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Preface

Linking Health and the Built Environment in Rural Settings: Evidence and Recommendations for Planning Healthy Communities in Middlesex County is a position paper initiated by the Healthy Communities Partnership (HCP) Middlesex-London with leadership provided by the Healthy Communities and Injury Prevention Team at the Middlesex-London Health Unit (MLHU). Funding for its development came from the Healthy Communities Fund, Ontario Ministry of Health and Long-Term Care, with the vision of “Ontarians leading healthy and active lives.” The grant was provided through the Partnership Stream to support “coordinated community mobilization activities to develop local healthy eating and physical activity policies that make it easier for Ontarians to be healthy”¹.

This position paper has been written by the Human Environments Analysis Laboratory at Western University in collaboration with the MLHU. The purpose of this position paper is to increase knowledge of the relationship between health and the built environment in rural contexts, while providing a local application to Middlesex County. A description of Middlesex County and its municipalities is included to display the generalizability of the policies and supplemental strategies recommended throughout the paper. Ideally, this position paper will not only serve as an educational tool about the importance of healthy communities² but also as a practical guide for creating them in rural environments. The position paper examines four priority topic areas related to the built environment and healthy communities:

- 1) Active Living;
- 2) Road Safety;
- 3) Food Systems and Healthy Eating; and
- 4) Social Capital and Mental Well-being.

Local surveillance data reported in this document was obtained from multiple sources (e.g., Statistics Canada, MLHU reports, and studies by local researchers). In some cases, local statistics are reported for both Middlesex County and the City of London together, as disaggregated health data are not available for certain topics. The reader should be cognizant of this detail when reading and interpreting the data. Words that are defined within the Glossary are ***bolded and italicised*** when first used.

“Healthy Communities initiatives are multi-sectoral collaborations that integrate social, economic and environmental goals to benefit the whole community and strengthen community capacity to promote and sustain health”

~ Ontario Healthy Communities Coalition, 2013.



LINKING HEALTH AND THE BUILT ENVIRONMENT IN RURAL SETTINGS:

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The development of this document is supported by the 2008 Ontario Public Health Standards for reducing the burden of preventable chronic diseases of public health importance and reducing the frequency, severity, and impact of preventable injury and of substance misuse³. The purpose of this document also aligns with the purpose of the HCP, which is to “foster a healthy community in London-Middlesex by influencing policy to support enhanced opportunities for active living across the lifespan.” This document is also aligned with the Mission (see inset) and the following Strategic Directions of the MLHU: improvement of health outcomes in the areas of healthy eating and physical activity for all⁴. In April of 2013, the Ontario Public Health Sector Strategic Plan entitled *Make No Little Plans* was released with the mission “to protect and promote the health of all people in Ontario through the delivery of quality public health programs and services, effective partnerships and a focus on health equity”⁶. It is comprised of five strategic goals and eight collective areas of focus including:

- Strategic Goal #3 - “improve health by reducing preventable diseases and injuries” (p. 16)
 - Collective Area of Focus - Physical Activity and Healthy Eating
- Strategic Goal #4 - “promote healthy environments – both natural and built” (p. 20)
 - Collective Area of Focus - Built Environment

Similarly, the work of planning bodies such as the Ontario Professional Planners Institute (OPPI) demonstrates an ongoing commitment to healthy communities that includes facilitating and advancing “discussions and understanding the impacts of land-use planning and design on people’s health”⁶. The Provincial Policy Statement⁵, which is the overarching document of planning policy that every Ontario municipality must abide by, also supports healthy communities, as will become apparent through the policy review sections throughout this document. Through engagement of municipal staff and local residents, it is the goal of the MLHU and the HCP to build community partnerships that guide policy development and facilitate healthier communities within Middlesex County.

Middlesex-London Health Unit Mission:

“to promote wellness, prevent disease and injury, and protect the public’s health through the delivery of public health programs, services and research.”

“Efficient development patterns optimize the use of land, resources and public investment in infrastructure and public service facilities. These land use patterns promote a mix of housing, employment, parks and open spaces, and transportation choices that facilitate pedestrian mobility and other modes of travel... Strong, liveable and healthy communities enhance social well-being and are economically and environmentally sound”

~ Ministry of Municipal Affairs and Housing, 2005, p. 5



Executive Summary

Healthy communities are places that are safe, contribute to a high quality of life, provide a strong sense of belonging and identity, and offer access to a wide range of health-promoting amenities, infrastructure, and opportunities for all residents. It is well documented that a community's **built environment**, defined as the human-made surroundings that provide the setting for human activity, can have a significant influence on the physical and mental health of its residents. This report aims to be an educational tool demonstrating the importance of building healthy communities within rural contexts with examples and applications being specific to staff, community partners, and residents of Middlesex County and its encompassed municipalities, but generalizable to other rural communities.

Using an evidence-based approach by incorporating a review of academic literature, a scan of relevant policy documents, and interviews with key informants, this position paper identifies existing support related to healthy communities in rural contexts and its relevance for Middlesex County. The position paper begins with an introduction to healthy communities, the purpose of the document, a description of Middlesex County, the importance of **official plans**, and the methodology used to develop this document. Following the introduction, the paper is organized into four priority topic areas related to the built environment and healthy communities: 1) Active Living, 2) Road Safety, 3) Food Systems and Healthy Eating, and 4) Social Capital and Mental Well-being. Practical policy and supportive recommendations are provided at the end of each topic area that can be customised to foster the development of healthy communities in any rural region. The remainder of this summary highlights key portions from each of the topic areas and recommendations aligned with the topic objectives.

Active Living

Definition: Meeting daily recommended levels of physical activity required to either maintain or improve individual health.

Goal: To increase opportunities for active living within the built and natural environments for all residents.

What we know: Two priority areas for increasing physical activity levels include **active transportation** (i.e. walking, cycling) and recreational physical activity (i.e. sports, play). Active transportation is supported by infrastructure such as sidewalks, bike lanes, trails, and accessible destinations. Recreational physical activity is supported by accessibility to parks and recreational facilities and program availability, especially for older adults, children, and low-income households.

Recommendations: Based on the findings of the research, we propose 21 recommendations to support active living including, but not limited to:

- Provide amenities and built form that will best support active transportation in all new residential, commercial, and industrial developments, including sidewalks on both sides of the street, bike lanes, and a well-connected trail network;
- Encourage a mix of land uses to enable shorter trip distances between homes and key destinations such as shops, schools, and workplaces to reduce dependence on automobiles and promote physical activity for discretionary activities; and
- Promote community design that provides opportunities for sport, recreation, and physical activity by increasing access to public space where people of all ages and abilities can be physically active in rural and **settlement areas**.

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Road Safety

Definition: A set of methods and measures used to reduce the risk of a person being killed or injured when using the road network, including pedestrians, cyclists, motorists, and their passengers.

Goal: Decrease the number of injuries and deaths among all road users by providing a safe transportation system.

What we know: Rural environments experience geographic challenges that can lead to increased numbers and severity of motor vehicle collisions (MVCs), however, characteristics of the built environment can be implemented to reduce the risk and increase the safety of all road users. Such factors include residential density, road design (i.e. **complete streets**), and separation of pedestrians and cyclists from vehicular traffic.

Recommendations: Based on the findings of the research, we propose 12 recommendations to support road safety including, but not limited to:

- Collaborate with municipalities and the county to provide a continuity of cycling infrastructure (both on and off-road routes/trails) including bike lanes, trails, and paved shoulders; and
- Create “Share the Road” routes with signage to facilitate safe travel of cyclists between settlements areas.

Food Systems and Healthy Eating

Definition: A system in which food production, processing, distribution and consumption are combined to improve the environmental, economic, social and nutritional health of a community.

Goal: To increase the intake of healthy foods among residents by increasing the accessibility, affordability, and sustainability of the local **food system**.

What we know: There is strong evidence that the consumption of nutritious food contributes significantly to a healthy lifestyle, and gaining access to foods which contribute to good health is important for nurturing and maintaining healthy dietary habits. Accessibility to grocery stores, community gardens, and farmers’ markets all improve access to and affordability of healthy foods and levels of food security.

Recommendations: Based on the findings of the research, we propose 15 recommendations to support food systems and healthy eating including, but not limited to:

- Create enabling legislation (including modifications to zoning bylaws) that encourage small-scale farmers and would-be gardeners in the community to grow food in unconventional locations, such as backyards, schoolyards, and church properties, as well as underutilized public open spaces and parks where appropriate;
- Facilitate the formation of farmers’ markets, especially in settlement areas without a local grocery store; and
- Create policies that direct and support affordable housing developments to locate near existing food retail facilities.

Social Capital & Mental Well-being

Definition: Social capital is the degree to which citizens are involved in their community, trust one another, and interact on a daily basis. Mental well-being is defined as a state where people realize their potential, can cope with the normal stresses of life, work productively and fruitfully, and are able to make a contribution to the community.

Goal: To increase social interaction, enhance social capital, and promote mental well-being of residents through well-designed built environments.

What we know: The literature identifies five key factors of the rural built environment that are linked to social capital and mental well-being: population density; the availability and accessibility of social, recreational, and **greenspace** destinations; diverse housing; land-use mix; and safety.

Recommendations: Based on the findings of the research, we propose 7 recommendations to support social capital and mental well-being including, but not limited to:

- Ensure a diversity of housing choice, including a mixture of dwelling types, affordable and mixed-income options, non-traditional arrangements, and universal design features to support more complete communities and foster **aging in place**;
- Provide complete communities with compact neighbourhood forms and mixed land-uses (residential, commercial, institutional) to facilitate access to neighbours, shops, schools, and public services, and to reduce the amount of time spent commuting outside the community; and
- Provide well-designed parks, greenspaces, schools and other public meeting spaces that may act as 'social hubs' to foster interactions among people from all backgrounds and stages of the life cycle.

The recommendations throughout this report suggest how the rural built environment can be designed and retrofitted to promote healthier behaviours, increase safety, and improve population health. The body of this paper will reinforce and build upon these points by providing additional background information and a more comprehensive list of policy recommendations and additional supportive strategies for creating healthier communities.

1. Introduction

1.1. Definition of Healthy Communities

Healthy communities are places that are safe, contribute to a high quality of life, provide a strong sense of belonging and identity, and offer access to a wide range of health-promoting amenities, infrastructure, and opportunities for all residents. It is well documented that a community's **built environment**, defined as the human-made surroundings that provide the setting for human activity, can have a significant influence on the physical and mental health of its residents. A growing body of research has shown influences of the built environment on increased physical activity levels, reduced injury rates related to road safety, improved access to affordable and healthy foods, sense of belonging, social connection to neighbours, and overall **mental well-being**^{7,8}. In addition to the personal health benefits, the built environment can influence a reduction in health care and social costs⁹⁻¹¹.

“Healthy communities are places that are safe, contribute to a high quality of life, provide a strong sense of belonging and identity, and offer access to a wide range of health-promoting amenities, infrastructure, and opportunities for all residents”

~ Dr. Jason Gilliland

Despite the mounting evidence supporting the notion that where we live can impact our health and well-being, the majority of research and related policy around the built environment and health has been directed to urban areas, with little being known about the relationship within rural communities^{10, 12}. This has led to many current policies and programs being implemented in rural areas based on research done in urban settings, which may lead to incorrect assumptions about the population and the factors that influence the health of those living in rural communities.

While there are some fundamental similarities between urban and rural areas, there are certain differences that make it important to be selective when using urban research to make decisions and create policies for rural locations. For instance, rural communities in Canada are typically experiencing declining populations with a greater proportion of older adults than urban centres, and Middlesex County is not an exception to this national trend. Research has also shown that rural residents are at a greater risk of compromised health¹²⁻¹⁵, making understanding and influencing healthy rural communities an important concern for **public health** officials.

1.2. Purpose and Layout of Document

A key purpose of this paper is to draw from current evidence to help identify some of the unique characteristics and special considerations to assist in the creation of health promoting policies within rural communities. This document will describe the methodology used to acquire the information and evidence used to create the background descriptions and policy recommendations within each topic area. While there are many built environment factors associated with healthy communities, the priority topic areas included in this position paper are: 1) Active Living, 2) Road Safety, 3) Food Systems and Healthy Eating, and 4) Social Capital and Mental Well-being. Each of the sections of the paper will focus on one of the four topic areas, providing background information, current local statistics, and exploring the built environment factors that influence the specific topics and related health outcomes. Each topic area finishes with a list of general recommended policy statements and additional supportive strategies to complement **official plans** to help with the advancement of healthy communities within rural contexts such as Middlesex County.

A goal statement and a number of related objectives for each topic area have been created to articulate the ideal results of implementing the stated recommendations. The statements were created using a variety of relevant public health documents including the *Ontario Public Health Standards, Make no little plans – Ontario Strategic Plan*, and the Hastings & Prince Edward Counties Health Unit's – *Building Complete and Sustainable Communities: Healthy Policies for Official Plans* document.

1.3. Description of Middlesex County

Middlesex County is located in Southwestern Ontario with a population of 73,000 people. As seen in Figure 1: *Municipalities of Middlesex County*, the County surrounds the City of London and consists of eight municipalities, including North Middlesex, Southwest Middlesex, Thames Centre, Strathroy-Caradoc, Middlesex Centre, Adelaide Metcalfe, Lucan Biddulph, and the Village of Newbury. There are also three First Nations communities in the Middlesex-London region, which are located south of Strathroy-Caradoc: the Chippewas of the Thames First Nation, Munsee-Delaware Nation, and Oneida. The population is spread throughout several towns, villages, hamlets, and along concession roads throughout the County (See Appendix A: Statistical description of Middlesex County and municipalities).

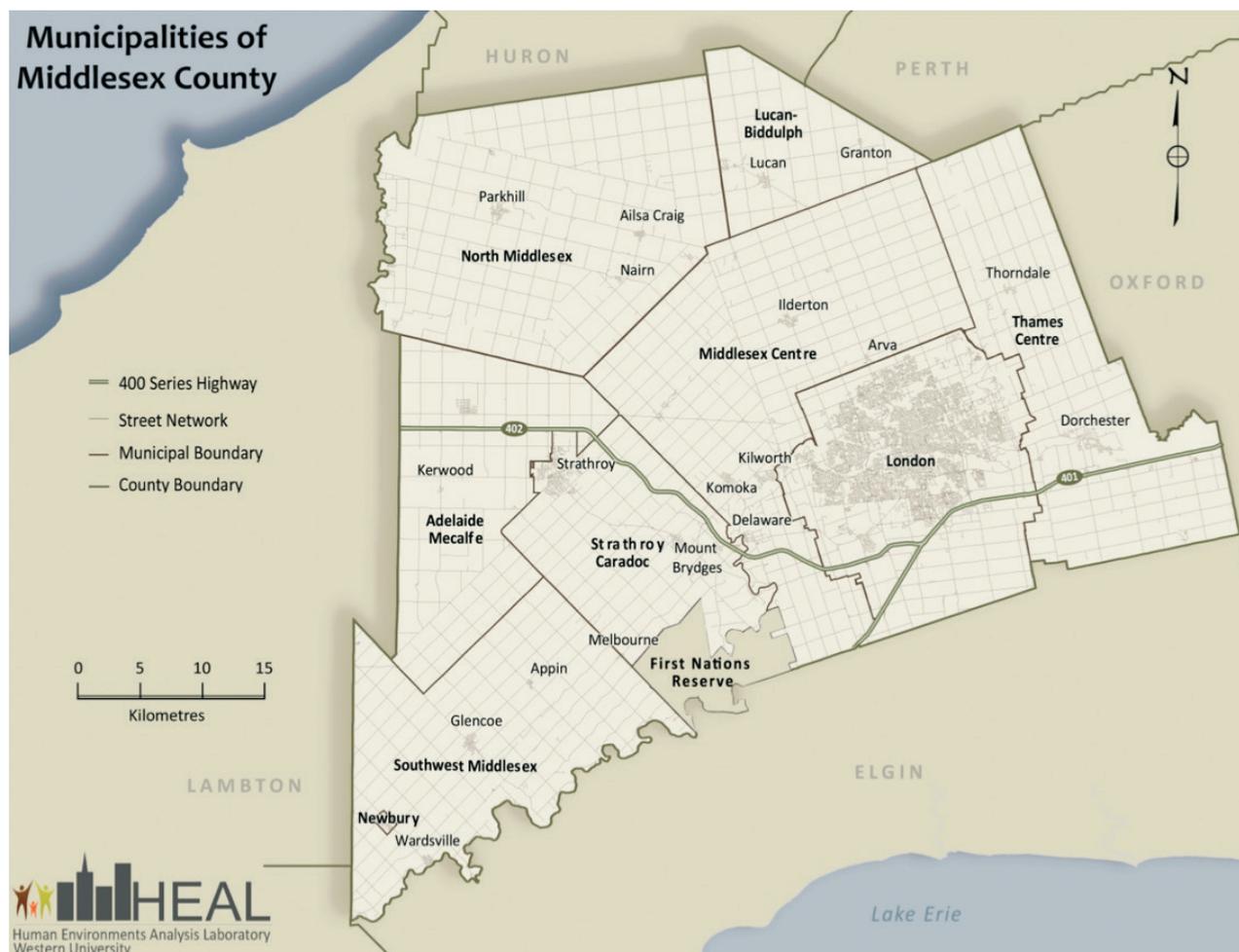


Figure 1: Municipalities of Middlesex County

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The population of Middlesex County has remained relatively stable in recent years, increasing slightly between the last two census periods, from 69,913 in 2006 to 73,000 in 2011^{16, 17}. Some rural settlements, such as Ilderton and Dorchester, have experienced population growth as **bedroom communities** for London. This growing trend, where young families are moving into dwellings in the rural settlements, but working and playing in London, is perceived by local planners and policy makers as a potential cause for loss of social cohesion in rural areas. Figure 2: *Population Change 2006 to 2011* shows how the population of the eight municipalities has changed and reveals that municipalities located closer to London have experienced population increases while municipalities located farther from London have experienced decreases.

Like most rural communities, the population of Middlesex County is aging. The proportion of the population that is 65 years of age and older has increased 1.6% in Middlesex County between 2006 and 2011; compared to only a 1.1% increase City of London. Adelaide Metcalfe experienced a 2.7% decrease in the proportion of older adults while the other seven municipalities have seen an increase in the proportion of older adults (between 1.1% and 3.1%). Figure 3: *Older Adults* shows the current proportion of population aged 65 years and older in each neighbourhood and reveals varying proportions throughout all municipalities (between 20.1-60.0%). Appendix A shows that the highest proportions of older adults

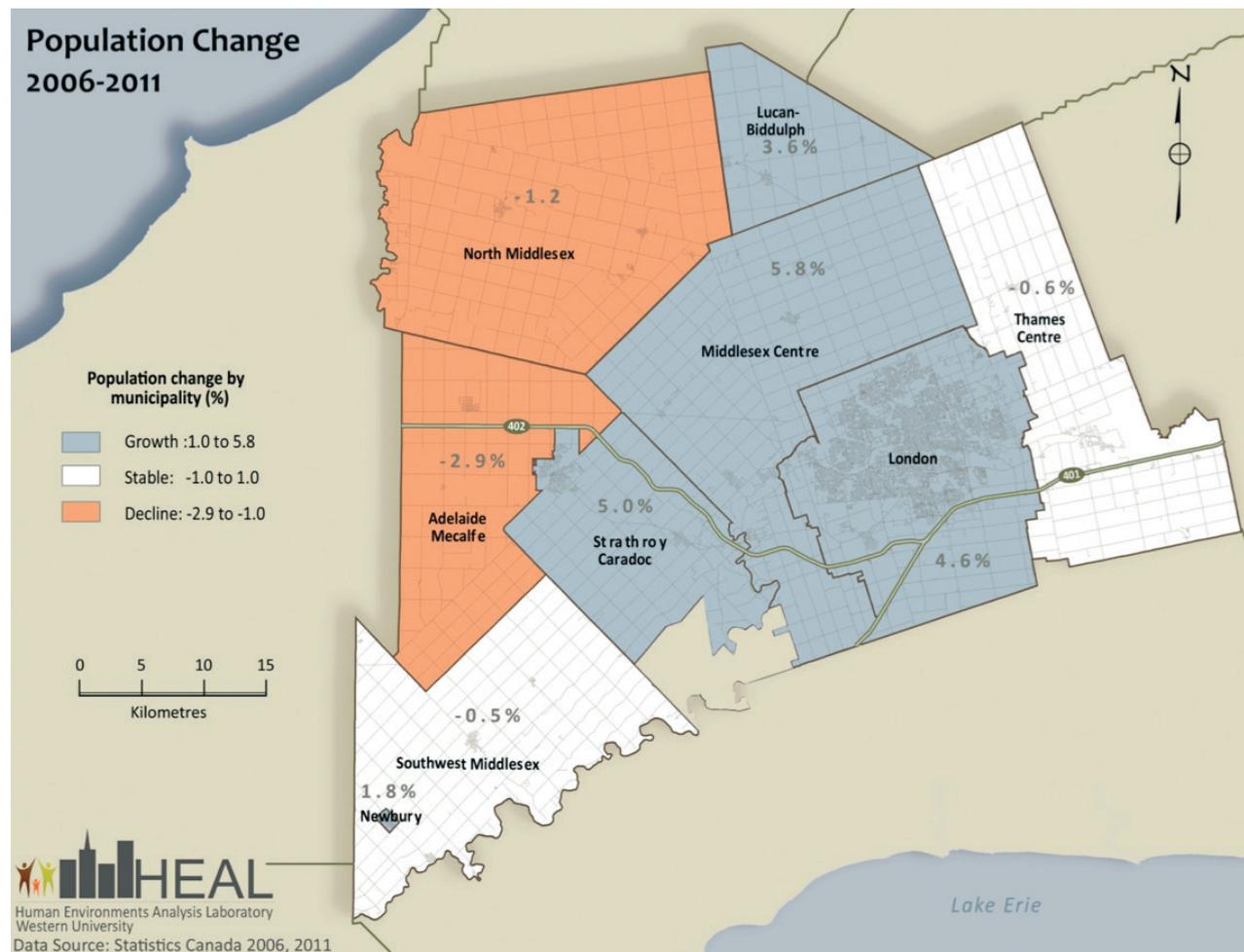


Figure 2: Population Change in Middlesex County, 2006 to 2011

are found in Newbury and Southwest Middlesex, with nearly one out of five residents (19.0% and 18.1% respectively) in these communities being older adults^{16, 17}.

The proportion of the population that is 19 years of age or younger in Middlesex County decreased by 4.6% between 2006 and 2011; by comparison, the proportion of children and youth in the City of London decreased by only 1.2% during the same period. Figure 4: *Children and Youth*, shows the proportion of the population in each neighbourhood that is 19 years of age or younger¹⁷. Middlesex Centre was the only municipality that experienced an increase in the proportion of children and youth (4.2%) from 2006 to 2011. Interviews with local planners suggest this increase is due to a high number of young families moving to Ilderton and Komoka, due to the bedroom community affect. The map also indicates that the highest proportions of children and youth live within **settlement areas**^{16, 17}.

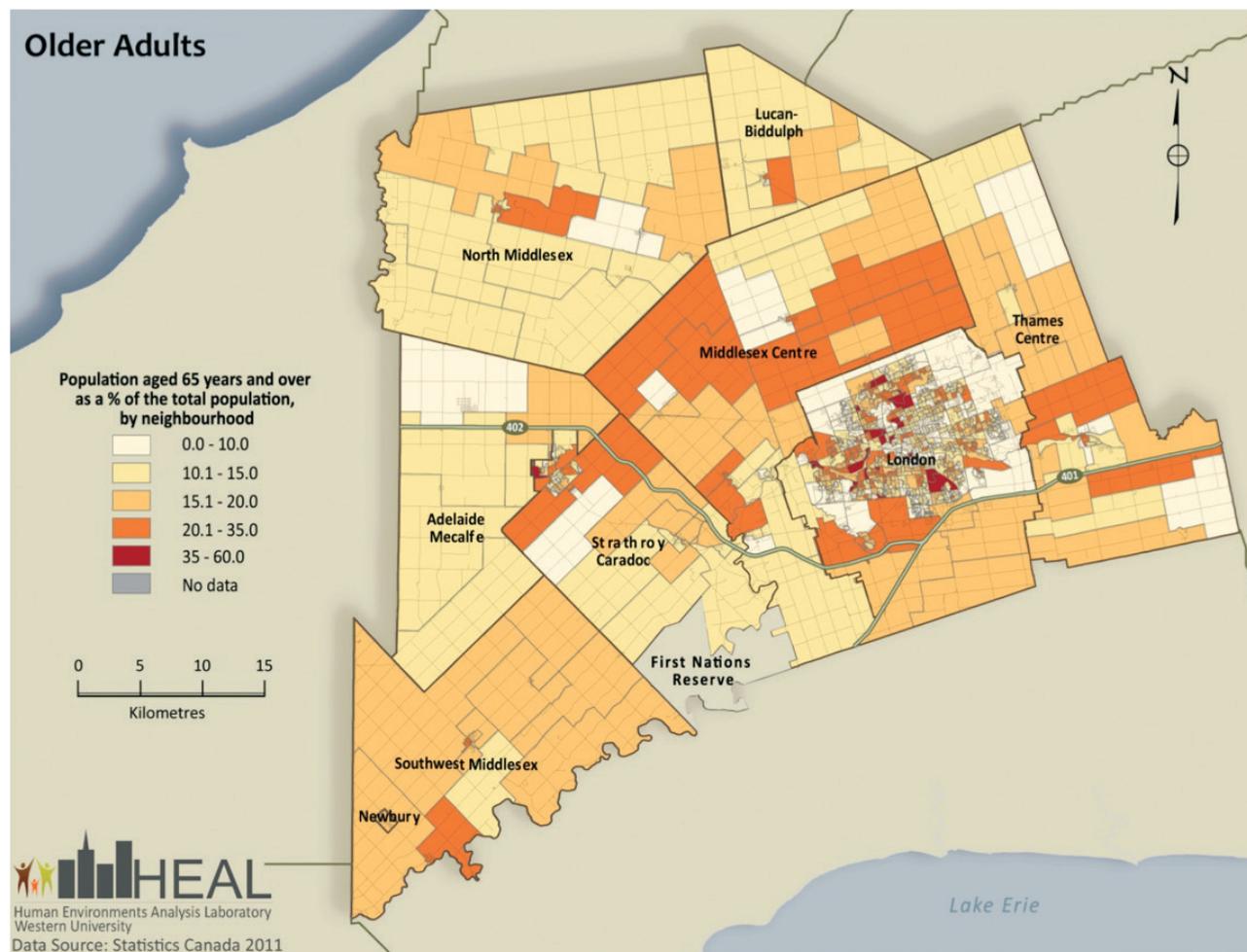


Figure 3: Older Adults as a Proportion of the Total Population in each Neighbourhood, 2011

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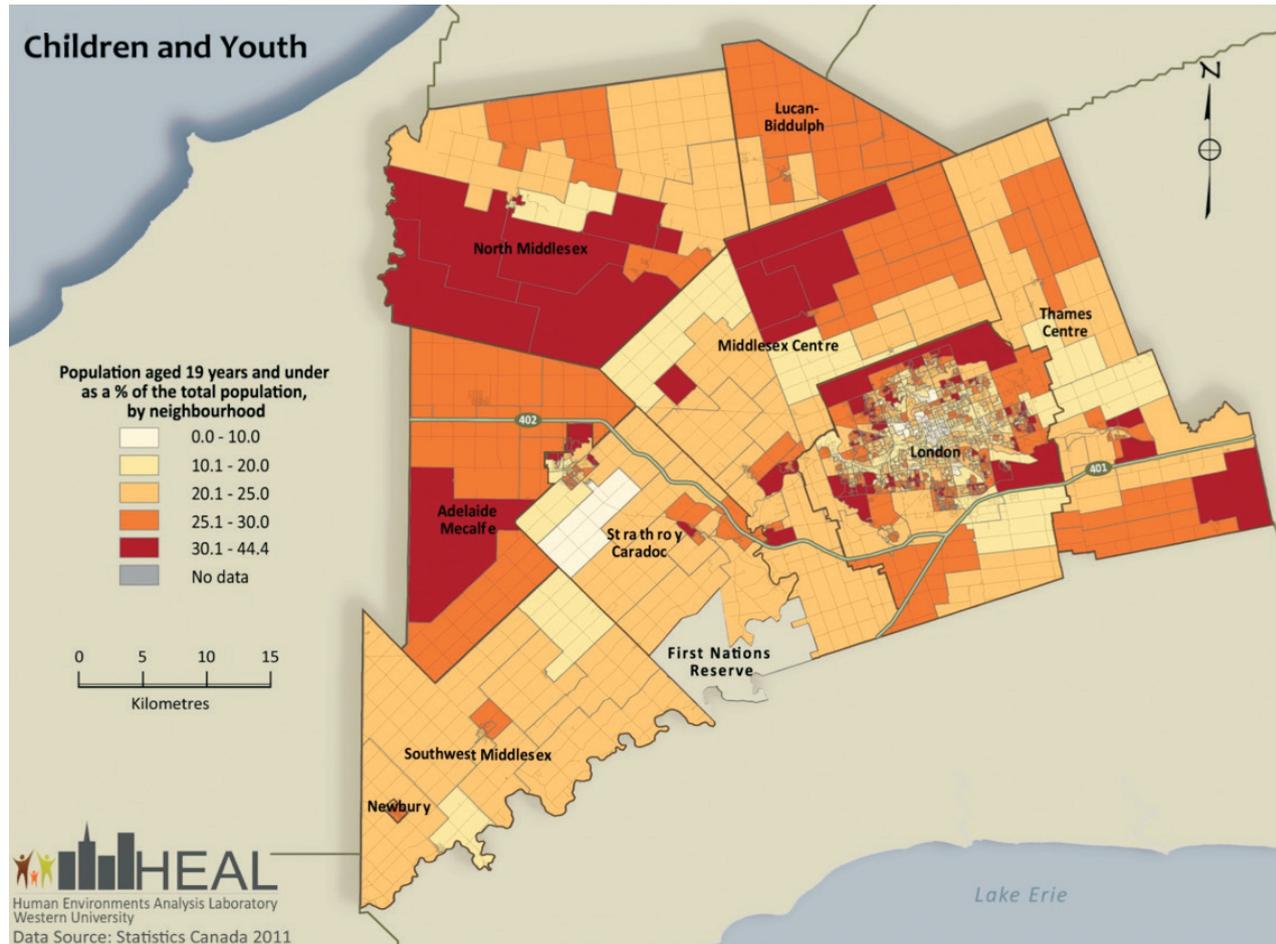


Figure 4: Children and Youth as a Proportion of the Total Population in each Neighbourhood, 2011

Selected characteristics of Middlesex County residents:

- Middlesex County has a low proportion of families that fall below Statistics Canada's low income cut-off (4.2%) compared to the City of London (11.4%);
- Only 270 residents of Middlesex County in 2006 were considered new immigrants (having moved to Canada within previous 5 years);
- A high proportion (55.6%) of Middlesex County residents commute to another community for work; whereas, only 9.5% of City of London residents commute to another community for work;
- 12.8% of Middlesex County residents telework from home, which is significantly higher than the rate in London (5.4%). North Middlesex and Adelaide Metcalfe have the highest proportion of teleworkers, with 20.5% and 20.4% respectively.

Statistics Canada, 2006a, Statistics Canada, 2011

1.3.1 Health in Middlesex County

What is known about health in Middlesex-London?

- 52.0% of adults are overweight or obese;
- 4.5% of Middlesex County residents walk or bicycle to work regularly;
- 53.0% of adults are at least 'moderately active' during their leisure time (i.e., equivalent to walking at least 30 minutes a day);
- Middlesex County residents are more likely to be injured (1.5-1.9 times) or die (2.3 times) from motor vehicle collisions than residents in London;
- 62.0% of adults do not meet the minimum daily vegetable and fruit serving consumption guidelines;
- 7.7% of households have experienced food insecurity;
- 23% of adults report that most days were 'extremely or quite a bit stressful'.

Middlesex-London Health Unit, 2013¹⁸, Statistics Canada, 2006¹⁶

Research has identified rural residents as being more likely to experience compromised health¹²⁻¹⁵. For instance, people living in rural environments have an increased risk of being obese and suffering from obesity-related illnesses¹⁹. Similarly, people living in rural areas are less likely to be physically active and have poorer access to healthy food outlets, as well as are more susceptible to mental illness than their urban counterparts¹². Associations between these health-related issues and built environmental factors attributed to rural environments (i.e., low density development, increased reliance on automobiles, declining investments in rural areas, encroachment of urban areas into farmlands) have been identified²⁰. Given the current state of the evidence, the Middlesex-London Health Unit, the Healthy Communities Partnership, and other health promotion agencies across Ontario, Canada, and internationally are turning their attention to rural built environments and the potential impact they can have on promoting health within rural areas.

1.4 Official Plans and Building Healthy Communities

Municipal councils have a considerable ability to contribute to the building of healthy communities through the land use policies found within their respective official plans. The official plan for a municipality is a legal document prepared with input from members and organizations of the community, that helps to ensure future planning and development will meet the specific needs of the community²¹. Currently, most official plans of Canadian communities, whether rural or urban, lack policies that explicitly promote healthy communities; whereas some existing policies included in official plans may even exacerbate the health concerns identified in box 1.3.1. This document will strive to increase the understanding among County and municipal staff, and other interested residents and stakeholders, of the relationship between, and importance of the built environment and health. Policy examples are provided that can be customized and used within respective official plans during their mandatory five-year review process. Including such policies within official plans guides developers to what physical features and infrastructure should be included to promote a healthy community.

1.5. Methodology

Information and data has been drawn from three sources to ensure that the material provided in this report is scientifically valid, locally accurate, and placed in the proper planning context: literature review, policy scans, and key informant interviews. The literature review was conducted by identifying and evaluating research which examines the relationship between the rural built environment and key health outcomes. While this task was made difficult by a lack of previous research conducted in rural contexts, urban literature was used to supplement the rural research where relevant. For instance, rural settlement areas often include urban design elements that make related literature relevant to these communities.

Key informant interviews were conducted with seven local planners and policy makers to gain a Middlesex-specific context regarding the planning process and policies that can affect a healthy community. These individuals included a Chief Administrative Officer, county and municipal planners, Community Development Managers, and a Director of Parks & Recreation. It was learned in these interviews that each municipality operates slightly differently with regard to action items, priorities, etc. Many of these key informants also recognized that official plans are an ideal place to provide a policy basis to direct and/or support healthy community initiatives.

A policy scan of the **Provincial Policy Statement**, the **Planning Act**, and the *Middlesex County Official Plan* was conducted to gain a better understanding of the current policy context in which planners and policy makers work in Middlesex County. Other planning documents and grey literature (i.e., municipal reports, position papers, etc.) were also scanned to see how other communities are integrating healthy community policies. During the year this document was created, three local municipalities were either undergoing or about to undergo 5-year official plan reviews. Supplemental documents to this report were created for these three municipalities (Lucan Biddulph, Strathroy-Caradoc, and Thames Centre) consisting of more thorough policy scans and more specific policy recommendations as submissions to their official plan reviews. These submissions can be used as practical examples of how this document can be utilized in other jurisdiction and can be obtained from the MLHU upon request.

2. Active Living

2.1. What it is and why it matters

Active living is defined by *Canada's Physical Activity Guide to Healthy Active Living* as meeting daily recommended levels of physical activity required to either maintain or improve an individual's health²². In Canada, the minimum daily recommendations for 'moderate to vigorous' physical activity (e.g., running, aerobics, hockey, or tennis) are 150 minutes per week for adults (including seniors) and 60 minutes per day for adolescents and children²³. While there has been a concerted effort through promotion programs (e.g., ParticipACTION) to increase physical activity, still only 15% of adults and 7% of children in Canada are achieving the recommended amount of physical activity²⁴. Lack of physical activity is a key contributor to many health problems, such as heart disease, some types of cancer, type-II diabetes, asthma, and obesity²⁵. Furthermore, the economic burden of physical inactivity in Canada is estimated to cost tax payers over \$5.3 billion per year in health care costs²⁶.

Previous North American research suggests that significantly fewer people in rural areas meet their recommended physical activity levels compared to their urban and suburban counterparts^{13, 14, 27}. In addition, the types of physical activity differ for people living in rural versus urban environments. Urbanites tend to participate more in **active transportation**, walking for exercise, and recreational physical activity, whereas rural residents tend to participate in more work-related physical activity and chores^{20, 28}.

Physical inactivity is consistently associated with chronic diseases such as diabetes, cardiovascular disease, and osteoporosis and chronic diseases are a significant cause of premature death.

~ Katzmarzyk & Janssen, 2004



Considering the lower rates of physical activity found among rural residents, the two primary sources of non-work related physical activity of recreation and active transportation are priority areas for increasing activity levels. Active transportation is defined by the Public Health Agency of Canada²⁹ as any form of human-powered transportation (i.e. walking, cycling, etc.), for utilitarian (e.g., commuting) and leisure (e.g., social, exercise) purposes. Recreational physical activity is defined in this report as all non-travel related physical activity, sports (structured and unstructured), and other forms of cardiovascular exercise.

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What is known about Active Living in Middlesex-London?

- In 2009/10, 53.0% of the Middlesex-London population reported being moderately active or active during leisure time activities;
- A higher proportion of males in Middlesex-London reported being moderately active (57.1%) compared to females (49.1%);
- The proportion of the Middlesex-London population who reported they were inactive during leisure time increased between 2003 and 2007/08. It remained the same in 2009/10. The increase was not statistically significant; however, this is a concerning trend;
- In 2008, 88% of those in Middlesex-London knew of recreational trails as a method to be active during leisure time; however, only 63.0% used the trails;
- 4.5% of Middlesex County residents regularly walk or bicycle to work, compared to 8.0% of residents in the City of London, and 6.8% of residents in the rest of Ontario.

Middlesex-London Health Unit, 2013¹⁸

2.2. Built Environment Influences on Active Transportation

The most common form of physical activity for people of all ages is walking¹⁰. In Middlesex County, only 4.5% of the population indicate they regularly walk or cycle to work, which is lower than the 6.8% of Ontarians³⁰. Residents in the municipalities of North Middlesex (6.1%) and Strathroy Caradoc (6.0%) use the most active transportation with the remainder of the municipalities having rates around 3.0%. Fewer Canadians use active modes of transportation in rural areas than in urban areas, with less than 5.0% of adults who

work outside the home (or farm) using active modes of transportation to/from work¹⁶. This low figure is expected due to the typically longer distances that rural residents are required to travel to reach destinations. Highlighting this fact, one study found that significantly more people living in small rural and remote settings travel greater than 20 km to reach their job than those living in larger communities³¹. The increased distance necessary for many residents to travel creates a high reliance on automobiles, which is one of the most frequently cited concerns regarding quality of life¹¹.

Goal:

- Increase opportunities for active living within the built and natural environments among residents.

Objectives:

1. Improve built environment infrastructure that encourages active transportation;
2. Develop and enhance policies that support connectivity and land use principles that encourage active transportation;
3. Ensure physical activity opportunities are available, accessible, and affordable for residents of all ages, genders, and physical abilities;
4. Ensure that **greenspaces** and indoor/outdoor facilities are provided that allow for structured and unstructured recreation for all residents.

In general, children are more likely to travel actively to and from school than adults are to and from work. One study in the Greater Toronto Area (GTA) suggests that the proportion of children commuting actively between school and home has declined significantly between 1986 and 2006: rates for 11 to 13 year olds declined from 53.0% to 42.5% and 38.6% to 30.7% for 14 to 15 year olds³². It is expected that rates of active transportation in rural areas would be lower than those in the GTA. For instance, approximately three-quarters of all children who attend elementary and secondary schools in Middlesex County are eligible for school bus service because they live beyond walking distance (1.6 km) of their school. While distance barriers to walking are largely due to larger school catchment areas and low population densities, in some cases the distance barriers are caused by school location decisions. For example, all of the children who attend Oxbow Public School in Ilderton are eligible for school bus service because the school is located on a busy road well beyond the built-up area of town. On the other hand, all of the children attending Southdale Public School, which is located entirely within the developed area of Strathroy, live within walking distance of the school (ineligible for busing), and are much more likely to walk or cycle to school.



While distance is the major barrier to active transportation, there are other factors that influence the use of active transportation within rural contexts. Existing evidence has identified three key factors in the promotion of active transportation: pedestrian and cycling infrastructure, trails, and accessible destinations.

The first key factor of the rural built environment that has been found to influence active transportation is pedestrian and cycling infrastructure, which includes sidewalks and cycling paths, as well as trails. The availability and quality of an interconnected pedestrian and cycling network can facilitate active transportation. Many residents in rural settlements believe that having access to sidewalks that are in good condition is the most important component of a walkable community³³. Unfortunately, in many communities poor sidewalk quality and availability is a barrier to active transportation³⁴⁻³⁷. When sidewalks are unavailable or of poor quality, it forces residents to either walk on the road³⁷ or use their car³⁴.

The second factor, trails, are especially important for residents living outside of settlement areas (i.e., on concession roads or highways). Having a trail system within a 10-minute walk or bicycle ride from home has been found to help facilitate active transportation³³. The building of new trails has been shown to significantly increase active transportation in rural areas³⁸. Issues involving land ownership, however, can cause significant barriers to creating, developing, and connecting trails by municipalities. Municipal councils can create policies in their official plans that serve to remove such barriers and encourage the development and maintenance of a continuous trail system. Additional by-laws should also be encouraged to restrict the use of these trails by motorized vehicles, as the use of recreation vehicles, such as ATVs and snowmobiles, on the trails has been shown to decrease use by non-motorized users due to the added danger, particularly for children and youth³⁵.

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The final key factor of the rural built environment found to influence active transportation is the existence of accessible destinations. Small settlement areas have fewer accessible destinations, such as workplaces, schools, grocery stores, restaurants, recreational facilities, and other common services (e.g., banks, doctors, dentists). These types of destinations are typically located in larger settlement areas, leaving fewer local destinations for rural residents^{15, 35}. If there are no destinations within a reasonable distance of rural dwellings the residents will have to drive regardless of their preference to use active transportation³⁵. Promoting the creation of new staple businesses in smaller settlement areas can shorten distances and provide accessible destinations to residents and potentially increase active transportation¹⁵. The *Park 'n Move* campaign in Haliburton, Ontario is one example where active transportation is promoted in a rural community; once visitors arrive in town, they can park for free in a central parking lot and then use active transportation to move around town. This campaign could easily be adapted for towns in Middlesex County, such as Strathroy and Dorchester. This would require the settlement to have a high degree of walkability, which can be defined by characteristics of the built environment that promote active transportation, such as high population densities, a high land use mix, highly-connected street network, and ample sidewalk coverage on local streets.

The first feature of a walkable community is high population density^{39, 40-42}. While rural settlements can never have the same density as urban centres, town homes, small apartment buildings, and smaller lot sizes can still be promoted to increase density. Increasing density in a community makes it easier to walk because distances between origins and destinations will typically be shorter.

The second feature of a walkable community is high land use mix^{39, 42-44}. Having the ability to live, work, and play in the same community decreases the reliance on cars to travel. While working and living in the same community is not always possible in rural settlements (especially in bedroom communities), having schools, stores, and recreational facilities located close to residential areas can increase the use of active transportation.

The third feature of a walkable community is high street connectivity^{39, 40, 42, 43}. Active transportation is most efficient in communities that are grid-like, so that traveling between locations is more direct, quick and easy. In traditional suburban neighbourhoods, looping streets and cul-de-sacs make active travel through a neighbourhood very difficult because distance is unnaturally increased. When suburban-like neighbourhoods are required, facilitating active transportation using short-cuts (i.e., pathways, catwalks, etc.) to improve connectivity is necessary.

Lastly, having quality sidewalks available can increase walkability in a community, as was previously discussed^{41, 42}. Sidewalks can also create a healthy walking environment by improving safety through the separation of pedestrians from the road.

2.3. Built Environment Influences on Recreational Physical Activity

As with active transportation, the majority of research to date on the built environment and recreational physical activity has focussed on urban and suburban settings. Nevertheless, several studies on rural settings do exist and have found accessibility to be the key built environment factor related to levels of recreational physical activity. Accessibility can be divided into three components: general accessibility to recreational facilities and parks, ability of certain groups to use recreational facilities, and availability of programs.

Research has clearly indicated that if public spaces and facilities for physical activity are not easily accessible, it is much more difficult to be active, and accordingly, physical activity levels are lower^{13, 36, 45, 46}. In rural municipalities, publicly provided recreational spaces offer important opportunities for physical activity. These are often concentrated within towns and other settlement areas³⁶, which is also true in Middlesex

County. Figure 5: *Access to Public Parks and Recreation Spaces* illustrates that residents in larger rural settlements have higher accessibility to public recreation opportunities (as represented by darker shading). The location within settlement areas increases accessibility to a greater proportion of the population and accessibility by active modes of transportation; however, accessibility and recreation alternatives must therefore be considered for those living in the outlying areas of the community.

Recreation facilities have been identified through stakeholder interviews as primary locations for physical activity including within Lucan Biddulph and Thames Centre. The new *Komoka Wellness Centre* has also been built recently in Middlesex Centre offering an ideal opportunity for physical activity among residents of the surrounding area. Excellent facilities also exist in other municipalities across the County, including the *Glencoe Arena Auditorium and outdoor pool* in Southwest Middlesex and the *North Middlesex Arena and Fitness Centre* in Parkhill. Residents living in the settlement areas of Middlesex County benefit greatly due to their higher level of accessibility to public parks and recreation facilities. However, due to changing trends in populations, facility use, and municipal finances, some recreational facilities (e.g., halls, baseball diamonds) in smaller settlement areas are being closed, which may result in decreased accessibility and increased travel distance for some residents to participate in certain physical activities.

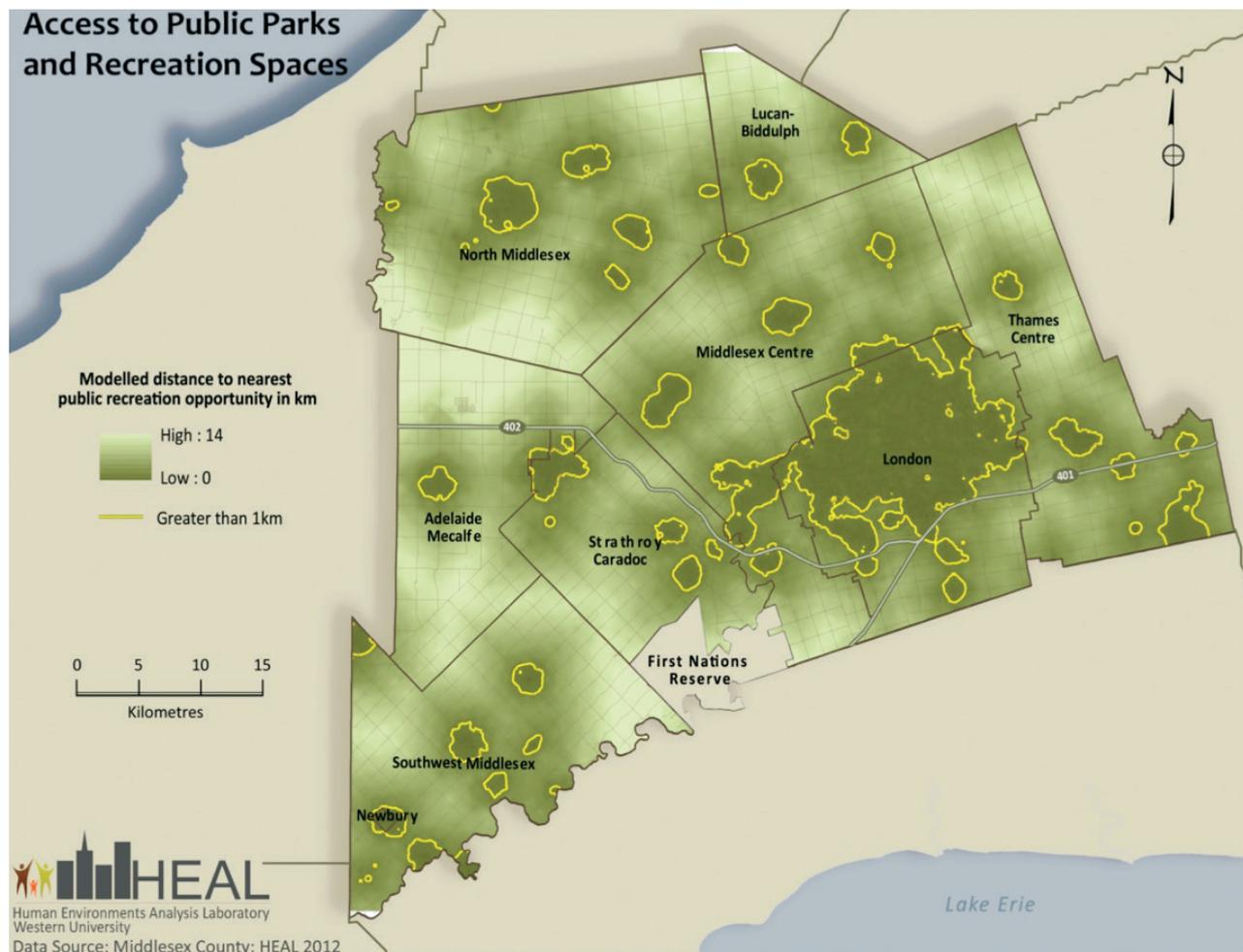


Figure 5: Access to Public Parks and Recreation Spaces in Middlesex County, 2012

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Community parks provide residents of all ages with the opportunity to play sports, enjoy nature, and be active. The literature indicates that public parks are less accessible in many rural areas, due to a lack of publicly owned open space¹⁵. Land is often at a premium in small communities and historical rural plans rarely included the provision of parks. While some communities within Middlesex County do have a large supply of public parks (i.e. Strathroy and Dorchester), there are others that are relatively underserved.

In rural communities, even when recreational opportunities exist within the community, there may still be issues of accessibility for people who are unable to independently travel the necessary distance for recreational activities^{15, 34}. While people in settlement areas can access the programs and facilities by foot, those outside of the settlements require vehicular transportation, but **vulnerable population groups**, such as children, youth, older adults, women, people with a disability, low-income and recent immigrants, are highly impacted by the distance as they are much less likely to have access to a vehicle.



A significant proportion of the population (15.3%) of Middlesex County are 65 years of age or older (see Figure 2 and Appendix A: *Statistical description of Middlesex County and municipalities*). Older adults have greater mobility restrictions (e.g., limitations on physical ability, no longer have driver's license), and therefore need facilities to be located locally to ensure maximum accessibility. One example of this issue being addressed successfully is in Lucan Biddulph, where the senior recreational facilities are located close to the retirement home to increase access and participation in recreational activities by residents.

Children and youth are another vulnerable population that can be highly influenced by reduced accessibility. It is often difficult for rural children to achieve physical activity through participation on school sports teams, as school bus schedules do not accommodate after school activities and many parents in rural areas commute a long distance for work, making early drop off or late pick up next to impossible³⁶. This problem is exacerbated by the fact that rural schools are often located at the fringes of towns, beyond walking distance of residential areas. If schools were more centrally located children and youth would have much more flexibility in their physical activity pursuits.

When free recreational facilities, such as parks and schools, are located close to places of residence, low-income families are more likely to be active³⁷. An example of a low cost recreational opportunity in rural communities is trails, but these trails need to be well maintained, connected, and easily accessible. Middlesex County already has some excellent trail systems, but more can be done to increase their connectivity throughout the County.

The final key factor of accessibility related to recreational physical activity is the availability of programs. While not specifically related to the built environment, having affordable, centrally located, more diverse, family-friendly programming helps existing recreational opportunities to be used to their fullest extent¹⁵. It is also important to target specific population groups, such as children, youth, and older adults, who need age-specific programming^{15, 34}. Finally, programming needs to be accessible to all. In many rural settlements there tends to be a focus on **high performance sport** (e.g., competitive level hockey, baseball), leaving those looking for **non-competitive recreational sport** without programs in which to participate³⁶.

2.4. Policy Scan and Recommendations

Scans of current policy that govern Middlesex County revealed several references to active living, including active transportation and recreational physical activity. Local planners frequently refer to the importance of parks, greenspace, recreational facilities, and active travel infrastructure in their role of creating healthy communities. The *Provincial Policy Statement* has bold language about the importance of creating healthy communities, including providing active transportation infrastructure, parkland, and recreational facilities for use by residents. *The Planning Act* supports the need for adequate pedestrian infrastructure, but more significantly requires 5% of all developed land to be conveyed to the local municipality for parks or other recreational purposes. One exception is in cases of cash-in-lieu where the value of the land is paid for parks of recreational purposes elsewhere in the settlement area.

The *Middlesex County Official Plan* builds on *The Planning Act* and the *Provincial Policy Statement* by providing additional language supportive of building healthy communities. In particular, pedestrian infrastructure is supported in 2.4.2.2 (e) stating, “The County shall encourage safe, convenient and visually appealing pedestrian facilities in settlement areas.” Section 4.5.1 elaborates on “encourages pedestrian facilities to be used” by saying that the municipality “may require” sidewalks to be built. This policy statement promotes and supports active transportation infrastructure. Similarly, the *Official Plan* is supportive of parks and recreational facilities in statements 3.2.3, 3.2.4.1, 3.2.5.1, and 3.3.3, which acknowledge recreational facilities as one of the permitted uses for urban areas, community areas, and agricultural areas.

The County shall encourage safe, convenient and visually appealing pedestrian facilities in settlement areas

~ Middlesex County
Official Plan, 2.4.2.2 (e)

2.4.1. Policy Recommendations

The following policy recommendations regarding active living are based on the policy scan previously described, a review of other relevant policy-related documents, and interviews with planners and other key officials working within Middlesex County.

Active transportation infrastructure

- Develop sidewalk policies to evaluate where sidewalks are needed and the parameters of sidewalk construction, replacement, funding, and winter maintenance;
- Provide sidewalks in all areas, but particularly in areas of high pedestrian traffic, such as along roads linking to schools or community facilities, in residential developments, within retail or service areas, or where needed to link to the present active transportation network;
- Where possible, utilize natural heritage corridors to facilitate walking and cycling for both recreational and every day travel in accordance with a walking and cycling network plan;
- Develop, maintain, and promote well-connected active transportation networks, including existing and proposed cycling, pedestrian, and trail routes;
- Provide infrastructure and design elements to facilitate active transportation in rural settlement areas, such as bike racks, benches, and shelters.

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- Provide amenities and built form that will best support active transportation in all new residential, commercial, and industrial developments, including sidewalks on both sides of the street, bike lanes, and a well-connected trail network.
- Encourage a mix of land uses to enable shorter trip distances between homes and key destinations such as shops, schools, and workplaces to reduce dependence on automobiles and promote physical activity for discretionary activities;
- Encourage new institutional land uses such as schools, community centres, recreation facilities, or churches, to locate near existing activity nodes or identified corridors;
- Housing, particularly for groups with mobility constraints, will be located within walking distance of community supports and shopping;
- Encourage new parks and open spaces to be connected with an active transportation network to facilitate safe, pleasant connections for walking and cycling for recreation and everyday active transportation.

Recreational physical activity

- Develop a program of on-going investment focused on maintaining and upgrading current recreation facilities to meet both current and future demand;
- Promote the lighting of parks and walking trails in rural settlements after dusk, to promote physical activity through increased safety;
- Promote community design that provides opportunities for sport, recreation, and physical activity by increasing access to public spaces where people of all ages and abilities can be physically active in settlement areas and rural settings.

2.4.2. Additional Supportive Strategies to Complement Official Plans

- Conduct an assessment of active transportation infrastructure to evaluate existing infrastructure, condition, and future needs;
- Encourage municipalities to develop and maintain an active transportation **master plan**;
- Develop a safe cycling plan for the county and encourage each municipality to consider developing a safe cycling plan;
- Encourage municipalities to develop and maintain a recreation master plan;
- Adopt a physical activity charter (i.e. the international Toronto Charter for Physical Activity) within Middlesex County and encourage the endorsement and implementation of the Charter among individual municipalities to help guide and influence policies that promote physical activity;
- Promote awareness of the importance of resident physical activity among politicians, municipal and county staff, engineers, and other decision makers;
- Engage the community to understand the needs of different groups. This will assist in making informed decisions pertaining to necessary equipment, skills, and transportation costs for physical activity opportunities.

3. Road Safety

3.1. What it is and why it matters

Motor vehicle collisions (MVCs) and related **road safety** is an important component of a healthy community, as MVCs have been identified as a leading cause of death and injury in Ontario⁴⁷. While there has been a significant decline in the number of serious collisions in Ontario since 1988, there are still over 65,000 serious collisions a year, 64,514 of which cause injury and 579 of which cause death⁴⁸. While data on the number of deaths due to MVCs in Middlesex-London are currently unavailable, data from the Trauma Program at the London Health Sciences



Centre (LHSC) indicates that a total of 242 adult residents of Middlesex-London were severely injured in MVCs between 2007 and 2011; 20% of those being pedestrians and 6% being cyclists. While the majority of these collisions occur within the urban environment where traffic volumes are heaviest, a high proportion of fatal collisions occur on rural roads and highways where infrastructure and high speeds are a greater concern^{49, 50}. For instance, 56.6% of 2,000 fatal collisions across Canada occurred on rural roads⁵¹.

A portion of the MVCs on rural roads involve vulnerable road users, such as pedestrians and cyclists. Although there are relatively few vulnerable road users in rural areas compared to urban areas, there were still approximately 270 pedestrian fatalities and 150 cyclist fatalities on rural roads in Canada between 2004 and 2006. Fewer vulnerable road users on rural roads can be attributed to a lack of perceived road safety. Road safety is one of the most significant barriers to active transportation^{15, 35-37, 45}. Numerous factors have been found to be associated with road safety and MVCs, such as speed, young drivers, alcohol, traffic conditions, distracted drivers, weather, and the built environment. It is the latter factor, the built environment, which can be modified through official planning policy to increase safety and decrease MVCs on rural roads⁵².

What is known about Road Safety in Middlesex-London?

- MVCs are a leading cause of unintentional injuries in Middlesex-London;
- Middlesex County residents are more likely to be injured (1.5-1.9 times) or die (2.3 times) from MVCs than residents in London;
- Middlesex County residents are more likely to be hospitalized (4.6 times) and more likely to visit an emergency department (5.4 times) due to off-road MVCs than residents in London;
- A total of 242 adult residents of Middlesex-London were severely injured in MVCs and treated at LHSC between 2007 and 2011; 20% were pedestrians and 6% were cyclists.

Middlesex-London Health Unit, 2012⁵³, Charyk-Stewart, 2013⁵⁴, Middlesex-London Health Unit, 2011⁵⁵

3.2. Built Environment Influences on Road Safety

The link between MVCs and rural roads is important to acknowledge from a public health perspective. MVCs are preventable and are generally attributed to factors such as young drivers, speeding, alcohol, or some combination of the three⁵⁶. The built environment can also play an important role in the seriousness of MVCs on rural roads, including the following three components: low population density, road design, and poor separation of pedestrians and cyclists from vehicular traffic^{15, 49}.

Low population density leads to longer distances between destinations and **travel exposure** (e.g., km of travel, time spent in traffic)⁵⁸ which is a major concern in rural areas⁵⁷. Increased travel exposure is directly linked to an increase in the per capita MVC rate, and therefore risk of injury or death⁵⁹. The greater travel distances within rural communities also affect the response time of emergency medical services, which could lead to worsening of injuries and higher fatality rates⁶⁰. One potential solution to decrease travel exposure within rural communities is to reduce the number of cars on the road through initiatives such as carpooling programs.

Road design is an important component capable of reducing MVCs, but influencing policy related to road design is complex as the responsibility for developing and maintaining different roads lies with different levels of government: provincial, county, and municipal. The purpose, speed, length, and volume of these roads also vary. Due to the three-tiered road authority, extensive changes to the road design or application of built environment policies requires cooperation between the three levels of government and understanding of the type and purpose of each road. For example, local roads are ideal for **complete streets** infrastructure while active transportation is prohibited on 400 series highways and therefore, infrastructure such as bike paths would be unnecessary.

Rural road design is also found to be more hazardous⁶¹ due to features such as small, or no, shoulders, ditches and trees or utility poles in close proximity to the road. Such features increase the chance and severity of run-off-road MVCs and vehicle rollovers^{61, 62}. The lack of medians dividing high speed roads in rural areas also increases the chance of head-on collisions^{61, 62}. During an interview, a local planner indicated that wide road allowances in rural residential areas lead to more speeding. All of these issues can be minimized by designing roads for their desired purpose and speed. Additional traffic-calming measures and complete streets infrastructure for pedestrians and cyclists can also be used on appropriate streets to increase safety of road users⁶³.

Road safety is also a barrier for active travellers (e.g. pedestrians and cyclists). Rural areas contain many through-roads that are used to commute between settlement areas, making speed limits high at times, thereby causing concern among those who want to use active transportation^{15, 35-37, 45}. The main safety issue related to rural roads is the poor separation of pedestrians and cyclists from vehicular traffic¹⁵. While

Goal:

- Decrease the number of injuries and deaths among all road users by providing a safe transportation system.

Objectives:

1. Provide infrastructure based on design principles that increase safety for all road users and transportation modes;
2. Develop and enhance policies that support comfortable, safe, and secure transportation networks for all road users.



sidewalks increase separation, they are not economically feasible on roads between settlements.

A concept to help improve safety among all road users is that of complete streets. Complete streets “are designed and operated to enable safe access for all users, including pedestrians, cyclists, and motorists... of all ages and abilities”⁶⁴. In rural settlements, complete streets are designed with similar features as in urban areas. Roads are designed for use by cars and bicycles, with designated bicycle lanes on all roads with high traffic volume. Providing sidewalks on both sides of the street gives pedestrians a safe place to walk. Busy, high speed county roads should primarily be used by motorized vehicles, but paved county roads with lower traffic volumes and paved concession roads can be made safer by applying the complete streets philosophy. Paving the shoulders

can provide a surface to make active transportation safer^{35, 36}. Paved shoulders also increase motor-vehicle safety and decrease maintenance costs. Ideally, a well-connected, county-wide network would be created that avoids high volume roads or those with a large number of farm-related vehicles and trucks. The use of “Share the Road” signs can also help direct cyclists to preferred routes and informs vehicle drivers to be extra aware of vulnerable road users.

Local engineers have recently begun to incorporate road design features into county and local roads that improve road safety for all road users by integrating the complete street philosophy. For example, Thames Centre has begun to pave shoulders within their jurisdiction and an old bridge in Dorchester is being converted into a pedestrian bridge to facilitate active transportation. A new bridge is also being built for all road users in Strathroy.

3.3. Policy Scan and Recommendations

A review of current planning documents that govern Middlesex County reveals limited references to road safety; however, the *Provincial Policy Statement* does refer to transportation systems needing to be safe while *the Planning Act* and *Middlesex County Official Plan* do not specifically reference road safety. Transportation is an integral part of all planning documents and provides an excellent opportunity to integrate road features that promote safety. While local planners have indicated in interviews that county and municipal engineers are responsible for the design of roads, official plans can be strengthened to support the development of safer roads.

Healthy, active communities should be promoted by: planning public streets, spaces, and facilities to be safe, meet the needs of pedestrians, and facilitate pedestrian and non-motorized movement, including but not limited to, walking and cycling.

~ Provincial Policy Statement
2005, 1.5.1

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3.3.1. Policy Recommendations

The following policy recommendations regarding road safety are based on the policy scan previously described, a review of other relevant policy-related documents, and interviews with planners and other key officials working within Middlesex County.

- Incorporate road safety features into road design when repaving existing major roads and undivided highways;
- Design roads that are properly suited for the desired speed limit of traffic;
- Consider traffic-calming measures where appropriate when designing new roads or redesigning older roads in settlement areas;
- Encourage the development and maintenance of road design that supports safe and convenient active transportation for all users;
- Encourage roads that are to be repaved to include a wide paved shoulder, where appropriate, to facilitate active transportation between settlements;
- Create "Share the Road" routes to facilitate safe cycling between settlements;
- Increase neighbourhood densities and land use mix in settlement areas to increase accessibility to amenities and resources to reduce automobile dependency, and reduce risk of injury from travel exposure.

Appropriate development standards should be promoted which facilitate intensification, redevelopment, and compact form, while maintaining appropriate levels of public health and safety.

~ **Provincial Policy Statement 2005, 1.1.3.4**

3.3.2. Additional Supportive Strategies to Complement Official Plans

- Encourage road design with clear sight lines at intersections to maximize visibility of all road users;
- Ensure adequate snow removal at sidewalks and crosswalks to allow drivers to see pedestrians;
- Encourage the creation of transportation, walking, and cycling master plans that address road safety;
- Integrate design features, such as textured pavement, reflective paint, and paved shoulders, into municipal master plans, which improve safety and injury prevention on roads;
- Encourage municipalities to work together to provide continuity of cycling infrastructure routes and off road trails;
- Use "Share the Road" signs to identify preferred cycling routes;
- Conduct audits of local built environments to assess their safety for pedestrians and cyclists and to identify where improvements are needed (e.g., lighting, signage, crosswalks). Excellent opportunity for collaboration between municipal councils and staff, police, school boards, community organizations, and different groups in the community, including elementary and secondary school students.

4. Food Systems and Healthy Eating

4.1. What it is and why it matters

There is broad agreement that the consumption of nutritious food contributes significantly to a healthy lifestyle⁶⁵. To meet this goal, *Eating Well with Canada's Food Guide* suggests adult daily consumption, varying by age and gender, of 7 to 10 servings of vegetables and fruit⁶⁶. Following *Canada's Food Guide* will help individuals to “meet your needs for vitamins, minerals and other nutrients; reduce your risk of obesity, type 2 diabetes, heart disease, certain types of cancer and osteoporosis; and contribute to your overall health and vitality.” In Middlesex-London, the proportion of the population eating five or more servings of fruit and vegetables per day declined between 2003 and 2010¹⁸. Currently only 40% of the population indicates they eat 5 or more servings of vegetables and fruit per day¹⁸. Although most people do have a certain degree of choice in deciding what food to consume, various social, economic, and geographic elements affect these choices.

As a means of addressing the concern for healthy eating, advocates frequently call for the strengthening of the local **food system** and the use of food systems planning. The sale of local food often occurs through farmers' markets, which have been shown to improve the availability and affordability of local, nutritious food^{67, 68}. Although local food systems cannot be considered a complete solution to concerns of sustainability⁶⁹, and there is some question as to their ability to replace the current food system altogether⁷⁰, there are ways to integrate more sustainable practices into local/regional food systems. Shortened **food supply chains** and regionalized food networks that take into account the competitive advantages of certain regions can help restore agricultural land to productive use⁷¹.

Additionally, food system planning offers the opportunity for a diverse range of stakeholders to convene and advance the dialogue around local best practices for enriching their food system and improving public health^{72, 73}. The idea is to consider food system issues in conventional planning methods and discourse. By doing so, a primary goal is to help correct social and economic inequalities related to the built environment through planning interventions.

What is known about Food Systems and Healthy Eating in Middlesex-London?

- Nearly 40% of the population of Middlesex-London reported that they ate five or more servings of vegetables and fruit per day in 2009/10;
- Females were more likely to report eating five servings of vegetables and fruit per day than males in 2009/10. This difference was statistically significant;
- There was a decrease in the proportion of the population eating five or more servings of vegetables and fruit per day between 2003 and 2010 in Middlesex-London;
- A 2007 report finds females with a post-secondary education more likely to consume at least five servings of vegetables and fruit per day compared to men and those with lower education;
- In 2010, the average distance to the nearest grocery store for households in Middlesex County was over 5 km; whereas the average distance to the nearest fast food restaurant was less than 3.5 km;
- A study of household accessibility to food outlets in Middlesex County in 2010 indicated that residents in the most socio-economically disadvantaged neighbourhoods tended to have better accessibility to all types of food retailers.

Middlesex-London Health Unit, 2013¹⁸, Sadler et al., 2011⁷⁴

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4.2. Built Environment Influences on Food Systems and Healthy Eating

Geographic proximity to food stores has received increased attention in recent years. Researchers and practitioners have coined terms such as ‘food deserts’ and ‘food swamps’ to refer to areas that either have poor access to nutritious, affordable food (deserts) or access to too many stores selling cheap, less healthy food (swamps)⁷⁵. These concepts are important as the distribution of nutritious food outlets can influence consumption behaviour and ultimately health⁷⁶.

Goal:

- Increase the intake of healthy foods among residents by increasing the accessibility, affordability, and sustainability of the local food system.

Objectives:

1. Preserve and protect agricultural land and potential food production locations;
2. Increase availability of land for residents to grow and share fresh local food;
3. Develop and enhance policies that support the availability and affordability of healthy foods.

People tend to shop close to where they live; however, the increased travel distances within rural communities lead to a need to shop for groceries with the assistance of an automobile. A travel survey conducted in eastern Ontario showed that cars are the mode of transportation for 90% of all trips greater than 2 kilometres⁷⁷. Because most food shopping trips in a rural area would surpass this distance – e.g., in 2010, the average distance to the nearest grocery store for households in Middlesex County was over 5 km⁷⁴ – rural residents without an automobile are at a considerable disadvantage when compared to their urban counterparts. Among residents with restricted mobility (e.g., due to lack of a vehicle), the need to shop close to home can translate into poorer dietary habits^{78, 79}.



Among low-income consumers, poor dietary habits may be related to larger social inequalities⁸⁰. Not only are low-income consumers less likely to own automobiles, they may also lack the money to make long trips to distant grocery stores⁸¹. Studies have shown that residents who shop at local variety stores may pay 30 to 76 percent more for groceries than if they had shopped at a larger chain store⁸². Unless low-income residents live close to a grocery store, they may be forced to shop at more expensive variety stores offering fewer nutritious food options. Other research has also found that fast food restaurants are more prevalent in low-income neighbourhoods^{10, 72, 83} and that fast food consumption is more prevalent among low-income consumers⁸⁴. In urban areas, emergency

food outlets are also more common and more easily accessible. In Middlesex County, local research has shown that rural residents with lower incomes tend to cluster in settlement areas, and as seen in Figure 6: *Access to Healthy Food Retailers*, grocery stores are also more likely to be found in the larger rural settlement areas⁷⁴.

Linking what has been discussed regarding healthy diets and access to nutritious foods, studies have now shown an increased prevalence of obesity and other illnesses in neighbourhoods where residents have poorer access to nutritious foods^{65, 79}. Multiple researchers suggest evidence for the ‘food desert’ hypothesis: lower obesity rates have been found among people living closer to nutritious food options^{79, 85}. The ‘food swamp’ hypothesis has also received support: obesity rates are higher among people who live, or go to school, in neighbourhoods that have greater density of, or proximity to, fast food restaurants and variety stores⁸⁶.

Many of the methods and results of urban **food access** studies are only relevant at the settlement area level since food environments and food access are frequently experienced differently in a city versus a village or other small rural settlement. Residents in urban areas cope with the departure of nutritious foods from the city’s core (necessitating bus travel to suburban stores), while the reduced concentration of food retailing in rural areas often means the closure of a hometown grocery store (for some the only source of nutritious food)⁸⁷. These changes thereby discourage large food retailers from re-opening in small towns due to a lack of population.

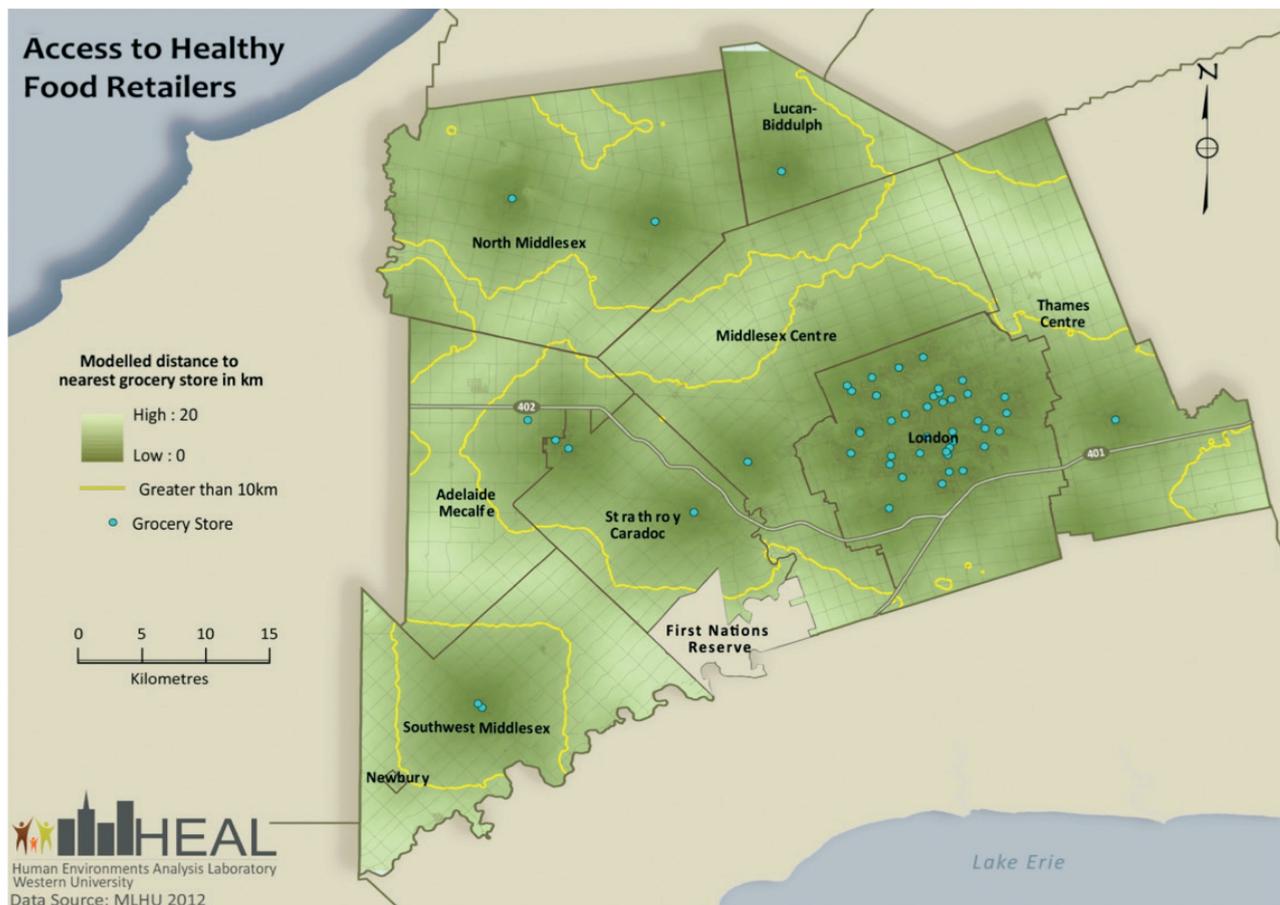


Figure 6: Access to Healthy Food Retailers in Middlesex County, 2012

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In spite of these difficulties often faced by residents in rural areas, there are a number of solutions to food insecurity and accessibility to nutritious foods. Shuttle programs are now used in many rural communities to address the lack of public transportation. A few examples of this exist in Middlesex County. In Strathroy, special taxis offer a flat-rate of \$5 to reach anywhere in town. This may be cost-effective for people needing to make a big shopping trip. In Thorndale, a bus service provides older adult residents access to a grocery store in St. Mary's (in Perth County).

Middlesex County also has a commitment to supporting affordable housing in population centres where healthy food is more accessible, as well as instituting skill-building opportunities for residents to learn more about cooking and preparing healthy meals⁸⁸. Generally, the presence of affordable housing can help improve food security by lessening the financial demands of paying for housing and freeing up more money to purchase food.

Some communities are encouraging the strengthening of the local food system through programs such as community gardens, which can not only serve as a source of healthy food for individuals and families but for soup kitchens and other charitable food distribution activities as well. An interview with one official in Middlesex County discussed the community initiated efforts within Lucan Biddulph to achieve this goal of building community gardens, which can now be found next to the Community Centre in Lucan. In the United States, farm-to-school programs have been used to improve food security among students, strengthen local economies, and preserve farmland⁸⁹. The presence of abundant agricultural land is also



a potential advantage for rural areas—especially where farming by large-scale corporations has not fully replaced smaller-scale farming—because it can be used to help strengthen the development of the local food system through retaining more money in the local community. Even in rural settlement areas, the presence of parks and large private yards (typically larger than those in cities) offers the opportunity to create community gardens and private gardening plots, which can help strengthen the economy and increase access to healthy foods.

Farmers' markets have also been implemented as an economic alternative to full-scale grocery stores in some urban and rural communities⁶⁷ throughout Ontario (www.farmersmarketsOntario.com). Examples from Middlesex County include seasonal markets such as the Ilderton Farmer's Market which occupies a municipal parking lot on Saturday mornings from mid-June to mid-October, and year-round markets such as the Trails End Farmer's Market, which is located on a permanent site outside of Thorndale. In the absence of funding for a large-scale grocery store, programs such as these improve access to healthy local food⁹⁰.

“Trends in food retailing associated with the consolidation of smaller-format retailers into fewer, larger-format supercentres have left some rural areas with fewer sources of nutritious, affordable food.”

~ Sadler, Gilliland & Arku 2011

There is already a strong commitment to protect agricultural land in Middlesex County, by instituting zoning legislation that encourages development in existing population centres⁸⁸. Middlesex County also encourages the use of sustainable farming practices to improve long-term viability of farmland⁸⁸. Additional techniques used in other rural communities include programs such as farmland trusts, which are used to ensure the preservation of agricultural land uses on productive farmland. The program presented above offer opportunities to increase economic and social integration of the farming community with local residents and helps to eliminate inequalities in access to healthy food.



4.3. Policy Scan and Recommendations

A review of current planning documents that govern Middlesex County reveals limited references to food systems and healthy eating. The current policy statements related to the food system are related to economic prosperity and the challenges of globalization. The *Provincial Policy Statement* Section 1.1.4.1 states, “In rural areas located in municipalities...locally-important agricultural and resource areas should be designated and protected by directing non-related development to areas where it will not constrain these uses.” This statement is not directly related to food systems and healthy eating, but focuses on the preservation of agricultural land in municipalities, and therefore serves to protect the local food system. Additionally, section 1.7.1 of the *Provincial Policy Statement* recognizes that “long-term economic prosperity should be supported by...promoting the sustainability of the agri-food sector by protecting agricultural resources and minimizing land use conflicts.” This policy encourages the promotion of sustainable farming practices, but does not explicitly enable techniques to strengthen the food system and public health in the rural environment. Middlesex County and its municipalities are also supportive of the protection of agricultural land. The *Middlesex County Official Plan* (1.2) states “the protection of the agricultural community” as a core objective within the Strategic Plan.

4.3.1. Policy Recommendations

The following policy recommendations regarding Food Systems and Healthy Eating are based on the policy scan previously described, a review of other relevant policy-related documents, and interviews with planners and other key officials working within Middlesex County.

- Create enabling legislation (including modifications to zoning bylaws) that encourages small-scale farmers and would-be gardeners in the community to grow food in unconventional locations, such as backyards, schoolyards, and church properties, as well as underutilized public open spaces and parks where appropriate;
- Encourage the use of sustainable agricultural techniques and best management practices;
- Create policies that facilitate the formation of farmers’ markets in small communities (especially those without grocery stores);

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- Create an expedited development approval and zoning review process for operations with a focus on supporting local or **sustainable agriculture**;
- Mandate mixed-use zoning in new developments over a certain size – to direct new food retail facilities to open in close proximity to residences;
- Promote diversity of housing choice, including affordable and mixed-income options;
- Create policies that direct and support new housing developments to locate near existing food retailers;
- Explore changes to the zoning code that would limit the opening of fast food and less healthy food outlets, especially near schools and low-income neighbourhoods.

4.3.2. Additional Supportive Strategies to Complement Official Plans

- Adopt a Food Charter for Middlesex County and encourage the endorsement and implementation of the Charter among individual municipalities to help guide and influence policies that promote healthy eating, access to healthy local food, and sustainability of the local food system;
- Collaborate with local schools, gardeners, and organizations involved in addressing food insecurity to develop initiatives aimed at educating the community about the importance of the local food system;
- Collaborate with parks and recreation departments, local schools, community gardeners, institutions, and organizations involved in local food to address food insecurity through identification of opportunities throughout Middlesex County for growing food in unconventional locations, such as underutilized institutional lands and municipal parks where appropriate;
- Work cooperatively to identify opportunities throughout the County for establishing seasonal farmers' markets in unconventional locations, such as underutilized institutional lands and/or parking lots, where appropriate, especially in communities without grocery stores or other healthy food retailers;
- Study the feasibility of creating a farmland trust or utilizing an existing one to protect farmland from urban development and limit fragmentation of existing farmland;
- Support incentive programs for grocery stores and other healthy food retailers to locate in underserved rural settlement areas;
- Support incentive programs for existing small food retailers to carry more healthy foods and/or to partner with local growers, farmers' markets, local food programs, or community supported agriculture operations;
- Link local food producers and area farmers with institutional bodies (including schools, hospitals, and nursing homes) to source food locally as a means of strengthening the local food system.

5. Social Capital and Mental Well-being

5.1. What it is and why it matters

Social capital is defined as “the degree of citizen involvement in a community, the degree to which people know and trust their neighbours, and the numerous social interactions and transactions that people have as we go about our daily business”⁹¹. Measurements that are often used to define social capital include social networks, political and civic participation, sense of community, feelings of inclusion/isolation, level of trust, number of social ties, and general level of community satisfaction⁹². Despite its recognized importance, social capital is measured less often than other dimensions of well-being. **Mental well-being** is defined as a state where people realize their potential, can cope with the normal stresses of life, work productively and fruitfully, and are able to make a contribution to the community. Research on mental well-being has overwhelmingly focussed on individual determinants, such as depression, anxiety, and stress, it is increasingly recognized that social capital is a determinant in its own right.

The most common variables used to evaluate social capital are sense of belonging and trust in others. A study of social capital among Ontario residents found that only 66% of people felt some level of belonging to their local communities and 56% felt that people can be trusted⁹³. Meanwhile, a recent study of residents in Middlesex-London revealed that 70% of residents feel a sense of belonging to their community⁵³. Studies also suggest that older adults in Ontario feel a greater sense of belonging to their local community than do youth^{93, 94}; however, both groups feel a greater sense of belonging than working adults⁹⁵. Additionally, those residing in rural communities were more likely to feel a strong sense of belonging than those living in urban areas⁹³. According to findings from Statistics Canada’s 2003 General Social Survey (GSS) on Social Engagement in Canada, over one-half (54%) of individuals who lived in rural and small town areas said they know most of the people in their neighbourhood, while this was the case for less than one out of five (17%) individuals in Canada’s largest cities⁹³.

Results from the GSS also show that levels of ‘life satisfaction’ were highest among people who reported a very strong sense of belonging to their community^{93, 96}. As Putnam⁹⁷ states, “the single most common finding from a half century’s research on the correlates of life satisfaction, [from] around the world, is that happiness is best predicted by the breadth and depth of one’s social connections”. Social capital is even implicated in childhood development, where children’s emotional and cognitive development is better facilitated in communities with greater social capital⁹⁸.

Social capital has long been associated with physical and mental well-being⁹⁹. Those living in places with high social capital have a higher probability of being healthier and living a prolonged life and a lower probability of being inflicted with chronic illness and cardiovascular diseases^{92, 100, 101}. Analysis of Canadian Community Health Survey data indicates that “close to two-thirds of those who felt a very strong or somewhat strong sense of belonging reported excellent or very good general health. By contrast, about half (51%) of those with weak sense of belonging viewed their general health favourably”¹⁰². Residents living in environments with poor social capital are also at greater risk of poor mental health¹⁰¹.

Several studies have indicated that residents of rural areas benefit from higher social capital^{93, 101}; however, at least one study also suggests that residents of rural areas suffer from greater incidence of mental health issues¹⁰³. The issues of mental health and social capital in rural areas are different than in urban areas. In particular, the increased distance between rural settlements increases the chance that residents

Residents in rural areas and rural settlements were more likely to feel a strong sense of belonging to their communities than those living in urban areas.

~Schellenberg, 2004

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experience higher levels of geographic or social isolation. The centralization of social gathering places, such as community centres, parks, and arenas, to larger rural settlements, may add to this potential isolation by making it difficult for residents in smaller communities to stay connected with their neighbours. This isolation is of most concern to vulnerable population groups, due to their inability to travel⁸. Distance, which is inherent to rural living, can be minimized to some degree by the built environment.

What is known about Social Capital and Mental Well-being in Middlesex-London?

- 70% of Middlesex-London residents experience a sense of belonging. This rate is somewhat higher than the rest of Ontario;
- 95% of Middlesex-London residents rate their mental health to be good, very good, or excellent. This rate is similar to the rest of Ontario;
- 1 in 4 residents in Middlesex-London report feeling that most days in their life are quite a bit or extremely stressful;
- 91% of Middlesex-London residents were satisfied with their life in 2009.

Middlesex-London Health Unit, 2011⁵³

5.2. Rural Built Environment Influences on Social Capital and Mental Well-being

Recent research has established a link between mental health issues and characteristics of neighbourhood environments¹⁰⁴. The literature finds five key factors of rural built environment linked to social capital and mental well-being: population density; the availability and accessibility of social, recreational, and greenspace destinations; diverse housing; land-use mix; and safety.

Low-density development has been found to be associated with decreased mental health and social capital. It has been argued that increased commute distance and travel exposure can lead to feelings of frustration and stress that can facilitate a depressive state^{92, 105}. Studies suggest that long-distance commuters tend to lack a strong sense of belonging, social ties, and trust with their community^{106, 107}. In such scenarios, community time is replaced with commuting, meaning that drivers have less time to spend with family

Goal:

- Increase social interaction, enhance social capital, and promote mental well-being of residents through well-designed built environments.

Objectives:

1. Encourage **complete communities** with a diverse mix of housing types and affordability to accommodate residents of all backgrounds and promote healthy **aging in place**;
2. Encourage complete communities with compact neighbourhood forms and mixed land uses to facilitate access to neighbours, shops, and schools to reduce the amount of time spent commuting outside the community;
3. Provide well-designed public spaces to foster safe interaction among residents of all ages and backgrounds;
4. Expand and maintain a system of publicly accessible parks, nature trails, and other greenspaces to support increased contact with natural environments.

and friends and less time to get involved in community and civic affairs^{97, 106}. This could particularly be a concern for those Middlesex County residents who live in bedroom communities where they live in the County but continue to work and play in the city. Conversely, those people who live in compact and walkable neighbourhoods are more likely to know their neighbours, be civically engaged, and feel a stronger sense of community¹⁰⁸. This is especially true where walkability combines with opportunities for social interaction¹⁰⁹, which is of particular importance for groups with mobility restrictions (i.e. older adults, people with a physical disability, women)¹⁰⁷.

The second factor found to promote social capital is that of the availability and accessibility of social, recreational, and greenspace destinations. Social hubs, such as greenspaces, local schools, recreational facilities, and stores, are vital focal points for social interaction, community activity, and providing things to do and places to do them⁹². In many of the key informant interviews, community and recreation centres were identified as important community gathering places. Promoting the use of these facilities strengthens social capital. Creating recreational and social hubs within Middlesex County can also help to retain residents, or draw new residents and tourists, as these features help create a complete community where people can live, learn, shop, and play.

One type of social hub that has multiple benefits to both mental health and social capital is greenspace. Exposure to natural environments has been found to reduce symptoms of anxiety, anger, violence¹¹⁰ and



mental illness¹⁰⁷, while improving social and cognitive function¹¹¹. Greenspace also has additional benefits such as offering ideal places for unstructured, creative play, which is important for a child's physical and social development¹¹². Furthermore, shade from natural features such as trees, provides protection from the sun and encourages parents to allow their children to play there as it is one of the most significant factors in parents' preferences for play areas for their children, and also protects them from skin damage and cancer causing ultraviolet rays¹¹³. Therefore, providing accessible greenspace should be promoted.

Local planners also believe that housing diversification can allow people from different backgrounds and stages of the life cycle to coexist. Diversity of housing particularly helps to enable aging in place, which is the ability for a person to remain an independent member of their community by providing housing options appropriate to their life stage. The desire

to promote housing diversification in Middlesex County is already very strong, with stakeholders recognizing it as a vital component of resident retention and promotion of their well-being.

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The fourth factor and the most effective way to promote diversity of social and recreational opportunities is diverse land use mix¹⁰⁸. In various interviews, local planners and policy makers indicated that having a diverse land use mix, combined with sufficient density, creates a rich, stimulating environment that fosters social capital through pedestrian activity, socialization, and recreational activities.

Lastly, safety concerns decrease the likelihood of residents engaging in physical or social activity, even if accessible opportunities exist⁹². To improve safety, both real and perceived, planners and policy makers can make

alterations to the built environment to improve safety related to roads and crime. Features that contribute to safety include sufficient lighting, availability of crosswalks or sidewalks, appropriate width and speeds of roads, clear separation of public and private land, improving the visibility of places in the neighbourhood to permit “eyes on the street”, and aesthetic improvements including fixing broken windows and removing or painting over graffiti^{105, 114}.

Addressing features of the rural built environment linked to social capital and mental well-being can help create complete communities within Middlesex County; that is, communities which any person, regardless of age, income, or lifestyle preference, can live comfortably and independently. Complete communities are, amongst other things, places with local access to different housing options, recreation, retail, transportation, and food. These combine the components necessary to best promote the creation and maintenance of social capital within a community. Although rural living by definition involves a greater degree of low-density development with limited facilities and services, the degree to which a settlement can ensure a safe, walkable community that provides access to a variety of social gathering places has a great impact on promoting both social capital and the mental well-being of residents¹¹⁵.

5.3 Policy Scan and Recommendations

The Provincial Policy Statement recognizes that the social well-being of Ontarians depends on promoting efficient land use and development patterns to support “strong, liveable and healthy communities.” It also promotes a mix of housing. For example, Section 1.4.3 states that “Planning authorities shall provide for an appropriate range of housing types and densities to meet projected requirements of current and future residents.” Beyond this, mentions of measures that support mental and social well-being in policy documents appear to be made from an economic development approach. For instance, the *Middlesex County Official Plan* supports the provision of a balanced mix of housing and the retention of educational, health, cultural, and religious facilities because such measures “add economic vitality and a **sense of place** where quality of life is considered a major attraction for growth and development” (2.3.4). These policies can be strengthened by also drawing attention to the positive impacts they have on the mental and social well-being of residents. Another example where the *Middlesex County Official Plan* already indirectly supports social capital is in its support of intensification and increased residential density within settlement areas (2.3.7.4). Municipalities are also encouraged to provide a range of land uses within settlement areas (2.3.8), and develop policies to promote affordable housing, including special needs housing (3.2.3).



5.3.1. Policy Recommendations

The following policy recommendations regarding social capital and mental well-being are based on the policy scan previously described, a review of other relevant policy-related documents, and interviews with planners and other key officials working within Middlesex County.

- Enact policies to ensure that increased density is pursued at every development or redevelopment opportunity;
- Encourage complete communities with compact neighbourhood forms and a balanced mix of land uses (e.g., residential, commercial, institutional) to facilitate access to neighbours, shops, schools, and public services and to reduce the amount of time spent commuting outside the community;
- Promote diversity of housing choice, including a mixture of dwelling types (including multi-unit options), affordable and mixed-income options, non-traditional arrangements (e.g., granny flats, live/work units), and universal design features (e.g., barrier free) to support more complete communities and foster aging in place;
- Promote well-designed parks, schools, and other public meeting spaces that may act as ‘social hubs’ to foster interactions among people from all backgrounds and stages of the life cycle;
- Encourage safe and easy public access to greenspace and other natural environments within close proximity to residential developments, schools, and workplaces.

5.3.2. Additional Supportive Strategies to Complement Official Plans

- Create, promote, and advocate for various policies to promote safety features, such as appropriate lighting, crosswalks or sidewalks, lower posted road speed, traffic calming measures, clear demarcation of public vs. private space, removing graffiti and other visible signs of neglect, and improving visibility and therefore the “natural surveillance” of an area, to remove fear-based barriers to active living and enhance social interaction among neighbours;
- Conduct an inventory of built environment opportunities for recreation and socialization to identify strengths and gaps in existing infrastructure;
- Encourage municipalities to develop and maintain a recreation master plan.



6. Conclusion

This report underlines the critical role that community design plays in supporting a safe, healthy, and active lifestyle in rural communities such as Middlesex County. Research evidence was presented on four topics of significant importance to the health of residents living in rural settings, specifically: 1) active living, 2) road safety, 3) food systems and healthy eating, and 4) social capital and mental well-being. The evidence and recommendations have shown how the rural built environment can be designed and retrofitted to promote healthier behaviours, increase safety, and improve population health.

This report will serve as a guiding document for future activities of the Middlesex-London Health Unit (MLHU) and the Healthy Community Partnership (HCP) in Middlesex County. By continuing to consult and work with municipal staff, stakeholder groups, and local residents throughout the County, it is the goal of the HCP to build community partnerships that guide policy development and facilitate healthier communities. There is strong evidence to indicate that land-use planning policies such as those found in official plans can help increase and improve the health and well-being of residents. This position paper provides many policy recommendations and additional strategies for the consideration of community partners working within Middlesex County. The recommendations in this document will also be useful for policymakers and stakeholders working in other rural contexts, particularly within Ontario. It is recognized that not all of the recommendations and strategies will be feasible, desirable or relevant for all rural municipalities, and that each municipality will implement recommendations and strategies according to their own priorities. Nevertheless, investment in infrastructure and commitment to policies that promote healthy communities are essential to ensure that governments continue to meet the health and safety needs of their citizens.

7. Glossary of Terms

Active Transportation: Any form of human powered transportation, including but not limited to walking, cycling, skateboarding, rollerblading, etc.

Aging in Place: The ability to live in one's own home and community safely, independently, and comfortably, regardless of age, income, or ability level.

Bedroom Community: A suburb or town with little to no major employment center to call its own. People only sleep there while working in a nearby city.

Built Environment: Human-made surroundings that provide the setting for human activity including land use patterns, transportation systems, and urban design.

Complete Communities: A great place to live, work, shop, and play. This means local access to options for food, transportation, housing, recreation, education, retail, and employment.

Complete Streets: Streets designed for all ages, abilities, and modes of travel. Providing safe and comfortable access for pedestrians, bicycles, transit users and the mobility-impaired is an integral planning feature and not an afterthought.

Food Access: Having sufficient resources, both economic and physical, to obtain appropriate foods for a nutritious and culturally appropriate diet, obtained in a socially acceptable manner.

Food Supply Chain: A system of organizations, people, activities, information, and resources involved in moving a food from production to distribution to consumption.

Food System: A system in which food production, processing, distribution and consumption are combined to improve the environmental, economic, social and nutritional health of a community.

Greenspace: Open, undeveloped land with natural vegetation that is maintained for recreational enjoyment, such as a park.

Healthy Communities: Places that are safe, contribute to a high quality of life, provide a strong sense of belonging and identity, and offer access to a wide range of health-promoting amenities, infrastructure, and opportunities for all residents.

High Performance Sport: A formal type of sport competition that requires high level of skill, time, and financial commitments to participate.

Master Plan: A document that identifies specific facilities, services and policies that a municipality will implement to serve the current and future population. It sets direction for a municipality's day-to-day programs and provides a basis for budget planning that is consistent with the growth management policies of the municipalities' official plan. Examples of a master plan include Transportation Master Plan, Active Transportation Master Plan, Parks and Recreation Master Plan, among others.

Mental Well-Being: A state where people realize their potential, can cope with the normal stresses of life, work productively and fruitfully, and are able to make a contribution to the community

Non-Competitive Recreational Sport: A type of sport participation that is primarily developed for fun and exercise rather than the competitiveness of the sport.

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Official Plan: A legal document prepared with input from members and organizations of the community, that helps to ensure future planning and development will meet the specific needs of the community.

Planning Act: Provincial legislation and a legal document that sets out the ground rules for land use planning in Ontario, describes how land uses may be controlled, and who may control them.

Provincial Policy Statement: A key component of Ontario's land use planning system, as it provides direction on matters of provincial interest related to land use planning and development, and guides the provincial "policy-led" planning system.

Public Health: All organized measures (whether public or private) to prevent disease, promote health, and prolong life among the population as a whole. Its activities aim to provide conditions in which people can be healthy and focus on entire populations, not on individual patients or diseases.

Road Safety: A set of methods and measures used to reduce the risk of a person being killed or injured using the road network, including pedestrians, cyclists, motorists, and their passengers.

Sense of Place: The feelings people have for particular locations and the meaning they gain from a relationship with these places.

Settlement Area: A populated place or community where people live. The population and size can range from hamlets to cities.

Social Capital: The degree of citizen involvement in a community, the degree to which people know and trust their neighbours, and the numerous social interactions and transactions that people have as they go about their daily business.

Sustainable Agriculture: A method of agriculture that attempts to ensure the long-term profitability of farms while preserving the environment.

Travel Exposure: The amount of time spent travelling and distance travelled in a given day.

Vulnerable Population Groups: Groups of people who are more susceptible to mobility and economic constraints which make living healthy lives more difficult, such as children, youth, older adults, women, people with a disability, low-income and recent immigrants.

8. Appendix 1: Statistical description of Middlesex County and municipalities

Municipality	Middlesex County		London		Adelaide Metcalfe		Lucan Biddulph		Middlesex Centre	
	Count	%	Count	%	Count	%	Count	%	Count	%
<i>Population</i>										
2006	69,913		350,206		3,117		4,187		15,589	
2011	73,000		366,151		3,028		4,338		16,487	
% Change		4.4%		4.6%		-2.9%		3.6%		5.8%
<i>Population Groups</i>										
<i>Seniors</i>										
2006	9,550	13.7%	47,440	13.5%	485	15.6%	445	10.6%	2,075	13.3%
2011	11,145	15.3%	53,640	14.6%	390	12.9%	545	12.6%	2,480	15.0%
Change in Proportion		1.6%		1.1%		-2.7%		1.9%		1.7%
<i>Children</i>										
2006	19,600	28.0%	85,155	24.3%	930	29.8%	1,200	28.7%	4,335	27.8%
2011	18,690	25.6%	84,140	23.0%	865	28.6%	1,160	26.7%	4,515	27.4%
Change in Proportion		-4.6%		-1.2%		-7.0%		-3.3%		4.2%
Under Low Income Cut-off (2006)	2,938	4.2%	39,982	11.4%	162	5.2%	192	4.6%	399	2.6%
Recent Immigrants (2001-2006)	270	0.4%	12,085	3.3%	-	0.0%	10	0.2%	70	0.4%
<i>Mode of Travel for Work (2006)</i>										
All Travellers for Work	32,905	100.0%	167,420	100.0%	1,355	100.0%	2,035	100.0%	7,305	100.0%
Auto	31,170	94.7%	139,475	83.3%	1,295	95.6%	1,920	94.3%	7,010	96.0%
Transit	115	0.3%	14,035	8.4%	-	0.0%	30	1.5%	40	0.5%
Walk/Cycle	1,470	4.5%	13,245	7.9%	40	3.0%	65	3.2%	270	3.7%
<i>Employment Location (2006)</i>										
Total Employed	37,920	100.0%	178,105	100.0%	1,710	100.0%	2,370	100.0%	8,485	100.0%
Inside Community	8,040	21.2%	134,610	75.6%	110	6.4%	285	12.0%	930	11.0%
Outside Community	21,075	55.6%	16,950	9.5%	1,095	64.0%	1,455	61.4%	5,580	65.8%
Telework	4,845	12.8%	9,630	5.4%	350	20.5%	325	13.7%	1,125	13.3%
Others (i.e., Out of Country)	3,960	10.4%	16,915	9.5%	155	9.1%	305	12.9%	850	10.0%

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Municipality	Newbury		North Middlesex		Southwest Middlesex		Strathroy-Caradoc		Thames Centre	
	Count	%	Count	%	Count	%	Count	%	Count	%
<i>Population</i>										
2006	439		6,740		5,890		19,977		13,085	
2011	447		6,658		5,860		20,978		13,000	
% Change		1.8%		-1.2%		-0.5%		5.0%		-0.6%
<i>Population Groups</i>										
<i>Seniors</i>										
2006	70	15.9%	985	14.6%	890	15.1%	2,955	14.8%	1,590	12.2%
2011	85	19.0%	1,060	15.9%	1,060	18.1%	3,525	16.8%	1,900	14.6%
Change in Proportion		3.1%		1.3%		3.0%		2.0%		2.5%
<i>Children</i>										
2006	125	28.5%	2,000	29.7%	1,485	25.2%	5,540	27.7%	3,675	28.1%
2011	115	25.7%	1,835	27.6%	1,360	23.2%	5,150	24.5%	3,375	26.0%
Change in Proportion		-8.0%		-8.3%		-8.4%		-7.0%		-8.2%
Under Low Income Cut-off (2006)	-	0.0%	217	3.2%	408	6.9%	1,084	5.4%	477	3.6%
Recent Immigrants (2001-2006)	-	0.0%	10	0.2%	-	0.0%	105	0.5%	75	0.6%
<i>Mode of Travel for Work (2006)</i>										
All Travellers for Work	190	100.0%	2,955	100.0%	2,625	100.0%	9,655	100.0%	6,480	100.0%
Auto	190	100.0%	2,785	94.2%	2,495	95.0%	9,000	93.2%	6,195	95.6%
Transit	-	0.0%	-	0.0%	10	0.4%	35	0.4%	-	0.0%
Walk/Cycle	-	0.0%	180	6.1%	100	3.8%	580	6.0%	225	3.5%
<i>Employment Location (2006)</i>										
Total Employed	200	100.0%	3,730	100.0%	3,120	100.0%	10,435	100.0%	7,540	100.0%
Inside Community	35	17.5%	690	18.5%	755	24.2%	4,065	39.0%	1,050	13.9%
Outside Community	140	70.0%	1,905	51.1%	1,570	50.3%	4,490	43.0%	4,750	63.0%
Telework	-	0.0%	760	20.4%	440	14.1%	775	7.4%	1,045	13.9%
Others (i.e., Out of Country)	25	12.5%	375	10.1%	355	11.4%	1,105	10.6%	695	9.2%

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