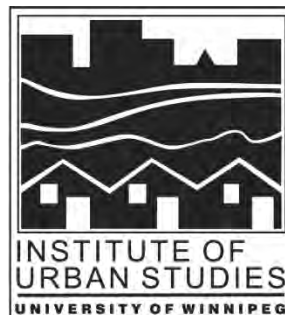


The Prairie Urban Countryside: Urban/Rural Fringe Development in Prairie Regional Cities

Research and Working Paper No. 37

**by Jeffrey Patterson
1993**

The Institute of Urban Studies





THE UNIVERSITY OF
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THE PRAIRIE URBAN COUNTRYSIDE: URBAN/RURAL FRINGE DEVELOPMENT IN PRAIRIE REGIONAL CITIES

Research and Working Paper No. 37

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The Institute of Urban Studies is an independent research arm of the University of Winnipeg. Since 1969, the IUS has been both an academic and an applied research centre, committed to examining urban development issues in a broad, non-partisan manner. The Institute examines inner city, environmental, Aboriginal and community development issues. In addition to its ongoing involvement in research, IUS brings in visiting scholars, hosts workshops, seminars and conferences, and acts in partnership with other organizations in the community to effect positive change.

THE PRAIRIE URBAN COUNTRYSIDE
Urban/Rural Fringe Development in Prairie Regional Cities

Research and Working Paper 37

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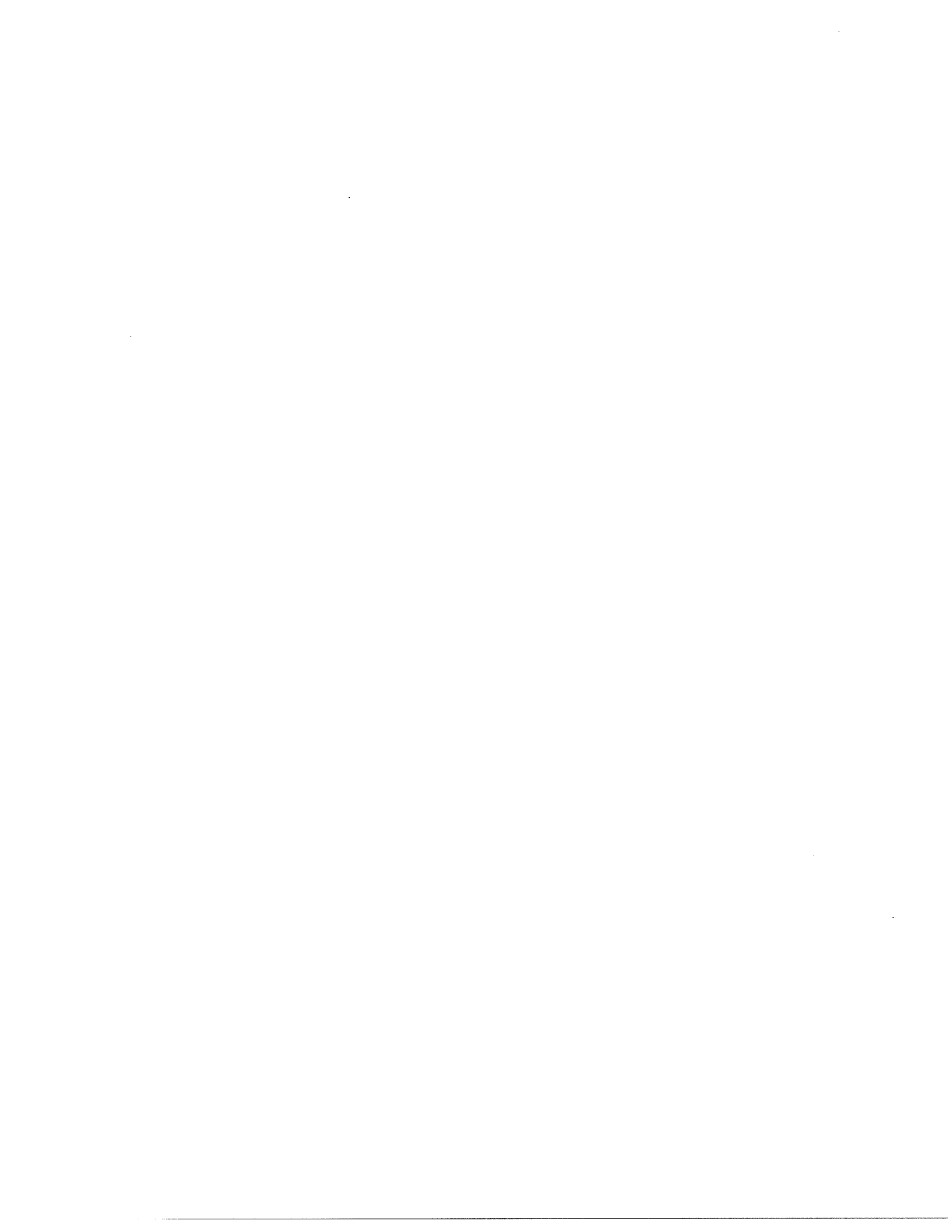
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Preface

This research report is one in a series of working papers by the Institute of Urban Studies (IUS) intended to address topics related to sustainable urban development. The interest of the Institute in sustainable urban development was initiated with a series of monthly seminars on the ethical dimensions of sustainable development and urbanization, held at the University of Winnipeg in the 1989-1990 academic year. Involving academicians from across Manitoba, planning practitioners, government officials and students, the papers presented at these meetings were published in *Ethical Dimensions of Sustainable Development and Urbanization* (Beavis, 1990). Since then the IUS has broadened and deepened its commitment to understanding the implications of sustainable development in cities.

A program of research into sustainable cities was initiated in 1991. In December 1991 the IUS launched a supplement, *Sustainable Cities*, to the *IUS Newsletter*, featuring research on sustainable urban development underway at the Institute, as well as features on sustainable cities. In 1992 the IUS published *Bibliographica 4, A Select, Annotated Bibliography on Sustainable Cities*, which represents our effort to keep interested professionals, public servants and students abreast of the rapidly developing literature in sustainable cities (Beavis and Patterson, 1992).

The overarching objective of the Institute's research programme in sustainable cities is improved planning practice and decision-making. The Institute's programme of research in urban sustainable development has three main dimensions. It focuses primarily on urban environments and their impact on natural resource use, as it is essential that urban economies be developed in accord with sound environmental principles. It also focuses on finances, both public and private, and effectiveness of resource use, a critical concern for urban development that is sustainable. Finally, it considers equity and social development. Sustainable development is not compatible with continued poverty in either developed or developing nations, and the existence of major pockets of poverty leads decision-makers to take choices with shorter pay-off periods even when it can be demonstrated that such choices are ecologically unsustainable in the longer term.

The publication of the report, *Our Common Future* by the United Nation's World Commission on Environment and Development (WCED) in 1987 has immeasurably assisted our understanding of the relationship between the environment and the economy, as well as the urgency of mitigating environmental degradation often associated with economic development. We are more aware than ever that humankind's impact on the natural environment is of increasing and critical significance.

Our Common Future and the world development community have understandably focused primarily on economy and environment in the developing world. Current population projections anticipate that almost 92 percent of the 3.5 billion additional persons expected in the world from 1991

to 2030 will reside in low income countries, and that low-income countries are where environmental degradation is often tied in a very direct and immediate way to population displacement, including forced migration to cities, and global security issues (World Bank, 1992: Table A1). Sustainable development of cities may also be more critical in the developing world, as approximately 82 percent of the world's additional population is anticipated to be added in cities in low income countries.

Sustainable development is also critical for the future development of the Western, developed world of which Canada is a part. That 77 percent of the population of both Canada and other high-income countries resides in urban areas increases the importance of sustainable development in the urban context. As well, it is anticipated that the population of urban areas in high-income countries will increase by a further 16 to 20 percent from 1991-2030, depending on the level of further rural to urban migration. As Canada continues to welcome international migrants and is a major country of destination for them, its urban population will likely increase by this magnitude by the year 2011.

Sustainable development issues in urban areas include continued degradation of the land, water and air. Also of critical importance to the world is the mitigation of greenhouse gases, mainly the result of combusting fossil fuels for space conditioning, transportation and the generation of electricity, and which contribute to global warming, climate change, more extreme climatic events and sea level rise. With only 14.5 percent of the world's current population, developed countries consume approximately 60 percent of the world's energy and produce over 45 percent of greenhouse gases (World Bank, 1992: Tables A.9 and 5). Reduced energy consumption is critical to sustainable development and to decreased greenhouse gas emissions. In addition, mitigating persistent poverty amongst a minority of urban residents and ensuring health for all in a world that is increasingly hostile to human habitation will remain important items on the policy agendas of developed nations.

Increased efficiency in energy use is especially critical for Canada and Canadian cities. With one half of one percent of the world's population, Canada produces two percent (120,000,000 metric tons of carbon) of the world's greenhouse gas emissions, four times the world's average on a *per capita* basis (Canada, House of Commons, 1991, Table C). In the quarter century between 1965 and 1990, the per capita consumption of commercial energy in Canada increased from 92 to 128 percent of the level in the United States (World Bank, 1992 Table 5). While much of this increased relative intensity of energy use is generated by Canada's position as a major energy producer, much of it also stems from Canada's not formulating conservation and alternative energy programs appropriate to its climate. Such programs will of necessity have a major impact on urban areas if Canada is to achieve the target of holding greenhouse gas emissions to the 1988 level in the year 2005. As well, consumption of both renewable and non-renewable resources in the developed world casts an

"ecological shadow" over much of the developing world (MacNeill, *et al.*, 1991, pp. 58-61). Reducing the intensity of resource use in developed countries, including in urban areas, is increasingly a problem of developing nations.

This report represents the first in a series of a trilogy of working papers on sustainable urban development to be generated under the IUS research program. The primary focus of this paper is the city's urban/rural fringe. The urban/rural fringe is an appropriate point at which to commence this series of working papers on sustainable cities. Most urban development occurs on the fringes of cities, and there are two major impacts of urban/rural fringe development on society's use of resources. Firstly, the nature and form of urban development will determine the operating and capital cost, both private and public, of development as well as its sustainability. Secondly, and assuming that there is an already-existing economy in the city's urban/rural fringe, it is commonly observed that the nature and kind of development at the city's edge influences the health and continued viability of the resource uses (most commonly agricultural uses) that are displaced or influenced on the city's edge. Not only does urban development divert resource use (usually land) from one function to another, but the kind and nature of urban development, as well as the relationship between urban development and the pattern and economics of resource use, influences the continued health of the resource industry that remains. This paper constitutes an initial exploration of these issues at the intersection of city and country, the urban/rural fringe. Its empirical focus is the Prairie's five largest regional cities, Edmonton, Calgary, Winnipeg, Saskatoon and Regina.

The second paper in the series, which is based on a survey of large-city Canadians by the Angus Reid Group and a parallel survey of the residents of Regina and Saskatoon commissioned by the IUS, will examine the preferences and practices of individuals as they impinge on the nature and type of urban development that typically occurs in Canadian cities and on the environmental and ecological health of cities. While urban development typically has immense and portentous implications for public policy and local public finance, most of that development is initiated by individual entrepreneurs or corporations in response to perceived demand for the urban development product being marketed. Very little is known about the nature of this demand and of the determinants of behaviour impinging on Canada's urban decision makers. This second report will focus on the characteristics of public opinion and demand as they shape development decisions, as well as the delivery of local public services in both the public and private sectors. While the focus of this report on public preferences and choices will be the five largest Prairie urban areas, this survey also includes residents of the four largest, non-Prairie cities, Toronto, Montreal, Vancouver and Ottawa and of Halifax, permitting a comparative exploration of opinions and behaviour in Prairie cities with those in non-Prairie cities.

The primary object of the third paper will be an examination of the economics, both public and private, of new urban development within the framework of sustainable development principles. It will be complementary to the current paper to the extent that it will also focus primarily on urban development of and the provision of services in the urban/rural fringes of Prairie cities, although it will focus on the human settlements replacing the receding rural uses. While the empirical base of this paper will be limited to Winnipeg, it is envisaged that the framework developed will be applicable to other cities as well.



Abstract

A large body of literature in several academic disciplines and spanning several decades is now focused on the succession of rural and agricultural communities and economies by settlement of the metropolitan urban/rural fringe by urbanites. This working paper examines urban/rural fringe development in the context of sustainable urban development. The settlement of the countryside, including small towns, villages and hamlets, by urbanites and its impact on physical resources is viewed within the framework of the social production of space and as part of the "fourth migration" forecast by Lewis Mumford as far back as 1925. The empirical focus of the paper is urban/rural fringe development in the five primary regional cities of the Prairie grasslands region.

Trends and patterns of urban/rural fringe development in the Prairie metropolises are placed in a national context. The population of fringe municipalities with densities of less than 1000 persons per km² increased by almost 12 fold from four to 31 percent of total metropolitan population and accounted for three fourths of the new population added to metropolitan areas. Equally significant was the over eight fold increase in the geographical extent of these low density suburbs.

Relative to other regions of the country, development patterns and trends in the five Prairie regional cities are characterized by lower central city densities, freer access to single family dwellings and inclusion of rural lands into central cities far in advance of development needs. A Prairie urban type appears to be emerging. Urban dwellers in Prairie cities nevertheless see the urban/rural fringe as an extension of the suburbs and a legitimate residential opportunity. Nearly one in five residents added to Prairie regional cities from 1966 to 1991 were residents of fringe areas despite the realization of ambitious annexation schemes by the major cities. Approximately half chose to reside in small hamlets, towns and villages near the major cities, where land use per resident has tended to be two to four times that typical for suburban areas of central cities, while the other half chose to live in rural areas. Among the features that distinguish fringe residents are their domination by younger than average aged child-rearing, coupled and affluent, families with 30 to 50 per cent more young children than the average suburban family.

Viewed from the perspective of resource use, the one fifth of new urban dwellers living in the countryside may be collectively identified with the loss of an equal amount of farmland as that lost to new suburban housing. Exurban development has generally been oblivious to the quality of agricultural land used. The location and pattern of development of country residences have often hindered the efficiency of remaining farm operations, as well as transport corridors and future urban growth. Degradation of water resources is also often identified with exurban development. Exurbs are also associated with almost complete auto dependence and much greater per capita emission of greenhouse gases to the atmosphere than typical low density suburbs at the edge of the city. Promotion of sustainable urban development requires increasing attention in the city's countryside.

Planners and provincial and municipal officials alike have become increasingly aware of the ecological risks associated with population dispersal, although the rights of land owners and the desire to accommodate diverse living opportunities, as well as the desire of hamlets and rural municipalities to increase their assessment and population bases, remain strong forces in favour of continued urban development of the countryside. While annexation of rural land to Prairie central cities has often resulted in the treatment by urban planners of agricultural uses as residual uses, the separation of urban and rural areas and planning may also have reduced urban sprawl characterized by discontinuous development and mitigated the impact of urban areas on the countryside. Decreased growth rates and reduced prosperity in the 1980s have stemmed the rate of exurban growth of Prairie

cities, although it is not clear that renewed growth and economic recovery would not again be associated with renewed growth pressures in the Prairie urban countryside.

INTRODUCTION

The pace and nature of urbanization in Canada is rapidly transforming traditional urban centres (traditional cities and contiguous suburbs) into large, sprawling regional/urban complexes, a city form that encompasses a concentrated built-up area (the traditional city and its contiguous suburbs) and its dispersed surroundings: the fringe; the urban shadow; and the rural hinterland (Marchand and Charland, 1992; Bryant, *et al.*, 1982). The different parts of regional cities are regarded as lying along a continuum of urban influence from the centre outward. The fringe, frequently referred to herein as the urban/rural fringe and consisting of residential development, dispersed commercial and industrial developments, idle land awaiting conversion to urban use and often still dominant rural land uses, is the area undergoing transition from rural to urban land use. While residential development in the urban/rural fringe is typically sparse in density, it may be more accurately portrayed as uneven development, often including apartment blocks and other joined housing forms — low-rise apartments and row and semi-detached houses — usually identified with older urban development, although gross average densities are usually low compared to older developed areas.

It is commonly observed that the low-density development of the urban periphery may lead to numerous attendant environmental, economic and social problems, including transport-induced smog, the emission of large quantities of greenhouse gases to which anticipated future climate change is often attributed, erosion of domestic non-renewable energy reserves, potentially leading to increased dependence on foreign supplies, increased numbers of deaths and injuries from needless road accidents, deterioration in the quality of public spaces, increased social inequity associated with distance between affluent and poor urban residents, and increased social isolation and loneliness (Newman, 1991). Gridlock, the threat to future mobility generated by excess automobile dependence and attendant traffic congestion, especially in newer suburbs and in access from suburban to inner-city areas, presents a future crisis stemming from recent and current development patterns on the urban periphery of our largest cities. A 1991 Canadian poll of large-city urban residents by the Angus Reid Group showed that about 50 percent of large-city Canadians resident in downtown or inner-city areas used cars to commute to work, while about 80 percent of those in new suburbs did so (Patterson, 1992).

Excessive low-density development may also result in serious consequences for society's rural resources. Lost agricultural production potential resulting from the removal of farmland for urban purposes and reduced efficiencies for remaining farmland are the most often cited. Others include soil

and water pollution from waste disposal, damage to drainage and flood control systems, pollution of aquifers, loss of aggregate resources, degradation of recreation resources, decreases in the amenity value of rural landscapes, interference with transportation corridors and the cost of providing community and human services to dispersed populations.

There is also a more positive side to low-density suburban development and more dispersed settlement in the urban/rural fringe on the periphery of our cities. For many Canadians, the metropolis' urban/rural fringe presents a positive residential opportunity. The Angus Reid Group survey found that the notion of living beyond the built-up urban area possessed "a lot of appeal" for 26 percent of large city residents, and in 1991 almost two thirds of these — 17 percent of the total — anticipated making good on this appeal by 1996. Thirty-two percent of the large city residents currently lived in areas they characterized as "new suburban," and 36 percent expressed a desire to live in a new suburb. Most respondents expressed a desire to live near where they were currently living. However, residents of older suburbs, essentially those containing housing older than 30 years at the time of the survey, appeared to be the most dissatisfied with either their housing or their neighbourhood. Forty-five percent were currently living in older suburbs, but only 39 percent expressed a desire to live in older suburbs.

While public opinion is generally considered to be fluid and is far from identical for residents of the eight cities surveyed, there is nevertheless little doubt of the current weight of public demand by urban Canadians to move outward and consume greater quantities of countryside. As will be seen below, the principal challenge to managing urban growth and to charting a more sustainable course of development in urban Canada is the balancing of public demand for ever greater amounts of space—land — with the resource cost and loss of amenity value associated with this consumption. Greater success in shifting this balance towards consumption of less land will ultimately only occur when and if there is a shift in this demand by urban Canadians.

TOWARDS CONCEPTUALIZING THE PRODUCTION OF SPACE IN CANADA'S URBAN/RURAL FRINGE

The principal objective of this paper is to go beyond describing the evolution of spread cities in Canada, although a description is included. It is only with a fuller understanding of the process of urban growth and expansion that we can address problems of resource depletion in the urban/rural fringe or undertake endeavours that can reasonably be anticipated to mitigate any undesirable impacts.

The science of urban form and urban dynamics, fields that are the domain of several academic

disciplines, including geography, economics and sociology, are in considerable flux. Earlier theories, now often referred to as bounded city theories, posited a biological model in which the periphery of (urban) organisms constantly expanded outward and the interior of the city became ever more internally differentiated as the organism grew in size (Hawley, 1981). The role of previous theories of cities and their development is increasingly being called into question (Saunders, 1981, 1989). The bounded city form is viewed by many urban practitioners to have been replaced by a city form that is multinucleated (Gottdiener, 1985, Introduction). This new perspective sees space as the functionally integrated product of fundamental societal processes, structures and transformations. Urbanization theories based upon the bounded city form have been increasingly replaced by those based on a production of space perspective.

The benefits of new theoretical perspectives may be seen, for instance, in the explanation for one of the central phenomena which has propelled so much urban development to the urban/rural fringe: deconcentration. Earlier perspectives saw deconcentration as the product of city growth and specific forms or modes of transportation and communications. Perspectives benefitting from the production of space perspective see the deconcentration of cities as both the movement of people and jobs from the older central cities, or decentralization, and the appearance of urban built forms in outlying areas, a form of concentration. This deconcentration is likely not the product of specific forms or modes of transportation and communications.

Indeed, technological and communications innovation and forms may be seen as one product of the changing forces of social organization. While not denying the importance of technological innovation, Gottdiener has asserted that the nature of metropolitan development is dependent as much on the growing power of large corporations, including those involved in the development and real estate industries, government policies and many other aspects of socio-spatial relations as it is on technology itself (1985, p. 229). In the case of the United States and after adjusting for the impact of municipal annexations, faster rates of growth in the suburban ring are shown to have occurred in every decade since 1900 for every regional grouping of large cities (Berry and Kasarda, 1977, p. 186). As well, throughout most of the twentieth century, the density development in each succeeding period has been less than in the previous period (Bourne, 1989).

The ways and means by which the multinucleated, unevenly developed city is produced is generally familiar. First, suburban single-family home development was transformed over time from small-scale, often custom-built construction to the present situation where housing is the product of large developers building for a mass market. Land speculators often precede developers in assembling

land. The development industry—sometimes the speculators—obtain planning, zoning and subdivision approval. The planning and local government officials providing approvals are highly oriented towards facilitating this process. While there is no statute or constitutional provision defining or establishing rights in this regard, it is generally presumed by the planning system and by the courts that individual land owners have the right to initiate development unless a by-law or regulation specifically denies such a right (Bryant and Johnston, 1992, pp. 139-44). Even in the event of such provisions, it is often possible for individuals to overcome them (Thompson, 1982). The development industry itself is highly specialized and variegated with different firms specializing in different types — single family residential, larger residential complexes and apartments, commercial shopping centres and so forth — and sizes of development. Spot builders, defined as those who take advantage of opportunities created by other developers, often build infill projects into the urban fabric, and it is quite often these that contribute most to the unevenness of development.

In more recent times industry and commerce have followed residences to the suburbs and exurbs, and many of the larger developments constructed since the mid-1960s have been massive enough that they have incorporated their own agglomeration economies. Named "edge cities" by one observer of urban development, they mirror modern needs and the evolution of technique in transportation and communication, and they are sometimes portrayed as having rendered the downtown core an anachronism (Garreau, 1991, p. 546; Des Rosiers, 1992). Now a major tourist attraction as well as metropolitan shopping complex, the West Edmonton Mall in Edmonton has perhaps become the best known Prairie example. Corporations and developments incorporating their own agglomeration economies are no longer bound by traditional urban place land markets. They are free to determine the location of their activity and the characteristics of new land markets.

One implication of a production of space perspective of urban development is the conclusion that space *per se* no longer plays a role in urban differentiation (Harvey, 1983).¹ Others continue to argue that spatial structures and relations between them remain a prominent feature of contemporary urban spaces (Giddens, 1984). For instance, based on four case studies, one observer concludes that negative attitudes towards low residential densities in rural areas have resulted in restrictive policies and regulations in the name of agricultural conservation, preservation of the rural landscape and protection of the municipal tax base, transforming the urban/rural fringe from a zone offering less expensive residential space to one that is increasingly exclusive (Punter, 1974). While traditional theories of urban development are no longer able to explain contemporary urban phenomenon, it may be argued that many of the traditional categories of analysis have not lost all of their analytic

capabilities or empiric usefulness. The category of the urban/rural fringe is among these (Walker, 1990). As well, it is a category that continues to derive usefulness from its place in politics, in municipal and planning legislation and regulations and as a locus of society's resources.

The theoretical perspective introduced above sees the urban/rural fringe as more than a zone of transition from rural to urban uses. Regional cities may be viewed as multinucleated, unevenly developed spaces. This uneven development, although characteristically of low density, extends into the urban/rural fringe.

While this perspective may be seen as an innovative way of viewing the settlement of Canada's regional cities on the one hand, it also on the other hand has deep roots in history and was foreseen by Lewis Mumford as early as 1925 (Mumford, 1976, p. 56):

The first migration....opened the (North American) continent; the second migration...worked over this fabric a new pattern of factories, railroads and dingy industrial towns....; there is the America of the third migration, the flow of men and materials into our financial centers, the cities where buildings and profits leap upward in riotous pyramids... But the mold of America has not been set; we are again in another period of flow, caused like the flows of the past by new industrial methods, new wants and necessities, and new ideals of life, and we have before us the great adventure of working out a new pattern so that the fourth migration will give the continent that stable, well-balanced, settled, cultivated life which grew out of its provincial settlement.

The fourth migration was to be a resettling of the countryside to achieve a better balance between rural and urban environments (Friedman and Bloch, 1990, p. 579).

The production of regional space is the consequence of societal processes and structures. Government and the formal planning system play a large role in urbanization, and this report focuses to a large extent on the role of government in these processes. An understanding of the role of government in maintaining and/or changing land use patterns, both as an independent force and as one that effects urban growth and management in conjunction with land markets, is therefore a major focus of this paper.

A GLOSSARY OF TERMS

The salient terms used in this report — *urban/rural fringe*, *urban shadow*, *regional city* and *rural hinterland* — were introduced in a brief way above. However, confusion about the meaning of these terms abounds, and one of the objectives of this paper is not to add further to such confusion. As

used in this paper, these terms are adopted from Marchand and Charland (1992), Walker (1990) and Russwurm (1974). The *traditional city*, also referred to as urban place or the urban core, is the area of continuous, built-up urban form, although the social forces described herein make it increasingly difficult to discern the traditional city in finite terms and certainly more difficult to describe in bounded terms. As will be seen below, a density criterion and a standard of contiguity for delimiting the urban core are used in this report. The urban/rural fringe may be seen as the transitional landscape, often including discontinuous urban agglomerations, which will accommodate urban growth in the foreseeable future, although the discontinuous nature of development makes it increasingly difficult to foresee exactly what parcels of land or landscapes will actually undergo transition to urban use. As a transitional zone, it also represents the interface between urban and resource systems. It occurs both inside and outside of the formal jurisdictional limits of cities. The term *exurb* or *exurbia* will be used from time to time in this report and refers to residential areas in the urban/rural fringe.

The *urban fringe* is also a category of analysis used by Statistics Canada to include incorporated hamlets and villages and so forth within Census Metropolitan Areas (CMAs), the statistical concept that comes closest to coinciding with regional cities, a geographical term. To avoid confusion between the geographical and statistical uses of the term, the category *urban/rural fringe* will often be used herein as the geographical description.

The *rural fringe* is a statistical term as well and will be used to describe the urban/rural fringe area lying outside urban areas, hamlets, villages and Census subdivisions. When the term *urban shadow* is occasionally used, it will be used to describe a zone of urban influence between the urban/rural fringe and the rural hinterland, although the term is also often used interchangeably with urban/rural fringe.

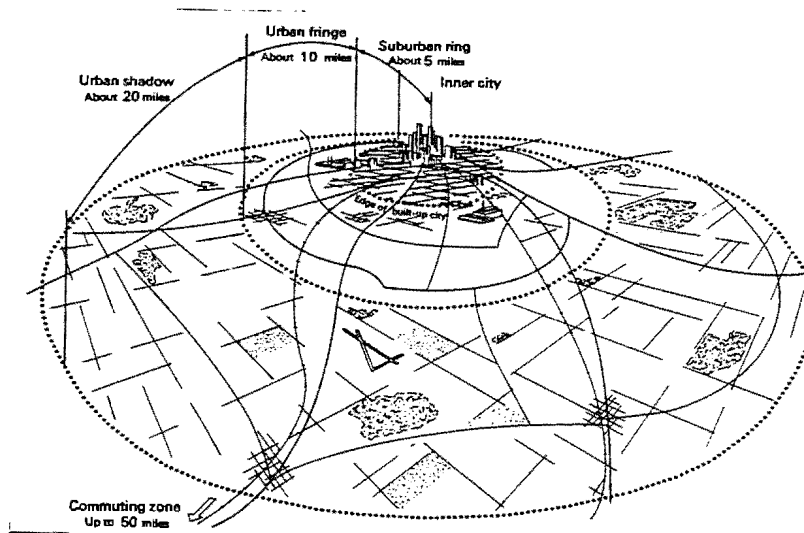
A commuting zone describes the area from which a metropolis or regional city frequently draws workers. The basis used by Statistics Canada for defining Census Metropolitan Areas (CMAs) is a commuting zone, but while a CMA will contain the vast majority of the commuters to a city, its bounds will not usually include the entire commutershed, as the main criterion for drawing the bounds is that areas included in CMAs are those from which 50 percent of workers commute to an urban core or working areas in the urban/rural fringe from which 25 percent of workers come from the urban core. There are areas beyond CMA boundaries from which fewer than 50 percent of workers may commute to the CMA's urban core. Such areas, which very few urbanists have attempted to determine empirically, will be part of the urban/rural fringe and of the regional city, but will not be included within the geographical boundaries of a CMA. The rural hinterland describes the trading area of regional

cities. Figure 1 below portrays the component parts of regional cities.

ORGANIZATION

This working paper commences with a discussion of the scale, nature and magnitude, both demographically and geographically, of urban/rural fringe development in both a national and Prairie context. Events in the Prairie regional cities, the ways in which they either differ from or resemble developments in other urban centres and regions, are then placed in this context. In Chapter 3 the nature of urban/rural fringe development in Prairie cities and the characteristics of people who choose to live in the urban/rural fringe are then examined. Finally, the public and planning policies as a system relating to the interface between rural and urban economies and affecting the development of fringe areas are examined in Chapter 4. This chapter contains an evaluation of regional planning in Prairie cities, including a summary of land use changes in Prairie cities to accommodate expansion of urban areas, as well as increased populations in the urban/rural fringe. The paper concludes with commentary on the significance of current trends in government regulation in the context of sustainable development principles.

FIGURE 1: SPATIAL PATTERN OF THE OUTWARD EXPANSION OF A CITY OF ABOUT 250,000 PEOPLE



Source: Russwurm, 1974



CHAPTER 1

A National Perspective on the Development of the Urban/Rural Fringe²

Most new urban development has always occurred and currently occurs on the periphery of our urban areas. It is the nature, form and density of development of the urban fringe, not that the fringe is the locus of development, that is critical to the achievement of sustainable city objectives. How urban areas develop is of increasing interest to Canadians. In this chapter, we examine the recent patterns of metropolitan development and the impact associated with development patterns on the metropolitan fringe.

CONCEPTS AND METHODS OF MEASURING RURAL TO URBAN LAND CONVERSION IN CANADA'S REGIONAL CITIES

As indicated above, the development of the urban/rural fringe has two separate impacts on the economics of resource use. On the one hand, the nature and extent of urban development will determine the capital and operating cost and other characteristics of our future cities. On the other hand, urban development also displaces rural resource uses, and it affects the economics of resource production of the remaining rural uses.

Providing a consistent basis for describing the development of regional cities and their urban/rural fringe presents major empirical difficulties. The oldest, most consistent and most reliable data on urbanization are provided by Canada's Census of Population. The Census occurs every five years, and data on population by municipality (Census subdivision) are readily available. There are essentially two difficulties in using them. First, municipal boundaries quite often bear little relationship to the central phenomena — urbanization and development of the urban/rural fringe — that are the foci of this section. Municipalities quite often include both urbanized land and rural land. Thus the bounds of urbanization, to the extent that they can be determined for cities increasingly characterized by multinucleated, uneven development, frequently cross many municipal boundaries in a complex regional city. As introduced above, the Census has created special geographical units called Census Metropolitan Areas, or CMAs, for purposes of accounting for and analysing demographic, social and economic phenomena in large, complex regional cities with populations over 100,000. In 1991 there were 25 CMAs in Canada.

Secondly, while constantly improving in quality and technique with time, the Census has historically been least adequate with respect to allowing researchers to analyze events in the urban/rural fringe. Municipal annexations and the increasing number of municipal reorganizations that have occurred since the mid-1960s have most often affected the urban/rural fringe (Sancton, 1991). While the Census makes even heroic attempts to allow researchers to compensate for and overcome these boundary changes, they cannot easily do so over a long period of time. Canada's CMAs have been divided into small areas with populations usually ranging from 4,000 to 8,000, called Census Tracts, since 1951. And while Statistics Canada attempts to minimize the number of changes to the boundaries of these small areas, there are always changes, and the concentration of development at the edges of cities means that the urban/rural fringe is most often the locus of these changes. As well, the boundaries of CMAs have been in continuous flux throughout the 1970s and 1980s, and often much of the urban/rural fringes of CMAs has been "traced" only in the relatively recent past.

Finally, and as will be detailed below, the outer boundaries of CMAs themselves, in addition to their component municipalities, have been in flux. Some of the changes have resulted from changes in the concepts and definitions employed by Statistics Canada, and these have gradually become more sophisticated. Others are of course the result of the processes being described herein. Labour force commutersheds and the amount of inter-municipal commuting for work purposes is the current basis for defining the limits of CMAs, and the expansion of commutersheds and urban areas means that these areas are constantly growing as well.

Despite its inadequacies, the urban scientist cannot help but make use of the Census in describing the processes and results of urbanization. However, it is complemented herein with the use of two other sources of data relevant to a discussion of changes in the urban/rural fringe. These sources focus more specifically on the conversion of land from rural to urban uses.

Measuring rural to urban land use conversion, especially on a regional or national basis, is a far from simple or easy exercise. There are a nearly infinite number of land-use classification schemes. For instance, those interested in biodiversity may be interested in classifying land by the number of plant or animal species it supports (Faulk, 1980; Wilson, 1985-86). Others may be interested in texture, water-holding capacity or any number of other measures. Planners are often interested in use designation and zoning. And others are interested in resource implications.

While the program was discontinued, and the Lands Directorate that maintained the program was phased out in a 1988 bureaucratic reorganization, Environment Canada monitored the conversion of rural to urban land from 1966 to 1986 (Environment Canada, 1986 and 1989; Warren and Rump,

1981). Aerial photographs were utilized until 1981, while the most recent data were obtained through Canada's remote/satellite sensing program. One of the values of this former service and the data it generated is that it allows the researcher to identify particular growth increments and actual rural land converted to urban uses, although there is some concern that this method understates the impact of dispersed and scattered residential fringe development on agriculture and other rural land uses.³ These data also allow the analyst to ignore legal jurisdictions on the ground. This is particularly valuable in measuring intensity of land use in cities such as those on the Prairie, where municipal boundaries are not necessarily of assistance in measuring urban uses.⁴ The Lands Directorate program also measured the suitability of land for different uses. Thus, it is possible to determine whether converted rural land is suitable for agricultural purposes, for sustaining wildlife and so forth.

A second source of data, focusing more directly on more common measures of economic productivity, is contained in Canada's quinquennial Census of Agriculture. Farm operators, both individual and corporate, are required to report on land owned, the uses, both agricultural and non-agricultural to which it is put, crops grown, equipment used and owned and so forth. The last Census of Agriculture that may be used for the purposes herein is that for 1986.

These two primary data sources are each useful for different purposes (Bryant and Johnston, 1992, pp. 32-34). Data on rural to urban land conversion from Environment Canada are especially useful for purposes of identifying the extent of the boundary of the built-up urban area. They are not nearly as accurate or useful for measuring the more scattered types of urban and urban-related development. Being spread over a much larger area, such development is much more difficult to identify. The inability to rely on proximity of uses is also a limitation. Their accuracy also depends on the size of the grid used, as the procedure used calls for the monitor to designate a use for each unit of a grid that reflects the use of the major part of the grid unit. The grid used in the Environment Canada program from 1966-1986 was approximately 2.5 ha (Warren and Rump, 1966, p. 11). Thus, if a grid unit contained a residence occupying, say, a hectare of land, while the remainder of the land continued to be farmed, the use for that unit would be recorded as agriculture. The fringe residential unit would not be counted as an urban use. Given that a major focus of this report is fringe residences, the Environment Canada program, while it is useful for some purposes, may not be the best measure of urban uses or the fringe residential phenomenon for purposes of this report. While the technological means of undertaking improved analyses will undoubtedly come as artificial intelligence and geographic information systems are improved, the Environment Canada data on urbanization are currently the best available (Shyy and Williams, 1992).

Hence, we also turn below to an analysis of data from the agricultural census. To the extent that land that might be used for fringe residential purposes is quite likely to be separated legally from a farm — that is, sold for the residential use, its severance from the remainder of a farm that might or might not still be intact is recorded. As well, if a rural resident purchases a fairly large piece of land for a rural residence, but continues to farm the remainder of the land or leases or otherwise allows the land to be farmed by another party, the use will be recorded as agricultural. A major problem with use of the Census of Agriculture is that a parcel of land no longer used for agricultural purposes is not necessarily urban. Unproductive farms are continuously acquired by public authorities for taxes or for public uses. Farms may be sold for purposes of rural residences, but the land may lie fallow and not be included in a Census of Agriculture. Thus, this source may overstate the conversion of land from farm to urban purposes.

For the purposes of the primary interest herein — the phenomenon of rural residential living — its resource and land use impact likely lies somewhere between the indications provided by the only two measures available. A description of the results using both methods is contained below.

Canada's Recent Growth and Development Patterns

Census data for 1991 recorded the first increase in the intercensal population growth rate since the 1951 Census.⁵ The recent increase is due to a combination of increased immigration, decreased emigration and stable natural increase. Equally significant, the 1991 Census revealed that over 61 percent of Canada's population lives in 25 census metropolitan areas (CMAs), an increase from 51 percent a quarter of a century earlier in 1966 and 59 percent in 1981.⁶ Almost four of five persons added to Canada's population during the decade of the 1980s were resident in Canada's CMAs in 1991.

Canada's CMAs may be divided into urbanized cores and fringes. That is, they consist of an urbanized area, around which a boundary may be drawn, and an area beyond, usually rural in character if not so in function, identified as the urban/rural fringe. The urbanized core is defined herein as Census subdivisions (a central city and often adjoining municipalities) with gross population densities of 10 persons per hectare (ha) or greater (average in 1991 of 15 persons/ha), while the remainder of the population in each CMA resides in the "fringe"⁷. The critical determinant of whether development is considered part of the "core" (built-up urban area) or "fringe" is density. While arbitrary to an extent, an attempt has been made to develop a reasonable criterion. Given that residential development is on average 50 percent of total urban development in the urban/rural fringe and

assuming that average household size is 2.5, single-family residential development of eight lots per hectare (0.4 acres) or lot sizes of slightly less than 100 feet by 200 feet would result in sufficiently high densities that such development, certainly sparser than most single-family suburban developments, would be considered part of the urban core. Less dense developments, or discontinuous or uneven development resulting in lower gross densities in individual municipalities, would result in that municipality being considered part of the urban fringe.

Table 1 indicates the distribution of metropolitan growth from 1966 and 1981 to 1991. Rates of growth for individual cities and CMAs varied considerably, both individually and in groups and over time. The national rate of population growth through the 1980s was 12.1 percent, virtually identical to the rate of growth from 1971 to 1981, although considerably less than the 18.2 percent experienced from 1961 to 1971. Canada's CMAs grew by approximately 16 percent through the 1980s (1981-1991), while population not resident in CMAs grew by a much smaller six percent during the period. The higher rate of growth for CMAs resulted from net positive migration flows from non-CMAs, as well as nearly record levels of net migration (immigrants less emigrants) from abroad. Through the 1980s, nearly 60 percent of the net growth occurring in Canada's CMAs and almost half the net population growth of Canada was situated in the fringe areas of CMAs outside the urbanized core, the contiguous area having a gross population density of 1,000 persons or more per km². The proportion of total metropolitan population residing in fringe areas increased from four percent in 1966 to 27 percent in 1981 and 31 percent in 1991.

The short-term pattern from 1981 to 1991 differs significantly from the pattern of development over the longer term. From 1981 to 1991 rates of growth were more or less associated with city-size class: the larger the class of city, the greater its growth. This pattern was fuelled both by internal migration within Canada and by external migration. Thus the three largest CMAs — Montreal, Toronto and Vancouver — with over one million population grew by 19 percent; the six CMAs with populations of 500,000 to 1 million — Quebec, Ottawa, Hamilton, Winnipeg, Calgary and Edmonton — grew by 16 percent; and the 16 smaller CMAs with populations of 100,000 to 500,000 grew by 13 percent. The remainder of Canada outside CMAs contained 39 percent of total population, and the population increase for these smaller cities and rural areas through the 1980s was six percent.

As Simmons and Bourne indicated in an analysis of metropolitan growth through 1986, the 1980s perhaps mark a watershed in Canadian urban development (1989). The period up to the 1980s may be characterized as a decentralizing period in Canadian urbanization and economic development.

TABLE 1
METROPOLITAN POPULATION AND DENSITY TRENDS, 1981 - 1991

	Population (000)			% Canada		% Change		Area (ha)		Density (pop/ha)	
	1966	1981	1991	1966	1991	1966-91	1981-91	1966	1991	1966	1991
MONTREAL, TORONTO, VANCOUVER											
Central Cities	2,297	2,032	2,125	11	8	(7)	5	35,280	38,750	65	55
Rest of Urbanized Core	3,090	3,533	3,969	15	14	28	12	254,720	180,910	12	22
Fringe	100	1,696	2,529	0.5	9	2,429	49	181,050	968,210	0.8	3
3 CMAs Total	5,488	7,261	8,623	27	32	57	19	471,050	1,187,870	12	7
QUEBEC, OTTAWA, HAMILTON											
Urbanized Core	1,271	965	1,005	6	4	(21)	4	98,480	45,750	13	22
Fringe	86	904	1,161	0.4	4	1,250	28	164,560	918,964	0.5	1
3 CMAs Total	1,357	1,870	2,166	7	8	60	16	263,040	964,714	5	2
WINNIPEG, EDMONTON, CALGARY											
Urbanized Core	1,210	1,731	1,986	6	7	64	15	106,470	197,260	11	10
Fringe	30	226	260	0.1	1	767	15	54,370	1,593,996	0.6	0.2
3 CMAs Total	1,241	1,957	2,246	6	8	81	15	160,840	1,791,256	8	1
16 SMALLER CMAS											
Urbanized Core	1,999	2,209	2,394	9	9	20	8	160,790	289,500	12	8
Fringe	197	1,016	1,236	1	4	527	22	319,120	2,885,781	0.8	0.5
16 CMAs Total	2,196	3,225	3,630	11	13	65	13	479,910	2,875,281	5	1
25 CMAS											
Urbanized Core	9,867	10,470	11,480	49	42	16	10	655,740	752,170	15	15
Fringe	413	3,843	5,186	2	19	1,156	35	719,100	6,166,927	0.6	1
25 CMAs Total	10,280	14,313	16,665	51	61	62	16	1,374,840	6,919,100	7	2

Source: Canada, Census of Population, 1966, 1981 and 1991.

Note: Numbers in parenthesis indicate decreases.

The 1980s may be characterized as a period of renewed centralization. One implication of this renewed centralization is the emergence of even greater urbanization pressures in urban/rural fringe areas. As population growth in larger cities is more likely to occur in fringe areas, and Canada's largest cities provide a good illustration of uneven development on the city's edge.

With the exception of the three largest Prairie regional cities, fringe areas grew considerably more rapidly than the central cities or urbanized cores over the longer period from 1966 to 1991, as well as from 1981 to 1991. The extent of fringe growth, as well as the magnitude of the differential between growth in the urbanized core and in the fringe, varied in the direction of city size. Fringe area growth from 1981 to 1991 was 49 percent for the three largest cities, 28 percent for the other three large eastern cities and 22 percent for the 16 smaller CMAs. In the case of the Eastern CMAs with populations 500,000 to 1,000,000, fringe populations exceeded populations of the urbanized core for the first time in 1991.

A notable exception to the above generalization is presented by the largest three Prairie metropolises. The fringe areas comprised less than 12 percent of total CMA population in 1991, and both the urbanized cores and fringe areas grew by equal amounts — 15 percent — between 1981 and 1991.⁹ What also characterizes these three cities is that they are among the few cities in Canada that continue to grow by means of annexing fringe areas, and they are developed at relatively low urban densities — less than half that of the three Eastern cities in the same size class and a little more than one-fourth that of the urbanized cores for the three largest metropolises. In 1991, the urbanized cores of Calgary, Edmonton and Winnipeg contained 17 percent of the population of all urbanized cores, but occupied 26 percent of the total land area occupied by urbanized cores of Canada's CMAs. Together, the urban cores of the Prairie metropolises contained 374 farms occupying nearly 55,000 hectares in 1986. Excluding area occupied by farms, which comprised approximately 30 percent of the land area of the urbanized cores in 1986, these three urban cores would average a density of about 15 persons/hectare, still about one-third less than the density of the urban cores of the three Eastern metropolises with similar populations. There was also a 37 percent increase in the land area of the three Prairie central cities between 1981 and 1991, and this constituted almost 55 percent of the land area added to Canada's urbanized cores in the 1980s. Territorial increments in the areas of the 16 smaller cities accounted for 43 percent of land added to urbanized cores.

Growth rates by city size over the longer period from 1966 to 1991 were nearly the inverse of the shorter period. Smaller CMAs tended to have the highest rates of growth, and the period from the mid-1960s to the 1980s is viewed as a decentralizing one in Canadian urban development,

although it is also important to emphasize that Canadian growth throughout the twentieth century has been urban-oriented (Simmons and Bourne, 1989).

The most remarkable geographical aspect of development over this quarter-century period was the rate of growth in the metropolitan fringe. While the population of the urbanized cores of the 25 CMAs grew by 16 percent, the population of the fringe areas increased by over elevenfold, from 413,000 to almost 5.2 million. The fringe areas of the three largest cities recorded the most rapid growth — almost 25 times — and the proportion of Canadian fringe population residing in fringe areas of the three largest CMAs increased from under 25 percent to almost half (49%) of the total fringe population.

Even more remarkable was the extent of geographic expansion of the urban/rural fringe. In 1966 fringe areas of the 25 CMAs occupied 719 km², an area only slightly larger than the 656 km² occupied by the urban cores. By 1991, this had increased almost nine times to 6,167 km². In 1991, this much larger area was occupied at approximately twice the density that the smaller area had been occupied in 1966. While a change in procedure by Statistics Canada between 1966 and 1991, which eliminates the designation of parts of municipalities as part of a CMA in favour of designation of only whole municipalities, has undoubtedly increased the geographical extent of fringe areas in CMAs, the fact that the density of development in fringe areas nearly doubled in the 25 years and the knowledge that designation now follows labour force commutation zones more strictly than it might have in 1966, justifies the conclusion that the total urban field of the 25 CMAs, which increased by over five times, increased disproportionately to population (62%).⁹

Expansion of the Urban Boundary in Canada's Regional Cities

In this section, trends in urban expansion and growth, as evidenced by Environment Canada's land-use monitoring program, are reviewed. While these data may not adequately record the conversion of farmland to rural residential or country residence use, they do permit an analysis of events inside urban boundaries.¹⁰

The reader is cautioned that in undertaking this introductory and capsulized national and regional review of rural to urban land conversion, no initial value position on the conversion of land is being taken. The objective is primarily to document the rate and scale of land-use conversion from rural to urban purposes or from agricultural uses to urban uses. There are informed observers, including natural and social scientists, who take the position that no lands currently used for food production—frequently the most common use of land in the city's countryside—should be diverted to other uses. For these people, food production is always the highest and best use.¹¹ There are others

6who take a more moderate position that rural to urban land conversion is acceptable as long as the urban uses are efficiently allocated, and as long as it demonstrates sensitivity to the economics of production for remaining resource uses and to sound ecological principles generally. There are still others who take the position that land use should always be determined by the values of the market place, that regulation of land use by other criteria always results in a less than optimal net wealth position for society as a whole. A fuller discussion of principles that might govern land-use regulation in the Prairie urban countryside is contained below in chapter 4.¹²

Table 2 shows that new urban development in the fringe areas of Canadian cities was developed at densities considerable lower than those amenable to service by public transport during the 1980s.¹³ It also shows that the efficiency of land use on the city's fringe varies inversely with city size. Cities with populations of 25,000-50,000 tended to utilize three to four times the amount of land per 1000 additional persons as cities with populations of over 500,000 population for each of the four quinquennial periods for which rural/urban land conversion was measured. As well, and while divergent trends in rural/urban land conversion rates were monitored over the 20 year period, there is no evidence that Canadian cities became more efficient converters of land through the period. On average, eight percent more land was converted from rural to urban use per 1,000 additional persons in the 1981-1986 period than in the initial 1966-1971 period. For the largest class of cities with populations over 500,000, the amount of land absorbed in the 1981-1986 period was 20 percent greater in the last period than in the first period. Conversion rates were considerably more efficient for the middle ten year period from 1971 to 1981, and peaked in the 1976-1981 period.

More disaggregated data point to a trend towards greater urban development densities over the period 1966 to 1986. Figure 2 portrays the gross development densities for Canada's 25 CMAs by size class for the periods 1966-1981 and 1981-1986, 1) over 1,000,000 population; 2) 500,000-1,000,000 (separate data for East and West); and 3) under 500,000.¹⁴ As anticipated, 1966 urban densities generally varied inversely with population, except that the three largest Prairie urban areas had gross densities that were approximately 20 percent less than for the average of the 16 CMAs with populations under 500,000 population (3 in the West and 13 in the East) and 45 percent than the three similar-sized Eastern cities (Ottawa-Hull, Quebec and Hamilton). On the whole, densities increased over the period 1966-1986, although at different rates for different cities and classes of cities. There was a slight convergence such that by 1986, the three large Prairie metropolises used 2.1 times as many hectares per 1,000 population as Canada's three largest cities. The densities of lands urbanized from 1966 to 1981 tended to cluster in two classes: 32 hectares per 1,000 new population for the

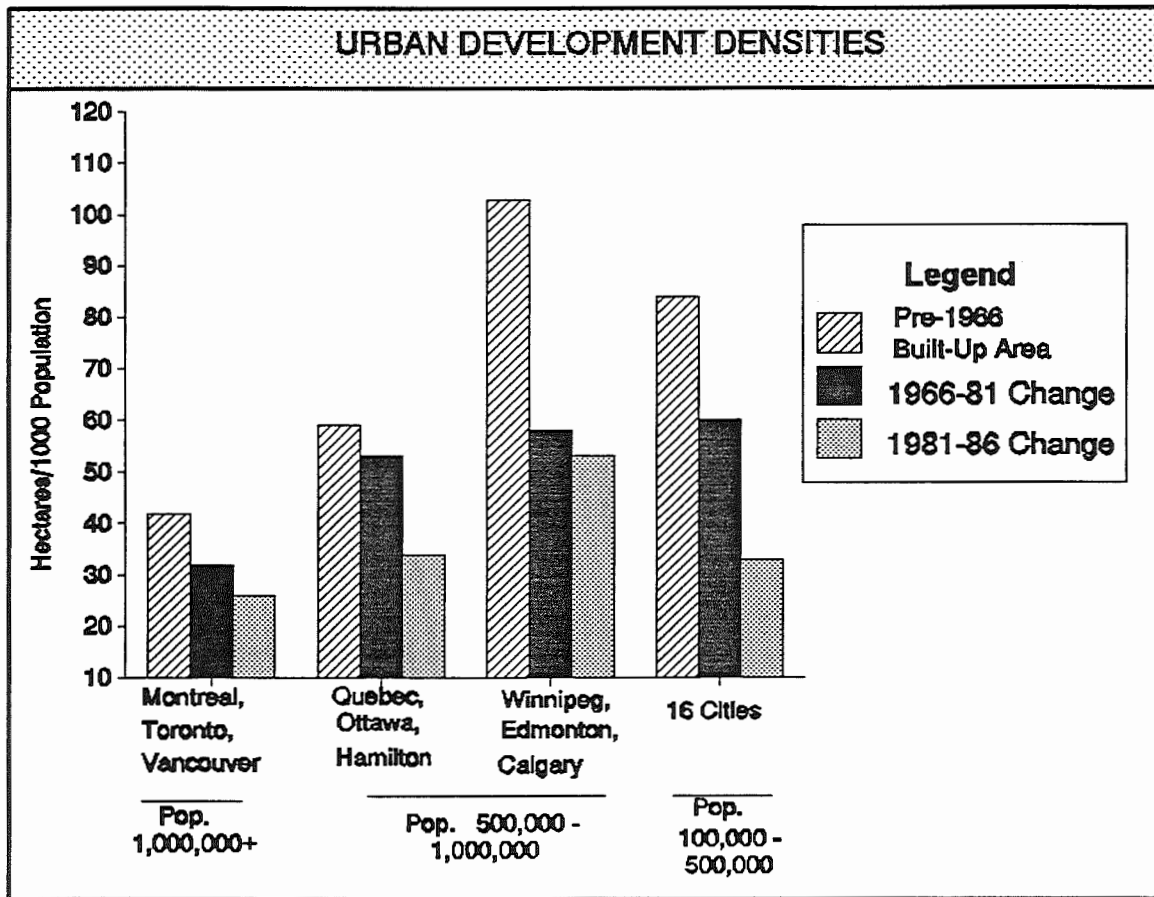
TABLE 2 GROWTH AND CHANGE, UCRs, BY POPULATION CLASS, 1966-1986				
Population Class	RATE OF LAND CONVERSION (ha/1000 pop change)			
	1966-71	1971-76	1976-81	1981-86
25,000 - 50,000	145	190	341	242
50,001 - 100,000	99	146	367	141
100,001 - 250,000	49	88	202	104
250,001 - 500,000	87	58	159	50
over 500,000	44	49	61	53
ALL	60	72	119	64

Source: Environment Canada, Lands Directorate and State of the Environment Reporting Branch.

three largest cities; and from 53 to 60 hectares per 1,000 new population for the other city classes. In the 1981-1986 period development densities for the smaller and larger CMAs and for the three middle-sized eastern CMAs varied from 26 to 33 hectares per 1,000 new population, while the three large Prairie metropolises were developing at a density of 53 hectares per 1,000 new population, approximately half the density of new development for the same period of the three largest cities.

In addition to a general concern for the form, efficiency and other characteristics of rural to urban land conversion, policymakers are especially concerned about the specific value and qualities of rural land converted to urban uses. For these reasons, Environment Canada has also monitored the qualities, characteristics and uses of rural land prior to conversion to urban purposes (Manning, 1986).¹⁵ Table 3 summarizes these data for converted land having the greatest potential for food production and agriculture, that is prime agricultural land in Canada Land Inventory classes I-III. Toronto and other municipalities in Southern Ontario possess the highest proportions of land in their countryside in agricultural classes I-III. About 96 percent of the land converted from rural to urban purposes from 1966 to 1986 in the Toronto CMA was prime agricultural land. Winnipeg ranked second with respect to the proportion of land converted having high agricultural potential — 94 percent. The proportion of rural land converted to urban purposes having high potential for agricultural production was only 12 percent in Vancouver. In large part owing to a combination of the high degree of suitability of rural land for agricultural purposes and the relatively lower overall density of new urban development, the three large Prairie cities used 38 ha of class I-III agricultural lands per 1,000 growth

FIGURE 2



Source: Environment Canada, Lands Directorate and State of the Environment Reporting Branch.

**TABLE 3
RURAL TO URBAN LAND CONVERSION: PRIME AGRICULTURAL LAND, 1966-86**

	Percent CLASSES I - III AGRICULTURE OF TOTAL					HECTARES OF LAND CONVERTED 1966-86			
	1966-71	1971-76	1976-81	1981-86	1966-86	TOTAL 1966-86	AGRIC. CLASSES I-III		Percent OF CANADA
							Ha	% of Total	
1,000,000 and over									
Toronto	97	92	94	97	96	33,801	32,400	96	18
Montreal	74	75	75	79	75	17,722	13,336	75	8
Vancouver	5	4	18	15	12	16,589	1,942	12	1
(Sub-Total)	75	64	59	77	70	68,112	47,678	70	27
500,000 - 1,000,000									
<u>East</u>									
Ottawa-Hull	56	62	48	62	56	15,258	8,630	56	5
Quebec	33	45	34	38	37	9,700	3,574	37	2
Hamilton	84	91	90	79	72	5,426	3,897	72	2
(Sub-Total)	56	60	51	60	53	30,384	16,101	53	9
<u>West</u>									
Edmonton	82	85	54	46	65	25,880	16,902	65	10
Calgary	45	66	68	48	55	18,354	10,185	55	6
Winnipeg	100	100	93	80	94	11,046	10,377	94	6
(Sub-Total)	73	79	69	52	68	55,280	37,464	68	21
Remaining 61 Census Agglomerations (CAs)	53	54	60	49	49	149,806	79,018	49	45
Total for 70 CMAs and CAs	63	61	50	59	58	303,582	175,261	58	100 ¹

Source: Environment Canada, Lands Directorate and State the Environment Reporting Branch.

¹ Data do not necessarily add to total due to rounding.

in population, while the three largest cities used high potential agricultural lands at approximately 45 percent less intensity for urban expansion — 21 ha per 1,000 additional population. Winnipeg, which used class I-III agricultural lands for urban growth at a rate of 89 ha/1,000 population change, ranked first, while Edmonton was second with 42 ha/1,000 population change of Class I-III agricultural lands.

The data for the four quinquennial periods between 1966 and 1986 reveal few if any trends. The quality of land converted may depend on the overall qualities of the land in the vicinity of city locations more than anything else. In most cases, although any trend may have been in the opposite direction for the three large Prairie cities, the proportion of prime agricultural land converted to urban purposes was higher in the 1981-1986 period than during the longer 20-year period.

Two individual large cities stand out with respect to increasing and decreasing densities, and they may illustrate the influence of land prices and population pressures on density and development trends. Table 4 shows that Vancouver, whose population increased by almost 55 percent from 1966 to 1986 witnessed an almost 20 percent increase in overall density, and the intensity of new land converted from rural to urban use was less than one-half the intensity of urban uses for the pre-1966 development. Winnipeg, whose population increased by only 23 percent over the same two decades, saw its net density decrease by about 10 percent, and new development from 1966-1986 used land almost 50 percent less intensely than was the case in the pre-1966 built-up area. Of course it is the overall balance of land supply and demand that likely influences densities of urban development. Edmonton and Calgary, with respective population growth rates of 109 and 128 percent for the 20 years, more closely resembled the three Eastern cities with similar population with respect to densities of new developments than they did either Vancouver or Winnipeg.

Loss of Farmland in Canada's Regional Cities, 1966-1986

As was indicated above, the data generated by Environment Canada's rural to urban land use conversion monitoring program probably provides one of the best measures of actual land conversion from the point of view of depicting the expanding urban boundary. While the development of an uneven, multinucleated city form increases the difficulty of drawing such boundaries, it is also likely that improved remote sensing and artificial intelligence techniques have allowed scientists more or less accurately to reflect urban boundaries. The land-use monitoring program is less useful for purposes of monitoring more dispersed urban-related uses, including rural residential or countryside living by urbanites, although its usefulness for the latter purpose also depends on the size of the grid that is used to record land uses. Data on the loss of farmland have the advantage of enabling those

TABLE 4
AGRICULTURAL LAND AND URBANIZED LAND, 1966 - 1986

CITIES AND POPULATION ²	(1)	(2)	(3)	(4)	(5)
	IMPROVED FARMLAND				
	1986 (HA)	LOST, 1966-86 (HA)	LAND URBANIZED 1966-86 (HA)	% FARMLAND LOST	RATIO 2/3
OVER 1,000,000					
Toronto	168,624	66,055	34,099	28.1	1.9
Montreal	74,763	24,956	17,719	25.0	1.4
Vancouver	29,610	7,980	16,590	21.2	0.5
(Sub-Total)	272,997	98,991	68,408	26.6	1.4
500,000 - 999,999					
<u>East</u>					
Ottawa-Hull	125,374	44,857	15,258	26.4	2.9
Quebec	33,268	14,183	9,700	30.8	1.5
Hamilton	57,639	12,657	5,426	18.0	2.3
(Sub-Total)	214,902	71,691	30,384	25.0	2.4
<u>West</u>					
Edmonton	652,430	(51,480) ¹	25,780	(8.5)	(2.0) ¹
Calgary	276,391	19,466	18,354	6.5	1.1
Winnipeg	306,075	18,182	11,046	5.6	1.6
(Sub-Total)	1,234,896	(14,206) ¹	55,180	N/A	(0.2) ¹
Over 500,000	1,722,795	156,476	153,972	8.3	1.0
100,000-500,000					
Saskatoon	352,112	8,377	3,693	2.3	2.3
Regina	298,670	(4,227)	3,090	(1.4)	(1.4)
Remaining 14	401,780	52,525	56,443	11.6	0.9
5 Prairie Cities	1,885,678	(10,056)	61,963	(0.5)	(0.2)
16 Small CMA's	1,052,562	56,676	63,226	5.1	0.9
25 CMA's	2,775,357	213,152	217,198	7.1	1.0

Sources: Environment Canada, Lands Directorate
Census of Agriculture

¹ Number in () denotes additions to improved farmland.
1966 areas adjusted to 1986 CMA definitions.

interested in resource use, especially the economics of agricultural production, to monitor changes in farming and food production in the city's countryside. Its major disadvantage for purposes of monitoring the impact of urbanization or rural/urban land use changes on the economics of agricultural production is that it does not distinguish the reasons for the loss of agricultural land. Urbanization or dispersed rural/urban fringe development is only one of a number of reasons for land to leave agricultural production.

Table 5 places the loss of farmland for the two decades from 1966 to 1986 in Canada's CMAs, including the five major Prairie cities, in a national context. It also attempts to depict the role of urbanization in farmland losses. Approximately 213,000 ha of farmland inside the boundaries of the 25 CMAs, just shy of the approximately 217,000 ha determined by Environment Canada to have been converted from rural to urban purposes, was lost from 1966 to 1986.¹⁶ However, perusal of these data by individual city, city class size and region demonstrates that the match in the aggregate totals is likely only coincidental. The ratio of farmland decreases in the three largest cities over 1,000,000 population to newly urbanized land was 1.4, while it was 2.4 for the three Eastern cities with populations 500,000 to 1,000,000. The three largest Prairie cities of similar size to their middle-sized Eastern counterparts experienced small net gains in farmland — about 14,000 ha, or one percent of the total — despite the conversion of over 55,000 ha of rural land to urban purposes. The five Prairie cities together experienced a gain of one half of one percent in improved farmland from 1966 to 1986. The explanation for this phenomenon is that while some lands in close proximity to large regional cities are being converted from rural to urban purposes, other lands are being converted from some other use to agricultural use. The data also indicate that the largest farmland losses, especially losses greater than measured urbanization over the 1966 to 1986 period, were concentrated in the three largest cities and in the three Eastern cities with populations over 500,000. About 80 percent of net farmland losses occurred in these six cities. Again, while these data do not necessarily comprise evidence of where dispersed settlement is occurring in the urban/rural fringe, taken together with the fact that these same six cities accounted for about 73 percent of fringe growth from 1966 to 1991, there does seem to be an association between the location of dispersed settlement and farmland loss.

Data for individual cities shows even wider variation in the ratio of lost farmland to newly urbanized land. At one extreme is Vancouver, where newly urbanized land exceeded losses of farmland by a factor of over two for one, leading to the conclusion that a considerable portion of new urban use in the Vancouver area is not occurring on farmland. The Vancouver region still lost over 21 percent of its 1966 farmland by 1986, despite the fact that its development densities for urban

TABLE 5
AGRICULTURAL LAND AND URBANIZED LAND, 1966 - 1986

CITIES AND POPULATION ²	(1)	(2)	(3)	(4)	(5)
	IMPROVED FARMLAND		LAND URBANIZED 1966-86 (HA)	% FARMLAND LOST	RATIO 2/3
	1986 (HA)	LOST, 1966- 86 (HA)			
OVER 1,000,000					
Toronto	168,624	66,055	34,099	28.1	1.9
Montreal	74,763	24,956	17,719	25.0	1.4
Vancouver	29,610	7,980	16,590	21.2	0.5
(Sub-Total)	272,997	98,991	68,408	26.6	1.4
500,000 - 999,999					
<u>East</u>					
Ottawa-Hull	125,374	44,857	15,258	26.4	2.9
Quebec	33,268	14,183	9,700	30.8	1.5
Hamilton	57,639	12,657	5,426	18.0	2.3
(Sub-Total)	214,902	71,691	30,384	25.0	2.4
<u>West</u>					
Edmonton	652,430	(51,480) ¹	25,780	(8.5)	(2.0) ¹
Calgary	276,391	19,466	18,354	6.5	1.1
Winnipeg	306,075	18,182	11,046	5.6	1.6
(Sub-Total)	1,234,896	(13,832) ¹	55,180	N/A	(0.2) ¹
Over 500,000	1,722,795	156,850	153,972	8.3	1.0
100,000-500,000					
Saskatoon	352,112	8,377	3,693	2.3	2.3
Regina	298,670	(4,227)	3,090	(1.4)	(1.4)
Remaining 14	401,780	52,525	56,443	11.6	0.9
5 Prairie Cities	1,885,678	(10,056)	61,963	(0.5)	(0.2)
16 Small CMAs	1,052,562	56,676	63,226	5.1	0.9
25 CMAs	2,775,357	213,152	217,198	7.1	1.0

Sources: Environment Canada, Lands Directorate
Census of Agriculture

¹ Number in () denotes additions to improved farmland.

² 1966 areas adjusted to 1986 CMA definitions.

expansion were amongst the highest in Canada (34 ha/1,000 population change), and that the provincial government has possessed policies for farmland preservation since about 1974. At the other extreme was Ottawa-Hull, where the ratio of farmland lost to land converted from rural to urban purposes was almost three to one. Other cities with high ratios were Hamilton, Toronto, Saskatoon and Winnipeg.

The range of experiences for the Prairie cities will be described in greater detail below. Edmonton was in the most paradoxical situation. While almost 26,000 ha were converted from rural to urban use, the Edmonton CMA showed a gain of almost 52,000 ha in farmland. Calgary and Winnipeg experienced similar losses of farmland, but the much slower rate of urban growth in Winnipeg meant that farmland losses for the latter were 60 percent greater than the amount of land converted from rural to urban purposes. Losses of farmland in the Calgary CMA nearly matched the amount of land converted from rural to urban purposes, although as will be shown in Chapter Two, further disaggregation of data by Census subdivision shows that much greater losses in City and immediate vicinity of Calgary were matched by gains elsewhere in the CMA and further distant from the City of Calgary.

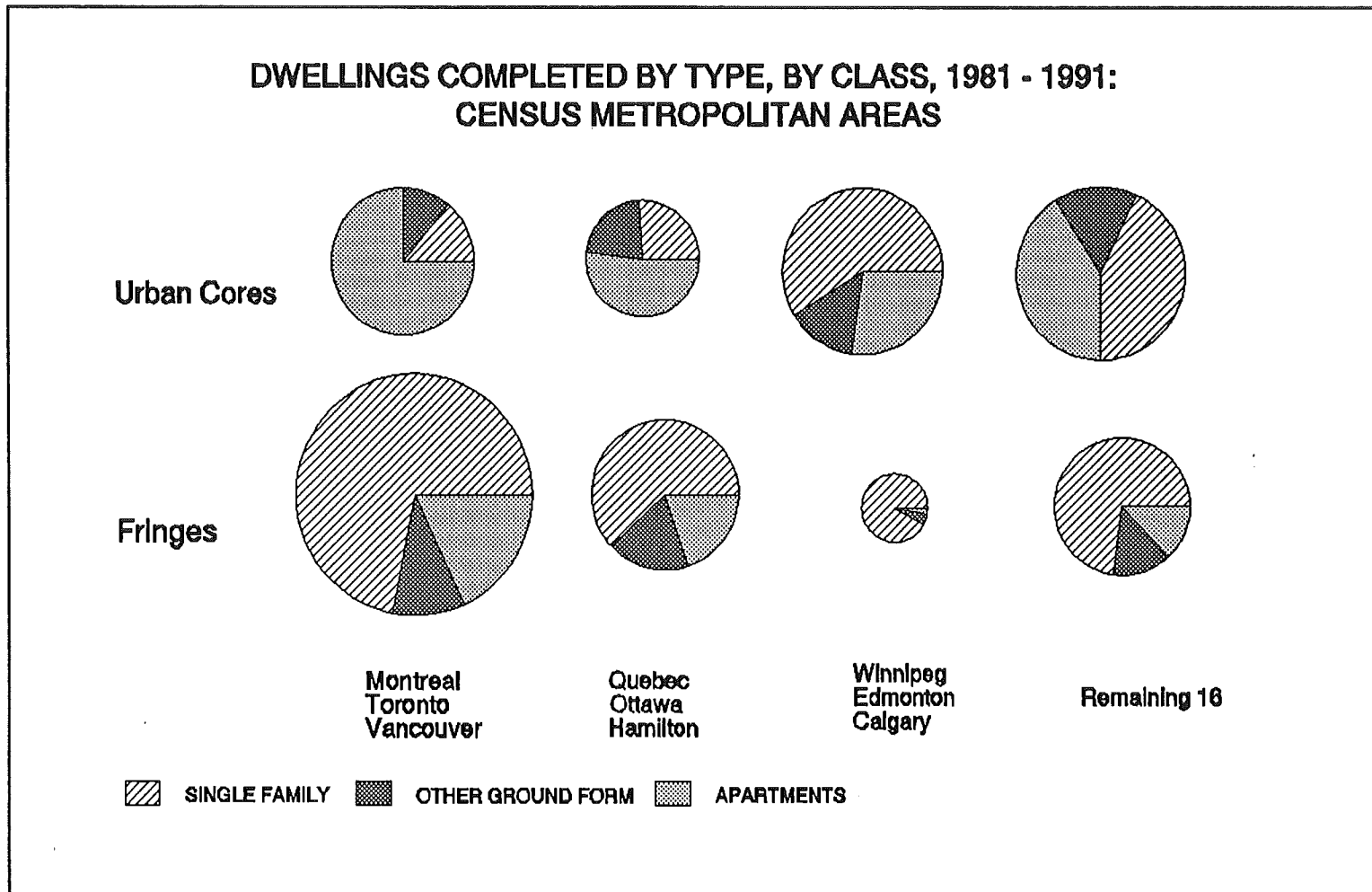
Land Conversion and Housing Construction

Low density suburban development is associated with singlefamily house construction. Data compiled with the assistance of the Canada Mortgage and Housing Corporation confirm that the most popular house form during the 1980s was the single family house — 52 percent of all completions in the 25 CMAs. About 35 percent of completions were apartments, and the remaining 13 percent were duplexes and row houses. The proportion of all completions comprised of single-family homes was significantly different than the large-city national average only in the three large Prairie cities, where it comprised 62 percent. It was 49 percent for the three largest metropolises, 50 percent for the average of Quebec, Ottawa and Hamilton, and 54 percent for the average of the 16 smaller CMAs.

Figure 3 shows that single-family home construction was the dominant type of completion in the fringe areas — 70 percent for the 25 CMAs combined, and 72 percent for fringe areas of the three largest metropolises, 62 percent for the average of the three mid-sized Eastern metropolises, 92 percent for the fringe areas of the three large Prairie metropolises and 73 percent for the fringe areas of the 16 smaller CMAs.

While residential construction was considerably more buoyant in the last half of the 1980s than in the first half, there were few noticeable trends in type of completion through the decade. There was

FIGURE 3



Note: Circle sizes portray relative numbers of dwellings completed.
 Source: Canada Mortgage and Housing Corporation.

a small decrease in the proportion of completed dwellings comprised of the medium-density types — duplexes and row houses — from the early to late 1980s. Regionally, completions of single-family homes increased from 52 to 77 percent of the total from the early to late 1980s in the three large Prairie cities, and it is quite likely this trend in Prairie Cities that may be associated with their lower densities of development.

Summary

The purpose of this initial chapter has been to place the urbanization and urban/rural fringe development of the Prairie countryside into an overall Canadian context:

1. One of the most remarkable conclusions is that in the quarter century from 1966 to 1991 the territorial extent of Canada's 25 CMAs, areas that can loosely be portrayed as urban labour force commuting zones, increased fivefold, from about 13,750 km² to 69,200 km². The population of these same CMAs increased by one-eighth that amount — 62 percent. The territory encompassed by the fringe areas of the CMAs, that is those contiguous areas outside the urban core developed at densities that average less than 10 persons/ha, increased by over eight times, while the resident population of the fringe increased by over 12 times, from four to over 31 percent of total CMA population. These trends continued in the most recent ten-year period from 1981 to 1991; the population of fringe areas of the 25 CMAs increased by 35 percent, while the population of urban cores increased by ten percent. While the requirement by Census Canada that municipal boundaries be used to delimit CMAs and Census Agglomerations (CAs) limits the usefulness of these data, and while the standard adopted herein that fringe areas of CMAs are those contiguous municipalities with gross population densities of less than 10 persons/ha have influenced these conclusions, there is evidence that these conclusions nevertheless reflect reality; the density of the much expanded urban fringe is almost double that of a much smaller 1966 fringe area.
2. The three large Prairie cities exhibited some characteristics that make them relative anomalies within Canada. Firstly, the territory included within the municipal boundaries of the urbanized cores (central-cities with one exception) increased more rapidly than central city populations: 64 percent population increase and an increase of 86 percent in

the areas of the central cities between 1966 and 1991. Territorial accretions have been generous enough that the areas of the three central cities were comprised of an average of 30 percent farms in 1986. The density of the urban core for the three largest Prairie cities was about one half of that for cities of similar size cities — Ottawa-Hull, Quebec and Hamilton — in the East (two thirds if farmland inside the city limits of the urban core in the three Prairie cities is deducted from the total) and about one-fourth the density of the urban cores of the three largest cities with populations over 1,000,000 — Toronto, Montreal and Vancouver.

3. Fringe development of the Prairie countryside also sets the Prairie cities apart as a group. While the population of the urban fringe of the three largest Prairie cities increased by 20 times over the 25 year period, and the territory encompassed by the fringe areas by about 30 times, the proportion of CMA population resident in the fringe area still comprised only 12 percent of the total CMA population, *versus* 29 percent for the three largest cities, 54 percent for the three Eastern cities with similar populations, and 34 percent for the 16 CMAs with populations from 100,000 to 500,000. Unlike in the rest of Canada, the standard practice of Census Canada, a change since 1966, of dictating that CMA boundaries be coterminous with municipal, or subdivision, boundaries may have artificially expanded the territory included within the three largest Prairie CMAs. The population density of the fringe areas in 1991 was one-third of the 1966 level and one-fifth the density of the fringe areas in the remaining 22 CMAs.

3. The data obtained from Environment Canada likely provide a much more accurate view of actual urbanization processes. However, while they reveal much about what is occurring on the limits of the built-up urban area, they reveal much less about the subject of the urban/rural fringe. Nevertheless, the data show that built-up urban densities are increasing in Canada's urban areas. The data indicate that the quantity of land used per 1000 population in the 25 CMAs decreased from 61 to 55 ha. While the largest three cities had the greatest densities and continued to use almost 40 percent less land than per 1,000 increase in population than the average for all CMAs, the greatest proportional gains in density of new development in the quarter century were in the smaller CMAs and the three large Prairie CMAs.

4. The amount of land used per 1,000 increase in population in the three Prairie cities decreased from 103 (1.7 times the average for all CMAs) to 82 (1.5 times the average for all CMAs). However, new development in the three largest Prairie cities absorbed close to 90 percent more land per 1000 increase in population as development in the same period for the three largest cities.

5. The experience of individual cities varies considerably from their class averages. Vancouver and Winnipeg come close to illustrating opposites with respect to intensity of land use. The amount of land used per 1,000 increase in population in Vancouver from 1966 to 1986 was less than half that for the built-up area of the city region prior to 1966, although its intensity of land use was still one-fourth less than for Toronto in the same period. On the other hand, the intensity of land use for Winnipeg for the same period was almost 50 percent less than it had been for the historical period prior to 1966, partly the result of a considerable thinning out of the historic inner city.

6. Use of the Census of Agriculture to measure the extent of rural to urban land conversion shows that the concentration of farm losses in excess of new land included in urban boundaries tended to be concentrated in the three largest cities, where the amount of land lost to improved farmland with respect to newly urbanized land was greater by a factor of 1.4 times. It was 2.4 times for the three Eastern cities with populations of 500,000 to 1,000,000. It is probably also reasonable to conclude that more than urbanization and increased country living in the urban/rural fringe are responsible for these larger ratios. The proportion of improved farmland in the CMA lost to agricultural production in these six cities generally ranged from 20 to 30 percent. The ratio of farmland lost from 1966 to 1986 to land converted from rural to urban use for the Prairie cities of Saskatoon and Winnipeg resembled ratios for the three largest cities.

CHAPTER 2

Rural/Urban Fringe Development in Prairie Regional Cities

Among the features setting Prairie cities apart from others include the fact that: (1) they are located in a fragile ecosystem critically threatened by the agriculture and energy producing sectors that are the main economic base of a primarily resource-based region: (2) they are located on a largely featureless plain, facilitating development and commuting in all directions: and (3) Prairie cities have historically developed to serve the resource industries of the Prairie region. While Prairie cities play national roles, they do so primarily with respect to the development and exploitation of the Prairie's rich resources, agriculture, forestry and mining, in all three Prairie provinces, and energy exploration and recovery in Alberta, and to a lesser extent Saskatchewan. While many of the resources of the Prairie provinces lie outside the grasslands region, primarily in the boreal forest that occupies the Northern parts of the Prairies provinces, the exploitation of those resources is often administered in the grasslands cities.

The Prairie Regional Cities and the Grasslands Region

The Prairie grasslands region in which the five regional cities are located occupies approximately 522,000 km², 27 percent, of the area of the three Prairie provinces (Environment Canada, 1991, p. 17-4). While much of the current wealth of the region stems from exploitation and development of less visible underground resources, as well as resources in the northern parts of the three Prairie provinces outside the grasslands region, the traditional resource focus and the main visible geographic feature of the region is farming. In 1986, 87 percent of the surface area of the grasslands region was in farmland, a proportion that has largely remained unchanged for the past 25 years. The degree of annual cultivation of the region, also known as Canada's "breadbasket," is high — possibly exceeding that of any other comparable region in the world, and it continues to expand. From 1971 to 1986, the proportion of the region devoted to cropland increased by almost 22 percent, and the proportion devoted to improved pasture increased by almost five percent. Paralleling the increase in the extent of cropland, the proportion of land area devoted to summer fallow, the second largest land use on Prairie farms, decreased by 22 percent, and the proportion comprised of woodland — only one half of one percent — decreased by 63 percent in the same time period (Environment Canada, 1991, p. 17-8).

In 1991, about four million people, over 85 percent of the population of the three Prairie provinces and nearly 15 percent of Canada's population, lived in the grasslands region. The remaining population of the three Prairie provinces lived principally in the boreal forest and grasslands regions north of the Prairie grasslands. Approximately 2.7 million people, 66 percent of the grasslands population, lived in the five Census Metropolitan Areas comprising the grasslands region's five regional cities, making the region at one and the same time one of Canada's most urbanized regions, as well as a sparsely populated one. The territory encompassed in the five CMAs — approximately five percent of the grasslands region — comprises most of the area of the five regional cities and their urban/rural fringes.¹⁷

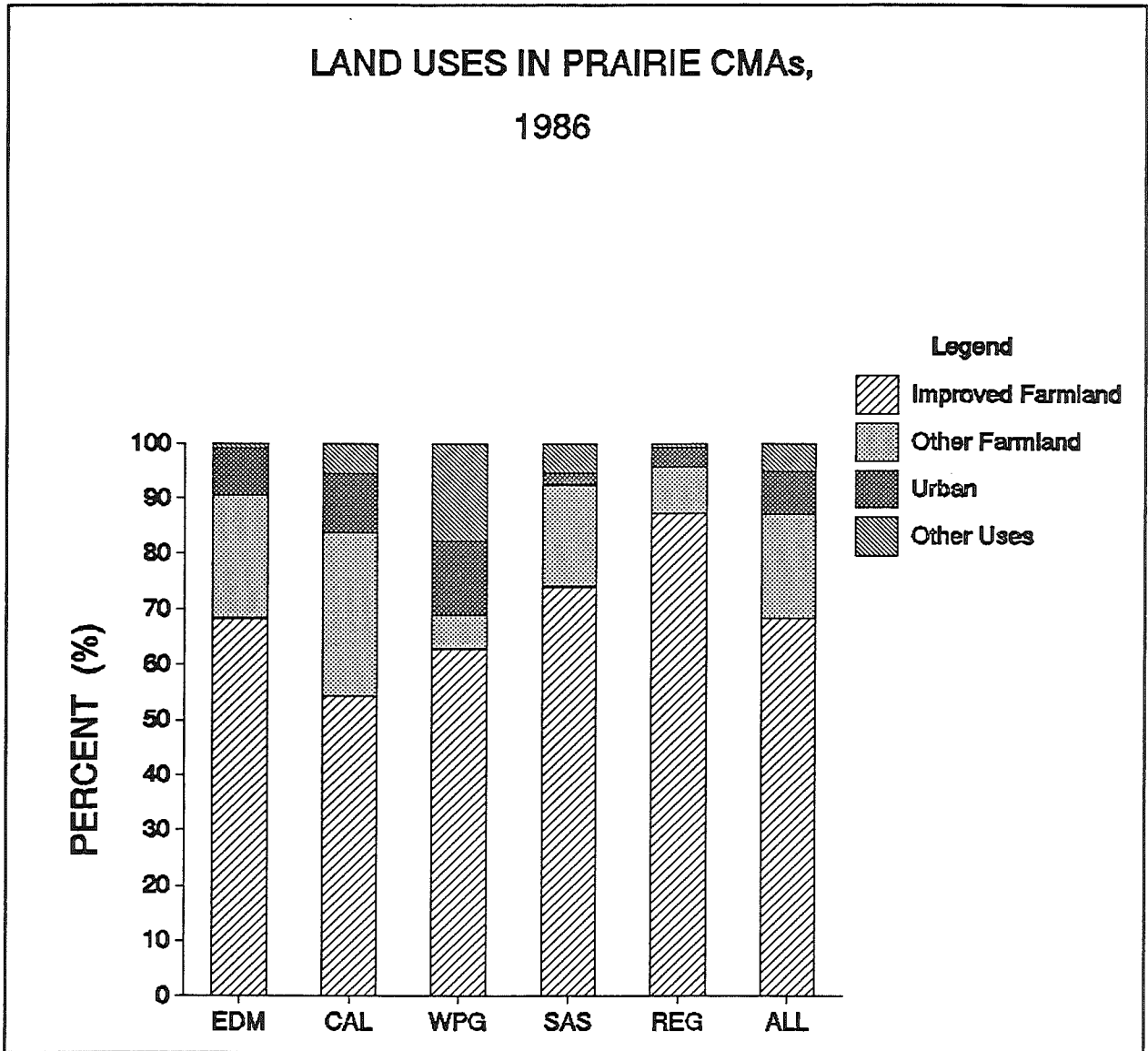
Most of the land contained in the five CMAs and in the regions of Calgary and Winnipeg that have been added to the CMAs for purposes of this report continues as farms and in crop cultivation. In 1986, it is estimated that almost eight percent of the land in the five CMA areas was urbanized, an increase of 2.4 from 5.5 percent in 1966. Over 87 percent of the area included in the five regional city areas was farmland in 1986. While this proportion was about the same as for the Prairie grasslands region as a whole in the same year, the increasing extent of urbanization is likely reflected in the fact that farmland use decreased by close to five percent in the CMAs (three percent for the larger regional city areas), while the farmland decrease over the same period for the Prairie grasslands region as a whole was less than one percent. In 1986, over 68 percent of farmland was improved farmland in the regions of the five cities, slightly higher than the estimated 62 percent for the Prairie grasslands region as a whole, and likely reflecting the quality of farmland in the regions of the five cities.

Figure 4 summarizes land uses by CMA for 1986. Urbanized areas ranged from 2.2 percent for Saskatoon to 13.3 percent of CMA land areas for Winnipeg. Most of the balance was in farmland, the proportion for which varied from under 69 percent for Winnipeg to almost 96 percent for Regina. Other remaining uses were less than one percent in Regina and Edmonton, approximately five percent for Calgary and Saskatoon and almost 18 percent for Winnipeg. Winnipeg lies at the eastern edge of the Prairie grasslands, and a large portion of the lands on the eastern fringe of the Winnipeg CMA not used for farming or urban purposes remains as Aspen parkland.

Principal Characteristics of Prairie Cities

The characteristics of Prairie cities have changed in the past quarter of a century. While significant differences between individual cities existed in 1986, the intervening 25 years have resulted

FIGURE 4



Sources: Census of Population, 1986
Census of Agriculture, 1986
Environment Canada State of the Environment Reporting Branch

characteristics that set it apart from other Canadian cities. Determined by the geography and economy of the Prairie, it is a type that increasingly possesses a regional identity despite the changes that have occurred.

One feature generally setting Prairie cities apart from others, and which is shown in Table 6, as well as in Table 1 above, is the relatively smaller proportion of total CMA population residing outside the central cities or urban cores in the urban/rural fringe than in most of Canada's other CMAs.

Related to relatively small fringe-area populations are the policies of Prairie provincial and municipal governments towards incorporation of rural lands destined for urbanization into municipal boundaries of the central cities prior to urban development.¹⁸ The amalgamation of 14 of the 16 municipalities then included within the CMA into Greater Winnipeg in 1961, succeeded in 1971 by the formation of a single municipality — Unicity—resulted in the incorporation of sufficient farmland into the city to provide space for urbanization for over a quarter of a century.¹⁸ Under these circumstances, of which Winnipeg is the most extreme case, country residential development has occurred inside the boundaries of central cities, and some large urban centres have had to be as concerned about the economics of agricultural production as the rural municipalities at their edge. Thus the urban/rural fringe may be said to exist as well inside the city limits of Prairie cities. Under these circumstances, the subject of the urban/rural fringe, including policies with respect to local taxation of farms, the economics of agricultural production, the nature of relationships between rural and urban land uses and others, are of concern to urban planners and municipal councils. One of the objectives of this chapter is to provide a functional conception of the urban/rural fringe that is not tied to municipal boundaries.

Having said this, it is also important to stress that the historical practice for the majority of Prairie cities has not been to annex rural lands so far ahead of development, although the 1980s may have also made such a practice more common. Table 7 shows that Winnipeg was the only major Prairie city to include sizeable blocks of farmland in 1966. However, by 1986 three of the five Prairie cities, Edmonton, Winnipeg and to a lesser extent Calgary, contained large areas of farmland.²⁰ One of the issues that will be addressed below is whether or not a policy of encouraging early annexation of rural lands to cities, a policy that is undoubtedly conducive to a more rational approach to developing newly urbanized lands, might also become a hindrance to meeting the objective of conserving land.

Table 8 shows that the land area contained in the municipal boundaries of core cities — identical to the central cities in four of the five regional centres and with Edmonton and St. Albert combined in the case of the Edmonton CMA — has tended to keep pace with or exceed the actual

**TABLE 6
POPULATION, AREA & DENSITIES, PRAIRIE CMAs AND COMPONENTS, 1966 - 1991**

	POPULATION (000)				AREA (Ha)				DENSITY (Ha/1000) Population			
	1966	1981	1986	1991	1966	1981	1986	1991	1966	1981	1986	1991
Edmonton												
Urban Core ¹	376.9	573.9	610.7	658.9	20,760	36,140	70,370	70,410	18.2	15.9	8.7	9.4
Fringe	24.4	165.4	163.3	181.0	27,550	1,086,960	1,052,130	882,790	0.9	0.2	0.2	0.2
CMA	401.3	739.3	774.0	839.9	48,310	1,123,100	1,122,500	953,200	8.3	0.6	0.7	0.9
Calgary												
City	330.6	592.8	636.8	710.7	38,480	50,500	53,480	69,690	8.6	11.7	11.9	10.2
Fringe	nil	33.2	34.6	43.4	nil	455,100	452,110	438,890	--	0.1	0.1	0.1
CMA	330.6	626.0	671.4	754.0	38,480	505,600	505,600	508,580	8.6	1.2	1.3	1.5
Winnipeg												
City ²	504.2	564.5	594.6	616.8	54,370	57,160	57,160	57,160	9.3	9.9	10.4	10.8
Fringe	4.5	27.6	30.8	35.6	12,230	272,320	272,320	272,320	0.4	0.1	0.1	0.1
CMA	508.8	592.1	625.3	652.4	66,600	329,480	329,480	329,480	7.6	1.8	1.8	2.0
Saskatoon												
City	115.9	154.2	177.6	186.0	7,710	12,200	13,230	13,540	15.0	12.6	13.4	13.7
Fringe	nil	20.8	23.0	24.0	nil	462,730	461,700	461,400	--	--	--	--
CMA	115.9	175.0	200.7	210.0	7,710	474,940	474,940	474,940	15.0	0.4	0.4	0.4
Regina												
City	131.1	163.0	175.1	179.2	7,225	11,010	11,010	11,140	18.1	14.8	15.9	16.1
Fringe	nil	10.2	11.4	12.5	nil	331,160	331,160	331,030	--	--	--	--
CMA	131.1	173.2	186.5	191.7	7,225	342,170	342,170	342,170	18.1	0.5	0.5	0.6
Prairie Cities												
Urban Core	1,458.7	2,048.4	2,164.8	2,351.2	128,545	167,010	205,250	221,940	11.3	12.3	10.5	10.6
Fringe	29.0	257.2	263.1	296.4	39,780	2,608,270	2,569,420	2,386,430	0.7	0.1	0.1	0.1
CMAs	1,487.6	2,305.6	2,400.9	2,944.4	168,325	2,775,280	2,774,670	2,608,370	8.8	0.8	0.9	1.1

Source: *Census Canada, Various Years*

1. Urban core in 1981 and afterward consists of cities of Edmonton and St. Albert.

2. Winnipeg city in 1986 includes municipalities comprising the municipality of Great Winnipeg, in a more identifiable type, one that may be portrayed as a Prairie type. It increasingly possesses common, identifiable

TABLE 7 URBAN FARMS, PRAIRIE CITIES, 1966 AND 1986								
CITY AND FARM AREAS (Ha)	FARMLAND (Ha)		TOTAL AREA (Ha)		NON FARM AREA (Ha)		NON-FARM (Ha/1000 Pop.)	
	1966	1986	1966	1986	1966	1986	1966	1986
Edmonton	—	37,598	20,760	67,010	20,760	29,412	55.1	51.2
Calgary	—	3,417	38,480	53,480	38,480	50,063	116.3	78.6
Winnipeg	35,211	13,626	54,370	57,160	19,159	43,534	38.0	73.2

Sources: Census of Agriculture, 1966 and 1986.
Census of Population, 1966 and 1986
Environment Canada, Lands Directorate and State of the Environment Reporting Program.

TABLE 8 URBANIZED AREAS, PRAIRIE CITIES, 1966 AND 1991						
	(1) URBAN CORE (Ha) ¹		(2) URBANIZED AREA (Ha)		RATIO 2:1	
	1966	1986	1966	1986	1966	1986
Edmonton	20,760	70,370	57,465	83,345	2.8	1.2
Calgary	38,480	53,480	37,332	55,686	1.0	1.0
Winnipeg	54,370	57,160	32,699	43,745	0.6	0.8
Saskatoon	7,710	13,230	6,774	10,467	0.9	0.8
Regina	7,225	11,010	9,163	12,253	1.3	1.1
Prairie City	128,545	205,250	143,433	205,496	1.1	1.0

Sources: 1) Statistics Canada, *Census*, 1966 and 1986.

2) Environment Canada, Lands Directorate and State of the Environment Reporting Program.

¹ Urban Core = central city(ies). Urban core and central cities are identical for Calgary, Regina, Saskatoon and Winnipeg. Edmonton urban core includes cities of Edmonton and St. Albert.

extent of urbanization as monitored by Environment Canada. Only in Edmonton and Regina does the extent of urbanization in the CMA exceed the land area of the urban core.²¹

Prairie Cities and Conversion of Rural Land

Prairie cities — urban cores and central cities, in part because they have tended to annex rural sparsely populated lands for new suburban development that in other regions in Canada would be developed in suburban municipalities and often in municipalities whose gross densities were below the threshold required to have them included as part of the urban core, are more sparsely settled than cities of similar size in Eastern Canada. The passage of time has made this generalization perhaps even more true than it might have been in the past. As was discussed above, the proportion of newly constructed dwellings comprised of single-family homes was considerably higher in the 1980s in Prairie cities than in other Canadian cities, and this difference is also likely a major reason for lower densities in Prairie cities than elsewhere in Canada. Both of these tendencies have likely overwhelmed, at least as far as urban densities are concerned, the efforts of planners, especially in Calgary, to increase net development densities. In 1966, the average intensity of land used per 1000 population was 103 ha/1,000 population for the three largest Prairie cities, compared to 59 ha/1,000 population for the three Eastern cities in the same size class.²² Most of the differential between the intensity of land use in the Eastern and Prairie cities resulted from relatively low intensity of land use in Calgary and Edmonton. The average intensity of land used for urban purposes in 1966 in Winnipeg, Regina and Saskatoon, the three older cities among the five, was only about eight percent less than for the Eastern cities with populations 500,000-1,000,000.

During the two decades between 1966 and 1986, the three largest Prairie cities converged with respect to intensity of land use. At 95 ha/1,000 population change for the period 1966 to 1986, Winnipeg was one of the most profligate users of land amongst Canada's major cities. This is undoubtedly attributable in part to the migration of large numbers of former residents of the relatively densely developed inner city to new suburbs. By way of contrast, the use of land in new developments in Calgary and Edmonton was comparable in intensity to new developments in Eastern cities of the same size, and by 1986 the overall densities of the urbanized areas of Calgary and Winnipeg were comparable.²³ Edmonton remains the lowest density major city in the Prairie grasslands region and in Canada.

Table 9 provides additional details on the conversion of rural to urban land for the five major Prairie cities for the four quinquennial periods from 1966 to 1986 for which Environment Canada

TABLE 9
RURAL TO URBAN LAND CONVERSION, MAJOR PRAIRIE
URBAN AREAS, 1966-1986

	WPG	REG	SASK	CAL	EDM	TOTAL
Rural to Urban Land Conversion (ha)						
1966-1971	4,385	380	474	6,417	6,552	18,208
1971-1976	1,300	1,164	442	4,964	5,808	13,678
1976-1981	3,258	1,033	1,609	3,420	4,789	14,109
1981-1986	2,103	513	1,168	3,553	8,731	16,068
Total	11,046	3,090	3,693	18,352	25,880	62,061
Per Cent Agriculture Class I-III						
1966-1971	100.0	97.6	42.4	45.0	81.6	72.4
1971-1976	99.6	97.6	76.7	65.8	85.0	80.2
1976-1981	92.8	69.2	59.0	67.7	54.0	67.9
1981-1986	79.6	79.7	71.7	48.3	46.2	54.0
Average	97.9	85.1	63.0	55.5	65.3	69.0
Population Change						
1966-1971	35,188	8,343	10,549	72,768	69,938	196,786
1971-1976	25,641	10,114	7,301	66,574	51,257	160,887
1976-1981	8,139	14,868	41,308	135,134	125,678	325,127
1981-1986	33,243	13,295	25,607	45,360	44,583	162,088
Total	102,211	46,620	84,765	319,836	291,456	844,888
Hectares Land Converted/1000 Population Change						
1966-1971	125	46	45	88	94	92
1971-1976	51	115	60	74	113	85
1976-1981	400	69	39	25	38	43
1981-1986	63	38	46	78	195	99
1966-1986	95	56	52	43	59	73
Urbanized Area (Ha)						
1966	32,699	9,163	6,774	37,332	57,465	143,433
1986	43,745	12,253	10,467	55,686	83,345	205,496
Gross Density Urban Ha/1000 Population						
1966	64	70	58	113	149	96
1986	70	66	52	74	99	86

Sources: Environment Canada, Land Directorate.
Census Canada

maintained its monitoring program. A total of over 62,000 hectares was converted from rural to urban use. Despite the variations in population growth in the four periods, the amount of land converted from rural to urban uses during the four quinquennial periods under review was similar, varying from under 14,000 to over 18,000 hectares per period. One result of this pattern is that land use for new urban development was relatively efficient during high-growth periods, for instance 1976 to 1981, but much less efficient during low-growth periods. The data might otherwise enable the observer to conclude that Prairie cities were becoming relatively more efficient at converting land from rural uses for new urban development, except that the slowest proportional growth was experienced during the period 1981 to 1986, and this period is identified as the least efficient with respect to converting rural land to urban purposes. The three earliest periods were characterized by increasing densities on newly converted lands. Figure 5 portrays the experience of each of the major Prairie cities for the four quinquennial periods under review.

One positive development in this two decade period from 1966 to 1986 may be a trend towards concentration of new urban development on less desirable agricultural lands. The proportion occurring on prime agricultural land was over 80 percent for the period 1971 to 1976 for the five cities, and it decreased to 54 percent for the period 1981 to 1986. The experience in the three largest cities was in the same direction, but there was no clear pattern with respect to Regina and Saskatoon. However, as will be explored below, there is no clear indication that this trend may be attributed to public policy.

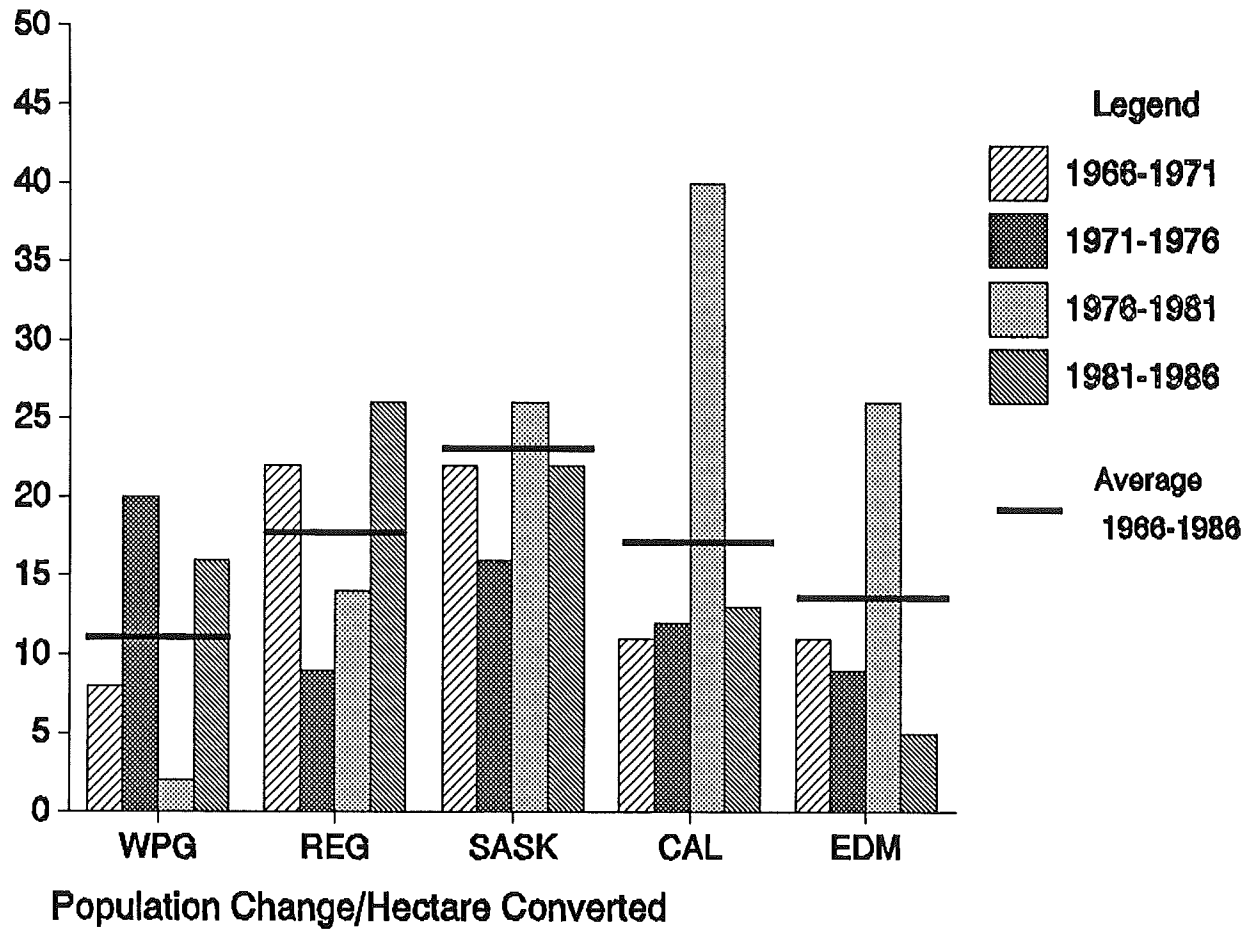
The Urban/Rural Fringe in the Prairie City

Parallel to increased territories for Prairie urban cores, the land area encompassed by the Prairie CMAs also increased significantly through the study period. The land area contained in the five urban cores increased from 129,000 to 205,000 ha, a 60 percent increase, to accommodate a 61 percent increase in population. The land area contained in what is identified from Census data as the fringe increased almost 60 times from just under 40,000 to almost 2.4 million hectares. As was indicated above, much of this increase is occasioned by the fact that the rural municipalities adjoining Prairie cities are often very large in extent, and Census Canada policy is that CMA boundaries coincide with municipal, or Census subdivision, boundaries. The total population increase of the fringe areas was slightly in excess of eight times from 1966 to 1991, and it would have been greater had extensive areas not been annexed to the urban core cities during this period.

Table 6 above shows that historically and as recently as a quarter century ago, the Prairie city was a relatively autonomous central city with few if any suburbs that were considered a part of a

FIGURE 5

RURAL TO URBAN LAND CONVERSION, 1966-1986



commutershed and meriting inclusion by Statistics Canada in a Census Metropolitan Area. In the case of Calgary, Saskatoon and Regina, the CMA boundaries were coterminous with the limits of the central city in 1966. Few people other than the farm population, and certainly fewer commuters, resided in the rural areas surrounding these central cities. Three of the Prairie cities — Regina, Saskatoon and Calgary — were relatively dense central cities surrounded for the most part by sparsely settled areas used predominately for agricultural production. The fringe area outside Edmonton comprised 57 percent of the CMA area, but contained only six percent of its population in 1966. Winnipeg's fringe population of less than one percent of the CMA total resided in two municipalities that comprised some 18 percent of the CMA's total land area.

Much has changed in the succeeding 25 years, although the Prairie cities as a group continued to have a lower proportion of their total CMA populations living in fringe areas outside the urbanized core in 1991 than other groups of major cities or individual cities in Canada. In 1991, Edmonton remained the only Prairie city with a significant fringe population — 21.5 percent of the CMA total. The proportions for the remaining four large centres ranged from 5.4 percent for Winnipeg to 11.4 percent for Saskatoon. While these proportions were more or less constant for 1981, 1986 and 1991, there was a small decrease in the rural fringe population of Edmonton associated with an annexation of slightly less than 35,000 hectares of land to the city in the early 1980s. As well, major annexations to Calgary, Regina and Saskatoon also contributed to smaller increases in the urban/rural fringe population than would otherwise have occurred. As will be shown in Chapter 3, the period from 1971 to 1981 is generally identified as the only one with significant additions to the urban/rural fringe population in these 25 years. However, the numerous and often extensive annexations to four of the five Prairie cities and the relatively large growth in the fringe population of the fifth city, Winnipeg, could also allow observers of the urban/rural fringe to conclude that the fringe areas remain attractive as residential locations. The extent to which this "consumer" demand, which may have been dormant through the late 1980s as a result of local and national economic conditions, may be realized will likely depend in part on the future level of economic activity in the five cities.

The urban/rural fringe of Prairie cities, unlike in most of Canada, may be portrayed as a constantly receding one, one whose inner boundaries continually move outward as the central city or cities annex the next area designated for urban development. And when annexations occur far enough in advance of urban development, a part of the urban/rural fringe and the planning issues and problems identified with the fringe may exist in the city as well. Planners in the Prairies' large cities are often called upon to address such problems.²⁴

**TABLE 10
LAND USE CHANGES AND URBANIZATION, MAJOR PRAIRIE CMAs
1966 - 1986**

CMA	Percent Change, 1966- 1986 ¹		Percent CMA Farm Sizes of Provincial		Ratio of Newly Urbanized Land 1966-1986 to Farmland Lost(%)
	No. of Farms	Farmland	1966	1986	
Edmonton	(11)	4	25	37	na ²
Calgary	(8)	(17)	90	74	21
Winnipeg	(42)	(13)	47	82	32
Saskatoon	(10)	(4)	73	65	20
Regina	(11)	2	77	69	NA ²
Prairie Cities	(16)	(7)			31

Sources: Environment Canada, State of the Environment Reporting Branch
Census of Agriculture, 1966 and 1986.

Note: ¹Numbers in parenthesis () indicate decreases.
²Farmland created exceeds farmland loss to urbanization.

One of the most difficult subjects to address is the precise nature of the relationship between land-use changes, principally the loss of agricultural land, and urban development in the urban/rural fringe of the major Prairie cities. While there can be no doubt, especially with the assistance of an urban land-use monitoring program such as that operated by Environment Canada from 1966 to 1986, that the loss of valuable prime agricultural lands, as well as wetlands and woodlands, is associated with urbanization, it is not clear how much of land-use change and resource use may be attributed casually to urbanization. Nor is the focus for mitigating any undesirable changes in resource use and availability clear. So many other factors are involved in the loss of agricultural lands and farmlands, and so many other factors are critical to sustaining farming in the Prairie grasslands that conversion to urban use may not be the most appropriate focus from the point of view of maximizing the value of resources while respecting the environmental limits to their development.

Nevertheless, data for Prairie cities show that there is a fairly strong association between the

loss of farmland and urbanization. Table 10 shows that farmland losses at the CMA level have other causes than urbanization, but that urbanization is likely a major one. From 1966 to 1986, farmland losses for the five major Prairie cities ranged from four percent for Saskatoon to 17 percent for Calgary. Urbanization of rural lands may have accounted for over 30 percent of losses for the major Prairie cities. Edmonton and Regina present an exception to the overall pattern. While urbanization from 1966 to 1986 in Edmonton is associated with the loss of nearly 26,000 hectares of land, the region experienced a gain of over 33,000 hectares of farmland, an increase of four percent, for the two decade period. Farmland increased by two percent in Regina in the same period.

On the other hand, disaggregation of data on farmland losses and gains to the municipality level, together with Census data on the location of additional dwellings to the housing stock, results in the conclusion that in addition to the conversion of rural land to urban uses, significant losses of farmland may also be associated with the addition of new, presumably dispersed in many instances, dwellings — country or rural residences — to the stock in the rural municipalities surrounding the major Prairie cities. Table 11 depicts changes in farmland areas and dwelling growth for rural and district municipalities in the five major Prairie cities.

For Winnipeg, the greatest proportional losses of farmland, in addition to the loss of over 21,000 hectares in the City of Winnipeg itself, were in East and West St. Paul, Tache, St. Andrews and St. Clements, and these were also rural municipalities experiencing major gains in rural fringe area dwellings. On the other hand, St. François Xavier, Rosser and Richthof rural municipalities experienced smaller losses, or gains, in farmland, and these municipalities also experienced smaller gains in numbers of dwellings for the two decade period. Springfield rural municipality was a major exception to this pattern. It both experienced a gain in farmland and a large gain in the number of dwellings. That it lies at the northeastern edge of the CMA, and that less than 75 percent of its land was utilized for farming in 1966, likely allowed it simultaneously to absorb gains in both farmland and additional dwellings in its countryside.

The Regina region as a whole shows the strongest relationship between farmland losses and urbanization. While the rural municipality which surrounds Regina showed a gain of only ten dwellings from 1971 to 1991, the loss of over 8,000 hectares of farmland can also be linked with the annexation of over 3,500 hectares to the City of Regina in the early 1980s. There were major gains in farmland in Edonwold rural municipality, which lies to the east of Regina and major losses in Pense rural municipality to the west of Regina, but neither event appears to be related to the appearance of rural residences. Lumsden rural municipality, which lies on the south bank of the Qu'Appelle River north

**TABLE 11
FARM AND FARM AREA CHANGES, PRAIRIE REGIONAL CITIES,
1966-1986**

MUNICIPALITY & URBAN AREA	1966			1986			1966 - 1986			New Dwellings 1971-1991
	Farms	Area (Ha)		Farms	Area (Ha)		Farms	Area (Ha)		
		Total	Improved		Total	Improved		Total	Improved	
Winnipeg Region										
Winnipeg City ¹	545	35,211	32,013	112	13,626	13,294	(433)	(21,585)	(18,719)	76,717
St. Francois Xavier	85	17,168	15,908	57	15,100	14,755	(28)	(2,068)	(1,153)	127
East & West St. Paul	187	9,824	8,500	64	5,325	4,980	(123)	(4,499)	(3,520)	1,614
Springfield	806	78,846	63,167	550	78,960	66,854	(256)	114	3,687	1,960
Rosser	195	40,279	38,124	163	37,963	37,135	(32)	(2,316)	(989)	139
Tache	418	49,691	41,114	303	41,910	37,792	(115)	(7,781)	3,322	1,387
Ritchot	248	30,550	29,113	188	33,979	32,375	(60)	3,429	3,262	870
Winnipeg CMA (1986)	2484	261,569	237,939	1437	226,863	297,185	(1047)	(34,308)	(20,754)	82,814
Cartier	201	57,585	54,818	146	55,635	53,569	(55)	(1,950)	(1,249)	194
MacDonald	511	103,407	101,188	406	111,514	109,342	(105)	8,107	8,154	433
St. Andrew	670	66,989	55,040	382	61,502	55,369	(288)	(5,487)	329	1,571
St. Clement	718	54,610	41,277	361	51,197	43,521	(357)	(3,413)	1,974	1,325
Winnipeg Region	4584	544,158	480,262	2732	506,711	468,986	(1852)	(37,449)	(11,546)	86,387
Regina Region										
Edonweld	417	91,129	79,199	395	98,499	89,351	(22)	7,370	10,152	362
Lumsden	285	77,397	61,152	276	79,254	65,708	(9)	1,857	4,554	177
Sherwood ¹	281	79,873	78,025	235	71,535	69,973	(46)	(8,338)	(8,052)	10
Pense	267	85,019	76,170	221	78,580	73,460	(46)	(6,439)	(2,710)	(19)
Regina CMA	1250	333,418	294,546	1127	327,868	298,490	(123)	(5,550)	4,214	530
Saskatoon Region										
Blucher	283	81,984	71,769	217	77,386	69,546	(66)	(4,598)	(2,223)	143
Corman Park ¹	1122	223,696	179,773	1004	205,079	168,490	(118)	(18,617)	(11,283)	881
Dundurn	140	66,683	38,000	118	71,777	39,550	(22)	5,094	1,550	25
Varnscoy	288	85,740	71,073	270	85,202	74,536	(18)	(538)	3,453	456
Saskatoon CMA	1801	458,103	360,615	1609	439,444	352,112	(192)	(18,659)	(8,503)	1,505

Table 11 (continued)

FARM AND FARM AREA CHANGES, 1966-1986										
MUNICIPALITY & URBAN AREA	1966			1986			1966 - 1986			New Dwellings
	Farms	Area (Ha)		Farms	Area (Ha)		Farms	Area (Ha)		
		Total	Improved		Total	Improved		Total	Improved	
<u>Calgary Region</u>										
Calgary City ¹	--	--	--	34	3417	2423	--	--	--	na
Rocky View ^{1, 2}	1536	513,000	295,858	1379	421,814	273,968	(123)	(87,763)	(19,462)	2,076
Calgary CMA	1536	513,000	295,858	1413	425,237	276,391	(123)	(87,763)	(19,467)	2,076
Foothills	1164	359,536	212,014	1212	363,999	224,030	48	4,463	12,016	1,189
Calgary Region	2700	872,536	507,872	2625	789,236	500,421	(75)	(83,300)	(7,451)	3,265
<u>Edmonton Region</u>										
Edmonton City	--	--	--	228	37,598	32,750	228	37,598	32,750	ha
Sturgeon	1483	203,785	173,233	1148	197,218	170,632	(335)	(6,567)	(2601)	1,469
Strathcona ¹	1208	133,074	99,533	899	92,635	71,565	(309)	(40,439)	(27,968)	6,496
Leduc	2307	294,293	203,851	2001	301,529	226,133	((306)	7,236	22,282	714
Parkland	1390	197,088	124,333	1379	232,669	151,350	(11)	35,581	27,017	2,172
Edmonton CMA	6388	828,240	600,950	5655	861,649	652,430	(733)	33,409	51,480	10,851
5 Regions	16,723	3,036,455	2,244,245	13,748	2,924,908	2,272,149	(2975)	(111,149)	28,194	25,821

Source: Census of Agriculture, 1966 and 1986; Census of Population, various years.

¹ Municipalities of primary urban impact.² Rocky View and City to Calgary combined to determine change, 1966-1986.³ Excludes Winnipeg City.

of Regina, also experienced gains in farmland, but this municipality had the lowest proportion of land in farmland in 1966 — slightly over 92 percent. Approximately 99 percent of the Regina CMA was either in urban or farmland use in 1986.

Corman Park rural municipality in the Saskatoon region experienced a loss of over 18,000 hectares of farmland from 1966 to 1986. Almost 4,400 may be attributed to annexations to the City of Saskatoon. It is difficult to speculate on the reasons for the remaining losses in Corman Park, as well as gains and losses of farmland in the remainder of the region.

The majority of the loss of farmland — almost 40 percent — in Rocky View district, which surrounds Calgary on the west, north and east, may be associated with annexations to the City of Calgary. The over 2000 dwellings added to the housing stock the rural municipality may be associated with the loss of almost another 54,000 hectares of farmland. Foothills district to the south of Calgary experienced a small gain of about one percent in farmland, as well as the construction of almost 1200 new dwellings.

A disaggregated view of the Edmonton region shows one of the stronger relationships between farmland changes and urbanization. The loss of over 40,000 hectares of farmland in Strathcona county from 1966 to 1986 may be associated both with the loss of land to annexation to the City of Edmonton and to the addition of nearly 6,500 rural fringe dwellings in the remainder of the county (up to 2.5 ha/additional dwelling). While Parkland county experienced the second largest gain in rural residences, that it also experienced a gain of over 35,000 hectares of farmland is likely attributable to the fact that only 80 percent — the lowest proportion in the Edmonton region, was developed as farmland in 1966.

Summary

This chapter has focused on the five major Prairie grasslands cities as an emerging type with increasingly common characteristics. In 1966, and at the beginning of the quarter century period on which this study focuses, the characteristics of the five Prairie cities could have more been more sharply described on a provincial basis. The characteristics of Winnipeg differed from the two smaller urban regions in Saskatchewan, as well as from Calgary and Edmonton. The former represented a relatively dense city with respect to the actual extent of the built-up, urbanized area, while the urbanized areas of the latter two cities were developed at considerably sparser densities. Although considerably smaller, Regina and Saskatoon were developed at densities comparable to those of Winnipeg.

The quarter century period from 1966 to 1991 witnessed the emergence of a regional type. Intensities of use of newly urbanized land in Winnipeg were low enough and those in Calgary and Edmonton high enough that at the end of the 25 year period the three larger Prairie cities bore a remarkable similarity to each other with respect to overall development densities. Changes to Regina and Saskatoon during the period were not major, and gross development densities were similar and less than for three larger Prairie cities throughout the period.

Throughout contemporary history, municipal policies of the three Prairie provinces have been remarkably similar. Much more than with respect to other cities in Canada, certainly those in the same size class as the largest three Prairie cities, there has been a deliberate policy of fostering the annexation of rural lands to central cities well in advance of urbanization. In addition to resulting in central cities with relatively low densities, the results of this policy include a low level of urban/rural fringe development relative to other CMAs, if for no other reason than that the fringe recedes as central cities expand by means of annexation.

Data at both the aggregated regional city level and at the disaggregated level of individual rural municipalities, counties and districts show a strong association between changes in farmland and changes in numbers of dwellings in the rural fringe. That the bulk of growth in the Prairie regional cities has occurred on lands converted from rural use and on prime agricultural lands is indisputable. The resource implications of this are unclear. And society's best response to these facts is even less clear.

More problematic, however, and undoubtedly more questionable, is the loss of farmland and other valuable land to rural fringe development. The loss of farmland in the vicinity of the five major Prairie regional cities over the quarter century under review was over three times that which may be attributed to new urban development. While factors and events other than those associated with residences in the countryside are involved in such losses, and these will be explored below, observers can nevertheless reach the conclusion that the almost 26,000 rural fringe residences constructed in a two-decade period contributed significantly to the loss of over 60,000 hectares of farmland. The farmland losses alone of rural or country residence development are upwards to 20 times those associated with urban development on a per dwelling basis.



CHAPTER 3

Resident Characteristics: The Prairie City's Countryside

Many of the individuals, households and families in the city's countryside reside there because they earn their living there. Some work in the resource (primary) industries: farming, mining, and oil exploration and recovery occurring in the fringe areas of Prairie cities. Others may serve resource industries or the workers or families of workers in those industries. Some also work in secondary manufacturing and construction establishments located in fringe areas. However, a significant number earn their living from jobs in the central cities or urban cores to which they may commute on a daily basis. Many families contain more than one commuter, and some members of families with other members otherwise engaged in work in resource industries or their servicing may also commute to urban jobs. The continued existence of many family farms in the city's countryside is reportedly supported by such diverse activities of family members (Bryant and Johnston, 1992, Chap. 3).

The inclusion of rural municipalities in CMAs occurs as a result of urban job commuting by large numbers of rural residents.²⁵ Residence of urbanites, especially those with few or any connections to the resource or other industries that may be present in the countryside, reflects a demand for living in the countryside by urbanites. A profile of such residents is of assistance to planners and public policy makers in determining the nature of this demand, as well as for assisting in defining the impact of urbanites on the countryside and the municipalities in which they reside. The object of this section is to describe the changing profile of residents of the city's countryside.

Prairie cities may be unique in the extent to which the policies of provincial and municipal officials and governments has been to assure that new urban growth occurs within the jurisdictions of central cities and that rural and regional planning remain separate from urban planning. Other characteristics of Prairie cities, such as the greater availability of single-family housing in central cities, may likewise have restrained the demand for country residences or for more dense subdivision of the rural fringe, such as that which often characterizes the uneven development on the edges of larger and Eastern cities.

In other respects, however, the characteristics of Prairie cities resemble those of other Canadian cities of similar size. The population of the urban/rural fringe continues to grow. Its slower pace of growth is a mirage to the extent that the outward expansion of the boundaries of Prairie central cities has incorporated what would otherwise be fringe populations. Where boundaries have

remained fixed, as they have in Winnipeg, the demand for residence in rural municipalities has exhibited considerable continuity right up to the 1990s. Prairie cities likewise exhibit the same characteristics of uneven development as other contemporary regional cities, although perhaps more dispersed geographically and at lower densities than is the case in other Canadian cities. This uneven development takes in the urban/rural fringe of Prairie cities is associated with several phenomena. Hamlets and villages and other urban forms provide nodes of growth in the urban/rural fringe. As well, country residence in the predominately rural parts of the urban/rural fringe occurs unevenly geographically, and it is often associated with the rise of specific groups of population demographically, socially and economically. The following examines the characteristics of settlers in the Prairie city's countryside.

Data Sources

The Census of Canada (agriculture and population) remains the most complete source of data on residents, enabling users to obtain a demographic, social, economic and occupational profile of population every five years. While the three Prairie provinces organize and administer their municipal jurisdictions on a similar basis and in a similar way, in part reflecting the proximity of the provinces, as well as the similarity of their geography and settlement patterns, there are also important differences. Each of the five large Prairie cities is surrounded by one or more rural municipalities (municipal districts in Alberta), ranging in size from an average of under 525 km² in Manitoba to 983 km² in Saskatchewan and 2,686 km² in Alberta, and these rural municipalities are the basic unit of analysis used by both the Censuses of Population and Agriculture. In addition, the governments of Alberta and Saskatchewan have designated a variety of smaller urban (mostly towns, villages and hamlets) jurisdictions separate and apart from the rural municipalities within which they are otherwise situated. This difference in municipal administration between Alberta and Saskatchewan on the one hand and Manitoba on the other is the primary impediment to comparability of data for all five cities and all three provinces. A total of approximately 70 jurisdictions comprising an area of 311 km² exist in the regions of the four cities in Alberta and Saskatchewan. The existence of these "urban" fringe municipalities permits the differentiation of "urban" and "rural" fringe areas from Census data for Alberta and Saskatchewan. While the Manitoba countryside around Winnipeg is dotted with what are likely similar villages and hamlets, they are administered as part of the eleven rural municipalities surrounding the City of Winnipeg, and this difference limits the comparability of Census data for the three provinces.²⁶

There are other limitations to Census data as well. While they provide detailed profiles of significant characteristics, it is difficult to relate different aspects of profiles. For instance, while it makes "common" sense to assume that young, adult couple families with children are more likely to have incomes above Statistics Canada's low-income cut-offs because this is known to be true on a national basis, these are tendencies which may or may not be true in specific small areas. While special tabulations of Census data would better enable researchers to avoid fallacious inferences, the small population of many of the jurisdictions also invites errors due to sample size.²⁷ Much data would either be suppressed to protect the identity of individual respondents or would be determined not to be statistically significant if special tabulations were obtained. Special tabulations are also costly. User tapes containing data on small samples of respondents — usually two to four percent — do not permit analysis on a small area basis. The researcher is therefore limited to the profiles of residents provided as standard output by the Census.

A further limitation of Census data, described briefly above, is lack of comparability from one time period to another. Difficulties imposed by changing jurisdictional boundaries, especially common on the city's edge, increase dramatically with longer time periods of analysis.

It is difficult to focus on specific populations within small-area jurisdictions. For instance, it may generally be presumed that only a proportion of the residents of any fringe area jurisdiction are urban commuters residing in urban/rural fringe areas, one of the foci of this report. Only special tabulations of Census data for residents by place of work could satisfy the need for these data.

A further limitation of Census data is that they tell the researcher little about individual or household behaviour, although some inferences are possible and may be justified on the basis of the science of statistics. If the probability that any given type of household is, say, more or less likely to live in a urban/rural fringe location, it may be reasonable to infer that certain characteristics are associated with certain behaviours even if it cannot be concluded that they are motivating or causal factors.

Much of what researchers know about behaviour is learned from small sample surveys designed specifically to elicit responses on behaviour or motivation. While few of these have been undertaken, and fewer still have focused specifically on the fringe area residents that are the subject of this study, information provided by these will be summarized following an analysis of Census data.

Fringe Area Population Changes, 1966-1991

As can be seen in Table 12, the combined population of the fringe areas of the five Prairie

**TABLE 12
POPULATION AND POPULATION CHANGE, PRAIRIE CITIES AND FRINGE AREAS,
1966 - 1991**

City and Area ¹	Population		Percent Region		Percent Change					Percent Change
	1966	1991	1966	1991	1966-71	1971-76	1976-81	1981-86	1986-91	1966-91
<u>Winnipeg</u>	539,526	676,799								
Rural Fringe	35,350	60,009	6.6	8.9	3.5	14.1	15.3	10.0	13.4	25.4
<u>Regina</u>	138,192	191,692								
Rural Fringe	4,443	5,285	3.2	2.8	(4.7)	14.9	10.6	(7.4)	5.9	38.7
Urban Fringe	2,622	7,229	1.9	3.8	7.8	38.0	33.9	15.6	11.8	18.9
<u>Saskatoon</u>	128,774	209,883								
Rural Fringe	8,885	10,911	6.9	5.2	(15.9)	15.7	19.9	4.8	2.7	63.0
Urban Fringe	3,997	12,914	3.1	6.2	33.9	21.5	59.5	15.8	5.5	22.8
<u>Calgary</u>	353,345	780,039								
Rural Fringe	14,977	30,811	4.2	3.9	20.4	33.9	21.1	(0.3)	18.1	120.8
Urban Fringe	7,793	38,562	2.2	4.9	21.1	34.9	107.1	16.6	22.0	105.7
<u>Edmonton</u>	459,324	839,920								
Rural Fringe	53,273	106,091	11.6	12.6	11.1	41.7	28.8	(5.7)	4.6	82.9
Urban Fringe	29,126	79,483	6.3	9.5	34.0	75.3	50.5	7.1	10.0	99.1
<u>Prairie Cities</u>	1,619,928	2,698,333								
Rural Fringe	116,928	213,096	7.2	7.9	7.3	30.1	21.4	0.7	8.2	86.7
Urban Fringe	43,538	138,188	2.7	5.1	30.1	61.6	20.6	11.0	12.8	82.2
										217.4

Source: Census of Canada (Various years)

¹ Fringe area of Winnipeg region includes four rural municipalities not in the CMA: Cartier, Macdonald, St. Andrews and St. Clements; Calgary region includes foothills rural municipality from outside CMA; boundaries of remaining regions are continuous with those of CMA.

regional cities in 1991 was 351,284, about 13 percent of the total population of almost 2.7 million. Despite the numerous and extensive annexations of urban/rural fringe areas to four of the five central cities or urban cores in the 25 years between 1966 and 1991, the population of the fringe areas nevertheless increased much more dramatically than the total population of the five regional cities. While the population of the five regional cities increased by 67 percent, the population of the fringe areas increased by 119 percent, although this increase was certainly considerably less than the average of an almost twelve fold increase in the population of the urban/rural fringe areas in Canada's 25 CMAs in this period.

Edmonton, whose urban/rural fringe population increased from less than 16 percent of the total region's to over 22 percent, is the only one of the five Prairie cities whose complexity and experience even remotely approached the experience of most non-Prairie Canadian cities.²⁸ Over 11 percent of Saskatoon's almost 210,000 residents lived in its urban/rural fringe areas. Each of Calgary and Winnipeg contained fringe populations of just under nine percent of the total for the region, up from around 6.5 percent in 1966 in both cases. Regina had the lowest proportion of its population living in fringe areas, 6.6 percent in 1991.

One of the most significant events in the Prairie city countryside for the quarter century under review is the change in the composition of the urban/rural fringe. While the proportion of fringe population residing in the rural fringe — rural municipalities — remained relatively constant, increasing from 7.2 to 7.9 percent of the total, the number and proportion living in the urban fringe, the approximately 70 towns and villages surrounding four of the five regional cities, increased from just under three to over five percent of the total. The population of the urban fringe increased by over three times, while the population of the rural fringe increased by a much smaller 82 percent. Intensity of land use in these towns and villages was about 222 ha/1000 population in 1991. The number of hectares utilized to accommodate the population change in the urban fringe areas over the 25 years was 197 ha/1,000 population change. While this is about four times the amount of land that might have been used to accommodate the same population change in the central cities or urban cores, the land-use implications of this development are far different than if the same population were dispersed more evenly throughout the countryside in rural residential settings.²⁸ The land area included in autonomous hamlets, villages and towns in the urban fringe areas of Prairie cities increased from 124 km² in 1966 to 311 km² in 1991. The urban fringe contained a population of nearly 140,000 in 1991, approximately 80,000 of whom (58% of both population and land area) resided in the 30 towns and villages in close proximity to Edmonton. Increases in population for the urban fringe municipalities

situated in the vicinity of the four cities ranged from 176 percent for Regina to 395 percent for Calgary, whose urban fringe population increased from under 7,800 in 1966 to over 38,500 in 1991.

The population of the rural fringe of the Prairie cities increased by 96,000 from under 117,000 in 1966 to 213,000 in 1991. Almost 55 percent of the increase and 50 percent of the 1991 total Prairie rural fringe population was in the Edmonton region, and 42 percent of the increase (76.5% of the increase in the rural fringe population of the Edmonton region) occurred in the rural municipality of Strathcona. It was also one of the foci of the annexation battle decided in 1981 and referred to above. Strathcona also experienced a loss of over 40,000 ha of farmland, although close to 60 percent of this loss may have been lands annexed to the City of Edmonton, principally in 1981. The rural fringe areas of Winnipeg experienced the second greatest population gains, increasing by 25,000 to 60,000 in the quarter century between 1966 and 1991. While these population increases for Winnipeg's fringe areas occurred in rural municipalities with total farmland losses of over 16,000 ha between 1966 and 1986 (917 ha/1,000 population increase), there were simultaneous gains of over 7,000 ha in improved farmlands.

The rural fringe of Calgary experienced the largest relative increase in population, 106 percent. The rural municipality of Rocky View, which accounted for about 85 percent of the lands annexed to the City of Calgary between 1966 and 1986, experienced approximately 55 percent of these gains even following the annexations.

The experience of changes in fringe population of Regina and Saskatoon show that only a small part of regional (CMA) population change from 1966 to 1991, 1.2 percent for Regina and 2.5 percent for Saskatoon, is associated with changes in the population of rural municipalities, while a much larger portion is associated with population changes in the urban fringe, 8.6 and 11.0 percent, respectively. Increases in rural fringe population over the quarter of a century were 19 and 23 percent respectively, significantly less than the average for the five regional cities combined. A significant proportion of the loss of farmland in the rural municipalities in which the two cities are located — 31 percent — is likely associated with annexations of 75 km² to the two primary cities in the 1980s, as well as another nine km² annexed to smaller urban fringe municipalities. Between 1971 and 1991, some 180 new dwellings were built in the rural municipality surrounding Regina, and over 1300 were built in Corman Park, the rural municipality surrounding Saskatoon.

A second significant conclusion that can be drawn from Census data is that the demand for living in the countryside may have declined since it peaked in the late 1970s, although apparent lack of demand in the 1980's may be the failure of much of the Prairie economy to recover from the 1981-

82 economic recession, as well as by the fact that the largest annexations to the two Alberta cities occurred in the 1980s. Over 26 percent of population increase in the 1970s was in fringe areas, and less than 15 percent of the much smaller population increase experienced from 1981 to 1991 was in fringe areas. While there is little doubt that increases in population in fringe municipalities were greater in the 1970s than in the 1980s, there is no solid evidence to suggest that the demand for rural living by urbanites has declined. Much of the decreased demand recorded by the Census for the period 1981 to 1986 is illusory, as the four Alberta and Saskatchewan central cities annexed considerable territories in the early 1980s. As well, and given that the period of the 1980s was also a period of slow economic growth for the Prairie cities, it would be speculation to suggest that demand would go one direction or another following another period of intense economic growth such as that which occurred in the 1970s. Almost 21 percent of population growth in Prairie cities in the last half of the 1980s was in fringe areas, while it was approximately 25 percent in the last half of the 1970s. Fringe area growth in the 1980s in Winnipeg was greater than in the 1970s. Growth rates were also relatively high on a historical basis for Regina and Calgary in the late 1980s.

Resident Demographic, Social and Economic Characteristics

Table 13 summarizes the age profile of residents of fringe and urban core areas in Prairie cities. The largest contrast between residents of the urban core or central city and residents in fringe areas is reflected in the representation in the population of children and youth. While the number of children in practically all Canadian municipalities has generally been decreasing for two decades or more, the data for the five Prairie cities for the period 1971 to 1986 indicate that differences between the fringe and the urban core with respect to the representation of children in the age profile are increasing, although this is more the case for the urban fringe than for the rural fringe in the four cities in which the two fringe areas are differentiated.³⁰ In 1986 the relative proportion of children under the age of 15 years was 28 to 46 percent greater in urban fringe areas than for the urban core. As will be seen below, these differences do not appear to reflect differences in the presence of adults of child-bearing age between the central cities and their fringe areas, as their representation is relatively similar. That adults of child-bearing age are more likely to live as couples in fringe areas than in urban cores and that the average number of children per family is greater in the fringe areas appear to be the main contributing factors to the difference in the proportion of young people in the population for fringe area.

TABLE 13
AGE GROUP CHARACTERISTICS, PRAIRIE CITIES AND FRINGE AREAS,
1971 - 1986

	1971 Percents					1986 Percents				
	0-14	15-24	25-44	45-64	65+	0-14	15-24	25-44	45-64	65+
Winnipeg¹										
Urban Core	26.4	19.3	24.5	20.3	9.5	19.8	17.1	32.0	18.8	18.2
Fringe ¹	30.3	17.3	26.6	18.3	7.7	25.7	15.4	32.3	18.4	8.2
Regina										
Urban Core	29.4	19.8	24.6	18.0	8.2	23.1	18.0	32.1	16.9	9.9
Rural Fringe	30.6	18.1	22.2	22.7	7.1	24.7	17.3	30.2	20.6	7.3
Urban Fringe	30.1	14.5	22.1	20.2	12.6	29.7	12.2	34.9	15.0	8.8
Saskatoon										
Urban Core	29.1	20.4	24.6	16.9	9.0	22.3	19.3	33.0	15.7	9.7
Rural fringe	36.9	16.8	21.9	19.7	5.2	28.1	16.4	31.7	18.4	5.4
Urban Fringe	35.5	14.4	21.7	16.7	12.0	32.6	13.6	33.3	11.5	8.5
Calgary²										
Urban Core	25.5	21.4	29.8	16.8	6.5	21.4	17.2	38.1	16.4	6.9
Rural Fringe ¹	29.3	18.4	28.4	19.0	4.8	22.4	16.5	32.6	22.8	5.9
Urban Fringe ¹	29.7	15.3	27.7	15.8	11.5	30.5	12.7	38.4	11.3	7.1
Edmonton²										
Urban Core	24.5	23.2	27.9	17.5	6.9	21.3	18.2	35.3	17.2	8.0
Rural Fringe	34.1	16.3	32.0	13.9	3.7	27.4	16.4	34.5	17.5	4.2
Urban Fringe	33.8	16.2	31.6	12.1	6.2	30.0	14.8	36.8	12.1	6.3
Prairie Cities										
Urban Core	24.4	21.6	27.5	18.3	8.2	21.1	17.7	34.8	17.3	9.1
Rural Fringe	32.1	17.2	29.6	16.5	5.0	26.2	16.2	33.4	18.6	5.6
Urban Fringe	33.3	16.2	31.8	12.7	6.5	30.3	14.0	36.8	12.0	6.9

Source: Census of Canada (Various years)

¹ Fringe area of Winnipeg region includes four rural municipalities not in the CMA: Cartier, Macdonald, St. Andrews and St. Clements; Calgary region includes Foothills rural municipality from outside CMA; boundaries of remaining cities are continuous with those of CMA.

² Data for 1971 for Calgary and Edmonton are for 1976.

The opposite situation prevails with respect to representation of youth aged 15 to 24 years in urban core and fringe populations. The disparity is especially great for older youth aged 19 to 24 years and likely reflects the fact that urban cores possess the kind of living environments and housing that are most suitable for people not yet involved in rearing families, who often continue to be enrolled in educational institutions and who are often not full-time members of the labour force or who still frequently go into and out of the labour force.

Urban cores and rural and urban fringe areas also appear to be differentiated with respect to the age of adult residents. That all five Prairie cities have likely been magnets for attracting youth and young adults is also apparent, although this is less the case for Winnipeg than for the other four cities. While the fringe areas do not necessarily have significantly greater proportions of young adults (aged 25-44 years) than urban cores, the urban fringe areas in particular tend to have many fewer adults aged 45-64. That adult couple families are younger in urban fringe areas is also likely one of the factors present in the over-representation of children aged under 15 years and the under-representation of youth aged 15-24 years in fringe populations.

These generalizations are far less true for the rural fringe than for the urban fringe. Middle-aged adults (45-64 years) tend to be more represented in rural fringe populations than in either the urban core or the urban fringe.

Older people, those aged 65 years and over, have traditionally formed a relatively large portion of residents of the urban fringe, although not as substantial as in the large cities. The relatively lower and declining proportion of older people in the hamlets, towns and villages in the urban fringe is likely the result of the influx of younger adults with young families through the 1970s and 1980s and not the result of any exodus of older residents in the urban fringe areas. Observers could reasonably conclude from the differential in the proportion of older people between the rural and urban fringe demographic composition at the beginning of the period that older people might have traditionally migrated from rural to urban fringe residence as they aged. By way of contrast, but also reflecting tendencies in non-Prairie cities and in Canada generally, the proportion of older people in urban cores increased in each one of the five Prairie cities between 1971 and 1986.

Miscellaneous social and economic characteristics of families and individuals in urban cores and fringes are summarized in Table 14. Household size (population per dwelling) and number of children per family declined in all parts of the Prairie regional cities between 1971 and 1986, although relative decreases in both measures were generally greater in the urban cores. Average household size in the urban cores ranged from 2.5 (Winnipeg) to 2.7 (Calgary) in 1986, and the average number of children

TABLE 14
SELECTED SOCIAL AND ECONOMIC CHARACTERISTICS, PRAIRIE CITIES AND FRINGE AREAS,
1966 - 1991

	Population/ Dwelling		% Adult Couples		Children/Families		1986 Income		
							Families		Individuals
	1971	1991	1976	1986	1971	1986	% Low Income	Median	% Low Income
Winnipeg¹									
Urban Core	3.2	2.5	88.7	85.6	1.5	1.2	15.2	34,632	42.0
Rural Fringe	4.0	3.2	94.8	93.8	2.0	1.4	7.4	36,733	24.6
Regina									
Urban Core	3.3	2.6	89.4	86.0	1.7	1.3	13.6	37,935	36.2
Rural Fringe	3.7	3.2	95.6	95.3	1.9	1.4	15.7	32,788	10.3
Urban Fringe	3.2	3.0	92.9	93.4	1.7	1.4	5.5	38,703	27.2
Saskatoon									
Urban Core	3.3	2.6	90.4	85.3	1.7	1.3	16.4	35,057	40.1
Rural fringe	4.1	3.3	95.6	94.6	2.3	1.6	14.2	35,943	31.4
Urban Fringe	3.6	3.2	91.7	92.7	2.0	1.6	10.7	30,785	34.5
Calgary									
Urban Core	<u>1976</u> 3.0	2.7	89.6	87.2	<u>1976</u> 1.5	1.2	13.2	39,783	34.2
Rural Fringe	3.6	3.1	95.7	94.6	1.7	1.3	8.9	42,774	24.8
Urban Fringe	3.1	3.1	91.8	90.1	1.5	1.4	9.8	37,700	21.4
Edmonton									
Urban Core	3.0	2.5	88.1	85.2	1.4	1.2	15.9	36,700	38.2
Rural Fringe	3.8	3.2	95.4	93.6	1.8	1.5	7.7	41,939	25.4
Urban Fringe	3.6	3.1	94.5	90.5	1.7	1.5	8.4	39,947	23.7
Prairie Cities									
Urban Core	3.0	2.6	89.0	86.0	1.6	1.2	14.8	36,821	38.0
Rural Fringe	3.7	3.2	95.1	93.9	2.0	1.5	8.3	38,036	25.0
Urban Fringe	3.5	3.1	92.1	90.8	1.9	1.5	8.9	36,784	24.0

Sources: Census of Canada (Various years)

¹ Fringe area of Winnipeg region includes four rural municipalities not in the CMA: Cartier, Meadonald, St. Andrews and St. Clements; Calgary region includes foothills rural municipality from outside CMA; boundaries of remaining regions are continuous with those of CMA.

ranged from 1.2 to 1.3. Average household size remained above three persons in all fringe areas in 1986, while the average number of children ranged from 1.3 to 1.5. While the number of children/family, as well as household size, were significantly greater in rural than urban fringe areas in 1971, these tendencies were not nearly so evident by 1986.

Disaggregation of families into adult couples and lone parents shows that the proportion of the latter in urban cores is double or more the proportion in fringe areas, although lone parent families were far more common in the urban fringe areas of Calgary and Edmonton in 1986 than they had been a decade earlier. The absence of lone parent families in rural fringe areas is especially notable.

That fringe areas are preferred by adult couple families in their earlier child-bearing years also tends to be reflected in the economic characteristics of families, although as in the case of other social and demographic characteristics not all the trends and characteristics are unidirectional. The proportion of families with incomes below Statistics Canada's low-income cut-off in fringe areas was generally considerably less than in the urban core (Canada, Statistics Canada, 1990: Appendix; Canadian Council on Social Development, 1989, pp. 39-41). The rural fringe areas of Regina and Saskatoon were exceptions, and the proportion of families with low incomes, as well as the level of median incomes, may reflect the large proportion of families with labour force members still engaged in farming and other resource industries. The same tendency for low-income individuals to be concentrated in larger proportions in urban cores is also present in the case of single-member households.

Education and Labour Force Characteristics

The proportion of population aged 15 years and over with some post-secondary education or a university degree, labour force participation by women and employment by industry are summarized in Table 15. Contrary to trends with respect to age composition and family size and the number of children, differentials between the urban core and fringe areas appear to be declining. The proportion of fringe area populations with post-secondary education was considerably less than for the urban core in the five cities at the beginning of the period of time under review, although this was less the case in Calgary and Edmonton than in the other three cities. Differentials were still present in 1986, but they were generally much less. The urban fringe area of Saskatoon and the fringe area of Winnipeg continued to be characterized by the lowest proportions of residents with post-secondary education. Workers in fringe areas in both cities were considerably over represented in the primary industry sector.

One of the greatest changes in the fringe areas of the major Prairie cities between 1971 and

TABLE 15
EDUCATION AND LABOUR FORCE EMPLOYMENT, PRAIRIE CITIES AND FRINGE AREAS,
1966 - 1991

					Industry Groups 1986 %						
	% Post Secondary		Participation Female L.F.		Primary		1986				
	1971	1986	1971	1986	1971	1986	MGF/CONST	F.I.R.	Gov't	Other	
<u>Winnipeg¹</u>	%	%	%	%	%	%	%	%	%	%	%
Urban Core	14.1	45.6	46.6	59.3	0.7	0.8	20.3	6.4	8.9	63.6	
Rural Fringe	7.4	37.9	38.4	58.2	28.3	14.8	20.5	4.5	7.7	52.4	
<u>Regina</u>											
Urban Core	33.5	49.1	47.8	63.3	na	1.9	13.5	7.5	12.8	64.4	
Rural Fringe	24.1	44.0	44.1	59.9	na	45.3	11.0	4.1	4.1	35.5	
Urban Fringe	27.1	46.5	39.2	57.1	na	4.2	17.9	8.8	10.6	58.4	
<u>Saskatoon</u>											
Urban Core	36.9	51.4	44.4	61.0	3.7	4.2	16.3	5.3	7.1	67.1	
Rural Fringe	16.8	40.8	34.2	61.6	na	33.1	15.6	3.9	4.6	42.7	
Urban Fringe	14.9	33.9	24.9	50.1	na	13.2	22.6	3.7	5.7	54.8	
<u>Calgary¹</u>	<u>1976</u>		<u>1976</u>								
Urban Core	42.2	55.9	50.7	66.6	na	9.6	15.4	6.7	5.8	62.6	
Rural Fringe	38.1	52.7	58.8	63.3	na	30.5	14.6	3.6	4.2	47.1	
Urban Fringe	32.6	47.7	42.3	62.0	na	10.3	18.9	5.4	7.6	57.8	
<u>Edmonton</u>											
Urban Core	39.2	51.3	52.2	64.9	na	3.0	16.2	6.1	10.0	64.8	
Rural Fringe	33.4	45.9	52.2	62.9	na	17.6	18.1	4.1	8.6	51.6	
Urban Fringe	38.9	44.2	45.6	60.2	na	9.2	20.3	4.6	7.7	58.3	
<u>Prairie Cities</u>											
Urban Core	29.2	50.9	46.5	63.4	na	4.4	16.8	6.4	8.4	64.0	
Rural Fringe	31.2	44.5	38.34	61.5	na	20.2	17.9	4.1	7.4	50.3	
Urban Fringe	36.3	44.2	3.9	59.5	na	9.6	20.0	4.9	7.7	57.9	

Source: Census of Canada (Various years)

¹ Fringe area of Winnipeg region includes four rural municipalities not in the CMA: Cartier, Macdonald, St. Andrews and St. Clemente; Calgary region includes foothills rural municipality from outside CMA; boundaries of remaining regions are continuous with those of CMA.

1986 was in the proportion of women active in the paid labour force. In 1971, labour force participation by women was usually considerably less than for either the urban core or the rural fringe. By 1986, women in fringe areas were paid labour force members almost as frequently as their urban core counterparts. Women were less likely to be paid labour force members in the urban fringe areas of Regina and Saskatoon in 1986 than in the fringe areas of the other three cities or the residents of those city's urban core, but the differential was much less than in 1971.

Participation of rural fringe workers in primary industries remains one of the distinguishing characteristics of the rural fringe areas of Prairie regional cities. The proportion of rural fringe workers engaged in the primary industries range from 15 to 45 percent and this proportion was generally inversely proportional to population growth during the period. The composition by industry of urban fringe area workers generally reflects a much greater likelihood of working in manufacturing and construction than in the case of urban core workers, and in the case of Edmonton, rural fringe workers were even more likely to be engaged in manufacturing and construction than workers in the urban core. Participation in other industries — finance insurance and real estate, public administration and other services — was less than for workers residing in the urban core.

Dwelling Characteristics

The growth of fringe areas in Prairie cities, as in the rest of Canada, is a recent phenomenon, having occurred primarily since 1966. The relative and absolute increases in the populations of both urban and rural fringe areas were greatest in the 1970s. Tables 16 and 17 show that home construction activity has generally been even more prodigious than population growth. While occasioned in part by decreasing household sizes in urban cores, as well as urban and rural fringe areas, dwelling construction activity in fringe areas also appears to reflect more frequent replacement or removal from use of older dwellings. The proportion of dwellings estimated to have been built between 1971 and 1991 in urban fringe areas ranged from just under three in five in Regina to over 78 percent in Edmonton.

Dwelling replacement appears to have been far more common in rural fringe areas. In Winnipeg's fringe areas, 61 percent of dwellings were built from 1971 to 1991, although only 39 percent of the 1991 population was added during this period. The data also show that the number of dwellings built prior to 1946 and still inhabited in the Winnipeg fringe decreased by over 37 percent during the period. In the case of the City of Winnipeg, about 25 percent of the older dwellings used in 1971 were no longer used in 1991.³¹ The experience of the other four cities was similar, although

differentials were generally greatest from 1981 to 1991. For instance, Edmonton's rural fringe population actually decreased during the 1980s, primarily as a result of annexations to the urban core (Edmonton and St. Albert); yet almost 22 percent of 1991 dwellings were built from 1981 to 1991.

TABLE 16 DWELLING AND POPULATION CHANGE, PRAIRIE CITIES AND FRINGE AREAS, 1971 - 1991				
	Percent Dwellings		Percent Pop. Growth	
	1971-80	1981-91	1971-81	1981-91
<u>Winnipeg</u> ¹				
Urban Core	24.8	13.7	4.7	8.5
Rural Fringe	31.9	29.1	19.2	19.8
<u>Regina</u>				
Urban Core	28.4	17.6	12.9	9.2
Rural Fringe	25.1	26.0	18.9	0.9
Urban Fringe	36.1	22.4	35.3	25.6
<u>Saskatoon</u>				
Urban Core	27.8	23.9	14.9	17.1
Rural Fringe	42.7	19.5	24.7	6.8
Urban Fringe	43.9	24.1	40.4	18.2
<u>Calgary</u> ¹				
Urban Core	35.7	25.1	26.6	16.6
Rural Fringe	38.1	25.8	29.4	12.0
Urban Fringe	40.0	38.8	45.5	30.0
<u>Edmonton</u>				
Urban Core	32.5	21.7	15.2	13.7
Rural Fringe	47.3	21.7	45.6	neg.
Urban Fringe	50.4	27.8	49.7	18.2
<u>Prairie Cities</u>				
Urban Core	31.0	20.6	19.4	13.3
Rural Fringe	40.8	24.4	36.7	7.0
Urban Fringe	46.9	28.6	48.7	20.1

Source: Census of Canada (Various years)

¹ Fringe area of Winnipeg region includes four rural municipalities not in the CMA: Cartier, Macdonald, St. Andrews and St. Clements; Calgary region includes foothills rural municipality from outside CMA; boundaries of remaining regions are continuous with those of CMA.

TABLE 17
SELECTED DWELLINGS CHARACTERISTICS, PRAIRIE CITIES AND FRINGE AREAS,
1966 - 1991

	Age Distribution (%)				% Single Family		% Owned		% Change pre-1946 Dwellings
	<1946	1946-70	1971-80	1981-91	1971	1986	1971	1986	1971-1986
<u>Winnipeg¹</u>									
Urban Core	21.5	40.0	24.8	13.7	63.1	58.4	58.9	59.6	(24.8)
Rural Fringe	12.8	26.2	31.9	29.1	96.6	94.0	85.9	92.0	(37.0)
<u>Regina</u>									
Urban Core	13.4	40.6	28.4	17.6	69.3	69.6	60.9	65.7	na
Rural Fringe	24.7	24.2	25.1	26.0	94.8	84.0	79.5	85.0	na
Urban Fringe	18.8	22.7	36.1	22.4	90.9	88.0	84.1	88.7	na
<u>Saskatoon</u>									
Urban Core	11.5	36.8	27.8	23.9	66.1	60.1	59.3	57.2	na
Rural Fringe	15.2	22.6	42.7	19.5	94.0	91.4	86.3	88.4	na
Urban Fringe	14.6	17.4	43.9	24.1	91.2	88.9	84.0	86.1	na
<u>Calgary¹</u>					<u>1976</u>		<u>1976</u>		
Urban Core	5.8	33.4	35.7	25.1	58.5	54.5	58.4	57.0	na
Rural Fringe	12.8	23.3	38.1	25.8	86.4	95.8	80.3	77.9	na
Urban Fringe	8.4	12.8	40.0	38.8	79.9	78.4	78.6	74.7	na
<u>Edmonton</u>									
Urban Core	5.7	40.1	32.5	21.7	51.6	51.5	51.1	51.5	na
Rural Fringe	5.7	25.3	47.3	21.7	83.2	88.0	85.8	85.7	na
Urban Fringe	2.2	19.6	50.4	27.8	79.2	79.3	82.7	75.5	na
<u>Prairie City</u>									
Urban Core	10.0	37.6	31.0	20.6	57.5	56.3	57.4	56.8	na
Rural Fringe	9.6	25.1	40.8	24.4	85.7	90.8	86.1	86.4	na
Urban Fringe	6.4	18.0	46.9	28.6	79.9	80.5	82.8	77.0	na

Source: Census of Canada (Various years)

¹ Fringe area of Winnipeg region includes four rural municipalities not in the CMA: Cartier, Macdonald, St. Andrews and St. Clements; Calgary region includes foothills rural municipality from outside CMA; boundaries of remaining are continuous with those of CMA.

Fringe area dwelling characteristics, not surprisingly, reflect the characteristics of their residents. Urban fringe area populations are more likely to be young married families than residents of the urban core, and their dwellings are correspondingly much more likely to be owned and to be single family houses. In 1986, ownership rates in urban fringe areas ranged from approximately 75 percent in Calgary to 89 percent for similar areas outside Regina. Ownership tenure decreased in the urban fringe areas of Calgary and Edmonton from 1971 to 1986, and it increased for the other three cities. Ownership rates in rural fringe areas ranged from 78 percent in Calgary to 92 percent in Winnipeg.

Nearly 90 or in excess of 90 percent of dwellings in the fringe areas of Regina, Saskatoon and Winnipeg and in the rural fringe areas of the remaining two cities were single-family dwellings. Single-family dwellings were less prevalent in the urban fringe areas of Calgary and Edmonton, but they were still just under 80 percent of the total in cities where only 50 to 55 percent of the dwellings in the urban core were of the single family type.

Rural and Urban Fringe Resident Characteristics

A significant feature of fringe area growth in Prairie regional cities over the quarter century from 1966 to 1991 is that over 55 percent of the net population increase was in urban fringe areas occupying about 300 km². The remainder of the growth has occurred in the rural municipalities surrounding each of the five cities. While the growth of rural or countryside residence by urbanites was certainly greatest in the 1970s in both absolute and relative terms than it has been since, Census data show that growth of fringe areas is still significantly more rapid than for urban cores. In the case of Winnipeg and Regina, the rate of population growth in rural fringe areas from 1986 to 1991 equaled or exceeded growth experienced over a five-year period in the 1970s. The rate of growth in the rural fringe of Edmonton and Calgary from 1986 to 1991 exceeded that in the last half of the 1970s, but not the first half. These differentials are significant in light of the generally slower rates of growth in Prairie cities in the 1980s than during the 1970s. Slow growth and even population losses in the rural municipalities surrounding the Prairie regional cities in the early 1980s were due in large part to municipal annexations, although the recession experienced in the early 1980s also contributed to slow growth in the rural fringe, as well as in the Prairie regional cities in general. While many observers doubt it, similar levels of demand for rural living by urban dwellers as those experienced in the 1970s might again occur as Canada and the Prairies emerge from the 1990-92 recession.

The demographic, social and economic characteristics of residents of the urban fringe, while they show that there is as much variety as in the rural fringe and in urban areas in general, also show the prevalence of young adult couple families in the composition of fringe areas, especially in the urban fringe. The average number of children per family in both the urban and rural fringe was approximately 25 percent greater than in the urban cores in 1986. Just as families living in the urban fringe are dominated by younger adults under 45 years, the children also tend to be younger. The proportion of population aged under 15 years in 1986 was 44 percent greater than in the urban cores and central cities. That average development densities in the urban fringe are one-half to one-third of average suburban development densities in the central cities and urban core, while they partially reflect the greater prevalence of single family dwellings in the urban fringe, may also reflect a demand for more outdoor space by many young families. Average education levels remain less than for the urban core, although differentials decreased during the period. The proportion of workers engaged in primary and secondary economic activities in both urban and rural fringe areas remains greater than for urban cores.

Prairie Countryside Resident Surveys

While Census data provide an accurate profile of urban/rural fringe area residents, shortcomings include the fact that they do not necessarily differentiate between residents earning their living from pursuits in the urban core or those dependent on fringe area resource industries. Nor do they assist the researcher in determining areas of conflict between the resident workers and farmers and the commuters, and nor do they differentiate the wants, needs and aspirations of the residents of large parcels of land frequently labelled country residence dwellers. Researchers typically depend on survey data to address such issues as social or economic conflict and to provide data more directly related to the motivations or behaviour of different individuals and households.

Empirical data relating directly to residents of the urban/rural fringe of Prairie cities are rare. As indicated above, the phenomenon of rural or country residence by urbanites is recent, having become significant only in the past quarter century. As well, the move to the countryside by urbanites peaked numerically and relatively in the 1970s, soon after it commenced in earnest. It also drew the interest of planners and urban researchers during this period. There are consequently several notable surveys dating from the 1970s and very few since that time.

Country residence surveys were carried out in the mid-1970s in Calgary, Edmonton, Saskatoon and Winnipeg (Manitoba, 1974; Calgary Regional Planning Commission, 1976; Parkland, 1976; Thomsen, 1978). All four studies focused on the characteristics of country residents, defined as rural

non-farm residents on parcels of land varying in size from 0.4 ha to over 32 ha and the motivations for their move to exurbia. The Calgary and Saskatoon studies also focused extensively on the country residents' use of land.

Winnipeg. The survey of country residents in the Winnipeg region focused on households residing on parcels of land of less than eight hectares in six rural municipalities. Hamlet and village residents were excluded. Slightly over 1,000 of the nearly 2,300 households forwarded the survey instrument by mail responded.

The education of respondents was slightly higher than for the City of Winnipeg. Nearly 15 percent possessed a university degree, compared with less than 12 percent at the time for the City of Winnipeg. The incomes of exurbanites were considerably higher than incomes of city households. Over 48 percent of respondent households had incomes of \$10,000 and over, versus slightly over 12 percent in the city.

Over 72 percent of respondent households had moved to their homes in the previous ten years, although the childhood backgrounds of the respondents — 36 percent had a farm background and 20 percent had grown up in small towns — indicates that they were not long-time large city residents. These backgrounds may have been in flux, as 58 percent of those moving to their homes in the previous five years had grown up in the city. Only 33 percent of respondents were "exurbanites" who commuted daily to the city for a living.

Space and the presence of rural amenities were the major attractions of country residence. Twenty percent chose their residence areas because they were less crowded, and almost 13 percent were motivated by privacy considerations. Another 13 percent were attracted by the landscape, and over ten percent were swayed by the amount of land. Lower taxes was the primary motivation for over 12 percent, a proportion that increased in the case of those with lower incomes.

Lot sizes were considerably smaller than for the other cities. They were less than an acre (0.4 ha.) for nearly 43 percent and between 0.4 and 1.2 ha. for another 25 percent. Only six percent occupied more than four hectares. About three fourths of the respondents disposed of wastes by means of septic tank and field.

Saskatoon. The survey instrument was mailed to each of 650 non-farm residents of five rural municipalities surrounding Saskatoon, and approximately 49 percent were returned. Most of the respondents were urban-oriented, 75 percent having moved from Saskatoon and 14 percent having previously lived in another urban area. Over half had lived in Saskatoon for over ten years. Over two-thirds of household heads commuted to Saskatoon for work. While almost half of the female spouses

were not paid labour force members, over 80 percent of spouses working outside the home commuted to Saskatoon.

Occupationally, over 25 percent of respondents were in the professional and technical category. Incomes were considerably higher than for the city.

Parcel sizes were less than four hectares for 30 percent of respondents, while 46 percent had parcels varying from eight to 32 ha. Almost 20 percent had parcels of over 32 ha. Only 13 percent used a septic field for waste disposal in 1978, while 78 percent used a pumpout tank.

Motivating factors for country living included peace and quiet, privacy, space, natural setting and freedom. Site-specific features included general physical appearance (41%), good water (20%) and privacy and space (10%).

Calgary. Personal interviews of a random ten percent sample of country residents — over 300 — were conducted in 1976. Most lived on land parcels of four to eight hectares, and the total land area consumed by the respondents was over 2,600 ha., or an average of slightly more than nine hectares per responding household. Few of the residents used their land for agricultural pursuits, although 57 percent of properties were located in agricultural preservation zones.

Rural residence households were characterized by a family size of four, an urban childhood background, previous residence in a single-family home in Calgary, employment in Calgary with home-to-work time of less than 30 minutes and above-average incomes.

The main attractions of country residence included expanded living space, aesthetics and amenities. Most residents preferred properties in hilly and treed areas.

The Commission projected land needs for country residence to 1991, and determined that an additional 22,000 ha would be required to accommodate 16,000 persons. The Commission reported that despite policies to preserve agricultural land, the attrition of quality farmland was actually increasing. They calculated that 19,000 ha were consumed by parcels of less than ten hectares, and another 15,000 ha were consumed by parcels of ten to 18 ha and that an additional 20,000-24,000 ha would be required by 1991 to accommodate the projected demand for rural residences.

Summary

Despite the numerous annexations to central cities and urban cores of the Prairie regional cities, the objective of which has been in part to contain urban growth within these cities, both the rural and urban fringes of the urban/rural fringe of Prairie cities have grown at rates exceeding population increases for the central cities. However, rates of growth for the hamlets, villages and towns in the

urban fringe have generally been greater than for the rural fringe areas, and this occurrence may have had a beneficial impact on the objective of conserving resources in the urban/rural fringe. While most of the urban fringe settlements are developed considerably more sparsely than typical new suburban development in the central cities, they tend to be developed at greater densities than most of the rural subdivisions or country residences in the rural fringe. The more compact nature of these settlements also facilitates the provision of services and likely results in less damaging impacts on remaining agricultural uses than dispersed settlement in the rural fringe. Although less efficient than compact urban settlement in a central city, accommodation of fringe growth pressures in the urban fringe may result in the abatement of pressures for more dispersed settlement patterns. Census data on the characteristics of residents of the Prairie urban countryside show that settlers in the hamlets and towns surrounding the major cities consist disproportionately of married couples (*versus* lone parent) families with younger children and with greater numbers of them than central city residents. Their incomes are not necessarily higher than those of families in the central city, but far fewer have incomes below Statistics Canada's low-income cut-off. The relative absence of poverty level incomes holds in the case of individuals living in the urban fringe as well.

The demographic profile of residents of the rural fringe areas surrounding the central cities in Prairie regional cities differs in major ways from that of the residents of small settlements in the urban/rural fringe. An even larger proportion — up to 95 percent — of families are married couple families. Family age profiles are dominated to a lesser extent by young adults, likely also reflecting the presence of farm families — over 30 percent of workers are in the primary industries in Calgary, Saskatoon and Regina and 15 to 20 percent in Edmonton and Winnipeg — in the rural fringe. Families in the rural fringe have approximately the same number of children, although they are often slightly older. Median incomes of families, especially in the rural fringes of the three larger Prairie cities, are often considerably higher than incomes of families in either the central cities or the smaller settlements in the fringe areas.

Aggregate Census data do not permit the analyst to focus specifically on central-city commuters or on the residents of large parcels of land in the countryside. A small number of sample surveys, unfortunately not current, provide some greater detail in this respect. Not surprisingly, country residents tended to have higher incomes than other residents. The desire for space and amenity are the primary motivating factors in the decision to live in the countryside. This is especially the case in the rural fringe areas of the Alberta and Saskatchewan cities, where parcel sizes tend to be relatively large — six to 16 hectares.

No attempt is made herein to project the demand for rural residence living, and it is doubtful that professionals can make reliable projections. Too little is known. Especially in the case of the rural fringe, the future magnitude of demand and future characteristics are overwhelmingly affected by urban annexation policies, as well as by planning policies and regulations. Other sources indicate that a strong demand for more space by urbanites remains. The prospect of more jobs following residents into exurban areas is also present. Young families with children will undoubtedly continue to demonstrate a fairly high demand for rural living. However, the average age of exurban families may increase as previous movers to these areas age and remain in their dwellings. Such an experience would not be different from the natural aging process experienced in the city's older suburbs (Social Planning Council of Metropolitan Toronto, 1979; Institute of Urban Studies, 1988; Edmonton, January 1990).



CHAPTER 4

Planning in the Prairie Urban Countryside

The urban/rural fringe is a zone in transition containing burgeoning and expanding urban land uses and receding rural land uses. It is also an accepted zone of residence for the large and growing number of urbanites who prefer more space and the amenities of living in the urban/rural fringe, either in country residences on large parcels of land or in the hamlets, villages and towns within commuting distance of the central cities and urban cores of the Prairie regional cities. Planning in the urban/rural fringe involves two principal concerns: (1) accommodating expanding human settlements efficiently and effectively; and (2) minimizing any negative impacts on society's resources, mostly its agricultural production potential in the case of the urban/rural fringe of Prairie cities. This working paper addresses principally the impact of urbanization on community resources. The third in the series of working papers currently planned will address the use of regarding resources in the expansion of urban development and its sustainability. The primary community concerns resource are the loss of agricultural land, the impact of urbanization and non-agricultural uses on agricultural productivity and conflicts between agricultural and non-agricultural land uses. There are many other resource issues as well, including the resource potential of wetlands and of forests and woodlands, active and passive recreation potential, drainage and flood control, depletion of ground water resources, pollution of ground water, streams and aquifers, protection of a myriad of other resources, including minerals and aggregates, and the protection of landscape amenities.

In the case of Prairie cities, the urban/rural fringe is also a zone characterized by two planning systems, one oriented towards the planning of expanded urban settlements and another more oriented towards conserving the receding countryside. Unlike most other places in Canada, Prairie cities and the provincial governments responsible for their development have attempted to isolate the two planning systems, both geographically and institutionally. Municipal annexation policies play a key role in preserving separate planning domains, and urban planners in the urban core, currently the five central cities plus St. Albert in the Edmonton area, have assumed responsibility for urban planning. The rural municipalities surrounding the urban core possess primary responsibility for conserving resources and managing land uses in the Prairie countryside, although other institutions and organizations play a role in planning the urban/rural fringe as well.

The two planning systems are not, however, "water tight compartments." They intersect in

the context of accommodating country residences in hamlets, villages and towns and in assuring a smooth transition from rural to urban use, both inside and outside of central city boundaries. The three largest Prairie cities, Edmonton, Calgary and Winnipeg, contain extensive farmland within their municipal boundaries. Rural residences, either because they were previously built on lands subsequently annexed to the central cities or because there are lands inside the city limits of the major central cities where rural residences have been permitted as a matter of course because specific lands were difficult to supply with urban services exist inside the city limits of all three of the largest cities.

One of the major conclusions above is that in many instances the land occupied by country residences, mostly developed in the quarter century between 1966 and 1991 and very little of it still farmed, may equal or exceed the amount of land used to accommodate growing cities during this period. The number of persons accommodated in growing cities was over nine times the additional number accommodated in the rural fringe. Many exurbanites have chosen to live in hamlets, villages and towns where the amount of land consumed for new development generally ranges from two to four times that of new suburban development in central cities. Exurbanites in these smaller settlements also have greater access to urban and urban-related services than do country residents. The harsh realities of these numbers and these performance indicators does not even begin to address the myriad of other resource issues attendant to the expansion of the city into the countryside.

The immediate and rational conclusion with respect to these facts is that society's planning, land-use and resource management systems have failed. Such a conclusion should not be reached prematurely. Planning and resource management systems often appear not to cope well with the problems that they portend to address because the problem is inadequately understood. It was argued above that urban change in contemporary societies must be understood in terms of the social production of space. The adequacy of planning may be judged in this context.

In this chapter, we set forth the institutional and legislative frameworks governing planning and management of development in the urban/rural fringe of Prairie cities. The resulting planning and planning practices in the five cities, using country residences as the major planning focus, is then described and its success or failure to achieve its objectives evaluated. Finally, and following a discussion of the planning problems stemming from the systems theory developed herein, an alternative framework for planning and managing development posited.

Institutional and Legislative Framework

As used here, planning systems include the panoply of public policies and institutions affecting

land uses, physical resources and human settlements in the urban/rural fringe. Public policies include legislation, regulations and practices with respect to the uses and settlement of the urban/rural fringe, and institutions include government departments and agencies and municipalities affecting land uses, resources and settlement. While there may be two planning systems for purposes of a functional description, there is frequently a unitary legislative and institutional regime at a formal level.

Alberta. Each of the Prairie provinces possesses both provincial and local planning legislation and institutions, although local and provincial planning processes in all three are also integrated. Alberta's current Planning Act was legislated in 1977. The underlying purpose of the Act is to:

- (a) achieve the orderly, economical and beneficial development and use of land and patterns of human settlement, and
- (b) maintain and improve the quality of the physical environment within which patterns of human settlement are situated in Alberta,

without infringing on the rights of individuals except to the extent that is necessary for the greater public interest."

Regional Planning Commissions, which prepare regional plans for submission to and approval by the Alberta Planning Board and then for ratification by the Minister of Municipal Affairs, are the primary mechanism for both provincial and local planning. While municipal planning commissions in both urban and rural municipalities are the primary unit of government responsible for initiating and authorizing uses of land, provisions of the Act are designed to assure that local plans conform with the regional plan and with each other. At least two provisions affect the urban/rural fringe. Firstly, a zone 3.2 km deep is circumscribed around every urban municipality, and any development proposals in this "fringe" zone must be accepted by both the urban and rural municipalities and by the regional planning board prior to authorization.³² Secondly, rural residences are generally not permitted in urban fringe areas.³³ In 1991, there were seven regional planning commissions designated in Alberta, including one each two for the Edmonton Metropolitan and Calgary regions.³⁴

The part played by the Alberta Planning Board is both important and unique for the Prairie region. As will be seen below, its role has also been critical with respect to country residential living. In addition to acting as an approving authority for regional plans, it hears, decides and issues orders respecting appeals related to subdivisions and severance, amendments to regional plans, inter-municipal disputes and non-conformity of local planning actions with regional plans. That is, it performs the role of adjudicator with respect to conflicts between municipalities, between municipalities and regional planning commissions and with respect to private parties whose subdivision or severance applications

may not be disposed of favourably by municipalities or regional planning commissions, which ever continues to have severance approval authority.

Saskatchewan. The Planning and Development Act, 1983, provides the framework for both provincial and local land use and settlement policies. Two departments, Community Affairs in the case of urban municipalities, and Rural Development in the case of rural municipalities, administer the Act. The Act provides that local plans, which must be approved by a minister before they are official, must be in conformity with provincial plans, although no provincial plans have ever been recommended or approved as of 1992.

With provincial approval two or more municipalities may form a district planning commission, which is required by statute to prepare a basic planning statement or a development plan for its entire area within two years of its establishment. District planning commissions and/or plans have been established between the City of Regina and the R.M. of Edenwold and between the City of Saskatoon and the R.M. of Corman Park. Both rural municipalities completely surround the two cities within them.

Manitoba. Two planning statutes administered by separate departments apply in the Winnipeg region. The City of Winnipeg Act, whose planning sections were last revised in 1989 and which is overseen by the Minister of Urban Affairs, regulates planning and the content of plans in the City of Winnipeg. The Planning Act, which is administered by the Minister of Rural Development, came into effect in 1976 and governs planning in the rest of the province, including the rural municipalities surrounding the City of Winnipeg. The Act sets forth the provincial land use policy as the primary provincial planning mechanism. A provincial land-use policy package containing 13 policy statements with respect to agricultural lands, recreational lands, shorelands and water bodies, critical resource sites, hazard lands, highways and aggregate and quarry minerals has been in effect since 1980. In 1989, Manitoba's premier created a Round Table on the Economy and the Environment to be chaired by himself. A draft of further provincial land-use policy statements was issued in 1992. Designed to bring Manitoba's provincial plan into accord with sustainable development principles, it is anticipated that new guidelines will be approved in the near future. However, the impact of new guidelines on the behaviour of authorities in the rural municipalities surrounding Winnipeg remains problematic, as it may be argued that the conditions limiting country residence and other development in the urban/rural fringe are relatively limited in the draft planning guidelines (Manitoba, 1992). One of the major problems associated with large lot development in the impermeable clay soils characterizing much of the Winnipeg region is septic tank failure, and new draft amendments to the province's Environment Act

being applied in the Winnipeg region increase the lot line setbacks required for new septic drainage fields and regulate the content and size of the fields.³⁵

From 1961 until 1989, Manitoba also possessed special mechanisms and policies designed to control development in Winnipeg's additional zone, which encompassed much of the urban/rural fringe. This mechanism gradually withered through the 1980s, and it was legislatively terminated in 1989. The additional zone had been established in 1961 to enable the Metropolitan Government of Greater Winnipeg to control the future development of lands approximately eight kilometres in depth in adjacent municipalities. Special legislation enabled the withdrawal of St. Andrews and St. Clements from the additional zone in 1965 (Selwood, 1984: 2). The power to plan in the "additional zone" was transferred to "Unicity" when the amalgamated City of Winnipeg was created from the two-level government encompassing twelve former municipalities in 1971. By the time of its formal termination, four municipalities — Rosser, Macdonald, Ritchot and West St. Paul — had opted out of the zone by joining or forming planning districts. The provisions of the Planning Act now apply as well in the entirety of the three remaining municipalities with all or part of their territory previously within the additional zone — East St. Paul, Springfield and Taché.

Beginning with the formal abolition of the additional zone in 1989, the provincial government became in effect the primary agency responsible for co-ordinating planning for urban/rural fringe development in the Winnipeg region. To assist it in its responsibilities and to increase the opportunities for discussing development policies, the provincial government formed a Winnipeg Region Committee in 1990. Consisting of elected officials from nine rural municipalities and the City of Winnipeg, it was renamed the Capital Region Committee in 1992.

Manitoba's Round Table on the Environment and the Economy, assisted by staff of several provincial departments, initiated the preparation of a sustainable development plan for the Capital Region, including the City of Winnipeg, in 1992. The current schedule for preparation and public and municipal review envisages acceptance by both the provincial and local governments by early 1994. In undertaking the preparation of this plan, the provincial government has taken advantage of a section of the Planning Act that enables it to protect the provincial interest through the establishment of special areas and then subsequently preparing plans for these areas, although further consultation with subject municipalities is required before final adoption of such plans may occur. While provincial officials currently envisage that the plan being prepared will be accepted by consensus, the provincial government could adopt it should such a consensus not develop.

Planning in the Urban/Rural Fringe of Prairie Cities

The above discussion establishes the formal processes under which planning occurs in the major cities of the Prairie region. The following describes the plans and planning in effect in the regions of the five major Prairie cities, focusing primarily on their impacts in the urban/rural fringe.

One of the distinctive features of Prairie planning is the distance placed between urban planning and planning for the urban/rural fringe. All five of the cities that are the subject of this report contain sufficient land, in the central city or urban core to permit new suburban expansion far into the future.³⁶ Winnipeg reached its current territorial size in 1972, and it has grown very little since 1961.³⁷ City planners estimate that the City still possesses sufficient vacant land to sustain its needs for new suburban development for more than a further two decades, or the year 2010 (Winnipeg, 1992). Similarly, the approval in 1981 of major additions to the City of Edmonton provided it with sufficient space to accommodate new suburban growth for as much as 30 years (Edmonton Metropolitan Regional Planning Commission, 1991, 1992).³⁸ While the City of Calgary has not previously contained large quantities of vacant or farmlands in excess of current needs on nearly the scale of either Edmonton or Winnipeg, its council adopted plans for similar annexations in 1986, and annexations totalling 16,200 ha occurred between then and 1991 (Calgary, 1986). As well, and while not as extensive or as ambitious, both the cities of Regina and Saskatoon still contained lands in excess of current new suburban development needs in the early 1990s.

The current expectation is that the large-city municipal authorities in each of the major Prairie cities will plan for most urban growth, principally new suburban growth, on lands contained within municipal boundaries. Only in the Edmonton region is it envisaged that significant urban growth will occur outside the central city, and most of that growth is projected to occur in the City of St. Albert and the unincorporated hamlet of Sherwood Park. A major challenge facing these authorities and their planning and other officials, given the availability of land for urban expansion, is the management of growth in an efficient and effective manner.

The planning legislation and institutions in each of the urban regions anticipates that planning for the urban/rural fringe will be primarily managed by rural municipalities, although within a framework established by either provincial or regional planning bodies or institutions. Both rural municipalities and the regional and provincial institutions responsible for managing planning have historically faced a dilemma and a problem that is difficult to manage. On the one hand, they have been responsible for conserving a major resource, agricultural lands. On the other hand, they have also been responsible for accommodating demand for country residences, and there is considerable evidence that the demand

for rural living is great by historical standards. At the same time, these same rural municipalities are also balancing the provision of urban services and property tax revenues, the primary source of revenues for local municipalities, from their residents. Not surprisingly, their approach, as well as the results evidence ambivalence. The following reviews the experiences with planning the urban/rural fringe in the five major Prairie regional cities.

Edmonton. Close to half the population of the of the rural fringe of the Prairie regional cities lives in the region of Edmonton, and almost 55 percent of total population increases from 1966 to 1991 for Prairie city rural fringe areas was experienced in the Edmonton region. The urban fringe areas of Edmonton contained 58 percent of the total urban fringe population in Prairie regional cities and accounted for 53 percent of growth from 1966 to 1991. With 22 percent of the region's population, Edmonton's fringe areas contained over twice the proportion of regional population as the average for fringe areas in the four other regional cities.

The Edmonton Metropolitan Regional Planning Commission's current official plan for the region was adopted in 1984 (Edmonton, 1984). In 1983, there were close to 11,500 country residential parcels in the region, distributed as follows: Strathcona, including the unincorporated town of Sherwood Park adjoining Edmonton, 41 percent; Parkland, 32 percent; Sturgeon, 19 percent; and Leduc, seven percent. Country residence dwellings comprised between 35 and 40 percent of all dwellings in the rural fringe. Over 91 percent of 1984 dwellings were developed between 1970 and 1983, and almost 55 percent had been developed between 1975 and 1980. Another 500 parcels were located in the City of Edmonton itself as the result of an annexation authorized by the provincial government in 1981. By 1983, and undoubtedly due in part to the economic recession at the time, annual additions were less than one percent of country residences.³⁹ Authorized country residence parcels occupied close to 25,000 hectares, although the commission estimated that only 31 percent of the total area approved for subdivision had been used for country residences. The Commission estimated that 40 percent of approved parcels remained vacant in 1983. Many of the parcels developed in the period were approved a decade or more previously. Average parcel sizes ranged from 1.8 ha for Sturgeon to 4.6 ha in Strathcona (Edmonton, 1984, p. 96).

Concern for the impact of country residences on agricultural productivity has evolved gradually. The Commission concluded in a 1975 report prepared as part of the development of the first regional plan that previous policies regarding country residence subdivisions had been too liberal, especially given the increase in demand that had been experienced by the mid-1970s (Edmonton, 1975, p. 48). It recommended that the regional plan should seriously consider organizing country residences into

more distinct communities or areas. A 1976 report by staff of the Rural Municipality of Parkland also concluded that (Edmonton, 1976, p. 10),

"With few exceptions the E.R.P.C. in its role as subdivision approving authority, has not exercised firm control in directing Country Residential subdivision to pre-designated and planned areas within the region in an orderly and direct manner."

Its main recommendation was that areas suitable for rural subdivisions be designated.

The 1984 regional plan attempted to prevent the development of country residences on prime agricultural lands, referred to as "better" agricultural lands in the plan, as well as to prevent the expansion of the approximately 21 hamlets in the Edmonton region into such areas. The plan directs rural municipalities to steer country residential land uses away from prime agricultural lands, wildlife habitat areas, environmentally sensitive areas, extractive resource areas and heavy industrial areas. Exceptions were permitted in the case of infilling. Rural municipalities were also advised to identify locations for future multiple parcel country residential land use, adequately separated from each other and from uses identified in the plan as posing a threat. The plan also directed municipalities to adopt minimum parcel sizes based on environmental constraints, the provision of appropriate water and sewer services, and the need to retain the rural character of the area.

The 1984 Regional Plan supported a 1981 decision of the Alberta government regarding the Edmonton annexation application (Alberta, 1981, p. 9) in which it was directed that it was in the provincial interest that the Cities of Edmonton and St. Albert and the hamlet of Sherwood Park would be the communities in which future regional growth would be accommodated and that an unduly dispersed pattern of human settlement and urban development should be avoided. Other growth would be accommodated in the next seven largest urban centres, although the government also directed that the regional planning commission to implement policies that would provide "for reasonable growth of and competition between all existing municipal entities" (Edmonton Metropolitan Regional Planning Commission, 1992b:12).

At the beginning of the 1990s, however, the municipalities in the Edmonton region and the regional planning commission were still attempting to address growth management issues. In deciding between a concurrency approach to regional planning in which it would be required that development should not be allowed to occur unless it can be adequately provided with essential public facilities and services, and an urban containment approach to growth management in which a collection of methods would be used to control the spatial pattern of development, the Commission concluded that the latter would be sufficient, although the Commission also concluded that the growth of the smaller urban municipalities should be severely restricted as part of a growth management strategy (Edmonton,

1992b, p. 12). The four rural municipalities of the region have formulated plans for recreational spaces and environmentally sensitive areas in co-operation with the regional planning commission. (Edmonton, no date).

It is clear that planning policies in the Edmonton region are still evolving. There is little doubt that initial policies in the 1970s even promoted dispersed country residence development. One study in the early 1980s documented the impact of previous policies and concluded that over the period from 1977 to 1979 over 70 percent of subdivision application, to the regional planning commission for country residences were either approved initially or approved on appeal by the Alberta Planning Board (Thompson, 1982). The initial approval rate for rural subdivisions was about one-half the initial applications, and the same approval rate applied to the two thirds of unapproved applications appealed to the Alberta Planning Board.

The impact of current regional plans is not clear, and the regional planning commission and others have recently noted that several problem areas continue, including the fact that regional plans are increasingly advisory in nature and that the regional planning commission is also gradually losing its authority to approve subdivisions (Dale and Burton, 1984). The extension of utilities to parts of rural municipalities for non-residential uses is often followed by residential subdivision applications for developments that would be connected to the same services (Edmonton, 1992, pp. 13-16). It is also noted that the prevailing structure of municipal government finance means that the desire for assessment and hence for residential growth is strong in most rural municipalities. Finally, it has been observed that the Alberta Planning Board has done little to enforce the government's 1981 directive that dispersed human settlement be discouraged (Edmonton Metropolitan Regional Planning Commission, 1992b, p. 16).

Calgary. Between 1966 and 1991 almost 16,000 persons, an increase of slightly more than 105 percent, were added to the rural fringe of Calgary. Almost twice that number were added to the population of urban municipalities in Calgary's urban/rural fringe in the same period. A 1986 inventory by the Calgary Regional Planning Commission concluded that there were about 2,500 country residence parcels between 1.6 ha (the smallest country residence parcel considered) and 8.5 ha, 1,500 of which were located in the 3.2 km deep ring around the City of Calgary identified as its urban fringe under the Alberta Planning Act. These parcels encompassed about 15,000 ha and averaged six ha in size. Sixty-three percent of the land occupied by country residence parcels was classified as prime agricultural land (Calgary, 1986).⁴⁰ In addition to the resource issue always posed by country residence use, it was concluded in the 1986 inventory that the location of many of the parcels was

within Calgary's urban growth corridors. The viability of residual parcels of agricultural land for future production was identified as a secondary problem.

The third and current regional plan for Calgary was adopted in 1984, the same year as Edmonton's regional plan (Calgary, 1988). It specified that higher capability agricultural land, except existing parcels of eight ha or less, not be subdivided for country residential use. Infilling of existing subdivided areas was encouraged, and new developments were to be directed to attractive and scenic locations. The plan also proposed to conserve land and sites containing wildlife habitats and other environmental features.

As in the case of Edmonton, the Regional Planning Commission strongly supported the annexation of sufficient lands to the City of Calgary to accommodate its future urban expansion, and 26,100 ha from the two rural municipalities adjoining Calgary, 37 percent of the City's total 1991 area, was annexed between 1981 and 1991. Also as in the case of Edmonton, it is difficult to specify the extent to which the regional plan has been successful in stemming country and other rural residence development, one of its major objectives. While almost 2,000 dwellings were added to the rural fringe between 1981 and 1991, about two thirds of the number added in the 1970s, one can not make definite conclusions regarding whether or not the parcels on which the dwellings were built had been severed prior to the 1980s. Also during the 1980s, the land area contained in municipalities in the urban fringe increased by over 28 percent, and their population grew by 43 percent for a land area to population change ratio of 164 ha/1,000 population change, or one-fourth to one-third the density of suburban development densities in the City of Calgary.

Winnipeg. While the population of the Winnipeg region increased by only 25 percent between 1966 and 1991, the population of the rural fringe increased by 70 percent, accommodating 18 percent of the population increment over the quarter of a century. The fringe experienced its greatest growth increment — over 7,000 new residents and almost 3,000 dwellings — in the 1986 to 1991 period. Rural residential development is concentrated along the Red, Assiniboine and Seine Rivers in the rural municipalities of Tache, Ritchot, East and West St. Paul, St. Andrews, St. Clements and in the northwest section of Springfield. Country parcels are considerably smaller than in the case of the two large Alberta cities, and over 75 percent were under 2.5 ha in size. Between 1976 and 1988, approximately 5,000 rural residential lots were created, and 6,500 dwelling permits were issued, 25 to 50 percent of the new dwelling stock built in the period in the rural municipalities surrounding the City of Winnipeg. In 1988, over 3,600 undeveloped building sites remained in the unincorporated hamlets of Bird's Hill, Oakbank, Lockport, Lorette, LaSalle and Ste. Agathe.⁴¹

The most significant change in planning in the Winnipeg region for over a quarter of a century was the formal abolition of the City of Winnipeg's "additional zone" in which the City exercised planning authority until 1989. While the loss of agricultural lands is a principal focus of planning in Winnipeg's rural fringe, a number of other problems were identified in a recent provincial study, including conflicts between country residences and farms, especially livestock farms, flooding along the Red and Seine Rivers south of the City of Winnipeg, wastewater disposal in the clay-based soils of the region, the development of country residences in areas that may be designated in the future for urban expansion, and protection of transportation corridors (Manitoba Urban Affairs, 1990).

Saskatoon. In 1966, Saskatoon ranked second among the Prairie cities with respect to the proportion of population residing in its urban/rural fringe areas, although the total population of the urban and rural fringe areas was less than 13,000. Over 69 percent of the fringe population and slightly under 9,000 residents lived in the rural municipalities now included in the Saskatoon CMA. In the quarter century since 1966, Corman Park, the large rural municipality completely surrounding the City of Saskatoon, witnessed a ten percent decrease in the number of farms and over an eight percent decrease in the amount of farmland. Annexation of territory to the City of Saskatoon accounted for only 21 percent of the net loss of farmland. While only slightly over 1500 new dwellings were built in Corman Park during the period, these dwellings are associated with the withdrawal of significant territory from agricultural production, although it is not clear that they are the cause. The median size of country residential parcel in a 1978 survey was over 16 ha, by far the largest average parcel size for country residences in the Prairie regional cities (Thomsen, 1978, p. 10).

Fringe area population increases in the 1980s have been considerably less than during the 1970s — 15 versus 62 percent. During the 1980s the total growth in rural fringe population for Saskatoon was slightly greater than seven percent, although there was a 19 percent increase in the number of dwellings. The population of urban settlements outside Saskatoon increased more than three fold over the 25 years, although only by 22 percent between 1981 and 1991.

Both Saskatoon and Regina have entered into contracts with their neighbouring rural municipalities, which is Corman Park in the case of Saskatoon. An official plan has been adopted for the Saskatoon Planning District in accordance with the Saskatchewan Planning Act. While the intent of the plan is to advance the priority of agriculture where it remains viable, its effectiveness at this time can not be assessed.

Regina. The extent of urban/rural fringe development, both proportionately and in absolute numbers, is less in Regina than in the other four Prairie cities. In 1991, only 2.8 percent of the CMA

population lived in the rural fringe, down from 3.2 percent in 1966, and 3.8 percent lived in the urban fringe. The rural municipality of Sherwood in which Regina is located experienced a loss of over 8,000 ha of farmland, and about 42 percent likely resulted from annexations to the City of Regina. Most of the remainder has been withdrawn from production by the owners, although it is not clear if the owners withdrawing the land from production are those who previously farmed the land. Revised development plans for Regina and for Sherwood Park were completed in 1991.

Taking Stock of Resources Implications and Effectiveness of Planning in the Urban/Rural Fringe

The urban/rural fringe of Canadian and Prairie regional cities is more than a zone of transition between an expanding city and a receding countryside. The notion of a zone of transition, like that of the organically expanding city, does not do justice to the nature of the social production of space in contemporary Western, industrialized societies. It has become increasingly accepted that the urban/rural fringe is a place of residence in the regional city, although it differs from typical suburban development in its spatial and geographical characteristics. In the urban/rural fringe this form depends on agricultural land markets and events in the agricultural production system, as well as on events and social relations in mainstream society (Gottdiener, 1985, p. 23). Although certainly different from traditionally conceived suburban development, the nature and characteristics of urban/rural fringe development results from the same social forces that act in other spheres of urban development. Uneven and multinucleated spatial development is a distinguishing characteristic.

Prairie cities have generally been among the most rapidly growing in Canada over the 25 years between 1966 and 1991, although their rate of growth decreased appreciably in the decade of the 1980s. The population of the five Prairie regional cities increased by 67 percent over the quarter of a century, *versus* 57 percent for the three largest CMAs and 64 percent for the remaining 17 CMAs. In the 15 years between 1966 and 1981, population increases were 53 percent for the Prairie cities versus 37 percent for the 20 non-Prairie CMAs. Managing this growth constituted a major challenge to authorities and planners at all levels.

Most of the growth was accommodated in central cities. In 1991, 87 percent of Prairie city residents lived in central cities/urban cores, versus 65 percent for non-Prairie cities. While annexation policies of Prairie provincial governments have facilitated the accommodation of 82 percent of new growth in urban cores, these policies have no doubt involved trade-offs. The major trade-off may have been in the nature of urban development in new suburban areas. More space per new resident is used in Prairie cities than in most other cities in Canada. Even discounting the major portions of land in

Prairie central cities that is vacant or farmed, the three largest Prairie cities — Edmonton, Calgary and Winnipeg — used over 45 percent more land for the same population as the three Eastern Canadian cities of similar size (Ottawa-Hull, Quebec and Hamilton) and over twice as much as Canada's three largest cities, although through much of the period under review herein differentials in the efficiency of development of new urban uses between the Prairie metropolises and similar-sized cities in Eastern Canada were minimal.⁴² The continued prevalence of detached, single-family home construction over apartments and other dwelling forms likely explains much of this continued differential in urban development densities. However, it is the same prevalence of the detached house form that has likely contributed at least in part to a very high desire on the part of Prairie city residents to live in new suburbs in Prairie cities rather than beyond the built-up urban area in the urban/rural fringe.⁴³

There is nevertheless a high demand for living in the urban/rural fringe by Prairie city residents, and this desire has generally been accommodated. About half of the population gain from 1966 to 1991 in the urban/rural fringe lived in the villages and hamlets within commuting distances of the central cities/urban cores. In many cases these settlements may be provided with urban services, although land development practices appear to result in net densities of one fourth to one half of those achieved in new suburban development in the Prairie central cities. Provincial and municipal officials in all three Prairie provinces have nevertheless tended to view these settlements as suitable venues for urban residents, although the Edmonton Metropolitan Regional Planning Commission has directed that expansion of these communities be steered away from prime agricultural land (1984). In its decision regarding annexations to the Cities of Edmonton and St. Albert in 1981, the Alberta government directed that seven of the approximately 20 hamlets and villages in Edmonton's urban/rural fringe area be designated as urban growth areas (Edmonton Metropolitan Regional Planning Commission, 1992a, 1992b). A dozen or so of the existing centres were not designated. The government also cautioned against too dispersed a pattern of human settlement, although there is some doubt that the Alberta Planning Board has pursued this concern (Edmonton Metropolitan Regional Planning Commission, 1992b, pp. 12, 16). In addition, in its discussion paper on the urban/rural fringe, the regional planning commission expressed some concern that too large a land area may be designated for future development in these communities (1991).

There continues to be demand for country living in Prairie cities. About half that demand may have taken the form of residence in villages and hamlets within commuting distances of the central cities and urban cores. Some of this demand has been exercised as demand for small parcels of land — often considerably larger than typical single family suburban lots, but also considerably smaller than

typical country residence parcels — in the rural fringe not far from the borders of the major Prairie cities. The unincorporated hamlet of Sherwood Park on the outskirts of Edmonton and the two St. Paul rural municipalities that share a border with Winnipeg are examples.⁴⁴

Another large portion of development in the urban/rural fringe, that which is of considerable interest to this working paper, has taken the form of demand for country residences on parcels averaging two hectares or more. In the mid- and late-1970s when country residents were surveyed in Calgary, Saskatoon and Winnipeg, country residences comprised from 29 to 52 percent of all rural fringe dwellings. The immediate impact of country residence development on the withdrawal of farmland from production, still by far the major concern of municipal and provincial planning officials, is not entirely clear. While there is evidence that country residence development in the quarter of a century between 1966 and 1991, and which accommodates less than five percent of the residents of the five regional cities, may occupy as much land as has been consumed by urban expansion during this period, the precise impact of these developments on the withdrawal of farmland is not clear. Farm abandonment has often preceded or coincided with country residence development.⁴⁵ Table 18 summarizes the extent of new urban development, of expanded hamlets, villages and of towns, and of country residences in the urban/rural fringe of Prairie cities for the period 1966 to 1986. Regardless of the role which it might have played in the withdrawal of farmland from production, it is evident that development in the urban/rural fringe, which has accommodated less than one in five new residents over the period under review, has consumed approximately as much land as new suburban development in the central cities.

Country residence development potentially has other documented impacts on the ecology of the urban/rural fringe. That older residences impede the direction of urban expansion even when it was initially envisaged that they would not is documented in each of the three largest Prairie cities. That many of the parcels remaining following severance or subdivision approval are not viable for continued agricultural production is also documented in these cities (Calgary Regional Planning Commission, 1987; Manitoba, 1990). Despite planning policies that direct otherwise, both the empirical data and more detailed studies have established that much of the country residence development has paid little heed one way or another to the quality of agricultural land being converted to country residence use (Thompson, 1984). Of course, even when the current prescriptions of official plans are regarded and respected, the impact on current development may be minimal, as it is also true that much current development occurs on parcels whose subdivision or severance predates current plans and practices or took place before current planning legislation was enacted.

Nevertheless, the ways in which the responsible planning authorities have approached the issue of country residence development, as is evidenced by plans and planning decisions, have become more observant with time. The quality of agricultural lands converted is increasingly a critical element in the decision to grant subdivision permission, as is the juxtaposition of a proposed subdivision with other agriculturally viable parcels of land. Planners now know that environmental impacts other than the withdrawal of agricultural land from production should be regarded in granting planning development permission, although it is not always evident that this knowledge is applied in a systematic fashion or that it is regarded by officials receiving advice and recommendations from planners.

While planning technique and resolve have both improved with time, there is still doubt that they are adequate. A recent discussion paper issued by the Edmonton Metropolitan Regional Planning Commission makes the following observation (1991, p. 41):

Many fringe areas already include country residential subdivisions that predate the Regional Plan. Both the Subdivision Regulation (which defers to a regional plan) and Policy 3.6 of the Regional Plan permit rural municipalities to "allow for multiple parcel country residential land use to infill or build on existing concentrations." The terms "infilling" and "build on" are left open to interpretation. Because the Regional Plan exercises only limited control over country residential development on poor agricultural land (Canada Land Inventory soil classification classes 4 to 7), the possibility exists for new country residential subdivision in a fringe area. Country residential subdivisions presently outside any designated fringe area may one day be included in an expanded fringe boundary. Therefore, the Subdivision Regulation and the Regional Plan policies, as they now exist, may be merely postponing contact between urban land uses and rural residential land uses.

The same discussion paper also emphasizes that the Regional Plan does not define "urban growth." Whether development is permitted often depends on interpretation.

However, the effectiveness of planning in the urban/rural fringe is as much an issue as ever before. Just at the time that regional planning authorities have become more willing to pay greater heed to resource and environmental issues, they have also come under increasing attack. This is the case in all three provinces in which the five major Prairie cities are located.

Some Alberta observers have questioned the continued efficacy of regional planning (Robinson and Wiesman, 1988). Robinson and Wiesman speculate that the lack of a theoretical basis for regional planning is at fault, although they also acknowledge that the fortune of regional planning bodies in the two provinces they studied — Alberta and British Columbia — appear to be related to cycles of growth and investment. In good times there is a need to plan for major public infrastructure and resolve competing spatial claims. In times of slow development, such as those that characterized the two Alberta cities throughout the 1980s, governments may see little need to waste resources on planning.

They also speculate that concerns for the biophysical environment, which have played only a small role in regional planning in Canada to date, might provide such a theoretical basis in the future.

The critical issue for regional planning in Alberta is the role and authority of regional planning *versus* the authority and autonomy of local authorities (Dale and Burton, 1981; Smith and Bayne, 1990). Dale and Burton found considerable opposition among both local planners and planning board members to the exercise of subdivision powers by regional planning commissions in Alberta. That the same authorities would both formulate plans and then carry them out was viewed as a conflict of interest. In their review of emerging trends in regional planning using the Edmonton Metropolitan Regional Planning Commission as a case study, Smith and Bayne conclude that the Alberta Planning Board has largely succeeded in neutralizing the potential effectiveness of regional planning in Alberta. Municipalities defend their sovereignty and mount their assaults on regional planning from the strong position of individualism and the ideals of local democratic freedom (Lim, 1983). Regional planning commissions now operate in a context in which regional plans are policy plans and that they must allow municipal governments a degree of flexibility to meet requirements of the Planning Act and to satisfy local aspirations (Alberta, 1982a, 1982b).

These ideals of local democratic freedom and initiative have also enabled the rural municipalities adjoining Winnipeg in Manitoba largely to escape attempts to control country residence development. As in the case of Alberta, the provincial government seems to have little choice but to bow to demands for local autonomy. Manitoba's recent review of rural residential development drew the following conclusion (1990, p. 44):

Rural residential development has had an impact and will have a greater impact on the management of resources and services in the Winnipeg region. The study found that there was a lack of information readily available to assess the extent of these impacts. There is need for the Province to undertake further studies related to the following:

- the actual number of serviced and unserviced rural residential lots, and potential lots as well as the geographic location of rural residential development;
- actual and potential loss of prime agricultural land to rural residential development;
- actual and potential loss of agricultural operations due to rural residential development;
- effects of rural residential development on land values of agricultural land and its effective use;

- extent and causes of septic field failures in the Winnipeg region and identification of areas where private sewage disposal systems are not suitable;
- detailed identification of all flood-prone lands in the Winnipeg region;
- impacts of rural residential development on the drainage infrastructure and the costs associated with maintaining or improving this infrastructure;
- a detailed inventory of aquifers at risk from pollution, salinity and depletion problems;
- effects of rural residential development on adjacent recreational resources;
- areas of future suburban growth in the Winnipeg region; and
- fiscal impacts of rural residential development on municipal and provincial governments.

While the list of ecological and planning concerns would differ for other regions, it would undoubtedly be similar.

From the beginning, the Manitoba Planning Act permitted rural municipalities to escape the additional zone by forming or joining larger planning commissions. Legitimate reasons for removing the additional zone from the City of Winnipeg's planning prerogatives in 1989 was that the provision was no longer serving its original purpose, and it applied to only three rural municipalities.

Other observers have attributed the difficulty of effective planning to related phenomena. The overwhelming reliance of local municipalities on property tax revenues often makes municipal governments reluctant to resist any but the most doubtful of private development proposals (Paehlke, 1990, p. 14). As well, it has continuously been observed that the balance of power in planning rests with the initiators of development. The objective of minimal intervention is an integral part of the objectives of the Alberta Planning Act. The power of private initiative is usually overcome only when other competing private interests are able to demonstrate probable likely harm or when the weight of the public interest is overwhelmingly opposed to granting planning permission.

A Planning Framework for the Future

While achieving lofty environmental objectives and conserving and protecting society's resources in the urban/rural fringe is not easy, the achievement of a considerable portion of the immediate objectives of environmentalists and others interested in sustainable development is possible. Considerable progress in the Prairie context has already occurred. While the Alberta Planning Board may have subjugated regional planning to the initiatives of rural municipalities in Alberta's two

metropolises, the Alberta government has specified that dispersed human settlement is to be discouraged. Similarly, while all observers might not agree with it, the government has provided the framework for growth management in the Edmonton region by specifying that 75 percent of all growth shall occur in the City of Edmonton and that the bulk of the remainder shall occur in the City of St. Albert and the unincorporated hamlet of Sherwood Park with residual growth to occur in seven other urban municipalities in the region (Edmonton Metropolitan Regional Planning Commission, 1991, pp. 36-41; 1992b, p. 16).

In the Winnipeg region, the Manitoba government, while it first permitted, and even authorized by legislation in the case of the rural municipalities of St. Andrews and St. Clements, the erosion of Winnipeg's additional zone, and then ended it legislatively in 1989, does have provincial policy guidelines in effect that provide the provincial minister responsible with latitude to prohibit further country residential development, notwithstanding that 13,000 undeveloped parcels have already been approved, and the planning and zoning framework permitting further development is already in effect. As well, the formulation of a sustainable development plan for the Capital Region that is currently underway also potentially allows the provincial government to intervene beneficially in planning in the region of Winnipeg.

The way ahead, both conceptually and practically, has begun to be laid by academics and planners. Bryant and Johnston, for instance, have identified four approaches applicable to land use planning in urban/rural fringe areas: (1) negative regulatory; (2) persuasive regulatory; (3) positive regulatory; and (4) integrated-comprehensive and five perspectives on agricultural land: (1) agricultural land as a residual; (2) agricultural land as a special resource; (3) agricultural land as part of a functioning agricultural system; (4) agricultural land as a support of amenity landscapes; and (5) agricultural production as one function amongst many (1992: 160).

The negative regulatory approach, which relied primarily on land-use planning, may be identified with urban/rural fringe planning through much of the 1970s and into the 1980s in the case of Prairie cities. Control was quite local, and considerable emphasis was placed on protection of private property rights and much less to the externalities of urban/rural fringe development. As well, agricultural land was viewed as a residual to the extent that the preservation of agricultural land and preventing its withdrawal from the market was seldom considered.

With the realization that the negative regulatory approaches were inadequate for dealing with rapid urbanization and the pressures for change in the urban/rural fringe, other methods began to be developed. As was seen above, the persuasive regulatory approach, which continues to characterize

the best of Prairie urban/rural fringe planning, came into use. It relies to a greater extent on intergovernmental co-operation. Thus in all three Prairie provinces, governments actively discouraged dispersed human settlement, especially on prime agricultural lands, and encouraged more rational patterns of development, but initiative is still left largely in the hands of local authorities and the rural municipalities. Achievement of policy objectives requires full co-operation among governments. This approach also includes programs for farmland conservation in which participation by farmers is essentially voluntary, although there are currently no such programmes in Canada (Peters, 1990; Napton and Borchert, 1986).

In some large regional centres and at the state and provincial level in the United States and Canada, more positive, centralized regulatory approaches have developed. Centralized land-use planning in London under the Town and Country Planning Act, state-wide growth management systems, such as that adopted by the State of Oregon in the late 1970s and rural land-use planning under Quebec's Agricultural Land Protection Law, 1978, are examples. However some of the experience under these planning regimes is not much more promising than previous approaches (Knaap and Nelson, 1992; Reid and Yeates, 1991; Wolfe and Glenn, 1992). Wolfe and Glenn note in the case of the suburban county of Laprairie near Montreal that despite protective, province-wide agricultural zoning and obligatory regional planning legislation, far-flung parcels of land continue to be urbanized. Research at McGill University has confirmed that many of the reasons are endemic to planning practice. While the plans follow fairly standard planning procedures, the downside is that almost invariably too much space is allowed for growth. Far too much land is often identified for urban purposes, with no regard for density, servicing possibilities, the phasing in of development or the shaping of urban growth. As indicated above, such practices likely result in more extensive urban development practices in the new suburban areas of Prairie central cities than would be the case if land resources were more limited. Although they cite several reasons for the lack of effectiveness of agricultural zoning and obligatory planning, Wolfe and Glenn believe that the lack of will at the political level to address the urban dispersion issue is critical.

In their study of the impact of the oldest state growth-management planning efforts in the State of Oregon, Knaap and Nelson conclude that use of urban growth boundaries to attempt to contain urban development and discourage sprawl has mixed results. Growth has been only partially contained. Densities within urban boundaries tend to be less than anticipated, development densities on "exception lands" outside the urban growth boundaries are often higher than initially projected.

Some planners have asserted that more comprehensive-integrated approaches are the answer.

The centralized planning in of regional governments in Ontario approaches this point on Bryant and Johnston's typology. One of the latest examples of this approach is Ontario's endeavour as part of its planning for the Greater Toronto Area to conserve the landscape and resources of the Oak Ridges Moraine. The need to take urgent action in the moraine and the various ways and means that this action could take were identified in 1990 (Kanter). New planning procedures to assure the conservation and preservation of the moraine were produced a year later (Ontario, 1991). The procedures include criteria for growth and settlement, ecological integrity, landform, conservation of significant natural areas, woodlands, water courses and lakes, highly permeable soils and groundwater resources, as well as detailed specifications of review procedures, processing of planning and development applications and internal government co-ordination. While the criteria and performance expectations of local planning authorities are exacting, local authorities will nevertheless continue to play the same formal role with respect to development applications that they always have.

More recently Ontario's Commission on Planning and Development Reform has tabled the most comprehensive proposals for reform of both the substance and process of planning to be seen since Ontario's current Planning Act was enacted in 1979 (1992). Implementation of the draft proposals would see a much more directive role for the provincial government in which the Ministry of Municipal Affairs, acting in part as the province's central planning bureau, would introduce a comprehensive set of provincial policy statements in areas considered important to provincial development. An expansion of current powers possessed by the provincial government, drafts of policy statements for natural heritage and ecosystem protection and restoration, community development and infrastructure, housing, agricultural land, conservation and non-renewable resources are proposed. In addition to current policies and procedures, it is anticipated that local governments will add "strategic" planning to their current practices and that local plans will be in "conformity" with provincial land use policy statements. Additional provincial grants to cover the cost of planning are also recommended in the Commission's *Draft Report*.

While Bryant and Johnston seem to favour the positive regulatory approach used in Canada in British Columbia and Quebec, they are also careful to emphasize that the public authorities implementing it must recognise regional diversity in the policies and intervention strategies devised. Without co-operation from farmers and their families, as well as other rural residents, it is unlikely that rapid progress towards achieving public goals will occur.

One limitation of an approach such as this in the case of the rural municipalities surrounding the five major Prairie regional cities is that, while far easier to satisfy than most environmental

assessment legislation, the knowledge and level of expertise required to apply the evaluation criteria may be beyond the means of the municipalities. However, regional planning commissions in Alberta and provincial departments in Manitoba and Saskatchewan have always assisted rural municipal councils in fulfilling the expectations of them, and they could and probably should expand their services in this respect.

Sustainable Cities and Development of the Prairie Urban Countryside

The major planning concern in the urban/rural fringe is the continued viability of the resource industries currently located there. The Prairie grasslands region in which the five regional cities that are the focus herein are located is Canada's "breadbasket" and reputedly subjected to more intense cropping than any similar region in the world. A variety of other resource issues are critical to the continued health of the land and water base of the five regions in addition to that of land use *per se*. Healthy water is critical to both the agricultural production and the continued habitability of the Prairie region, and both the quantity and quality of Prairie surface waters are threatened by urban and agricultural practices.

The social production of space perspective allows the analyst to focus on all of the factors that generate the demand for living in the urban/rural fringe, as well as the nature of the development that has occurred in the five city regions. That this demand is not determined entirely by transport and communications technology or by the gradual deconcentration of urban form has been emphasized. Since the mid-1960s, settlement by urban commuters throughout the regions of Prairie cities has occurred. Government and planning policies and practices may have resulted in lower levels of demand for living in the urban/rural fringe than in many other Canadian cities, although some observers might assert that the featureless plain that dominates the regions of Prairie cities and the Prairie climate have also dampened this demand. The continued viability of and demand for agricultural production may also influence the willingness of farmers to sell their farms. As well, this demand has taken different forms than it might have in non-Prairie cities. Much of the human settlement in the urban/rural fringe has occurred in a small number of hamlets, villages and towns within commuting distance of central cities. Only a small part has taken the "sprawl" form that often characterizes urban/rural fringe development in Central and Eastern Canada, although it is also argued that "sprawl" occurs in the Prairie context inside the boundaries of central cities. However, that country residence development that typically comprises 30 to 50 percent of new dwellings in the rural municipalities in Prairie regional cities has an impact on land use, as well as on other land- and water-based issues has been

emphasized.

The desire to live in the countryside is an integral part of the demand for ever-greater amounts of space by urban Canadians. Country living is viewed as an acceptable residential alternative. It may also constitute one of several means for socially structuring the city's edge. Not only is the demand for greater space evident in responses to survey questions directed at country settlers, it is also evident in queries regarding residential preferences directed at urban dwellers in general.⁴⁶ A recent survey of Winnipeggers on their willingness to alter their behaviour to protect the environment likewise indicated the importance of space to urban Canadians. While over 55 percent of respondents would invest in a programmable home thermostat to save on their heating costs if the price of fuel increased by one half, only 11 percent said that they would be willing to move to a denser form of housing with the same living space to save energy used for transportation, heating and air-conditioning. Over 45 percent said that they definitely would not be willing to move to a denser form of housing, and the latter response was positively correlated with income.⁴⁷

While improved planning systems based on a model such as that posited herein will likely result in improved planning practice and development results, it will not overcome the problem of lack of political will or lack of intergovernmental co-operation that have been identified so many times previously as a major reason for the failure to realize planning goals and objectives. This will and these objectives come to the fore when they are demanded by public opinion and expectation.

Sustainable development practices, especially the conservation of society's resources, will occur only as the incentives to husband those resources arise or are applied. There is increasing recognition that a major reason for current wasteful practices is that those who pollute the environment or who consume excessive resources often do not bear the true cost of doing so. It is argued that consumers would more likely conserve water if they paid the marginal cost of supplying the infrastructure and bringing additional supplies to users and that potential urban/rural fringe dwellers would more carefully consider the impact of commuting greater distances if they were required to pay for any environmental damage, including the costs of adding to greenhouse gas emissions (Pearse, 1985; Pucher, 1988; Tate, 1990). The recent report of Canada's Royal Commission on National Passenger Transportation suggested that municipal street construction and maintenance be paid for from user (fuel) taxes as one part, of a strategy of requiring transport users to pay the real resource costs of transportation (1992).

A public policy challenge is the generation of an economic environment that is conducive to

ecologically sound decisions. User charges and fees, however, are not a panacea. Another public policy challenge is assuring that user charges are applied appropriately and with consideration of their impact on health, well-being and economic participation in the life of communities. Nor are user charges or an economic environment more conducive to sound ecological decision-making a substitute for public-policy making. Regulatory decisions will still be required. However, some of the excessive, even politically impossible burden required to make ecologically sound decisions in the community interest should be lightened.

Conclusion

The evolution of spread cities in Canada, including the form that they have taken in the Canadian grasslands region, has been described above. A social production of space perspective permits an explanation of peculiarities in the spread city form on the Prairie that is not dependent on such explanations as technology and communication, which constitute fairly uniform forces throughout Canada. The peculiarities and the emergence of a Prairie city form have been explored. While there are other cities in Canada and elsewhere that have developed in similar ways, provincial authorities in the three Prairie provinces have perfected an identifiable approach to planning and urban development. An attempt has been made to assure that most future growth occurs in central cities and to confine urban planning to single jurisdictions. While the development of Edmonton historically provided an exception to this approach, the Alberta government's 1981 decision regarding a major annexation proposal by the City of Edmonton also brought planning in that city into greater conformity with this approach.

Planning for the urban/rural fringe areas is generally separate from urban planning in the Prairie regional cities. Fringe area development also differs from that characterizing many other Canadian cities. Much of the new development over the past quarter century has been successfully steered into hamlets, villages and towns in the vicinity of the major cities. Much of the remainder, 30 to 50 percent of dwellings developed in the rural fringe of Prairie cities, and one of the major foci of this working paper, has taken the form of country or rural residential development. Country parcels have generally varied from two to 30 ha. The smaller parcels have been more dominant in the environs of Winnipeg, while the two Saskatchewan cities appear to have the largest country parcels. While no link between country residence development and the withdrawal of farmland from production can be pinpointed, a relationship or association can generally be said to exist. Other negative ecological impacts of country residence development can be cited as well.

The review of plans, planning legislation and regulations and practices in this chapter has shown that planning has failed to address many of the challenges of the urban/rural fringe. Some of this failure, maybe even most of it, is attributable to events in the past. That may predate current plans and planning legislation. However, the assessment of planners and public officials in the Prairie regional cities is that even the planning approaches adopted through the 1980s have failed to adequately address the problems presented by the implications of development in the Prairie urban countryside even if they are superior to earlier approaches.

Prairie public authorities, local and provincial, are by no means unique in this respect. Many states in the United States, as well as provinces in Canada, have attempted to pursue what are labelled centralized, positive regulatory approaches to preserving agricultural functions and uses while meeting the challenges of rapid urban growth and change. These efforts have seldom been any more successful than those attempted in Prairie regional cities. An integrated-comprehensive approach to planning, involving greater input from farmers and urban country dwellers alike and co-operation amongst different governmental jurisdictions is suggested. The bare outlines of some of the content of such an approach have been posited.

References

- Alberta. *Framework for Application of Regional Plan Guidelines*. Edmonton: Ministry of Municipal Affairs, 1982b.
- _____. *Revised Guidelines for Regional Plan Preparation and Review*. Edmonton: Ministry of Municipal Affairs, March 1982a.
- Berry, Brian J.L. and J. Kasarda. *Contemporary Urban Ecology*. New York: Macmillan, 1977.
- Beavis, Mary Ann, ed. *Ethical Dimensions of Sustainable Development and Urbanization: Seminar Papers*. Winnipeg: Institute of Urban Studies, The University of Winnipeg, Occasional Paper 23, 1990.
- Beavis, Mary Ann and Jeffrey Patterson. *A Select, Annotated Bibliography on Sustainable Cities*. Winnipeg: Institute of Urban Studies, The University of Winnipeg, Bibliographica 4, 1992.
- Bourne, Larry S. "Are New Urban Forms Emerging? Empirical Tests for Canadian Urban Areas." *The Canadian Geographer*, 33.4 (1989): 312-28.
- Bryant, Chris. R. et. al. *The City's Countryside: Land and Its Management in the Rural-Urban Fringe*. New York: Longman's, 1982.
- Bryant, Chris R. and Thomas R.R. Johnston. *Agriculture in the City's Countryside*. Toronto: University of Toronto Press, 1992.
- Calgary. *Long-Term Growth Management Study*. Calgary: City of Calgary, Report of the Inter-Departmental Growth Management Steering Committee, 3 Volumes, November, 1986.
- Calgary Regional Planning Commission. *The Calgary Regional Plan*. Calgary: The Commission, Office Consolidation, including all amendments to August 10, 1988.
- _____. *Country Residential Survey*. Calgary: The Commission, 1976.
- _____. *Fragmentation Study*. Calgary: The Commission, Volume II, Technical Appendix, 1987.
- _____. *Some Characteristics of Small Parcels in the Calgary Region: A Preliminary Report*. Calgary: The Commission, May, 1986.
- Canada. Department of the Environment. *The State of Canada's Environment*. Ottawa: Environment Canada, 1991.
- _____. "Urbanization of Rural Land in Canada." *Lands Directorate Fact Sheet*, 85-4, February, 1985.

- _____, "Urbanization of Rural Land in Canada: 1981-1986." *State of the Environment Fact Sheet*, 89-1, 1989.
- Canada. House of Commons, The Standing Committee on Environment. "Out of Balance: The Risks of Irreversible Climate Change." *Our Changing Atmosphere*, Part III, 1991.
- Canada. Royal Commission on National Passenger Transportation, *Moving Canadians into the 21st Century*. Ottawa: Minister of Supply and Services Canada, Summary Report, 1992.
- Canadian Council on Social Development. *Perception*, 13.1, 1989.
- Dale, Lynne and Thomas L. Burton. "Regional Planning in Alberta: Problems and Prospects." *Alberta Journal of Planning Practice*, No.3 (Summer, 1984): 17-41.
- Des Rosiers, François. "Urban Sprawl and the Central City." *Plan Canada* (November, 1992): 14-18.
- Diemer, H.L. *Parkland Country Residential Survey*. Edmonton: Alberta Land Use Forum, Technical Report No.4A, 1974.
- Edmonton. Department of Planning and Development. *Neighbourhood Life-Cycle and Indicators of Neighbourhood Demographic Change in Edmonton*. Edmonton: Planning and Development Department, Research Paper No. 34, January, 1990.
- Edmonton Metropolitan Regional Planning Commission. *Future Population Estimates: Municipalities in the Edmonton Metropolitan Region, 1991-2011*. Edmonton: The Commission, February, 1992a.
- _____. *Growth Management Discussion Paper: The Need for Partnership*. Edmonton: The Commission, February, 1992b.
- _____. *Living with Nature: Protection of Natural Areas*. Edmonton: The Commission, no date.
- _____. *Parks for the Future: Protection of Outdoor Recreation Resources*. Edmonton: The Commission, no date.
- _____. *Regional Plan*. Edmonton: The Commission, 1984.
- _____. *The Rural/Urban Fringe: A Review of Some Concepts and Issues*. Edmonton: The Commission, March, 1991.
- Edmonton Regional Planning Commission. *Rural Land Use Policy*. Edmonton: The Commission, Position paper No.1, Regional Plan Project, September, 1975.
- Faulk, J.H. "The Primary Productivity of Lawns in a Temperate Climate." *Journal of Applied Ecology*, 17 (1980): 689-96.

- Friedman, John and Robin Block. "American Exceptionalism in Regional Planning, 1993-2000." *International Journal of Urban and Regional Research*, 14.4 (1990): 576-601.
- Garreau, Joël. *Edge City: Life on the Frontier*. New York: Doubleday, 1991.
- Giddens, Anthony. *The Constitution of Society: An Outline of the Theory of Structuration*. Berkeley: University of California Press, 1984.
- Gottdiener, M. *The Social Production of Urban Space*. Austin: University of Texas Press, 1985.
- Harvey, David. "The Urban Process Under Capitalism." in M. Dear and A. Scott, eds. *Urbanization and Urban Planning in Capitalist Society*, pp. ???. New York: Methuen, 1981.
- Hawley, Amos. *Urban Society: An Ecological Approach*. New York: John Wiley and Sons, 1981.
- Institute of Urban Studies. *St. James-Assiniboia School Division: An Urban Futures Study*. Winnipeg: St. James-Assiniboia School Division, April, 1988.
- Kanter, Ron, MPP. *Space for All: Options for a Greater Toronto Area Greenland's Strategy*. Toronto: Ontario Government Bookstore, 1990.
- Knaap, Gerrit and Arthur Nelson. *The Regulated Landscape: Lessons on State Land Use Planning*. Cambridge: Lincoln Institute of Land Policy, 1992.
- Lim, G. *Regional Planning: Evolution, Crisis and Prospects*. Totowa, NJ: Allanheld, Osmun and Co., 1983.
- MacNeill, Jim, Pieter Winsemius and Taizo Yakushiji. *Beyond Interdependence: The Meshing of the World's Economy and the Earth's Ecology*. New York: Oxford University Press, 1991.
- Manitoba. *Provincial Land Use Policies: Draft Revisions*. Winnipeg: Department of Rural Development, January, 1992.
- Manitoba Urban Affairs. *Rural Residential Development in the Winnipeg Region*. Winnipeg: Manitoba Department of Urban Affairs, Report prepared for the Winnipeg Region Committee, May, 1990.
- Manitoba, University of. Department of City Planning. *The Nature of Demand for Exurbia Living: The Winnipeg City Region*. Winnipeg: Department of Municipal Affairs, 1974.
- Manning, Edward W. *Towards Sustainable Land Use: A Strategy*. Ottawa: Environment Canada, Lands Directorate, April, 1986.
- Marchand, Claude and Janine Charland. *The Rural/Urban Fringe: A Review of Patterns and Development Costs*. Toronto: ICURR Press, 1992.
- Mumford, Lewis. "The Fourth Migration," in C. Sussman, ed., *Planning the Fourth Migration: The Neglected Vision, The Regional Planning Association of America*. Cambridge: MIT Press, 1976.

- Napton, Darrell E. and John R. Borchert. "Preserving Metro Area Farmland: A Survey and Perspective." *CURA Reporter*, 16.1 (January 1986): 1-6. Minneapolis: Centre for Urban and Regional Affairs, University of Minnesota.
- Newman, Peter. "Sustainable Urban Structures: Overcoming Automobile Dependence." Paper presented to the Seminar on Sustainable Municipalities, Danish Building Research Institute. Perth, Australia: Murdoch University, August, 1991.
- Ontario. *Implementation Guidelines: Provincial Interest on the Oak Ridges Moraine Area of the Greater Toronto Area*. Toronto: Ontario Ministries of Natural Resources, The Environment and Municipal Affairs, June, 1991.
- _____. Commission on Planning and Development Reform. *Draft Report*. Toronto: The Commission, December, 1992.
- Ottensmann, John R. "Urban Sprawl, Land Values and the Density of Development." *Land Economics*, 53.4 (1977): 389-400.
- Paehlke, Robert. "Possibilities for and Limitations on Environmental Protection Initiatives in the Changing Metropolis." Paper presented to the conference, "The Changing Canadian Metropolis." York University, October 1990. Peterborough: Trent University.
- Parkland, Rural Municipality of. *Report to the Edmonton Regional Planning Commission on Country Residential Subdivision*. Edmonton: Municipal Planning Division of the Rural Municipality, November, 1976.
- Patterson, Jeffrey. "Transport to Work: Eight Selected Cities." *Sustainable Cities*. Winnipeg: Institute of Urban Studies, University of Winnipeg, Spring 1992a.
- Patterson, Jeffrey. "Urban Stream Degradation: Five Prairie Cities." *Sustainable Cities*. Winnipeg: Institute of Urban Studies, The University of Winnipeg, Spring 1992b.
- Pearse, P., et. al. *Currents of Change: Final Report of the Federal Inquiry on Water Policy*. Ottawa: Environment Canada, 1985.
- Peiser, Richard B. "Density and Urban Sprawl." *Land Economics*, 65.3 (1989): 193-204.
- Peters, James. "Saving Farmland: How Well Have We Done? A Reassessment of Some of the Most Popular Preservation Techniques." *Planning Practice*, September 1990: 12-17.
- Pucher, John. "Urban Travel Behaviour as the Outcome of Public Policy: The Example of Modal Split in Western Europe and North America." *Journal of the American Planning Association*, 54.4 (1988): 509-20.
- Punter, J.V. *The Impact of Exurban Development on Land and Landscape in the Toronto-Centred Region, 1954-1971*. Downsview: York University, Report to Canada Mortgage and Housing Corporation, April, 1974.

- Reid, Evelyne Power and Maurice Yeates. "Bill 90—An Act to Protect Agricultural Land: An Assessment of its Success in Laprairie County, Quebec." *Urban Geography*, 12.4 (July/August 1991): 295-309.
- Robinson, Ira and Brahm Wiesman. "Planning Without Theory, Reflections on Regional Planning Experience in Western Canada," in Thomas L. Harper, ed. *Planning in the West: Canadian and American Perspectives*. Calgary: Selected Papers from the Fourth Conference on New Perspectives on Planning in the West, Faculty of Environmental Design, University of Calgary, 1988.
- Russwurm, Lorne H. *The Urban Fringe in Canada: Problems, Research Needs, Policy Implications*. Ottawa: Ministry of State for Urban Affairs, February, 1974.
- Sancton, Andrew. *Local Government Reorganization in Canada Since 1975*. Toronto: Intergovernmental Council on Urban and Regional Research (ICURR) Press, 1991.
- Saskatchewan, Departments of Municipal Affairs and Environment. *Urban Fringe Development Problems*. Regina: Government of Saskatchewan, 1972.
- Saunders, P. *Social Theory and the Urban Question*. London: Hutchinson, 1981.
- _____. "Space, Urbanism and Created Environment," in D. Held and J.B. Thompson, eds. *Social Theory of Modern Societies: Anthony Giddens and His Critics*. Cambridge: Cambridge University Press, 1989.
- Selwood, H. John and Elisabeth A. Hicks. "New Perspectives on Winnipeg's Urban Fringe." Winnipeg: mimeo, Department of Geography, University of Winnipeg, 1984.
- Shyy, Tung-Kai and T.H. Lee Williams. "The Potential of Artificial Intelligence in Remote Sensing for Urban Land Use Classifications," in ASPRS/ACSM/RT92, *Technical Papers*, Vol. 4. Bethesda: American Society for Photogrammetry and Remote Sensing and American Congress in Surveying and Mapping, 1992.
- Simmons, J.W. and L.S. Bourne. *Urban Growth Trends in Canada, 1981-1986: A New Geography of Change*. Toronto: University of Toronto, Centre for Urban and Community Studies, Major Report No. 25, 1989.
- Smith, P.J. and Patricia E. Bayne. "Metropolitan Planning and Local Autonomy: The Case of Edmonton's Regional Plan." Paper presented to the conference, The Changing Metropolis, held at York University, October 1990. Edmonton, AB: Department of Geography, University of Alberta.
- Social Planning Council of Metropolitan Toronto. *Metro's Suburbs in Transition: A Review of Trends in the Social Development of new Suburban Communities in Metropolitan Toronto*. Toronto: The Council, April, 1979.
- Statistics Canada. 1990. *Income Distribution by Size in Canada*. Catalogue No. 13-207.

- Tate, D.M. *Water Demand Management in Canada: A State of the Art Review*. Ottawa: Environment Canada, Social Science Series No. 23, 1990.
- Thompson, Peggy. *Rural Subdivision in the Edmonton, Battle River, Red Deer and Calgary Regional Planning Commissions, 1977-79*. Edmonton: Ministry of Municipal Affairs, February, 1982.
- Thomsen, Ron. *Country Residential Survey: Saskatoon Region*. Saskatoon: Department of Municipal Affairs, Municipal Lands Branch, Discussion paper No. 3, December, 1978.
- United Nations World Commission on Environment and Development. *Our Common Future*. New York: Oxford University Press, 1987.
- Walker, Gerald. "The Rural-Urban Fringe: City in the Countryside." Paper presented to the conference, "The Changing Metropolis." Toronto: York University, October 1990.
- Warren, C.L. and P.C. Rump. *The Urbanization of Rural Land in Canada: 1966-1971 and 1971-1976*. Ottawa: Environment Canada, Land Use in Canada Series No. 20, 1981.
- Wilson, Alexander. "Towards a Culture of Diversity: Politics in the Urban Ecosystem." *Border/Lines*, 4 (1985/86): 38-40.
- Winnipeg, City of. *Towards 2010*. Winnipeg: Department of City Planning and Development, 1992.
- Wolfe, Jeanne M. and Jane Matthews Glenn. "The Effects of Regional County Municipal Plans and Agricultural Zoning in the Region of Montreal." *Plan Canada*, (November 1992): pp. 9-13.
- World Bank. *Development and the Environment: World Development Report 1992*. Washington: The International (World) Development Bank, 1992.

End Notes

1. The integrity of the countryside is compromised as barriers to capital accumulation are dissolved.
2. An earlier version of this chapter appeared in Jeffrey Patterson, "A Quarter Century of Canada's Metropolitan Fringe Development," *Sustainable Cities*, 4 (Autumn, 1992), to which the reader is also referred.
3. Data interpretation at Environment Canada is based on a polygon of 2.519 ha (1/8" on map scale of 1:50,000), and the entire use of any polygon is in accord with the use of the majority of the polygon.
4. Cf. above. Upwards of 30% of the land in the three largest Prairie cities is used for farming.
5. Canada, Statistics Canada, *The Daily*, April 28, 1992.
6. A CMA is characterized by Statistics Canada as an urbanized core, sometimes one central city but often several municipalities, at the centre of a labour market commuting zone of 100,000 persons or more.
7. The reader is cautioned that the fringe, as defined by geographers, is likely greater in extent than the area included in CMAs. CMA boundaries include areas in which 50% or more of workers commute to a central city. Significant numbers of commuters are likely to be generated in areas outside which this threshold requirement might be met.
8. In Chapters 2 and 3 below, a slightly larger area than is included in Statistics Canada's CMAs for Calgary and Winnipeg will be included in the regional city. These additional fringe areas result in a population for the urban/rural fringe areas in Prairie regional cities equivalent to 13% of the total.
9. This much larger fringe area aptly illustrates uneven development. The fringe tends not to be belt of continuous low density development. Rather, development of various forms and densities often occurs along major transport corridors, along stream valleys at nodes and so forth.
10. Trends in urban land-use densities by CMA class size are illustrated in Figure 2. While the three large Prairie cities used the most land *per capita* when the Environment Canada monitoring program was initiated in 1966, their use of land in the 1966 to 1981 period placed them at or near rates for the three Eastern CMAs with similar population, as well as the smaller CMAs. And while rural land in the three large prairie cities was converted to urban uses at similar rates for the period 1981 to 1986, the other cities had considerably reduced the rate of which they convert rural land to urban purposes.
11. Even abandoned farmland may be valued for its productive potential.

12. These same assertions are being increasingly used with respect to land markets inside urban agglomerations (Ottensmann, 1977; Peiser, 1989), as well as with respect to the conversion of land from rural to urban use. Garreau has argued that urban sprawl should not be unduly impeded and that the issue of sprawl should be tackled from a more generalized, macro-economic perspective as a normal process of metropolitan growth. Garreau notes that "edge cities," the discontinuous, large developments on the edge of the city that are such a noticeable part of the multinucleated city in the USA, have financed 80% of the economic growth through the 1980s and that the traditional downtown core is an anachronism from the point of view of economic development potential (1991).
13. A density of approximately 45 persons/ha is required to support reasonably frequent bus service, and a density of approximately 60 persons/ha, about the same as the central cities of the three largest Canadian CMAs, is required to support light rail transit (Lowe, 1992, pp. 119-137).
14. Again, the reader is cautioned that these data may understate the extent of urban uses, especially sparse residential development in the urban/rural fringe where the residential use may occupy a minority of 0.5 ha polygons that are the basis for analysing aerial photographs and satellite imagery that are the basis for the data.
15. Variations in the reports published by Environment Canada over the period 1966-1986 make it difficult to provide a continuous summary of the characteristics of converted land. For the period 1966-1976, detailed monitoring of prior characteristics and uses for practically all purposes was maintained (Warren and Rump, 1981). From 1976 to 1981, the published data are only disaggregated by agricultural class (I-VII) (Environment Canada, 1985). Thus the summary contained herein is limited to this one aspect of the characteristics of converted land.
16. 1986 CMA boundaries as determined by Statistics Canada.
17. For purposes of this report, four additional rural municipalities -- Cartier, MacDonald, St. Andrews and St. Clements, all part of the Capital Region designated for planning purposes by the Manitoba government and containing an additional 3051.7 km² with 24,455 persons in 1991 have been added to the Winnipeg CMA as part of the rural/urban fringe area of Winnipeg. In the Calgary region Foothills municipality, which contains 3554.2 km² and a 1991 population of 10,912 and lies immediately south of the City of Calgary has been included as part of the Calgary region for purposes of this report. The regional cities for the cities of Edmonton, Regina and Saskatoon coincide with the boundaries of the CMA as designated by Statistics Canada.
18. While it is easy to specify that economic and geographical characteristics of the Prairie and the Prairie economy are ultimately responsible for such policies, very little empirical research on the reasons has been undertaken. One environmental imperative that may be relatively unique to the Prairie is that soil and water conditions are often such that attachment to urban sewers is an imperative, as is the central treatment of sewage. These imperatives may have made it easier for planners and engineers to impose a rationality on Prairie urban development that is more difficult to assert elsewhere in Canada.

19. Winnipeg comprises at least one example of such a practice. In 1961, the Metropolitan Government of Greater Winnipeg was created with a total area of 54,370 hectares, approximately 65% of which was still included in commercial farms in the 1966 Census of Agriculture. Despite some of the highest rates of conversion of rural land to urban purposes over the period 1966-1986, some 13,600 hectares of farmland, or 24% of Winnipeg's area, remained in farmland in 1986.
20. Since these data were accumulated and between 1986 and 1991, the City of Calgary annexed 16,200 hectares of the adjoining rural municipalities of Rocky Mountain and Foothills.
21. The reader is cautioned that central cities and urban cores in Prairie cities often contain fairly large tracts of land that remain in rural, or agricultural use, and that extensive areas of urbanization also occur outside central cities. Approximately 24% of the City of Winnipeg was comprised of farms in 1986, a decrease from approximately 65% in 1966. Much of this has since disappeared from the city as a result of the provincial government's permitting the secession of Headingly, previously the only former municipality in Winnipeg comprised principally of farms and lying for the most part outside the urban limit line. Also in 1986, the City of Calgary contained farms totalling 6.4% of its area, and the City of Edmonton, which annexed approximately 35,000 hectares of land in the early 1980s, contained farms in 1986 totalling over 37,500 hectares, or 56% of its total territory, making it the second major Prairie city to annex rural lands a considerable number of years ahead of need for urban development.
22. The cities of Regina and Saskatoon have tended to violate the generalization that smaller cities utilize land less intensely than larger cities. In 1966, Saskatoon ranked highest among the five Prairie cities in gross density, while Regina ranked third.
23. Throughout the late 1970s and early 1980s, which includes its period of greatest growth, the City of Calgary strove to maintain a density in new residential developments of 60 persons/ha (a gross density of 30 persons/ha, assuming residential development to be 50% of total), and this planning objective likely contributed to the greater densities in new suburban development in Calgary during this period relative to other cities, such as Edmonton and Winnipeg.
24. Until it was replaced in 1992, the City of Winnipeg's 1986 official plan designated areas inside the city limits for rural residential development. Such areas were outside Winnipeg's Urban Limit Line, and it was anticipated that they would never require urban services. Local and provincial planners in all five major Prairie cities and their provinces have had to address issues such as municipal assessment and taxation policies of rural uses inside central city boundaries. Cf. Chapter 4 below.
25. Cf. Statistics Canada, *1986 Census Dictionary* (Catalogue No. 99-101E) for a definition of Census Metropolitan Areas and the methods used for delineating them. Additional commuters to jobs in an urban core, as well as commuters from urban to rural areas for employment, may reside outside CMA boundaries, but not in sufficient numbers or proportions to justify the inclusion of more outlying jurisdictions within a CMA. One rural municipality, Foothills, which adjoins the City of Calgary, was added to the Calgary CMA for purposes of this report, and two rural municipalities, Cartier and MacDonald, were added to the Winnipeg CMA. In addition to sharing a boundary with the City of Winnipeg, these two municipalities have been designated

by the Government of Manitoba as part of the "Capital Region" for provincial planning purposes by its Department of Urban Affairs.

26. In accord with Statistics Canada's classification, all of the residents of the rural municipalities surrounding Winnipeg are considered as part of the "rural" fringe, although a portion would be considered as part of the "urban" fringe if Manitoba's system of municipal jurisdictions were more closely in accord with those in the other two Prairie provinces. Readers are also cautioned that an analysis of population and characteristics is also limited by more or less continuous changes in municipal boundaries too numerous for standardization. Annexations of 35 km² to Regina, 40 km² to Saskatoon, 293 km² to Calgary and 389 km² to Edmonton from 1966 to 1991 and concentrated in the period 1981 to 1986 could potentially accommodate over 1,350,000 persons at typical densities for Prairie cities. The populations of the seven rural municipalities from which these lands were annexed would have been correspondingly greater if the annexations not occurred.
27. Most Census profile characteristics are based on a 20% sample.
28. Data for the Edmonton region and CMA have been adjusted beginning in 1981 to include the City of St. Albert, previously included in population totals for the "urban fringe," in the urban core. This reflects approval in June 1981 by the Alberta government of extensive annexations to the Cities of Edmonton and St. Albert, which also made the two cities contiguous. Edmonton's fringe population would have totalled 27% of the total had St. Albert remained in the fringe.
29. These calculations are only for the land area included in the municipal boundaries and may not reflect actual use for settlement.
30. Data for the Alberta municipalities is for the single decade period 1976 to 1986.
31. Decreases in number of dwellings may also reflect the combining of older units, as well as cessation of use or demolition.
32. Subject to appeal to the Alberta Planning Board as discussed below.
33. They may be permitted where the urban and rural municipality and the regional planning commission agree.
34. Alberta, Ministry of Municipal Affairs, *Land Use Planning in Alberta*, n.d. Edmonton, AB: Ministry of Municipal Affairs.
35. The Environment Act (CCSM, c. E125), Manitoba Regulation 95/88R, and Recommended Application Criteria Interim Guidelines for Septic Field Approval in the Winnipeg Region.
36. The Edmonton urban core also includes the City of St. Albert.
37. With the succession of Headingley from the City of Winnipeg in 1992, the land area of the city decreased by 108 km² from 572 km² to 464 km². However, for a variety of reasons neither Manitoba nor Winnipeg officials have envisaged that Headingley would ever be the location

- of urban expansion. Water quality problems have reportedly militated against the establishment of considerable numbers of rural residences in the new rural municipality.
38. The Edmonton Metropolitan Regional Planning Commission has assumed that the City of Edmonton will accommodate 70-75% of total population growth of the region for the projection period.
 39. During the period 1986 to 1991, the rate of growth in Edmonton's urban fringe was 10%, marginally above the 7.1% between 1981 and 1986, while the rate of growth in the rural fringe was 4.6%. Land area included in hamlets and villages had increased by a more modest 3.1%. It had decreased from 1981 to 1986 as a result of the 1981 annexation.
 40. Assuming the same relationships as existed in 1978 when the Calgary Regional Planning Commission undertook a survey of all country residences, including those larger than 8.5 ha, the total area encompassed by country residences might be as much as 27,000 ha.
 41. Minutes, Winnipeg Region Committee, June 6, 1990.
 42. This generalization, like many others, ignores differences between individual cities. For instance, the overall density of land use in Calgary and Winnipeg is similar to that of Ottawa-Hull, and urban development in Calgary over the period 1966-1986 was denser than that of any of the three Eastern cities in the same size class. From 1966-1986 the three largest Prairie cities used 14% more land per 1000 population change than the three Eastern cities. This differential increased during the 1981-1986 period when all size classes of CMAs except the three largest Prairie centres achieved rates of 30-35 ha/100 population growth. Cf. Table 4.
 43. In the aforementioned *Urban Canada Study, 1991* by the Angus Reid Group, the proportion of respondents providing an "overall high rating of housing" was 20% for Edmonton, 21% for Calgary, 34% for Winnipeg, 36% for Saskatoon and 30% for Regina. The responses for five non-Prairie cities ranged from 11% for Toronto and Vancouver to 19% for Montreal.
 44. The Alberta government has designated Sherwood Park as a designated centre for future development up to 70,000 population. Manitoba officials have likewise accepted official plans initiated by the St. Paul municipalities, although some of the plans were completed prior to the enactment of the current Planning Act and there is increasing concern with septic tank failures in these areas. While lots in these areas may not be large enough to accommodate existing septic tank-based wastewater treatment systems or replacement septic fields where existing fields have failed, they may be too large to economically serve with communal sewage systems.
 45. In the Regina region there has been little country residence development *per se* in the rural municipality of Sherwood in which the City of Regina is located, but over 5,000 ha of farmland were withdrawn from production between 1966 and 1986 that were not accounted for by annexations to the City.
 46. Cf. p. 2 above.

47. **Winnipeg Area Study, 1992. The correlation between income and lack of willingness to move to denser housing forms was significant at a level of .000.**