LOT CREATION IN ONTARIO'S AGRICULTURAL LANDSCAPES: TRENDS, IMPACTS AND POLICY IMPLICATIONS

Report 1: Literature Review

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Overview and Acknowledgements

Overview

This report is the first in a series of three reports in a research project titled “Lot Creation in Ontario’s Agricultural Landscapes: Trends, Impacts and Policy Implications”. This project has documented lot creation in Ontario’s agricultural land from 2000-2009.

This report reviews literature that has documented the impact of rural non-farm development on agricultural communities, with a particular focus on Ontario.

This report is an update to the literature review that was released in 2003 as part of a series of three reports on Rural Non-Farm Development: Its Impact on the Viability and Sustainability of Agricultural and Rural Communities, in which Dr. Wayne Caldwell and Claire Dodds-Weir documented severance activity in Ontario’s Agricultural Land between 1990 and 2000.

Three reports have been produced from the research project entitled “Lot Creation in Ontario’s Agricultural Landscapes: Trends, Impacts and Policy Implications”.

The three reports in this series are entitled:

1. Report 1: Literature Review
2. Report 2: Profiles and Summaries
3. Report 3: Impacts and Analysis

The reports from this study (2011) and the previous study (2003/2002) are available online at www.waynecaldwell.ca .

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1.0 Introduction

Ontario's planning policies regarding lot creation in prime agricultural areas are a modern expression of the age-old battle to balance competing land uses. In the interest of remaining competitive in the global market and meeting new social challenges, many agricultural operators are choosing to expand their operations, whether large or small scale, through intensification. At the same time, rural non-farm lots are segmenting Ontario's rural landscape. While these changes to the rural landscape can complement one another, they can also be the source of considerable tension. Numerous conflicts between scattered rural development and an increasingly industrial farm sector have been documented (Caldwell and Williams, 2002).

New non-farm lots not only remove land from agricultural production, but can also restrict surrounding agricultural land and potentially threaten future agricultural viability. Non-farm residential lots can introduce to rural areas, residents who may have limited understanding of current methods of agricultural production. Conflicts surrounding noise, dust, water pollution, livestock and manure odours, chemical applications, and sharing of the road with slow-moving farm machinery can arise. Once created, rural non-farm lots exist within the agricultural resource in perpetuity. Even residential severances that were initially related to the agricultural operation can create conflict later as the lots are sold and resold to individuals without an agricultural connection.

The literature identifies that as urban boundaries continue to expand and as rural non-farm development increases in the countryside, Ontario's agricultural resource

becomes scarcer, and the viability of the agricultural industry it supports becomes increasingly challenged. The New Webster's English Dictionary defines viable as "possessing the ability to grow and develop". While the viability of the agricultural industry is an incredibly complex issue, influenced by national and international laws regulations and markets, it has been recognized that the introduction of non-farm development that occurs in proximity to agriculture also has an impact on the viability of agriculture.

While there are a number of perspectives on the specific impacts of rural non-farm development on the agricultural industry, the majority of authors who have written on the subject agree that there is some impact as a result of non-farm development establishing in an agricultural area. In his review of evolution of agricultural land preservation in Ontario, and specifically in Huron County, Caldwell (1995) identified that the long-term welfare of many rural communities is dependent upon the preservation of the agricultural land resource. Caldwell also stated that "not only is the physical loss of farmland a threat to an active agricultural industry, but so too are the restrictions that tend to accompany the gradual introduction of non-farm uses in agricultural areas" (1995, p.22). This conclusion is reflected in the literature that discusses the impact of non-farm development on the agricultural industry.

In order to substantiate this conclusion, this report explores literature on a number of topics related to rural non-farm development and its impact on agriculture.

This report documents the relevant literature and presents it to the reader in the following sections:

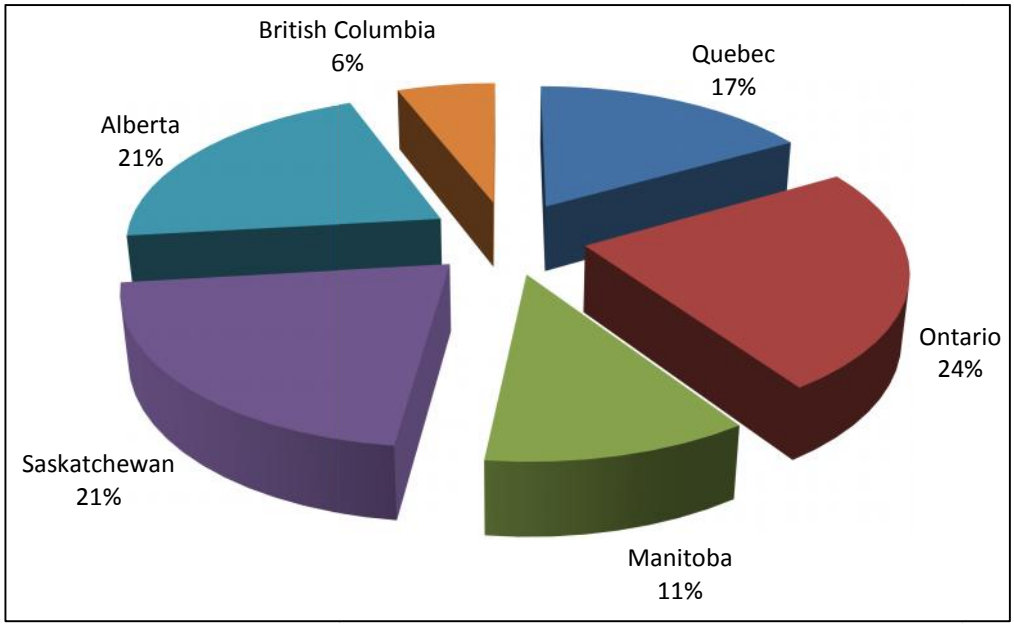
Sections	Topic
2.0:	Significance and Development if Ontario's Agricultural Industry.
3.0:	Farmland Loss in Canada and Ontario
4.0:	Evolution of the Agricultural Land Preservation Effort in Ontario.
5.0:	Impact of Rural Non-Farm Development on Agriculture.
6.0:	Why is The Creation of Rural Non-Farm Development Is So Persistent?
7.0:	Role of Land Use Planning In Rural Non-Farm Lot Creation in Ontario
8.0:	Macro Trends Impacting Agriculture and Rural Non-Farm Development
9.0:	Conclusion

2.0 Development and Significance Ontario's Agricultural Industry

2.1 Significance of Ontario's Agricultural Industry

Despite tremendous changes in the twentieth century in terms of economic development and urbanization, agriculture and food production remains a critical element in our daily lives in Ontario (Bryant, Russworm and McLellan, 1982; Bryant and Johnston, 1992). The agricultural industry in Ontario is significant at both a national and provincial scale. Figure 1 illustrates that Ontario led all provinces in farm cash receipts in 2010, with approximately 24% of the national total (Statistics Canada, 2011). Ontario also accounted for almost one quarter of Canada's farms and has the most farms of any province in Canada (Statistics Canada, 2006).

Figure 1 Farm Cash Receipts by Province, Canada, 2010

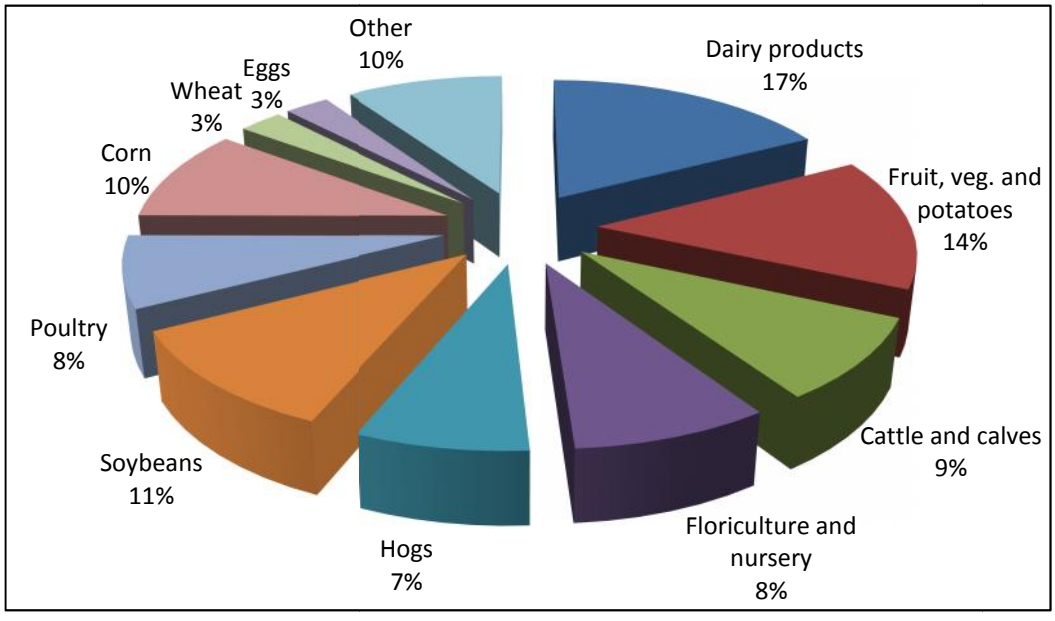


Source: Statistics Canada, 2011, Catalogue No. 21-011-X.

Ontario is an economic powerhouse within Canadian agriculture, with its total gross farm receipts totalling just over $10.2 billion in 2010, up from $9.1 billion in 2000 (Statistics Canada, 2011 and 2001).

The Census of Agriculture conducted by Statistics Canada illustrates the diversity of the agricultural industry in Ontario. Figure 2 illustrates the major commodity groups by farm cash receipts. In 2001, the livestock sector accounted for over 50% of Ontario's farm receipts, making it the most economically significant component of Ontario's agricultural industry at that time. Compared to 2001, farm cash receipts reported from the livestock sector had declined by 8% to represent 44% of farm cash receipts in 2010. Over the same 10 year period there has been a significant increase in the percentage of farm cash receipts from the cash crop sector (wheat, corn and soybeans) with this sector growing from 9.7% of receipts in 2000, up to 24% of the 2010 receipts. The fruit, vegetable and potato sectors grew to represent 14% of the 2010 receipts, up from 10.5% in 2000 (Statistics Canada, 2011 and 2006).

Figure 2 Farm Cash Receipts by Commodity, Ontario, 2010



Source: Statistics Canada, 2011, Catalogue No. 21-011-X.

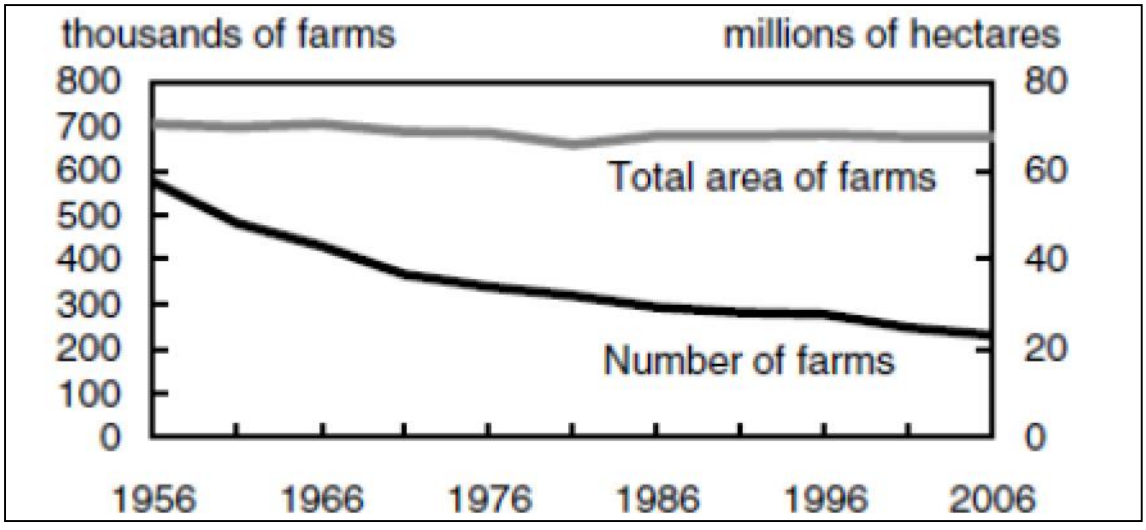
2.2 Trends in Ontario's Agricultural Industry

Despite the apparent prosperity that continues to be generated by the agricultural industry, some individuals and entire commodities are under pressure; virtually every sector is facing the challenge of rapid change.

Over the past few decades Ontario has seen a number of trends that indicate significant changes in the agricultural industry. The number of farms in Ontario has declined from 68,633 in 1991 to 59,728 in 2001 and then 57,211 in 2006 (Statistics Canada, 2006 and 2001). While there is an overall trend that indicates the number of farms in Ontario has been declining, the size in terms of area, herd sizes and gross farm receipts have been increasing. The average Ontario farm was 233 acres in 2006, up from 226 acres in 2001 (Statistics Canada, 2006 and 2001). This is a continuation of the long term trend that has seen average farm size increase from an average 119 acres per farm in 1931 to 233 acres in 2006 (Statistics Canada, 2006b). Over the

same time frame 1931-2006, the total farm area has gone down from 22.8 million acres in 1931 to 13.3 million acres in 2006 (Statistics Canada, 2006b). Figure 3 illustrates a comparison of census farms and the area of farms in Canada between 1956 and 2006.

Figure 3 Number and Area of Farms, Canada, 1956-2006



Source: Statistics Canada, Canada at a Glance 2008 with data from Census of Agriculture. 1956 to 2006

There are many reasons why these changes in the agricultural industry have, and continue to occur. According to a report published by Agricultural Odyssey Group in 2002, these changes have been brought on, in part, by international trade-liberalization, consumer demands, growing environmental concerns, a rationalization of suppliers and processors, shrinking government commitment to the sector as well as the use of science and communication technologies that were not imagined a generation ago" (Agricultural Odyssey Group, 2002, p.5).

Increased technology such as mechanization, computerization, and biotechnology, has played a central part in the development of the agricultural industry. This increase in technology has allowed farms to raise more livestock with less labour and to obtain increased crop yields. As labour requirements in agriculture have declined drastically,

the industry has become economically rationalized, dividing the industry into fewer, larger units and has shifted from labour to capital intensity (Troughton, 1990, p.24). This trend has partially driven the shift in agriculture towards intensive livestock facilities and large-scale crop production.

Increasingly farmers are forced to compete in the global market. As barriers to trade are removed, farmers are forced to compete internationally. In response, farmers compete for larger portions of limited production under cost-price squeeze[1] conditions (Toughton, 2007; Caldwell, 2001). Success is measured in terms of cost-per-unit of production and production efficiency is seen as stemming from increased scale of operation, capital intensification, and reliance on secondary inputs (Troughton, 1995). In order to "purchase inputs needed to maintain income against falling prices, farms became larger and more specialized, especially in livestock production" (Troughton, 2007, p.48). Adoption of new technology and enlargement of the enterprise has lead to intensification in farming and food production to achieve economies of scale (Smithers and Johnson, 2004). Agriculture in Ontario is dominated by the manufacturing model of industrial agriculture (Troughton, 2007; Smithers and Johnson, 2004).

In order to make a profit, farmers feel pressure to grow larger. "In a search for increasing efficiencies and in response to the cost price squeeze, farmers find that net returns per unit of production are decreasing – dictating larger, more specialized and more efficient operations" (Caldwell, 2001, p.3). As a result, family farmers often find themselves working with large corporations to develop vertically integrated networks, where the corporation provides the farmer with funding to build a new barn and to

[1] The cost price squeeze is a crisis in farming because the price that farmers are paid is low but the cost of production keeps going up.

produce livestock on a contract basis. "The highly productive farms that dominate Canada's agricultural system are increasingly linked with agribusiness, government and financial institutions" (Smithers and Johnson, 2004, p.192). In the industrialized model, the farmer is increasingly financially connected to the corporation and may be less directly connected with the rural community.

As discussed above, there are numerous demands and challenges that pressure Ontario's agricultural industry. As non-farm development is established, the ability of the producer to remain flexible is challenged. Farmers must remain as flexible as possible in order to be able to adapt and respond to future demands and challenges.

3.0 Loss of Agricultural Land

In Canada, approximately 673,000 square kilometres of land are used for agriculture (Statistics Canada, 2001b). Although this figure seems large, it represents only about 7 percent of Canada's total landmass (Statistics Canada, 2001b). Not all the land-used for agriculture is considered high-capability. Despite Canada's size, dependable[2] agricultural land is a scarce resource. Agricultural land in Canada has been classified according to its limitations for production based on variables such as soil and climate. Table 1 illustrates the percentage of Canada's land area that is considered Class 1 to 3. This table demonstrates that only about 5 percent of Canada's land area is considered dependable.

Table 1 National Agricultural Land Supply by Capability Rating

Canada Land Inventory Class	Description	% Of Canada's Land Area	Relative Production Potential For Arable Agriculture	Relative Direct Costs Of Production Per Kg. Of Product Produced
1	EXCELLENT TO VERY GOOD	0.45%	1.00	1.00
2	GOOD	1.80%	0.80	1.30
3	FAIRLY GOOD	2.80%	0.65	1.50
		5.05%		

Source: C.F. Bentley and L.A. Leskiw, "Sustainability of Farmed Lands: Current Trends and Thinking", Canadian Environmental Advisory Council, 1984, p.11 in Misek-Evans, Margaret. 1992a. *Balancing Growth with Agriculture: Approaches to Managing Non-Farm Rural Residential Development*. Department of Planning and Development, County of Oxford, p.3.

Ontario's countryside is made up of some of the best farmland in Canada. Numbers published by Statistics Canada's Environment Accounts and Statistics

[2] Dependable agricultural land is a term that is used by Statistics Canada to describe agricultural land considered as Class 1 to 3 by the Canada Land Inventory.

Division indicate that Ontario contains 52% of Canada's Class 1 land, 14% of Canada's Class 2 land, 11% of its Class 3 land and 8% of its Class 4 land (Statistics Canada, 2001b). The same publication identified that only 6.8% of Ontario's total land is considered dependable agricultural land. These statistics identify that the preservation of the agricultural resource in Ontario is critical, due to the lack of high-capability agricultural land within Canada.

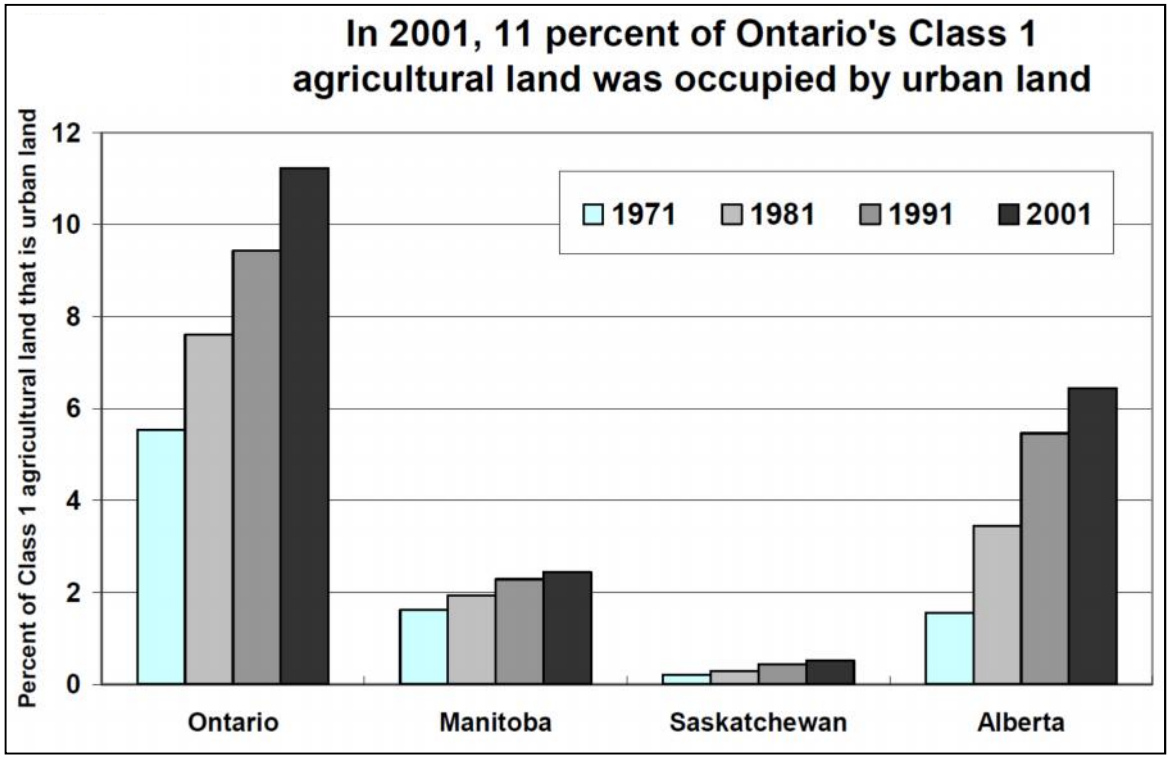
In 1977, the Canada Land Inventory established that a total of 16.3 million acres in Ontario is potentially suitable for arable agriculture (Soil Conservation Society of America, 1977, p.5). About 3.5 million acres are north of North Bay where climactic limitations tend to restrict agricultural development. The remaining 12.8 million acres are south of the Laurentian Shield, where most Ontario residents and their space-consuming activities are located (Soil Conservation Society of America. 1977, p.5). Statistics Canada (2005) identified that over 11% of Ontario's best quality agricultural land has been used for urban purposes.

The challenge in Ontario is that, due to historic settlement patterns, most urban centres are situated in the middle of highly-productive agricultural land. In all but a few cases, further outward expansion of these centres has little alternative but to use good farmland for urban uses (Soil Conservation Society of America. 1977, p.5). As a result, there is a great deal of pressure to use agricultural land for purposes other than agriculture. There is competition from residential, industrial, commercial, institutional and recreational uses, gravel pits, landfill sites, highways, and other uses (Ontario Ministry of Agriculture and Food, 1992, p.3). Statistics Canada (2005) also identified that the influence of urban areas goes well beyond their boundaries with the

establishment of golf courses, gravel pits and recreational areas in the surrounding rural area. This pressure is increasing as the population of Ontario is predicted to grow at rapid rates over the next several decades.

In 2001, almost half of the land area of urban centres in Canada was located on land that has been converted from dependable agricultural land (Statistics Canada, 2005). Between 1951 and 2001, the amount of cultivated land in Canada increased by 20% while the supply of available dependable agricultural land declined by 4% as a result of urbanization and other non-agricultural uses (Statistics Canada, 2005). Figure 4 illustrates as of 2001, over 11% of Ontario's Class 1 farmland was being used for urban purposes. This land is, for all intents and purposes, has been permanently lost from agriculture (Statistics Canada, 2005).

Figure 4 Percentage of Provincial Class 1 Soil Consumed for Urban Purposes

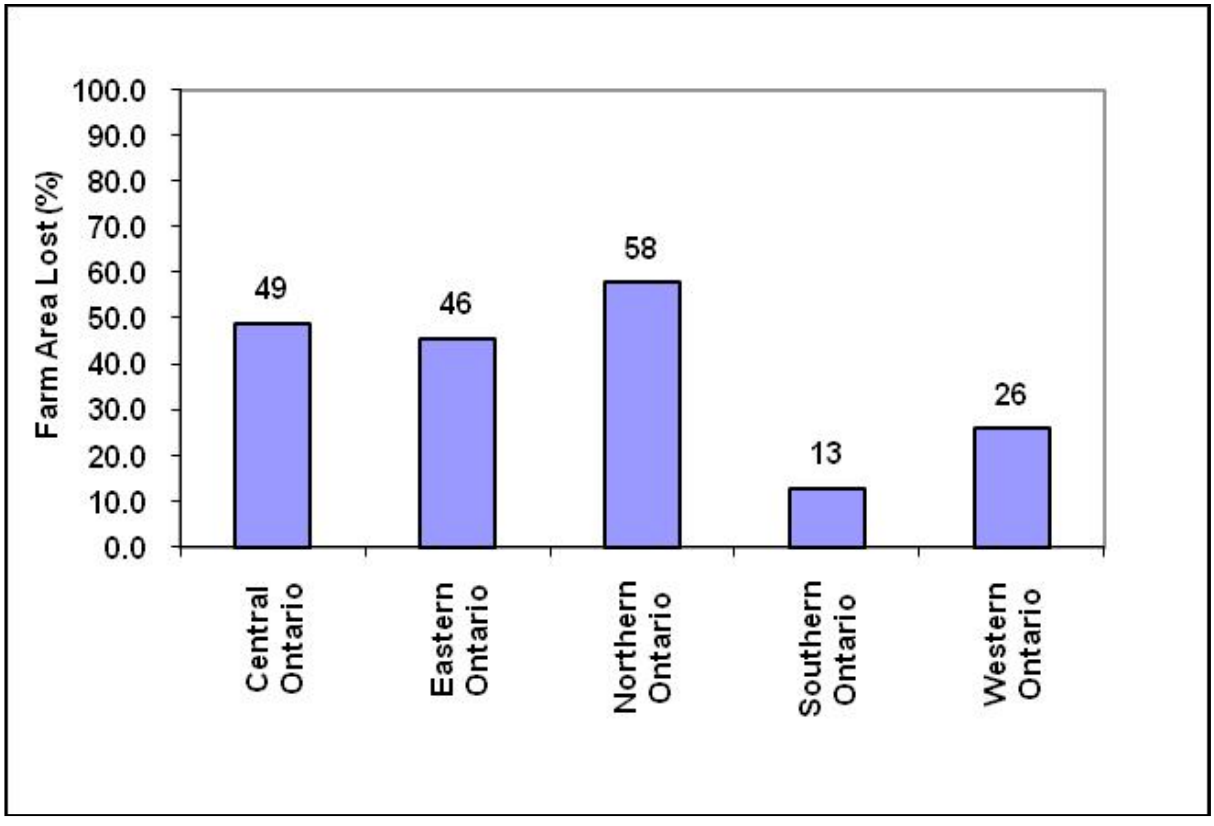


Source: Statistics Canada. 2005. *Loss of Dependable Agricultural Land in Canada.* Rural and Small Town Canada Analysis Bulletin. Volume 6, Number 1. Catalogue no. 21-006-XIE

Between 1996 and 2001 there was a 2.7% reduction in total farmland and an 11.5% reduction in the total number of farms in Ontario (Statistics Canada, 2001). This is a continuation of the long term trend that has seen average farm size increase from an average 119 acres per farm in 1931 to 233 acres in 2006 (Statistics Canada, 2006). Over the same time frame 1931-2006, the total farm area has gone down from 22.8 million acres in 1931 to 13.3 million acres in 2006 (Statistics Canada, 2006).

Figure 5 illustrates the percentage of farm area lost in the latter half of the past century in Ontario, by region. Central, Eastern and Northern Ontario has lost the most farm area. In Central and Eastern Ontario, this is likely in part due to the rapid urbanization and growth in non-farm development during this time period. In Northern, and to some extent Eastern, Ontario the decline in farm area may be a function of locational, soil and climactic constraints. The least decline in farm area has occurred in Southern and Western Ontario. The dominance of high quality agricultural land, historically lower population growth compared to other parts of Ontario, and a history of supportive agricultural land use policies in Western and Southern Ontario may partly explain the lower rates of farm area loss in these areas.

Figure 5 Total Farm Area Lost in Percentage in Ontario between 1951-2001 by Census Agricultural Region



Source: Statistics Canada. 1951-2001. Census of Agriculture data as reported in Ontario Farmland Trust. 2008. *Farmland in Ontario – Are we Losing a Valuable Resource.* University of Guelph.

Much of the loss of farm area land can be attributed to two processes. First, a considerable amount of agricultural land has been lost to the expansion of urban areas and scattered rural residential development within the agricultural areas of Ontario. Second, there has been a long-term trend to abandon marginal agricultural land and allow it to naturalize. Table 2 illustrates the estimated area of non-agricultural uses on dependable agricultural land in Canada between 1951 and 2001:

Table 2: Estimated area of Non-Agricultural Uses of Dependable Agricultural Land, Canada, 1951-2001

Estimated area of non-agricultural uses of dependable agricultural land, Canada, 1951-2001

Year	Urban and rural built-up[1]	Transportation and utilities[2]	Protected areas and campgrounds	Other[3]	Total
	square kilometres				
1951	11,400	7,400	1,000	200	20,000
1961	12,600	7,400	1,100	300	21,400
1971	14,300	8,200	1,300	500	24,300
1981	18,000	9,800	1,500	1,100	30,400
1991	21,100	10,600	2,100	1,700	35,500
2001	23,200	11,700	3,400	2,100	40,400

Notes:
Figures are rounded to the nearest 100.
1. Includes inventoried human settlements with populations above 1000, settlements with a population under 1000, and rural farmsteads/housing lots.
2. Includes roads, railways, airports and utility transmission lines.
3. Includes lumberyards, sewage treatment facilities, dumps, Federal Real Property, cemetaries, pits, quarries, autowreckers and golf courses.
Source: Statistics Canada, Environment Accounts and Statistics Division.

Source: Statistics Canada. 2005. *Loss of Dependable Agricultural Land in Canada.* Rural and Small Town Canada Analysis Bulletin. Volume 6, Number 1. Catalogue no. 21-006-XIE

Statistics Canada (2005) identified that when urban land is combined with the area of land used for small rural settlements (population under 1000), farmsteads and rural residential lots, over 23,200 square kilometres of dependable farmland across Canada had been lost by 2001. This represents 57% of dependable agricultural land converted to non-agricultural uses in Canada. The updated methodology used by Statistics Canada in their 2005 publication documenting the loss of dependable agricultural land in Canada has highlighted that large urban regions have a significant impact on the supply of agricultural land surrounding them.

4.0 Protection of Ontario's Agricultural Resource

The issue of agricultural land preservation in Canada has been a topic of discussion for well over forty years. A variety of perspectives exist regarding the importance of farmland protection. Some argue that with low commodity prices, agricultural surpluses, inexpensive food imports, and the overall pessimism that exists in certain agricultural sectors, agricultural land should not be protected. Edgens and Stanley, in a 1999 article entitled the "Myth of Farmland Loss", demonstrated the lack of concern for the preservation of agricultural land. While their research was specifically dealing with the situation of farmland loss in the United States, there have been similar criticisms made about farmland loss in Canada. A central argument is that farmland loss is a myth because the U.S.A. is losing farmland at half the rate it was lost in previous decades (Edgens and Stanley, 1999). While this is hopefully the case, this argument does not take into consideration the cumulative impact of any additional agricultural land being lost to urban and non-farm uses. Nor does it take into account the growth pressures on agricultural land surrounding urban regions and within rural communities.

In an article comparing planning in Pennsylvania vs. Ontario, Ball et. al. (2002, p.31) reflect that "individual rights seem to be valued more highly than the public good. … The strength of property owners' rights presents difficulties for cohesive and coordinated planning among communities". Lancaster County in Pennsylvania ranks first in total agricultural receipts among all non-irrigation counties in the United States and it expects that the population will double in the next fifty years (Ball et al, 2002). A concern exists in Lancaster County about where these people will go.

The situation in Lancaster County is similar to the situation that is anticipated in the Greater Golden Horseshoe around Toronto. The Greater Toronto Area alone is expected to increase from 7.4 million people in 2000 to 10.5 million people in 2031 (Ontario Farmland Trust, 2008). As the population of Southern Ontario continues to increase, it will become increasingly important to protect and maintain the flexibility of the agricultural land base of Ontario. The anticipation of this population increase demonstrates that there continues to be significant pressure to develop on some of the Ontario's best agricultural land and the on-going need for commitment to the protection of farmland. Although agricultural land may be lost at a slower rate than what it was in previous decades, the agricultural community Ontario is still threatened by pressure from urban development. The Ontario Farmland Trust identified that farmland preservation initiatives will have to be innovative, collaborative and strong to be successful Ontario over the long term.

Others argue that the protection of farmland should be a priority because there is a need to protect both food-production potential and the role of agriculture in the local and national economy. "Society cannot afford to consume the farmland base for other uses in the hope that technology will be able to provide the productivity required to feed growing domestic and global populations in the hope that food importation will be an adequate and affordable alternative to domestic food supplies" (Misek-Evans, 1992a, p.9). The long-term welfare of many rural communities is dependent upon the preservation of the agricultural land resource.

Farmland has increasingly been recognized as a strategic resource, fundamental to national (U.S.A) security and therefore should be worth protecting (Daniels and Bowers, 1997). The same statement can be made about Canada's agricultural land.

Agricultural land preservation has remained a contentious goal that has had mixed-success in Canada. The preservation of agricultural land is a key component of some municipalities' planning, while other jurisdictions do not truly incorporate agricultural preservation as part of their planning strategy. The Canadian approach to agricultural land preservation has typically been policy and process based (Caldwell, 1995). The development of policy as a planning tool to protect and preserve agriculture as a resource in Ontario came about initially because of an increase in public awareness of the loss of agricultural land; concerns about the cost of urban sprawl and service delivery to scattered rural residential development; and the demands of an academic and professional community to conserve the agricultural resource. Its success relies on the stability of political decisions.

Throughout the 1950s and 1960s the dominant public perception was of a continent with a limitless supply of farmland and unbounded technological capabilities, which was the breadbasket of the world (Bunce, 1998, p.233). A study by Krueger (1959) on the loss of tender fruit lands in the Niagara Peninsula was one of the first in Canada to focus attention on the issue of agricultural land loss. This study and several others elsewhere, combined with public demand, gradually led to provincial action in the early 1970s.

In the early 1970s the Ontario Institute of Agrologists (OIA) stated "it is imperative … that … Governments take steps immediately to designate and preserve

for food production all those limited areas of land which are most suitable for effective production of food" (OIA, 1975, p.3)

The OIA argued that, in order to preserve foodland, steps must be taken in the immediate future to:

1. greatly reduce the demand for foodland by those users of land not engaged in food production; and
2. prevent further fragmentation of foodland and further loss of this land; and
3. ensure the ability of producers to continue using foodland for food production

(Ontario Institute of Agrologists, 1975, p.3)

Individuals and groups began to demand that rural land-use policies be developed in order to encourage a viable agricultural industry.

The public sector Canada and the United States have taken a variety of approaches in response to the demand to protect agricultural land. Some of these approaches include: the use of legislation; the purchase of development rights; easements; land trusts; tax incentives; land use planning; and ordinances and zoning as basic tools used to preserve farmland (Wilton, 2007; Daniels and Bowers, 1997; Pfeffer and Lapping, 1995; Peters, 1990; and Furuseth and Pierce, 1982). One policy-led approach that emerged in the early 2000s across the United States and Canada is what has been called "Smart Growth" (Davidson, 2007). This movement has largely been driven in Ontario through concerns related to planning reform, large area integrated planning and infrastructure renewal (Davidson, 2007).

In 2002, the Ontario government set up its own Smart Growth panels across the province to help plan for the tremendous population increase that's expected over the next 25 to 30 years (Ontario Smart Growth, 2003). A key component of Ontario's Smart Growth strategy is to "protect rural areas, which are not settled primarily for sustainable

resource use" (Ontario Smart Growth, 2003, p. 15). Since 2002, the Province of Ontario has implemented several policy-led initiatives (Green Belt Act, 2005; 2005 Provincial Policy Statement; and the Places to Grow Act, 2005) all of which encourage the protection of the agricultural resource in the province and direct urban intensification. Davidson (2007) called the plans and reforms implemented in Ontario in the mid-2000s the most concerted effort to change planning directions in recent history and will guide planning in Ontario for some time[3].

Significant policy development and implementation has occurred in Ontario during the 2000s to help address agricultural land loss and creation of non-farm lots. Research undertaken by Caldwell et. al. (2011, 2003) has documented a decline in the number of rural non-farm lots being created in Ontario's agricultural land each year, it is the cumulative impact of this lot creation that creates the impact on the viability of the agricultural industry.

[3] Refer to Section 7 for a discussion about the Provincial Planning Policy and Smart Growth in Ontario.

5.0 Impact of Rural Non-Farm Development in Agricultural Land

Development of non-farm uses in agricultural areas typically occurs through the severance process[4]. The most common reason to sever land from an agricultural operation is to create a residential non-farm lot. Debate exists over the impact of rural non-farm lots. Bryant and Russwurm (1979) concluded that such development does not have significant impact. On the other hand, Rodd (1976) concluded that the impacts were of major significance. Authors, such as Caldwell in 1995 and Davidson in 1984, have made the argument that in isolation, individual rural non-farm lots may have minimal impact on the agricultural community. However, "careful attention is required in the evaluation of the small but numerous non-farm uses since they chip away and weaken the structure of the rural community in a slow, but cumulative fashion" (Davidson, 1984, p.344). Recent work undertaken by Milburn (2011), Smithers and Johnson (2004) and Parquette and Damon (2003) have documented the characteristics of the growing non-farm population and observed changing farm-community interactions within rural communities in Ontario and Southern Quebec.

The conversion of farmland to non-farm uses, and the growth of the rural non-farm population in rural areas, can influence the commercial viability of farms. The development of non-farm lots may also reduce a farmer's options to react to changing economics and farm practices because it fragments the agricultural land base. Low-density, non-farm residential development has the tendency to have a detrimental effect on agriculture because of farm fragmentation, rising land prices, and restrictions placed

[4] See Section 7 for description of the severance process in Ontario.

on farm operations (Fuller, 1984; Rawson 1976; Rodd, 1976). According to Bentley, "it is indisputable that unnecessary conversions of high quality agricultural lands to other uses – conversions which are usually permanent – are reducing the agricultural production potential of Canada" (Bentley, 1984 in Misek-Evans, 1992a, p.8). Zollinger and Krannich (2002), in their study on the factors that influence farmers to sell their land to non-agricultural uses, concluded that "increased non-agricultural land-use near farming operations has the potential to cause negative changes in the farming operation," (Zollinger and Krannich, 2002, p.444).

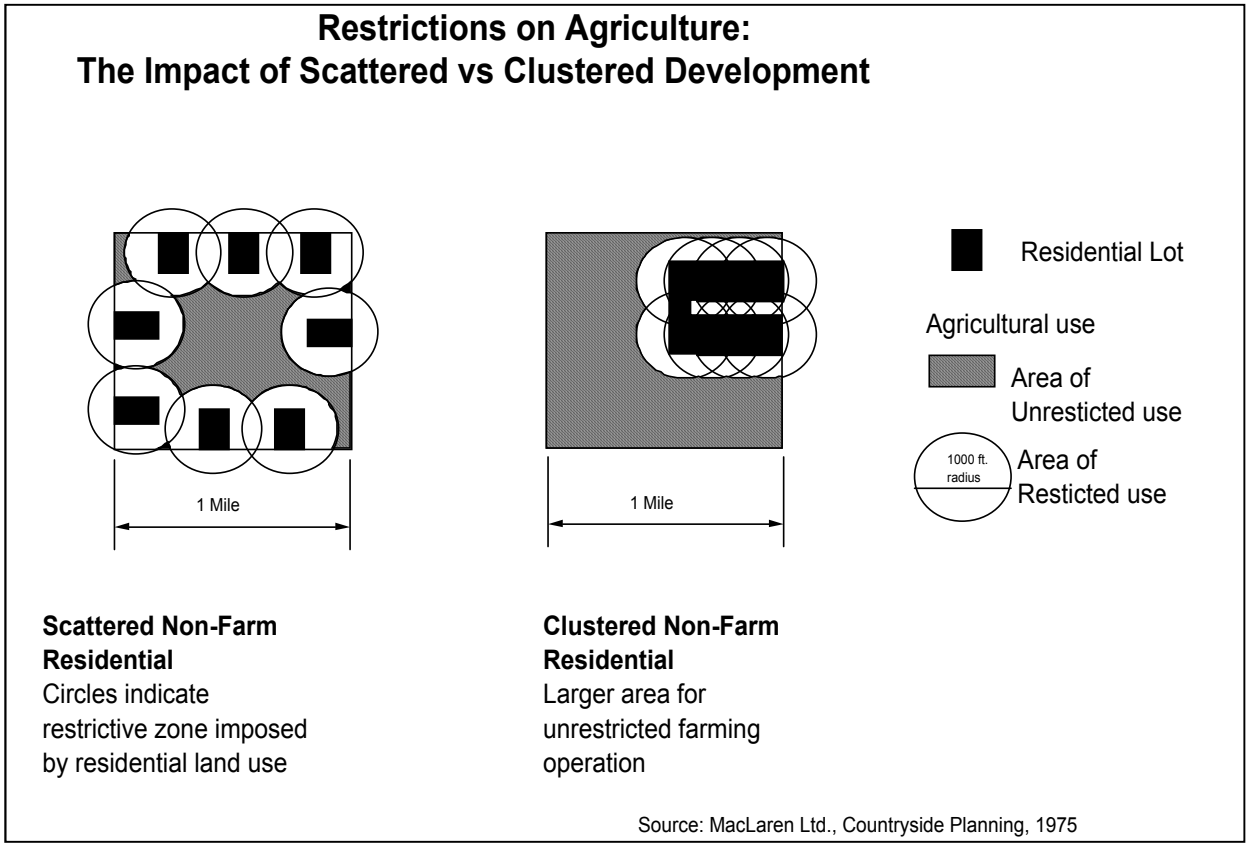
5.1 Fragmentation of the Agricultural Land Base

It has been well documented that the development of non-farm lots may reduce a farmer's options by fragmenting the land base (Caldwell and Dodds-Weir, 2003). Caldwell (1995) identifies that as rural non-farm lots are established in the countryside, it becomes increasingly complicated to assemble large contiguous farm holdings. This has the possibility of reducing the flexibility of a farmer to respond to changing economies and farming practices. Caldwell (1995) states, "over time this may contribute to the under-utilization of the productive capacity of the farm". Overall the presence of rural non-farm development has the potential to impact the viability of the agricultural operation. Also, as farmland becomes fragmented there are additional concerns about the loss of open space and local amenity in the landscape (Beasley and Workman, 1986).

5.2 Restrictions that Accompany Rural Non-Farm Development

Most non-farm development is scattered throughout the countryside. It has been documented that when development occurs in a scattered way it restricts much more agricultural land than when development occurs in a clustered hamlet or village. In a 1975 study on Countryside Planning in Ontario, James MacLaren Ltd. identified that scattered rural development had a larger sphere of influence than clustered development in a hamlet or village. Figure 6 identifies MacLaren's view of the impact of scattered versus clustered development.

Figure 6 The Impact of Scattered versus Clustered Development



The presence of rural non-farm development in Ontario's agricultural land can be considered challenging for an active agricultural industry. As MacLaren identified in 1975, a number of restrictions accompany the presence of non-farm and farm-related

development. New lot creation imposes a minimum distance separation (MDS) on surrounding agricultural operations. "The intent of the separation distances is to ensure sufficient distance between livestock, poultry and manure storage facilities and non-agricultural uses to allow the dissipation of odours and thereby prevent conflict" (Misek-Evans, 1992b, p.27). This requirement may restrict the expansion of an existing livestock operation or prohibit the establishment of a new operation. "A move to increase the viability of a farm through an expansion of its livestock or poultry facilities, may be limited or prevented due to the close proximity to non-farm residential development (or other non-compatible uses) and the conflict which may result" (Misek-Evans, 1992b, p.24). Given the tendency towards larger, more intensive livestock operations the restrictions associated with non-farm development are greater today than what was anticipated in by McLaren in 1975 (i.e. the area of restricted use maybe significantly larger than 1000 feet).

5.3 Cost of Servicing Rural Non-Farm Development

Another reason why rural non-farm lot development can be problematic is the cost and difficulty to service. When lots are created randomly in agricultural land there is little opportunity to provide this development with services such as water or sewer. As more people relocate to the countryside, there are also additional demands put on other municipal services, such as roads.

Joseph and Smit (1985) undertook a study to consider the relationship between rural residential development and the provision of services in rural municipalities by exploring a case study in Puslinch Township, south of Guelph in southern Ontario. In this study they made two conclusions: 1. Much of the motivation to limit non-farm

residential development in Ontario has stemmed from service related concerns; and 2. the cost of service provision to rural residential development has played an important role in the evolution of provincial planning policies.

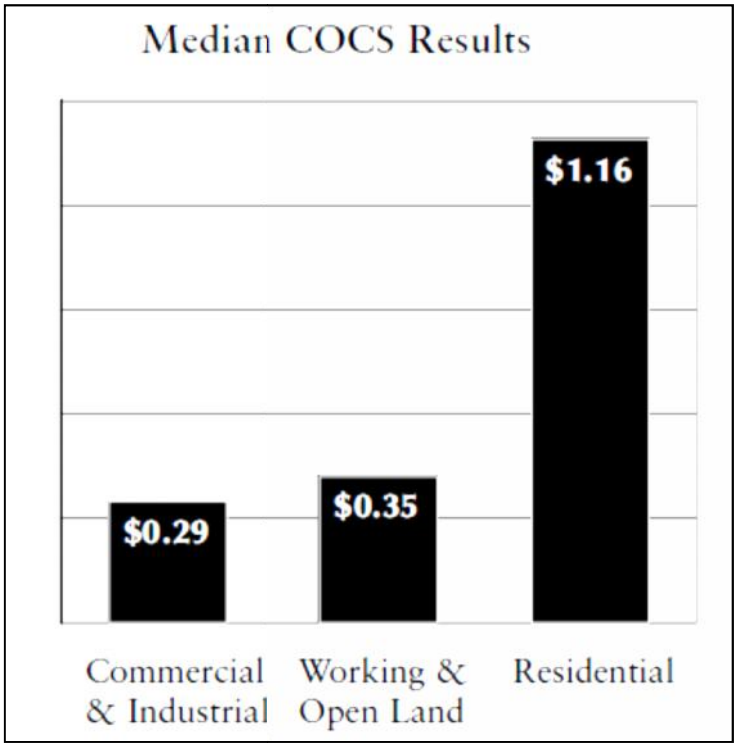
At the time of the study in 1985, Joseph and Smit noted that the cost of service provision to rural residential development has been difficult to quantify. Rural residential development has the ability to both generate revenue in the form of property taxes, but also placed increased demands for services. The 2003 study undertaken by Paquette and Damon identified that "with the migration of urban populations to the countryside, there emerges increased social demand for an array of new functions and services (e.g. environmental, recreational, aesthetic, etc.)" (p.425). Paquette and Damon (2003) identified that most of these new demands are primarily concentrated within agricultural land and forested areas.

A 1988 study of Brighton Township in the County of Northumberland by the Community Planning Advisory Branch of the Ontario Ministry of Municipal Affairs clearly showed that the Township consistently lost money on small residential properties every year. This study has accounted for municipal costs as well as for revenues from taxation, service fees, and provincial grants. In 1988, the average residential property cost the Township $32 more annually than was brought in, in revenue for the property. The greatest losses ($46 per property annually) were found to be on properties less than two acres.

The American Farmland Trust (AFT) has undertaken as significant volume of work related to the question surrounding the cost of servicing different land uses. As of August 2010, the AFT had completed 151 Cost of Servicing Studies across the United

States. Recently completed studies by the American Farmland Trust have drawn similar conclusions. Figure 7 identifies the median cost of services per dollar of revenue raised, based on 151 studies done by the American Farmland Trust and others in the United States.

Figure 7: Median Cost of Community Services per Dollar of Revenue Raised to Provide Public Services by Land Use



Source: American Farmland Trust. August 2010. Cost of Community Services Studies Factsheet. Washington, U.S.A: Farmland Information Centre.

In virtually every study conducted by the American Farmland Trust, the agricultural/open land sector combined with commercial/industrial land offset deficits created by resident's high demand for services from residential land uses (American Farmland Trust, 2010). The Cost of Community Studies show that over the past 20 years in 151 communities, working lands (agricultural land and open space) generate more public revenues than they receive back in public services and are similar to

industrial/commercial land uses (American Farmland Trust, 2010). The cost of community studies document that it takes more tax revenue to provide services for residential land uses than they provide (American Farmland Trust, 2010). The Amercian Farmland Trust (2010, p.6) noted that:

> Communities need reliable information to help them see the full picture of their land uses. COCS studies are an inexpensive way to evaluate the net contribution of working and open lands. They can help local leaders discard the notion that natural resources must be converted to other uses to ensure fiscal stability. They also dispel the myths that residential development leads to lower taxes, that differential assessment programs give landowners an "unfair" tax break and that farmland is an interim land use just waiting around for development.

While there have been relatively few studies in Canada related to the costs of servicing different land uses, the ones that have been conducted have agreed with the findings of the Cost of Community Servicing Studies undertaken in the United States. While it is tempting to think of the creation of non-farm lots as a source of municipal tax revenue, the findings of the studies that have been completed in North America over the past 20 years on this subject indicate that converting agricultural land to residential land use is not an effective way to increase municipal revenue.

5.4 Additional Costs to Agricultural Practice

As rural non-farm uses are established in the countryside, farmers are often faced with additional costs to mitigate and relieve conflict (Daniels and Bowers, 1997; Misek-Evans, 1992b; Anderson; 1995; Baden, 1984). Farmers recognize the "threat of increased operating costs, rising land taxes, and general headaches from non-farm neighbours when residential development invades the countryside" (Daniels and Bowers, 1997, p.3). Due to the fact that rural non-farm lots are generally not directly

related to, or supportive of, agriculture and do not leave the land suitable for future use in agriculture, farmers often have to bear costs related to changing their agricultural practices. "Because non-farm rural residents tend to have values oriented towards enjoyment of the rural environment rather than uses of the rural environment for agriculture, conflicts over dust, odour, hours of operation, chemical spraying, etc. frequently arise" (Misek-Evans, 1992b, p.20). The spread of non-farm people and activities into farming areas – can impose costs on farmers. Baden identified that "dogs attack farm animals, people tramp through cultivated fields, and ordinances [by-laws] are passed against the noises associated with farm machinery and against the spray application of pesticides" (1984, p.13). The Ontario Farmland Trust (2008) documented that farming in the urban shadow often additional impacts/costs such as: an increase in traffic and related safety concerns; complaints about normal farm practices; decline in agricultural service businesses; and high pressure to convert land to non-agricultural uses to deal with high capital costs.

Anderson raised a concern regarding investment in agriculture in areas where non-farm development is prevalent. "If a farmer feels that adjacent residential development is restricting his traditional farming practices, he may cease to make capital investments which help to maintain the long term viability of his farm. Where this occurs, farm practices may also shift from a focus on resource stewardship to resource exploitation" (Anderson, 1995, p. 17).

In her study on the characteristics and motivations of the non-farm rural population in southern Ontario, Milburn (2011, 2007) identifies that there is an increased cost to the agricultural community as a result of the changing rural demographic.

Milburn et. al (2010) note that non-farm landowners are very concerned about farmland preservation and want to preserve the functionality and existing aesthetic of local farms. Milburn et. al. (2010) make the following observation about the dynamic between the non-farm and farm community and how it impacts costs of operating a farm in a community where the dominant perspective is directed by non-farm interests:

> Non-farmers are becoming increasingly dominant in the rural political arena as their numbers increase, and their time commitments often permit voluntary involvement. They tend to use this power to bolster or protect those aspects of the rural environment which supported their decision to move outside the city, which, ironically, results in a transition from an agricultural to an urban focus in the political arena. Issues such as nutrient management, chemical spraying, and controlled burns (among others) will be ever increasingly mandated by a non-farm population whose primary motivation is their quality of life and the perceived impact of certain activities on the environment, and compounded by urban perceptions of the land which discount farmers' traditional knowledge. These changes will increase the cost of operating farms, which will make our farms less economically viable.
>
> Milburn et. al, 2010, p. 42.

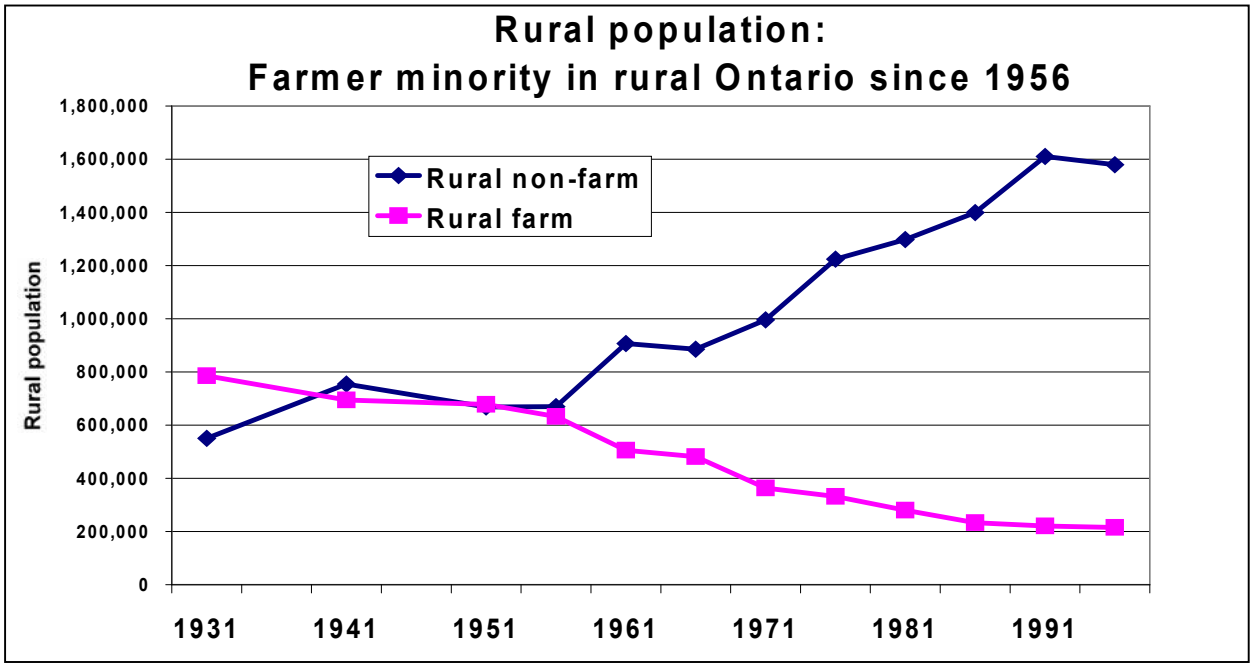
The changing composition of rural communities, as identified by Milburn et.al (2010) has the ability to significantly impact the flexibility of agricultural production, which may lead to increased costs and increased oversight of the agricultural industry by non-farm interests.

5.5 Change in Rural Demographic

As non-farm development increases in the countryside, there is an increase in the rural non-farm population. In his 1995 study Caldwell identified that each additional residence established in the agricultural area changes the farm/non-farm composition of the community. In 2002, then president of the Ontario Federation of Agriculture, Ron Bonnet, commented that one of the significant impacts of rural non-farm development is

the change in the rural demographic. "Dramatic changes in demographics in rural Ontario are resulting in a multitude of new challenges for Ontario farmers. The most obvious of challenges is the significant decline in numbers of farmers and the increase in non-farm residents in rural Ontario" (Bonnett, 2002, p.1). Figure 8 illustrates the historic growth of the rural non-farm population in Ontario.

Figure 8 Rural Non-Farm vs. Rural Farm Population in Ontario Since 1956



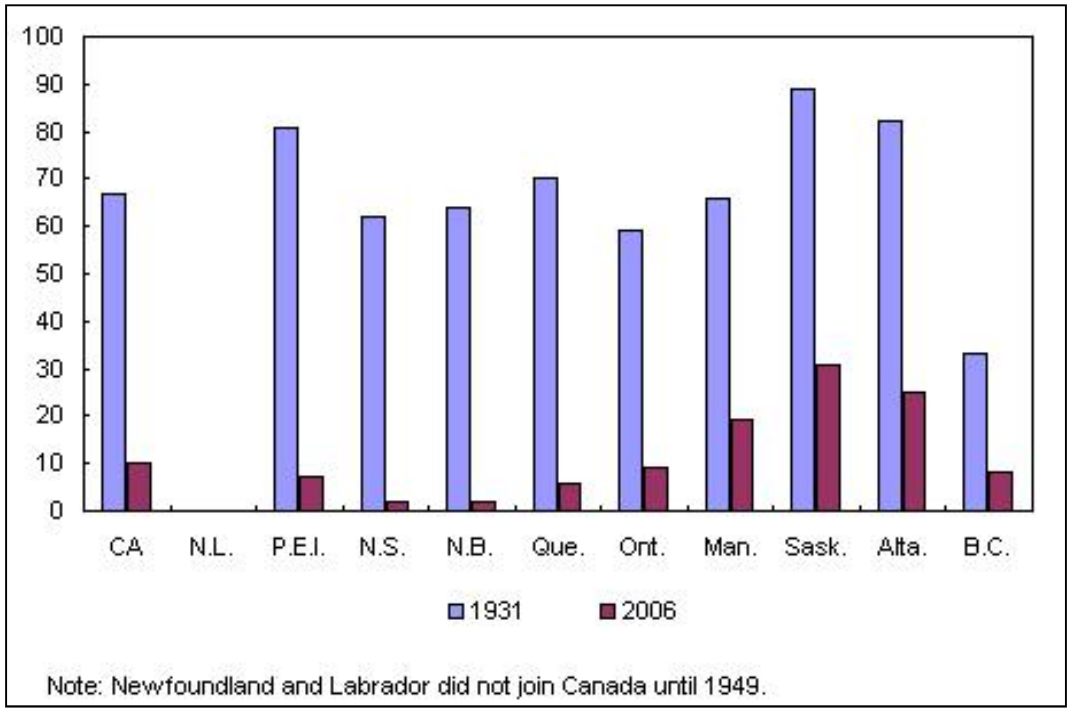
Source: Statistics Canada, Census of Population 1931-1996, Ray Bollman

This continued trend is reflected in the numbers reported in the 2001 and 2006 census years. While the rural population increased in 2001 to 1,733,870 and again in 2006 to 1,808,480, the farm population declined to 181,230 in 2001 and again in 2006 to 171,410 (Statistics Canada, 2006b).

In 1931, 1 in 3 Canadians lived on a farm, whereas in 2006, the number of Canadians who lived on a farm was reduced to 1 in 46 (Statistics Canada, 2006b). By 2006, only 2.2% of the Canadian population identified themselves as a farm population.

Figure 9 illustrates the decline of the farm population as a proportion of the rural population:

Figure 9 Rural Farm Population as a Percentage of the Total Rural Population in Canada, 1931 and 2006



Source: Statistics Canada. 2006c. Agriculture-Population Linkage Database and Canada Census, 1931. Retreived from http://www.statcan.gc.ca/ca-ra2006/agpop/article-eng.htm

As rural non-farm development occurs and agriculture becomes less labour intensive, the composition of the rural community changes. The continued reduction in size of the farm population is largely attributed to the substitution of capital and technology for labour (Smithers and Johnson, 2004) and migration to urban centres. Increasingly farmers are producing food through industrialized methods on an agricultural resource that is increasingly occupied by non-farm residents.

The introduction of residents who may not be familiar with the reality of an active agricultural industry may also lead to conflict within the community. "Where conflict

develops between the non-farm and farm community around land-use, it decreases the efficiency of a farm, or where a conflict restricts or limits a farm's operation currently or in the future, the viability of that farm is diminished" (Misek-Evans, 1992b, p.24).

The increase in the non-farm population also has political implications that may in turn have implications for agriculture. Caldwell (1995) identifies that over time, the non-farm population may become dominant with a corresponding impact on local politics and decision-making. "Municipal councils today are commonly under the control of non-farm rural residents, and the decisions coming from those councils are increasingly difficult for today's farmers to live with. Some of the decisions pose an outright threat to the future of farming in some municipalities" (Bonnett, 2002, p.1). An indicator of this change may be the degree to which local by-laws or decisions are supportive of agriculture.

The majority of the literature which explores the impact of rural non-farm development has documented that the creation of rural non-farm lots tends to bring about significant challenges for agricultural operations. While each study highlighted different impacts, all of the documented impacts of rural non-farm development indicate that the presence of this type of development tends to reduce the flexibility of farmers to adapt to changes in agricultural production, which thereby reduces the viability of agriculture. According to Davidson (1984), in order to function optimally, agriculture requires large spaces free of disruptive factors in which to operate; this space must be as free as possible from non-farm development.

5.6 Characteristics of Ontario's Rural Non-Farm Population

At the same time that there is pressure on agricultural producers to expand their operations, there has been a significant demographic change in the composition of rural communities across Canada and Ontario. Statistics Canada does not collect data using the category of non-farm resident. As such, there has been little statistical data to build a profile of the characteristics of the residents who share the agricultural resource with the farm community, and little academic study of this population.

In 2011, Lee-Anne Milburn published a paper in the Journal of Rural Studies based on her Ph.D dissertation (2007) that assists rural practitioners in the task of understanding and describing the characteristics of the rural non-farm population in Southern Ontario. Milburn's research utilized focus groups and surveys to identify this group's characteristics. This research was also intended to support a minor level of prediction, process and generalization related to the rural non-farm population in Southern Ontario.

Milburn (2011) notes in her research that rural areas are undergoing non-farm population growth as a result of various factors including changing lifestyle preferences, an aging population, and technological innovations which allow exurbanites to commute. In addition to the factors identified by Milburn, previous research by Caldwell and Dodds-Weir (2003) would also indicate that the supply of available non-farm residential lots in agricultural communities may also contribute to a growth of the non-farm population in these areas.

Milburn's focus groups and survey's helped provide qualitiative and quantitative data to assist in profiling the rural non-farm population. The results of her study indicate of the 476 rural non-farm landowners surveyed:

- 10% were retired farmers
- 11% were commuters (50km or more)
- 18% were weekenders
- 21% were urbanites
- 25% were rebounders (grew up in country, moved to the city, moved back to the country)
- 29% were children of farmers (an adult son or daughter of farmer)
- 37% were retirees (non-farmer)

It is noteworthy that a significant proportion of the rural non-farm population had some connection to farms or rural communities and that almost 50% of the population were retired (either retired farmers or retired non-farmers).

Results of Milburn's (2011) study are suggestive of the following trends in the rural non-farm landowner population:

1. The number and proportion of retirees in rural areas is increasing;
2. The number and proportion of professionals in rural areas is increasing;
3. Non-farm landowners are more likely to live on or near their properties;
4. Average property size of non-farm landholdings had decreased; and
5. Non-farm landowners have formal education levels are substantially higher than the farm population.

Milburn (2011) concludes that non-farm owners are distinct and separate from farmers and should be viewed as such when considering policy decisions. She also identifies that while non-farm owners have much in common; there is the potential to see increased conflict between non-farm interests in rural areas in the future.

Milburn shares the following observation regarding the essence of the relationship between farm and non-farm land owners in rural communities:

> While both groups [farm and non-farm] are very concerned about the health and long-term sustainability of the environment, farmers' conservation activities must exist within a framework of financial sustainability; they must either be supported by external financial resources, or they must demonstrate a positive cost/benefit relationship. Non-farm landowners on the other hand are motivated by environmental and quality of life considerations.
>
> Milburn, 2011, p.18.

Milburn (2011), Smithers, et. al (2004) and Caldwell and Dodds-Weir (2003) and Caldwell (2001) have all documented pressures that exist for farmers where the phenomenon of agricultural intensification has become associated with increased frequency of community conflict with non-farm landowners.

6.0 Creation of Rural Non-Farm Lots in Ontario's Countryside

Through the review of the literature that identifies the impact of rural non-farm development it has been established that rural non-farm development tends to negatively impact the viability of an increasingly industrialized agricultural industry. And yet rural non-farm lots continue to be established in agricultural land. This section reviews some of the literature that identifies why rural non-farm development is created, despite its problematic nature.

According to the literature, the most significant reason for persistent residential development in Ontario's countryside is the demand. Most typically the demand is for the creation of residential lots in the countryside. The demand comes from both urban and rural dwellers.

The literature has identified a number of push and pull factors that have been instrumental in creating a demand for rural properties over the last thirty years. Some key push factors from large urban centres include: the economic push primarily related to housing costs and high tax assessments (Milburn et. al., 2010; Bryant, Russwurm and McLellan, 1982); and environmental push factors, such as pollution, congestion or pace of life (Bryant, Russwurm and McLellan 1982; Williams and Sofranko 1979). Numerous factors that pull people to the countryside have also been identified. The most frequently mentioned pull factor is the search for rural quality of life (Milburn et. al., 2010; Paquette and Damon, 2003; Williams and Sofranko, 1979; Fuguitt and Zuiches, 1975). Included in quality of life are privacy and space (Milburn et. al., 2010; Bryant, Russwurm and McLellan 1982; Joseph, Smit and McIlravey 1989), freedom of activity,

quality of environment for raising children (Bryant, Russwurm and McLellan 1982), decentralization of cultural facilities, retirement, back-to-the-land ideology and return migration (Weeks 1976, Williams and Sofranko 1979).

The agricultural land lost to non-farm rural residential development is a topical issue in Ontario because of the intense demands for housing from population growth coupled with a preference for rural living. In his book, *Conflict and Crisis in Rural America*, Waterfield speaks about the American preference for rural living:

> Most Americans come from rural roots. The suburbs, with one foot in the city, one in the country, reflect this divided loyalty. Americans have taken the country with them to the city: the open spaces, parks, trees, music, games and sports. The ongoing struggle to save and preserve the best of rural America has led to conflict in Eden. Some serpents still lurk there. Voltaire said, 'Let each man cultivate his own garden.' Americans understand what he meant: they are torn between the call of the pavement and the deep desire to cultivate that garden. Rural America lives in the hearts of millions who see little more than glass, brick and stone.
>
> Waterfield, 1986, p.18.

A very similar statement could be made about Canadians. In a recent study of non-farm landowners in southern Ontario, Milburn et. al. (2010) suggest that "non-farm rural landowners prefer landscapes with trees and water, and landscape health, restorative benefits, and aesthetic quality are crucial. Environmental qualities such as peace and quiet, solitude and open space, are central to their continued enjoyment of their properties" (p. 42). Milburn et. al also found that despite their preferences for rural idyllic landscapes; non-farm rural landowners often chose to "buy their properties for very practical reasons: location, cost, availability and quality of resources, and size" (2010, p.42).

The appeal to living in a rural setting, coupled practical reasons that generate demand (i.e. cost, value for money), along with advances in technology and transportation, has produced a demand for rural non-farm properties in Ontario's countryside.

In addition to the demand for rural residential properties from non-farmers, there is pressure from the supply side as farmers sever off small parcels of land from their farms. In the past (prior to 2005), it has been appealing to farmers to create retirement lots, on their own farm property, so that they can stay close to the farm and perhaps family. There is also an economic incentive for farmers as they were able to sell the retirement lot and obtain some additional retirement income. Farmers also engage in rural non-farm lot development by severing lots that are surplus to their agricultural operations. While these lots may have been considered farm-related at the time the severance was granted, evidence (van Donkersgoed, 2001) has shown that they do not stay connected to agriculture in the long term. In 2001, van Donkersgoed reported, on average, a retired farmer stays on their retirement lot for 1.8 to 3 years. Based on this information, farm retirement lots quickly became rural residential building lots.

Since 2005, the only non-farm residential lot that has been permitted in Ontario's prime agricultural areas have been severances of existing farm dwellings that are made surplus to the needs of farmers (surplus dwelling severances) through farm consolidation[5]. This change was brought about with the enactment of the 2005 Provincial Policy Statement. Since 2005, jurisdictions that previously did not permit the creation of non-farm residential lots or permitted them under very limited circumstances

[5] See Section 7 for a discussion of the evolution of provincial policy related to the creation of rural non-farm lots in Ontario's agricultural land.

(i.e. Huron County and Perth County) have shown more interest in allowing surplus dwelling severances. This may be due in part to the dominance of industrial-scale agriculture in these areas, where farms are increasing in size and a supply of surplus houses due to farm consolidations exist. There has also been a decline in livestock production in these areas over the 2000s. With fewer livestock operation, farmers have less concern about the minimum distance separation impact of non-farm residential lots on building new barns. The interest in pursuing surplus dwelling severances may also be due in part to an on-going increase in farmland values that have been rising steadily since 1993 (Farm Credit Canada, 2011). As the cost of crop land increases, severing off a surplus dwelling can assist the farming in reducing land costs. It can also facilitate the existing farm owner selling off the farmland to a large scale farm corporation and allow the farmer to live in the surplus dwelling in their retirement. Many large scale farmers have commonly express that they have no interest in being landlords. AS such, where policies exist, many commercial scale farmers are often the ones who are pursuing surplus dwelling severances.

In 2007, the Ontario Federation of Agriculture (OFA) adopted a consolidated agricultural land use policy statement. In this statement the OFA noted they oppose the creation of new non-agricultural lots within prime agricultural areas and are supportive of policy changes in Ontario[6] (2005 Provincial Policy Statement) that removed the practice of creating farm retirement lots. The same policy statement (OFA, 2007) supports the severance of a residence surplus to a farming operation, and while they acknowledge that this creates a non-farm residential lot that impacts surrounding

[6] See Section 7 for a discussion of the evolution of provincial policy related to the creation of rural non-farm lots in Ontario's agricultural land.

agricultural operations, the OFA understands it is economically necessary for some farmers to be able to sever and sell a surplus farm dwelling.

In many instances, farmers opt to sell off land in small parcels for residential purposes in order to inject much needed cash into their farm business (Misek-Evans, 1992a, p.5). In many places there is an attitude that it is a farmers right to sever land when times are tough. Misek-Evans captured this attitude in her report about the impact of severances in Oxford County by including the following quote, which appeared as an editorial piece in a local newspaper:

> …let the farmers sever the lots from their farms…a great deal of good would result from that decision…farmers would get a much needed cash injection to keep them viable…local tax bases would grow…small rural hamlets and villages would be revitalized…there would be an increased need for local goods and services…increased availability of land would lower the cost of building lots making it easier for first time builders and buyers of land…
>
> (anonymous, in Misek-Evans, 1992a, p.8)

While severing land and creating a building lot may assist farmers by injecting money into the farming operation in the short-term the creation of a non-farm lot may impact that farm's future viability.

Zollinger and Krannich (2002) identify factors that influence farmers' expectations to sell agricultural land for non-agricultural uses. The study was conducted in Utah, U.S.A., where rapid population growth occurred in the 1990s. Zollinger and Krannich identified that "though broad economic and demographic changes are a key factor in this trend, the decisions of individual agricultural operators account for the aggregate loss of agricultural land in areas affected by growth" (2002, p.442). Zollinger and Krannich's study concluded that when a farmer was nearing retirement age, the farm was typically viewed as a retirement income. Selling a farm

that would be converted to non-farm uses would ensure the farmer a larger retirement income. The study also found that a farmer whose profit was declining was more likely to sell the farm to a non-farm use. A farmer was less likely to sell the farm to a non-farm use if there was a chance that a child was interested in taking over the farm. The study also determined that that when a farmer's operation suffers negative changes due to increased urban land-uses in the area, he or she may begin to view the area as an increasingly problematic place for a farming operation (Zollinger and Krannich, 2002).

As the Ontario farming population ages and the farm population continues to decline, there is an increased chance of conversion of farm to non-farm ownership. Farm Credit Canada (2011) already reports in 2010, "rural residential demand for farmland increased in select areas throughout southwestern Ontario and on the outskirts of the Greater Toronto Area. As a result, smaller farms are sometimes purchased by non-traditional buyers. This contributes to increased competition for farmland". More competition for farmland will continue to contribute to increased land costs for agricultural producers, which threatens long-term viability of the agricultural industry in Ontario.

This section has summarized some of the key reasons why rural non-farm lots are created in Ontario's farmland, despite the acknowledgement that the impact from rural non-farm development has a tendency to have an overall negative impact on the agricultural industry. The next section explores the role of land-use planning in permitting the establishment of rural non-farm uses in the countryside.

7.0 Role of Land-use Planning in Rural Non-Farm Lot Creation

There are many influences and factors that impact the viability of Ontario's agricultural industry. Some of these include: national and international laws; regulations and markets; changes in production technology; and consumer demand. Some influences may have a more direct impact on agricultural viability than others. Land-use planners in Ontario such as Misek-Evans (1992a) and Caldwell (2001) have identified that while viability is a complex issue, it is recognized that municipalities have had, and continue to have, a role in supporting the viability of the agricultural industry through land-use planning. The New Webster's English Dictionary (Bergquist, 1988) defines viable as "possessing the ability to grow and develop". Under the Planning Act, land-use planning is the jurisdiction that processes and gives comment on applications that result in a wide variety of development within Ontario's land base. Planning encourages the rational use of land, assists communities to develop long-term goals and objectives, and provides a framework to resolve conflicts.

This section will review the role of planning in the establishment of non-farm uses in agricultural land through the severance process. It will also review the policies that the province of Ontario has developed over the past two decades to manage non-farm development in the province's agricultural land.

7.1 Rural Lot Creation Process

The consumption of farmland in Ontario occurs through two main processes: subdivisions and consents (severances) processed under the Planning Act.

Subdivisions tend to occur as part of the expansion of an existing urban area. They occur at relatively high densities and are the preferred way of accommodating new growth. Conversely severances (also known as consents) are the predominant way to create new properties in rural areas. Consent to sever is the authorized separation of a parcel of land from an adjoining parcel in order to create a lot which can be conveyed (Anderson, 1995). The approved lot can be sold, mortgaged or leased. The planning principle behind the severance process is based on a desire to prevent indiscriminate division of land by subjecting all applications to review by an approved severance granting authority (Anderson, 1995).

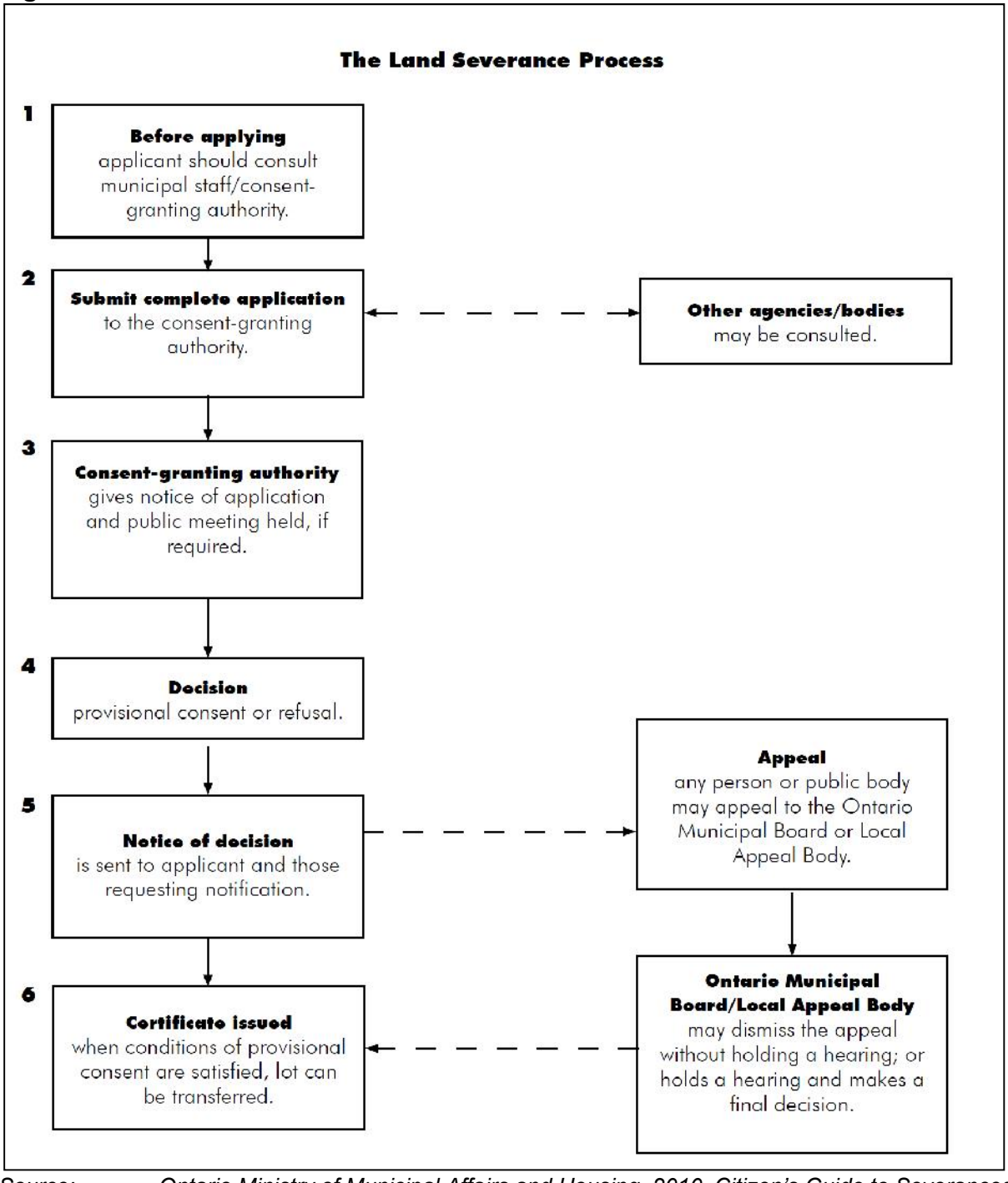
Non-farm development that has resulted from consent to sever land is visible in the landscape of rural Ontario. The majority of development that occurs in rural Ontario results from approval of severances (consents). According to the Ministry of Municipal Affairs in 1988, consents are undoubtedly the means of subdividing undeveloped lands in rural areas. In 1988, the Ministry of Municipal Affairs identified that they were in fact the predominant vehicle for permitting land division and account for more residential lots on an annual basis than do conventional subdivision plans in rural areas. The consent process continues to be the predominant way to create non-farm lots in Ontario.

7.2 Current Land Division Process in Ontario

From 1970 to the present day, rural municipalities have been, and continue to be, dependent on the severance process to create new lots. Currently, the authority to grant consents/severances is held at either the County or Regional level unless it has been delegated to lower tier municipalities. Typically a committee of individuals, known as a land division committee, makes the decision as to whether or not to approve a

severance. The land division committee may be comprised of local citizens or politicians. The generalized process is illustrated in Figure 10.

Figure 10 The Current Land Division Process in Ontario



Source: Ontario Ministry of Municipal Affairs and Housing. 2010. Citizen's Guide to Severances. Queen's Printer, Toronto.

This decision is usually made after taking into account the input and the recommendation of a land use planner and other key agencies. The recommendations and decisions are based on the conformity of the severance application to a series of policy. In most municipalities there is a local plan that sets out severance policies in agricultural land. At present, local policy must be in conformity with a county/regional plan and must be consistent with the 2005 Provincial Policy Statement. The policy that is developed at each level plays a significant part in influencing the number, type, and distribution of rural non-farm development in Ontario's agricultural land.

7.3 A Review of Land Use Planning Policy Influencing Lot Creation in Ontario's Agricultural Resource: 1978 to 2012

Currently, Ontario does not have specific legislation with the sole intent to directly protect farmland. Farmland preservation is primarily a function of the land-use planning process and in a legal sense is governed by the Planning Act (Agricultural Odyssey Group, 2002). Between 1990 and 2010, there have been five different province-wide policies statements enacted under section 3 of the Planning Act which have directed the creation of new lots in agricultural land in Ontario. Each of these five policies are an expression of the provincial interest in land use planning matters and provide direction to local, county and regional governments as they make land use planning decisions. The five policies that have impacted land use planning decisions in Ontario's agricultural resource since 1978 include:

1. Foodland Guidelines (1978-1994);
2. Growth and Settlement Policy Guidelines (1992-1994);
3. Comprehensive Provincial Policy Statement (1994-1996);
4. 1996 Provincial Policy Statement (1996-2004); and
5. 2005 Provincial Policy Statement (2005 to present).

In addition to the province-wide policy statements, the Ontario Government implemented Smart Growth legislation to address geographically specific planning issues. This legislation includes:

1. Greenbelt Act, 2004
2. Places to Grow Act, 2005

Section 7.4 discusses the Smart Growth initiative and outlines how the two key pieces of Smart Growth legislation, the Greenbelt Act and the Places to Grow Act have impacted the creation of rural non-farm development in the Greater Golden Horseshoe.

7.3.1. Foodland Guidelines (1978-1994)

The Foodland Guidelines were in place from 1978 to 1994. The Foodland Guidelines were widely reflected in County and Regional Official Plans. They helped decision makers and landowners identify prime agricultural areas and make decisions on permitted uses, land severances, and policies dealing with the conversion of agricultural land to non-agricultural uses.

The purpose of these guidelines was to preserve farmland, especially land with high agricultural capability, or specialized soil and climate combinations. It was felt that by curtailing non-farm severances, land-use conflicts and impacts would be reduced (Troughton, 1981). Under the Foodland Guidelines agricultural land in CLI Classes (1-4), as well as specialty croplands, were deemed to be prime agricultural lands and therefore protected from non-farm uses.

Another feature of the Foodland Guidelines is that they recognized farm-related residential lot creation for bona-fide retiring farmers, hired help, or son/daughter involved in the farming operation, and surplus housing that resulted from farm

consolidations (Penfold, 1990). The Foodland Guidelines also incorporated the use of the Agricultural Code of Practice within its policy, using a distance formula to separate livestock facilities from non-farm land-uses in an effort to avoid nuisance conflicts.

While most Counties and Regions adopted the Foodland Guidelines through their Official Plans, questions have been raised about their effectiveness in reaching their desired goal. "The Guidelines and local policy seemed to reduce severance activity in the early 1980s; however by 1989, about 12,000 rural severances were granted in Ontario which is equivalent to severance activity prior to the Foodland Guidelines." (Penfold, 1990 in Misek-Evans, 1992a, p.16). This amount of development is equivalent to a city the size of Woodstock, Ontario.

7.3.2 Growth and Settlement Policy Guidelines (1992-1994)

The Ministry of Municipal Affairs released the Growth and Settlement Policy Guidelines in 1992. These guidelines were designed to compliment the Foodland Guidelines. It was the last major piece of land-use policy released by the Province prior to planning reform in 1993 and 1994. The goal of the Growth and Settlement Policy Guidelines was "to foster land-use planning practices which result in efficient, economically viable, sustainable and environmentally sound growth and settlement patterns"(MMA, 1992, p.3). The overall intent of the policy was to direct development into existing settlement areas. These guidelines did not specifically implement new policy directions for planning in agricultural areas. Because the Growth and Settlement Policies were in place for a short period (1992-1994) it is hard to assess their effectiveness.

7.3.3. Comprehensive Provincial Policy Statement (1994-1996)

In 1992 the Sewell Commission was established by the province to look at Planning and Development Reform in Ontario. The Commission's broad goals focused on a number of interest areas such as growth management and the environment, including agricultural land protection (Ontario Ministry of Agriculture and Food, 1992). As a result of planning reform the role of the province shifted from its previous role of performing a reactive, regulatory development-control function, to a more proactive policy-oriented function in which many approval functions have been transferred to upper tier municipal government (Anderson, 1995).

Less than one year following the release of the Commission's final report, the province released the Comprehensive Set of Policy Statements, introducing six new provincial policy statements including policy specifically for agriculture. The new agricultural land policies replaced the Foodland Guidelines. The most important change was that all development within agricultural areas needed to be consistent with the Comprehensive Set of Policy Statements.

Within the Policy Statements, the goal of the agricultural land policies was to protect prime agricultural areas for long-term agricultural use. The Policy stated lot creation in prime agricultural areas is generally discouraged, and will be permitted only for:

- primary agricultural uses where the severed and retained lots are intended for primary agricultural uses and are of a size appropriate for the type of agricultural use(s) common in the area and are sufficiently large to maintain flexibility for future changes in type or size of agricultural operation;
- existing agriculture-related uses;

- residences surplus to farming operations as a result of farm consolidation;
- residential infilling;
- one lot for a full time farmer of retirement age who is retiring from active working life, was farming on January 1, 1994 or an earlier date set in an existing official plan and has owned and operated the farm for a substantial number of years;
- infrastructure where the facility cannot be accommodated through the use of easements or rights-of-way; and
- legal or technical reasons.

Ontario Ministry of Municipal Affairs, 1994, p.13

From one perspective the Comprehensive Set of Policy Statements were more lenient than the Foodland Guidelines by virtue of allowing residential infilling. At the same time, the development allowed under the Comprehensive Set of Policy Statements was more restrictive than the Foodland Guidelines (1978) in two ways. First, it eliminated the creation of lots for farm help, and secondly, it very clearly defined the only types of development to be allowed. All municipal plans had to be consistent with the Comprehensive Set of Policy Statements. The Comprehensive Set of Policy Statements remained in place from 1994 to 1996.

7.3.4. 1996 Provincial Policy Statement (1996-2004)

In 1996, the provincial NDP government that brought in the Comprehensive Set of Policy Statements was replaced by a Conservative Government. The new Conservative Government replaced the Comprehensive Set of Policy Statements with the 1996 Provincial Policy Statement, which reflects the original Foodland Guidelines and the Comprehensive Set of Policy Statements on planning for agriculture. It states "prime agricultural areas will be protected for agriculture" (MMAH, 1996, p.4). It allows the same type of lots that were granted under the Comprehensive Set of Policy

Statements (agricultural-related uses). Unlike the Comprehensive Set of Policy Statements, the 1996 Provincial Policy Statement allows areas to be excluded from "prime agricultural areas for the expansion of an urban area; extraction of mineral resources; and limited non-residential uses where need is demonstrated" (MMAH, 1996, p.4).

The fact that the 1996 Provincial Policy Statement moved from the wording "consistent with" to "shall have regard to", combined with providing opportunities for prime agricultural land to be excluded from these policies, suggests that these policies were not as committed to keeping agricultural land for agricultural uses. This version of the Provincial Policy Statement was in place until 2005.

7.3.5. Provincial Policy Statement (2005 - present)

A Liberal government was elected in Ontario in 2004. This government reviewed and updated the 1996 Provincial Policy Statement. In 2005, a new Provincial Policy Statement (PPS) was released and implemented across Ontario.

Part of the information considered as part of the Provincial Policy Statement review was Caldwell and Dodds-Weir's review[7] of severance activity in Ontario's agricultural land between 1990-2000 was published in 2002/2003. This study was the first comprehensive review of severance activity in Ontario's agricultural land since the Ontario Ministry of Agriculture and Food stopped commenting (and tracking) severances in agricultural land in the late 1980s. Caldwell and Dodds-Weir (2003) documented between 1990 and 2000 there were over 15,500 new lots created on

[7] Ontario's Country Side: A Resource to Preserve or an Urban Area in Waiting? A Review of Severance Activity in Ontario's Agricultural Land During the 1990s. Dr. Wayne Caldwell and Claire Dodds-Weir. University of Guelph. 2003.

Ontario's agricultural land. Almost 80 percent of these were created for residential uses. Caldwell and Dodds-Weir (2003)[8] identified that residential severances for both farm-related (surplus farm dwelling and retirement lots) and non-farm related (infill lots) take land away from production and have the potential to place restrictions and additional pressures on agricultural production.

Caldwell and Dodds-Weir's study (2003) provided policy makers with a count of the number, type or distribution of new lots created during the 1990s on Ontario's agricultural land. This provided factual data to assist policy makers evaluate the effectiveness of the land use policies in effect during the 1990s.

The 2005 PPS requires municipalities to identify prime agricultural areas and protect the agricultural land base and allows farms to function, change and expand over the long term.

The 2005 PPS no longer allows severances that create new residential lots. It removed the ability to create farm retirement lots and lots for residential infill. It does continue to allow the severance of an existing residence, surplus to a farmers needs due to farm consolidation. Farm consolidation, under the 2005 PPS, means the acquisition of additional farm parcels to be operated as one farm operation. The approval authority must ensure that a new residence is not permitted to be built on the remnant parcel of farmland once the surplus residence is severed from the farm.

One of the most significant changes to the 2005 PPS is that it moved back to the language that was used in the Comprehensive Set of Policy Statements "shall be

[8] OMAFRA commissioned this study and have previously identified that this document helps planning authorities, municipal planners, other municipal staff and land use planning consultants develop local lot creation policies.

consistent with". Within Ontario's Planning Profession the language "shall we consistent with" is perceived to provide land division authorities with stronger policy direction and provide a higher test than the language "shall have regard for" which was used in the 1996 PPS.

Other sections of the 2005 Provincial Policy Statement assist in the preservation of agricultural land through a variety of policies, including:

1. requiring residential intensification and efficient use of existing services within existing urban boundaries;
2. requiring comprehensive planning studies to evaluate the supply of land for urban uses prior to expanding urban boundaries onto prime agricultural land; and
3. providing justification studies prior to establishing non-agricultural uses in prime agricultural areas.

All of these policies assist in providing increased stability for agriculture to continue to invest in proximity to urban areas.

The 2005 Provincial Policy Statement is currently under review by the provincial government. Report 2 and 3 in this series takes the data that Caldwell and Dodds-Weir (2003) had reported for the 1990s and updates it to provide a longitudinal study of lot creation in Ontario's agricultural resource from 1990-2009. The findings of this research will assist policy makers in determining the effectiveness of the policy changes in the 1996 and 2005 Provincial Policy in achieving the province's goals related to non-farm development and preservation of agricultural land.

7.4 Smart Growth in Ontario and its Impact on Rural Non-Farm Development in the Greater Golden Horseshoe: 2004 - 2012

In 2004, the province of Ontario began to release discussion papers and proposed reforms to planning legislation developed by Smart Growth panels to assist the province, regional and local government make decisions linking transportation, the natural environment, infrastructure, planning and public investment. The smart growth movement in Ontario was driven by the "need for the provincial government to address several major planning problems [sprawl; gridlock; infrastructure; protecting environment; economic growth] that gained public profile in the 1990s and to provide specific plans for high growth regions of Ontario" (Davidson, 2007, p.195).

Davidson (2007, p.195) considers "these suggested reforms and plans [Smart Growth] represent the most concerted effort to change planning directions in a generation and will guide planning in Ontario for some time in the future". Major components of Smart Growth in Ontario included:

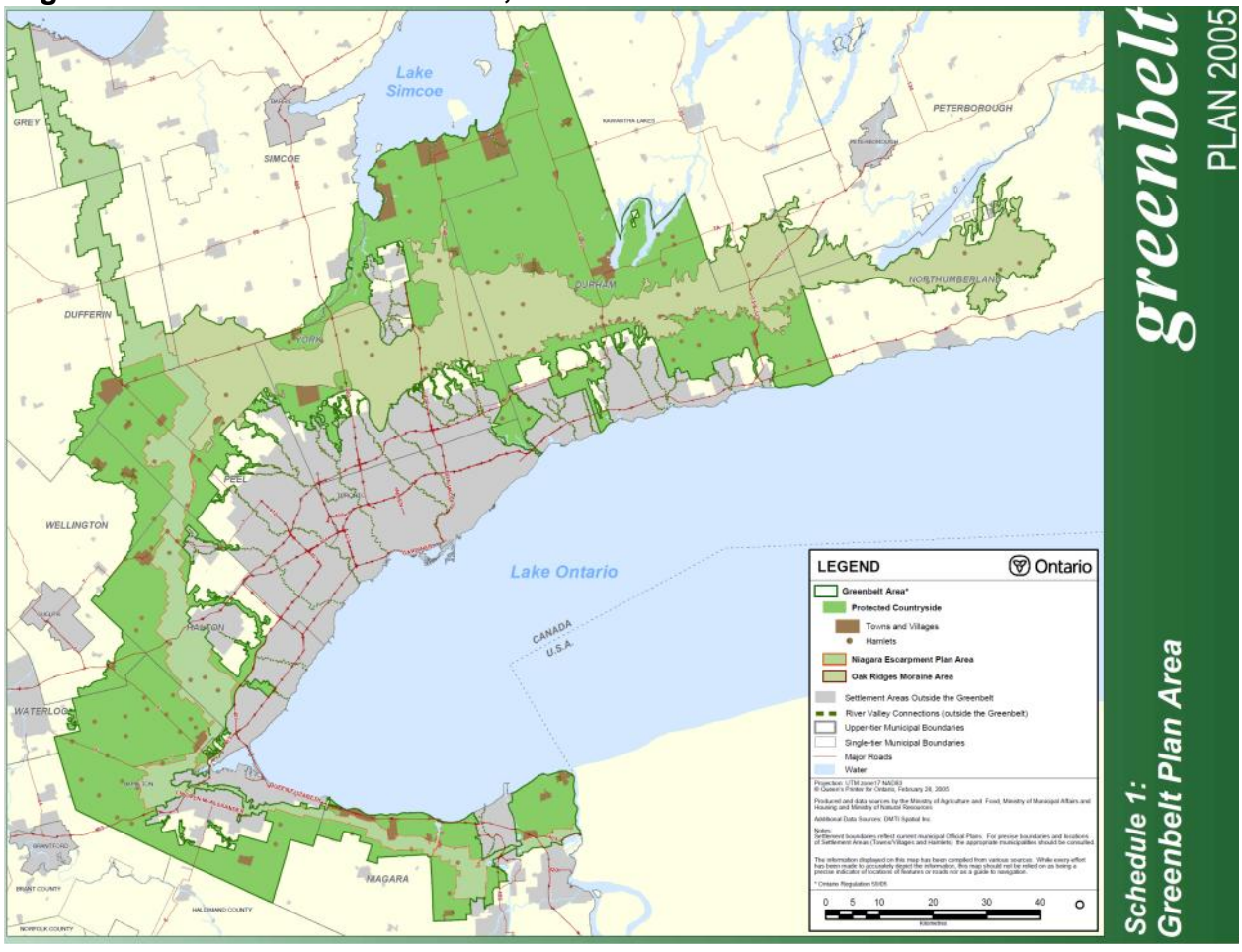
1. Planning Reform
2. Large-Area Integrated Planning
3. Infrastructure Renewal

The 2005 Provincial Policy Statement is one of the major planning reforms that took place as a result of Smart Growth in Ontario. The Places to Grow Act in 2005 and the Greenbelt Act in 2005 are both examples of the large-area integrated planning that were implemented to manage future growth in Ontario.

7.4.1 Greenbelt Act, 2004

The Greenbelt Act was implemented as law in 2004 in Ontario. The Greenbelt Act authorized the provincial government to designate a Greenbelt Area and develop a Greenbelt Plan. Both the Greenbelt Area and Plan were created in 2005.

Figure 11 Greenbelt Plan Area, 2005



Source: Greenbelt Plan Area Map, 2005. Schedule 1, Ministry of Municipal Affairs. http://www.mah.gov.on.ca/Asset1293.aspx

The purpose of the Greenbelt Plan is to permanently protect 1.8 million acres of farmland and natural environment surrounding the Greater Golden Horseshoe from urban development and sprawl. The Greenbelt Plan identifies "where urbanization

should not occur to provide permanent protection to the agricultural land base and the ecological features and functions occurring on this landscape" (Government of Ontario, Greenbelt Plan, 2005, p.4). Figure 11 illustrates the extent of the lands impacted by the Greenbelt Plan in the Greater Golden Horseshoe in Ontario.

Lands within the Greenbelt Plan are referred to as "Protected Countryside". Within the Protected Countryside land is identified as part of the Agricultural System, Natural System or Settlement Areas. Within the Agricultural System, land is either identified as specialty crop land, prime agricultural area or rural area, as identified in local official plans.

The Greenbelt Plan provides the following description of the Agricultural System:

> The Protected Countryside contains an Agricultural System that provides a continuous and permanent land base necessary to support long-term agricultural production and economic activity. Many of the farms within this system also contain important natural heritage and hydrologic features, and the stewardship of these farms has facilitated both environmental and agricultural protection. The Agricultural System is therefore integral to the long-term sustainability of the Natural Heritage System within the Protected Countryside. It is through evolving agricultural and environmental approaches and practices that this relationship can continue and improve.
>
> Government of Ontario, Greenbelt Plan, 2005, p. 12

The Greenbelt Plan, 2005 established policies on land use and lot creation within the Agricultural System.

Within specialty crop areas, the following is permitted:

- Normal farm practices and full range of agricultural, agriculture-related, and secondary uses.
- Farm split severances, provided severed and retained parcels are both 40 acres.
- Surplus dwelling severances.

- Minor lot adjustment severances.
- Infrastructure and servicing

Urban areas cannot expand onto specialty crop areas, nor can specialty crop areas be redesignated for non-agricultural uses. All new land uses shall comply with minimum distance separation formulae.

Within prime agricultural areas, the following is permitted:

- Normal farm practices and full range of agricultural, agriculture-related, and secondary uses.
- Minor lot adjustment severances
- Farm split severances, provided severed and retained parcels are both 100 acres.
- Surplus dwelling severances.
- Severance for agricultural related uses.

Prime agricultural areas shall not be redesignated for non-agricultural uses except, refinements to designations, or limited settlement expansion subject to the policies of the Greenbelt Plan. All new land uses shall comply with minimum distance separation formulae.

The vision of the Greenbelt Plan is to protect against the loss and fragmentation of agricultural lands, provide permanent protection to natural heritage features and water resource systems, and to provide for a range of economic and social activities associated with urbanization.

In the area surrounding the Greater Golden Horseshoe, rural land is often in demand for competing land uses. "Agriculture also has to compete for land not only with residential, industrial and commercial uses, but also with golf courses and other recreational facilities, transportation and service corridors, aggregate extraction, open space and wetland complexes" (Walton, 2003, p.23). The Greenbelt Plan has

removed some of the competing land uses from the equation and provides for increased certainty that may facilitate agricultural investment in proximity to some of Ontario's largest urban centres.

The establishment of the Greenbelt Act and the Greenbelt Plan, 2005, establishes clear policies at a provincial level to protect a significant amount of agricultural land surrounding the Greater Golden Horseshoe.

7.4.2 Places to Grow Act, 2005

The Places to Grow Act came into effect in Ontario in 2005. This legislation allows the government of Ontario to identify and designate growth plan areas and develop strategic growth plans for those communities.

Places to Grow is the Ontario government's program to plan for growth and development in a way that supports economic prosperity, protects the environment and helps communities achieve a high quality of life across the province. Growth plans assist the provincial government plan for growth and infrastructure investments across municipal boundaries.

The first growth plan was created by the Government of Ontario in 2006 for the Greater Golden Horseshoe. It guides decisions on how land is developed, resources are managed and public dollars are invested. A second growth plan was released in 2011 for Northern Ontario.

The growth plan for the Greater Golden Horseshoe, 2006 established firm urban boundaries, requires residential intensification within those boundaries, and the creation

of compact, complete communities. The Greater Golden Horseshoe Growth Plan identifies prime agricultural areas are identified within the Greenbelt Plan and land use within those areas are subject to those policies.

The Northern Ontario Growth Plan, 2011 focuses on strengthening the economy in the north by: diversifying the region's traditional resource-based industries; stimulating new investment and entrepreneurship; and nurturing new and emerging sectors with high growth potential.

Places to Grow is primarily an initiative to manage urban growth and development. It is driven by the need to accommodate more population in an affordable way within existing urban areas. While it does not directly manage rural development, farmland preservation or non-farm development; it does create some benefits for rural areas by reducing the amount of agricultural land that is consumed by expanding urban uses and minimizing the effect of the spread of the urban shadow around Ontario's largest urban region.

The Places to Grow Act and its resulting plans are an urban expression of Smart Growth in Ontario. Davidson states "while there are numerous benefits to rural areas from appropriate urban planning strategies, Smart Growth cannot be seen as a rural development strategy (2007, p.208). Davidson (2007) notes that if these plans are effective over the long term, Smart Growth can bring stability to the rural and agricultural land market that would benefit agricultural producers in Ontario

7.5 Role of Municipalities in Rural Non-Farm Lot Creation

While the province issues land-use planning guidelines, policy statements and plans under the authority of the Planning Act (and other related Acts), much of the day to day planning decisions occur at the municipal level. "While municipalities must develop their planning policies in conformity to the Provincial Policy Statement, there are however, many inconsistencies between municipalities regarding the interpretation and application of the Act" (Agricultural Odyssey Group, 2002, p.72).

Caldwell and Dodds-Weir (2003) identified Huron and Perth County as having strong policies that support agriculture and minimize the creation of non-farm uses in the agricultural resource. Not all Counties and Regions have had a history of implementing policies that minimize the intrusion of non-farm development in the agricultural resource. In fact, local rural politicians may have a tendency to encourage residential or commercial development ahead of agriculture. This political tendency is largely driven by a political perception that severing lots in the countryside will lead to rural population growth, which in turn may lead to the preservation of rural institutions, such as churches and schools. It is also driven from the fact that the majority of municipal services are funded through property assessment and there is a perception that residential land use generates additional tax revenue. This report documented the cost to revenues relationship of rural non-farm development in Section 5.

Under the direct influence of local political perception, policies are often developed or implemented in a way that favours non-farm residents, thereby posing certain obstacles to agricultural activity (Caldwell, 1998). In this context, planning has a role to play in encouraging local commitment to effective development and

implementation of policies which support the protection of the agricultural resource and in turn support the viability of Ontario's agricultural industry. As Ontario's population is expected to grow to 17 million people by 2036, (Ontario Ministry of Finance, 2011) planning has a critical role in accommodating this growth without urban sprawl and in minimizing the impact on agriculture.

8.0 Future Trends Impacting Rural Non-Farm Development and Agriculture

Earlier sections of this report outlined the dominant perspectives regarding the development of Ontario's agricultural industry and the impact that rural non-farm development has on its viability.

The dominant perspective documented in the literature is that rural non-farm development has a negative impact on the viability of an increasingly industrialized agricultural sector in Ontario. The land use policy changes initiated by the provincial government in Ontario has validated this perspective as more recent revisions to the Provincial Policy Statement have removed the majority of policies that allow rural non-farm lots to be created.

While tremendous work has been undertaken by the province, regions/counties and local municipalities in Ontario to develop land use planning policies that are supportive of a variety of types, intensities and sizes of agriculture, there continues to be a vast supply of non-farm lots that will continue to exist in perpetuity in Ontario's agricultural resource.

The presence of non-farm uses in the middle of agricultural areas demand that the agricultural industry and non-farm residents find ways to minimize conflict and to find common ground to secure the future of Ontario's agricultural resource in a world where there are increasing pressures on the finite supply of agricultural land.

Other bodies of literature have documented a number of macro trends that have the potential to impact agriculture over the short and long-term in Ontario. These trends include:

1. Peak Oil
2. Local Food – the New Consumer Preference
3. Climate Change
4. Population Growth and Security

This section documents each of these macro trends and describes how it may impact the relationship between agricultural producers and non-farm development in Ontario's agricultural resource.

8.1 Macro Trend 1: Peak Oil

The term 'peak oil' can be defined as the point in time when the maximum amount of global oil extraction is reached. From that point on, petroleum extraction will decline. While it is unclear exactly when the world reached peak oil production, many believe that peak production is imminent or has already occurred. A number of observers believe in a post-peak oil production scenario that there will be negative implications for the global economy due to the high price and lack of availability of oil. Rural communities rely heavily on fossil fuels to maintain their current standard of living. The agricultural industry in the developed world is one of the largest consumers of fossil fuels. Industrialization of agriculture has relied heavily on fossil fuels in order to achieve today's level of global production. "The application of fossil fuels to the food system has supported a human population grow from fewer than two billion at the turn of the twentieth century to nearly seven billion today" (Post Carbon Institute, 2009, p.1). Current methods of agricultural production rely on a cheap and readily available supply

of fossil fuels. The Post Carbon Institute (2009) has expressed concerns that it is this dependence on fossil fuels in post peak oil society that puts agriculture in an extremely vulnerable state.

The agricultural industry relies on fossil fuels for both production of food and transportation through a centralized food distribution network. The Post Carbon Institute (Spring 2009, p. 1) identified, in the U.S, the process of getting food from the farm to the plate uses over four times as much energy as does the production of food. Under the current food distribution system in North America:

> Farmers typically sell their harvest to a distributor or processor, who then sells packaged food products to a wholesaler, who in turn sells these products to chains of supermarkets. The ultimate consumer of the food is thus several steps removed from the producer, and food systems in most nations or regions have become dominated by a few giant multinational seed companies, agricultural chemicals corporations, and farm machinery manufacturers, as well as food wholesalers, distributors, and supermarket chains.
>
> Post Carbon Institute, 2009, p.1

As demonstrated by the above quote, the current food distribution network is not sustainable in a post peak oil society.

In order to reduce agriculture's vulnerability in a post peak oil society the Post Carbon Institute (2009) recommends agriculture reorient production to support local needs and demands and to become less intensively energy dependent. "Decentralization of the food system will result in greater societal resilience in the face of fuel price volatility" (Post Carbon Institute, 2009, p. 17). Regions must deliberately reduce the energy needed to transport food by relocalizing their networks, bringing together local producers and consumers.

In order to make relocalized food systems successful, consumers must also change their preference towards consuming food that is locally grown, that is in season, and is less processed. Prime farm lands capable of producing food in close proximity to urban markets will need to be protected. In a post peak oil society, farmland in close proximity to urban markets will be required for both localized food production and for renewable energy generation. Agricultural land will be important producers of energy from wind and biomass sources. Revitalization of local food production and income from renewable energy generation can help renew local agricultural economies.

In a post peak oil society, agricultural land will become increasingly valuable for agricultural production. In a localized food system, small agricultural parcels of land will become highly valuable as a source of local food production. In a post peak oil society, agriculture may become the priority land use to feed local populations. Mixed farming, with a combination of livestock and crop production will become increasingly important in Ontario in a post peak oil society.

8.2 Macro Trend 2: Local Food Production – A Consumer Preference

It is well recognized that consumer preference drives change. The decisions consumers make about food has the potential to impact what agricultural production looks like on the landscape of rural communities. Walton (2003, p.27) identified that city dwellers benefit from living near sources of fresh produce and access to pick-your-own farms and farm-based tourism. In many situations, consumer's choices are as significant in shaping the food system as producers' choices.

Over the past several decades, consumer preferences have been influenced to fit the industrialized food system through advertising and development of mass-marketed, uniform, packaged food products that while often nutritionally inferior, are cheap, attractive, and in some cases addictive (Post Carbon Institute, 2009). There has recently been a change in consumer trends towards purchasing local food, organic food and ethnic food. This has a significant impact on both food markets and agricultural production. The effect of this trend is starting to become noticeable in the shift in agricultural commodities that are being produced in the Greater Golden Horseshoe that surrounds the Greater Toronto Area.

By developing the habit of preferentially buying locally produced foods, consumers are helping change food production systems to be better prepared to deal with the challenges of peak oil and climate change. Government and agricultural producers can encourage this trend by developing "buy local" campaigns (Post Carbon Institute, Spring 2009). Regional/County and local government has been supportive of the change to local food production through "Eat Local" campaigns and by supporting value added production on agricultural land. These types of programs promote the local agricultural industry, encourage healthy eating and physical activity. These types of programs create valuable connections between non-farm residents and agricultural producers. Changing consumer preference toward purchasing local food may influence rural land use in Ontario by increasing the interest of local farmers in producing agricultural products for local consumption and establishing on-farm retail stores and agri-tourism opportunities to attract local residents to purchase their product.

This trend has the opportunity for farmers and non-farmers to build a mutually supportive relationship and improve their mutual understanding. Strengthening the relationship between agricultural producers and non-farm consumers may assist in minimizing conflict and reducing tension.

8.3 Macro Trend 3: Climate Change

Climate change is defined by the United Nations as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time period" (United Nations Framework Convention on Climate Change, 2009).

Agricultural production in rural areas both contributes to and mitigates climate change. For example, "an average hectare of corn in Ontario removes 22 tonnes of carbon dioxide from the air during the growing season" (Walton, 2003, p.27). Agriculture also contributes to climate change through soil degradation and through the combustion of fossil fuels (Post Carbon Institute, 2009). Climate change is occurring in part through global warming because of the release of greenhouse gases through the combustion of fossil fuels that are commonly used in agricultural production.

The biggest risk to agriculture and rural communities is the uncertainty posed by climate change. Agriculture is inherently sensitive to climate conditions and variation, and is among the most frequently cited human systems likely to be affected by global climate change (Wall et al, 2007; Reid, 2003). The most frequently cited (Environment

Canada, 2007; York Region, 2008; Kurukulasuriya and Rosenthal, 2003; Reid, 2003) impacts of climate change on agriculture include:

- Change in temperature and precipitation will effect soil moisture and timing/length of the growing season;
- Summer droughts and less consistent snowfall will affect the quality and quantity of water resources;
- Competition for declining water supplies will increase;
- Increased frequency of severe weather that will damage crops, farm buildings and limit planting and harvesting activities;
- Increased erosion, flooding and runoff of nutrients, pesticides and other toxins from agricultural operations;
- Increasing risk of non-native (invasive) pests and diseases to crops;
- Longer growing seasons, but crop yields may be impacted by more frequent and longer droughts;
- Livestock will become more vulnerable to disease and illness;
- High summer temperatures and heat stress effects livestock and can be fatal.

These impacts will increase the vulnerability of agriculture to be able to produce consistent yields to meet local, regional and international demand for food. Several of these impacts of climate change are already being experienced by Ontario's farmers.

Changes in precipitation not only impact agricultural production, but also rural residences and businesses by influencing the supply of drinking water that service rural residences and settlement areas. The variation in precipitation that will occur as a result of climate change may mean that the supply of water, especially for communities that rely on surface and ground water through private wells, will need to be protected. Land uses that have the potential to negatively impact the quality and quantity of water will need to be carefully considered.

Climate change is connected to peak oil in the sense that climate change is in large part attributed to the release of greenhouse gases from consumption of fossil fuels. Often people living in rural areas will commute to nearby urban areas for

employment and services. The increase in the cost of fossil fuels will make it less affordable to commute long distances. Increasing public awareness of individual's impact on climate change and the cost of living in a post peak oil society may mean that people will use technology to find ways to work from home and lessen their need to commute into urban areas from outlying rural communities. It may also mean that moving to rural areas is less attractive to those who are not directly employed in rural resource industries, such as agriculture and aggregate production.

The increased frequency of severe weather patterns also has the potential to threaten production of agricultural goods. In a scenario where food production is threatened as a result of severe weather events (droughts, floods, hail, damaging winds, etc.) it will be important to preserve as much agricultural land as possible for production. Maximizing the amount of available land capable of agricultural production means that there is potential for production in one area to compensate for another area that might have reduced production due to severe weather events. As society feels the increased effect of climate change, the agricultural resource in rural communities will become increasingly valuable to meet local, regional and international demand for food.

8.4 Macro Trend 4: Population Growth and Food Security

The world has experienced an unprecedented increase in population growth during the past century. This increase in population is partly attributed to the increased industrialization of agriculture and international trade. The supply of cheap, safe, and a readily available supply of food in much of the world has lead to dramatic shifts in consumption which has had a direct impact on population trends.

The United Nations estimate the world's population will reach 7 billion in early 2012, up from the current 6.8 billion in 2008, and will surpass 9 billion people by 2050 (United Nations, 2008, p. vii). It is estimated that most of the additional population growth will occur in developing countries. The United Nations expect the population of developed regions to experience minimal change, growing from 1.23 billion to 1.28 billion in 2050 (United Nations, 2008, p.vii). The United Nations estimate, under a medium variant scenario, Canada's population will increase from 32.3 million in 2005 to 44.4 million in 2050 (United Nations, 2008b). Most of the growth expected in the developed world is attributed to immigration from developing countries.

At the same time as the world's population is expected to grow, the availability of land for farming is on the decline, and water for agriculture and other uses is increasingly scarce (International Food Policy Research Institute, 2001). As population increases, demand for food will increase. The "land base must be carefully managed to ensure it is available when needed" (Walton, 2003, p.39). These forces, combined with the challenges presented by peak oil and climate change, will increasingly test the world's food production systems.

The Canadian agricultural industry is a leader in global food production. As the amount of available prime agricultural land declines in Canada, the country increasingly is losing the ability to feed itself and the world. With the threats from climate change and peak oil creating a new uncertainly for agricultural production, it is unwise to allow a continued decline in the amount of productive agricultural land. Walton (2003) states that it is short-sighted to let the agricultural industry decline and rely on external food supplies that are neither of the same quality as locally grown food nor within the control

of Ontarians. With the projected increase in the world's population, there will be more value in protecting agricultural land within rural communities in order to feed ourselves and the world.

8.5 Role of Planning in Response to Future Trends

There is a role and responsibility within the planning profession to ensure land use policy is supportive of the need for agricultural producer to adapt and change their operations in response to the future trends summarized above.

While Planners' role in shaping agriculture and food production is not new, Raja et. al. (2008) feel that the connection between planning and food was forgotten for several decades, while Planners were thinking about other necessities of life like air, water and transportation. Raja et. al. (2008) identify that since 2000, the connection between planning and food has re-emerged in the Planning profession. Raja et. al. (2008) points to the increased focus within the planning profession on community health, food access and physical planning. Farmland preservation is identified by Raja et. al. (2008) as one expression of one of planning's pre-occupation with the connection between land, farming and food production.

Planning's role within a conventional food system has predominantly been connected to farmland preservation and maintenance of a land base within which conventional forms of agriculture are able to operate with limited restriction. The impact future trends such as peak oil and climate change may influence the food system to become one in which the relationship between producers, processor, distributors and consumers of food is much more viable (Raja et. al., 2008). As the food system evolves

into a more place-based system, Raja et. al. (2008) identify an increased role for land use planning to promote local and regional networks between producers, processors, distributors and consumers of food.

The idea that future trends may lead to a more localized community food system has positive implications for the relationship between Ontario's agricultural industry and rural non-farm residents. Localizing food production and consumption has the potential to improve the connection between non-farm residents and their farming neighbours. Engaging non-farm residents more directly in the consumption of local foods may assist in building a positive relationship and minimizing conflict between these two groups. Support and understanding from the non-farm living in rural communities has the potential to improve the viability of agriculture.

9.0 Conclusion

This report has endeavoured to summarize a vast body of literature and policy that relates to rural non-farm development and its impact on the viability of Ontario's agricultural industry. In reviewing the literature related to this subject, this report has documented the following topics:

- the significance and development of Ontario's agricultural industry;
- farmland loss in both Canada and Ontario;
- evolution of the agricultural land preservation effort in Ontario;
- impact of rural non-farm development on agriculture;
- creation of rural non-farm lots in Ontario's countryside;
- the role of land use planning in rural non-farm lot creation in Ontario; and
- future trends impacting agriculture and rural non-farm development.

After reviewing the literature that has dealt with the issues that surround rural non-farm development and agriculture in Ontario, the following conclusions can be made:

1. prime agricultural land is physically removed from production as a result of non-farm uses being established; and
2. the literature agrees that rural non-farm development does have some impact on the viability of the agricultural industry in Ontario.

While there may not be a consensus amongst the literature about the same list of impacts, all the literature on this subject identifies that agriculture experiences specific challenges from the presence of non-farm development.

There is general agreement among the literature that non-farm uses most directly impact the viability of large scale agriculture, especially intensive livestock-based farming in Ontario.

The conclusions made in the literature are substantiated by the evolution in the planning framework that has regulated the creation of non-farm lots in Ontario since the late 1970s. In the period from the 1970s to now, the provincial government has continued to refine the provincial policy framework to put more regulations in place to reduce the number of non-farm lots that can be created in Ontario's prime agricultural lands.

The provincial policy framework in the mid-2000s changed to prohibit the creation of the majority of residential lots (farm help lot, retirement lots, infill lots) in prime agricultural lands. While this change is responsive to address the impact of non-farm lots on the viability of agriculture on a go forward basis, Caldwell's research (20011; 2003) has illustrated that there is a large supply of non-farm lots that will exist in perpetuity in Ontario's agricultural resource. These lots will continue to impact the viability of agricultural production in the province.

In the interest of remaining competitive in the global market and meeting new social challenges, many agricultural operators are choosing to expand their operations, whether large or small scale, through intensification. At the same time, the presence of rural non-farm lots is changing Ontario's rural population and landscape. While these changes in rural Ontario can complement one another, they can also be the source of considerable tension.

There are several future trends that will impact both the agricultural industry and non-farm residents. These trends include: peak oil; climate change; consumer preference; and population growth and food security. As the agricultural industry in

Ontario evolves in response to these future trends, the relationship between farmers and their rural non-farm neighbours will become increasingly important. Both farmers and non-farm residents are intrinsically linked and share a mutual responsibility to support the long term viability of the agricultural industry in Ontario. The extent of the impact of these trends on agriculture and rural non-farm development is unknown, but it is clear that the ability of Ontario's agricultural industry to respond to these trends is dependent on having the maximum flexibility in order to remain viable.

Changes in Ontario's planning policy have significantly reduced the number of new non-farm lots being created. While the change in the policy framework has acknowledged the impact of rural non-farm development on the long-term viability on agriculture, the non-farm lots that exist within Ontario's agricultural resource will continue to do so in perpetuity. The success of Ontario's agricultural industry to remain viable will also depend on the dynamic relationship between agricultural and non-farm interests in rural Ontario.

References and Additional Sources

Agricultural Odyssey Group. 2002. *The Odyssey Report: An Industry Quest for Solutions. Published by the Agricultural Adaptation Council.* Ontario.

Anderson, P. M. 1995. *An Exploration of Opportunity and Policy Constraints Surrounding Rural Non-Farm Residential Development in Ontario.* Major Paper for School of Rural Planning and Development, University of Guelph.

American Farmland Trust. *2010. Cost of Community Services Studies Factsheet.* Washington, U.S.A: Farmland Information Centre. Retrieved from http://www.farmlandinfo.org/documents/38422/COCS_08-2010.pdf

Baden, J. 1984. *The Vanishing Farmland Crisis: Critical Views of the Movement to Preserve Agricultural Land*. University of Kansas, USA.

Ball, J., E. Brockie, W. Caldwell, J. Marks, M. Nelson, J. Parsons, H. Rudy, S. Stonehouse, S. Weber, C. Dodds-Weir, and M. Williams. 2002. "Reflections on Planning: Pennsylvania vs. Ontario." *Plan Canada*. 42(2), 30-33.

Beasley, S. and W. Workman. 1986. "Amenity Values of Farmland." *Agroborealis*. 18 (1), 52-54.

Bentley, C.F. and L.A. Leskiw. *Sustainability of Farmed Lands: Current Trends and Thinking*. Canadian Environmental Advisory Council, 1984, in Misek-Evans, Margaret. 1992a. Balancing Growth with Agriculture: Approaches to Managing Non-Farm Rural Residential Development. Department of Planning and Development, County of Oxford.

Bergquist, S.R. (ed.) 1988. *New Webster's Dictionary of the English Language*. Modern Desk Edition. Delair Publishing, Illinois, USA.

Bonnett, R. August 2002. *Municipal Impact on Agriculture.* Ontario Federation of Agriculture. *http://www.nfawebsite.org/main_column.asp?id=213*.

Bryant, C.R. and L.H. Russwurm. 1979. "The Impact of Non-Farm Development on Agriculture: A Synthesis." *Plan Canada*. 19(2): 122-139.

Bryant, C.R., L.H. Russwurm, A.G. McLellan. 1982. *The City's Countryside: Land and Its Management in the Rural-Urban Fringe.* Longman. London, Ontario.

Bryant, C.R. and T. R. Johnston. 1992. *Agriculture in the City's Countryside.* University of Toronto Press. Toronto, Ontario.

Bunce, M. 1998. "Thirty Years of Farmland Preservation in North America: Discourses and Ideologies of a Movement." *Journal of Rural Studies.* 14(2), 233-247.

Caldwell, W. J. 2001. *Agriculture In the New Rural Community: The Municipal Role*. Presented at the conference – Livestock: Options for the Future, Winnipeg, Manitoba.

Caldwell, W.J. 1998. "Land-use Planning, the Environment and Siting Intensive Livestock Facilities in the 21st Century". *Journal of Soil and Water Conservation.* 53 (2), 102-106.

Caldwell, Wayne J. 1995. "Rural Planning and Agricultural Land Preservation: The Experience of Huron County, Ontario." *The Great Lakes Geographer.* 2(2) 21-34.

Caldwell, W.J. and C.J. Dodds-Weir. 2003. *Ontario's Countryside: A Resource to Preserve or an Urban Area in Waiting? A Review of Severance Activity in Ontario's Agricultural Land During the 1990s. School of Rural Planning and Development.* University of Guelph. http://www.waynecaldwell.ca/development_final.PDF

Caldwell, W.J. and M. Williams. 2002. *Livestock Intensification: Community Perceptions of Environmental, Economic & Social Impacts After Establishment.* University of Guelph. *http://www.waynecaldwell.ca.*

Daniels, T. and D. Bowers. 1997. *Holding Our Ground – Protecting America's Farms and Farmland*. Island Press: Washington, D.C.

Davidson, G. 2007. *Smart Growth in Ontario – Getting Ahead of Your Future* . In W. J. Caldwell, S. Hilts & B. Wilton (Eds), *Farmland Preservation: Land for Future Generations.* Kitchener, Ontario: Volumes Publishing.

Davidson, G. 1984. *Current Issues in Rural Planning Policy.* In Bunce and Troughton (eds.) Pressures and Change in Rural Canada. Downsview: York University. 328-348.

Edgens, J and S. Stanley. 1999. "The Myth of Farmland Loss." *Forum for Applied Research and Public Policy.* 14 (3), 29-54.

Environment Canada. 2007. *The Science of Climate Change.* Retrieved August 21, 2009 from http://www.msc-smc.ec.gc.ca/education/scienceofclimatechange/IPCC/cc_factsheet_e.pdf

Farm Credit Canada. 2011. *Farmland Values Report.* Retrieved from http://www.fcc-fac.ca/en/Products/Property/FLV/Fall2011/index.asp#on

Fuguitt, G.V. and J.J. Zuiches. 1975. "Residential Preferences and Population Distribution." *Demography*. 12(3), 491-504.

Fuller, T. 1985. *Farming and the Rural Community in Ontario: An Introduction.* Toronto: Foundation for Rural Living, Toronto: University of Toronto Press.

Furuseth, Owen and J.T. Pierce. 1982. "A Comparative Analysis of Farmland Programs in North American." *Canadian Geographer.* 26(3), 191-206.

Government of Ontario. 2005. *Greenbelt Plan.* Queen's Park. Toronto, Ontario. Retrieved from http://www.mah.gov.on.ca/Page189.aspx#greenbelt

Government of Ontario. 2005. *Places to Grow Act.* Queen's Park. Toronto, Ontario.

Government of Ontario. 2005. *Greenbelt Act*. Queen's Park. Toronto, Ontario.

Government of Ontario 1990. *The Planning Act*. Queen's Park. Toronto, Ontario.

International Food Policy Research Institute. August 2001. *2020 Global Food Outlook: Trends, Alternatives, and Choices*. Washington, D.C., United States. Retrieved September, 2009 from http://www.ifpri.org/pubs/fpr/fpr30.pdf

Joseph, A.E. and B. Smith. 1985."Rural Residential Development and Municipal Service Provision: a Canadian Case Study". *Journal of Rural Studies*. 1(4), 321-337.

Joseph, A.E., B. Smit. and G.P. McIllravey. 1989. "Consumer preferences for rural residences: a joint analysis in Ontario, Canada." *Environment and Planning A*. 21, 47-63.

Krueger, R.R. 1959. "Changing Land-Use Patterns in the Niagara Fruit Belt." *Transactions of the Royal Canadian Institute.* 32, Part 2, No.67.

Kurukulasuriya,P. and S. Rosenthal. 2003. *Climate Change and Agriculture: A Review of Impacts and Adaptations*. Paper 91 Climate Change Series: World Bank. Washington D.C., U.S.A. Retrieved from http://www.c-ciarn.uoguelph.ca/documents/World_Bank_Paper.pdf

MacLaren, J. 1976. *Countryside Planning: A Pilot Study of Huron County.* Prepared for the County of Huron and the Province of Ontario. Ontario Ministry of Housing.

Milburn, L. 2011. "The New Decision Makers in the Rural Landscape – Who are the Non-Farm Rural Landowners". *Journal of Rural and Community Development.* 6(1): 1-2

Milburn L. 2007. *Our rural future? The non-farm landowner and Ontario's changing countryside. Unpublished PhD dissertation. University of Guelph. Guelph. Ontario.*

Milburn, L., R. Brown & S. Mulley. 2010. "Silver in the Stars and Gold in the Morning Sun: Non-Farm Rural Landowners' Motivations for Rural Living and Attachment to their Land"*. Landscape Research. 35(1): 27-26*

Misek-Evans, Margaret. 1992a. *Balancing Growth with Agriculture: Approaches to Managing Non-Farm Rural Residential Development.* Department of Planning and Development, County of Oxford.

Misek-Evans, Margaret. 1992b. *Setting the Agricultural Agenda: Issues and Directions of Oxford County Agriculture.* Department of Planning and Development, County of Oxford.

Ontario Farmland Trust. 2008. *Farmland in Ontario – Are we Losing a Valuable Resource.* University of Guelph. Retrieved from http://www.ontariofarmlandtrust.ca/sites/default/files/farmland%20loss%20factsheet%20updated.pdf

Ontario Federation of Agriculture. 2007. *Consolidated Agricultural Land Use Policy Statement.* Retrieved from *http://legacy.ofa.on.ca/uploads/File/Issues/Land%20Use/OFA%20Consolidated%20Land%20Use%20Policy.pdf*

Ontario Institute of Agrologists. 1975. *Foodland Preservation or Starvation: A Statement on Land Use Policy.* Executive Committee of the Council of Ontario Institute of Agrologists.

Ontario Ministry of Agriculture and Food. 1992. *An Agricultural Land Protection Program for Ontario: A Discussion Paper.* Toronto, Ontario, Queen's Printer.

Ontario Ministry of Agriculture and Food, Ministry of Environment and Ministry of Housing. 1976. *Agricultural Code of Practice.* Toronto: Queen's Printer.

Ontario Ministry of Agriculture and Food. 1978. *Foodland Guidelines*. A Policy Statement of the Government of Ontario on Planning for Agriculture. Queen's Park. Toronto, Ontario.

Ontario Ministry of Finance. 2011. *Ontario Population Projections Update 2010-2036: Ontario and its 49 Census Divisions.* Queen's Printer, Toronto. Retrieved from http://www.fin.gov.on.ca/en/economy/demographics/projections/projections2010-2036.pdf

Ontario Ministry of Infrastructure. 2006. *Growth Plan for the Greater Golden Horseshoe*. Toronto: Queen's Printer. Retrieved at https://www.placestogrow.ca/content/ggh/plan-cons-english-all-web.pdf

Ontario Ministry of Municipal Affairs and Housing. 2010. *Citizen's Guide to Severances.* Queen's Printer, Toronto. Retrieved from http://www.mah.gov.on.ca/AssetFactory.aspx?did=5924

Ontario Ministry of Municipal Affairs and Housing. 2005. *Greenbelt Plan Area Map.* Queen's Park. Toronto, Ontario. Retrieved from http://www.mah.gov.on.ca/Asset1293.aspx

Ontario Ministry of Municipal Affairs and Housing. 2005. *Provincial Policy Statement.* Queen's Park. Toronto, Ontario.

Ontario Ministry of Municipal Affairs and Housing. 1996. *Provincial Policy Statement.* Queen's Park. Toronto, Ontario.

Ontario Ministry of Municipal Affairs. 1994. *Comprehensive Set of Policy Statements.* Queen's Park. Toronto, Ontario.

Ontario Ministry of Municipal Affairs. 1992. *Growth and Settlement Policy Guidelines.* Queen's Park. Toronto, Ontario.

Ontario Ministry of Municipal Affairs. 1988. *Financial Analysis of Residential Development: A Case Study for Brighton Township.* Prepared by Community Planning Branch.

Ontario Smart Growth. 2003. *Shape the Future: Central Ontario Smart Growth Panel Discussion Paper*. Queen's Printer, Toronto, Ontario.

Parquette, S. and G. Damon. 2003. "Changing ruralities, changing landscapes: exploring social recomposition using a multi-scale approach". *Journal of Rural Studies*. 19: 425-444.

Penfold, G. 1990. *Impacts of Rural Land Division on Agriculture in Ontario.* Paper presented at the Annual Conference of Canadian Association of Rural Studies held in Victoria British Columbia.

Peters J.E. 1990. "Saving Farmland: How Well Have We Done?" *Planning.* September, 12-17.

Pfeffer, M and M. Lapping. 1995. "Support For Purchase of Development Right." *Journal of Soil and Water Conservation.* 50(1), 30-33.

Post Carbon Institute. 2009. *Food and Farming Transition toward a Post Carbon Food System*. Sebastopol, California, USA.

Rawson, M. 1976. *Ill Fares the Land: Land-Use Management at the Urban/Rural/Resource Edges: The British Columbia Land Commission.* The Ministry for Urban Affairs, Canada.

Reid, S. 2003. *Farm-Level Participation of and Adaptation to Climate Risk in Perth County, Ontario.* M.Sc. Thesis, School of Rural Planning and Development. University of Guelph. Guelph, Ontario.

Rodd, R.S. 1976. "The Crisis of Agricultural Land in the Ontario Countryside." *Plan Canada.*16(3), 159-170.

Raja, S., B. Born, and J. Kozlowski Russell. 2008. *Planners Guide to Community and Regional food Planning: Transforming Food Environments, Facilitating Healthy Eating*. Planning Advisory Service Report 554. American Planning Association.

Soil Conservation Society American. 1977. *Crisis in the Countryside: New Directions for Land Use Policy in Ontario.* A Position Statement of the Ontario Chapter Soil Conservation Society of America.

Smithers, J. and P. Johnson. 2004. "The dynamics of family farming in North Huron County, Ontario. Part I Development trajectories*". The Canadian Geographers.* 48(2):191-208

Smithers, . J, P. Johnson and A. Joseph. 2004. "The dynamics of family farming in North Huron County, Ontario. Part II. Development trajectories". *The Canadian Geographers*. 48(2): 209-224

Statistics Canada. 2011. *Farm Cash Receipts. Catalogue No. 21-011-X. Retrieved from* http://www.statcan.gc.ca/pub/21-011-x/21-011-x2011002-eng.pdf

Statistics Canada. 2008. *Canada at a Glance.* Catalogue No. 12-581-XPE. Retrieved from http://www.statcan.gc.ca/pub/12-581-x/12-581-x2007001-eng.pdf

Statistics Canada. 2006. *Census of Agriculture – Highlights and Analysis*. Retrieved from http://www.statcan.gc.ca/ca-ra2006/analysis-analyses/ont-eng.htm.

Statistics Canada, 2006b, *Ontario's Farm Population.* Retrieved from http://www.statcan.gc.ca/ca-ra2006/agpop/on-eng.htm.

Statistics Canada, 2006c. Census of Agriculture. Agriculture-Population Linkage Data. Retreived from http://www.statcan.gc.ca/ca-ra2006/agpop/article-eng.htm

Statistics Canada. 2005. *Loss of Dependable Agricultural Land in Canada.* Rural and Small Town Canada Analysis Bulletin. Volume 6, Number 1. Catalogue no. 21-006-XIE

Statistics Canada. 2001. Census of Agriculture. Retreived from http://www.statscan.ca/english/agcensus2001/first/regions/farmon.htm

Statistics Canada. 2001b. "Urban Consumption of Agricultural Land." Rural and Small Town Canada Analysis Bulletin. Volume 3, Number 2. Catalogue no. 21-006-XIE

Statistics Canada. 1951-2001 Data. Census of Agriculture. As reported in Ontario Farmland Trust. 2008. *Farmland in Ontario – Are we Losing a Valuable Resource.* University of Guelph.

Statistics Canada. 1931-1996. Census of Population. Prepared by Ray Bollman

Troughton, M. 2007. Canadian Farmland – A Fluctuating Commodity. . In W. J. Caldwell, S. Hilts & B. Wilton (Eds), *Farmland Preservation: Land for Future Generations.* Kitchener, Ontario: Volumes Publishing, Kitchener, Ontario. 2007.

Troughton, M.J. 1981. "The Policy and Legislative Response to Loss of Agricultural Land in Canada." *Ontario Geography.* 18, 79-105.

van Donkersgoed, E. October 19, 2001. *Countryside Smart Growth.* Farm and Countryside Commentary.

United Nations Framework Convention on Climate Change. 2009. Retrieved August 21, 2009 from http://unfccc.int/essential_background/convention/background/items/2536.php

United Nations. 2008a. *World Population Prospects: The 2008 Revision – Highlights*. New York, New York. Retrieved September, 2009 from http://www.un.org/esa/population/publications/wpp2008/wpp2008_highlights.pdf

United Nations. 2008b. *World Population Prospects: The 2008 Revision* – Canadian Population Estimates 2050. Retrieved September, 2009 from http://esa.un.org/unpp,

Wall, E., Smit, B. and Wandel, J (Eds.). 2007. *Farming in a Changing Climate: Agricultural Adaptations in Canada.* Vancouver, B.C.: University of British Columbia Press.

Walton. M. 2003. *Agriculture in the Central Ontario Zone*. Smart Growth Issue Papers. Neptis Foundation. Toronto, Ontario. Retrieved September, 2009 from http://www.neptis.org/library/show.cfm?id=72&c_id=6

Waterfield, L.W. 1986. *Conflict and Crisis in Rural America.* Praeger Press.New York, U.S.A.

Weeks, S.B. 1976. "More About Controlling Demographic Change." *Small Town.* 6(12), 4-6.

Williams, J.D. and A.J. Sofranko. 1979. "Motivations for the Immigration Components of Population Turnaround in Non-metropolitan Arena." *Demography.* 16(2), 239-255.

Wilton, B. 2007. Farmland Preservation Perspectives. In W. J. Caldwell, S. Hilts & B. Wilton (Eds), *Farmland Preservation: Land for Future Generations.* Kitchener, Ontario: Volumes Publishing, Kitchener, Ontario. 2007.

York Region. 2008. *Climate Change and Sustainability*. Draft Discussion Paper.

Zollinger, B. and R. Krannich. 2002. "Factors Influencing Farmer's Expectations To Sell Agricultural Land For Non-Agricultural Uses." *Rural Sociology.* pp.442-463.