

# MEASURING FARMLAND LOSS

Quantifying the Conversion of Prime Agricultural Land  
To Non-Farmland Uses Across Southern Ontario

**Volume I**

**Report**

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# 1. Executive Summary

Ontario's agricultural industry depends on the availability of quality farmland. This farmland however, often faces development pressure from urbanizing communities and other resource-based activities. Though the Provincial Policy Statement and Greenbelt Plan have endeavoured to protect much of the prime agricultural land within Ontario, municipal land use policies vary in their interpretation and implementation of these directives. Land use changes such as new lot creation, surplus farm dwellings, and the redesignation of prime agricultural land to non-farm uses can have a significant impact on the preservation of agricultural land.

In general, we lack quality data that documents changes to the availability of agricultural land, or identifies current impacts of non-farm and urban development that contributes to long-term trends of farmland conversion. While the census provides an enumeration of land in production, it does not account for planning decisions that compromise the long-term availability of this land nor does it distinguish prime from non-prime lands.

This research responds to these gaps by documenting the conversion of farmland through official plan amendments. Using this method, this study captured land use changes relevant to prime agricultural land across Southern Ontario from 2000–2017. The resulting data provides insight into land use changes as they occur prior to development, and ultimately test the effectiveness of existing policy tools in their ability to protect the long-term availability of agricultural land in Ontario. The primary policies looked at in this research include the Provincial Policy Statement (2005, 2014) and the Greenbelt Plan (2005).

The data contained within this report is intended to provide the reader with an understanding of prime agricultural land loss within the timeframe. While the data provided is as accurate as possible, it should be read and interpreted as an approximation, as missing files and inconsistent information from primary records may have affected the complete accuracy of the data. In an attempt to verify the accuracy of this data, reports were circulated to the respective municipalities for comment and review.

Key takeaways include:

- Between 2000–2017, more than 29,000 Hectares of prime agricultural lands were converted to non-agricultural uses through 545 separate Official Plan Amendment across Southern Ontario.
- The majority (83.5%) of prime agricultural land loss occurred in Central Ontario. Southwestern Ontario accounts for 12.1% of the prime agricultural land loss and Southeastern Ontario represents 4.4% of the prime agricultural land loss in the study period.
- The number and size of OPAs in these three different regions above demonstrated different patterns of farmland loss: Central Ontario has seen most large-scale farmland conversion due to urban boundary

expansion, while the more rural Southwestern and Southeastern counties have experienced mostly small-scale farmland conversion for single usage.

- The year-by-year farmland loss data shows that the most yearly prime agricultural land loss occurred in 2006, 2013 and 2015, when York Region, Halton Region and Durham expanded their urban boundaries through Municipal Comprehensive Review (MCR). There would be an overall downward trending of yearly farmland loss since 2000 if excluding these large-scale MCRs.
- The highest amount of prime agricultural land loss in absolute terms occurred in York Region (7989 ha), Peel Region (3442 ha) and Halton Region (2938 ha), which is consistent with the level of population growth and development pressure.
- The highest number of approved official plan amendments occurred in Perth County (72).

## 1.2 Acknowledgements

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**\*The other three volumes of this report are available as separate documets**

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## Abbreviation

CLI: Canada Land Inventory  
DEV: large development  
DEVAG: agricultural development  
DEVCL: commercial development  
DEVIN: industrial lands development  
DEVIS: institutional development  
DEVR: residential development  
DEVSAG: settlement area expansions and growth development  
GGH: Greater Golden Horseshoe  
GTHA: Greater Toronto and Hamilton Area  
MMAH: Ministry of Municipal Affairs and Housing  
NEP: Niagara Escarpment Plan.  
OFDU: on-farm diversified uses  
OMAFRA: Ontario Ministry of Agriculture, Food and Rural Affairs  
OMB: Ontario Municipal Board  
OP: Official Plan  
OPA: Official Plan Amendment  
ORMCP: Oak Ridges Moraine Conservation Plan  
PAL: Primary Agricultural Land  
PPS: Provincial Policy Statement  
SBIZ: small businesses  
SPORT: sport and recreation facilities

## 2. Introduction

Agriculture is a major cornerstone of Ontario. It is one of the economic drivers of the province, provides a reliable food source, and is foundational to many rural and urban communities. This is true today and historically. In fact, the same characteristics that make the area attractive for agriculture are the same characteristics that contribute to the province's rapidly urbanizing municipalities: high quality soil, good climate, and access to water and transportation networks. As productive farms were established, small communities began to grow around them along with new services required to meet their population's needs (Neptis, n.d.). This combination of pull factors catalyzed population growth, and eventually agricultural land was converted to accommodate a wide variety of other uses. Over time, this trend of demand-triggered land conversion resulted in a sprawling effect and significant amounts of the best agricultural land in the province were taken out of active agricultural production for residential, commercial, industrial, and other development uses.

This loss of farmland is most pronounced in Southern Ontario. Of Canada's entire land base, only 5 percent is considered to be highly suitable for agricultural production, otherwise referred to as *prime land* (Neptis, n.d.). Within Ontario, 6.8 percent of the land base is considered to be prime, the majority of which can be found in the Southern region of the province, south of the Canadian Shield. This is also home to the greatest population growth in the country. The associated pressure for development in this area is, however, palpable as even the provincial capital, the City of Toronto, lies on some of the most historically productive land, in the country. In fact, the majority of Ontario's prime land is within 100 kilometres of Toronto (Troughton, 2007).

The conversion of agricultural land to non-agricultural purposes impacts Ontario's GDP and local socio-economic structures (Armstrong and Taylor, 2000). Francis et al. (2012), note that while residential development or other urban land uses may provide short-term economic stimulus, every dollar earned by agriculture is actually tripled through direct and indirect economic activities. Without a stable land base, the economic benefits of agriculture quickly diminish. Socio-economic factors, such as the fracturing of the land base and the associated restructuring of the agricultural industry and rural communities have also significantly impacted the practice of farming.

These impacts can be observed through census data, which document a shift away from agriculture. Once the dominant way of life, now just 70,470 people in Ontario are farm operators (Statistics Canada, 2017b). This number has been steadily decreasing, and now constitutes less than 1% of the total provincial population of 13,448,494 (Statistics Canada, 2017a). This small proportion of the population continues to play an important role in providing adequate food, fibre, and fuel to not only the local population, but increasingly as a member of the global market.

Continued agricultural contribution is contingent on reliable access to prime land. While the census provides an enumeration of land in production, it does not account for planning decisions that compromise the long-term

availability of this land nor does it distinguish prime from non-prime lands. The Provincial Policy Statement (PPS) and Greenbelt Plan have protected much of the prime agricultural land within Ontario; however, at a regional/county level, land use policies vary for new lot creation, surplus farm dwellings and the redesignation of prime agricultural land to non-farm uses. Planning decisions have immediate impact on how land is allocated and how growth is managed. While tracking land use conversion usually occurs post development as agricultural land is taken out of production, the planning decisions that critically define the land use is a process

Considering the significant development pressures on agricultural land, it is necessary to develop tools that accurately measure farmland availability and loss, which includes identifying the impact of planning decisions that may not be captured by the census. This research responds to these gaps by documenting the conversion of farmland through official plan amendments. Using this method, this study captured land use changes relevant to prime agricultural land across Southern Ontario from 2000–2017. The resulting data more effectively quantifies land loss as it occurs prior to development, and ultimately provides an opportunity to test the effectiveness of land use policy in Ontario linking it to timeframes connected to major provincial policy instruments. The primary policies looked at in this research include the Provincial Policy Statement (2005, 2014) and the Greenbelt Plan (2005). Agriculture remains critical to Ontario, and this study quantifies prime farmland change across Southern Ontario in order to help ensure a productive and vibrant agricultural future.

## 2.1 Purpose of the Study

Balancing the preservation of prime agricultural land with the increasing demand for development is a challenging task for municipalities. Provincial planning policies have been developed to encourage the protection of prime land and direct growth to suitable areas, but there has not yet been a study that has evaluated the effectiveness of these policies from a farmland preservation perspective. Further, this study responds to gaps identified in the traditional measurement of farmland conversion using the census which may not account for loss associated with new lot creation, surplus farm dwellings and redesignations of agricultural land to other uses. The absence of data that accounts for this kind of land use conversion relegates our understanding of agricultural land loss to a post-development analysis rather than a product of decision-making processes.

This research study was designed to meet the following objectives. First, this study developed a methodology for tracking the conversion of prime agricultural farmland at a regional/county level through a planning-focused lens. This study and associated reports were designed to be achievable, replicable, and translatable to ensure opportunities for policy analysis and supplementary studies. To that end, summary reports have been compiled for each region documenting the conversion of prime agricultural lands within the context of each location and capturing inherent nuances between these areas (county and regional summaries are documented in volume 2 of the report).

Using these methods, this study is able to identify where development pressure is felt most acutely, and reflect on how municipalities are responding within their official plans. In addition to documenting quantified conversions, an analysis of related planning policies and their effectiveness in protecting prime agricultural lands

has been provided through this study. Best practices were subsequently identified that work to protect the future availability of agricultural land in Ontario.

The agricultural sector will benefit most from this research project as this research provides a clear reflection of farmland loss as a result of municipal planning decisions made from 2000–2017. This is fundamentally related to land use and preservation policies enacted by the province and municipalities in support of agriculture in Ontario. Further, this research will provide concrete data for rural areas to utilize to make more informed decisions on land use planning.

Diverse stakeholders such as decision makers, planners, and community economic developers will also benefit from this research as an accurate measure of farmland availability and loss provides a clearer understanding of the effectiveness of provincial and local policies oriented towards farmland preservation in Ontario (PPS/Greenbelt Plan). This research will assist in land use planning decisions and broadly inform stakeholders of the current state of farmland availability/loss.

## 2.2 Prime Agricultural Land

The term *prime agricultural land* used throughout this report is consistent with the definition presented by the Canada Land Inventory (CLI). CLI uses classes to describe soil capability for agriculture and of the seven related classes, soils in Class 1, 2 and 3 are considered to be highly capable due to their soil, climatic, and locational qualities. As demonstrated by Hoffman (1973, 1971), these soils are undoubtedly the most productive. It is important to note that prime agricultural land is a finite resource. Provincial policies have jointly prioritized the identification and protection of prime agricultural land at a regional and municipal level. The majority of Canada's Class 1 soil is concentrated within southern Ontario, the most rapidly urbanizing region of the country.

Specialty crop areas, such as the Holland Marsh and Niagara tender fruit regions, are also considered to be prime agricultural lands (OMAFRA, 2016). Unlike field crops that can be grown in a variety of conditions, specialty crops instead only thrive in limited areas that provide the specific combination of conditions they require. Examples of specialty crops noted in the PPS include tender fruits, grapes, and other fruit, vegetable and greenhouse crops. Land loss impacting these areas have been captured and identified. In instances where the original planning documents that form the basis of this report have not included the soil classification within their description, the location has been cross-referenced with Ontario Ministry of Agriculture, Food, and Rural Affairs' (OMAFRA) Agricultural Information Atlas which indicates CLI land classifications on a GIS-enabled mapping database to ensure relevance to the study.

## 2.3 Relevant Policies

Land use planning in Ontario is organized and regulated as a hierarchical system. The provincial government creates policy frameworks for the province as a whole as well as for specialized regional systems. These

documents determine the processes, terms, and goals that municipalities must be compliant and consistent with during the local planning and policy creation. This context gives the provincial government advantages in exercising political will in defining and protecting public interests. This hierarchical structure is central to this research, as prioritizing agricultural land preservation and managing population growth have largely been initiated through recent provincial policies (discussed further in Section 5.2).

At the top of the planning hierarchy is the Planning Act which identifies how land-use decisions may be made and by whom (Ontario Ministry of Municipal Affairs, 2018). The Provincial Policy Statement (PPS) complements the Planning Act and provides more details on policy direction related to topics of provincial interest. In Southern Ontario, four additional provincial plans guide growth and land use in the region and include the Growth Plan for the Greater Golden Horseshoe, the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan, and the Niagara Escarpment Plan.

Ontario's provincial government has recognized the importance of maintaining the province's prime agricultural land along with the struggles that come when faced with opportunities for development. In recent years there have been several policies and land use plans put into place by the provincial government that work to protect prime agricultural lands from future development. These planning policies influenced this research by providing a platform to measure provincial success of preserving prime agricultural lands. The most relevant policies that will be referenced in this report include the PPS, the Greenbelt Plan, and the Places to Grow Act.

### **Provincial Policy Statement**

The Provincial Policy Statement (PPS) establishes the provincial interest in land use planning in Ontario. Municipal planning decisions must be consistent with this document. It lays out the long-term vision for Ontario's agricultural land protection and specifies conditions under which agricultural lands can be converted to non-agricultural uses. The 2005 version of the PPS dictated that prime agricultural areas shall be protected for long-term agriculture with certain exceptions for settlement boundary expansions, mineral and petroleum resource extraction, and limited non-residential uses given there are no reasonable alternative locations. In addition to the 2005 version of the PPS the Province introduced other legislative changes, including the Greenbelt Plan. The 2005 version of the Provincial Policy Statement also included the concept of specialty crop areas, mandating planning authorities to designate these areas, and giving them the highest priority for protection.

In 2014, the PPS was updated to provide further guidelines for identifying, designating, and protecting prime agricultural lands within Official Plans. The Province also introduced stricter policies for settlement area expansions onto prime agricultural areas, mandating that in addition to the policies outlined in earlier PPS documents, identification and expansion of settlement areas may only occur at the time of a comprehensive review. The policies and guidance provided in the Provincial Policy Statement and the provincial plans are implemented through regional and local official plans, which must be consistent with the policy directions provided at a provincial level. (The PPS was revised again in 2020, although this is outside the scope of this study).

## **Official Plans**

Upper and lower tier municipalities have the authority the responsibility, to create an Official Plan (OP) where local priorities and policies are defined and accompanying land use and zoning regulations are established. OPs define the terms of local agricultural land designation, local agricultural land use policies are specified, and maps describe the designated agricultural lands within the municipality's jurisdictional boundary. Most commonly specialty crop areas and prime agricultural lands are recognized in an agricultural designation, while lower capability lands are often categorized under a rural designation.

Official plan designations may be amended through an Official Plan Amendment (OPA) process, which changes the existing designation on the property in order to permit an alternate use desired by the applicant. OPAs may be initiated by either private applicants or by the municipality, both of which are subject to approval by the municipal council and in some instances by the Ministry of Municipal Affairs and Housing as well. OPs must contain policies that are equivalent to, or more stringent than existing provincial policies such as the Greenbelt Plan. When prime agricultural lands are implicated in a proposed OPA, municipalities need to be consistent with the Provincial Policy Statement and conform with the Greenbelt Plan (Ontario Ministry of Municipal Affairs and Housing, 2005a).

## **Greenbelt Plan**

The Greenbelt Plan is particularly relevant to this study. Policies within the Greenbelt Plan protect prime agricultural lands by identifying specific areas where development should not occur, preventing loss and discouraging fragmentation. Enacted in 2005, it serves to protect natural resources, including green space, farmland, forests, wetlands and watersheds (MH & MMA, 2017). As of 2017, it covers over 2 million acres of land, including 1.2 million acres of Protected Countryside and Urban River Valley, and 800,000 acres within the Niagara Escarpment Plan and Oak Ridges Moraine Conservation Plan (MH & MMA, 2017).

## **Places to Grow Act and the Growth Plan for the Greater Golden Horseshoe**

The Province introduced the Places to Grow Act in 2005. This legislation enables the province to develop plans guiding growth and land use (Ontario Ministry of Municipal Affairs, 2017b). The Growth Plan for the Greater Golden Horseshoe was then introduced in 2006 under the Places to Grow Act in support of increasing densities and limiting sprawl by directing growth to built-up areas and restricting settlement area boundary expansions (Ontario Ministry of Municipal Affairs, 2017b). This was influenced though specific policies that required that by 2015, at least 40 percent of all new residential development would be within a built-up area (2.2.3.1) and in greenfield areas new development meet a minimum density of 50 residents and jobs combined per hectare (2.2.7.2) (Ontario Ministry of Public Infrastructure Renewal, 2006). Specific to agricultural lands, the updated Growth Plan requires an Agricultural Impact Assessment to be conducted where an expansion into prime agricultural lands cannot be avoided and is justified (Ontario Ministry of Municipal Affairs, 2017b). These targets were subsequently increased in later revisions of the Growth Plan.

## 3. Methodology

### 3.1 Introduction to Methodology

A new methodology was designed specifically for this project that tracks the conversion of prime agricultural lands at a regional/county level. The specific study areas were chosen to best reflect geographies in Ontario that have both high levels of prime agricultural areas and experience significant growth pressures. The timeframe of this study 2000–2017 was selected to allow for pre- and post-analysis of relevant provincial policy introductions. 2000 was chosen as the early cut-off date as files prior to this date were not considered to be readily available or in some cases, available at all. This time frame also enables reflections on the success of provincial land use policies, most significantly the Greenbelt Plan, on preserving prime agricultural lands. As the Greenbelt Plan was enacted in 2005, the time frame for this study enables analysis of prime agricultural land within and outside its border before and after adoption. Data collection began in December 2014 and continued to the end of 2017.

The primary data collected for this study is taken directly from OPAs approved at the upper-tier, region or county level during the study's timeframe. Where available, secondary data including data from the accompanying planner's report, initial OPA application forms, archived municipal council minutes, and Ontario Municipal Board (OMB) case decisions was also used. In some cases, the upper-tier municipal plan was not in effect prior to 2014, or came into effect halfway through the time frame for the study. Where access to upper-tier OPA files were not available, or in instances when the upper-tier's OP was introduced after 2000, OPA files were also collected from the constituting lower-tier municipalities.

The methodological process used for this project can be simplified to location analysis and study boundary identification, data collection, and analysis. The first step was to determine where the prime agricultural lands exist in Ontario and thereby determine the areas of focus for the study. Information was drawn from a variety of sources including OMAFRA's Agricultural Information Atlas soil capability for agricultural mapping layer. Once counties and regions with prime agricultural lands were identified, their OPs were reviewed to determine what designations applied to prime agricultural lands and if there was any distinction between areas of prime agricultural land and land less suitable for agriculture within designation systems.

After relevant designations had been identified, data was collected either in partnership with municipalities or independently through online databases. The manner of storage for OPA files varied between each municipality. For some jurisdictions, files were available electronically on the region or county website, while other municipalities had digitized reports available for access through an internal department server. In many instances, the original documents were physically stored within the planning department or in off-site storage facilities. When working with the municipality, planners or clerks would provide access to physical or electronic documents relevant to OPAs as available. Alternatively, by-laws adopted in 2000–2017 were reviewed through online databases. With all of the relevant OPAs available, various pieces of information were pulled from the file

to use for data collection. Information included: application date, adoption date, OPA purpose, previous land use designation, new land use designation, special policy (if applicable), impacted area in hectares, lot and concession plan, other location identifiers and OMB appeals if applicable. The data collected was then sorted into three categories (as stated in Section 3.3).

When necessary, further analysis was completed to determine whether prime agricultural land was impacted, as well as to verify if the subject lands were located within the Greenbelt. This was done by using locating parcels on Greenbelt mapping or through OMAFRA's Agricultural Information Atlas through lot and concession plan lot numbers. These tools provide a geographic layer of the CLI soil suitability for agriculture and identify each of the different soil classes in an area. Using this layer, it was determined if a strong presence of Class 1, 2 and 3 soils were present in the area of the official plan amendment. The presence of the type of soils, combined with information from the planning reports, were used in conjunction to determine if the area subject to the official plan amendment should be classified as prime agricultural. This information, combined with the application date, determined if OPAs causing the loss of prime agricultural land had occurred within the Greenbelt after its adoption. Any adopted official plan amendments that redesignated prime agricultural lands and that were applied for after the Greenbelt Plan was enacted serve as an indication that provincial policy has not been effective in preserving prime agricultural lands.

## 3.2 Study Areas

This study's methodology was first tested in 2014 through pilot case studies in Huron, Perth and Wellington counties. These municipalities were selected thanks to the support of their respective planning departments along with access to the required OPA documents. These pilot studies helped to refine the methodology and identified potential methodological limitations. Upon completion of data collection, the methodological process for data collection was deemed appropriate and then applied to twelve other regions and counties within Central Ontario as a part of phase one of the project which was underway from 2014–2017.

The Central Ontario boundaries were selected consistent with the Greater Golden Horseshoe. Municipalities covered by the Greenbelt Plan were also identified. Phase one aimed to capture relevant OPAs that had been approved in the timeframe of 2000–2014 to further provide insight on the efficacy of relevant policies, namely the 2005 PPS, Greenbelt Plan, and Places to Grow Act. The municipalities included in this phase were: Durham Region, Halton Region, Niagara Region, Peel Region, York Region, Brant County, Dufferin County, the City of Kawartha Lakes, Haldimand County, Northumberland County, the City of Peterborough, Simcoe County, Waterloo Region and Wellington County. Though the City of Hamilton falls within the Central Ontario boundaries and within the Greenbelt, data was unavailable to researchers until the study was expanded during phase 2. Another exception is Grey and Huron counties, which were not included in the Greenbelt's boundaries at the outset of this research. These two counties are grouped with Southwestern Ontario.

**Table 3. 1 Study Area Boundaries**

<b>Study Area Boundaries</b>			
<b>Southwestern Ontario</b>	<b>Central Ontario</b>		<b>Southeastern Ontario</b>
	Inner Ring	Outer Ring	
Bruce County	Durham Region	Brant County	Frontenac County
Municipality of Chatham-Kent	Halton Region	Dufferin County	Hastings County
Elgin County	City of Hamilton	City of Kawartha Lakes	Lanark County
Essex County	Niagara Region	Haldimand County	Leeds and Grenville United Counties
Grey County	Peel Region	Northumberland County	Lennox and Addington County
Huron County	York Region	City of Peterborough	City of Ottawa
Lambton County		Simcoe County	Prescott and Russell United Counties
Middlesex County		Waterloo Region	Prince Edward County
Norfolk County		Wellington County	Renfrew County
Oxford County			Stormont, Dundas and Glengarry United Counties
Perth County			

In 2018, this project expanded to include counties and regions in Southern Ontario as well as expand the timeframe across all municipalities to capture data from 2000–2017. The focus was limited to Southern Ontario to best capture municipalities with both a significant amount of prime agricultural land as well as a strong demand for development in accordance with the research objectives. The municipalities included in this phase include Bruce County, the Municipality of Chatham-Kent, Elgin County, Essex County, Grey County, Huron County, Lambton County, Middlesex County, Norfolk County, Oxford County and Perth County in the Southwestern area. The municipalities captured in Southeastern Ontario include Frontenac County, Hastings County, Lanark County, Leeds and Grenville United Counties, Lennox & Addington County, the City of Ottawa, Prescott and Russell United Counties, Prince Edward County, Renfrew County, and Stormont, Dundas and Glengarry United Counties. Haliburton County and Muskoka District Municipality were initially included within the study boundaries, but were later removed upon verification that they do not contain significant amounts of prime agricultural land. Phase two of this project was completed in 2020.

### 3.3 Organizational Categories

This project captured relevant OPAs and organized them into three categories:

- 1) Prime agricultural areas redesignated to a development designation;
- 2) Prime agricultural areas redesignated to a rural designation; and
- 3) Land designated as a prime agricultural area with a site-specific amendment to allow additional uses.

The first category includes OPAs that converted the agricultural land to a variety of development designation, including residential, commercial, industrial, and infrastructure, as well OPAs that were a product of Municipal

Comprehensive Reviews and boundary adjustments. The second category includes OPAs that change the agricultural designation to a rural designation to permit certain non-agricultural uses on them (such as the development of a village or hamlet). The third category refers to OPAs that add site-specific special policies on the designated prime agricultural lands, permitting specific non-agricultural uses on either a portion of the land or the entire parcel. In this third category, some of the land may remain in agricultural production.

Housekeeping type amendments have not been tallied as contributing to farmland conversion. Housekeeping type amendments arise as OP schedules are updated to align land use designations with more accurate parcel lines, or to reflect existing physical features. For instance, changes from a prime agricultural to a rural designation as the result of a land evaluation and area review (LEAR) were not considered relevant to this study. Further, specific policies relating to wind turbines were also not considered. Another typical amendment impacting agricultural land that was not captured in this study were OPAs used to permit aggregate operations. These OPAs were not reported as they were not a permanent urban conversion.

### **3.4 Research Limitations**

The methodology for this study provides a timely reflection of farmland conversion at a municipal scale. While attempts have been made to ensure the data within this study is as accurate as possible, there are limitations of this data that need to be recognized. As this research was made possible through the effort of numerous people across the province and analyzed by a rotating team of research assistants, the possibility of human error is present. Municipalities were given the opportunity to review and respond to the data that form the basis of the county and region summaries prior to finalization. These steps were taken to help verify findings and ensure a reasonable level of assurance. The identified limitations within the methodology, however, include municipal variability, accuracy, and availability. These limitations may create barriers to regional and cross-municipality comparisons.

#### **Municipal Variability**

As this study only captures land use changes that trigger an Official Plan Amendment, it is important to note the variability within municipal OPs, particularly in the handling of severances, infrastructure, and diversified uses. Different interpretations of these land use changes may varyingly trigger an OPA, subsequently impacting this study's ability to capture agricultural impacts. Infrastructural projects that may be permitted in prime agricultural areas and permanently disrupt soil capability include sewage treatment, stormwater management facilities, and public works yards. Different approaches to residential uses on agricultural properties may also account for the loss of a considerable amount of agricultural land being established on agricultural properties. While some municipalities require an OPA to permit a garden suite or the severance of a surplus dwelling, others are more lenient and may allow a range of additional dwellings, outbuildings, ponds, and landscaping without limitations.

The same is true of on-farm diversified uses. Municipalities' interpretation and thresholds related to what constitutes as an agricultural use varies. Agri-tourism is a typical and often controversial example, as though

these uses may help add or retain value in support of agriculture, they may cumulatively consume significant amounts of agricultural land, and the impacts of on-farm diversified uses may be evaluated and monitored to different standards across the province. Rural designations are another grey area within this research as some municipalities allow significant agricultural uses however any changes to that use would not trigger an OPA but only a zoning by-law amendment.

### **Accuracy**

The accuracy of the dataset captured within this research has the potential to be limited either by human error on the municipal side, or during collection and management. There is also the potential even in circumstances without human error, the results may be misleading to the point of inaccuracy due to the nature of the methodological devices.

While this project strived to distinguish between what constituted a housekeeping amendment and a relevant OPA, there were instances where the line between the two was unclear. When such instances were identified, OPAs that may better be considered as a housekeeping amendment, yet were still included have been indicated with an asterisk and a disclaimer. An example of this kind of amendment occurred in the Municipality of Chatham-Kent. In 2016, OPA 42 redesignated agricultural land to a conservation/open space designation in order to facilitate the protection of a Provincially Significant Wetland as well as to permit the severance of an existing dwelling. While the municipality's planners suggest this OPA was used to better reflect the land use, researchers determined that the addition of the severance was of continued interest.

Special policies also posed challenges in respect to accuracy. This research is based upon the information contained with OPA documents, including the hectarage as provided. Municipalities use of special policies varied, as some apply the special policy to the entire subject parcel, whereas others limit the special policy to the amount of land necessary for the additional use. The hectarage for some municipalities may therefore be misleading in respect to the special policy category, as the cumulative number may not necessarily be reflective of the amount of agricultural land actually taken out of production. When possible, data was revised to be as specific as possible. In Grey County, this process dramatically reduced the amount of hectares implicated within this category.

Another limitation of utilizing official plan amendment data is ensuring the accuracy of information provided by the municipality in the OPA files. The most common issue was missing values, particularly the area (hectare value) of prime agricultural lands affected by the amendment. To ensure the area (hectare) value provided in the official plan amendment documents was accurate in data collection, files with missing information were subject to additional testing. Specifically, using the maps provided in the official plan amendment files, the area affected by the official plan amendment was mapped using online GIS technology or rudimentarily using Google Maps measurement tools. If a map was not available for the official plan amendment, and additional information on the area value was not available from the municipality, the official plan amendment was removed from the data set.

## Availability

Another limitation of this methodology is that the availability of the information varies greatly by municipality. This is due to municipal records retention policies, where historical records and files may be destroyed based on the date or number of years set in the record retention policy. Some municipalities within this study with record retention policies no longer had physical copies of the official plan amendments relevant to the early period of the study timeframe. In addition, with no digital log or copy of the official plan amendments, there was no information available on these files, and thus they could not be included in the research. Factors external to the municipality's control also affected the availability of records. In some instances, natural events including floods had destroyed the only copies of the official plan amendments held in records. Again, as such, there was no other information available on these historical official plan amendments, and they could not be included in the research. This project also coincided with COVID-19 which created barriers to OPA collection. This was particularly pertinent in Bruce County where missing data could only be verified using physical copies of documents that were unavailable due to restrictions on in-person visits. The impacted OPAs were removed from the dataset.

## 4. Findings

### 4.1 Introduction

This section of the report presents data on the conversion of prime agricultural land to non-agricultural uses through Official Plan amendments (OPA) in Southern Ontario between 2000 and 2017. The ‘prime agricultural land’ in this report refers to the agricultural lands with the soil classified as classes 1, 2 and 3 by the Canada Land Inventory (CLI). Local municipalities across Southern Ontario adopt different land designation systems in their local Official Plans. Prime agricultural lands are included in various land designations such as *Agriculture, Prime Agriculture, Rural, Recreational, Good Tender, and Restricted*. Detailed information on the local land designation as it relates to prime agricultural land is described in individual county summaries.

The majority of OPAs captured in this report were provided by county/regional planning departments with support from planning staff. For the counties/region/cities that did not have a county/regional Official Plan throughout the applicable time frame, data where available was collected from the lower-tier municipalities. Electronic documents were either sent to the research team by planners or retrieved from the municipalities’ online information portals such as a By-Law registry. Physical documents were primarily collected in person at local planning offices.

This project covers 36 counties across Southern Ontario. When available, data collected from OPA documents includes application and approval time, purpose of the OPA, former land designation, permitted land designation, size and location of the subject land, OMB/LPAT documents, and a map schedule. There were instances where data such as subject land size and location were missing, or original OPA documents were not available. The research team has made its best effort to ensure the accuracy of this report and denote when their own calculations or judgements have been made.

The OPAs included in this report meet the following criteria:

1. The OPA must have been approved by the municipal/county government or OMB/LPAT between January 1, 2000 and December 31, 2017.
2. The land involved must be identified as ‘prime agricultural land’ by the Official Plan or as Class 1-3 soil on OMAFRA’s soil classification map where a prime agricultural land designation does not exist.
3. OPA’s were included that added special policies that while leaving the land “called” agriculture added a new use/policy that effectively removed the lands from agricultural production.

This project divides Southern Ontario into three regions, as in Figure 4.1. The Central Ontario area covers all the Greater Golden Horseshoe counties and cities which are part of the Greenbelt in their jurisdictional boundaries,

including Dufferin, Durham, Niagara, Haldimand, Brant, Hamilton, Halton, Waterloo, Wellington, Peel, York, Simcoe, Kawartha Lakes, Peterborough, Northumberland. The Southwestern Ontario area covers the counties of Grey, Bruce, Huron, Perth, Oxford, Norfolk, Middlesex, Elgin, Lambton, Chatham-Kent and Essex. The Southeastern Ontario area covers the counties (cities) of Muskoka, Halliburton, Hastings, Prince Edward, Lennox and Addington, Frontenac, Renfrew, Lanark, Leeds and Grenville, Ottawa, Stormont Dundas and Glengarry, Prescott and Russell.

This section starts with an overview on the provincial trends of prime agricultural land loss in the study time period. This includes the amount of prime agricultural land loss, yearly trends, and overall regional patterns. The following parts of this section will further present the data at a regional (Central Ontario, Southwestern Ontario and Southeastern Ontario) level. Each county/region in the study has its own summary describing the data collection methods, local agricultural land use designation, trends in prime agricultural land conversion and its conformity with provincial land use planning policies. The county and regional summaries are included in volume II of the report.

## 4.2 Southern Ontario

Figure 4. 1 Municipalities in Southern Ontario

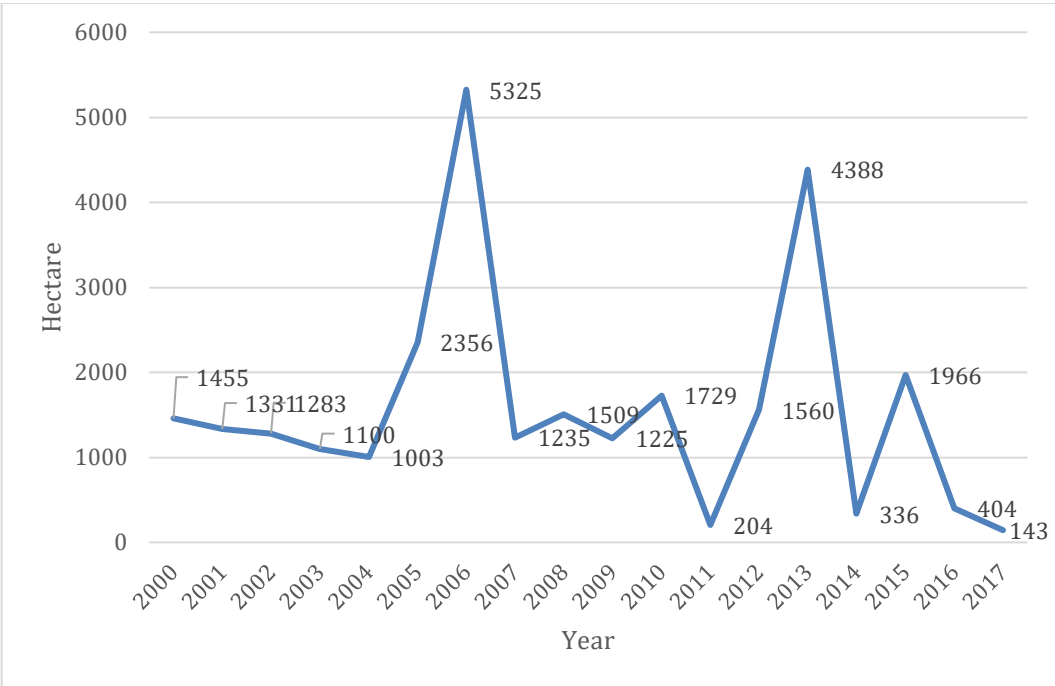


Between 2000 and 2017, 545 OPAs were approved to convert prime agricultural lands to non-agricultural designations or permit non-agricultural uses across 36 counties/regions and municipalities in Southern Ontario.

These amendments affected a total of 29,217 hectares of designated prime agricultural land. The greatest amount of prime agricultural land loss occurred in Central Ontario, which not surprisingly also experienced the most development pressure. This study captured 24,404 hectares of prime agricultural lands that were converted across the 15 counties in Central Ontario during the study period. Southwestern Ontario had 3,541 hectares of prime agricultural lands converted. Southeastern Ontario had 1,272 hectares of prime agricultural land lost.

Chart 4.1 identifies the total prime agricultural land loss through OPAs per year in Southern Ontario. 2006, 2013 and 2015 have comparatively large amounts of prime agricultural land loss. The highest number of yearly prime agricultural land loss occurred in 2006, where 5,325 hectares of designated prime agricultural lands were converted. This loss can be accounted for by York Region, which converted 1,696 hectares through a single OPA. The same is true of Peel Region, which similarly converted 2,428 hectares through a single OPA. 2013 saw the second largest amount of prime agricultural land loss where 4,388 hectares of prime agricultural lands were converted. Similar to 2006, some large-scale OPAs contributed to this amount, including a 2,656 hectare OPA in Halton Region and a 1,562 hectare OPA in Durham Region. 2015 has the third largest amount of yearly prime agricultural land loss of 1,966 hectares. A large part of this number came from two OPAs, including a 1,000 hectare OPA in York Region and a 688 hectare OPA in Peterborough.

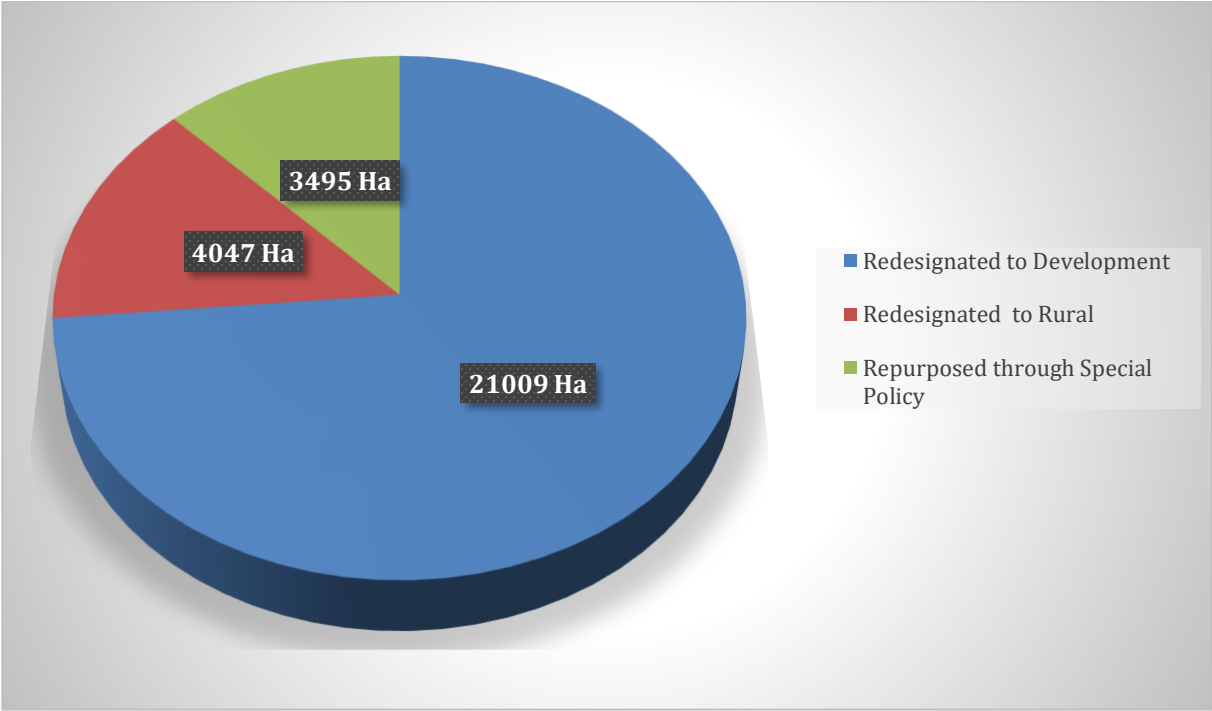
**Chart 4. 1 Agricultural Land Loss Across Southern Ontario by Year, 2000–2017**



Most of the large-scale OPAs occurred in the Greater Golden Horseshoe and were part of local Municipal Comprehensive Reviews (MCRs). Large-scale OPAs of this kind also contributed to the high yearly prime agricultural land loss number in the years of 2005, 2010 and 2012. If these large-scale MCR OPAs were removed from the calculation, the peaks highlighted in Figure 4.2 would instead be replaced by a stable downtrend line of the amount of agricultural land loss across the province annually.

This project captured relevant OPAs and organized them into three categories. The first category covered the OPAs which converted the agricultural land to a variety of development designation including residential, employment, recreational, commercial, industrial, infrastructure, institutional and Municipal Comprehensive Review. The second category includes the OPAs which change the ‘prime agricultural’ land designation to a ‘rural’ designation and therefore permit some non-agricultural uses on them (such as village, hamlet and so on). The third category refers to the OPAs which added specific policies on the designated prime agricultural lands and therefore permitted specific non-agricultural uses on them (while the land designation remains agriculture). Chart 4.2 illustrates the overall number of prime agricultural land conversion by the category of OPA.

**Chart 4. 2 Number & Percentage of Prime Agricultural Land Conversion in Southern Ontario by Category**



The chart shows that the majority (76%) of prime agricultural lands were re-designated to development uses. 14% of the collected OPAs re-designated the prime agricultural lands to ‘rural’ designation and the remaining 12% OPAs added specific policies on the designated prime agricultural lands. Chart 4.3 describes the prime agricultural land loss by development category and year. The chart shows that development-purposed land re-designation is the main channel of prime agricultural land loss for all years. Both small-scale and large-scale OPAs have been captured in the ‘development re-designation’ category. The years 2006 and 2015 saw large-scale land re-designation to rural use while in other years most OPAs in the ‘rural re-designation’ category were small-scale. Most OPAs in the ‘site-specific policies’ category were small in scale (usually under 10 hectares).

**Chart 4. 3 Yearly Prime Agricultural Land Loss Divided by Category in Southern Ontario, 2000–2017**

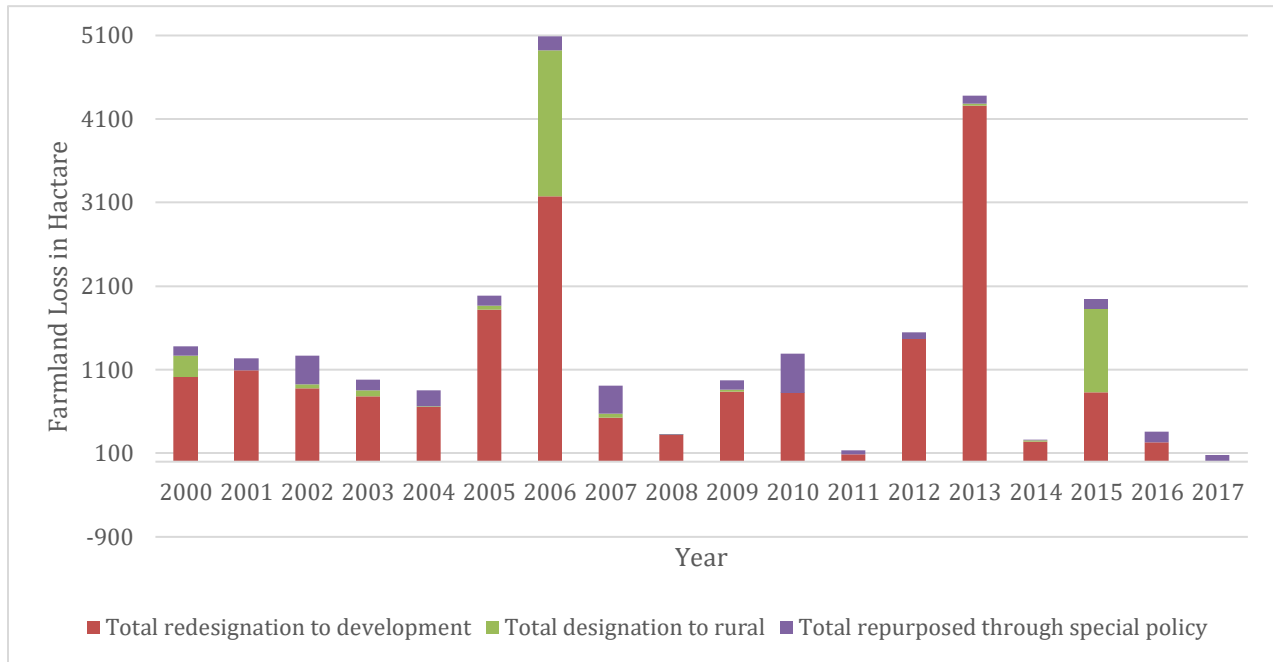
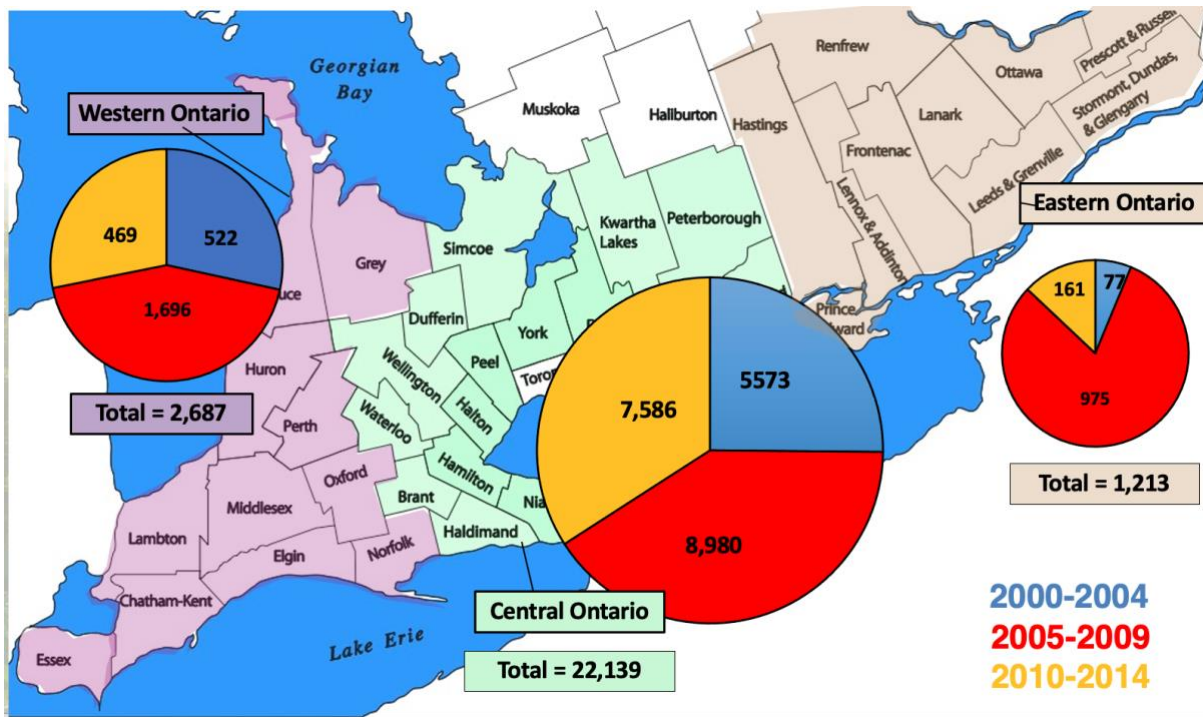


Figure 4.2 further demonstrates the amount of regional prime agricultural land loss in 5-year increments. The period between 2000-2004 saw 6,172 Hectares of primary agricultural land loss in total: Central Ontario lost 5,573 Hectares of prime agricultural land, whereas Southwestern Ontario lost 522 Hectares of prime agricultural land, and Southeastern Ontario lost 77 Hectares of prime agricultural land.

The period between 2005–2009 had the greatest amount (11,651 Hectares) of prime agricultural land loss: Central Ontario lost 8,980 hectares of prime agricultural land in this period, which was a 61% increase from the 2000–2004 period; Southwestern Ontario lost 1,696 hectares of prime agricultural land, which was 3.25 times more than the 2000–2004 period and Southeastern Ontario lost 975 Hectares of prime agricultural land, which was 12.6 times more than the 2000–2004 period.

The period between 2010 and 2014 has experienced 8,216 Hectares of primary agricultural land loss in total: Central Ontario has 7,586 Hectares of prime agricultural land lost, which was a 15.5 % decrease from the 2005-2009 period; Southwestern Ontario experienced 469 Hectares of prime agricultural land loss, which was a 72.3 % drop from the 2005-2009 period. Southeastern Ontario lost 161 hectares of prime agricultural lands, which was 2.1 times more than the 2005-2009 period.

Figure 4. 2 Regional Total Prime Agricultural Land Loss in 5-Year Increments in Southern Ontario, 2000–2014



It is important to keep in mind that the prime agricultural land loss was documented in keeping with the date when the OPA was approved by the county/municipalities/OMB/LPAT, rather than the when the application was made. Although some OPA applications were made before the 2005 Provincial Policy Statement and the Greenbelt Plan (2005) came into effect, most of them were approved between 2005 and 2009. This to a large extent contributed to the large farmland loss number during 2005–2009, as most of the large-scale MCR OPA applications (as described earlier) in the Greater Golden Horseshoe area were made between 2000–2004 and were later approved between 2005–2009.

### 4.3 Central Ontario

Figure 4. 3 Municipalities within Central Ontario



The Central Ontario region in this project covers 15 counties/cities in the Greater Golden Horseshoe area (excluding the City of Toronto, which has no significant undeveloped prime agricultural land in its jurisdictional boundary), including Dufferin, Durham, Niagara, Haldimand, Brant, Hamilton, Halton, Waterloo, Wellington, Peel, York, Simcoe, Kawartha Lakes, Peterborough and Northumberland. The 2001 census reported 1,520,816 hectares of farmland in this region, which is 27.8% of the farmland area in Ontario. This project captured 24,404 hectares of prime agricultural land loss in this region between 2000–2017, which accounts for 83% of the total captured prime agricultural land loss in in this project and 1.6% of the census farmland area. The total number of OPAs relevant to prime agricultural land conversion in this region is 260, with an average land loss of 93.9 Hectares per OPA.

**Table 4. 1 Prime Agricultural Land Loss in Central Ontario, 2000–2017**

County	Census Farmland (ha) 2001	Prime Agricultural Land Loss (ha)		Percentage Loss (%)	OPA Number	Average OPA Size
		2000-2017				
York	71,211	7,989		11.22	17	469.9
Peel	42,263	3,442		8.15	6	573.7
Halton	39,966	2,938		7.12	11	267
Niagara	94,218	2,087		2.22	45	46.4
Durham	133,662	1,693		1.27	5	338.6
Simcoe	218,882	2,426		1.11	45	53.9
Waterloo	91,378	1,019		1.12	7	145.6
Peterborough	104,669	796		0.76	12	66.3
Wellington	190,764	935		0.47	28	33.4
Hamilton*	56,202	186		0.33	21	8.9
Haldimand	86,590	284		0.33	21	13.5
Dufferin	78,170	247		0.32	8	30.9
Kawartha Lakes	145,966	236		0.16	23	10.3
Northumberland	102,654	63		0.06	6	10.5
Brant	64,221	64		0.1	5	12.8
<b>Total</b>	<b>1,520,816</b>	<b>24,404</b>		<b>1.6</b>	<b>260</b>	<b>93.9</b>

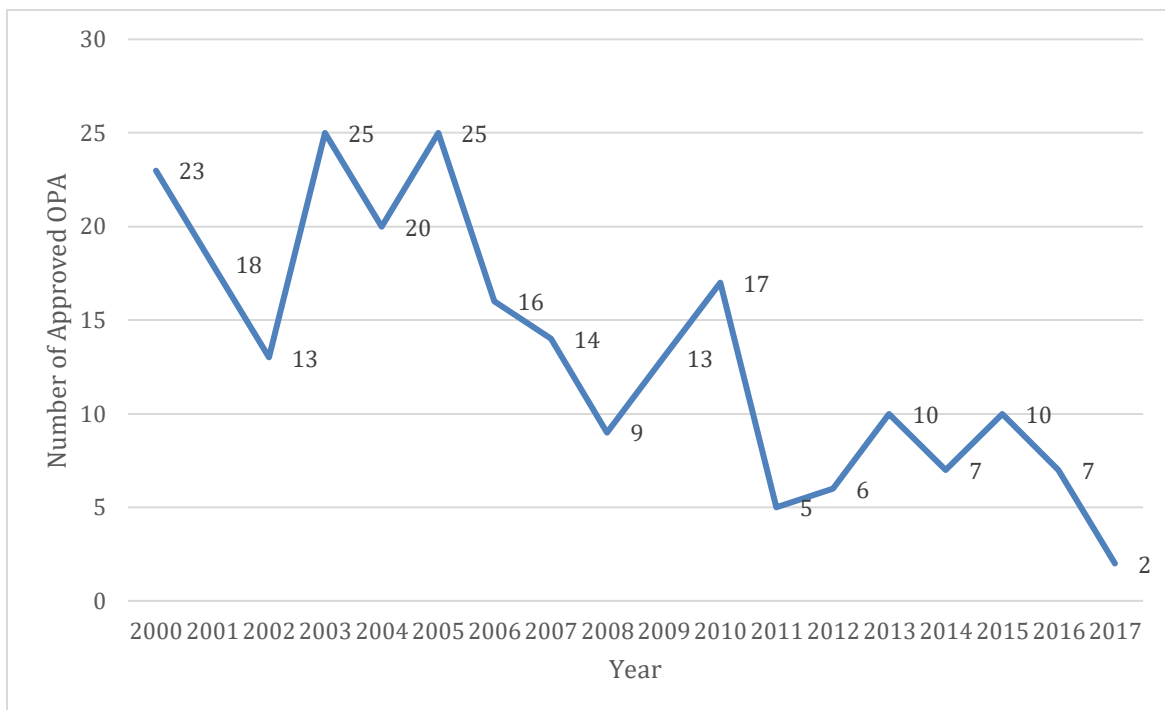
*\*\*The City of Hamilton’s results are not directly comparable to other regions in this Table as the dataset is not considered to be complete or verified.*

Key observations regarding trends in prime agricultural land loss through Official Plan Amendments in Central Ontario include:

- Between 2000–2017, there is an overall downward trend in the number of approved OPAs relevant to prime agricultural land loss in this region (Table 4.1 and Chart 4.4).
- The total number of relevant OPAs is 260.
- The average size is 93.9 hectares, which is 1.75 times of the provincial average (53.6 hectares).
- The years with most OPAs approved were 2003 and 2005.
- The three counties/regions which have experienced the most prime agricultural land loss are York Region, Peel Region and Halton Region. They are also the three regions with the largest percentage of prime agricultural land loss.
  - York Region has lost 7,989 hectares of prime agricultural land, which was 11.22% of the census agricultural land as reported in 2001;

- Peel Region has lost 3442 hectares of prime agricultural land, which was 8.15% of its 2001 census agricultural land;
- Halton Region has lost 2938 hectares of prime agricultural land, which was 7.12% of its 2001 census agricultural land;
- Northumberland County is the region which lost the least prime agricultural land, with 63 hectares of prime agricultural land loss during this timeframe.
- Simcoe County and Niagara Region had the largest number of relevant OPAs (45) in this region, followed by Wellington County (28). Brant County has the fewest relevant OPAs approved (5) in the study period.
- Peel Region had the largest average OPA size (573.7 hectares), followed by York Region (469.9 hectares) and Halton Region (267 hectares). The City of Hamilton had the smallest average size of land loss per OPA (8.9 hectares).
- The number of OPAs and their average size demonstrate three different patterns of farmland loss in this region: the GTHA municipalities have comparatively few OPAs and a large average size (more than 200 hectares); Niagara Region, Wellington County and Simcoe County have a comparatively large number with a medium average size (20-50 hectares); other Outer Ring counties have a comparatively small average OPA size and they vary in the total number of OPAs.

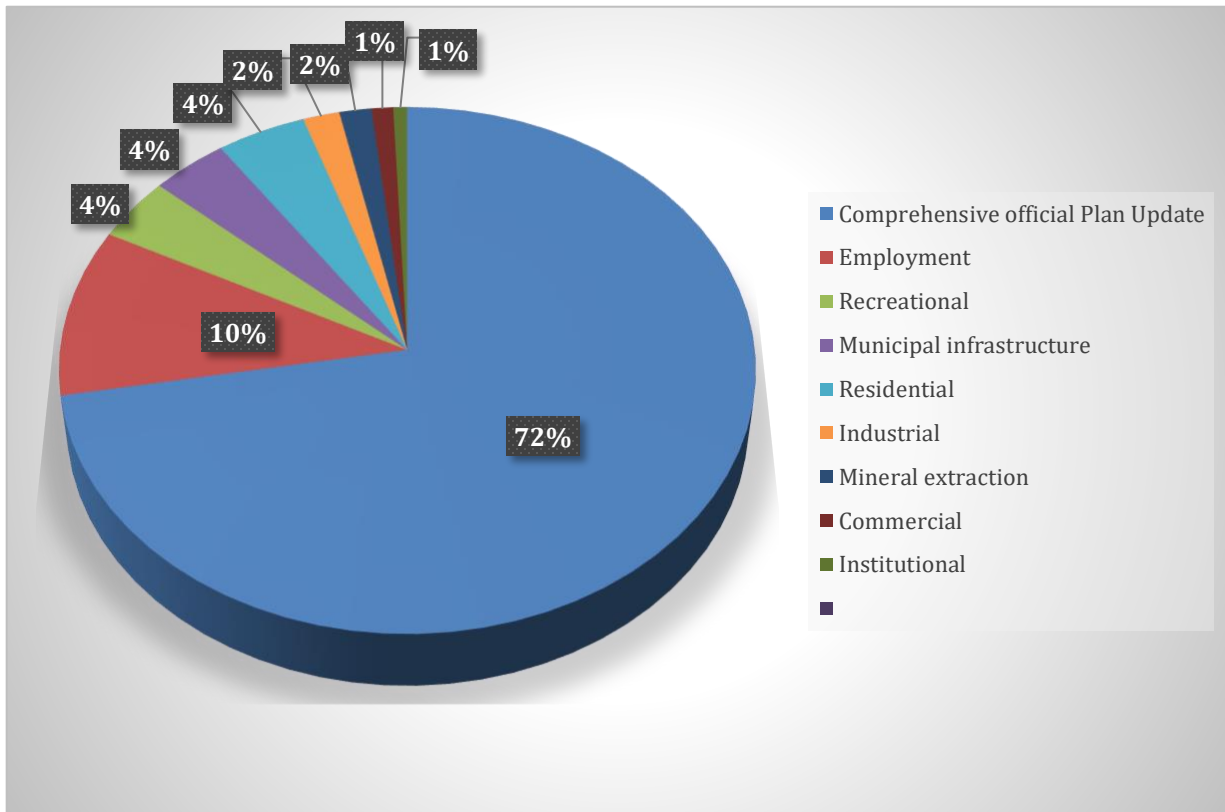
**Chart 4. 4 Number of Yearly Approved OPA in Central Ontario**



In order to understand the implication of farmland loss on local community and regional development, it is important to understand the approved land designation, or the purpose of the relevant OPAs. Chart 4.5 categorizes the captured OPAs by purpose in Central Ontario. The following observations are notes:

- 72% of the prime agricultural land was converted through Municipal Comprehensive Reviews (MCR) to expand urban boundaries/re-designated farmland for comprehensive urban use.
- 10% redesignated prime agricultural land to employment land.
- Recreational, residential and municipal infrastructural land took 4% of the redesignated land use and
- other land uses including industrial, commercial, institutional took 5–6%of the redesignated farmland.

**Chart 4. 5 Area of Official Plan Amendments Categorized by Purpose**

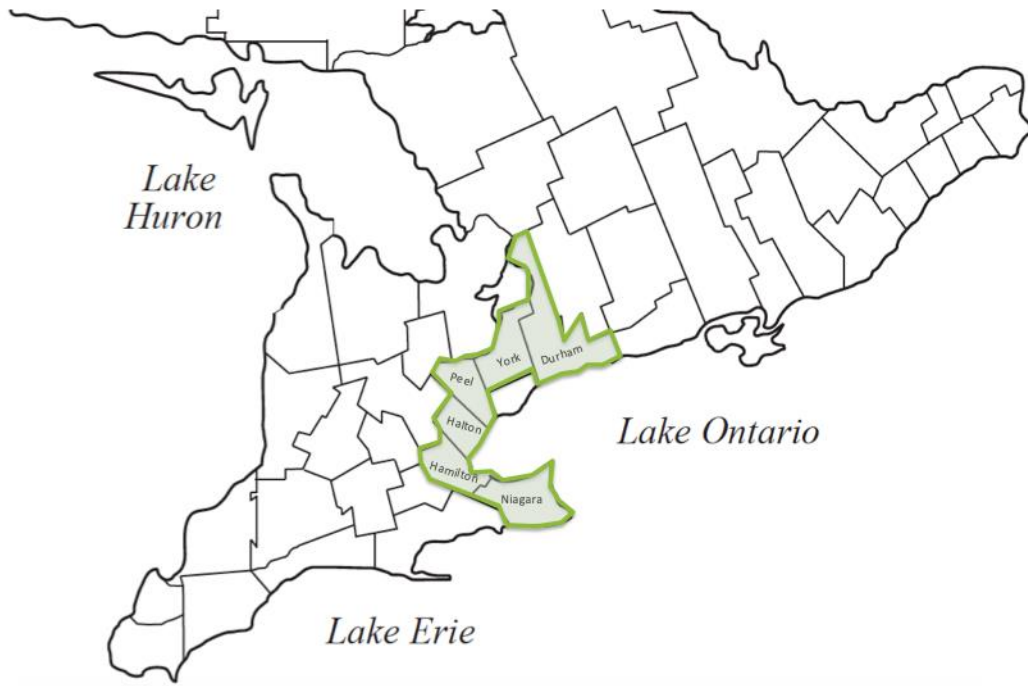


### 4.3.1 Rings of the Greenbelt

The Central region is further divided into the ‘Inner Ring’ greenbelt area and the ‘Outer Ring’ greenbelt area. The Inner Ring area includes the counties/regions that were under the most intense development pressure, including the counties/regions of Durham, York, Peel, Halton, Hamilton and Niagara. The Outer Ring greenbelt area includes the counties/regions of Dufferin, Haldimand, Brant, Waterloo, Wellington, Simcoe, Kawartha Lakes, Peterborough and Northumberland (Figure 4.4).

## Inner Ring of the Greenbelt Area

Figure 4. 4 Municipalities within the Inner Ring of the Greenbelt Area



The inner ring greenbelt municipalities have witnessed the greatest amount of prime agricultural land loss during the past two decades. There are six regions/city in this area, including Durham, Peel, York, Halton and Niagara Region along with the City of Hamilton. This area contains 437,522 hectares of census farmland, which is 28.8 % of the total census farmland in Central Ontario. Meanwhile, the area has lost 18,337 hectares of prime agricultural land between 2000 and 2017, which accounts for 75% of the total captured land loss in Central Ontario. 104 individual OPAs were captured in the inner area and their average size was 176.3 hectares.

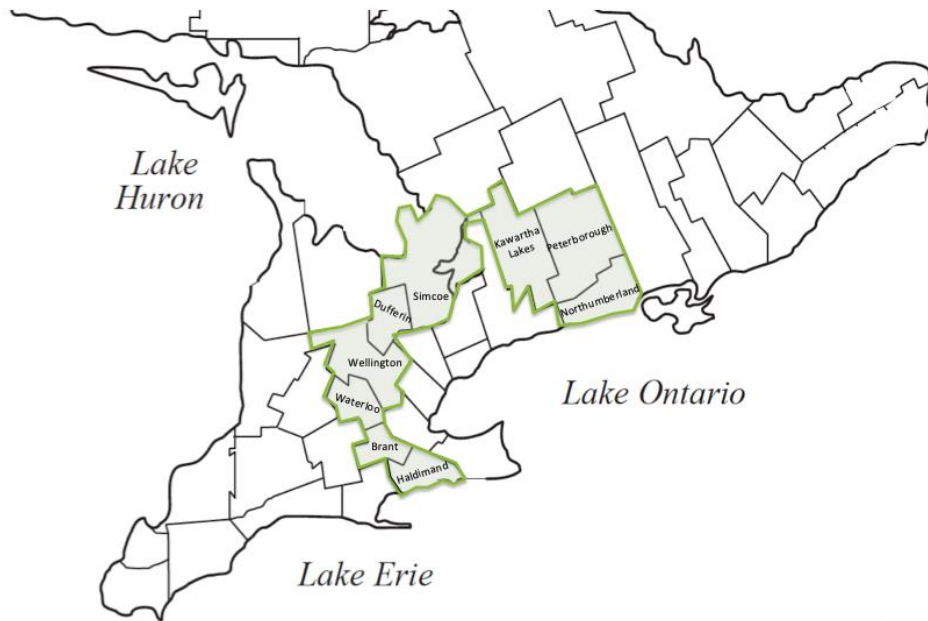
Among the three categories of OPAs captured in the Inner Ring of the Greenbelt lands redesignated for development total 13,860 hectares. Lands redesignated for rural purposes total 3052 Hectares and lands with site-specific policies converted 1426 hectares of prime agricultural land to non-farm uses (Table 4.2).

Table 4. 2 Redesignations in the Inner Ring of the Greenbelt, 2000–2017

County/Region	Number of Approved OPAs Related to the Loss of Prime Agricultural Land	Prime Agriculture Redesignated to:		
		Development (ha)	Rural (ha)	Non-Farm Uses through Site-Specific Policies (ha)
Durham	5	1,619	56	18
Halton	11	2,656	0	282
Niagara	45	1,001	240	847
Peel	6	3,316	0	127
York	17	5,233	2,756	0
Hamilton	20	34.5	0	152
<b>Total</b>	<b>104</b>	<b>13,860</b>	<b>3,052</b>	<b>1,426</b>

### Outer Ring Greenbelt Area

Figure 4. 5 Municipalities within the Outer Ring of the Greenbelt Area



There are 9 counties/regions in the outer ring greenbelt area, including Dufferin, Haldimand, Brant, Waterloo, Wellington, Simcoe, Kawartha Lakes, Peterborough and Northumberland.

This region has 1,083,294 Hectare of census farms, which is 72.2% of the census farmland area in Central Ontario. This project identified 6,072 Hectare of prime agricultural land loss in the study period from 156 relevant OPAs. While the number of OPAs is 50% higher than in the inner ring of the greenbelt, the average OPA size is distinctly less at 38.9 hectares (vs 176.3 hectares in the inner ring). This demonstrates the different farmland loss pattern within the Greater Golden Horseshoe area: the areas that are under greater development pressure has seen smaller OPA number and larger OPA size. Section 5.0 will further discuss the implication of different regional farmland loss patterns on local and regional communities.

**Table 4. 3 Redesignations in the Outer Ring of the Greenbelt 2000–2017**

County/Region	Number of Approved OPAs Related to the Loss of Prime Agricultural Land	Prime Agriculture Redesignated to:		
		Development (ha)	Rural (ha)	Non-Farm Uses through Site-Specific Policies (ha)
Brant	5	0	0	63.5
Simcoe	45	2,034.2	82	310
Waterloo	7	1,019	0	0
Wellington	29	817	32	88
Haldimand	21	71	0	213
Peterborough	12	746	15	34
Dufferin	8	59	0	188
Northumberland	6	2	60	2
Kawartha Lakes	23	129	50	57
<b>Total</b>	<b>156</b>	<b>4877.2</b>	<b>239</b>	<b>955.5</b>

## 4.4 Southwestern Ontario

Figure 4. 6 Municipalities within Southwestern Ontario



There are 11 counties in Southwestern Ontario. These include Grey, Bruce, Huron, Perth, Oxford, Norfolk, Middlesex, Elgin, Lambton, Chatham-Kent and Essex. This region has 2,257,632 hectares of census farmland, which was 45.2% of the census farm area in Southern Ontario. This region has seen 3,541 hectares of prime agricultural land converted to non-farm use through OPAs between 2000 and 2017, which was 12% of the total captured prime agricultural land loss in this project.

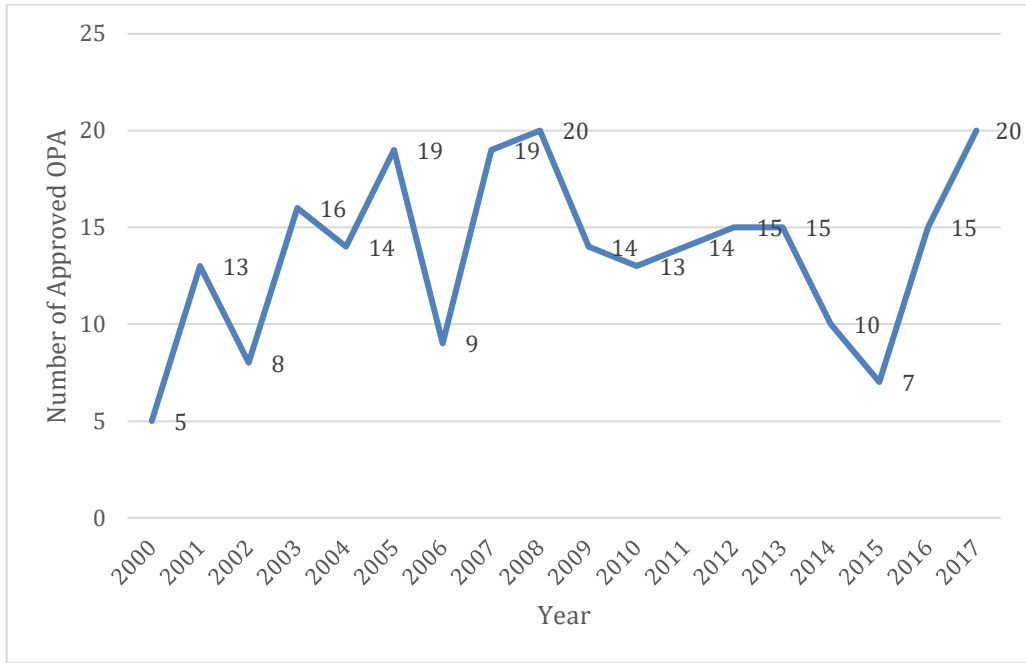
**Table 4. 4 Redesignations in Southwestern Ontario, 2000–2017**

County/Region	Redesignations in Southwestern Ontario 2000–2017			
	Number of Approved OPAs Related to the Loss of Prime Agricultural Land	Prime Agriculture Redesignated to:		
		Development (ha)	Rural (ha)	Non-Farm Uses through Site-Specific Policies (ha)
Grey	15	107	29	136
Huron	2	25	0	0
Perth	72	254	0	502
Middlesex	15	78	0	97
Lambton	31	285	0	255
Chatham-Kent	16	74	0	58
Elgin	7	242	0	0
Bruce	35	43	0	93
Oxford	16	842	0	27
Norfolk	37	85	0	434
Essex	0	0	0	0
<b>Total</b>	<b>246</b>	<b>2035</b>	<b>29</b>	<b>1602</b>

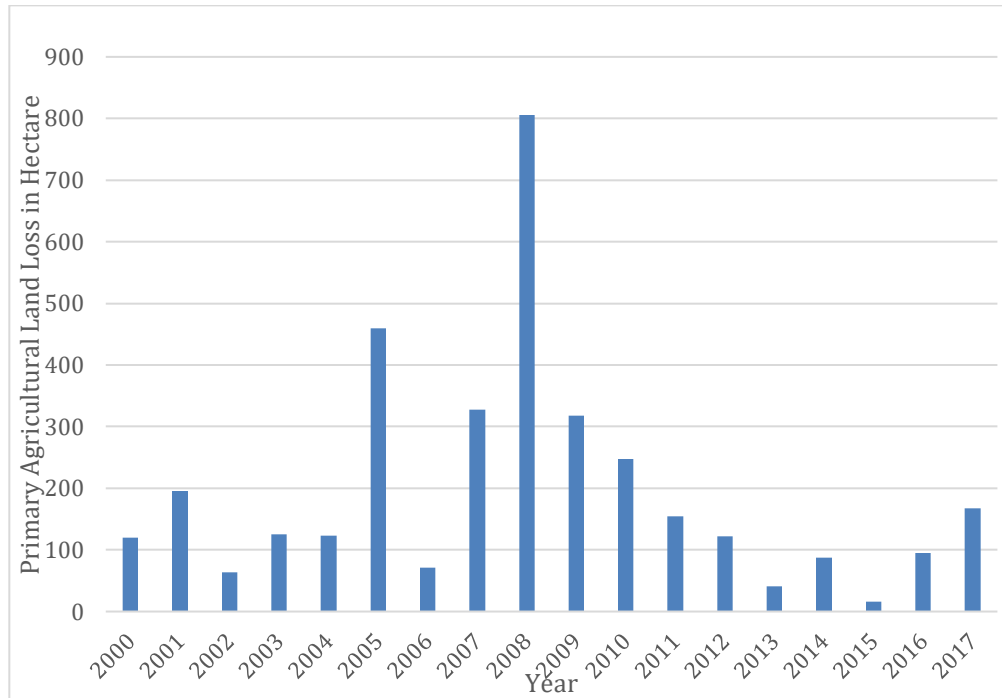
Key observations regarding trends in prime agricultural land loss through Official Plan Amendment in Southwestern Ontario include:

- The number of relevant OPAs captured in Southwestern Ontario is 246. This accounts for 45% of the total number of captured OPAs in this project.
- The average OPA size in this region is 14.9 hectares, which is 27.8% of the provincial average.
- There is no obvious upward or downward trend regarding the yearly primary agricultural land loss and approved OPAs in this region, as shown in Chart 4.6 and 4.7. The years with most OPAs approved were 2008 and 2017 (20 each). The year which has seen most primary agricultural land loss was 2008.
- The counties that have the most relevant OPAs captured are Perth, Norfolk, Bruce and Lambton.
- The counties that have experienced most prime agricultural land loss are Oxford (842 Hectares), Lambton (285 Hectares), Perth (254 Hectares), and Elgin (242 Hectares).
- The county which has the largest average OPA size is Oxford and the one which has the smallest average OPA size is Chatham-Kent
- The county of Essex reported zero relevant OPA between 2000–2017.

**Chart 4. 6 Number of Yearly Approved OPA in Southwestern Ontario**

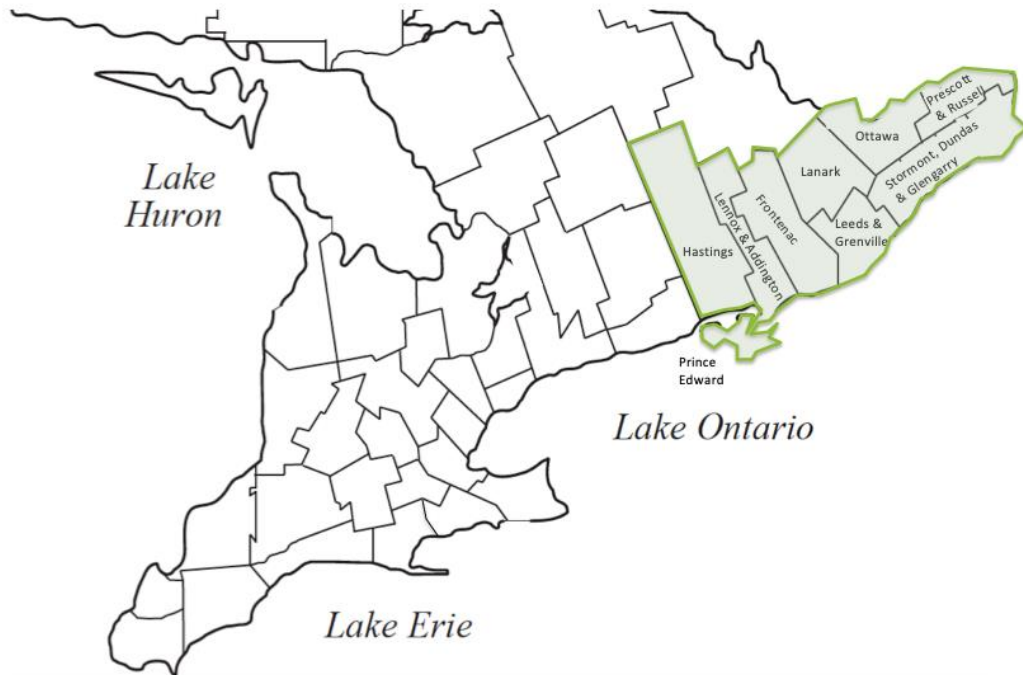


**Chart 4. 7 Yearly Primary Agricultural Land Loss in Southwestern Ontario**



## 4.5 Southeastern Ontario

Figure 4. 7 Municipalities within Southeastern Ontario



The Southeastern Ontario area covers 10 counties and cities, including Hastings, Prince Edward, Lennox and Addington, Frontenac, Renfrew, Lanark, Leeds and Grenville, Ottawa, Stormont, Dundas and Glengarry, and Prescott and Russell. This region has both the lowest proportion of census farms in southern Ontario and the lowest amount of prime agricultural land loss. The total census farm area is 1,014,968 hectares in 2016, which is 20.3% of the provincial census area of farms. Between 2000–2017, 1,272 hectares of prime agricultural land have been re-designated to non-farm uses through OPAs, which represented around 5% of the total captured prime agricultural land loss captured in this project.

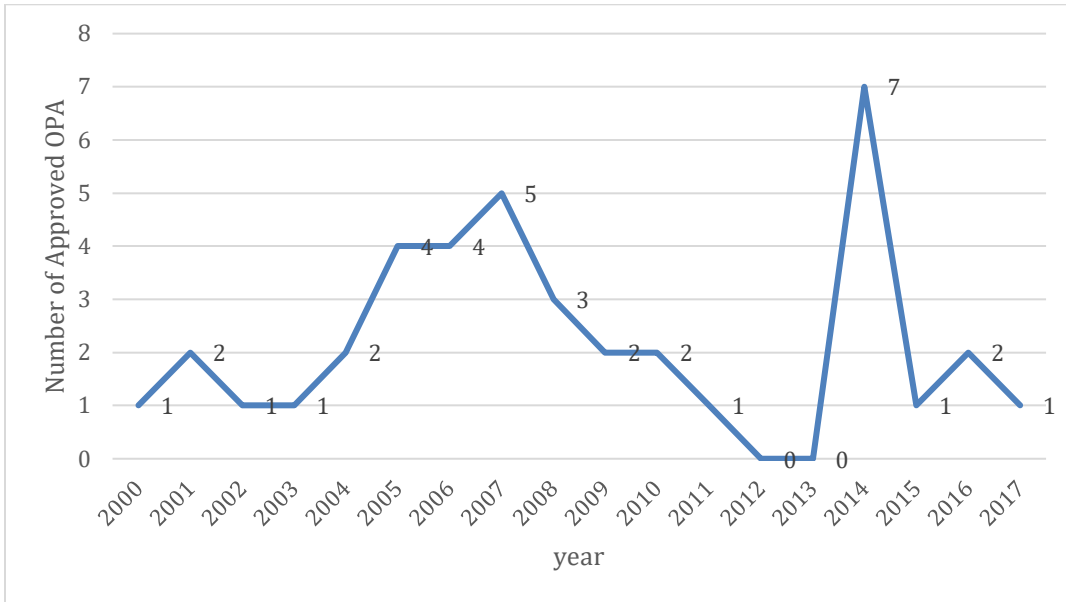
**Table 4. 5 Redesignations in Southeastern Ontario, 2000–2017**

County/Region	Number of Approved OPAs Related to the Loss of Prime Agricultural Land	Prime Agriculture Redesignated to:		
		Development (ha)	Rural (ha)	Non-Farm Uses through Site-Specific Policies (ha)
Ottawa	3	132	41	6
Prescott and Russell	5	51	137	29
Stormont, Dundas, and Glengarry	9	1.4	120	33
Leeds and Grenville	3	186	12	7
Renfrew	3	0	54	0
Hastings	7	40	179	0
Prince Edward	9	0	110	137
Frontenac	0	0	0	0
Lennox and Addington	0	0	0	0
Lanark	0	0	0	0
<b>Total</b>	<b>39</b>	<b>777</b>	<b>431</b>	<b>212</b>

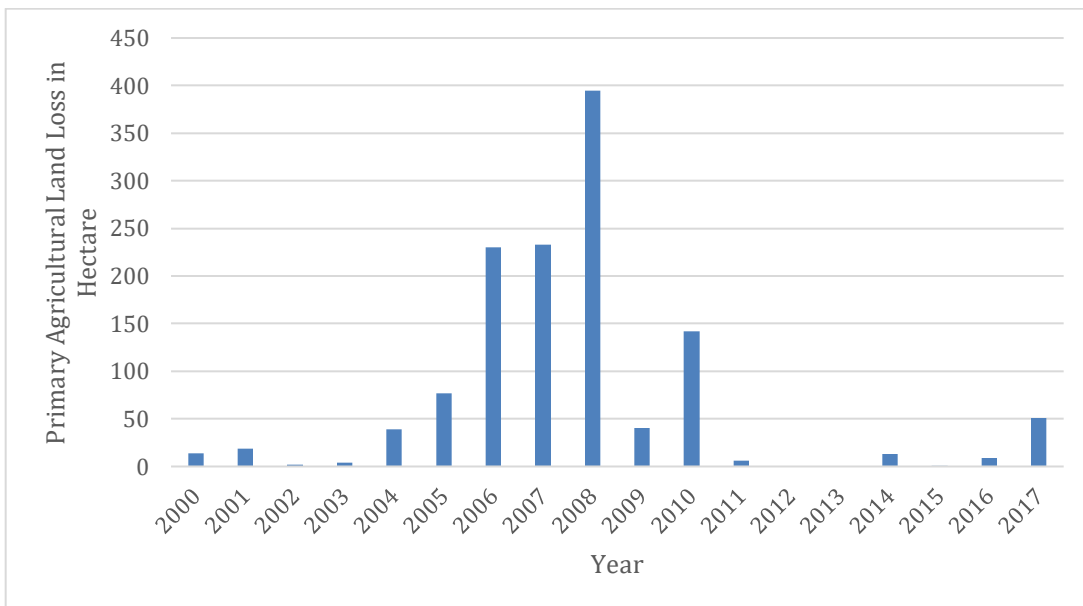
Key observations regarding trends in prime agricultural land loss through Official Plan Amendment in Southeastern Ontario include:

- Overall, this region has a low number of relevant OPAs with a relatively small size compared to Central Ontario and Southwestern Ontario. All counties in this region have reported less than 10 relevant OPAs within the study period.
- There is no obvious upward or downward trend regarding the yearly primary agricultural land loss and number of approved OPAs in this region, as shown in Chart 4.8 and 4.9.
- The average OPA size in this region is 32.6 hectares, which is 60.8% of the provincial average.
- The year with most OPAs approved and most primary agricultural land loss was 2008, when 394 Hectares of primary agricultural land were converted through 8 OPAs.
- Prince Edward, Hastings and Prescott and Russell and Stormont are the three counties/city which have seen the most prime agricultural land loss in this region.
- Among the three categories of relevant OPAs, development re-designation accounts for 54.7% of the total land loss. Rural re-designation accounts for 30.4% and site-specific policy accounts for 14.9% total captured land loss.
- Among the counties/cities in this region, Leeds and Grenville saw most prime agricultural land converted to development designation (186 Hectares). Hastings has the most prime agricultural land converted to rural designation (179 Hectares). Prince Edward has the most prime agricultural land converted to non-agricultural site-specific policies (137 Hectares).

**Chart 4. 8 Number of Yearly Approved OPA in Southeastern Ontario**



**Chart 4. 9 Yearly Primary Agricultural Land Loss in Southeastern Ontario**



# 5. Discussion

## 5.1 Introduction

This section discusses the protection and loss of agricultural land from a number of perspectives. It provides a policy review of agricultural land protection in Ontario (5.2), including both the provincial/regional regulations and the local planning tools and the impact of changing provincial policy on local planning. This section also analyses the collected data and looks at how agricultural land conversion is related to development in Southern Ontario (5.3). We provide a specific focus on the greenbelt and the relationship to the protection of agricultural land (5.4). The following sections (5.5 and 5.6) discuss the influence of the farmland loss on the economic productivity, food security and how different patterns of agricultural land conversion influence local farming communities the newly introduced ‘agricultural system’ approach, which gives the supporting agri-food network more policy support intended to enhance the current planning system. The last part (5.7) analyzes the farmland loss in the Greenbelt and tested whether the Greenbelt has caused the so-called ‘leap-frog’ effect of development.

## 5.2 The Role of Policy

### 5.2.1 Provincial Policy Framework

Agricultural lands in Ontario are regulated by a hierarchical planning system. The provincial government sets up the overall policy framework and municipal policies must meet the consistency requirements and abide by provincial and regional regulations, plans, and policies in their local planning decisions. This system is designed to ensure a coordinated planning system, achieve ‘good planning’ while recognizing certain provincial interests (such as growth management and agricultural land conservation).

The Provincial Policy Statement establishes the provincial interest in planning and across the province is the major policy guidance for lower levels of government. It lays out the vision for Ontario’s long-term agricultural land protection and specifies conditions under which agricultural lands can be converted to non-agricultural uses. Under the regulations of the Provincial Policy Statement, local municipalities have the authority to establish their own Official Plans, in which they can establish their local agricultural land designation system, specify local agricultural land use policies and map out the designated agricultural lands under the authority of the *Planning Act* (1990). Official Plans serve as a guiding document that outline the vision of the community and designate lands for a variety of uses. Any change in the designation of agricultural lands must go through the municipal government’s approval and be finalized via Official Plan Amendments. Zoning By-Laws regulate the use of land, type of construction, building specifications, parking facilities, area, density and height. Site plan

control is another tool used by municipalities to address elements such as entrance, parking, pedestrian pathways, lighting, appearance of building, landscape and so on. In many cases agricultural uses are exempted from site plan control. Municipalities can also use a Development Permit System to streamline the land-use planning process by combining zoning, site plan and minor variance processes. This can provide greater certainty upfront and speed up approvals. At the building level, municipalities use the Ontario Building Code to regulate the design and construction of buildings in order to meet health, safety, fire protection, accessibility, resource conservation and other objectives.

In 2005, the provincial government took a number of initiatives to strengthen their response to urban sprawl (McDonald and Keil, 2012). Several legislations and policies were issued in tandem to provide guidance in both urban intensification and agricultural resource protection in southern Ontario, and agricultural lands were given a greater level of protection with a more comprehensive regional governance approach. Specifically, Provincial Policy Statement revisions in 2005 listed agriculture as a 'key area to address' and provided the following directions:

- Prime agricultural areas shall be protected for long-term use for agriculture
- Prime agricultural areas given priority for protection with specialty crop areas provided highest protection, followed by Classes 1, 2 and 3 soils
- Permit all types / intensities of agricultural uses and normal farm practices
- Allow removal of prime agricultural land for settlement expansion only when there are no other alternatives and no urban expansions onto specialty cropland – comprehensive review required
- Lot creation in prime agricultural areas is discouraged and only permitted for certain reasons, e.g. for agricultural and agriculture- related uses, subject to criteria
- Prohibit creation of new residential lots in prime agricultural areas, except for surplus farm dwellings (which are permitted subject to strict criteria)

Following these policy directions, the Greenbelt Act established in 2005 provided a legislative foundation to create a permanently protected 'greenbelt area' and gave agricultural lands further protection. The Greenbelt Act led to the establishment of a Greenbelt Plan in June 2005 and this was subsequently updated in 2017. This continuous and permanent land base secured by the greenbelt is intended to support long- term agricultural production in the Greater Golden Horseshoe area. According to the Greenbelt Act, the Greenbelt Plan prevails and Official plans and zoning by-laws within the Protected Countryside must be amended to conform with the Greenbelt Plan. Prime agricultural lands were given the following protection by the Greenbelt Plan:

*"Prime agricultural lands in the 'protected countryside' will be protected 'by preventing further fragmentation and loss of the agricultural land base caused by lot creation and the re-designation of prime agricultural areas; (section 1 (c)). "*

Any municipality with lands designated 'protected countryside' by the *Greenbelt Plan* were required to identify such area within their official plan. Agricultural lands outside of the jurisdiction of the *Greenbelt Plan* would be designated as agricultural but land use protections would vary (reflecting the PPS or other Provincial plans). It is important to note that prime agricultural lands not protected by the Greenbelt Plan can potentially be re-

designated to non-farmland uses through amendments to local official plans (while still respecting the PPS or other Provincial Plans).

Two other provincial plans should be noted: the Oak Ridges Moraine Conservation Plan (ORMCP) (2001, 2017) and the Niagara Escarpment Plan (NEP). The ORMCP and NEP tend to be focused on ecological and environmental features. In this context the differing plans need to be interpreted for consistency where they overlap. For example, natural heritage protection can potentially conflict with agricultural viability.

Apart from the conservation plans noted above, the Places to Grow Act (2005) and the Growth Plan for the Greater Golden Horseshoe (established in 2006 and updated in 2017) also indirectly supported agricultural land protection by regulating urban boundary expansion, setting urban intensification targets and encouraging more compact and mixed-use development. Policies regarding primary agricultural areas in the Growth Plan (2006) are summarized as follows (4.2.2):

- Through *sub-area* assessment, the Minister of Public Infrastructure Renewal and other Ministers of the Crown, in consultation with municipalities and other stakeholders, will identify *prime agricultural areas*, including *specialty crop areas*, in the *GGH*, and where appropriate, develop additional policies for their protection.
- For lands within the *Greenbelt Area*, all policies regarding agricultural areas set out in provincial plans, applicable to lands within the *Greenbelt Area*, continue to apply.
- Municipalities are encouraged to maintain, improve and provide opportunities for farm-related infrastructure such as drainage and irrigation.
- Municipalities are encouraged to establish and work with agricultural advisory committees and consult with them on decision-making related to agriculture and growth management.

Table 5.1 lists the provincial and regional policies mentioned above. As stated earlier, the Provincial Policy Statement applies to the whole province and the various regional policies have specific goals and priorities.

**Table 5. 1 Policies relevant to agricultural land protection in Ontario**

Plan/ Policy	Priority
Provincial Policy Statement	Protect agricultural resource for long-term use
Oak Ridge Moraine Plan	Protect the ecological integrity and continuity of Oak Ridge Moraine
Niagara Escarpment Plan	Protect the ecological integrity and continuity of Niagara Escarpment
Greenbelt Plan	Protect farmland, communities, forests, wetlands, watersheds, preserves cultural heritage
Growth Plan	Growth management in the GGH area

### 5.2.1 Local Planning Reactions To Provincial Policies

Agricultural lands in Ontario are regulated by local municipalities’ Official Plans in diverse ways. Municipalities must be consistent with the PPS and conform with Provincial plans and lower tier plans must conform with upper tier plans. Within this framework municipalities establish their official plans, establish local agricultural land designation system and map out the designated agricultural lands within their boundaries.

Table 5.2 summarizes the prime agricultural land-related designation in all Southern Ontario regions/counties/cities’ Official Plans. As the table shows, some municipalities (such as Brant and Chatham-Kent) have a single ‘agriculture’ designation which only includes the primary agricultural lands (Canada Land Inventory class 1, 2 and 3 lands). Some municipalities (such as Halton, Prince Edward etc.) also have primary agricultural land in the ‘rural’ designation. Some municipalities have further land designations on speciality crop such as in York, Niagara, Hamilton and Simcoe. Some municipalities invented innovative designation systems (such as the ‘rural system’ designation in Wellington county) in which agricultural lands are further classified into different designations and given specific definitions.

**Table 5. 2 Agricultural Land-Related Land Designations In Local Official Plan Across Southern Ontario**

County	Land Designations That Include PAL <sup>1</sup>	County	Land Designations That Include PAL
Brant	Agriculture	Huron	Prime Agricultural Area
Kawartha Lakes	Prime Agricultural Area, Rural Area	Chatham-Kent	Agriculture
Dufferin	Agriculture, Rural	Hamilton	Agriculture, Speciality Crop, Rural
Durham	2000–2007: Permanent Agricultural Reserve, General Agricultural Area	Hastings	Agricultural, Rural And Waterfront
	2008–Present: Prime Agricultural Areas And Major Open Space (2008-Now)		
Haldimand	Agricultural	Leeds And Grenville	Agricultural, Rural
Halton	2000–2008: Agricultural Rural Area	Middlesex	Agriculture
	2009–Present: Agricultural Area, Agricultural System		
Niagara	2000–2004: Good Grape Areas, Good Tender Fruit Areas 2005–Present: Unique	Prescott And Russell	Agricultural Resource Policy Area, Rural Policy Area

<sup>1</sup> PAL: Primary Agricultural Land

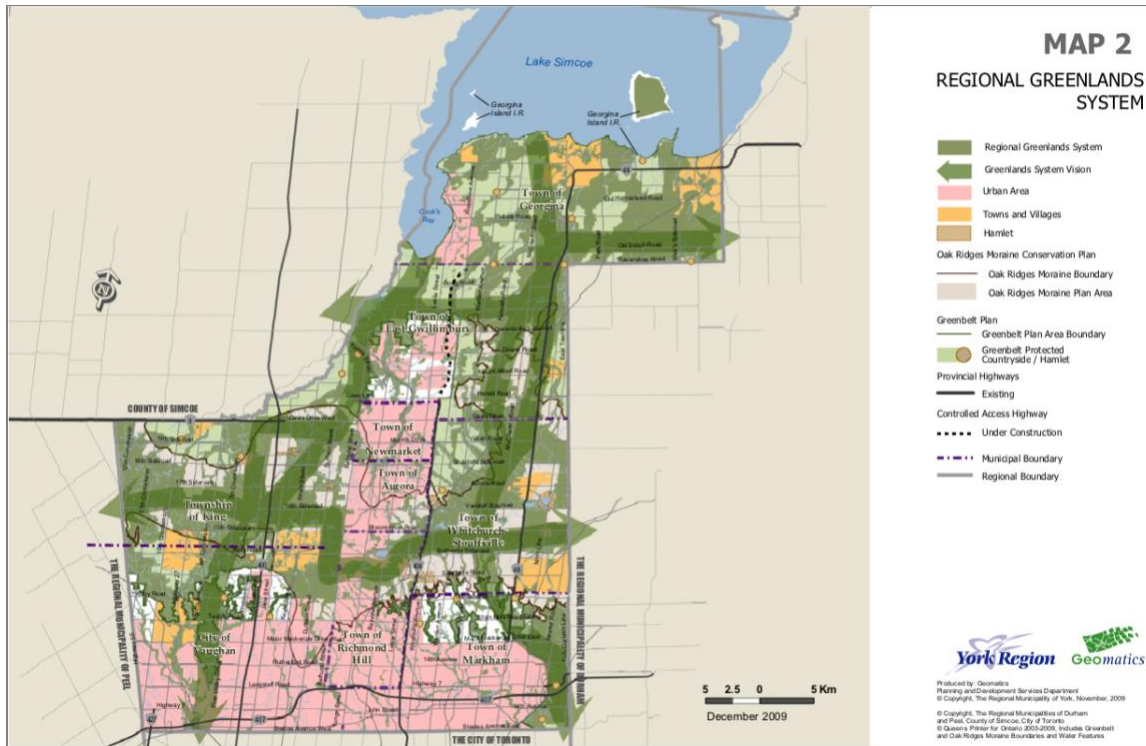
	Agricultural Area, Good General Agricultural Area & Rural Area		
Northumberland	Agricultural, Rural, Prime Agricultural Lands, Permanent Agriculture, Marginal Agriculture, And Agricultural Priority Area	Prince Edward	Prime Agricultural, Rural
Perth	Agriculture	Renfrew	Agricultural, Rural
Wellington	Rural System, Prime Agricultural Areas, Secondary Agriculture Areas,	Stormont, Dundas, Glengarry	Agricultural Resource Lands, Rural Area
Peterborough	Prime Agriculture, Rural	Oxford	Agricultural Reserve
Simcoe	Agricultural, Rural, Restricted Rural	Grey	Agricultural Area
Waterloo	Prime Agricultural Area, Rural Area	Bruce	Agricultural Area, Rural Area
Peel	Rural Service Centres, Prime Agricultural Area	Elgin	Agricultural Area
York	Holland Marsh Specialty Crop Area, Agricultural Areas And Rural Areas.	Norfolk	Agricultural
Simcoe	Agricultural, Rural, Restricted Rural, Marsh Agricultural, Specialty Crop Area	Ottawa	Agricultural Resource, Rural

York Region is a good example of the complexity associated with agricultural land protection. The Region is part of the GTA and has significant urban growth pressure. The average rate of population growth during the study period was 11.6%, more than double the provincial average. It is also a highly protected area with several provincial plans having jurisdiction within the Region: 69 percent of the region is protected by the *Greenbelt Plan*; the Oak Ridges Moraine Conservation Plan applies and the north part of York region also hosts more than a half of the Holland Marsh Speciality Crop Area.

In consideration of the above factors , York Region’s Official Plan established two special policy areas including ‘Agricultural Policy Areas’ and ‘Speciality Crop Areas’. In the Official Plan, three categories of agricultural land-related designation are established to specify different levels of protection: The *Holland Marsh Specialty Crop Area*, *Agricultural Areas* and *Rural Areas*. The *Holland Marsh Specialty Crop Area* receives the highest level of protection for future agricultural use through the *Provincial Policy Statement* for its black organic and muck soils suitable for a range of horticultural crops. Both lands designated as *Agricultural Areas* or the *Holland Marsh Specialty Crop Area* permit a range of farm practices. *Rural Areas* support agriculture as a primary use but also permit uses such as equestrian facilities, farm markets, rural settlements, existing rural residential and estate residential development and golf courses. Apart from the above three categories of land designation, York Region also established a ‘Regional Greenlands System’ which incorporated the policies of the Greenbelt Plan

and Oak Ridge Moraine Conservation on one map. The Regional Greenlands System is composed of cores of key natural heritage and hydrological features and corridors and linkage which connect the system. Agricultural, agricultural-related and secondary agricultural uses and normal farm practices are also permitted in the Regional Greenlands System as 'Agricultural Policy Areas' (Figure 5.1).

Figure 5. 1 Greenland System in York Region



The complexity associated with agricultural land designation also leads to variability between counties and regions and within counties and regions. This has complicated the collection of consistent data. For instance, in the case of Simcoe County, data was collected from each of the lower-tier municipalities (Towns of Bradford West Gwillimbury, Innisfil, Midland and New Tecumseth, and Townships of Adjala-Tosorontio, Clearview, Essa, Oro-Medonte, Ramara, Severn, Springwater, Tay and Tiny). Each of these had their own respective Official Plan as the county Official Plan was not consolidated by the Ontario Municipality Board until 2016. As the land-use designations used by the lower-tier municipalities across Simcoe County varied, the research team had to cross-check each local designation system to capture the prime agricultural land-related designations. Most of the lower-tier municipalities in Simcoe county use both *Agricultural* and *Rural* designations. In Midland however, only a *Restricted Rural* designation is used to recognize areas not of urban-type development, however these lands are not considered to be prime agriculture. Meanwhile, the Towns of Bradford West Gwillimbury and Innisfil also use 'specialty' designations in addition to the *Agricultural* and *Rural* designations. In Bradford West Gwillimbury, a *Marsh Agricultural* designation is used to identify specialty crop lands that enable intensive farming on muck soils. The *Specialty Crop Area* designation is used in Innisfil to identify prime agricultural lands with soil that has the ability to produce specialty crops.

## 5.3 Farmland Loss and Population Growth

Urbanization was believed to be a main reason for farmland loss in Ontario in the past few decades, especially in the Greater Golden Horseshoe area (Tomalty, 2015). Data collected in this project shows that 72% of the prime agricultural land conversion in the Greater Golden Horseshoe counties took place through local Municipal Comprehensive Reviews which lead to the expansion of urban boundaries. Chart 5.1 demonstrates both farmland loss and population growth in Southern Ontario municipalities between 2001 and 2016. As the chart shows, the 5 municipalities with the largest agricultural land loss are York, Peel, Halton and Durham Region along with Simcoe County. All of these municipalities have experienced major population growth (more than 100,000) in the past two decades. Ottawa, Waterloo Region, Hamilton and Middlesex have also experienced important population increases but with lesser losses of prime agricultural land.

Chart 5.1 farmland loss and population growth in Southern Ontario municipalities (2001-2016)<sup>2</sup>

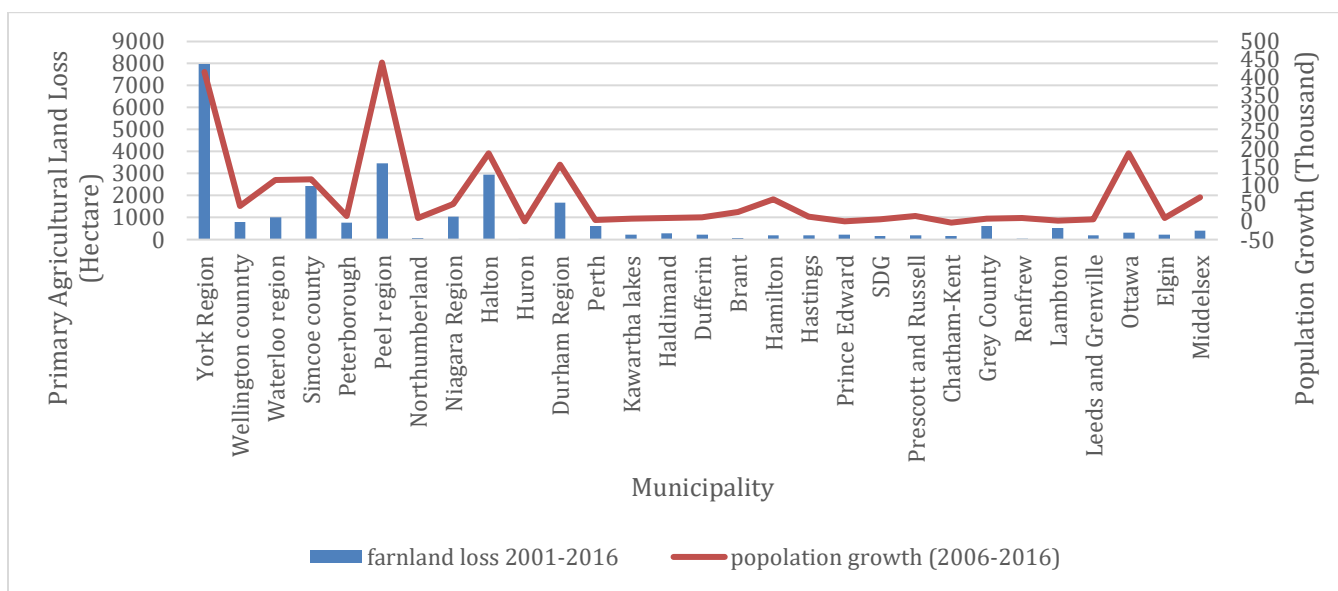


Table 5.3 and 5.4 further demonstrate the relationship between farmland loss and urban development. Table 5.4 lists the top-5 ranking municipalities in population growth between 2001 and 2016 (including Peel, York, Ottawa, Halton and Durham). All of these municipalities are large population centres and Ottawa is the only municipality outside of the GTA. As mentioned earlier, large total amounts of farmland were also lost in the GTA municipalities during the past two decades. Ottawa on the other hand, shows a quite different scenario: As Ontario’s second largest population centre (following Toronto), Ottawa’s population increased by 190,300 between 2001 and 2016 while only 178 Hectares of prime agricultural lands were converted to non-farm use during this time. It means that 0.94 Hectares of prime agricultural land were converted to non-farming use for

<sup>2</sup> <https://www.fin.gov.on.ca/en/economy/demographics/projections/table4.html>

every 1000 population increase (it is noted that the proportion of prime land varies). With the four GTA municipalities, the prime agricultural land lost per 1000 population increase was all below 20 Hectares due to the relatively high density of development. This number is much lower than for many rural municipalities.

**Table 5. 3 The Top-5 Counties By Population Growth**

Ranking	Municipality	Population Growth 2001-2016 (1000) <sup>3</sup>	PAL loss 2001–2016 (ha)	PAL loss per 1000 population increase
1	Peel	441.6	3442.4	7.8
2	York	414.9	7989	19.3
3	Ottawa	190.3	178.2	0.94
4	Halton	189.6	2847	15
5	Durham	158.9	1693.1	10.7

Table 5.5 and Chart 5.2 provide a different perspective on farmland loss by evaluating the ‘efficiency’ of development, or how much agricultural land has been lost to host population growth. Table 5.5 ranked the 5 municipalities that lost the most prime agricultural land with every 1000 population increase. These are all rural municipalities with relatively low growth. Prince Edward County has the highest loss per 1000 population increase because of its slow population growth between 2000 and 2016 (300), although the total loss in Prince Edward County was comparatively small (246.6 Hectares). Other municipalities in this table include Lambton, Perth, Grey and Peterborough. Similar to Prince Edward County, their total PAL loss was much less than in the GTA but their rates of consumption are relatively high.

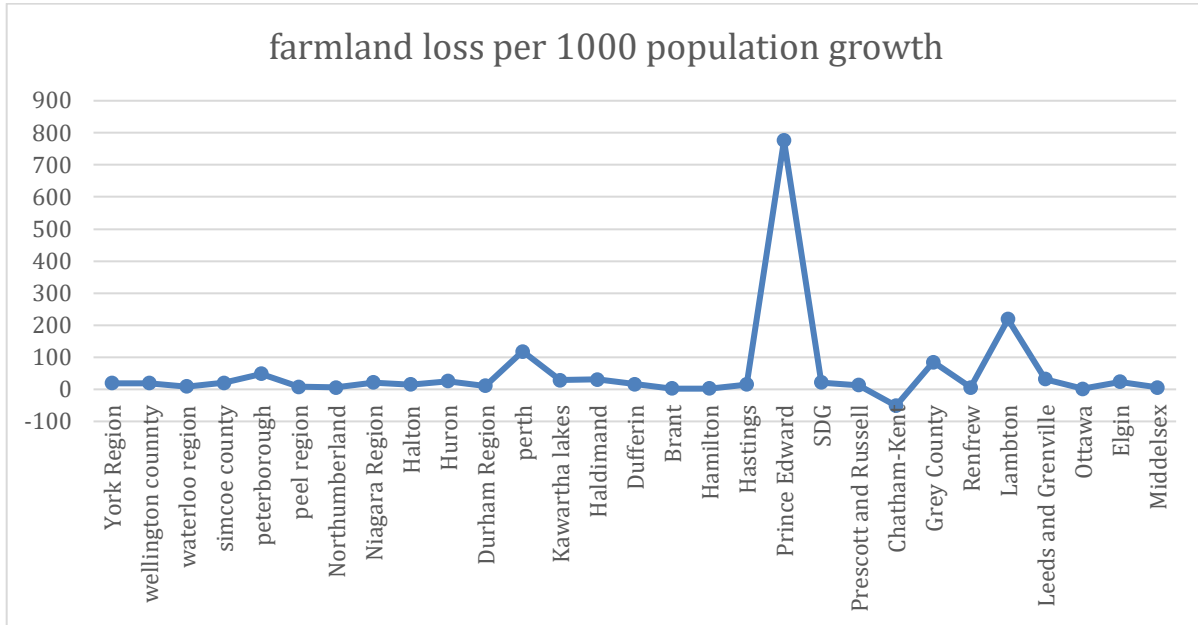
**Table 5. 4 Five Municipalities That Lost the Most Prime Agricultural Land With Every 1000 Population Increase**

Ranking	Municipality	PAL Loss Per 1000 Population Increase	Population Growth 2001-2016 (1000) <sup>4</sup>	PAL Loss 2001-2016 ( Hectare)
1	Prince Edward	822	0.3	246.6
2	Lambton	224.6	2.4	539.1
3	Perth	142.4	5.3	754.7
4	Grey	18.9	7.2	135.8
5	Peterborough	50.3	15.8	795.5

<sup>3</sup> <https://www.fin.gov.on.ca/en/economy/demographics/projections/table4.html>

<sup>4</sup> <https://www.fin.gov.on.ca/en/economy/demographics/projections/table4.html>

**Chart 5. 2 Farmland Loss Per 1000 Population Growth Across Southern Ontario Municipalities**



In summary, Southern Ontario’s population centres including GTA municipalities and Ottawa showed more ‘efficient’ patterns of development than the rural municipalities from the perspective of farmland loss/population growth loss ratio. Indeed, it was the large urbanizing centres that lost the most prime agricultural lands, but the rural areas also faced many implicit farmland problems with their relatively high rates of conversion.

## 5.4 Farmland Loss and the Greenbelt Plan

This section focuses on farmland loss in proximity to the Greenbelt and examines the success of the Greenbelt plan.

Table 5.5 analyzed the data of the Greater Golden Horseshoe municipalities by listing the conversion of prime agricultural land within and outside the Greenbelt boundary and compared farmland conversion before and after the establishment of the Greenbelt Plan. This table demonstrates the very positive strength of the Greenbelt Plan. Within the Greenbelt boundary, there were 1424.8 Hectares prime agricultural land converted between 2000 and 2004 and this number dropped to 30.6 Hectares under the Greenbelt plan’s regulation. Outside the Greenbelt, 9169.4 Hectares of prime agricultural land were lost between 2000 and 2004 and

12224.9 Hectares of prime agricultural land were lost between 2005 and 2017 (which on an annual average basis is a major reduction).

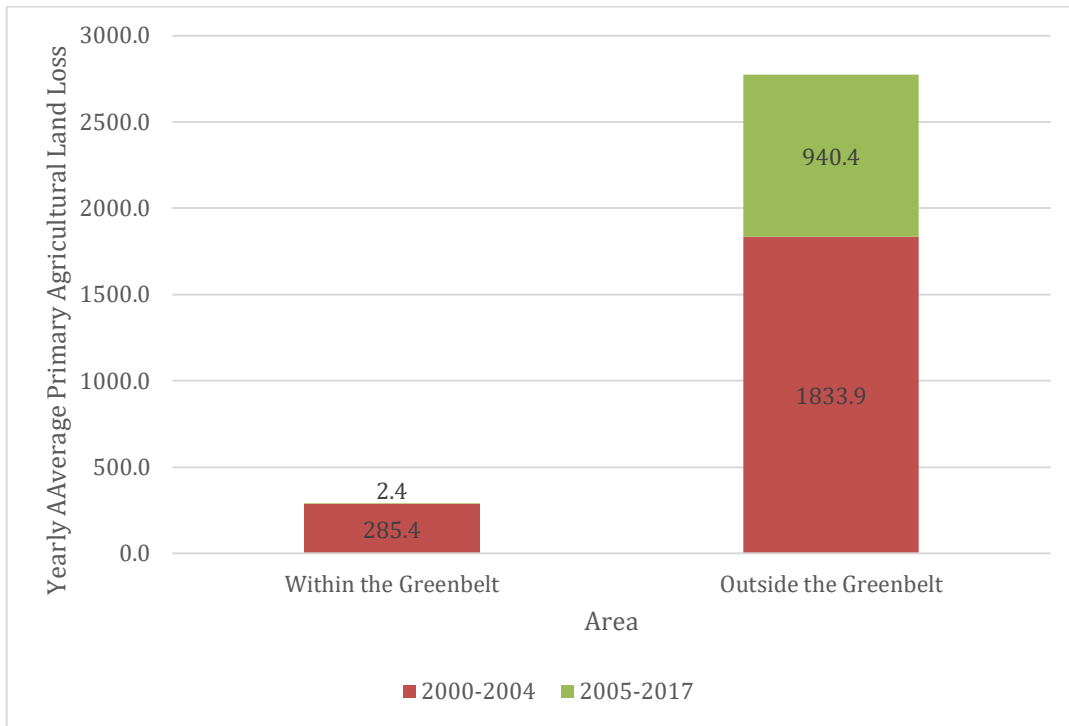
**Table 5. 5 Prime agricultural land conversion within Greenbelt 2005 -2017<sup>5</sup>**

Municipality	Within the Greenbelt		Outside the Greenbelt	
	2000-2004	2005-2017	2000-2004	2005-2017
<b>Durham</b>	104.6	0.5	0	1588
<b>Halton</b>	129.7	0	95.1	2713.2
<b>York</b>	877.4	0	2267.2	4844.4
<b>Peel</b>	168.6	0	2,865	408.8
<b>Hamilton</b>	N/A	N/A	N/A	N/A
<b>Niagara</b>	139.2	12.1	1,312.4	623.3
<b>Northumberland</b>	0	0	48.9	13.6
<b>Simcoe</b>	3.2	0	1495.1	928.1
<b>Dufferin</b>	4.1	18	35.9	188.8
<b>Wellington</b>	0	0	789.5	145.9
<b>Kawartha Lakes</b>	0	0	205.2	30.5
<b>Peterborough</b>	0	0	55.1	740.3
<b>Total</b>	1426.8	30.6	9169.4	12224.9

Chart 5.3 further compares the annual prime agricultural land conversion within and outside the Greenbelt boundary before and after the establishment of the Greenbelt. Within the Greenbelt, 285.36 Hectares of prime agricultural lands were redesignated every year between 2000 and 2004 and this number dropped to 2.35 under the Greenbelt regulation. Outside the Greenbelt, the annual farmland loss has also dropped from 1833.88 Hectares to 940.37 since the establishment of the Greenbelt.

<sup>5</sup> Data is obtained from Dr. Wayne Caldwell's project *Measuring Farmland Loss in Ontario*. <http://waynecaldwell.ca/Projects/measuringfarmlandavailability.html>

Chart 5. 3 Annual prime agricultural land conversion within and outside the Greenbelt



## 5.5 Implication of Farmland Loss to Agricultural Productivity and Local Community

This section explores the implication of farmland loss from several perspectives. The economic impact of the captured loss of prime agricultural lands on agricultural productivity will be evaluated, followed by further discussions on its impact on food security and how different patterns of farmland loss might influence the local farming community.

In 2016, the average gross farm receipt of census farms across southern Ontario was \$3,203.55 per hectare (Calculated from Statistics Canada's census data, 2016). This project documented the loss of 29,027.7 hectares of prime agricultural land through official plan amendments. Consequently, between 2000 and 2017 an estimated \$92,991,603 of potential agricultural revenue was lost on an annual basis. This was 0.74% of Ontario's total farm market receipt (12,629 Million)<sup>6</sup> in 2016. It is important to keep in mind that this economic loss has not been calculated to include the loss in agricultural labour market, supporting infrastructural industries and a much wider range of indirect loss across local rural communities.

<sup>6</sup> [http://www.omafra.gov.on.ca/english/stats/agriculture\\_summary.htm#income](http://www.omafra.gov.on.ca/english/stats/agriculture_summary.htm#income)

According to research conducted by the Ontario Farmland Trust (McCallum, 2012)<sup>7</sup>, Ontario required 0.29 hectares to feed a person. This means that the province lost the capacity of to feed more than 100,000 persons over the time period 2000 -2017. McCallum (2012) documented that the province was already reaching its capacity for self-sufficiency in food production in 2009 (McCallum, 2012). These losses combined with current and projected population growth further exacerbate this issue.

Table 5.6 lists the ten municipalities with the greatest projected agricultural revenue losses (land lost \* 2016 per hectare gross farm receipts). The fast-urbanizing municipalities such as York, Halton, Peel and Waterloo are found at the top of the list as they have both high census farm receipt per hectare and a large amount of agricultural land loss. Niagara listed the second because of its high census farm receipt per hectare. Wellington, Oxford and Perth had lost comparatively smaller amounts of farmland and are listed because of their comparatively high gross farm receipts per hectare.

**Table 5. 6 Ten Municipalities That Lost the Most Agricultural Productivity**

County	Census Farm Receipts		Measuring Farmland Loss Project	Annual Agricultural Productivity Lost in Dollars (2016)
	Gross Farm Receipts, 2016	Average Gross Farm Receipts per Hectare of Census Farmland	Total Agricultural Land Loss (ha)	
York	301,500,000	5,224.00	7988.95	41,734,275
Niagara	836,100,000	9,467.00	2086.88	19,756,493
Halton	143,800,000	5,174.21	2846.95	14,730,717
Peel	94,100,000	2,791.00	3442.4	9,607,738
Waterloo	563,630,000	6,478.69	1418.86	9,192,354
Simcoe	447,760,000	2,230.52	2471.05	5,511,726
Wellington	943,200,000	4,997.00	936.18	4,678,091
Durham	321,700,000	2,715.00	1693.11	4,596,794
Perth	966,500,000	4,601.00	759.67	3,495,242
Oxford	910,779,360	5,067.30	373.6	1,893,143

This project also shows that the patterns of farmland conversions vary across different municipalities and have different impacts on local farming communities. These impacts go beyond economic numbers and reflect a broader dilemma impacting the fabric of rural communities.

For instance, Durham, Wellington and Perth have shown similar loss in total agricultural productivity in dollars but totally different patterns of farmland conversion. Durham is located at the east end of the GTA as a comparatively ‘fast-urbanizing area’ (the south portion of the region is highly urbanized and the northern

<sup>7</sup> <https://ontariofarmlandtrust.ca/wp-content/uploads/2014/01/Farmland-Requirements-Report-Ontario-Farmland-Trust.pdf>

portion is mainly rural area and small towns). The population density is 2.6 people/hectare. Only 6 relevant OPAs were captured in Durham between 2000 and 2017, 5 of which were small in scale and the purposes included allowing retail, municipal infrastructures and a golf course. The last OPA was a large-scale Comprehensive Municipal Review of the Official Plan which expanded its urban boundary by 1563 Hectares. This makes the average size of each Official Plan Amendment 282.2 Hectares.

Wellington County on the other hand, is a predominantly rural region with a relatively low population density of 0.8 people/hectare. It is within commuting distance of the GTA and given the relatively low cost of housing in the County, is facing some urban growth and development pressure. Meanwhile, Wellington also has an active agricultural industry. More than half of the county was classified as active farmland in the 2016 Census of Agriculture and agriculture in Wellington County is diverse, with dairy, calves and cattle and poultry representing 60% of farm cash receipts. Data collected from this project shows 29 relevant Official Plan Amendments with a much smaller average size of 32.2 Hectares per OPA. The OPAs captured in Wellington showed a hybrid landscape of farmland conversion with both urban and rural features: about half of the OPAs are typical ‘rural’ style which were small (less than 20 Hectares) in scale and permitted some specific usage (such as retail, industrial, residential). The other half are the more ‘urban-style’ ones which permitted larger-sized conversion with diverse usage, such as highway commercial, industrial and urban centre expansion and so on.

Perth County is a rural region with a low population of 0.18 people/hectare. The OPAs captured in Perth showed a very different pattern of farmland conversion from urban areas, which had a much larger number of OPAs and smaller OPA size. In total 72 amendments were captured in Perth and the average OPA size is 11.1 Hectares, which is less than 1/20 of that in Durham. Among them 51 OPAs were site-specific policies which permitted specific non-farm usages (such as manufacturing, school, retail, industrial and office) on farms and most others were small-scale designation changes. Considering the cumulative effect, this kind of small-scale non-farm uses could have significant impact on the rural community (Rodd, 1976; Davidson, 1984; Caldwell, 1995). This research has provided evidence for this argument. It is important to track how these small-scale OPAs influenced the local community in terms of the conflicts between neighbors, additional restrictions of minimal distance separation, reduction of farming options, increase of the municipal service cost and tax base, and change of rural demographic.

**Table 5. 7 Different Patterns of farmland loss in Wellington, Durham and Perth**

Pattern of farmland loss	Durham	Wellington	Perth
Total loss of agricultural productivity (\$)	4,596,794	4,678,091	3,495,242
OPA number	6	29	72
Average OPA size (Ha)	282.2	32.3	11.1

## 5.6 Beyond Farmland Conservation: An Agricultural System Perspective

This section broadens our discussions from farmland preservation to the government's recent effort on preserving the agriculture and related industries as an integrated system. Ontario's agri-food sector provides jobs to over 800,000 individuals and contributes greater than \$37 billion in gross domestic product (GDP) to the provincial economy (OMAFRA, 2017). This is not possible without the diversity of relationships between farmers, environmental features (i.e. climate, soil, water), politics, planning, infrastructure, and law. Although the initial implementation of the Growth Plan for the Greater Golden Horseshoe (2006) and the Greenbelt Plan (2005) established stricter policies for protecting farmland, the absence of support for agricultural communities and relationships resulted in the agri-food sector experiencing a decline in productivity (Walton, 2015).

In the past 5 years, the value of protecting agriculture and its related industries as an interrelated network is increasingly strengthened by academic literature and government discourse. The Government of Ontario introduced a new 'Agricultural System' approach for the Greater Golden Horseshoe with the aim of protecting both the farmland and the agri-food sector (OMAFRA, 2018a). The 'agricultural system' is defined as including the following two components (OMAFRA, 2018b):

- a protected agricultural land base: includes prime agricultural areas, specialty crop areas, and rural lands that together establish a continuous, productive, base for agriculture
- an agri-food network, which is composed of inter-connected relationships between regional infrastructure, transportation, on-farm infrastructure/inputs, services, distribution and processing, and agriculture-supportive communities- essentially every factor that assists farmers in supporting their operation and getting products to consumers.

The Agricultural System is regulated through various provincial documents and plans as a result of the ten-year policy review from 2015 - 2017 (OMAFRA, 2018a). Inclusion of references to the Agricultural System throughout provincial documents create an innovative framework to protect farmland and support agricultural networks and communities. Although Provincial and municipal governments are responsible for different components of implementation, together they maintain Ontario's Agricultural System. The Agricultural System in Ontario is most strictly regulated by the provincial Growth Plan and Greenbelt Plan. While other documents include supportive language (Niagara Escarpment Plan, etc.), the identified plans include specific policies pertaining to the Agricultural Systems approach and take precedence over the PPS, unless relevant law specifies otherwise (OMAFRA, 2018b, OMAFRA, 2018a). Policies outlined by the Province establish broad requirements and the implementation of the system occurs at a local level (Caldwell, 2015; OMAFRA, 2018a).

### **5.6.1 Summary of Policy**

The Growth Plan and Greenbelt Plan specify that the Agricultural System and its components are to be identified and mapped by the Province (OMAFRA, 2018a). The Agricultural Land Base designations are still to be implemented by municipal governments through Official Plans, thereby limiting certain activities and development that would be incompatible with agricultural activity. Official Plan land designations are to be consistent with Provincial direction. The Agricultural System is further protected by policies requiring Agricultural Impact Assessments to be completed, ensuring that development does not negatively impact *any*

components of the system (land and network). However, there are permissions for agricultural related uses that offer support to the agri-food network (OMAFRA, 2016; OMAFRA, 2018a). Policies throughout the two documents establish official definitions for *prime agricultural land*, *rural lands*, and *specialty crop areas* to be utilized by all levels of government in Ontario. Rural lands are recognized as an important aspect of the Agricultural System as farm related activities often occur on these lands (OMAFRA, 2018a).

Policies included in the Growth Plan and Greenbelt plan extend beyond those relating to land use planning, as discussed previously. The provincial plans recognize that an agri-food network cannot be designated in a municipal Official Plan as it is a government and public awareness-based relationship/ideology (OMAFRA, 2018a). Therefore, policies relating to this aspect of the Agricultural System encourage municipalities to develop local initiatives and economic development strategies through engagement with farmers and agri-food experts that must be considered when making land use decisions. Policies are intended to integrate considerations for agricultural viability with farmland protection (OMAFRA, 2018a).

### **5.6.2 Benefits of Planning for an Agricultural System**

Policies related to the Agricultural System and the protection of farmland address an important provincial priority. As mentioned in section 5.2 inconsistency resulting from varying nomenclature for land use designations across municipal Official Plans in the Greater Golden Horseshoe adds to the complexity of planning for farmland protection. By establishing more consistent land-use designations through mapping, improved continuity of farmland and agricultural activity across jurisdictional boundaries can be achieved.

Furthermore, through creating awareness of the agri-food network and the Agricultural System overall, municipalities are able to better advance economic development opportunities related to agriculture. In recognizing and appreciating the Agricultural System, communities can become more supportive of agricultural activity (OMAFRA, 2017, OMAFRA, 2018a). The creation of community-based strategies (as encouraged by policy), allows for relationships to form between the public and agricultural producers. By educating the general public on the importance of the Agricultural System, a greater level of support for agriculture can be achieved. Additionally, the creation of a provincial mapping system for the Agricultural System allows decision makers to appreciate the components of the agri-food network, improving land use planning and compatibility of development (OMAFRA, 2018a). Overall, the Agricultural System supports farmers and producers in remaining profitable. The application of a systems approach allows for more consistent application of policy, informed land use planning, and an enhanced understanding of how decision-making impacts agriculture (Caldwell, 2015).

### **5.6.3 Challenges of Planning for an Agricultural System**

Given that the Agricultural System approach in Ontario is relatively new, there are several challenges associated with implementation. There are two main issues that are identified in literature that can potentially limit the effectiveness of the systems approach to planning. At the provincial level, many of the challenges originate from

the lack of available or contemporary data. Whereas, at the municipal level challenges are faced due to capacity and resource constraints.

Much of the Agricultural System Mapping implemented by the Ontario Government utilizes existing data and available information. OMAFRA indicates that the land designation aspects of the mapping system are limited in its currency as the Canada Land Inventory (CLI) was last updated in the 1980s (Government of Canada, 2016). Additionally, the information is limited in accuracy as there is the potential that local or unique circumstances are not fully captured. This is a key limitation as local governments are reliant on this information.

Municipal governments may be limited in their ability to implement procedures and community-based strategies. Local governments face monetary and human resources limitations that potentially impact their ability to implement an agricultural systems approach. OMAFRA recognizes these limitations and suggests that community priorities in regard to the Agricultural System be examined, and only those activities that the municipal government is capable of implementing be considered (OMAFRA, 2018a). Examples can range from the promotion of local agri-food businesses (low capacity) to investment attraction and a dedicated agricultural economic development staff member (high capacity). Communities can proactively improve their capacities by creating partnerships with adjacent jurisdictions and sponsoring existing initiatives (OMAFRA, 2018a).

## **5.7 Leap-frog Effect in the Context of Ontario's Greenbelt: An Analysis of Farmland Loss in the Unprotected Countryside<sup>8</sup>**

Ontario's Greenbelt Plan protects 1.8 million acres of the most vulnerable ecological and agricultural lands within the Greater Golden Horseshoe (Eidelman, 2010). The Greenbelt Plan's protection of these ecological and agricultural lands emphasizes the lands within the inner ring of the Greater Golden Horseshoe that are centered around the urban proximate zones of the growing Toronto area. However, much of the physical area of the outer ring of the Greater Golden Horseshoe, being further away from the urban regions under the greatest development pressures, was left without Greenbelt protection. The lack of Greenbelt protection in much of the outer-ring has left the prime agricultural lands in this region more susceptible to consumption for development purposes.

Despite being further from the most highly urbanized zones, much of the outer-ring of the Greater Golden Horseshoe is within a proximity that enables a commuter lifestyle. Provided with the opportunity to live in the outer-ring of the Greater Golden Horseshoe and commute to employment in the inner-ring, there is concern that the outer-ring municipalities may have experienced a greater loss of prime agricultural land since the

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<sup>8</sup> The section was prepared by Emma Drake using the data collected through the research. A more detailed discussion of this subject is available as part of Emma's MSc thesis (2018). (See The Leap-frog Effect in the Context of Ontario's Greenbelt: An Analysis of Farmland Loss in the Unprotected Countryside, Report #4)

implementation of the Greenbelt Plan, due to a phenomenon named the leap-frog effect. Specifically, it has been anticipated that applications for OPAs on prime agricultural lands adjacent to the Greenbelt may have spiked following implementation of the Greenbelt Plan; thereby dramatically increasing the conversion of these prime agricultural lands for alternate purposes after Greenbelt implementation.

Despite much speculation around the existence and implications of the leap-frog effect in the Greater Golden Horseshoe, very little research is available to track this phenomenon, especially as it specifically relates to prime agricultural land. In order to understand development patterns in the Greater Golden Horseshoe and how the province's prime agricultural land is being affected by development, it is important to determine if the leap-frog effect is a cause for concern or if this phenomenon has not yet been realized in the Greater Golden Horseshoe. This section aims to determine the existence and extent of the leap-frog effect as it relates to prime agricultural land in the unprotected countryside adjacent to Ontario's Greenbelt.

### **5.7.1 Greenbelts**

There are many methods that can be used to preserve farmland. Various land use planning controls, such as urban growth boundaries and greenbelts, as well as agricultural land reserves, purchase of development rights and conservation agreements have all been used for this intended goal. Urban containment policies are one of the most common land-use planning tools used to preserve agricultural land, as they simultaneously target revitalizing downtown cores and establishing lower costs of growth (Woo & Guldman, 2014). Some urban containment policies also include regulations and incentives to improve densities and curb decentralization (Hortas-Rico, 2015). It is generally accepted in both the literature and in practice that there are three types of urban containment policies: urban growth boundaries, urban service boundaries and greenbelts (Han et al., 2017).

Greenbelts are the strictest form of urban containment policies (Bengston & Youn, 2006; Vyn, 2012). A greenbelt is a continuous area of protected land which may be implemented for a variety of purposes including preventing sprawl, preserving land, protecting environmental features or providing recreational opportunities (Ali, 2008; Carter-Whitney, 2008; Daniels, 2010). Greenbelts typically take the form of a ring or band surrounding an urban area, however the size and form of greenbelts vary greatly (Ali, 2008). Land within a greenbelt is typically used for farming, recreation, greenspace and forestry, with some limited rural residential uses (Daniels, 2010). In some instances, the establishments of greenbelts may involve public acquisition of land and landowner compensation, while in other cases, such as in Ontario, private property is strictly regulated (Bengston & Youn, 2006; Vyn, 2012). The purpose of a greenbelt, and specifically the objective of preserving agricultural land within a greenbelt, is met through strict regulation of greenbelt lands (Bengston & Youn, 2006).

### **5.7.2 Ontario's Greenbelt Plan**

The Greenbelt Plan was first introduced in 2005, and took effect retroactively on December 16, 2004 (MMAH, 2005a). The plan protects 1.8 million acres of land in regions across the Greater Golden Horseshoe from development by designating areas where growth may not occur and implementing strict policies for the preservation of natural areas, including prime agricultural land (MMAH, 2005a; Pond, 2009b). When established, the Greenbelt Plan included previously protected sensitive natural areas within the Niagara Escarpment and the Oak Ridges Moraine (Newbold & Scott, 2013). In addition to the policies of the Greenbelt Plan, lands in the Niagara Escarpment and Oak Ridges Moraine are each subject to their own provincial plans.

While the Niagara Escarpment and Oak Ridges Moraine are captured in the Greenbelt Plan under individual designations, the Greenbelt Plan also introduced a new designation named the Protected Countryside (MMAH, 2005a). Lands within the Protected Countryside designation of the Greenbelt Plan may be specialty crop areas, prime agricultural areas, rural areas, towns/villages, hamlets or shoreline areas. However, together specialty crop areas, prime agricultural areas and rural areas make up the Agricultural System of the Greater Golden Horseshoe, which outlines protection for farmlands (MMAH, 2005a). Within the Agricultural System of the Greenbelt Plan, specialty crop areas and prime agricultural areas have stricter policies for preservation compared to rural areas, which are considered non-prime agricultural lands and have a lower capability for agriculture (MMAH, 2005a).

The 2005 Greenbelt Plan specified that specialty crop areas shall not be redesignated within municipal OPs, and that settlement area expansions may not occur within specialty crop areas (MMAH, 2005a). Prime agricultural areas were also not to be redesignated in municipal OPs, except to bring the OP into conformity with the Greenbelt Plan, or for settlement area expansions subject to the policies of the Provincial Policy Statement (MMAH, 2005a). An exception was provided through Policy 3.4.4. for settlement area expansion proposals that had been initiated prior to the implementation of the Greenbelt Plan. In these cases, settlement area expansions may be permitted into prime agricultural areas (MMAH, 2005a).

The Greenbelt Plan was updated in 2017, as part of a coordinated review of all four provincial plans launched in 2015 by the province (Advisory Panel on the Coordinated Review, 2015). The updated Greenbelt Plan was released in May of 2017, and came into effect on July 1 of the same year (Davies Howe LLP, 2017). The policies of the 2005 Greenbelt Plan were maintained in the updated 2017 Greenbelt Plan, ensuring continued preservation of the agricultural land base. However, two new policies relating to specialty crop areas prime agricultural areas were also introduced. These policies describe that land use compatibility between agricultural uses and non-agricultural uses will be achieved by avoiding and mitigating impacts on the Agricultural System (MMAH, 2017a). In addition, the new policies emphasize the importance of maintaining the spatial continuity of the agricultural land base and avoiding fragmentation of agricultural lands, as well as promoting economic connections to support the industry (MMAH, 2017a).

Boundary changes to the Greenbelt Plan also occurred as a result of the review (MMAH, 2017b). Approximately 10,100 hectares of land was added to the Greenbelt Plan under two designations: Urban River Valley and Protected Countryside. Several removals from the Greenbelt Plan Protected Countryside also occurred. The majority of these removals consisted of smaller parcels of land which were concentrated along the southern boundary of the Greenbelt Plan area (MMAH, 2017b). The removal of lands from the Protected Countryside

constituted a loss of approximately 150 hectares; overall the boundary changes saw a net increase of almost 10,000 hectares into the Greenbelt Plan (MMAH, 2017b). 57 Figure 2: Plan of the boundary of removals from the Protected Countryside, 2017 (MMAH, 2017a).

Overall, the language used in the Greenbelt Plan policies is stronger and stricter than the Provincial Policy Statement, providing greater emphasis on farmland preservation. Through the policies noted above, the Greenbelt Plan preserves the existing prime agricultural and specialty crop land base by prohibiting redesignation of these lands to alternative designations through OPAs that would enable non-agricultural uses and development.

### **5.7.3 Unintended Consequences of Greenbelt Legislation**

Several studies looked at the unintended consequences of the Greenbelt Plan, which affect land both within and outside of the Greenbelt Plan borders. These consequences include a decrease in agricultural viability and investment within the Greenbelt borders (Akimowicz et al., 2016; Inwood & Sharp, 2012; Li, Vyn, & McEwan, 2016), and a speculated increase in the conversion of prime agricultural land for development outside of the Greenbelt borders (Macpherson et al., 2013; Pond, 2009a).

By protecting and preserving agricultural land within its borders, the Greenbelt Plan created the potential for rural-urban interfaces through mixed-land uses and potentially abrupt transitions from agricultural to non-agricultural areas (Inwood & Sharp, 2012). In Ontario's Greenbelt, agricultural lands exist in close proximity to urban areas (Caldwell & Procter, 2013). As a result of this rural-urban interface, the agricultural community is faced with many challenges that may affect the overall viability of agriculture within the Greenbelt, contrary to the original purpose of the plan (Cummings, Megens, & Murray, 2010; Inwood & Sharp, 2012).

A common challenge cited in the implementation of a greenbelt is the appreciation effect on land and residential prices in existing urban areas by restricting developable land (Ali, 2008; 19 Han et al., 2017). In this manner, greenbelts have also been said to create winners and losers in the land market, and concerns have been raised over the fairness of greenbelt policies (Ali, 2008). Another drawback of greenbelt policy is that being tied to political institutions, they may be modified or revoked at political will, undermining the permanency of the protection of farmland within its boundaries. Though historically greenbelt boundaries have been firm in most cases, land is often held in speculation by private land owners as they expect the greenbelt boundaries to adjust to development pressures (Ali, 2008).

These effects combined lead to a drawback of greenbelt policies, as it specifically relates to farmland preservation. As developable land is restricted, prices within inner city areas rise and businesses and developments may be pushed to develop on areas of agricultural land beyond the greenbelt, where more land is available and fewer restrictions are in place (Ali, 2008; Bengston & Youn, 2006; Pond, 2009a). In this manner, though land is protected within a greenbelt, farmland outside of the greenbelt could be consumed at a greater rate. This issue, has been coined the leap-frog effect.

Despite the negative consequences and concerns with greenbelt policies, studies have shown that greenbelts typically achieve success in preserving agricultural land within their boundaries (Ali, 2008; Han & Go, 2018).

However, acting on their own greenbelts may preserve agricultural land, but they cannot ensure that agricultural production on the land is preserved; additional programs and policies are needed to support the agricultural industry on the protected lands (Carter-Whitney, 2008; 20 Macdonald & Keil, 2012). Working in conjunction, greenbelts and agricultural programs can preserve agricultural land and ensure the continued viability of agricultural operations in the area (Carter-Whitney, 2008).

#### **5.7.4 The Leap-Frog Effect**

Another potential consequence of the Greenbelt Plan is the leap-frog effect, which is a perceived impact on the prime agricultural land outside of the protected area rather than within. The leap-frog effect causes development to “jump” to the outer edge of a Greenbelt where there are fewer restrictions and requirements of developers (Pond, 2009a). As a result, more prime agricultural land outside of the Greenbelt may be consumed for development as compared to the area consumed prior to the implementation of the Greenbelt. The leap-frog effect has been suggested to cause development of bedroom or satellite communities and decentralization, shifting development and consumption of land from urban to rural areas (Newbold & Scott, 2013; Vyn, 2012).

Newbold and Scott (2013) suggested that Ontario’s Greenbelt Plan may not be achieving its goal of intensification within its border, but instead may be encouraging growth outside of its borders through leap-frogging development. There has been much recent growth in areas beyond the Greenbelt, encouraged by the new housing opportunities provided by developers seeking business in areas with fewer restrictions, including the unprotected countryside beyond the northern edge of the Greenbelt (Newbold & Scott, 2013). Municipalities such as Wellington, Dufferin and Simcoe Counties, have an abundance of unprotected countryside containing large swaths of prime agricultural land north of the Greenbelt and did not receive protection in 2004 (Newbold & Scott, 2013; Pond, 2009a). These municipalities also tend to have lower housing prices, but still remain in a commuting distance to job markets that make the area attractive to working professionals (Newbold & Scott, 2013). It is predicted that municipalities such as these, with unprotected countryside in the outer-ring of the Greater Golden Horseshoe, are inevitably subject to the leap-frog effect and strong development pressures (Pond, 2009a).

Speculation of the leap-frog effect has also been explored by Deaton and Vyn (2014), who described the phenomenon in relation to farmland prices within and outside of the Greenbelt. Their study found that prices for farmland outside of the Greenbelt appreciated at a greater rate than farmland within the Greenbelt (Deaton & Vyn, 2014). As farmers face declining incomes, those that can sell to developers are likely to participate in the land market, and thus the leap-frogging effect is promoted both by a desire by farmers to sell high-value land outside of the Greenbelt, and by the limited income of new farmers to pay the appreciated value that developers can afford (Bourne et al., 2004; Krushelnicki & Bell, 1989). Vyn (2012) also contributes to speculation of leap-frog development by highlighting the non-continuous sprawl of urban centres and satellite communities.

In this research, Simcoe County is highlighted specifically as an area vulnerable to leap-frog development, along with Brant County where development applications are noted to have increased substantially (Vyn, 2012).

Despite the suspected existence of the leap-frog effect as a result of Greenbelt implementation in Ontario, proving evidence is still limited. Newbold and Scott (2013) provide anecdotal evidence that the leap-frog effect may exist, thus propelling farmland loss, in the regions on the external periphery of the Greenbelt, by analyzing the number of commuters crossing the Greenbelt boundaries. In 2001, 103,585 commuters crossed the Greenbelt for employment, while this number increased to 111,535 in 2006 (Newbold & Scott, 2013). While more recent commuter estimates are not available, continued growth beyond the Greenbelt provides reasonable grounds to assume this trend has persisted, and the volume of commuters is expected to have increased.

**5.7.5 Testing the Leap-frog Effect in the Context of Ontario’s Greenbelt: An Analysis of Farmland Loss in the Unprotected Countryside**

The municipalities included in this study had a substantial amount of prime agricultural land specifically designated within the municipality’s OP during the study time frame from 2000 to 2017. Municipalities that contained a substantial amount of prime agricultural land were then included in the research, while others were excluded from the study. Table 5.8 provides the status of the municipalities in the Greater Golden Horseshoe in this study.

**Table 5. 8 Status of Municipalities in the Greater Golden Horseshoe in the research**

Status	Rationale	Tier	Municipality
Included	Substantial presence of prime agricultural land 2000–2017	Upper-Tier	Durham Region, York Region, Peel Region, Halton Region, Dufferin County, Northumberland Region, Peterborough County, City of Kawartha Lakes, Simcoe County, Wellington County, Waterloo Region, Brant County, Haldimand County, Niagara Region
Not Included	Limited presence of prime agricultural land 2000–2017	Single-Tier	City of Toronto, City of Peterborough, City of Barrie, City of Orillia, City of Guelph, City of Brantford
Not Included	Information not available from Municipality	Single-Tier	City of Hamilton

The first phase of analysis focused on looking at the combined effects in the unprotected countryside of the Greater Golden Horseshoe region as a whole and was intended to provide a broad overview and initial evidence of whether the number and size of amendments had increased outside of the Greenbelt after 2004, which may lead to initial evidence of the leap-frog effect. These results are summarized in Table 5.9.

**Table 5. 9 Number And Size Of Opas By Application Time-Frame And Location Relative To The Greenbelt\***

<b>Application Time-Frame</b>	<b>Number of Amendments Within the Greenbelt aAea</b>	<b>Size Of Amendments Within The Greenbelt Area</b>	<b>Number Of Amendments Outside The Greenbelt Area</b>	<b>Size Of Amendments Outside The Greenbelt Area</b>
2000–2004	13	891 ha	70	3670
2005–2009	3	316 ha	39	9159 ha
2010–2014	0	0 ha	32	3989 ha
2015–2017**	1	0.5 ha	5	113 ha

*\*Values have been rounded. \*\*2015-2017 data reflects a shorter period of time compared to the other application time-frames and as such analysis is restrained.*

Within the Greenbelt, prior to its implementation (2000–2004), thirteen OPAs affecting prime agricultural lands were applied for which affected over 891 hectares of land. In the following five years (2005–2009), despite the fact that the Greenbelt was in force and in effect at this time, there were three OPAs which did affect prime agricultural lands.

Two of the OPAs approved within the Greenbelt after it was implemented were for settlement area boundary expansions to accommodate future residential and employment growth. These amendments were initiated at the lower-tier level prior to the effective date of the Greenbelt Plan but were not applied to at the upper-tier level until afterwards, which is the date captured in this study. As per Greenbelt Plan policy 3.4.4.1, these amendments were allowed to move forward. Policy 3.4.4.1 describes that municipal settlement area expansions that were supported by a council resolution and background studies prior to December 16, 2003, may be approved, provided that the settlement area expansion does not extend into the Natural Heritage System or specialty crop areas (MMAH, 2005a). The third amendment was a site-specific policy which permitted expansion of a golf facility, which affecting 18 hectares of prime agricultural land.

In the years 2010-2014 no amendments were approved within the Greenbelt. However, in 2015-2017, noting the reduced three-year time-frame, another amendment was permitted. This amendment, affecting 0.5 hectares of prime agricultural land, permitted a site-specific policy for a paramedic station. Given the above noted context of the two amendments for settlement area boundary expansions approved within the Greenbelt, these two site-specific policies, together affecting 18.5 hectares of prime agricultural lands, are the only amendments considered to have been approved in conflict with the Greenbelt legislation. Largely, the Greenbelt Plan has been effective in stopping the conversion of prime agricultural land within its' borders since coming into effect.

Analysis of the unprotected countryside outside of the Greenbelt provides an interesting contrast to Greenbelt protected prime agricultural lands and is required to understand any evidence of a leap-frog effect. Outside of the Greenbelt, through the entire study time-frame, there has been a substantially higher number of OPAs when compared to area within the Greenbelt boundaries. Even before the Greenbelt was in effect, focusing on the time-frame from 2000-2004, prime agricultural lands outside what became the Greenbelt were subject to over

five-times more amendments, which constituted an area of over four-times more, affecting 3,670 hectares. In addition, outside of the Greenbelt, though the number of amendments decreased, the area affected by OPAs increased drastically, more than doubling, in the five years after the Greenbelt was implemented (2005-2009), affecting over 9,150 hectares of prime agricultural land.

These results indicate that even before the Greenbelt was implemented, the area outside of the Greenbelt boundaries was experiencing greater pressure for OPAs. Further, these lands have continued to be under pressure for conversion after the implementation of the Greenbelt, affecting an additional approximately 3,970 hectares of prime agricultural areas from 2010-2014, and so far recorded in the following years (2015-2017), 113 hectares.

To sum, this high-level analytical overview provides preliminary insight that the leap-frog effect may be occurring in the study region of the Greater Golden Horseshoe. The following analyses focused specifically on the unprotected countryside area outside of the Greenbelt and sought to provide more detail on what these OPAs were approved for, and if the pattern of OPAs changed once the Greenbelt Plan was implemented.

#### **5.7.6 OPAs By Theme**

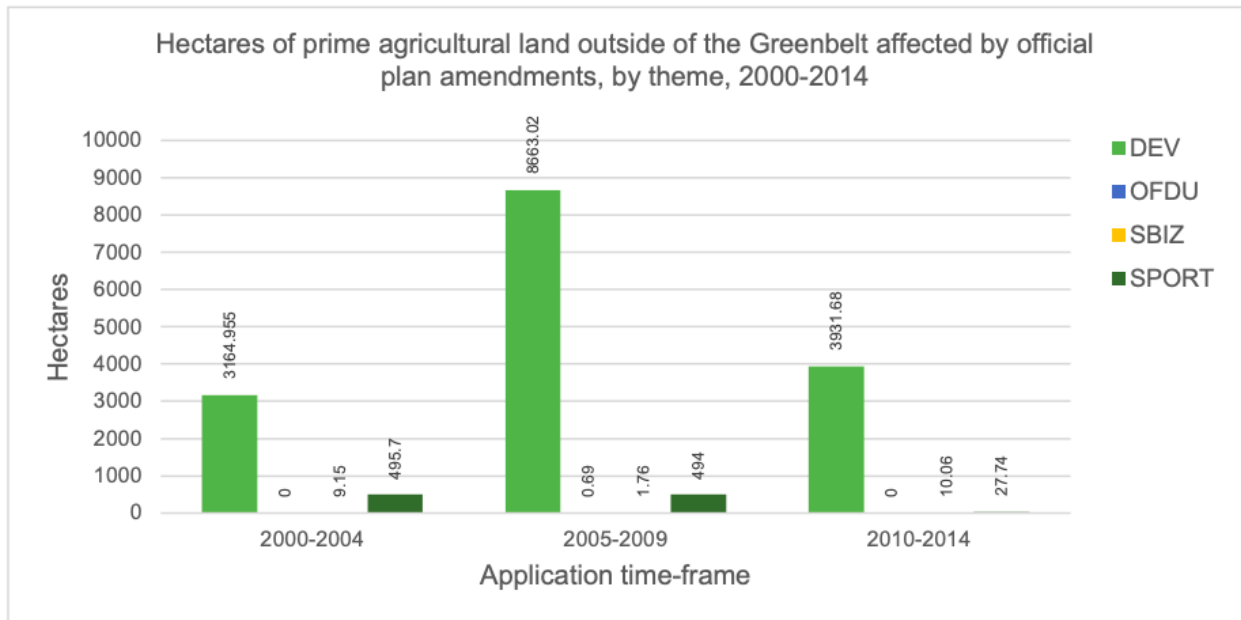
The second layer of analysis focused on the Greater Golden Horseshoe area sought to understand the purpose of each OPA affecting prime agricultural lands outside of the Greenbelt Plan area. The purpose of the OPA was classified using four different themes: to permit sport and recreation facilities (SPORT), to permit small businesses (SBIZ), to permit on-farm diversified uses (OFDU), or to permit large development (DEV). Given the reduced time frame for 2015–2017, the data provided in the analyses below is only for the comparable time frames of 2000–2004, 2005–2009 and 2010–2014.

OPAs in the unprotected countryside outside of the Greenbelt that were intended to permit development (DEV) emerged as the dominant theme across all three application time frames. These development-type OPAs affected nearly 15,760 hectares of prime agricultural land from 2000 to 2014 through 114 amendment applications. Interestingly, more than half of the prime agricultural land outside of the Greenbelt affected by development-type applications was applied for during the five years after the Greenbelt was implemented (2005-2009).

Though the number of development-type amendments decreased from 2000–2004 to 2005–2009, the area affected by these amendments increased more than two-fold after the Greenbelt was implemented, affecting over 8,663 hectares of prime agricultural land. As the area of prime agricultural land affected by OPAs for development purposes increased in the unprotected countryside after the Greenbelt was implemented, it can be inferred that any leap-frog loss of prime agricultural land that is being experienced is largely due to development purposes. However, OPAs outside of the Greenbelt that permitted sport and recreational factors also played a role in the effect on prime agricultural land and followed a similar pattern of that of the development-type applications. Though the number of OPAs in the unprotected countryside for sport and recreational purposes decreased after the Greenbelt was implemented, the area of prime agricultural land affected by these amendments remained relatively constant in the five years after the Greenbelt was

implemented. Overall, 15 of these amendments subject roughly 1,017 hectares of prime agricultural lands to sport and recreational uses from 2000 to 2014.

**Chart 5. 4 Prime Agricultural Land Outside Of The Greenbelt Affected By OPAs, By Theme, 2000–2014**

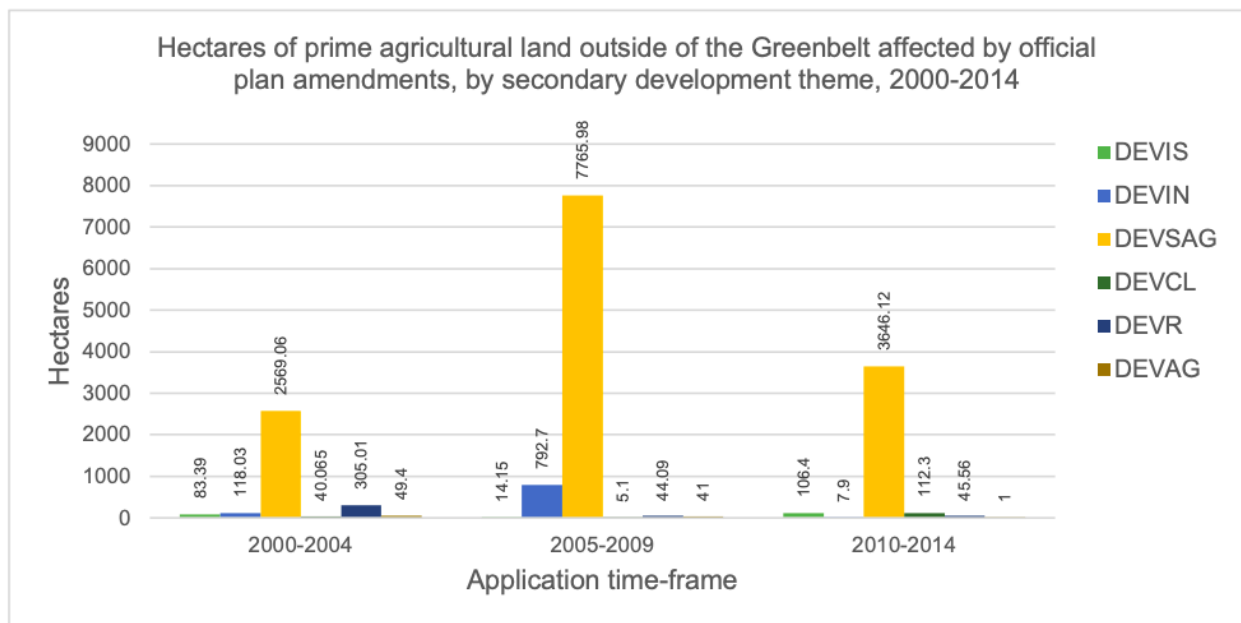


The remaining two themes used did not represent a substantial effect on prime agricultural lands, nor did the size or number of these amendments change dramatically after the implementation of the Greenbelt Plan. OPAs for small business purposes and on-farm diversified uses together represented less than one percent of all the prime agricultural land outside of the Greenbelt subject to amendment.

### 5.7.7 OPAs By Secondary Development Theme

A third level of analysis was performed to provide detail on the types of development permitted on agricultural lands through OPAs outside of the Greenbelt, as development applications contributed most substantially to the loss of prime agricultural lands. All OPAs under the primary development theme were further categorized into six secondary themes: institutional (DEVIS), industrial (DEVIN), settlement area expansions and growth (DEVSAG), commercial (DEVCL), residential (DEVR) and agricultural (DEVAG) development. The area of prime agricultural land redesignated for each of these secondary themes, by application timeframe, is shown in Chart 5.5.

**Chart 5. 5 Prime Agricultural Land Outside Of The Greenbelt Affected By OPAs, By Secondary Development Theme, 2000–2014**



Of the development-oriented OPAs in the unprotected countryside of the Greater Golden Horseshoe, OPAs representing settlement area boundary expansions and growth conformity exercises (DEVSAG) had the greatest effect on prime agricultural land. These OPAs permit general development of a community, and may permit a variety of uses, including residential, commercial and institutional, rather than specifying only one specific use or type of development. These amendments accounted for approximately 81 percent, 90 percent and 93 percent of the total prime agricultural land redesignated for development purposes in the 2000–2004, 2005–2009 and 2010–2014 application time frames, respectively.

Aligned with the trend observed at the primary theme level, at the secondary theme level, specifically and most prominently with settlement area and growth conformity types of development amendments, there was a substantial increase in the area of prime agricultural land affected when comparing the 2000-2004 and 2005-2009 time-frames. Though the other categories of development did fluctuate throughout the application-time frames, the largest and most pronounced difference was with the settlement area and growth conformity amendments. From 2005 to 2009, the area of prime agricultural land affected by settlement area and growth conformity OPAs was more than three times greater than what was observed in the five years previous, before the Greenbelt was implemented, affecting more than 7,765 hectares. The area of prime agricultural land amended to be used for settlement area and growth conformity types of development from 2010 to 2014 was also higher than the 2000 to 2004 time-frame, affecting roughly 1.42 times the area. Observing these results, settlement boundary expansions and growth conformity exercises have had the greatest effect on the leap-frog consumption of prime agricultural lands outside of the Greenbelt, as evidenced by the area of these

amendments and the substantial increases of 2005-2009 and 2010-2014, as compared to the years prior to the Greenbelt implementation.

**5.7.8 Sub-Regional Analysis: Unprotected Countryside North Of The Greenbelt**

As previously noted, in the Greater Golden Horseshoe, unprotected countryside exists both north of the Greenbelt boundary and south of the Greenbelt boundary. Unprotected countryside in the area considered north of the Greenbelt exists in all outer-ring municipalities, including Niagara, Haldimand, Brant, Waterloo, Wellington, Dufferin, Simcoe, Kawartha Lakes, Peterborough and Northumberland.

The rationale provided for expected leap-frog development north of the Greenbelt, rather than south, relates to market forces (Newbold & Scott, 2013). It is anticipated that given the reduced greenfield developable area in the Toronto region, and the resulting increased land and housing prices, movement of the population to the unprotected countryside north of the Greenbelt, where land and housing prices are presumably lower, will occur (Newbold & Scott, 2013; Tomalty & Komorowski, 2011). Personal preferences for greater space and access to natural amenities is also cited in the literature as a factor that will motivate development in the unprotected countryside north of the Greenbelt (Newbold & Scott, 2013). A secondary analysis was performed at this sub-regional level. This analysis focused on the unprotected countryside in the Greater Golden Horseshoe beyond the northern edge of the Greenbelt.

**OPAs In The Unprotected Countryside North Of The Greenbelt**

Prior to the implementation of the Greenbelt Plan (2000-2004), in the area north of what would become the Greenbelt boundary, 64 amendments were applied for and later approved, which affected roughly 2,601 hectares of prime agricultural land. Contrary to expectations, in the years following implementation of the Greenbelt, the number of OPAs affecting prime agricultural land decreased, as did the total area of prime agricultural land affected by these amendments.

**Table 5. 10 Number And Size Of OPAs In The Unprotected Countryside North Of The Greenbelt, By Application Time Frame\***

Application Time-Frame	Number Of Amendments North Of The Greenbelt	Size Of Amendments North Of The Greenbelt
2000–2004	64	2,601 ha
2005–2009	34	1,432 ha
2010–2014	25	1,065 ha
2015–2017**	5	113 ha

*\*Values have been rounded. \*\*2015-2017 data reflects a shorter period of time compared to the other application time frames and as such analysis is restrained.*

From 2005 to 2009, 34 OPAs that affected prime agricultural land were applied for and later approved. These OPAs affected roughly 1,432 hectares of prime agricultural land. These figures represent a decrease of

approximately 47 percent in the number of OPAs and a decrease of approximately 45 percent in the area of prime agricultural land affected, compared to the five years prior to the implementation of the Greenbelt Plan (2000- 2004).

This decreasing trend continues in the years 2010-2014. Both the number of and size of amendments decreased around 25 percent compared to the five years previously (2005-2009) and decreased roughly 60 percent when compared to the five years prior to Greenbelt implementation (2000-2004). Further, so far recorded for the following years (2015-2017) the decreasing pattern has continued.

This analysis contradicts expectations and what was found when looking at the entire unprotected countryside in the Greater Golden Horseshoe, as per the first analysis. Neither the number of OPAs nor the area of prime agricultural land affected by OPAs increased in the unprotected countryside of the Greater Golden Horseshoe north of the Greenbelt boundary after the Greenbelt was implemented. No evidence of the leap-frog effect affecting prime agricultural lands in these areas was found.

### **5.7.9 Locational Analysis: Regions Affected By Greenbelt**

The first level of analysis provided preliminary evidence that an increased amount of prime agricultural land in the unprotected countryside may have been consumed as a result of the leap-frog effect after implementation of the Greenbelt Plan. However, the secondary analysis, which focused on the area north of the Greenbelt though to be at greater risk of the leap-frog effect, found no evidence of this pattern. Given the contrasting results, analysis was then conducted to determine which particular regions in the Greater Golden Horseshoe were affected by the Greenbelt Plan, specifically experiencing an increase in the loss of unprotected farmland.

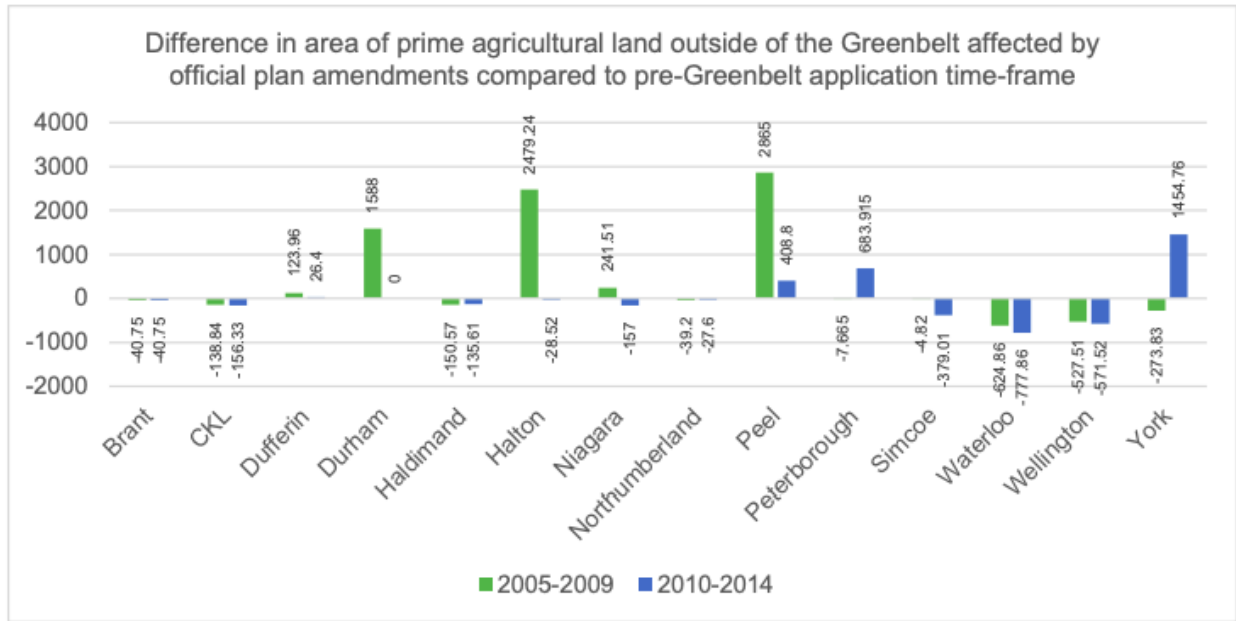
To reach this objective, a value differential was prepared for each of the municipal counties and regions. This value differential calculated the difference in the hectares of prime agricultural land affected by OPAs in the application time-frames from 2005–2009 and from 2010–2014, compared to the five years before the Greenbelt was implemented (2000–2004). These differentials are displayed by municipality visually in the chart below. A positive value differential indicates an increase in the area of prime agricultural land affected by OPAs in the 2005–2009 and 2010–2014 application time frames, compared to the 2000–2004 application period. A negative value differential indicates a decrease in the area of prime agricultural land affected by OPAs; for clarity however, negative value differentials do not represent an increase in prime agricultural land.

The differential calculation produced some interesting results. Contrary to what was suggested in the literature, there was no substantial increase in the area of prime agricultural lands affected in the outer-ring municipalities that have unprotected countryside north of the Greenbelt. This confirms the results of the secondary analysis.

In fact, most counties and regions in the outer-ring of the Greater Golden Horseshoe and on the outside of the northern boundary of the Greenbelt plan saw a decrease in the area of prime agricultural land affected after the Greenbelt Plan was implemented. The most extensive increases in the area of prime agricultural land affected by OPAs, when compared to the 2000–2004 pre-Greenbelt application time-frame, occurred in Durham, Halton,

Peel and York Regions. Each of these regions are part of the inner-ring of the Greater Golden Horseshoe and make up a part of the Greater Toronto Area.

**Chart 5. 6 Difference In Area Of Prime Agricultural Land Outside Of The Greenbelt Affected By OPAs Compared To Pre-Greenbelt Application Time-Frame**

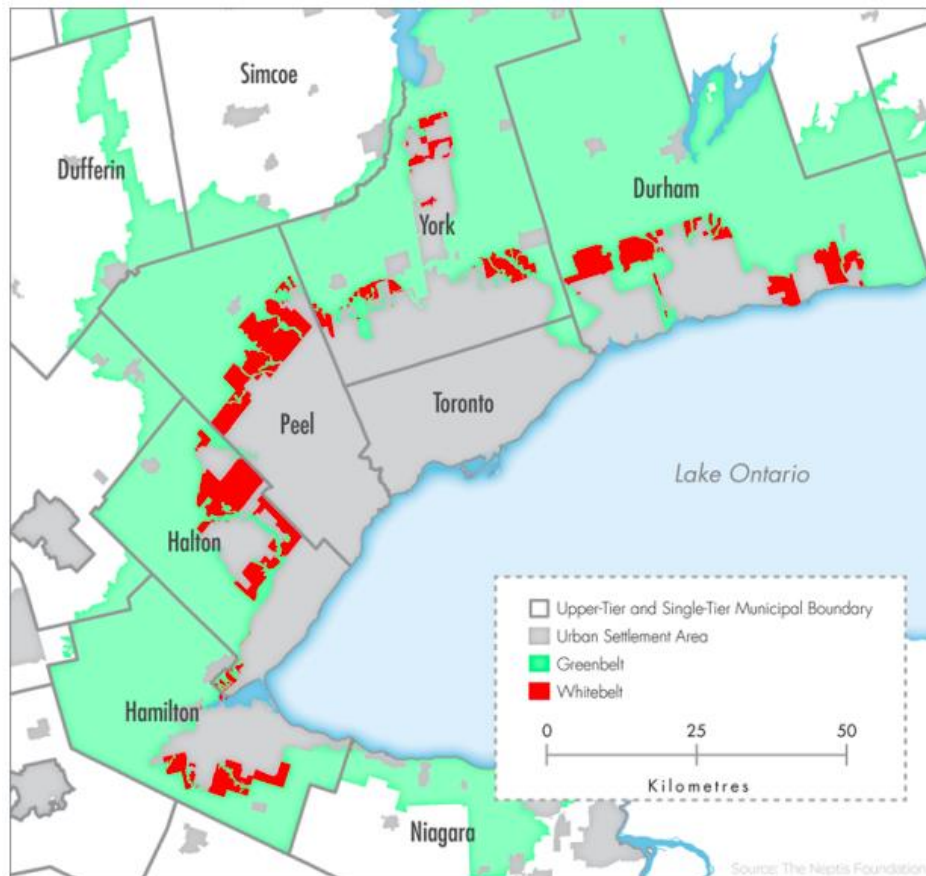


In the years from 2005 to 2009, Durham Region experienced a loss of 1,588 hectares of prime agricultural land greater than when compared to the five years previous. Halton and Peel also experienced similar increases in the 2005–2009 timeframe compared to the pre-Greenbelt application period, observing increases in the loss of prime agricultural land of nearly 2,480 and 2,865 hectares, respectively. In York Region, less prime agricultural land was lost in 2005–2009 versus 2000–2004, however there was a difference in excess of 1,400 hectares when comparing prime agricultural land lost in 2010-2014 versus 2000–2004.

### OPAs In The GTA’s Whitebelt

The results of the previous analyses contradicted the expected leap-frog effect as there was no considerable increase in the area of prime agricultural land affected by OPAs in the unprotected countryside in the outer-ring of the Greater Golden Horseshoe beyond the Greenbelt’s northern border. However, the results conclude that within the unprotected countryside within the inner-ring of the Greater Golden Horseshoe, a substantial increase in the loss of prime agricultural land through OPAs did occur after the implementation of the Greenbelt. This unprotected countryside in the inner-ring of the Greater Golden Horseshoe constitutes part of what is known as the Whitebelt, located specifically in the Halton, Peel, York and Durham Regions, as well as the City of Hamilton, which was not included in this research (Allen & Campsie, 2013).

Figure 5. 2: Location Of Whitebelt Lands



The Whitebelt is an unofficial term, referring to the lands between the outer edge of the existing urban settlement areas around the City of Toronto and the inner edge of the Greenbelt Plan (Allen & Campsie, 2013). These lands comprise a landscape similar to that of the Greenbelt, however they are not subject to the protection policies of the Greenbelt Plan. Rather, the lands in the Whitebelt, in regards to farmland protection, are subject to the policies of the Provincial Policy Statement and thus have less restrictions on development. While these lands have less restrictions for development, they may continue to be used for agricultural purposes, as the lands within the Whitebelt often have not yet been specifically designated for growth. (Allen & Campsie, 2013). For the purposes of this research, any amendments affecting prime agricultural land approved south of the Greenbelt border were considered to be within the Whitebelt.

In the regions of Durham, Halton, Peel and York, amendments which affected prime agricultural lands were mostly within the Greenbelt Plan Protected Countryside area or within the Whitebelt. Two amendments in these

regions were not in the Greenbelt Protected Countryside or Whitebelt; these were instead within the Oak Ridges Moraine and represented a conversion of over 2,500 hectares. The amendments in the Oak Ridges Moraine however were not included in this study. Table 5.11 lists the area of prime agricultural land lost within the Whitebelt in these regions.

**Table 5. 11 Number And Size Of OPAs In The Unprotected Countryside Of The Whitebelt, By Application Time Frame\***

Application Time-Frame	Number Of Amendments in the Whitebelt	Size Of Amendments in the Whitebelt
2000–2004	6	1,069 ha
2005–2009	5	7,728 ha
2010–2014	7	2,904 ha
2015–2017**	0	0ha

*\*Values have been rounded. \*\*2015-2017 data reflects a shorter period of time compared to the other application time frames and as such analysis is restrained.*

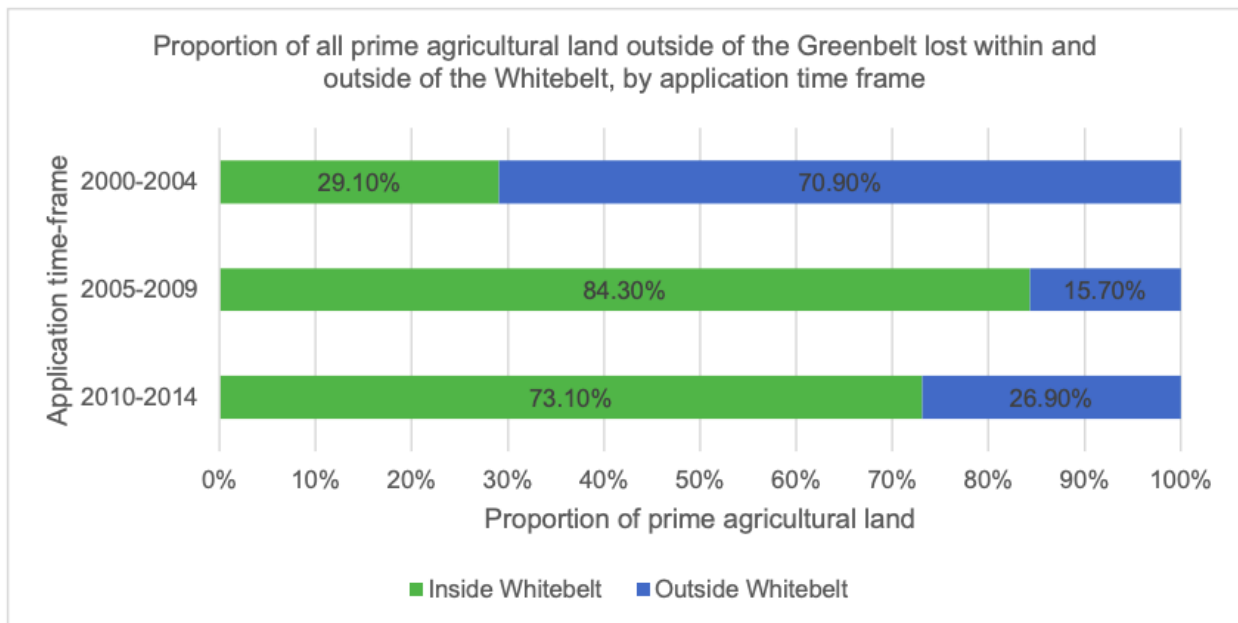
Prime agricultural land loss in the Whitebelt, in total, has affected over 11,700 hectares of land. Prior to the implementation of the Greenbelt, in the Greater Toronto Area, outside of what would become the Greenbelt, just under 1,070 hectares of prime agricultural land were lost within the Whitebelt. This area constitutes less than half (48 percent) of all prime agricultural land lost in the GTA during this time (2000–2004); most prime agricultural land lost in the GTA from 2000–2004 was within the area that would become the Greenbelt. However, after the implementation of the Greenbelt Plan, and coincidentally the Growth Plan for the Greater Golden Horseshoe, 100 percent of agricultural land lost outside of the Greenbelt in the GTA was within the Whitebelt. The results are not necessarily surprising. In the inner ring of the Greater Golden Horseshoe, and specifically in the regions of Durham, York, Peel and Halton, the Greenbelt covered the entirety of the region that was not designated under the Oak Ridges Moraine, a settlement area, or left as the Whitebelt. As such, conversion of prime agricultural lands in the unprotected countryside of these regions after the implementation of the Greenbelt had to take place in the Whitebelt or would otherwise violate provincial policies.

These conversions of prime agricultural land in the Whitebelt together accounted for over 10,630 hectares of prime agricultural land affected by an OPA in the ten years after the Greenbelt was implemented (2005-2014). These results, interpreted with those presented above, dispute what would be expected from the traditional leap-frog effect. Prime agricultural land lost at the northern edge of the Greenbelt decreased after Greenbelt implementation while agricultural land loss has increased within the inner-ring of the Greater Golden Horseshoe.

The lands lost within the Whitebelt make up a sizable proportion of the total prime agricultural land lost in the unprotected countryside outside of the Greenbelt in the Greater Golden Horseshoe. Prior to the implementation of the Greenbelt Plan and Growth Plan for the Greater Golden Horseshoe, prime agricultural land loss in the Whitebelt was minimal, relative to the total. However, in the following years, the prime agricultural land lost in the Whitebelt represented a considerable portion of the total. From 2005–2009, prime agricultural land lost in

the Whitebelt made up over 84 percent of all prime agricultural land lost outside of the Greenbelt. From 2010-2014, this figure was approximately 73 percent.

**Chart 5. 7 Proportion Of All Prime Agricultural Land Outside Of The Greenbelt Lost Within And Outside Of The Whitebelt, By Application Time Frame**



### 5.7.10 Summary

As reflected in each of the geographic analyses, for the unprotected countryside in all of the Greater Golden Horseshoe, beyond the northern Greenbelt boundary and within the Whitebelt, OPAs which redesignated prime agricultural land for development purposes have historically had the largest effect on the loss of prime agricultural lands. Across the entire unprotected countryside, prime agricultural land redesignated for development purposes accounted for more than 93 percent of all prime agricultural land in the unprotected countryside affected by an OPA. In the northern unprotected countryside this number was slightly decreased, at 81 percent, while in the Whitebelt region it was significantly higher at 99 percent. Amendments for other purposes, including on-farm diversified uses, small businesses and sport and recreation, accounted for a marginal percentage of all prime agricultural land subject to OPAs across the Greater Golden Horseshoe during the 2000 to 2017 time period.

More specifically, settlement area and growth conformity types of development amendments, which occurred to accommodate a variety of development purposes, including a mix of residential, commercial, and institutional uses, rather than one specific use, affected the largest area of prime agricultural land from 2000 to 2017. Nearly 89 percent of all prime agricultural land in the unprotected countryside of the Greater Golden Horseshoe during

the study time frame was converted for settlement area expansion and growth conformity exercises. Development amendments which identified a specific purpose, such as institutional, industrial, commercial, residential or agricultural uses, together accounted for less than 12 percent of all prime agricultural land in the unprotected countryside affected by development OPAs.

When looking specifically at the unprotected countryside north of the Greenbelt, settlement area and growth conformity types of development amendments still affected the greatest proportion of prime agricultural land, however, the proportion was less; these amendments affected 59 percent of the prime agricultural land subject to development related amendments from 2000-2017. A greater diversity in the purpose of development amendments was seen in the northern unprotected countryside. Industrial specific development amendments accounted for 22 percent of all prime agricultural land affected by development related amendments and residential specific amendments accounted for just over 9 percent, while institutional, commercial and agricultural specific development amendments made up the remaining roughly 9 percent. In the southern unprotected countryside of the Whitebelt, the opposite was true; there was very little diversity in the type of development specific amendments. Settlement area expansions and growth conformity amendments accounted for 99 percent of all development related amendments from 2000 to 2017.

Further, the analyses have shown that the prime agricultural land which did not receive protection under the Greenbelt Plan has historically been under greater pressure than the lands which did eventually receive Greenbelt protection. Before the Greenbelt was implemented (2000-2004), in the area which became the Greenbelt, approximately 891 hectares of prime agricultural land was converted through an OPA to alternate uses. During this same period, nearly 3,700 hectares of prime agricultural land were lost in what became the unprotected countryside. The unprotected countryside has continued to be under pressure; since the implementation of the Greenbelt (2005-2017) more than 13,240 hectares of prime agricultural land has been converted through an OPA to alternate uses.

### **5.7.11 Conclusion**

The analyses provided above have demonstrated that this traditional form of the leap-frog effect has not been proven to exist in the context of prime agricultural land converted through OPAs. More than 5,210 hectares of prime agricultural land has been lost in the northern unprotected countryside, however this represents only 30.8 percent of all prime agricultural land lost in the unprotected countryside of the Greater Golden Horseshoe, and the area of prime agricultural land lost in this geography has actually decreased every five years since the implementation of the Greenbelt Plan.

In the Whitebelt, the loss of prime agricultural lands has been much higher; more than 11,700 hectares of prime agricultural land has been lost in this area, representing nearly 70 percent of all prime agricultural land lost in the unprotected countryside. Further, the hectares of prime agricultural land lost in the Whitebelt increased drastically when comparing the pre-Greenbelt (2000-2004) and post Greenbelt (2005-2009) time-frames. Though the hectares of prime agricultural land lost in the Whitebelt decreased in 2010-2014, the area affected still remained high.

All of the above being noted, it could be debated that Greenbelt protection should have been expanded further south given that these lands have historically been and continue to be under the greatest pressure for conversion. However, keeping prime agricultural lands in the Whitebelt has enabled the regions of Durham, York, Halton and Peel, which have faced the highest population pressures, to accommodate growth. The Whitebelt lands, in conjunction with the delivery of the intensification policies of the Growth Plan for the Greater Golden Horseshoe, have encouraged these regions to develop and intensify in the Whitebelt lands. If the Whitebelt lands had not been left available for development, it is more likely that the traditional leap-frog effect would have been experienced and more land would have been lost beyond the northern borders of the Greenbelt.

While the Whitebelt has enabled the GTA regions facing high population and development pressure to accommodate growth by converting prime agricultural lands, this may not be a trend that can continue to sustainably persist. The Neptis Foundation has estimated the inventory of lands in the Whitebelt to be 46,000 hectares (Allen & Campsie, 2013). This estimate however does not specify the land use designation of these lands. Thus, while this study has found that 11,700 hectares of prime agricultural land in the Whitebelt has already been designated for other uses to accommodate growth, the amount of land in the Whitebelt which has been designated and consumed for growth may be higher; land which was not designated prime agricultural would not have been captured in this study.

The results of the previous analyses contradicted the expected leap-frog effect; there was no considerable increase in the area of prime agricultural land affected by OPAs in the unprotected countryside in the outer-ring of the Greater Golden Horseshoe, beyond the Greenbelt's northerly bounds. However, the results conclude that within the unprotected countryside that exists within the inner-ring of the Greater Golden Horseshoe, a substantial increase in the loss of prime agricultural land through OPAs did occur after the implementation of the Greenbelt. This unprotected countryside in the inner-ring of the Greater Golden Horseshoe constitutes part of what is known as the Whitebelt, located specifically in the Halton, Peel, York and Durham Regions, as well as the City of Hamilton, which was not included in this research (Allen & Campsie, 2013).

Results of this research have shown that substantial amounts of prime agricultural land in the unprotected countryside outside of the Greenbelt continue to be redesignated through OPAs, namely for development purposes. However, most of the prime agricultural land in the unprotected countryside affected by OPAs in the study time period from 2000 to 2017 has been within the Whitebelt lands south of the Greenbelt; in comparison, a much smaller amount of prime agricultural land has been lost north of the Greenbelt boundaries. Thus, the traditional leap frog effect has not yet been evidenced in the context of Ontario's Greenbelt, specifically as it relates to prime agricultural land. However, as the population of the Greater Golden Horseshoe continues to expand, these lands may be under increased pressure if the Whitebelt lands become exhausted and increased growth cannot be accommodated through intensification and redevelopment. Thus, though the traditional form of the leap-frog effect has not yet been observed, continued monitoring of prime agricultural lands north of the Greenbelt should be maintained. These lands, though attractive for growth, represent a valuable and limited resource in Ontario, and should be protected to ensure continued viability of the agricultural sector in the province.

## 6. Conclusion

This research tracked agricultural land conversion according to regional and local municipalities' official plan amendment decisions. This serves as a predictor of future farmland loss. Planning decisions as captured through official plan amendments provide enhanced information relative to the census. These decisions also depicts a more accurate blueprint to help manage growth and protect farmland resources in the future. The data listed in section 4 and section 5 demonstrates that this method can be helpful in evaluating the effectiveness of policy in real time, in contrast to waiting for census results that document the conversion of farmland after it has already happened.

This research collected information from 545 relevant Official Plan Amendments spread across 36 regions/cities/counties across southern Ontario. The results show that almost 30,000 hectares of designated prime agricultural lands were redesignated from agriculture via municipal official plans between 2000 and 2017. The rates and nature of farmland loss varied regionally across the province. In general, large-scale farmland conversion caused by urban boundary expansion dominated Central Ontario, while the more rural Southwestern and Southeastern counties have experienced mostly small-scale farmland conversion for single usage. The key findings of agricultural land loss in different regions are summarized as following:

### Central Ontario:

- Between 2000–2017, there is an overall downward trend in the number of approved OPAs relevant to prime agricultural land loss in this region.
- The total number of relevant OPAs is 260.
- The average size is 93.9 hectares, which is 1.75 times of the provincial average (53.6 hectares).
- The years with most OPAs approved were 2003 and 2005.
- The three counties/regions which have experienced the most prime agricultural land loss are York Region, Peel Region and Halton Region. They are also the three regions with the largest percentage of prime agricultural land loss.
  - York Region has lost 7,989 hectares of prime agricultural land, which was 11.22% of the census agricultural land as reported in 2001;
  - Peel Region has lost 3442 hectares of prime agricultural land, which was 8.15% of its 2001 census agricultural land;
  - Halton Region has lost 2938 hectares of prime agricultural land, which was 7.12% of its 2001 census agricultural land;

- Northumberland County is the region which lost the least prime agricultural land, with 63 hectares of prime agricultural land loss during this timeframe.
- Simcoe County and Niagara Region had the largest number of relevant OPAs (45) in this region, followed by Wellington County (28). Brant County has the fewest relevant OPAs approved (5) in the study period.
- Peel Region had the largest average OPA size (573.7 hectares), followed by York Region (469.9 hectares) and Halton Region (267 hectares). The City of Hamilton had the smallest average size of land loss per OPA (8.9 hectares).
- The number of OPAs and their average size demonstrate three different patterns of farmland loss in this region: the GTHA municipalities have comparatively few OPAs and a large average size (more than 200 hectares); Niagara Region, Wellington County and Simcoe County have a comparatively large number with a medium average size (20-50 hectares); other Outer Ring counties have a comparatively small average OPA size and they vary in the total number of OPAs.

#### Southwestern Ontario:

- The number of relevant OPAs captured in Southwestern Ontario is 246. This accounts for 45% of the total number of captured OPAs in this project.
- The average OPA size in this region is 14.9 hectares, which is 27.8% of the provincial average.
- There is no obvious upward or downward trend regarding the yearly primary agricultural land loss and approved OPAs in this region, as shown in Chart 4.6 and 4.7. The years with most OPAs approved were 2008 and 2017 (20 each). The year which has seen most primary agricultural land loss was 2008.
- The counties that have the most relevant OPAs captured are Perth, Norfolk, Bruce and Lambton.
- The counties that have experienced most prime agricultural land loss are Oxford (842 Hectares), Lambton (285 Hectares), Perth (254 Hectares), and Elgin (242 Hectares).
- The county which has the largest average OPA size is Oxford and the one which has the smallest average OPA size is Chatham-Kent
- The county of Essex reported zero relevant OPAs between 2000–2017.

#### Southeastern Ontario:

- Overall, this region has a low number of relevant OPAs with a relatively small size compared to Central Ontario and Southwestern Ontario. All counties in this region have reported less than 10 relevant OPAs within the study period.
- There is no obvious upward or downward trend regarding the yearly primary agricultural land loss and number of approved OPAs in this region, as shown in Chart 4.8 and 4.9.
- The average OPA size in this region is 32.6 hectares, which is 60.8% of the provincial average.
- The year with most OPAs approved and most primary agricultural land loss was 2008, when 394 Hectares of primary agricultural land were converted through 8 OPAs.

- Prince Edward, Hastings and Prescott and Russell and Stormont are the three counties/city which have seen the most prime agricultural land loss in this region.
- Among the three categories of relevant OPAs, development re-designation accounts for 54.7% of the total land loss. Rural re-designation accounts for 30.4% and site-specific policy accounts for 14.9% total captured land loss.
- Among the counties/cities in this region, Leeds and Grenville saw most prime agricultural land converted to development designation (186 Hectares). Hastings has the most prime agricultural land converted to rural designation (179 Hectares). Prince Edward has the most prime agricultural land converted to non-agricultural site-specific policies (137 Hectares).

This research has demonstrated the important role of the Provincial Policy Statement and Greenbelt Plan in preserving farmland, especially in the Greater Golden Horseshoe area. Comparison of the annual farmland loss both within the Greenbelt boundary and the in area outside showed an obvious declining trend since the establishment of the Greenbelt Plan. The annual farmland loss within the Greenbelt dropped from 256.36 hectares to 2.35 hectares. The annual farmland loss outside the Greenbelt has also dropped from 1833.88 hectares to 940.37 hectares among the Greater Golden Horseshoe municipalities. Lessons from other Greenbelts in the world demonstrate that policy plays a pivotal role in helping to achieve goals of sustainability within Greenbelt protected areas (Carter-Whitney, 2010). As provincial and local policies faces ongoing changes, further research is needed to explore the implication of development and planning policies on farmland availability .

A comparison between population growth and farmland loss data across Southern Ontario revealed some interesting observations. Although most of the municipalities with large amount of farmland loss have experienced great population growth, not all areas with a huge population growth have lost proportionally as much farmland. For instance, Waterloo region, Hamilton and Middlesex have seen comparatively large population increase with a low number of prime agricultural land loss captured (this may reflect several other trends ranging from pre-2000 conversion to different rate of intensification to development of non-prime lands). Meanwhile, from the perspective of ‘growth efficiency’, the GGH municipalities have performed much better than the more rural municipalities. For instance, Peel region lost 7.8 hectares of prime agricultural lands with every 1000 population increase. York region lost 19.5 hectares of prime agricultural lands with every 1000 population increase. On the other hand, Prince Edward county lost 822 hectares of prime agricultural lands with every 1000 population increase. This fact is partly caused by the limited farmland resource in more populous areas, the need to achieve greater densities/intensification and potentially the speculative or premature conversions of farmland in less populated areas. It may also reflect pressures on farmland that do not lead to population growth (for example recreational developments).

This research has also calculated the economic implication of agricultural land conversion between 2000 and 2017 by linking the loss of designated prime agricultural land with reduced agricultural capacity (gross receipts per hectare). It shows that agricultural land loss had the greatest direct economic impact in York, Niagara and Halton. Clearly these rates vary across the province reflecting the amount of land lost in an area and the overall productivity of the agricultural system in the given area. This variability is evident in Durham, Wellington and Perth for example. These three region/counties have lost different amounts of land but a similar total amount of

cash productivity between 2000 and 2017. Durham was a fast-urbanizing area. It only had 6 OPAs and most of these were large-scale, which was a typical 'urban-style' farmland loss. Wellington is a predominantly rural region but has experiencing increasing urbanizing pressure. There were 29 OPAs and there were both large-scale urban boundary expansion and small-scale conversions. Perth is a typical rural region. There were 72 OPAs and the most of them were small-scale (more typical 'rural-style' farmland loss).

This research has introduced a planning-based methodology to track the availability of the agricultural land base and has documented the farmland conversion at regional and municipal levels since 2000. This methodology has potential broader applicability in Canada and elsewhere, where land use decisions rest primarily with municipal governments. Measuring approvals at this level can help to describe large regional trends, successes and failures in helping to guide growth. Moreover, the data in this research has provided a baseline for future farmland availability research, and has created a framework for further policy, agricultural, economic and planning research.

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