURBAN SCA PROJECTS BY FOUR CITY ZONES (percentages in brackets)

Zone of Origin	601 Osborne	53 Stadacona	Total Inner Suburb
DOWNTOWN	11(13.4)	1(4.0)	12(11.2)
INNER CITY	12(14.6)	5(20.0)	17(15.9)
INNER SUBURB	24(29.3)	9(36.0)	33(30.8)
OUTER SUBURB	35(42.7)	10(40.0)	45(42.1)
TOTAL MOVES	82(100.0)	25(100.0)	107(100.0)

Table 14: NUMBERS OF MOVES TO OUTER SUBURBAN SCA PROJECTS BY FOUR CITY ZONES (percentages in brackets)

Zone of Origin	60 Chester- field	529 Country Club	Total Outer Suburb
Downtown	2(2.82)	13(17.6)	15(10.4)
Central Area	8(11.3)	6(8.1)	14(9.7)
Inner Suburb	12(16.9)	8(10.8)	20(13.8)
Outer Suburb	49(69.0)	47(63.5)	96(66.2)
Total Moves	71(100.0)	74(100.0)	145(100.0)

4.5. NEIGHBOURHOOD (MICRO LEVEL) ANALYSIS

This section presents the results of the neighbourhood level analysis for the eight public and eight private sample projects. The physical characteristics of the project neighbourhoods will be presented first. This will include a description of the 'area designation' of each neighbourhood based on the Department of Environmental Planning Area Designation (Winnipeg [CITY], 1978 and 1992), and an analysis of the percent of private dwellings in need of major repair in each project neighbourhood (Statistics Canada Neighbourhoods Census data [1991], no date). Data on the age profile of the project neighbourhoods will then be presented,

followed by the results of the field research on the local service environment of the projects.

4.5.1 NEIGHBOURHOOD AREA DESIGNATION

The neighbourhood classification system was developed by the Department of Environmental Planning (Winnipeg [City], 1978). With this system, the process of urban development is used as the basis for grouping areas. Areas of the City are designated as falling into three developmental stages: (i) growth, (ii) stability, and (iii) decline. The boundaries of these areas are defined on the basis of physical criteria such as major transportation routes, land-use change, and changing condition of buildings. Data indicating the physical condition and population trends are collected for each area. In general, all areas of a city inevitably pass through these three stages with initial growth occurring in response to growth of the city as a whole. Although growth of the city may continue, the area or neighbourhood then experiences a period of stability where growth levels off and a high degree of self sufficiency is evident in the resident population. The natural conclusion of the cycle is a period of decline where the physical neighbourhood becomes obsolete, either because it naturally wears out or because demands of the resident population change (Winnipeg [City], 1978).

4.5.2 AREA DESIGNATION AND CONDITION OF PRIVATE DWELLINGS IN PROJECT NEIGHBOURHOODS

The sixteen projects, eight public and eight private, are located in different zones of the City (Table 15 & Fig. 3). Three are located in the downtown area, three in the inner city, four in the inner suburbs and six in the outer suburbs. Two downtown project neighbourhoods are not classified in the area designation system because they are located in areas that are primarily commercial. While 10 of the remaining 14 project neighbourhoods are classified as areas of stability, two are classified as areas of decline (both public projects located in the inner city and inner suburb respectively), and two as areas of growth (both private projects located in the outer suburbs). These four neighbourhoods may not be ideal for the location of SCA projects. Neighbourhoods in decline are areas where the major proportion of the housing stock requires rehabilitation and where existing municipal services are in poor condition. On the other hand, growth neighbourhoods are areas where there may not yet be well established neighbourhood services such as bus services, community clubs and retail outlets.

The older downtown, inner city, and inner suburban neighbourhoods display the highest percent of private

dwellings in need of major repair. The six project neighbourhoods (3 private and 3 public) with more than 8.4% (the City average) of their private dwellings in need of major repair include the two areas in decline (William Whyte and Chalmers). Not surprisingly, all of the newer outer suburban neighbourhoods have less than 8.4% of their dwellings in need of major repairs.

Results of the analysis reveal, therefore, that while there was some sectoral bias (public vs private) in the developmental stage of project neighbourhoods, there was no such bias when the condition of private dwellings in project neighbourhoods was examined. In addition, there was a definite spatial bias in the condition of the dwellings, due to the different ages of neighbourhoods in concentric zones of the City located around the central business district.

Table 15: PHYSICAL CHARACTERISTICS OF PROJECT NEIGHBOURHOODS

Project/Zone (p=public; pr=private ¹⁵)	Neighbour- hood Area	Area Designation Life Cycle Stage	% of Occupied Private Dwellings Requiring Major Repairs
<u>DOWNTOWN</u>			
Assiniboine (p)	Broadway Assiniboine	commercial	5.1
Kennedy (p)	North Portage	commercial	3.9
Sherbrook (pr)	St. Matthews	stability	16.6
<u>INNER CITY</u>			
Elgin (p)	Centennial	stability	7.9
Powers (p)	William Whyte	decline	16.4
Evanson (pr)	Wolseley	stability	16.5
<u>INNER SUBURBS</u>			
Stadacona (p)	Chalmers	decline	12.7
Osborne (p)	Lord Roberts	stability	16.8
Boulton Bay (pr)	Mathers	stability	2.6
Wilton (pr)	Rockwood	stability	9.6
<u>OUTER SUBURBS</u>			
Country Club (p)	Kirkfield	stability	3.6
Chesterfield (p)	Worthington	stability	7.4
Henderson (pr)	Rossmere A	stability	6.5
Leila (pr)	Templeton- Sinclair	growth	1.9
Pembina (pr)	Ft. Richmond	stability	3.8
Dakota (pr)	Dakota Crossing	growth	3.5
WINNIPEG			8.4

¹⁵ See also Fig. 3.

4.5.3 AGE STRUCTURE OF RESIDENTS OF PROJECT NEIGHBOURHOOD

This section examines the age structure of the residents of neighbourhoods in which the projects are located. Two measures of age concentration are used:

- i) Percentage of the population in the neighbourhood that are 65 years or over;
- ii) Life cycle index of the neighbourhood.

The City of Winnipeg had 13.2% of its population that were sixty-five years and older in 1991. Thirteen of the sixteen project neighbourhoods had a value higher than the average for the City (Table 16). All of the public projects were located in neighbourhoods with higher than average age 65+ populations while only 5 of the 8 private projects were so located (Table. 16). Four project neighbourhoods (2 public and 2 private) had over 20% of the population aged sixty-five and over. These four projects were found in all of the city zones but one, the inner city zone. Conversely, three of the private projects were located in neighbourhoods with less than 10 percent of their population sixty-five and over (Table 17).

Table 16: SUMMARY OF AGE STRUCTURES OF NEIGHBOURHOOD POPULATION: PUBLIC V PRIVATE

Sector	Number of Project Neighbourhoods with % of Age 65+ Population > than City Average	Number of Project Neighbourhoods with > 20% of Population that is age 65+	Number of Project Neighbourhoods with Life Cycle Index > City Average
Public (n=8)	8	2	3
Private (n=8)	5	2	3

The second measure of neighbourhood population age is the life cycle index. The concept of the life cycle of a neighbourhood is based on the premise that a person's age is the best indicator of his stage in the life cycle. This index is the ratio of middle-aged and old population to the child population (equation 3). Higher index values indicate that the neighbourhood, in general, has an older population who are more advanced along in the life cycle stages (Hill, 1976:207-208).

$$\text{Life cycle Index} = \frac{\text{population} \geq 45 \text{ YEARS}}{\text{population under 15 YEARS}} \quad (3)$$

An examination of the life cycle indices for the project neighbourhoods reveals that nine of the sixteen project

Table 17: AGE STRUCTURE OF PROJECT NEIGHBOURHOOD: ZONAL ANALYSIS

Area	Project (p=public; pr=private) ¹⁶	Percentage of Population 65+	Life Cycle Index
<u>DOWNTOWN</u>			
Broadway -Assiniboine	Assiniboine (p)	13.6	5
North Portage	Kennedy (p)	26.1	3.1
St. Matthews	Sherbrook (pr)	14.1	1.3
<u>INNER CITY</u>			
Centennial	Elgin (p)	14.1	1.2
William Whyte	Powers (p)	12.8	1.1
Wolseley	Evanston (pr)	9.6	1.3
<u>INNER SUBURBS</u>			
Chalmers	Stadacona (p)	12.7	1.3
Lord Roberts	Osborne (p)	13.1	1.5
Mathers	Boulton Bay (pr)	20.7	3.9
Rockwood	Wilton (pr)	29.9	3.9
<u>OUTER SUBURBS</u>			
Kirkfield	Country Club (p)	23.3	4.1
Worthington	Chesterfield (p)	12.4	1.4
Rossmere A	Henderson (pr)	16.6	2
Templeton- Sinclair	Leila (pr)	13.4	1.6
Ft. Richmond	Pembina (pr)	6.6	1.5
Dakota Crossing	Dakota (pr)	9.5	1
WINNIPEG		13.2	1.6

¹⁶ See also Fig. 3.

neighbourhoods (56.3%) had life cycle indices that were less than the City average of 1.6, indicating a fairly young population profile (Table 17). Life cycle index values that were higher than the City average were found in neighbourhoods in all zones but the inner city. In addition, these "higher-than-average" values were equally distributed between neighbourhoods in which public and private projects were located (Tables 16 & 17).

Overall, the projects were not always located in neighbourhoods with a high percent of elderly people and, with the exception of the projects located in the inner city, there was no clear zonal or sectoral bias associated with projects in age concentrated neighbourhoods. Although the inner city neighbourhoods are older in terms of physical age of the area, young resident age profiles are registered. This seemingly anomaly can be explained by the presence of large numbers of families in the child bearing stage of the Life Cycle (e.g. native and immigrant families).

4.5.4 ANALYSIS OF THE SERVICE ENVIRONMENTS OF THE SAMPLE PROJECTS

This section presents the results of the field research. The presence and number of selected services located within walking distance (0.4 km. or 0.25 ml. radius) of each project

was determined. The three types of service outlets investigated were:

- i) major chain grocery/supermarket
- ii) bank or credit union
- iii) pharmacy

In addition to counting the number of outlets per type in the walking environment around each project, a fourth variable is included which summarizes the range of services offered by each walking environment. This 'range of services index' indicates the presence of at least one outlet per service type. A walking environment with none of the three services has a value of zero for this variable, while a walking environment that had all three takes on a value of three.

In addition to counting the number of outlets per type in the walking environment around each project, a fourth variable is included which summarizes the range of services offered by each walking environment. This 'range of service index' indicates the presence of at least one outlet per service type. A walking environment with none of the three services has a value of zero for this variable, while a walking environment that has all three takes on a value of three.

In addition to the service outlet variables, information is recorded concerning the location of the nearest bus stop, the number and types of routes which are served by the stop, and the distance (in kilometres) of the bus stop from the nearest community and regional shopping centres. A regional shopping centre is defined as containing 31-100 outlets, while the community centre contains about 16-30 outlets (Smith, 1991),

An examination of the 'range of services index' (Table 18-20) discloses that only two projects, one public and one private, failed to have at least one of the three types of service outlets within walking distance, and that these projects were located in each of the inner suburban and outer suburban areas. Interestingly, seven of the sixteen projects (four public and three private) have a 'range of services index' of value of 3. Three of these projects are located in each of the inner and outer suburbs, while the remaining project is located in the downtown.

The percentages of potential outlets that are located in the walking environment of projects in each zone of the city (Table 19) reveals that the inner city has the poorest service environment for the selected outlet types, while the innersuburbs has the richest environment. In addition, there is no distinct sectoral bias (public v private) in the types

of service environments surrounding the projects.

Table 18: NUMBER OF PUBLIC AND PRIVATE PROJECTS WITH 0-3 SERVICE OUTLET TYPES

	No. Of Service Outlet Types				No Supermarket
	0	1	2	3	
PUBLIC (n=8)	1	2	1	4	4
PRIVATE (n=8)	1	2	2	3	5

Table 19: NUMBER OF PROJECTS IN EACH CITY ZONE WITH 0-3 SERVICE OUTLET TYPES

	No. of Service Outlet Types				Percent of Possible Outlets
	0	1	2	3	
Downtown	0	1	1	1	66.7
Inner City	0	1	2	0	55.6
Inner Suburb	1	0	0	3	75.0
Outer Suburb	1	2	0	3	61.1

The type of service outlet that is not present within the walking environment of the majority of senior projects (4 public and 5 private) is a grocery store or supermarket (Tables 18). In fact, none of the inner city projects, and only one of the three downtown projects, have a grocery or supermarket within walking distance. On the other hand, three of the inner suburban projects and three of the outer suburban projects are located within walking distance of a grocery

Table 20: NUMBER OF SERVICE OUTLETS WITHIN WALKING DISTANCE¹⁷
OF PROJECTS

Project/Zone (p=public; pr=private) ¹⁸	Super- market	Pharmacy	Bank	Total No. of Outlet Types
<u>DOWNTOWN</u>				
Assiniboine (p)	0	0	10	1
Kennedy (p)	1	7	13	3
Sherbrook (pr)	0	2	1	2
<u>INNER CITY</u>				
Elgin (p)	0	2	0	1
Powers (p)	0	2	4	2
Evanston (pr)	0	2	2	2
<u>INNER SUBURBS</u>				
Stadacona (p)	0	0	0	0
Osborne (p)	1	1	2	3
Boulton (pr)	2	1	2	3
Wilton (pr)	1	2	2	3
<u>OUTER SUBURBS</u>				
Country Club (p)	1	2	3	3
Chesterfield (p)	2	4	3	3
Henderson (pr)	0	0	5	1
Leila (pr)	0	1	0	1
Pembina (pr)	1	1	6	3
Dakota (pr)	0	0	0	0

¹⁷ Defined as 0.4 km. around the project.

¹⁸ See also Fig. 3.

store or supermarket. The relative lack of major chain groceries or supermarkets in the downtown area in Winnipeg has already been noted by Smith (1991). He attributes this to the fact that "Winnipeg's downtown area is broadly representative of the central cores of many North American cities with limited food shopping facilities..."(Smith, 1991: 96). The results of this study show that inner city neighbourhoods ringing the Downtown area are similarly lacking in access to grocery stores or supermarkets.

Although there was an overall lack of access to supermarkets in neighbourhoods in all areas of the City, the impact in the inner city is potentially more serious than in other zones. While chain supermarkets or groceries are lacking in two of the three downtown project neighbourhoods, two of the major department stores, Eaton's and the Bay, have groceries located in their basements. In addition, there is a small grocery outlet located south of Portage Avenue.

Some of the outer suburban projects, and one of the inner suburban projects (Stadacona), also lacked a neighbourhood supermarket. An examination of these projects showed that each of them, with the exception of Stadacona, had large parking lots with many of the stalls filled - an indication that many of the residents owned vehicles. For

these residents, access to supermarkets may not be a major problem. Indeed, previous research (Smith, 1991; Sherman and Brittan, 1973) has revealed that suburban elderly were more likely to drive to the grocery stores than central area elderly. In addition, the gradual densification of the outer suburbs will likely result in an increase in more retail and service facilities in the future.

Each of the other two types of service outlets (i.e. pharmacies and banks) is more frequently located within walking distance of the projects. Specifically, 75% of all the projects are located within walking distance of at least one bank, while a similar percent are within walking distance of at least one pharmacy. However, while all of the projects in the inner city are located within walking distance of a pharmacy, each of the other three areas has at least one project that is not within walking distance of this outlet type.

Not surprisingly, the downtown projects are all located within walking distance of at least one bank or credit union. In fact, two of the downtown projects respectively register ten and thirteen proximate banking outlets. In contrast, each of the other three areas has at least one project that is not within walking distance of a bank or credit union.

Overall, there is considerable variation in the number and types of service outlets available within walking distance of the projects. While there is no consistent pattern to the level of service provision in the four zones of the City, the inner city and downtown are singularly lacking in grocery stores or supermarkets.

While the projects vary in the number and types of service outlets available locally, they all have at least one bus stop within a reasonable walking distance (Table 21). All but one of the projects are located within one block of a bus stop and all but one of the bus route types are either crosstown or downtown. These types of routes run through the downtown, or to the downtown, respectively, and normally provide frequent service and good access to downtown facilities. The only project located on a feeder route is Boulton Bay (private), in the inner suburbs.

It is noteworthy that all but one of the projects are located on a direct bus route to a community or regional shopping centre. The inner suburban Boulton Bay project is again the exception. The feeder route that services this area operates only during the peak times i.e. towards Portage Avenue in the morning and the suburbs in the afternoon. Residents of the Boulton Bay project would, therefore, have to walk 10 minutes to the nearest intersection that has a stop

serviced by downtown buses operating at frequent intervals.

There is a substantial variation in the distances between each of the projects and the nearest regional or community shopping centre. The definition of maximum walking distance for a trip to or from a shopping centre is extended to 0.8 km. because it is possible for anyone using these centres to sit and rest before undertaking the return trip home. This opportunity to sit and rest is not usually possible while undertaking the three previously discussed trip types. Using this definition of maximum comfortable walking distance, all of the downtown projects are located within walking distance of a shopping centre (in this case, the downtown shopping area). Other projects located within walking distance of a shopping centre are (i) the Wilton project in the inner suburbs located opposite a community centre; (ii) the Chesterfield project, in the outer suburbs, located opposite a regional centre; and (iii) the Pembina Highway project in the outer suburbs located about a block from a community centre.

For those projects that are outside a reasonable walking distance for the elderly (0.8 km.), the time of travel to the nearest regional/community shopping centre by Winnipeg Transit is calculated (Table 21). In this context, nearest shopping centre is determined to be the closest centre on a direct bus

Table 21: BUS ROUTES AND DISTANCES TO SHOPPING CENTRES (travel time in minutes to shopping centres in brackets)

Project/ Zone (p= public; pr=private)	No. of Blocks to Bus Stop	Bus Stop Type 1= Feeder; 2=DT/CT	Kms. to Community Centre ¹⁹	Kms. to Regional Centre	Shopp- ing Centre on Bus Route
<u>DOWNTOWN</u>					
Assiniboine (p)	1-2	2	0.70	0.70	yes
Kennedy (p)	<1	2	0.20	0.20	yes
Sherbrook (pr)	<1	2	0.80	0.80	yes
<u>INNER CITY</u>					
Elgin (p)	<1	2	1.50(10)	1.50(10)	yes
Powers (p)	<1	2	4.00(15)	4.00(15)	yes
Evanston (pr)	<1	2	2.00(10)	2.00(12)	yes
<u>INNER SUBURBS</u>					
Stadacona(p)	<1	2	3.50(15)	3.50(15)	yes
Osborne (p)	<1	2	2.00(10)	3.50(15)	yes
Boulton (p)	<1	1	3.30(15)	3.30(15)	no
Wilton (pr)	<1	2	0.10	5.00(18)	yes
<u>OUTER SUBURBS</u>					
Country Club (p)	<1	2	1.00(3)	2.25(7)	yes
Chesterfield (p)	<1	2	0.30	0.30	yes
Henderson (pr)	<1	2	0.90(10)	5.50(15)	yes
Leila (pr)	<1	2	1.25(5)	1.25(5)	yes
Pembina (pr)	<1	2	0.20	11.75(30)	yes
Dakota (pr)	<1	2	1.75(5)	1.75(5)	yes

¹⁹ Where the larger regional shopping centre is closer than the nearest community centre, the distance to the regional centre is given in this column.

route (no transfers). Some shopping centres are closer in terms of kilometre distances but would require project residents to take two buses to gain access to them. The travel times by Winnipeg Transit to nearest community shopping centre range from 3 minutes for one project in the outer suburbs (Country Club) to 15 minutes for Powers (inner city), and Stadacona and Boulton Bay (inner suburbs). While travel times to the nearest regional shopping centre range from 5 minutes for two outer suburban projects (Leila and Dakota) to 30 minutes for one outer suburban project (Pembina).

To summarize, each of the three downtown projects is located within walking distance of the downtown shopping area, while twelve of the remaining thirteen projects are located on a direct downtown/crosstown bus route that operates to a shopping centre. Residents from these projects are able to take a direct bus to a shopping centre from a bus stop located less than one block from their project. The other project (a private project) is on a feeder route that has only rush hour service.

4.6 SUMMARY AND CONCLUSION

The results of the analysis at the macro (city) and micro (neighbourhood) scales are presented in this chapter. The first part of this chapter presents the results of the

macro analysis of the congregation and concentration of elderly people in Winnipeg in each of 1981 and 1993. Next, the congregation of SCA units in the City for these years is presented. This is followed by a discussion of the structural composition of the SCA market in the City, and the relative concentration of SCA units in Winnipeg for 1981 and 1993. The last section of part one discusses the origins of moves to (public) SCA projects.

The second part of the chapter includes the neighbourhood analysis of sample public and private SCA projects in Winnipeg in 1993. First, data concerning the physical condition and age of project neighbourhoods are presented. This is followed by a discussion of the age structure of residents of the project neighbourhoods. Finally, the results of the field research are presented. This includes analysis of the service environment around the sample projects.

Three methods of analyzing the data are used in this thesis: (i) image differencing, a type of time series analysis, (ii) use of the location quotient, and (iii) use of the coefficient of localization.

The results disclose that in 1981 the elderly were concentrated in the older neighbourhoods of (i) the inner city, and (ii) the inner suburbs that bordered the Red and

Assiniboine Rivers. The spatial pattern was broadly similar in 1991, except that there was a decrease in elderly congregation and concentration in central area FSUs and an increase in elderly congregation and concentration in some suburban FSUs, especially those bordering the Red River.

The analysis of the unit share of each sector of the SCA market in 1981 disclosed that 53% of senior citizen apartment units were provided by the public sector in 1981. However, by 1993, 60% were provided by the private sector. In 1981, SCA units were congregated in the downtown and older inner city neighbourhoods. By 1991, there was an increase in number of SCA units in the outer suburban areas due almost entirely to private sector construction of SCA projects between 1981 and 1993. Analysis of the location of public and private SCA units reveals that, in both years, public SCA units tended to be located in the central area, while private units were concentrated in the suburban areas.

Location quotients were computed to analyse the relative concentration of SCA units in the City in 1981 and 1993, while coefficient of localization values were calculated to measure the overall spatial concentration of SCA units relative to regional distribution of elderly population. Results disclose that the downtown area tended to have an overrepresentation of SCA units in 1981, while SCA units were generally

underrepresented in suburban areas. Over the period 1981-93, with a few exceptions, the outer suburbs experienced a further decline in their share of SCA units. The CL value for the city increased between 1981 and 1993, showing that, in relation to elderly people, SCA units had become more concentrated.

Analysis of origins of moves to public SCA projects reveals that in 7 of the 8 projects, the highest number of moves was from the local FSU, and the next highest number of origins was from adjacent FSUs. Out-of-town origins of moves to public SCAs constituted a small percent of all origins, with the highest number of out-of-town origins of moves terminating in outer suburban projects.

The analysis of neighbourhood environments around the projects showed that there was considerable variety in physical condition and service environments of project neighbourhoods and that these differences were not usually associated with any zonal or sectoral bias. The one exception to this was the inner city neighbourhoods. These neighbourhoods had the highest percentage of private dwellings in need of major repairs and all of the inner city project neighbourhoods had life cycle indices that were lower than the City average. Furthermore, the service environment analysis revealed that the inner city projects were located in neighbourhoods with the lowest number of possible outlet

types. The service outlet missing most often was a grocery or supermarket. On the other hand, there was almost universally good access to transportation by bus and to shopping centres on the bus routes.

CHAPTER 5

SUMMARY AND CONCLUSIONS

5.0 INTRODUCTION

The main objective of this thesis is to analyze the distribution of senior citizen apartment (SCA) units at both the macro (city) and micro (neighbourhood) scales. The study area is the City of Winnipeg. Research questions are formulated and addressed concerning: (1) the structural compositions of Winnipeg's SCA market in 1981 and 1993; (2) change in the spatial concentration of all categories of SCA units in Winnipeg in 1981 and 1993; (3) the origins of moves to public SCA projects in Winnipeg; and (4) the local neighbourhood characteristics of sample projects located in different areas of the city.

The objectives and related research questions are outlined in Chapter 1. This is followed by a discussion of the field of gerontological geography. The first chapter concludes with an outline of the contribution of the present study to gerontological geography. Chapter 2 presents a review of the relevant literature, and also indicates the place of the present study within the discipline of geography. Chapter 3 introduces the study area, formulates the four research questions, and outlines the data sources and data

collection methods. Finally, the tools used in the analysis of data are presented. Chapter 4 offers a descriptive analysis of the research questions. The purpose of the present chapter is (i) to summarize the findings of the study; (ii) to offer suggestions for future research; and (iii) to propose recommendations concerning the siting of senior citizen apartment projects.

5.1 RESEARCH DESIGN

Data were obtained from a variety of sources: (i) population data (by FSUs) from the Manitoba Department of Health (1981, 1991); (ii) listings of public and private SCAs in Winnipeg from the Manitoba Housing Authority (1992) and the Age and Opportunity Centre (1980, 1993) ; (iii) previous postal code addresses of current tenants of public SCAs from the form entitled "Manitoba Housing and Renewal Corporation Application for Family Housing"; (iv) neighbourhood census data from Statistics Canada (1991 Census Data); and (v) service environment data from a field survey.

All SCA housing categories were included in the analysis: two public categories (non-sponsored and sponsored), and four private categories (non-profit, co-operative, private-for-profit, and lifelease). For the purpose of analysis, the City was divided into four zones, two central area zones (downtown

and inner city), and two suburban zones (inner suburbs and outer suburbs).

Three methods of data analysis were used (image differencing and the use of location quotients and coefficient of localization), The analysis was conducted in order to answer four research questions. These questions were based on the research objectives outlined in Chapter 1 and at the introduction of this chapter. The research questions are presented in the following section along with the results of the analysis.

5.2 RESEARCH FINDINGS

This section first discusses the results of the structural analysis of the SCA market in relation to Research Question 1. Following this, the results of the image differencing and location quotient analyses are discussed in relation to Research Question 2. The results of the origins of moves analysis are next presented in relation to Research Question 3. Finally, the results of the neighbourhood analysis are presented in relation to Research Question 4.

5.2.1 STRUCTURAL COMPOSITION OF SCA MARKET: 1981, 1993

Research question 1 states " Has there been a change in the structural composition of the SCA market between 1981 and 1993 and has this change resulted in changes in the locational concentration of different types of SCA projects?" In response to this question, the analysis of the unit share of each sector of the SCA market discloses that the majority of SCA units (53%) were provided by the public sector in 1981. However, in 1993, the private sector accounted for no less than 60% of the units. This reflects the fact that there was virtually no change in the number of public units provided between 1981 and 1993, while there was a substantial increase in absolute numbers of private units (especially private-for-profit) during the twelve year period.

Analysis of the locational congregation of the public and private SCA projects revealed that, in 1981, 72% of the projects in the central area were public while 35% of projects in the suburbs were private. By 1993, however, public SCA projects became less concentrated in the central area, while private SCA projects became more concentrated in the suburbs. These changes in concentration of public and private projects in both the central area and the suburbs were due to the construction of private projects in both of these areas. One result of this process was the lessening of spatial cleavage

between public and private projects in the central area and an increase of spatial cleavage in the suburbs (Tables 7 & 8).

Certain aspects of these results broadly parallel the findings of studies in the context of institutional care resources conducted in Britain (Phillips and Vincent, 1986; Hamnett and Mullings, 1992a). The trend toward the increase in private provision of residential care homes for the elderly has been documented at the regional scale by Phillips and Vincent (1986) and at the national scale by Hamnett and Mullings (1992a). Hamnett and Mullings (1992a) also indicate that, while private provision of elderly residential care resources continued to increase between 1978 and 1988, there was not an "intensification of a spatial cleavage between private and public care" but, rather, that there was "a trend towards the spatial equalization of independent residential care provision" (Hamnett and Mullings, 1992a:140). However, it should be noted that Hamnett and Mullings' findings were based on a national scale of analysis.

5.2.2 SPATIAL DISTRIBUTION OF SCA UNITS IN WINNIPEG: 1981, 1993

Research Question 2 states "Is the distribution of SCA units in the city in each of 1981 and 1993 related to the distribution of elderly in the city?" In response to this

question, the results disclose that in 1981, the elderly were congregated in the older neighbourhoods of the inner city and inner suburbs that bordered the Red and Assiniboine Rivers. The situation was similar in 1991 except for an increased number of elderly people living in the outlying suburbs and a decreased number of elderly people living in the inner city (Fig.8). In 1981, SCA units were congregated in the downtown and older inner city neighbourhoods. In 1993, there was an increased congregation of SCA units in the northern and southern outer suburban areas bounding the Red River (Figs. 10-11). A breakdown of SCA units into public and private units showed that, in both years, public SCA units tended to be located in the inner city area, while private units were concentrated in the suburban areas (Figs.12-13).

Analysis of the LQ values discloses that, in 1981, there was a relative concentration of SCA units in the central area in 1981, while the suburban areas were generally characterised by an underrepresentation of SCA units (Fig.16). The pattern of relative concentration of SCA units was broadly the same in 1991 except that many suburban FSUs displayed lower relative concentrations of SCA units than they did in 1981. Those suburban areas that showed a decline in relative concentration of SCA units were areas with a fairly substantial increase in elderly population between 1981 and 1991, but very little increase in numbers of SCA units during that time.

An examination of LQ point change values between the two years (Fig.18) reveals much the same results. Some central city areas, despite having an overrepresentation of SCA values in 1981, had some of the largest increases in LQ values indicating a further concentration of SCA units in central city areas. Conversely, areas showing the largest negative changes in their LQ values were restricted to the outer suburban zone. The increase in the CL value for the city as a whole between 1981 and 1993 demonstrates this trend towards concentration of SCA units in relation to elderly people.

The above findings indicate that although there is an overrepresentation of SCA units in the downtown area, new units continue to be built there. This increase in SCA units in the downtown area was largely due to the construction of private SCA projects. These projects tend to offer more up-scale accommodation than existing public SCA projects and may be a response to the increasing numbers of middle to high income elderly people who may want to locate in the downtown area to take advantage of the shopping and entertainment opportunities available there. The findings also indicate that, although the number of suburban SCA projects increased in 1993 due mostly to private sector construction, this increase did not keep pace with the increase in number of elderly people aging-in-place in the suburbs.

These results are broadly consistent with studies by Mercer (1979) and Hodge (1987) which demonstrated that location of SCA projects are not always based on need but on various local and land interest, and the availability of cheap land (p.31). Studies carried out in Britain (Corden, 1992; Phillips and Vincent, 1986; Bochel, 1988), likewise revealed that the spatial distribution of specialized elderly housing did not correlate with the distribution of the target population. Bochel (1988:474) states that this results in "substantial inequalities in terms of choice of types of provision for the elderly population." Studies by Pinch (1980) and Bebbington and Davies (1982), however, reveal that residential provision by for the elderly is highly correlated with need (see pp. 34-35).

5.2.3 ORIGINS OF MOVES TO PUBLIC SCA PROJECTS

Research Question 3 states, "what are the origins of elderly movers into public SCA projects?" The analysis of moves into eight public SCA projects reveals that, in seven of the eight cases, the highest number of origins of moves were from the local FSU in which the project was located (Table 9 and Figs. 17-24). In addition, for all of the projects except one, the next largest number of origins of moves was from an adjacent FSU. Moreover, the majority of residents of central area projects were previously domiciled in central area FSUs,

while the majority of residents of suburban projects previously lived in suburban FSUs (Tables 15-16). The overall pattern remained much the same when the central/suburban zones were disaggregated into downtown/inner city, and inner suburban/outer suburban zones respectively. The only exception to this relates to projects located in the inner suburban zone. These projects drew more residents from the outer suburban areas than from the "origin zone"(Table 13).

These above results indicate that the highest percentages of elderly public SCA tenants typically moved from dwellings located in the same zone as the project. The exceptional tendency for the outer suburban elderly to locate in inner suburban projects may be partly due to the better local service environments compared to the outer suburbs. In Leung's (1992) study of the reasons that elderly people move, it was disclosed that "with declining health and income, shelter problems and shelter costs had become more serious and the need to gain access to services and to secure social support had become greater (Leung, 1992:28)." It is also likely that residents of inner suburban projects who moved from the outer suburbs may have moved at a time when there was a more limited choice of outer suburban projects compared to recent years.

These results are broadly consistent with Golant's (1979)

study of the intraurban migration patterns of elderly people in the United States. He found that "the majority of elderly persons, when they do move, relocate within their same central city, suburban, or nonmetropolitan place of residence (Golant, 1979:46)." However, Golant's results revealed that the central city elderly were far more likely to move to places in a different zone (i.e., the suburbs or nonmetropolitan areas). In contrast, the result of the present study reveals that outer suburban residents are more likely to move to residences in a different zone.

5.2.4 NEIGHBOURHOOD CHARACTERISTICS OF SAMPLE PUBLIC AND PRIVATE PROJECTS

Research Question 4 states "Are SCA projects located in neighbourhoods with similar physical, demographic and service environment characteristics? If not, is the observable pattern of physical, demographic and service environment characteristics related to (i) the area of the City where the project is located, and (ii) the type of housing (Public vs private)?" Results of the analysis of the physical characteristics of project neighbourhoods revealed that, while there was some sectoral bias (public vs private) in the developmental stage of project neighbourhoods, there was no such bias when the condition of private dwellings in project neighbourhoods was examined. In addition, there was a

definite zonal bias in these two characteristics due to the variation in the age of neighbourhoods in concentric rings of the city.

Analysis of the age profiles of residents of project neighbourhoods revealed that projects were not always located in neighbourhoods that had a high relative concentration of elderly people and, with the exception of the inner city projects, there was no clear zonal or sectoral bias associated with this variable. Although inner city neighbourhoods are, on the whole, fairly old in terms of physical age of the area, youthful life cycle profiles were registered in all three inner city neighbourhoods.

The results of the service environment analysis revealed, somewhat surprisingly, that there tends to be a poorer services environment around inner city projects than around downtown and suburban projects. The inner suburban project neighbourhoods displayed the richest service environments (Table 19). The service outlet missing in most of the poorer service environments was a major chain grocery or supermarket (Table 20). The relative lack of major chain supermarkets in the downtown area of Winnipeg has already been noted by Smith (1991). This thesis shows, in addition, that inner city neighbourhoods ringing the downtown are similarly lacking in access to supermarkets or groceries. Conversely,

there was almost universally good access to transportation by bus and, consequently, to shopping centres located along the bus routes (Table 21). Finally, there was no distinct sectoral bias (public vs private) in the types of service environments surrounding the projects (Table 18).

These results indicate that SCA projects are located in a variety of neighbourhoods, both in terms of physical, demographic and service environmental characteristics. However, on the whole, inner city neighbourhoods, (i.e. those surrounding the downtown commercial area), tend to have the poorest neighbourhood environments. Although there was an overall lack of access to major chain groceries/supermarkets in neighbourhoods in all areas of the city, the consequences of this situation in the inner city are potentially more serious than in downtown and suburban areas of the city. Although chain supermarkets or groceries, such as Safeway or IGA, were missing from all but one of the downtown project neighbourhoods, two of the major department stores, Eaton's and The Bay, had groceries located in their basements. Additionally, a small grocery outlet located immediately south of the main downtown shopping area carried a good selection of groceries at prices that were lower than those typically available in convenience stores.

Three of the six outer suburban project neighbourhoods

had no grocery store or supermarket. An examination of the areas surrounding these projects, however, showed that they all had large parking lots with many of the stalls filled - an indication that many of the residents owned their own vehicles. For these residents, access to a grocery or supermarket may not be a major problem. Indeed, Smith (1991), and Sherman and Brittan (1973) found that the vast majority of suburban elderly in their studies drove to purchase groceries.

Overall, one of the most deprived project neighbourhoods, Stadacona, is located in the inner city area. This public project warrants further discussion as it is obviously the result of poor planning. Not only is this project lacking in any of the basic three service outlet types that were examined in this study, but it is also located in a dismal area that almost lacks any redeeming features whatsoever. A lumber yard and railway lines are located across the road from the project and, with the exception of a small convenience store, there were are no services such as a hairdresser or coffee shop located nearby. Hodge's (1987) study of senior projects in Ontario small towns displayed similar results. He noted that the projects were not always situated close to community resources and that some of them were separated from the service rich town centres by imposing barriers such as highways and railways.

5.3 SUGGESTIONS FOR FUTURE RESEARCH

In this section, three suggestions for future research are offered. These suggestions are based on the results of the analyses conducted in this study.

Firstly, the analysis of equity of distribution of SCA units in the city needs to be carried out for different types of SCA units. In order for a wide variety of SCA options to be made available to the urban elderly, different types of public and private projects need to be located in 'high need' areas of the city. Hodge (1990) emphasises the fact that, "just because a person has reached retirement age does not mean that he/she stops wanting to exercise her/his preferences for housing..."(Hodge, 1990: 9). He quotes a senior who says:

There is no single type of housing or package of housing and services which fits all our circumstances. There should be choices available to us which reflect our diversity, even for those of us who must exist on low incomes (Hodge, 1990: 10).

Future research is needed, therefore, to calculate LQ and CL values for the different types of SCA units. For example, the locational concentration of income-gearred v market-gearred SCA units could be examined. Results of this type of analysis would reveal the relative spatial concentration of different

types of SCA projects in the City.

Secondly, the origins of residents of private SCA projects need to be examined. This study analyzed the origins of moves into public SCA projects only. The results of this analysis are not necessarily applicable to moves into private SCA projects due to variations in the resources of elderly movers. More specifically, public SCA projects are geared for low income elderly who may be more restricted in terms of finances and mobility. Hodge (1990) points out that "low income affects mobility and housing choices of the elderly..." (Hodge, 1990:8). Middle and higher income elderly are more likely to be able to afford private SCA projects that offer a variety of amenities. In other words, these more affluent elderly are more likely to "shop around" for accommodation that meets their needs because they have greater financial resources at their disposal. Wiseman and Virden (1977) found that there were indeed two significant patterns in intraurban moves of the elderly in Kansas City and that these spatial patterns were related to income levels of the elderly movers. An analysis of the origins of moves to some of the more up-scale private SCA projects may, therefore, reveal spatial patterns that differ from those of public SCA projects. For example, there may be less "distance bias".

Thirdly, an analysis of more subjective qualities of the

neighbourhoods surrounding SCA projects is needed. This study examined measurable aspects of the project neighbourhoods (physical and service environment characteristics). Other physical aspects that are not as easily measured, such as safety and the quality of the walking environment are very important to the people living in a neighbourhood (Lawton et al, 1978; Wilson, 1982) and need to be examined. In addition, a thorough examination of neighbourhood characteristics needs to include an identification of any unsuitable or noxious uses that would make the neighbourhood unpleasant or unsafe for the elderly. Lawton et al. (1978) found that, in general, quiet neighbourhoods in small or middle sized communities where the risk of crime was low were conducive to active and satisfying lives for older people. Similarly, Hodge (1990) notes that more than half of all Canadian seniors feel anxious about being assaulted while walking on the street or when using public transit, especially after dark. Finally, there needs to be an examination of the ways in which the neighbourhood is able to meet some of the higher needs of the elderly, such as the need for independence, recreation and socialising (Gonyea, et al., 1990). For example, Wilson (1982) found that the neighbourhood environment had an effect on activity levels of the elderly. He found that older people are stimulated to walk more if there are "places to go to", especially centres of human activity, and potential companionship.

5.4 POLICY RECOMMENDATIONS

On the basis of the results of this study, the following recommendations can be made which could produce a more geographically equitable provision of SCA projects in the city. Recommendations are also offered concerning the improvement of the neighbourhood environments of SCA projects.

The first recommendation is the formulation and implementation of policies that would ensure that any new SCA projects must be built in "high need areas", i.e. areas with moderate to severe underrepresentation of SCA units to a rapidly growing elderly population. Planners should also take care to ensure that a variety of housing options are available in these areas in order to give seniors the choice in residential accommodation that they desire (Hodge, 1990; Gonyea et al., 1990). Hodge (1990:11) notes that planners need to "link implementation measures to planning goals". He states that planners should find ways around dilemmas such as rigid zoning regulations in order to provide housing options that meet the need of a diverse and growing population of elderly who are spatially concentrated in different areas or regions. Results of this thesis revealed that SCA projects were not always located in neighbourhoods with high elderly concentrations. In addition, the analysis of relative concentration of SCA units disclosed that these units are not

always located in "high need" areas i.e. areas with large congregations of elderly people or rapidly growing elderly populations.

The second recommendation is that care should be taken when locating SCA projects in neighbourhoods as "inappropriate siting can result in social and personal pathologies (Howell, 1976:188)". "Declining" neighbourhoods or neighbourhoods with high proportions of dwellings in need of major repair could indicate a deteriorating neighbourhood where existing municipal services are in poor condition and neighbourhood services are inadequate. These areas may also be experiencing external intrusions by incompatible land-uses such as transportation routes that jeopardises neighbourhood stability (Winnipeg [City], 1978). Such neighbourhoods may, therefore, be unsuitable for the location of a SCA project. Findings from this study, however, reveal that some of the SCA projects (Sherbrook, Powers, Evanson, Stadacona and Osborne) were located in neighbourhoods that were classified as 'declining' and/or had over 16 percent of the private housing stock in need of major repairs.

In addition, care should be taken to ensure that all of the basic services are within walking distance of all SCA projects. The results of this thesis indicate that not all SCA projects are located in an adequate service environment

and that the service outlet type missing most often from the local area is a grocery or supermarket. Yet this is the service outlet type that many elderly people use frequently (Carp, 1971, Rollinson, 1990; Smith, 1991) Any plans for the construction of an SCA project should take into account existing service outlets within walking distance of the chosen site and plans for the construction of new local service outlets.

In summary, plans for the location of SCA projects should be comprehensive and include all currently available information as well as projections for future service developments and demographic changes. In addition, policy makers and planners should remember that the elderly in the future will probably be very different from the elderly of today in terms of personal resources and expectations. The built environment appropriate for today's elderly may be less desirable for the future aged. The increase in popularity of the lifelease concept for elderly housing (see pg. 92-93) is a probable example of such changing preferences. Any planning for the location of elderly housing should, therefore, take into consideration changing market characteristics.

APPENDIX 1: NUMBERS OF PERSONS AGE 65 AND OVER BY FSU: 1981,
1991, 1981-1991

FSU/Zone	1981	1991	1981-91
CENTRAL AREA			
R3A	663	501	-162
R3B	2208	2088	-120
R2W	5550	4731	-819
R3C	2729	3388	+659
R3E	2839	2785	-54
R3G	3970	3444	-526
SUBURBAN AREA			
R2X	2661	3380	+719
R2L	1894	2111	+217
R2H	3559	3384	-175
R3L	3681	3497	-184
R2K	3301	4584	+1283
R2V	3512	4940	+1428
R3T	2675	4008	+1333
R2M	4089	5430	+1341
R2P	762	1566	+804
R2R	378	914	+536
R2C	1741	2555	+814
R2G	2774	4339	+1565
R2Y	1056	1738	+682
R2J	1544	2377	+833
R3J	4725	5762	+1037
R3V	313	519	+206
R3M	4377	4605	+228
R3K	1069	1828	+759
R3R	1520	2238	+718
R3S	8	18	+10
R3N	2448	2671	+223
R2E	71	132	+1428
R2N	172	869	+697
R3W	20	49	+29
R3X	0	59	+59
R3P	755	1613	+858
R3Y	9	63	+54
R3H	9	14	+5

APPENDIX 2-1: NUMBERS OF SCA UNITS IN OWNERSHIP CATEGORIES BY FSU: 1981

FSU/Zone	Public (NS) ¹	Public (S) ²	Non Profit	Private for Profit	Life-Lease	Co-Op
CENTRAL AREA						
R3A	174	116	0	0	0	0
R3B	423	210	301	0	0	0
R2W	345	290	0	0	0	0
R3C	557	97	75	0	0	0
R3E	0	305	0	106	0	0
R3G	0	0	84	219	0	0
SUBURBAN Area						
R2X	100	0	0	104	0	0
R2L	0	0	0	153	0	0
R2H	210	299	0	195	0	0
R3L	326	146	139	175	0	0
R2K	0	125	55	0	0	0
R2V	0	131	0	274	0	0
R3T	0	123	97	171	0	0
R2M	107	0	90	237	0	0
R2P	0	0	0	0	0	0
R2R	0	0	0	0	0	0
R2C	0	85	0	26	0	0
R2G	0	150	0	935	0	104
R2Y	98	0	91	0	0	0
R2J	84	0	0	0	0	0
R3J	104	48	0	279	0	0
R3V	0	0	0	0	0	0
R3M	0	0	0	272	0	0
R3K	107	0	0	0	0	0
R3R	151	0	0	125	0	0
R3S	0	0	0	0	0	0
R3N	0	0	0	188	0	0
R2E	0	0	0	0	0	0
R2N	0	0	0	0	0	0
R3W	0	0	0	0	0	0
R3X	0	0	0	0	0	0
R3P	0	119	0	0	0	0
R3Y	0	0	0	0	0	0
R3H	0	0	0	0	0	0

¹ NS=Non-sponsored² S =Sponsored

APPENDIX 2-2: NUMBERS OF SCA UNITS IN OWNERSHIP CATEGORIES BY FSU: 1993

FSU/Zone	Public (NS ¹)	Public (S ²)	Non Profit	Private for Profit	Life-Lease	Co-Op
CENTRAL AREA						
R3A	174	116	0	0	0	0
R3B	423	210	301	139	252	62
R2W	345	369	0	0	0	0
R3C	557	97	362	0	0	0
R3E	0	305	0	180	0	75
R3G	0	0	84	219	0	0
SUBURBAN AREA						
R2X	0	0	0	104	110	0
R2L	64	0	0	153	0	70
R2H	210	299	147	293	0	0
R3L	326	146	154	191	0	0
R2K	0	125	108	0	0	0
R2V	0	131	0	339	0	0
R3T	0	123	97	171	0	0
R2M	107	0	218	846	0	0
R2P	0	0	0	0	0	0
R2R	0	0	0	0	0	0
R2C	0	85	0	86	57	0
R2G	0	150	68	1157	0	104
R2Y	98	0	91	0	0	0
R2J	84	0	0	0	0	0
R3J	104	48	0	279	0	0
R3V	0	0	0	0	0	0
R3M	0	0	0	316	0	49
R3K	107	0	0	109	0	0
R3R	151	0	0	236	60	0
R3S	0	0	0	0	0	0
R3N	0	0	0	188	0	0
R2E	0	0	0	0	0	0
R2N	0	0	0	0	96	0
R3W	0	0	0	0	0	0
R3X	0	0	0	0	0	0
R3P	0	119	0	60	0	0
R3Y	0	0	0	0	0	0
R3H	0	0	0	0	0	0

¹ NS=Non-Sponsored

² S =Sponsored

APPENDIX 2-3: NUMBERS OF SCA UNITS: 1981, 1993, 1981-1993

FSU/Zone	1981	1993	1981-1993
CENTRAL AREA			
R3A	290	290	0
R3B	1387	934	453
R2W	714	635	79
R3C	1016	729	287
R3E	560	411	149
R3G	303	303	0
SUBURBAN AREA			
R2X	214	204	10
R2L	287	153	134
R2H	949	704	245
R3L	817	786	31
R2K	233	180	53
R2V	470	405	65
R3T	391	391	0
R2M	1171	434	737
R2P	0	0	0
R2R	0	0	0
R2C	228	111	117
R2G	1479	1189	290
R2Y	189	189	0
R2J	84	84	0
R3J	431	431	0
R3V	0	0	0
R3M	365	272	93
R3K	216	107	109
R3R	447	276	171
R3S	0	0	0
R3N	188	188	0
R2E	0	0	0
R2N	96	0	96
R3W	0	0	0
R3X	0	0	0
R3P	179	119	60
R3Y	0	0	0
R3H	0	0	0

APPENDIX 3: LQ POINT VALUES FOR ALL SCA UNITS: 1981, 1993

FSU	1981	1993	Point Change 1981-93
R3A	3.08	3.75	0.66
R3B	2.98	4.30	1.32
R2W	0.81	0.98	0.17
R3C	1.88	1.94	0.06
R3E	1.02	0.00	0.28
R3G	0.54	0.57	0.03
R2X	0.54	0.41	-0.13
R2L	0.57	0.88	0.31
R2H	1.39	1.81	0.42
R3L	1.50	1.51	0.01
R2K	0.38	0.33	-0.06
R2V	0.81	0.62	-0.20
R3T	1.03	0.63	-0.40
R2M	0.75	1.40	0.65
R2P	0.00	0.00	0.00
R2R	0.00	0.00	0.00
R2C	0.45	0.58	0.13
R2G	3.02	2.21	-0.81
R2Y	1.26	0.70	-0.56
R2J	0.38	0.23	-0.15
R3J	0.64	0.48	-0.16
R3V	0.00	0.00	0.00
R3M	0.44	0.51	0.08
R3K	0.70	0.76	0.06
R3R	1.28	1.29	0.01
R3S	0.00	0.00	0.00
R3N	0.54	0.45	-0.09
R2E	0.00	0.00	0.00
R2N	0.00	0.72	0.71
R3W	0.00	0.00	0.00
R3X	1.00	0.00	-1.00
R3P	1.11	0.72	-0.39
R3Y	0.00	0.00	0.00
R3H	0.00	0.00	0.00

APPENDIX 4-1: CALCULATION OF LOCATION QUOTIENT VALUES

The LQ was calculated using GIS technology. The first step in the analysis was the creation of images (maps) showing the FSUs in Winnipeg with attribute values assigned to each FSU. The following attribute values were used in the calculation of the LQ:

- i. elderly population in each FSU in Winnipeg in 1981 or 1991
- ii. number of SCA units in each FSU in Winnipeg in 1981 or 1993

For each of the two years (1981 AND 1991/3), the images showing elderly population in each FSU (pop81 and pop91) were divided by the total elderly population in the city in that year (67,082 in 1981 and 82,200 in 1991) using the 'SCALAR' operation in IDRISI. The images showing the number of senior citizen apartment units in each FSU (SCA81 and SCA93) were then divided by the total senior citizen apartment units in the city in that year (9525 in 1981 and 12,704 in 1993). Finally, for each year, the output images showing the ratio of senior citizen apartment units to total senior citizen apartment units in the city were divided by the output images showing the ratio of elderly population in each FSU to total elderly population in the city.

The steps for calculating the location quotient for 1981 were as follows:

$$\text{POPULATION RATIO} = \frac{\text{POP81}}{67,082} \quad (1)$$

$$\text{SCA UNIT RATIO} = \frac{\text{SCA81}}{9525} \quad (2)$$

$$\text{LQ 81} = \frac{\text{SCA81}}{9525} / \frac{\text{POP81}}{67,082} \quad (3)$$

The steps for calculating the location quotient for 1993 were as follows:

$$\text{POPULATION RATIO} = \frac{\text{POP91}}{82,200} \quad (4)$$

$$\text{SCA UNIT RATIO} = \frac{\text{SCA93}}{12,704} \quad (5)$$

$$\text{LQ 93} = \frac{\text{SCA93}}{12,704} / \frac{\text{POP91}}{82,200} \quad (6)$$

APPENDIX 4-2: CALCULATION OF COEFFICIENT OF LOCALIZATION

Calculation of the coefficient of localization for senior citizen apartment units was as follows:

- iii. the % share of the city's SCA units in each FSU was calculated
- iv. the % share of the city's elderly (65+) population in each area was calculated
- v. the value in step (ii) was subtracted from that in step (i) and either all the positive differences or all the negative differences were added
- vi. the result of step v was then divided by 100

APPENDIX 5-1: ORIGINS OF TENANTS OF CENTRAL AREA PUBLIC SCA PROJECTS (% of total origins of moves)

FSU	Assiniboine n=43	Kennedy n=42	Elgin n=54	Powers n=68
R3A	0.00	7.14	26.63	5.97
R3B	6.97	26.19	12.96	2.99
R2W	9.30	9.52	14.81	62.69
R3C	34.88	23.81	3.70	2.99
R3E	2.30	0.00	11.11	5.97
R3G	11.62	9.52	7.41	1.49
R2X	2.30	0.00	1.85	5.97
R2L	2.30	2.38	0.00	1.49
R2H	0.00	0.00	0.00	0.00
R3L	11.62	0.00	3.70	1.49
R2K	4.65	2.38	0.00	1.49
R2V	0.00	0.00	0.00	0.00
R3T	0.00	0.00	0.00	0.00
R2M	2.30	0.00	1.85	0.00
R2P	0.00	0.00	0.00	0.00
R2R	0.00	7.14	0.00	0.00
R2C	2.30	0.00	0.00	0.00
R2G	0.00	2.38	1.85	0.00
R2Y	2.30	0.00	0.00	0.00
R2J	0.00	2.38	0.00	0.00
R3J	0.00	0.00	1.85	0.00
R3V	0.00	0.00	0.00	0.00
R3M	2.30	0.00	3.70	0.00
R3K	0.00	0.00	0.00	0.00
R3R	2.30	0.00	0.00	0.00
R3S	0.00	0.00	0.00	0.00
R3N	0.00	0.00	0.00	0.00
R2E	0.00	0.00	0.00	0.00
R2N	0.00	0.00	0.00	0.00
R3W	0.00	0.00	0.00	0.00
R3X	0.00	0.00	0.00	0.00
R3P	2.30	0.00	0.00	2.99
R3Y	0.00	0.00	0.00	0.00
R3H	0.00	0.00	0.00	0.00
out of town	0.00	0.00	5.56	4.48

APPENDIX 5-2: ORIGINS OF TENANTS OF SUBURBAN PUBLIC SCA PROJECTS (% of total origins of moves)

	Osborne n=89	Stadacona n=25	Chesterfield =78	Country Club n=84
R3A	1.15	0.00	0.00	0.00
R3B	5.75	0.00	1.28	6.10
R2W	4.60	12.00	2.56	0.00
R3C	6.90	4.00	1.28	9.76
R3E	1.15	4.00	2.56	4.88
R3G	6.90	4.00	5.13	2.44
R2X	1.15	4.00	0.00	3.66
R2L	3.45	32.00	3.85	0.00
R2H	1.15	0.00	3.85	0.00
R3L	21.84	0.00	5.13	3.66
R2K	3.45	12.00	0.00	1.22
R2V	3.45	4.00	0.00	0.00
R3T	6.90	0.00	8.97	2.44
R2M	12.64	4.00	44.87	3.66
R2P	0.00	0.00	0.00	1.22
R2R	0.00	0.00	0.00	1.22
R2C	1.15	4.00	1.28	0.00
R2G	0.00	12.00	0.00	1.22
R2Y	0.00	0.00	0.00	8.54
R2J	0.00	0.00	1.28	0.00
R3J	1.15	0.00	1.28	28.01
R3V	0.00	0.00	1.28	0.00
R3M	3.45	0.00	2.56	1.22
R3K	1.15	0.00	0.00	8.54
R3R	3.45	0.00	0.00	1.22
R3S	0.00	0.00	0.00	0.00
R3N	0.00	0.00	0.00	1.22
R2E	0.00	4.00	0.00	0.00
R2N	2.30	0.00	3.85	0.00
R3W	1.15	0.00	0.00	0.00
R3X	0.00	0.00	0.00	0.00
R3P	0.00	0.00	0.00	0.00
R3Y	0.00	0.00	0.00	0.00
R3H	0.00	0.00	0.00	0.00
out of town	5.75	0.00	8.97	9.7

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