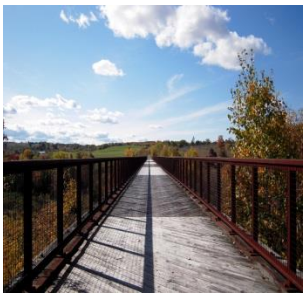




Healthy Rural Communities: Strategies and Models of Practice

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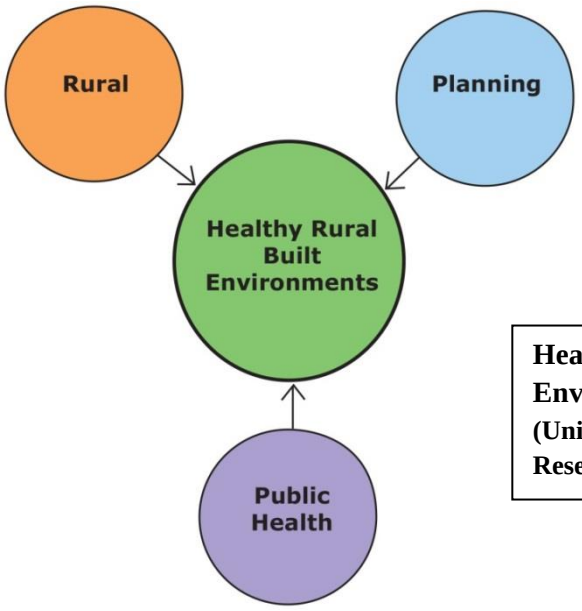
Appendices

Literature Review Methodology

The literature review was a collaborative effort between the University of Guelph Research Team and Public Health Units; particularly the Chatham-Kent Public Health Unit and Elgin St. Thomas Public Health. The process of working on the literature review began with some initial resource recommendations provided by the health units; these included both public health and planning related literature resources. The resources included grey literature; from all levels of government and academics, as well as published books and academic literature. Literature continued to be gathered throughout the course of review development. The decision to use specific pieces of literature was based on a variety of factors, including: recommendations by public health professionals and planning professionals, availability either through the University of Guelph library, internet searches or through bookstores, as well as the relevance of literature to the topic of healthy rural built environments.

While working through the content of the literature review, an overall vision for the project was kept in mind, which involved an integration of elements. These elements included: rural, public health and planning features and how they relate to 'healthy rural built environments'. A diagram was created which represents this concept:



Healthy Rural Built Environments Diagram (University of Guelph Research Team, 2013).

Healthy Rural Communities: Strategies and Models of Practice

Literature Review

This literature review establishes the context for the study "Evidence-informed strategies and models of practice for Healthy Rural Built Environments". This study has been funded by Public Health Ontario and includes a number of objectives. These are as follows:

- To identify existing effective land use planning policies and models of practice for healthy rural communities.
- To identify land use planning policies and practices that detract from creating a healthy rural community.
- To identify barriers and gaps in healthy community design from diverse rural settings.
- To identify criteria that will help to evaluate the relative merits of individual actions or strategies within a rural context.
- To develop a toolkit that will include recommendations for effective land use planning policies and models of practice that can help lead the future implementation.

This literature review necessarily takes a broad approach to the literature as it impacts rural communities. In this context it is important to remember that rural is broad by definition and as a result we have included issues and strategies that apply to sparsely dispersed rural communities and also to concentrated small urban settlements. The key point is that these strategies are identified and provide lessons that will help to inform subsequent research and next steps associated with this project.

Introduction

This literature review will explore the concept of “healthy communities” and consider what a healthy community may look like in rural Ontario. In the recent past, the concept of a ‘healthy community’ was considered to be an outcome of 'smart growth'. The ‘healthy community’ concept now appears to be evolving from a ‘smart growth’ perspective into a focused 'health-centred' approach to planning, one that places health as the desired outcome. This concept examines the impacts that the built environment has on health and how health outcomes may be improved through better planning of the built environment and the incorporation of sustainable practices.

A variety of background data and information will be provided on topics such as health, sustainability, rural planning, and the built environment. This is meant to provide a thorough understanding of the elements that are necessary in order to lay the foundations for “healthy rural communities”. A rural lens on various aspects of the built environment will be provided, as well as a thorough understanding of the importance of sustainability when planning for rural communities. Lastly, a variety of solutions will be provided to the complex problems that face rural communities, through focusing on social, environmental, recreational/cultural, and economic factors that are all related to and necessary for the formation of “healthy rural communities”.

CHAPTER 1: Current State of Health in Rural Communities

Health Definitions

The decision to start this paper with a discussion on the definition of health and the key determinants of health is based on using a 'health' lens to assess a community's well-being. In other words, a community can be judged by the health of its members and that all aspects of a community, including the economy and the environment (both the natural and the social/cultural environment) impact the health of an individual. Currently the primary enemies of good health are those that we as society impose on ourselves, an unhealthy environment, a deficiency in exercise, and bad nutrition (Jackson & Sinclair, 2012).

This is a broad view of health, taking into account the mental, social, physical and multi-generational aspect of a person's health, and by extension, a community. This is not the only definition or understanding of health. In the literature there are three common and distinct approaches to understanding 'health' and all three approaches are described below:

Medical Model: The medical model of health essentially views a person's health through a person's physical state and the presence or absence of disease. Health is the absence of disease. Health improvements are obtained by way of physical medical intervention. This definition of health has been criticized for ignoring the importance of mental health and the social or environmental factors that may influence health. Further the medical model of health typically leads to a focus less on prevention and more on intervention after person's health is compromised (UOttawa, 2012).

Holistic Model: As a counter approach, the holistic model of health has become synonymous with the World Health Organization's definition of health (WHO, 1948) as being a "state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity". This is in keeping with a 'holistic' model of health. This definition acknowledges the importance of the many factors that may influence and contribute to a person's physical and mental health that are not physically-oriented, such as social and environmental factors. This definition enables a focus on health promotion and disease prevention. This model acknowledges that health is about our mental, physical, and spiritual well-being, not just the absence of disease (Jackson & Sinclair, 2012).

Some criticize this approach due to its inability to distinguish between the determinants of health and health outcomes. For instance, social capital may be both an indicator and a determinant of health according to this holistic model. Further, this approach has also been criticized for being un-measurable in comparison to the objective measures typically used in the medical model (UOttawa, 2012).

The Wellness Model: The wellness model of health is the most recent model developed in large part to address the perceived deficiencies of the medical and holistic models of health. The wellness approach was developed during the WHO's 1984 health promotion initiative and views health as a process or force rather than a singular state, that it is a resource upon which people draw upon to realize their aspirations and to cope with change. It may be thought of in terms of 'resiliency', and may be used to describe both the ability of an individual and/or a community's

ability to adapt to change (ibid). Like the holistic model of health, the wellness model has been criticized for being too broad and for confusing the determinants and outcomes of health.

Health Indicators & Determinants

As a way to conceptualize human health the 'Population Health Approach' (PHA) was developed. The PHA focuses on the health of an entire population and relies upon facets of the three approaches to health discussed above in order to do so. The PHA recognizes the importance of the physical state of health but moves beyond the concept of health as being only the absence of disease. Rather, it includes a broad view of health, one that views health as a capacity or resource. It recognizes that many factors influence health; include social, economic and physical environments. The PHA defines health as "the capacity of people to adapt to, respond to or control life's challenges and changes" (Frankish et al., 1996).

This approach is adopted by the Public Health Agency of Canada, to guide their full complement of health services, from accident and illness prevention and health promotion to health protection, diagnosis, treatment and care. It's origin in Canada may be traced back to 1974, when the federal government published the 'Lalonde Report: White Paper, a New Perspective on the Health of Canadians', which suggested that changes to lifestyle, social, and physical environments may lead to more health improvements than would be achieved by spending more money on existing health care delivery systems, systems not based solely on the medical approach to health (Public Health Agency of Canada, 2012).

Since then, the Public Health Agency of Canada (PHAC) has focused on defining the key factors influencing health and encourages health promotion and prevention as much as the medical assets and infrastructure to improve health. In 2013, The PHAC developed a table identifying and describing twelve key determinants of health.

Key Determinates of Health, PHAC, 2013

1. Income and Social Status, ability to access appropriate and safe housing, food and health resources all impact on health
2. Social Support Networks, support of family, friends and community impacts health
3. Education and Literacy, level of education influence job opportunities and income
4. Employment / Working Conditions, job security in terms of having a steady job and a safe working environment impact health
5. Social Environments, refers to the strength of social networks within a particular community
6. Physical Environment, includes both the natural and human built environment
7. Personal Health and Practices and Coping Skills, refers to a person's knowledge and behaviours (lifestyle habits) that may increase resiliency to change
8. Healthy Child Development, includes factors that may influence early childhood development, including safe positive pregnancies and parenting and child friendly neighbourhoods
9. Biology and Genetic Endowment, genetic endowment contributes to predisposition to certain diseases, biology may influence response to sources of stress whether physical or mental

10. Health Services, access to appropriate services to restore, maintain, promote health, prevent illness
11. Gender, level of gender equality may impact health
12. Culture, language, beliefs influence peoples behaviours, access to health information and interaction with health system

Crucial to understanding the key determinants is that each factor does not exist in and of itself but health is a function of the interaction of all of these factors and this interaction continues to evolve over time. Unlike the medical approach to health whereby the impact of the built environment on health may only be seen in the availability of direct health infrastructure, the population health approach recognizes that multiple factors may influence health and the many facets that influence the built environment may have an effect on these factors.

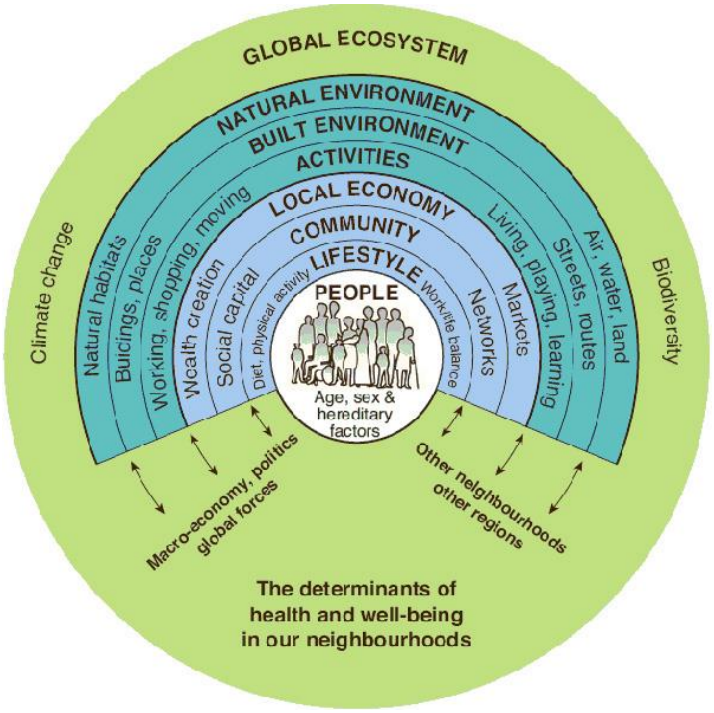


Figure 1: The Determinants of Health, (Barton & Grant, 2006)

Rural & What It Is

The link between built environments and the health status of rural people depends largely on the way one defines the 'rural'. Much debate exists as to whether the term rural is a socio-cultural or a geographical representation. For the purpose of this paper we will focus on rural as a place based concept. In 2001, Statistics Canada issued an article on summarizing the various definitions of 'rural' in Canada (duPlessis, V., Beshiri, R., Bollman, R.D., Clemenson, H., 2001). It described the six (6) ways in which 'rural' may be defined, they are as follows:

1. Census Rural (CR) – refers to individuals living outside centres of 1,000 or more population;
2. Rural and Small Town (RST) – refers to individuals in towns or municipalities outside the commuting zone to larger urban centres with 10,000 or more population (i.e. less than 30 % commute to work in an urban area). This category is disaggregated into four categories based on the degree of commuting influence of the metropolitan centre (MIZ)
    a. Strong MIZ – 30% or more work in an urban core
    b. Moderate MIZ – at least 5%, but less than 30% work in an urban core
    c. Weak MIZ – more than 0%, but less than 5% work in an urban core
    d. No MIZ – either a small employed labour force (less than 40 people) or none of the employed labour force works in any CMA or CA urban core
3. OECD (Organization of Economic Co-operation and Development) Rural Communities (OECD –RC) – refers to individuals in communities with less than 150 persons per square kilometer. This includes people living in the countryside and small towns or cities

4. OECD predominately Rural Regions (OECD – RR) – refers to individuals living in Census Divisions (CD) with more than 50 percent of the population living in OECD rural communities.
5. Beale non-metropolitan regions (BEAL) – refers to individuals living outside metropolitan regions with urban centres of 50,000 or more population.
6. Rural postal codes (RPO) – refers to individuals with a "0" as the second character in their postal code. These individuals live in areas where there are no mail carriers.

In contrast to the above noted 'rural' definitions, the Census Metropolitan Area (CMA) is an area consisting of more than one adjacent municipality situated around an urban core. A CMA must have a total population of at least 100,000 people of which half live in the urban core. A Census Agglomeration (CA) is an area consisting of one or more adjacent municipalities situated around a major urban core. A CA must have an urban core population of at least 10,000 people.

If one were to ask for an estimate on the number of people living in rural Canada, the number would be very different based upon the definition of 'rural' being used. For instance, Canada's rural population estimates range from 22 – 38% depending on the definition of 'rural' (Gupta, S., and L. Scenzilet, 2007). Rural and small town, census rural and rural postal code definitions include the fewest people living in 'Rural Canada' while the OECD Rural Community definition includes the most people within the definition (ibid).

For the purposes of this literature review, the definition deemed most appropriate is one that can be found in an earlier report titled "Rural Health in Rural Hands: Strategic Directions for Rural, Remote and Northern and Aboriginal Communities", which was also completed at a federal level and was tasked with identifying the unique health challenges facing rural Canadians (Ministerial Advisory Council on Rural Health, 2002). The definition of rural in this report is described as "all territory outside a major urban centre and constitutes more than 95% of the country's land mass" (ibid). This paper was prepared in order to provide advice to the Federal Minister of Health on how the government could improve the health of rural individuals and communities. According to this report 'rural' includes 'rural, remote and northern' communities.

The difficulty with employing any one definition of rural for the purpose of discussing how the built environment may impact the health of a rural community, is that while the built environment features in the countryside may be similar outside an urban centre (not including remote or northern communities), the ability to implement changes to the built environment may be largely influenced by the governance context in which the area resides (i.e. is the rural area governed by a large municipality that has financial, staff and leadership capabilities to finance and make changes). This may have a huge impact on health outcomes of an area. Health outcomes may therefore not be place based but largely based on the political context within which a rural area resides.

Rural Health Status & Challenges

The purpose of providing a summary background into the health of rural Canadians is to investigate if it is currently possible to suggest whether the same health issues exist in both urban and rural communities. It would follow that the built environments that can potentially influence the health outcomes in urban communities may also influence the health outcomes in rural communities. If the health outcomes or issues differ between urban and rural areas, it may be suitable to vary built environment initiatives between the two areas.

At a Canadian – wide level, ``Canada's Rural Communities: Understanding Rural Health and its Determinants" initiative undertook an in-depth statistical analysis of various health risks and mortality rates between and amongst rural and urban populations, utilizing the RST/MIZ definition of 'rural' (DesMeules & Pong, 2006). Some of the interesting findings include:

- Rural areas were at a general health 'disadvantage' compared to urban areas for many health-related measures examined.
- Health related lifestyle factors such as smoking and obesity rates were higher in rural Canada and dietary practices, leisure time and physical activity rates were lower in rural Canada
- Life expectancy rates at birth for men were higher in urban areas than rural areas generally, but in strong MIZ areas, life expectancy rates were higher than in urban areas. For women, life expectancy was

"In Chatham-Kent 63% of the population is considered overweight or obese, relative to 52% of the province of Ontario as a whole" (Statistics Canada, 2013b).

highest in strong MIZ areas, and lowest in weak MIZ areas.

- Mortality rates were generally higher in rural areas, than urban areas, seemingly driven by higher death rates from circulatory diseases, injuries and suicides. However these trends include significant variants, being that those in strong MIZ areas were at a lower risk of dying from a number of conditions than their urban counterparts or other rural areas, while those in the most rural areas were often at the highest death rate.
- Cancer mortality rates were slightly lower in rural than urban areas generally.
- Respiratory disease mortality risks were generally significantly higher in rural areas; however those living in a strong MIZ area had a reduced risk of dying from a respiratory condition compared to those in an urban area. Women living in a weak MIZ area reported a significantly lower prevalence of asthma compared to those in the urban area.
- Women living in weak or no MIZ areas reported a higher rate of diabetes than women in urban areas. Men living in a strong MIZ area had a reduced risk of dying from diabetes than their urban counterparts. Women living in the most rural areas had a higher risk of dying from diabetes compared to their urban counterparts.
- Canadians living in strong, weak and no MIZ areas reported a higher prevalence of arthritis / rheumatism than those in urban areas.

> ***"In Huron County 22% of the population suffers from arthritis, relative to 17% of the province of Ontario as a whole" (Statistics Canada, 2013b).***

- Higher mortality risks in rural areas (adjusted for various socio-economic and demographic factors) existed for all-cause mortality, motor vehicles accident deaths, and suicides. Motor vehicle accident deaths for men and women (particularly women) held, by far, the highest mortality risk. (ibid)

Interestingly for many of the above noted statistical observations, the differences within the rural areas were greater than between the rural and urban area, and few health risks (asthma being the exception) existed on a rural-urban continuum. Further, differences between men and women within rural areas were often greater than the differences between their counterparts in urban areas. For instance, with respect to diabetes, rates in men in both urban and rural areas were similar, although men in strong MIZ areas had a significantly lower rate of diabetes mortality compared to men in urban areas in all age groups. However, men aged 45-65 living in No MIZ areas had mortality rates higher than their urban counterparts. Further, rates amongst women aged 45 years and older generally increased with rurality and were higher than those in urban areas (ibid). The subject report made a number of recommendations, some of which include:

- Overall mortality due to injury and poisoning is much higher in rural than urban areas, reflecting the nature of some types of rural-based industries such as farming, fishing and logging. Health initiatives should focus on occupational health and safety issues in rural areas.
- People living in rural areas have to travel further and more often for work, shopping, etc., and this places them at a higher risk of being involved in traffic accidents. Improving rural road conditions and road safety awareness could be beneficial.
- Disease prevention and promotion initiatives have typically been developed by urban practitioners for urban environments. Developing variations of such initiatives for rural areas may be needed to tackle the prevalence of lifestyle influencing health risks such as smoking, obesity, low consumption of fruits and vegetables and low physical activity levels. (ibid)

The ‘Rural Health in Rural Hands’ report mentioned earlier identified a number of broad trends and characteristics suggested to impact on the health of individuals living in rural communities, including:

- High dependency populations – high proportion of senior and youth populations and low proportion of working aged population.
- Varied linguistic and cultural communities, with some having very high minority communities, while most have low proportion of recent immigrants or visible minorities.
- Half of all Aboriginal people live in rural, remote and northern communities – such communities tend to be younger.
- Health status indicators tend to indicate rural communities have shorter life expectancies, higher death rates and higher infant mortality rates.
- Health determinants suggest lower income rates, higher unemployment, poorer working conditions, lower levels of formal education, and high rates of smoking, heavy alcohol consumption, obesity and lower rates of physical activity amongst people in rural areas compared to urban areas.
- Rural areas tend to have less access to safe drinking water.
- Some benefits of living in rural communities include: more affordable housing, less prevalence of high stress and stronger social support networks.
- Aboriginal communities suffer from significantly poorer health than the general Canadian population.

Like the previous report, this report also noted such trends are not homogeneous amongst all rural populations.

Seven broad based initiatives were recommended to improve health outcomes in rural, remote and northern communities, many of which were focused on addressing access to health services and improving the social-economic capacity of the communities themselves. Initiatives focused on influencing the built environment were not identified as one of the recommended methods to improve health outcomes.

To summarize, at a Canadian – wide level, research is beginning to identify the differences between the health status of rural versus urban populations. However, much of this work has concluded that rural populations are not homogeneous populations exhibiting the same health trends. The degree of rurality and differences between sexes seem to influence health status greatly. Further, many health indicators do not differentiate on a simple sliding scale from urban to the various degrees of rural.

Further, much of the Canadian –wide research utilizes the RST/MIZ definition of 'rural' which largely excludes large swaths of populations in areas such as Southern Ontario where the majority of populations live in CMA's or CA's. However, while rural areas within CMA's may have access to medical infrastructure (i.e. hospitals, clinics, etc.,) within a reasonable driving distance, the lack of public transit options may limit access to such resources. Further, opportunities to enhance the non-medical infrastructure type factors that contribute to health, such as physical activity, may be limited for those living in rural areas, even those in close

proximity to urban centres. At a local level, defining rural areas based on the RST/MIZ definition do not adequately reflect the challenges rural areas face in attempting to improve built environmental features to support health.

Another more useful method of assessing health in a rural population may be reflected in local initiatives undertaken by Health Units or rural municipalities to assess the health status of its local populations. While typically most Health Units will include at least one urban centre, some are distinctly more 'rural' than others.

One example of such a local assessment is the Rural Health Study completed by the Region of Waterloo Public Health in 2004. This study, based largely on independently collected qualitative community survey data found the health of rural residents to be at increased risk due to stress (from economic challenges, longer commutes, and perceived cultural decline) and limited access to facilities (Zupko et al., 2004). The study method reflected an inability to otherwise differentiate between rural and urban health status using available statistical sources. Instead, the study relied upon the use of open ended questions during key informant interviews, focus groups, township meetings and personal interviews. The study was able to describe some general themes that participants perceived and identified as being particular challenges to their health status (health being defined in a broad sense), due to their living in a rural area, but it did not provide a statistical description of health status or trends similar to those found in the Canadian-wide studies referred to above.

CHAPTER 2: Rural Planning & Sustainability

Rural Planning & What It Is

There are a variety of components and facets to rural planning which will be described, however to start "rural planning is the practice of planning for rural areas, with a focus on rural issues and from a rural perspective (implying an appreciation for the rural community, its needs and aspirations)" (Caldwell, 2011a). Rural planning involves a focus on land use planning; it also encompasses the local economy, labour and employment, demographics, community development, resource management, and ecological protection (ibid). Planners often "adapt to and capitalize on parallel processes, relying on community initiatives as much as on legislated processes in the implementation of their initiatives" (ibid).

Figure 2: Components of Rural Planning (Caldwell, 2011)

In Thomas Adams' book *Rural Planning and Development in Canada,* which was written in 1917, however still represents issues that are relevant today; Adams recognized the difficulties of rural life, the misleading comfort of urban living, and the need for planners to maintain the urban-rural balance by planning rural communities that offer the same amenities as their urban equivalents (Caldwell, 2011). The 29 November 2004 issue of Maclean's, which featured an article on the war between town and country, illustrates the continued relevance of this issue. Canada has been continually transforming from a rural to an urban country, and this type of shift has often resulted in a loss of political power for rural communities (ibid). This issue is enhanced

with migrating youth, an aging population, the transformation of farmland into suburbs, and ongoing competition with urban Canada for limited resources. “By the mid to late 1970’s, effective municipal rural planning systems existed in areas such as the County of Kings, Nova Scotia and Huron County and Waterloo Region in Ontario” (ibid). Although Canadian urban areas have achieved fairly high densities, the issue of sprawl and the related loss of agricultural land still exist. Current initiatives, including Greenbelt legislation, attempt to react to these concerns (ibid).

The Greenbelt is a positive development in rural planning as it protects approximately one point eight million acres of environmentally significant and agricultural land around the Greater Golden Horseshoe from urban development as well as supports a wide variety of recreational, tourism, and cultural amenities (MMAH, 2009). The goals of the Greenbelt are to enhance urban and rural quality of life by promoting the following items within the protected countryside: agricultural protection, environmental protection, culture, recreation and tourism, settlement areas, infrastructure and natural resources (MMAH, 2008). The Greenbelt is an affirmative plan, as its purpose is permanent agricultural and environmental protection, supporting a strong agricultural and rural economy, as well as providing for recreational, cultural, and tourism opportunities (ibid). These are all elements of effective and progressive rural planning.

Overall, rural planning works to create vibrant, healthy, and sustainable rural communities. “In our current changing, multifaceted world, where communities struggle to achieve ‘sustainability’ planners have the role to be courageous enough to provide leadership in this direction” (Caldwell, 2011).

A Sustainable Future for Rural Communities

According to the Center for Rural Design at the University of Minnesota, sustainable rural development is defined as "the shaping of rural environments to provide an integrated system of human communities, plants and animal production that meets the needs of people, the economy, and *the environment* in the present without compromising the future" (Thorbeck, 2012). This is an effective summary of the necessary elements and interactions that are required for the development of healthy rural communities.

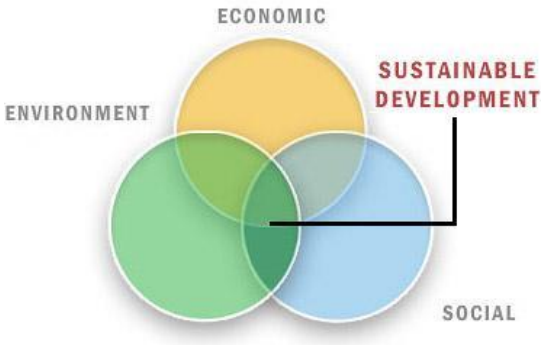


Figure 3: Sustainability Diagram (Sustainable Development From Brundtland to Rio 2012 (2012))

In terms of environmental factors that have the ability to improve rural communities, several recent documents advocate for the provision of 'infrastructure' to be used in promoting healthy natural conditions as well as the health and well-being of humans. Natural elements in the environment that are associated with health and well-ness are often thought as being 'green infrastructure' (GI) for a community. This term embodies the natural built elements of the landscape as well as human-inspired natural functioning facilities. Many elements of health and well-ness are embodied within the requirements for clean water, air and land. Nature provides a cost effective (because of the externalities associated with the goods and services embedded within nature) means to assist in providing these essential elements of life.

The following definition is a succinct portrayal of what constitutes GI elements:

> ***Green infrastructure i****s defined as natural vegetation and green technologies that collectively provide society with a broad array of products and services for healthy living. Green infrastructure takes many forms including but not limited to the following: urban forests, natural areas, greenways, streams and riparian zones, meadows and*

agricultural lands; green roofs and green walls; parks, gardens and landscaped areas, community gardens, and other green open spaces; rain gardens, bioswales, engineered wetlands and storm water ponds.

Green infrastructure also includes soil- in volumes and qualities adequate to sustain living green infrastructure and absorb water, as well as technologies like porous paving, rain barrels, cisterns and structural soil.

Source: Green Infrastructure Ontario Coalition, 2012.

Another publication directed at design specifically for rural areas comes from Karen Williamson in her publication entitled *Growing with Green Infrastructure*. This publication lays out the basic design template; from protecting important natural areas in rural areas – areas for example that protect water supplies, treed landscapes, wetland areas and connects all of these areas together. The connection is important for both natural environment protection and enhancement purposes, (e.g. biodiversity protection) but also as a foundation for an interconnected off-road trail network for human transport. The publication also describes the importance of cleaning up contaminated lands – brownfield locations, and designing grey infrastructure (i.e. highways, utility corridors) to consider their impacts when bisecting natural grounds.

The built conditions in rural areas can be designed to acknowledge the many attributes defined within the conceptual framework. Sandstrom's work in Sweden provided a substantive documentation of attributes of GI that could support health and well-ness of a community (see Appendix A for a listing of the various elements that can structure health and wellness in a community).

An example of a community that has embraced sustainability is Elgin, Illinois, which is a small city of about 100,000 people. Elgin was a classic example of an unsustainable community, economically, socially, and environmentally. After a factory closure, almost one-third of the community lost their income; this in turn negatively affected the community in many ways. In

order to re-build, the community embarked on a Sustainability Master Plan (Jackson & Sinclair, 2012). The sustainability plan guided the community in cleaning up its environment; the next step was designing neighbourhoods that met the needs of residents that lived and worked there, which would effectively improve the social fabric of Elgin. Currently the City of Elgin has "nine working groups dedicated to revitalization issues: transportation, urban design, water resources, parks and green infrastructure, recycling and waste management, green buildings and technology, alternative energy, economic development, and education and outreach" (Jackson & Sinclair, 2012).

An example of a sustainable business in Elgin is that of Janet Jarecki who owns Rieke Office Interiors, a business that manufactures office furniture and also helps clients create environmentally responsible workspaces. This is an example of an organic business; "businesses are effective when they are the right industry in the right place and time. When Janet Jarecki designs environmentally conscious workspaces for her own business, she can prove that certain technologies work and can sell them to her clients" (Jackson & Sinclair, 2012).

In terms of social well-being and prosperity, Elgin has invested in parks, trail systems, and scenic outdoor spaces which attract people and encourage social interaction. As an example, Festival Park was created on a previously contaminated site, after thorough rehabilitation and renovation it was turned into a successful public space. As described by Jackson and Sinclair (2012), "in the center of the park there is a fountain that young people use by the hundreds in the summer time. Parents sit along the benches that rim the fountain".

Overall, the case study of Elgin, Illinois represents a community that has embraced the social, environmental, and economic elements required for a sustainable and healthy community.

CHAPTER 3: A Rural Lens on the Built Environment & Health

As described by Health Canada, "the built environment includes our homes, schools, workplaces, parks/recreation areas, business areas and roads. It extends overhead in the form of electric transmission lines, underground in the form of waste disposal sites, and across the country in the form of highways. The built environment encompasses all buildings, spaces and products that are created or modified by people" (as cited in Srinivasan, O'Fallon and Dearry, 2003). These spaces range from rural streets to bustling downtowns and all the places in between (Health Canada, 2011).

Furthermore, it has been found that "health and well-being is intimately tied to social and environmental conditions and suggests that the primary focus of intervention be at the community and policy levels rather than at the level of the individual" (Minkler, 2012). Therefore the community realm and the built environment play an integral role in human health and well-being. This is true for all areas in which people reside, including urban, suburban, rural and remote. This section of the paper will focus on the importance of effective built environments in rural areas.

In considering the relationship between the built environment and health, the Ontario Public Health Standards outline several areas where public health units and municipal governments are obligated to collaborate. These areas include: active transportation, air quality, water quality, access to affordable healthy foods, injury prevention, climate change, safe and affordable housing, livelihood and economic opportunities, and natural spaces/greening of communities. All of these topics and their relationship to rural areas will be discussed in turn below.

Active Transportation

Community design that incorporates opportunities for active transportation is integral to maintaining a healthy built environment, as it provides the opportunity for physical activity when travelling for both utilitarian and recreational purposes. Transport Canada defines active transportation as "all human powered forms of transportation, in particular walking and cycling. It includes the use of mobility aids such as wheelchairs, and can also encompass other active transport variations such as in-line skating, skateboarding, cross-country skiing, and even kayaking. Active transportation can also be combined with other modes, such as public transit" (Transport Canada, 2010).

Infrastructure and facilities that provide chances for active transportation in rural areas are especially important, as they are generally less prevalent in these regions. Often in rural communities transportation planning is focused on infrastructure for roads and cars. This is mostly due to the distances that people must travel from their homes to various destinations and reflective of the diffused low density land use base (Young, 2008). As a result there are less multi-use trails, sidewalks, and bike lanes in rural areas, which decrease opportunities for residents to part take in active transportation. This is a negative circumstance, as active transportation is a way in which to incorporate physical activity into one's daily routine. Regular physical activity is important as it has the ability to reduce disease,

> *"**The Town of East Gwillimbury achieves its active transportation goals through a town-wide active transportation and trails network that connects people with their communities, open space areas, significant natural, historic, and recreational features"** **(Town of East Gwillimbury Active Transportation and Trails Master Plan, as cited in Caldwell, 2013).***

as it helps to boost energy levels, improve mental health, prevent depression, and maintain self-esteem (Venhaus, 2012). The link between physical activity and health has been acknowledged at a national level in both the United States and Canada. In 1996, the U.S. Surgeon General released a statement acknowledging that the there was evidence to conclude that physical activity produced positive health outcomes, such as lowering mortality rates for old and young adults, lowering the risk for heart disease and stroke, decreased risk of colon cancer and lowered risk of Type 2 diabetes, lower weight and reduced body fat and improvements in mood and relief from symptoms of depression and anxiety (Williams & Wright, 2007).

Recent Canadian research, supported by a substantial body of US and international data, has associated the built environment, including active transportation and physical activity infrastructure, with more physically active lifestyles (Health Canada, 2011). It is acknowledged as well that there are benefits in considering each community's unique context and to target specific user groups when creating active transportation programs and approaches (Health Canada, 2011). This is important to keep in mind when considering active transportation initiatives in rural areas, as unique and different approaches are necessary when compared to urban settings. Solutions would be required to understand how to deal with longer distances between destinations, county roads, and higher traffic speeds, among other considerations.

"*In rural settings, where destinations can be spread across several miles, walking and biking to get to places are not realistic options. In fact, even reaching destinations by car proved to be a major barrier for rural youth. The rural transportation domain should therefore be approached differently than in urban models and should prioritize finding ways to provide transportation, such as late school buses and organized car pools, to give youth safe, affordable, and convenient ways to access physical activity opportunities in their communities". (*Yousefian, et al. 2009 as cited in Caldwell, 2013)

The above statement emphasizes the fact that transportation solutions, must meet the needs of the rural population. The differences in rural communities which include geography, culture, and the economy need to be considered (Caldwell, 2013).

Listed below are some initial changes which may improve opportunities for active transportation in rural communities, thereby achieving the health benefits associated with physical activity:

- Activity destinations and facilities, whether they be a naturalized trail system, dedicated bike paths/lanes, children's park or a formal recreational facility (i.e. soccer fields/swimming pool, etc.) should be adequately distributed throughout a community making access to such facilities as equitable as possible.
- Innovative ideas such as late night school buses and organized car pools that can transport youth to recreational amenities within their communities.
- Where population density warrants, development of mass public transit should be a priority.
- New streets should have good connectivity with the existing street pattern, based on a grid pattern. As well, streets should have clear connections to trail systems within a community.

Air Quality

Air quality is typically associated with the emissions of vehicles and industrial facilities. While the Ministry of Environment regulates the amount and type of emissions from single source facilities and the Ministry of Transportation regulates vehicle emissions there is no overarching regulating body to ensure that cumulative emissions of an area or neighbourhood are within appropriate air quality standards.

Health may be impacted in a number of ways by poor air quality, including respiratory-illnesses, such as asthma, pneumonia, bronchitis and general decreased lung function and development in children, and low-birth weights of newborns (Bray, Vakil & Elliott, 2005).

Furthermore, a significant amount of Ontario's smog originates from emission sources in the United States; this can also be referred to as transboundary air pollution. Although data analysis strongly indicates that neighbouring U.S. states continue to be major contributors to elevated levels of ground- level ozone and fine particulate matter, Ontario recognizes and takes responsibility for its local emissions and its role as a contributor to the regional transport of air pollution (Ontario Ministry of the Environment, 2005).

"Based on 2003 demographics, Ontario is burdened with almost $9.6 billion in health and environmental damages each year due to the impact of ground-level ozone and fine particulate matter. Of this total, approximately 55 per cent is attributable to U.S. emissions. The remainder is attributable to Ontario emissions related to human activity. These results are largely based on recent health studies that suggest smog pollutants have very low or no health thresholds". (Ontario Ministry of the Environment, 2005)

During extensive smog episodes, the United States contributes as much as ninety percent of ozone excluding background levels to Ontario cities and towns on the northern shore of Lake Erie, the eastern shore of Lake Huron and in the extreme southwest near the U.S. border (Ontario Ministry of the Environment, 2005).

As well, hundreds of other air pollutants, known as air toxics or hazardous air pollutants, can impact human health in some conditions. Hazardous air pollutants can be released from a broad range of activities including mining, smelting, manufacturing, electricity generation, waste disposal, vehicles, and wood burning (Halton Region Health Department, 2009).

Historically, health professionals and land use planners encouraged the separation of sensitive uses, such as homes, day cares and schools from industrial facilities in order to lessen air quality issues. However, traffic corridors have also come to be recognized as significant sources of pollutants and separation between sensitive uses and such corridors may also be required (HEI, 2010). Further, the amount of time spent commuting (including children who ride on school buses for long periods of time) has also been linked to negative health effects from cumulative exposure to air pollution (Natural Resources Defence Council, 2001).

Certain populations of people are more sensitive to the negative health impacts associated with air pollution. While poor air quality can affect all people, it is the young, the elderly, pregnant women and those with existing health problems who are more likely to become ill, be hospitalized, or to die prematurely in response to poor air quality, rather than healthy adults (Halton Region Health Department, 2009).

Further, while some may suggest low density, homogeneous sprawling residential neighbourhoods may avoid exposure to air pollutants, in fact the opposite may be true as such neighbourhoods increase the number and length of vehicles trips taken. Further, the large lot sizes typical of rural and small community neighbourhoods require lawn and yard maintenance equipment which further adds to the accumulation of air pollution.

Reducing dependency on vehicles will reduce vehicle emissions as a source of air pollution; however, for those people who currently choose alternative modes of transportation such as walking on sidewalks or cycling on bike paths, they may actually place themselves at higher exposure risk to pollution. Until an appropriate balance is reached between all modes of transportation, air pollution will remain a risk.

Another relevant air quality issue relates to farming; farmers are exposed to heavy and hazardous equipment, as well as to a wide range of noxious substances such as pesticides. Moreover, "the farm is both a workplace and a home, implying that children and seniors may also be exposed to the same health and safety risks" (Laurent, 2002). While other hazardous occupations are typically regulated and their workers protected against unsafe working conditions through legislation, in farming, due to the prevalence of independent owner/operators, health and safety regulations may not be given adequate attention (ibid).

*"**Farmers are exposed to noxious substances such as pesticides – children and seniors may be exposed to the same health and safety risks" (Laurent, 2002).***

To summarize, a number of changes to the built environment may reduce air pollution:

- Incorporate adequate separation distances between major traffic corridors and industrial sources of air pollutants and sensitive land uses such as residential areas, daycare centres, and schools.
- Support land use intensification so to encourage the use of alternative modes of travel.
- Encourage new developments that support walking and cycling or the retrofit of existing developments to include paths and trails that may be used by pedestrians or cyclists.
- Schools should be located in areas that reduce as much as possible the use of buses for long distance pick-up and drop-off times.
- Increased consideration for health and safety regulations related to farming practices.

Water Quality

Development often results in the removal of nature's water filter. Water, rather than being filtered through natural vegetation and soil before reaching underground aquifers or streams and rivers, instead travels as surface run-off over paving, concrete, asphalt and rooftops, before entering either a municipal stormwater treatment facility or directly into streams and rivers carrying with it all the surface pollutants collected. As a result, underground aquifers may not be recharged adequately and there is a potential that the aquifers or the lakes and streams may become polluted. Aquifers also have the potential to be impacted by failed private septic systems. Development that is dependent on ground water (wells) and private septic systems may be particularly vulnerable to water quantity and quality issues, however urban areas relying on water reservoirs or even on long distance fresh water sources have the potential to become

contaminated or suffer from limited quantities during drought. Inappropriate or ill-managed land uses in proximity to these vulnerable water sources may also negatively impact water quality (Frumkin, Frank, Jackson, 2004). Furthermore, while both rural and urban water sources are susceptible to contamination, regulatory frameworks exist for the protection of municipal drinking water, while stewardship is the main method for groundwater protection in the operation of private wells (Imgrund, 2009).

"For existing private well and septic system owners, the promotion of well stewardship and the need for support of stewardship programs is apparent" (Imgrund, 2009).

Built environments that include the following, may reduce the potential or negative water quality or quantity impacts:

- Reduce dependence on non-pervious surface treatments, increase use of pervious material to provide for more naturalized water drainage and filtering systems.
- Focusing on land use intensification if co-ordinated with a reduction in greenfield development will lessen the amount of land used for development and the associated destruction of natural drainage, filtering and recharge systems.
- Adequate management of particularly hazardous land uses.
- Adequate separation distances between sensitive lands uses and those that have the potential to impact water quality and quantity.
- Reduce the reliance on development that depends upon private well and septic systems.
- For existing private well and septic system owners, the promotion of well stewardship and the need for support of stewardship programs is apparent (Imgrund, 2009).

Access to Affordable Healthy Foods

Recent research has investigated the ability of the built environment to enable people to eat healthy food. There are several means by which the built environment can either promote or hinder a person's ability to eat healthy. The combined trends towards larger, big box food stores and associated zoning regulations have led to large areas being devoid of an available location to obtain food stuffs, otherwise known as 'food desserts. In such areas, the only available sources of groceries tend to be corner stores. There are many communities that can be considered as having 'food deserts', these are typically low income neighbourhoods or rural communities. "A food desert is a socio-economically distressed neighbourhood where there is no nutritious food source within walking distance" (Gilliland, 2012). A study was completed to measure and map levels of access to food-retailers in Chatham-Kent, Ontario. The summary of findings showed that access to unhealthy food retailers (variety stores and fast food) is better than access to grocery stores in Chatham-Kent. Generally, the most distressed neighbourhoods have three variety stores and three fast food establishments closer than the nearest grocery store. Overall, there are many food deserts in Chatham-Kent; "food deserts are an issue of health equity. Unequal access to healthy food may further worsen health inequalities due to socio-economic difficulty" (Gilliland, 2012).

In studies completed in the United States, it has been shown that rural communities face healthy food access challenges. "In one example from the Mississippi Delta, nearly three-quarters of households that qualify for food stamp benefits must travel more than 30 miles to reach a large grocery store or supermarket" (PolicyLink, 2013). The major food related issues in rural areas are different from those in urban areas given the low population density, lengthier distances between retailers, and rapid rise of supercenters and their effect on other food retailers (Karpyn,

2010). Residents in communities that are underserved in terms of healthy foods, usually lack the transportation to be able to make trips to grocery stores in other parts of the community. Rural residents generally have greater access to cars; however those that often don't, such as farmworkers, for example, have practically no available public transportation to stores beyond their immediate communities. With limited transportation, low-income residents often must rely on smaller convenience stores closer to their homes (PolicyLink, 2013).While basic groceries may be available at a corner store they are not competitively priced, and tend to focus on junk foods and snacks.

Another issue associated with access to healthy food, is the availability of local food. A large amount of food available in grocery stores or supermarkets is imported. The import of foods often involves the burning of fossil fuels during transportation. The chemicals emitted by the burning of fossil fuels have other effects in addition to their contribution to global climate change (Xuereb, 2005). Fossil fuel combustion creates a variety of chemicals which contribute to environmental problems such as acid rain, smog, and toxic air pollution. These emissions are increased with the transport of food imports (ibid). To a certain degree, replacing consumption of food imports with local ones is possible on an individual level. However, barriers exist to purchasing local food, including perceptions that it is unavailable, consumer inability to identify it, and acceptance of preserved foods in the off-season (ibid). Reducing food imports will require policy changes that make local food consumption more convenient to consumers. The Region of Waterloo Public Health's document *Toward a Healthy Community Food System* (2005) suggested several possible strategies for moving towards this goal. These included increasing urban agriculture plans, expanding farmers' markets, establishing farm to organization programs, and

encouraging the local food processing and distribution industries. A combination of these approaches has potential for reducing the environmental effect of food miles (Xuereb, 2005).

Neighbourhood community gardens and farmer's markets have been considered a viable option to provide a source of fresh, affordable and culturally appropriate food to those who would not otherwise have access. The physical, social and mental health benefits of community gardens and farmer's markets have also been suggested (Wakefield, S., Yeudall, F., Taron, C., Reynold, J. & A. Skinner, 2007). Increasing the availability of healthy foods through community design not only contributes to improved dietary health of a community, but can also contribute to increased levels of physical activity. Specifically, the inclusion of community gardens in community design supports healthy eating and food skills while contributing to active recreation. "According to the Canadian Fitness and Lifestyle Research Institute, gardening is the second most popular physical activity for Canadian adults" (Hastings & Prince Edward Counties Health Unit - HPECHU, 2012).

As outlined by Bergeron (2012) food system planning can encourage a built environment that is conducive to local food production and consumption through:

- Protecting spaces for community gardens
- Protecting agricultural land for food growing and production
- Providing better opportunities for local food processing and sale
- Encouraging the development of healthy community food sources

(As cited by Hastings & Prince Edward Counties Health Unit - HPECHU, 2012)

Injury Prevention

> *"**Injury requiring hospitalization in 2011 in Grey Bruce County involved 635 cases (per 100,000 population) relative to 407 cases (per 100,000 population) for the province of Ontario as a whole"** **(Statistics Canada, 2013b).***

Vehicle related injuries have been described as the least appreciated risk behaviour undertaken by people (Frumkin, Frank, and Jackson, 2004). While vehicle fatalities and injuries in Canada have decreased between 1990 and 2009, from a high of 262,680 in 1990 to 172, 883 in 2009, Canada is ranked 10th in terms of fatalities per billion vehicle kilometers travelled compared to other countries of the Organization for Economic Cooperation and Development (Transport Canada, 2009 & Office of the Chief Coroner, 2012). The World Health Organization and the World Bank estimated that by the year 2020, road traffic injuries will become the third greatest contributor to the 'global burden of disease and injury' (Office of the Chief Coroner, 2012b). American statistics suggest vehicle crashes are the leading cause of death among people between the ages of 1 and 24 and cost an estimated $200 billion annually (CDC, 1999 as cited in Frumkin, Frank and Jackson, 2004).

Vehicle related deaths and injuries include drivers, passengers, pedestrians and bicyclists. Recently the Office of the Chief Coroner of Ontario issued two reports on the issue, a 'Cycling Death Review' and a 'Pedestrian Death Review'. Both reports highlighted the importance of walking and cycling in maintaining a healthy lifestyle but noted that the built environment may not always safely accommodate such pursuits.

Some of the factors associated with such injuries include the speed of vehicles travelling, the street design itself (vehicle lane widths, proximity to sidewalks and or bike paths etc.) and overall neighbourhood design (whether it is pedestrian or vehicle oriented).

Traffic volumes have been documented to be linked to frequency of collisions, while traffic speeds are linked with collision severity. Indeed, pedestrians are 45% more likely to suffer severe injuries or die if hit by a vehicle travelling faster than 50 km/hr or higher, while they have only a 5% chance of suffering such a severe injury or be killed by a vehicle travelling 30 km/hr (Pilkington, 2000 as cited in Frumkin, Frank and Jackson, 2004).

An example of the increasingly common intersection of health and the built environment, the 'Pedestrian Death Review' concluded modification to the built environment as the primary means of reducing pedestrian deaths, in particular this included recommending a "Complete Streets" approach to the development and re-development of communities whereby streets be designed to accommodate all types of users regardless of transportation mode, age or physical ability (Office of the Chief Coroner, 2012). The report also concluded by recommending the inclusion of a 'Walking Strategy for Ontarians' be included in the revised Provincial Policy Statement and the reduction of speed limits on residential streets (ibid).

Also of particular note, research suggests that rural areas suffer from higher injury rates both from vehicle related and work related accidents due to the often long commute times and high speeds of travel and the type of occupations that are more often found in rural areas (Frumkin, Frank & Jackson, 2004, Ministerial Advisory Council on Rural Health, 2002).

Injury prevention on farms is extremely important; farms and rural areas have ponds, streams, animals, machines, equipment and vehicles not typically found in residential areas. These surroundings increase the threat of preventable deaths and injuries to people who visit, live and work on farms and in rural areas (City of Hamilton, 2013). In Ontario, from 1990 to 2004, the primary causes of agricultural related injuries and hospitalizations were (ibid):

- machine entanglements
- animal-related events
- falls from height
- machine run overs and rollovers
- being pinned or struck by a machine
- falls on the same level

A great number of fatalities and injuries on Ontario farms were in youth under the age of 16 years. Older adults had a much more significant death rate than younger adults aged 15-59; deaths in those over 80 years of age were the highest. Adults aged 65 and over also had the most significant rates of injuries requiring a hospital stay, 26% of these injuries were due to falls (City of Hamilton, 2013).

One initiative in Ontario that is attempting to improve injury prevention is Ontario's Rural Plan, this is a plan that is aiming to help communities boost economic development, address infrastructure requirements, improve access to educational opportunities, and support healthy communities (Ministry of Health Promotion, 2007).

To summarize, a number of changes to the built environment may reduce injuries:

- Encouraging intensification of existing urban areas, and the coordinated promotion of alternate modes of transportation (transit, walking, biking, etc.) will reduce the dependence on vehicles for commuting.
- Promoting 'complete street' designs – incorporated all modes of traffic, including pedestrians into the streetscape.
- Designing neighbourhoods to be pedestrian friendly such as by providing adequate sidewalks, interesting landscaping and street furniture, safe street crossing opportunities.
- Reduction of traffic speeds.
- Inclusion of dedicated bike paths / lanes, connected to existing trails and routes to major destinations.
- Reduce development in rural areas that would require its residents to commute long distances for work.
- Incorporate paved shoulders in rural areas to provide for cyclists and pedestrians.

Climate Change

Carbon dioxide (CO2) produced from vehicle emissions is one of the largest source of greenhouse gases in Canada (Bray, Vakil & Elliott, 2005). Most research has come to agree that greenhouse gases from human activity are responsible for the climate change now being experienced. Health impacts associated with climate change include those directly and indirectly related to weather changes. For instance, an increasing number of smog days is associated with an increasing number of respiratory illnesses, while an increasing number of extreme heat days lead to increased number of those suffering heat exhaustion (Perrotta, 2011). Other storm events, such as ice storms and hurricanes have had very direct health impacts on those caught in such events and their aftermath. In addition, climate change has been associated with an increasing risk of insect and water born-diseases. Further, changes to the built environment, such as including more green space and permeable surfaces to streetscapes, avoiding development on flood prone areas, and changing building design to improve conservation of resources or reduce susceptibility to major climatic events may help mitigate the health effects of climate change (ibid).

Several changes to the way we design our built environment may have a positive health impact on the health of vulnerable populations, improve our access to healthy food and increase resilience to climate change:

- Design neighbourhoods and streetscapes for an '8-80' aged target population.
- Increase diversity in housing types, forms and tenure to reduce likelihood of a homogenous neighbourhood, thereby enabling families to remain in their communities as they age and making the neighbourhoods less susceptible to economic downturns.

- Intensification and mix of land uses, including the location of schools and shopping areas may lessen the length of time commuting thereby decreasing air pollution, increasing physical activity and reducing vehicle related injuries.
- Promotion of community gardens and local farmer's markets provide for community gathering places, improve access to fresh and culturally appropriate food and fosters relationships between rural and urban areas.
- Zoning provisions that permit the development of grocery store space throughout the community in order to limit the creation of 'food deserts'.
- Restricting the location of building and structures in areas prone to flooding and improving their conservation capacity (green roofs, green space, permeable surface treatments, increasing tree canopy etc.) may enhance the resilience of a community to climate change.

The above noted section reviews the variety of ways the built environment may be influenced to improve the health of a community. Many of the changes, such as urban intensification and mix of land uses have multiple health benefits. However, while many of the changes require collaboration of approaches in both the rural and urban areas, some approaches may not be as suitable in rural areas as they are in urban areas.

Safe and Affordable Housing

Rural Ontario differs in a number of significant ways from patterns found in the rest of rural Canada (Delaney, Brownlee, & Slick, 2001 as cited in Elias, 2009). For instance, at 4.3%, the unemployment rate in rural Ontario is much lower than the total rate for both urban and rural Canada (Bellman & Clemens on, 2008 as cited in Elias, 2009). As well, in spite of generally lower incomes, the level of poverty is lower in rural areas because of lower costs of living, principally the cost of housing (Runic et al., 2001 as cited in Elias, 2009). As an example, many artists choose to live in rural settings, due to affordable living costs, access to markets, and the attractiveness of the rural landscape (Fleming, 2009).

The Ministry of Municipal Affairs and Housing (MMAH) as part of their *Building Blocks for Sustainable Planning* project, has outlined the Protection of Second Unit Policies. Essentially this tool enables municipalities to adopt policies that allow second units in detached, semi-detached and row houses as-of-right (MMAH, 2011). This tool may be especially useful for rural communities as some benefits include, an increase in the supply of affordable housing units and increases in density without changing the community's character (MMAH, 2011).

In addition to some of the measures mentioned above, further solutions can be developed through housing and homelessness services. As a result of the provincial *Housing Services Act, 2012,* each Service Manager across the Province is required to prepare a local 10-year Housing and Homelessness Plan (Reffle, 2013). These plans are to articulate the long-term vision for the provision of housing and homelessness services over the next ten years and are required to include:

- An assessment of current and future housing needs in the Service Manager Area;
- Objectives and targets related to housing needs;
- A description of the measures proposed to meet the objectives and targets;
- A description of how progress will be measured (Housing Services Act, 2011).

In terms of safety, "the construction of homes, schools, or workplaces can be a source of chronic allergies and asthma or irritations caused by volatile organic compounds (VOCs) or natural agents such as dust mites, cockroach feces, and spores from fungi. Although molds, such as black mold, reproduce naturally in areas with high humidity, a building that is excessively wet during construction or is not sealed properly can become a long-term mold incubator" (Jackson & Sinclair, 2012). Unattended leaks and water intrusion after construction are not just cosmetic and economic problems; they are health challenges as well (ibid). Choices made in home construction materials and furnishings can also affect our health over time. Many houses built before 1978 and those furnished with old furniture likely contain lead-based paint. If this paint peels, chips, or cracks, it can be hazardous (ibid).

When looking at built environments, the goal should be to put a solution in place that alleviates multiple problems, yet we cannot authorize people's choices in personal health. For ourselves, "although we may not know the original construction of our homes, schools, and workplaces, we can choose or advocate for wall and floor coverings not associated with health issues, as well as choose whether to open a window for fresh air, and select appropriate plants when landscaping" (Jackson & Sinclair, 2012).

According to Allison and Peters (2011), affordable housing can be seen as a tool for making communities more liveable. They go on to discuss solutions on how historic preservation and

low-income housing can be used in conjunction to contribute to the revitalization of communities. “There are tax breaks for historic preservation. But there are also tax breaks, credits, and incentives for low-income housing. Combining these two can enable projects that would normally not be viable. This is a powerful tool, because, by increasing the financial return from converting historic structures to affordable housing, we can achieve many of the goals of revitalization and liveable communities” (Allison & Peters, 2011). Rehabilitation is sustainable because it utilizes the existing energy of a building and remaining infrastructure, creates a local workforce for the community, and brings a diversity of people into the residential sector. Continued investment in heritage buildings through restoration and repair for affordable housing purposes and stabilization of historic districts through the construction of infill housing should be acknowledged as contributing to civic beautification and retention in small communities (ibid).

Furthermore, if affordable housing is created in a downtown setting, this form of development is conducive to lifestyles for low-income families. In such cases, active transportation is an option; as well there are a variety of social amenities such as daycare, hospitals, after school programs, and parks in a downtown environment that do not require extensive transportation (Allison & Peters, 2011). By combining affordable housing with heritage preservation, we are improving both the built surroundings and liveability in small communities (ibid). To summarize, the following elements in the built environment can improve access to safe and affordable housing:

- Policies and zoning provisions that allow for second units in single family homes, semi-detached homes and row houses as-of-right.

- Choosing materials for the interior and exterior of homes, which mitigate health issues.
- Rehabilitation of heritage or historic buildings in a rural community into affordable housing.
- Creating affordable housing in the downtown of a small city, town, or village, in order to provide opportunities for an affordable lifestyle to low-income residents in rural communities.

Livelihood and Economic Opportunities

The quick pace of change in the New Economy (Chisolm, 2006), is making rural leaders struggle to keep pace with the local economic development processes. Due to the slowing down of the manufacturing industry, many communities are struggling with finding an economic approach that works well for them. The New Economy is represented by a change from primary industries and natural resources to more technological and knowledge based economies. The New Economy is characterized by the following four attributes: globalization, accelerated pace, a knowledge driven-economy, and a reliance on specialization and networks (Blakely and Bradshaw, 2002 as cited in Doucette, 2004).

This is not to imply that rural communities are passively giving way to the actualities of The New Economy. Alternatively, driven by crisis many have found themselves searching for new prospects, identifying unused resources, creating innovative collaborations both between and within communities and devising choices to the mainstream economy (Doucette, 2004).

Arts based projects could be a solution to the economic problems facing rural communities. Arts centred projects recognize the value of art and can be an important source of pride in rural communities. The benefits and challenges of starting a creative economy in a rural setting, and its links to sustainability, are not yet well understood (Fleming, 2009). A creative economy, is one "focused on the economic geography of creative activities and on a more post-structural understanding of culture and the economy as mutually essential ideas" (Fleming, 2009*).* Overall, it can be said that social, cultural, artistic and environmental variety is fulfilling for all people who live, work, and play in rural communities, and for their quality of life. The arts can become a tool for learning, social interaction, entertainment, and motivation and a vital aspect of economic development (Thorbeck, 2012).

Some initial steps that can be taken in order to improve economic situations in rural communities include:

- Creating an inventory of cultural, artistic, recreational and tourism assets in a community (art galleries, museums, cultural centres, conservation areas, trail systems, parks, heritage buildings, etc.)
- Brainstorming ideas for job creation, potential visitor attractions, and attracting new residents by the use of these community assets.
- Supporting entrepreneurs and artists, through financial and moral resources.

Natural Spaces/Greening of Communities

Effectively designed spaces make visual and physical access to nature an incorporated and essential part of design. As a result, the spaces have the ability to improve mental health and overall ability of site users to manage major life issues (Venhaus, 2012). Therefore, incorporating nature when enhancing and revitalizing a public space has important positive effects for community members and visitors.

Parks, open space, and natural areas provide chances for physical activity, leisure, contemplation and socializing. "A community with nature present at a variety of scales contributes to the spirit of a place. The availability of green space is associated with increased levels of social capital, and exposure to nature reduces stress levels, anger and anxiety, and replaces these with feelings of pleasure" (Canadian Institute of Planners - CIP, 2012).

Furthermore, in the book *Designing Healthy Communities,* Jackson and Sinclair (2012), explains "when I was in Elgin, Illinois, I heard high-schooler Ashley Lundgren talk about attention deficit disorder (ADD) and attention deficit/hyperactive disorder (ADHD). Her research showed that up to ten percent of students are being diagnosed with ADD or ADHD and approximately thirty-five percent of high school dropouts are students with ADD or ADHD. She found studies that say students are better able to concentrate when they are in contact with nature" (ibid). A solution could be incorporating nature into communities. Community gardens and parks connect people because they can interact with their neighbours, reducing social isolation. Isolation and alienation are big factors to address in depression and stress management. Mental health and stability are influenced by nature and green spaces. Overall, people are happiest when they are outside and surrounded by nature (Jackson & Sinclair, 2012).

Nature plays a critical role in making public spaces successful and healthy for people; however natural elements also have the effect of environmental sustainability and health. ”Environmental or ecological sustainability stems from the realization that human life (and the life of other creatures as well) is dependent upon the natural environment and its provision of ecosystem services” (Venhaus, 2012). To guarantee the prolonged existence of natural resources, sites must safeguard and repair ecosystem services and humans must act as stewards of the land. Sustainable spaces help communities build an environmental ethic by providing everyday opportunities for people to connect with nature (ibid). “Constructed landscapes can reveal the ecological processes, rhythms, and cycles of nature”, which in effect educate community members who come in contact with these spaces (ibid). Overall, sustainability is very significant in the revitalization of public spaces; it provides the public with an increased understanding of nature, allows for land stewardship, and encourages preservation.h

To summarize, some changes in the built environment that may aid with the improvement of natural spaces and the ‘greening’ of communities, include:

- Ensuring a variety of parks in a community; such as dog parks, sport field parks, community parks, memorial parks, etc.
- Creating a variety of connected trail systems, which provide a wide-range of recreational opportunities; these may include multi-use trails for walking, running, and cycling, as well as naturalized trails for hiking, mountain biking, and cross-country skiing.
- Developing community gardens has the ability to contribute to the natural elements in a community.

- Preserving natural heritage and agricultural landscapes also adds to the natural spaces in a community; some of these landscapes may be appropriate for recreational activities, others may need to be designated for farming or ecological preservation.

CHAPTER 4: Solutions for Healthy Rural Communities: Health & Sustainability

The complex planning issues associated with the built environment and health, have been categorized into four specific sections; social, environmental, recreational/cultural, and economic factors. These categories were developed in order to summarize and provide a comprehensive description of the various issues facing rural communities. Throughout this section, detailed descriptions of rural concerns based on the factors mentioned above will be provided, along with practical examples and potential solutions.

Social Factors Associated with Healthy Rural Communities

Aging Communities

A major social planning topic that many municipalities have already begun to undertake and will continue to work on is the issue of aging populations. This issue is particularly of interest to rural communities, as smaller and rural communities have larger proportions of aging populations when compared to larger urban centres (OPPI, 2009). Some of the services that will have to be improved will include increasing transportation options, geriatric services, and creating models of support that replicate systems in areas such as Denmark (Social Planning Network of Ontario, 2010). In studies on the impacts of an aging demographic, the number one issue identified is consistently transportation (OPPI, 2009).

Many communities of all sizes across Ontario have begun planning processes to explore and develop guidelines to address age-friendly communities (OPPI, 2009). These include:

- The County of Brant and City of Brantford have recently released A Master Aging Plan that creates a guide for the delivery of a wide-ranging and harmonized set of community services to older adults that have a variety of needs.
- The County of Oxford has also finalized a Master Aging Plan; the plan is intended to serve as a guide for the future development of services for seniors in Oxford County (Oxford Master Aging Plan Steering Committee et al., 2012).

An Age Friendly Community, Elliot Lake, Ontario

A very senior-friendly community in Ontario is Elliot Lake. This mining community, incorporated in 1955, lost 4,500 jobs in the 1990's when the mines closed. The community reacted by attracting retirees, since there was established high quality housing, an array of recreational opportunities nearby, good health care services, and a built environment that fostered a safe, unified community. Currently the community has developed into one where almost half of the population is retired. These retirees contribute to tourism when their friends and families come to visit, and contribute to public revenues. The town has improved its recreation facilities and added a seniors' issues office to deal with problems such as security and fraud. Transit routes are designed to stop at the front doors of residential complexes and to take seniors to the front doors of the places they need to visit, such as health clinics. The town of Elliot Lake keenly recruits and offers incentives to doctors, for them to provide health care to community residents (OPPI, 2009).

As mentioned previously, not all communities will be equally affected; many smaller municipalities and communities in northern Ontario are aging more rapidly than larger cities in Ontario (OPPI, 2009). The solutions to the challenges of an aging population are many, "ranging from changes in legislation to allow for property tax credits for low-income seniors as well as infrastructure redesign such as road narrowing, or the addition of pedestrian islands, to make walking more comfortable. These benefits are considerable, since many of the changes will also make life easier for children, parents, disabled persons and others" (OPPI, 2009).

Youth and Child Land Use Planning

Another very important social factor to consider when developing a healthy rural community is planning for the needs of children and youth. Youth and child land use and transportation policies are very important, especially in today's car dependant society. In 1974, sixty-six percent of all children walked or rode a bike to school. By 2000, that number had dropped to thirteen percent, and childhood obesity had skyrocketed (Jackson & Sinclair, 2012). Furthermore, rural children are approximately 25% more likely to be overweight than their metropolitan counterparts. One of the factors that may be driving this epidemic in rural settings is a lack of physical activity (Yousefian et al., 2010). Studies have shown that walking or bicycling to school increases children's concentration, improves mood and alertness, and enhances memory, creativity, and overall learning. Programs that promote safe routes to school for children result in improvements in both academics and physical fitness. When infrastructure and social programs create and support those safe routes, schools in areas with initially low levels of walking or biking to school

show increases in these healthy behaviours by twenty to two hundred percent (Jackson & Sinclair, 2012).

A specific document was developed to address the above noted issues, titled *Child and Youth Friendly Land-Use and Transportation Guidelines*, which was created by the Centre for Sustainable Transportation at the University of Winnipeg. The twenty one child and youth friendly land-use and transportation guidelines were developed in the spirit of a statement by Enrique Peñalosa, former mayor of Bogotà, Colombia; who stated "if we can build a successful city for children we will have a successful city for all people" (OPPI, 2009b). As stated by the OPPI (2009b), the guidelines are organized in six groups, which include the following: *Give priority to the needs of children and youth, plan for children and youth as pedestrians, plan for children and youth on bicycles (and other wheels), plan for children and youth as transit users, focus on journeys to and from school, reduce transport's adverse impacts on children and youth*. For further detail on the above mentioned guidelines please refer to Appendix B.

Active & Safe Routes to School Project, Peterborough, Ontario

An example of a project that focuses on youth and child land use and transportation is the Active and Safe Routes to School project in Peterborough, Ontario. The City of Peterborough started this initiative as a joint venture with local community organizations to promote sustainable transportation choices within the city (City of Peterborough, 2012). The project involves a variety of community groups around Peterborough County. As described by the City of Peterborough (2012), Active and Safe Routes to School is a programming project that includes the following current programs:

a) Car Free School Days – the first Wednesday of the month is designated as a Car Free School Day

b) High School Shifting Gears – two weeks where students and teachers track their travel to school to win prizes by increasing their walking, cycling and transit use

c) On the Bus Workshops – Grade 3 students get a workshop on how to ride the bus including a transit ride to important landmarks in the city

d) Grade 8 Transit Quest – all grade 8 students in the city receive a free transit pass for March Break

e) School Travel Planning Maps – student-friendly maps of walking, cycling and transit access to several schools around the city have been created and distributed

The Active and Safe Routes to School project focuses on the transportation methods that students use to get to and from school. The aim of this initiative is to understand current travel patterns of students and to educate and encourage more active and environmentally conscious methods of travelling to and from school (City of Peterborough, 2012).

In order to better understand the changes in youth transportation patterns over time, surveys in south-central Ontario were conducted in 1986 and 2006. The findings showed the following results, which may be indicative of wider trends, "young people's school day travel by car increased greatly between 1986 and 2006. For eleven to fifteen year olds the per-capita increase was 96 per cent. For sixteen to nineteen year-olds, the per-capita increase was much lower—12 percent—chiefly reflecting a sharp fall in driving by this age group across the two decades. Per-capita car use by adults, as passenger or driver, increased by only 4 percent, further highlighting

the extraordinary increase among young people under sixteen years of age" (OPPI, 2009b). The twenty one guidelines outlined earlier include land-use, as well as transport because land-use patterns indicate what mode of transportation youth are most likely to use. A major aim of the guidelines is to reduce the amount of travel by vehicle for children and youth, as well as reducing the amount of vehicular traffic near children and youth (OPPI, 2009b).

All of the goals described above seek to improve the health of children and youth, and expectantly aim to reduce epidemics such as childhood obesity. The initiatives described also indicate planning that is environmentally conscious by reducing the amount of vehicle emissions, which is an indicator of sustainable community design and practices.

Community Access to Healthy Food

In order to sustain a healthy rural community from a social planning perspective, access to affordable and nutritious food is a fundamental necessity. This fact is true for all individuals in a community, both old and young, and everyone in between. Currently across Canada, communities are working together on developing grassroots solutions to 'food security' (Public Health Agency of Canada - PHAC, 2012b). There are many definitions of food security and many solutions undertaken by communities to address food related problems. However, one definition that has been used internationally, as well as in Canada, is the following: "Food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (Agriculture and Agri-Food Canada, 1998 as cited in PHAC, 2012b). More recently, many groups have supplemented the definition, introducing concepts of local self-sufficiency,

protecting human dignity in food access, the need for food system reform, environmental sustainability, cultural considerations, and the importance of engaging communities in undertaking these issues (PHAC, 2012b).

Food security has come to refer to the various food related issues that our society is currently experiencing. The promotion of food security has inspired hundreds of "Community Food Actions (CFAs)" (PHAC, 2012b). The recently developing CFAs are varied and many are quite innovative. There are some CFAs such as food cooperatives, which are concerned with getting affordable foods into the hands of individuals. Other initiatives are focused on developing community capacity to produce and prepare their own food; these include actions such as community gardens and kitchens (PHAC, 2012b). Some other CFAs involve policy, which aims to reduce poverty and/or support local food economies. For the most part, Community Food Actions reflect a commitment to working collaboratively as a community to find solutions that will enhance quality of life and make a difference (PHAC, 2012b).

Haliburton Highlands Food Coalition

Haliburton County is an example of a rural community that has embraced Community Food Actions. Haliburton County (Haliburton Highlands) is an area at the north end of Southern Ontario, just south of Algonquin Park. The Community Food Actions that Haliburton has undertaken include the creation of the Haliburton Highlands Food Coalition. This coalition is a working group formed to develop, inspire, and enhance the production and purchase of local foods within the region (County of Haliburton, 2011).

The Haliburton Highlands Food Coalition has a variety of goals including; supporting educational opportunities and knowledge of local foods, improving resident awareness and access to local food, providing support to local food producers, improving the health of their community, and strengthening the local economy (County of Haliburton, 2011). A key way in which the Coalition achieves its goals is through their website and database which lists Farmers' Markets, Food Producers, Restaurants and Retailers, and Groups and Associations related to local food production. The function of the website is to connect farmers with consumers and to advertise local food events. For more information on the Haliburton Highlands Coalition please refer to Appendix C. Overall, the Community Food Actions that have been undertaken in Haliburton County are an example of sustainable and progressive initiatives that aim to solve community food related problems.

Environmental Factors Associated with Healthy Rural Communities

A Sustainable Approach: Taking Care of People and Nature

There are a wide range of environmental and sustainable measures that rural communities can undertake in order to improve the health of both people and nature. Sustainable rural environments involve making connections between human, animal, and environmental health, this is crucial to understanding wellness. "Keeping people, animals, and environments healthy is economically preferable to taking care of them when they are sick" (Thorbeck, 2012). A report commissioned for the Friends of the Greenbelt Foundation has identified that the goods and services embedded within the Greenbelt of the Toronto-centred region returns to the economy a value of $2.6 billion of value on an annual basis. This is found within the land base of the Greenbelt that provides services for clean air, water, and land (David Suzuki Foundation, 2006). A variety of goods and services of nature and of natural systems can be identified for Ontario communities.

Environmental Advisory Committee in Caledon, Ontario

A case study of the environmental focus of the Town of Caledon can be had where their Official Plan has a focus on environmental sustainability, and the Council has enacted an 'Environmental Advisory Committee' of interested citizens to give them advice on all things dealing with the environment. The Town has also created an environmental planner position which is quite rare for municipality's under 100,000 people (Caldwell, 2008).

Alternative Land Use Services (ALUS) program in Norfolk County

Alternative Land Use Services (ALUS) was designed by farmers for the use of farmers. It is reflective of a means to conserve and restore Canada's natural capital. The program respects and rewards farmers for good environmental management on their properties. The program is incentive based; ALUS does not compensate farmers for their impact on the land through environmental regulations. Instead it provides the tools and capacity to build on their good environmental practices (Agriculture and Agri-Food Canada and North American Wetlands Conservation Council, 2009).

There are several key principles associated with the program:

1) Shared responsibility for government and landowners. Farmers receive annual payments and 'other forms of compensation'.
2) Stewardship and conservation provides service valuation at 'fair market value'.
3) ALUS provides payments for the maintenance of existing natural works.
4) It is based on measureable environmental goods.
5) Farmers lead the environmental agenda.
6) ALUS is independently monitored.
7) Transparent and accountable.
8) Represents a fee for service; does not represent a significant increase for farm incomes. (Agriculture and Agri-Food Canada and North American Wetlands Conservation Council, 2009).

Munsee-Delaware Nation Tree Reforestation Project

Another interesting case comes from the Munsee-Delaware Nation Tree Reforestation Project on their lands near London, Ontario. Seventy seven thousand trees have been planted on 'idle agricultural lands' near London, Ontario and carbon credits associated with the trees' climate change mitigation benefits have been sold to a major corporation to offset its corporate gas emissions impacts. The land is on the Munsee-Delaware Nation and the buyer of the carbon credits is the TD Bank (Caldwell, 2011b).

This is the first carbon forest to be developed on First Nations land in Ontario and the first time a comprehensive guide has been used that accounts for the greenhouse gas value of the trees. The Munsee-Delaware Nation has launched Munsee Tree Corp. to handle the project and hopes to expand to other areas. The trees planted at Munsee-Delaware are a fast-growing hybrid poplar developed by researchers at the University of Guelph (Caldwell, 2011b). Tree Canada, a not-for-profit corporation, has calculated the seventy seven thousand poplar trees will sequester twenty thousand tonnes of carbon dioxide. The plan is to grow the trees for thirty-one years and then harvest them for biofuel production (ibid). Planting the trees has employed forty-two youth over a six week timeframe. For the TD Bank, the project will help it to meet its commitment made in 2008 to have carbon-neutral business operations (ibid).

Overall, all of the environmental ideas and initiatives described above identify solutions that will improve both the well-being of humans and the natural environment in rural communities. This is extremely important in order for "short-and long-term rural community success which embodies a synergistic relationship between the human and natural environments, society and culture, and the economy" (Thorbeck, 2012).

Recreational & Cultural Factors Associated with Healthy Rural Communities

For many instances, small communities are surrounded by agricultural land on the periphery. The preservation of this land is extremely important; for the preservation of agricultural practices, however also because rural land can be considered a cultural landscape. This type of land is significant to small communities because it provides scenery, heritage, natural features and potential places for recreation. In order to maintain these elements; it is important to preserve rural landscapes, which ultimately contribute to human health and well-being. The characteristics of rural historic landscapes include "land uses and activities, patterns of spatial organization, response to the natural environment, and cultural traditions; there are also circulation networks; boundary demarcations; topography; vegetation related to land use; buildings, structures, and objects; clusters; archeological sites and small scale elements, etc." (Longstreth, 2008).

In existing agricultural landscapes, "it is the permanency of human processes interacting with the natural landscape – farming versus (sub) urbanization – that will best ensure protection of this cultural resource. The physical components of the past should be protected to the highest degree possible" (Longstreth, 2008). However, conservation of specific "scenes" should not take precedence over insertion of new agricultural elements or crops if they respond to contemporary farming practices (ibid); an example could be farming practices that incorporate stewardship and environmental practices. A good approach to agricultural preservation, is to work to protect the material and process traditions of the past, integrating components so that the overarching appearance of these heritage lands remains intact, and facilitating new approaches to support the continuation of farming and preservation of the natural heritage and scenery of the rural

landscape (Longstreth, 2008). This type of preservation will encourage the well-being of the agricultural landscape, as well as contribute to the well-being of communities in and around these landscapes.

Active Transportation in Rural Communities

Another important reason for preserving historic rural landscapes is that they are able to provide opportunities for active transportation in small communities. The rural landscape can provide opportunities for multi-use and recreational trail systems, rail-trial projects, and general enjoyment of natural heritage features such as woodlots. All of these amenities and components can contribute to the health and well-being of residents in small communities. The challenge lies within connecting villages/towns and the broader agricultural lands in an effective and safe manner. To shed some light on this topic, Active Transportation (AT) Plans for small communities have given some guidance and ideas on how to develop successful recreational facilities for residents in small and rural communities. AT Plans for both Minden and Haliburton, Ontario, offer some innovative solutions for active transportation in small communities, which increase opportunities for physical activity. A key point made in both AT Plans was that connections to 'key points' or 'hotspots' are a great way to develop active transportation facilities in villages and rural areas (Young, 2008 and Hall, 2009). As an example, some assets around which active transportation could be developed in Minden, Ontario include: The Gull River, Minden Hills Cultural Centre, Minden Walking Trail, Heritage Buildings identified through Heritage Tour signage, and events such as 'Timberfest' (Young, 2008). Similarly in Haliburton, Ontario, hotspots were identified that could aid in successful active transportation development (Hall, 2009). Through public engagement and research activities, the following key

areas were identified for the development of active transportation facilities in, Haliburton: the Bridge on County Road 21, Haliburton Walking Trail as safe route to school and medical facilities, Wetland Boardwalk on Haliburton Walking Trail, and Haliburton Walking Trail to Medical Centre, Drag River Rehabilitation Trail, and the Rail Trail towards Barnum Lake (Hall, 2009).

These AT Plans indicate solutions on how to make active transportation a reality in small communities and rural areas. In the AT Plans discussed above, key natural, cultural, and service landmarks are used to create connections by the use of trails, sidewalks, and bike lanes. This helps create active transportation facilities that are functional, attractive, and safe. Moreover, these ideas promote the possibility of active transportation facilities in small and remote areas, by focusing on the existing assets and cultural wealth of these communities.

Eastern and South-western Ontario Art, Heritage and Culinary Trails

The Eastern Ontario Trail Alliance has developed a variety of trail systems for all types of trail users. Trails have been developed based on various themes that appeal to a variety of users, one particular trail system is based on art and heritage amenities. This trail system has the purpose of recreation, however due to heritage and art elements could also have the purpose of active transportation, if residents and visitors are travelling to these locations. The trail system in Eastern Ontario has the benefit of history and architectural details in the towns, hamlets and villages surrounding the trails (Eastern Ontario Trails Alliance, 2012). Often described as an artist's and photography lover’s delight, one can let creativity flow amongst the natural and historic elements. There are galleries, antique and treasure shops for residents and visitors to explore. Due to the cultural characteristics of the trail, unique heritage indulgences and top notch

craftsmanship can be found along the way, passed on through many generations (Eastern Ontario Trails Alliance, 2012).

The trails in rural communities have the ability to connect to a variety of other assets that can be found in these regions which are filled with culture, history, agriculture and nature. In south-western Ontario the trails are often connected to culinary, artisanal, farmland, studio and gallery amenities. Such is the case in Middlesex County and the heart of Sarnia-Lambton, this region offers the Forest City and the Carolinian Life Zone; a hotspot for natural diversity, which then connects to Lake Huron (Government of Ontario, 2013). In this type of journey, it is possible to find everything from farmer's markets and pick-your-own berry farms to a flour mill, vineyards and even a fishery.

Another exciting experience can be found on the North Shore of Lake Erie; which includes communities such as Port Stanley and St. Thomas. In this region, "there are miles of shoreline, sandy beaches and picturesque ports and villages" (Government of Ontario, 2013). Some activities that can be enjoyed in this area include sport fishing, cycling along farmlands or discovering the many studios and galleries showcasing visual arts attractions in the area.

All of the regions in south-western Ontario mentioned above offer a variety of cultural and recreational opportunities, as well as incorporate agri-tourism, tourism, agriculture, history and culture. This is fundamental in understanding the many qualities that rural communities are valued for by residents and visitors, as they offer unique experiences. These experiences have the

ability to improve the quality of life and well-being of residents, as well as the economic development of rural municipalities.

The heritage trails mentioned above are significant as they use a community's natural assets, character and cultural attributes to develop a recreational and physically active amenity. They are unique, as they are located in traditionally rural areas and build upon special landmarks or nodes, connect places, while at the same time showcase distinctive features of communities'.

Economic Factors Associated with Healthy Rural Communities

One of the first steps to revitalization and the improvement of a community's economy, which will ultimately contribute to the well-being of residents, is the conservation of culturally significant attributes. Successful revitalization occurs when citizens are behind the plans and see the value of what is being done. A key way in which this could be made possible is to emphasize that, that which is held in high regards or is considered special to residents, will be respected and conserved. "Community involvement is thus not only key to the conservation process, but success depends on applying locally based collaborative strategies that respect cultural and historical traditions along with ecological systems. Community-based conservation can enable people to cooperate in both identifying and retaining the values and the essential character of places by planning for the future and managing change" (Longstreth, 2008).

Economic Development: Art, Culture, and Innovation

The acknowledgment of the importance of culture in the economic development of a community also leads to the idea of art. "Studies suggest that "the arts" have a significant role in terms of encouraging employment growth, facilitating downtown regeneration, and attracting tourists" (Garrett-Petts, 2005). It has also been shown that "a thriving culture industry also has psychological impacts on community members, helping construct and affirm the image and feel of a place" (Garrett-Petts, 2005). Garrett-Petts (2005) has indicated several key indicators of a healthy community culture:

- Opportunities for direct and indirect participation in local arts and culture
- A generative mix of high art and vernacular cultural expression
- An effective rhetoric of arts and culture advocacy

Eastern Ontario: A Creative Economy

The creative economy is made up of individuals who are paid to think. They are often analytical and explore many possibilities in order to reach viable solutions in their day to day work (Prince Edward County, 2013). Below are the categories of creative workers in a community who drive the creative economy, they include; Senior Management, Business and Finance Professionals, Health Professionals, Teachers and Professors, Professional Occupations in Art and Culture and Technical Occupations in Recreation, among others.

In Eastern Ontario this sector of the economy is growing and prospering. The creative economy "is a high growth sector and is expected to contribute 42% of the new jobs over the next decade. Eastern Ontario is in the heart of the largest economy in Canada, the 5th largest in North America and 12th largest in the world" (Prince Edward County, 2013). This geographic position

presents significant trading opportunities in the new creative economy. In a creative economy place matters, just as infrastructure and taxes are a competitive advantage for classic industrial development, quality of place and lifestyle amenities are necessary characteristics to develop the creative economy (Prince Edward County, 2013). Eastern Ontario's abundant recreational opportunities, small town and rural charm offer ideal lifestyle qualities that the creative class desires. Cultural resources play a key role in enhancing quality of place and enhancing local creative economies. Municipal cultural planning is a tool for weighting these assets and increasing success in a local creative economy (Prince Edward County, 2013). Eastern Ontario's quality of place, combined with its geographic position and creative economy base, positions it very well to grow and succeed at building a creative economy.

An encouraging sign is that the rural areas of Eastern Ontario have a much higher rate of creative industry establishments (9.0%) than rural areas in the province overall (6.5%) (Prince Edward County, 2013). This may be due to the fact that Eastern Ontario has almost twice the rural population as the province. Based on "the Canadian Business Patterns data, the following sectors comprise the largest number of businesses in the Eastern Ontario Region (including Ottawa): Heritage, Photography Services, Artists, Public Relations and Architecture. When this data is reviewed without the presence of Ottawa, Photography Services comprises the largest number of creative businesses in Eastern Ontario (1,530 businesses), followed by Heritage, Artists, Public Relations and Architecture" (Prince Edward County, 2013). Overall, a greater number of workers in Eastern Ontario are employed in 'creative' occupations relative to the province as a whole. This may be attributed to the prevalence of manufacturing in other parts of the province, however further research is required to provide a stronger understanding.

People who have the psychological attributes of successful innovators are not only more likely to be attracted to a location where there is a vibrant arts and cultural community, but that exposure to the arts provides a stimulus for innovation. With the "perceived need to attract and retain "knowledgeable" workers, with relearning and innovative capacities that are now considered necessary for sustainable, competitive advantage, communities with a variety of cultural attributes can further attract and retain these types of innovative workers" (Garrett-Petts, 2005). This is important as places that do well in attracting and retaining creative people are more likely to thrive (Thorbeck, 2012). Another point is that "creative people value outdoor recreation very highly and are attracted to places and communities where many outdoor activities are available. Openness to migration is particularly important for smaller cities and rural regions. To attract and welcome creative people they have to develop the kind of social opportunities creative people value" (Thorbeck, 2012). The overarching idea is that, "the arts provide fertile conditions for developing and validating new "crazy" ideas or "out-of- the- box" thinking, in other words the arts foster innovation" (Garrett-Petts, 2005).

A community that has worked to conserve and build on its cultural, creative and artistic attributes, can inspire existing residents as well as attract new individuals and businesses, which can in turn have a positive effect on the economy of a rural community.

CHAPTER 5: A Planning Perspective

The relationship between land use planning and health appears be enjoying a recent resurgence in interest amongst both planning and health professionals. As recently as May 30th, 2012 mass media world-wide covered a journal article called, “Shaping cities for health: complexity and the planning of urban environments in the 21st century”, published in ‘The Lancet’. Locally, endorsement of the importance of the built environment and health amongst planners is demonstrated by the inclusion of health in important Provincial policy and legislative documents, such as the Provincial Policy Statement, 2005 (PPS) and the Planning Act. The PPS recommends numerous land use policies that support ‘liveable, healthy communities’.

Provincial Policy Statement

A large part of what municipalities do is ensuring that planning decisions enhance and protect the health and well-being of all citizens. The Ontario Planning Act (2006) and the Provincial Policy Statement (2005) recognize the complex inter-relationship among these factors while offering clear guidance on the creation of healthy communities (Hastings & Prince Edward Counties Health Unit - HPECHU, 2012). The current PPS opens with a commitment to "Building Strong Communities" which clearly articulates the link between land use development patterns, environmental health, economic well-being, and the notion of "liveable and healthy communities" (Perrotta, 2011):

"Ontario's long-term prosperity, environmental health and social well-being depend on wisely managing change and promoting efficient land use and development patterns. Efficient land use and development patterns support strong, liveable and healthy communities, protect the

environment and public health and safety, and facilitate economic growth" (PPS, 2005 as cited in Perrotta, 2011).

Existing provincial policy guides municipalities to:

- Build strong communities by managing and directing land use to achieve healthy, liveable and safe communities;
- Plan public streets, spaces and facilities to be safe and meet the needs of non-motorized and motorized movement;
- Promote mixed land uses and increased densities;
- Increase support for transit and reduce automobile dependence;
- Provide for a full range and equitable distribution of publicly accessible built and natural settings for recreation;
- Preserve all significant natural heritage features; and
- Create communities with places to live, work, learn, and play in close proximity to each other (HPECHU, 2012).

Official Plans

Another aspect of municipal planning is the development of Official Plans; municipalities must develop these plans and review them every five years. An Official Plan is a legislative document which sets out long-term land use policy for growth and development in a municipality (HPECHU, 2012). An Official Plan provides direction for development over a minimum twenty-year period while taking into consideration a wide range of social, economic, and environmental conditions that are important in building a healthy, safe, and sustainable community. An Official Plan usually includes a set of goals and objectives along with a conforming set of specific land use policies and accompanying schedules (HPECHU, 2012). Official Plans are a form of policy and direction at a more community scale. Official Plans comply with and complement Provincial policies. Goals related to public health are usually incorporated into these plans, a way by which to ensure this is to make health one of the overarching goals of a plan (Canadian Institute of Planners - CIP, 2012).

Functional Plans

Another form of policy development can be found in Functional Plans, which are non-regulatory, and often relate to specific topic areas. These types of plans offer more specific policy direction and strategies. Functional Plans are often on topics such as recreation (Recreation, Parks & Open Space Plans), cycling and pedestrian movement (Active Transportation Plans), and food systems (Food & Agriculture Strategies). Comparable to an Official Plan, a Functional Plan should have a clear description relating the topic area to health, and, where possible, should reference related health goals in the Official Plan (CIP, 2012).

Active Transportation Plans, a type of Functional Plan, are being created by municipalities as communities are realizing the importance of walking and cycling to attain their public health goals. These types of plans also realize the goals of greenhouse gas emissions lessening and climate protection, as well as reducing traffic problems (CIP, 2012). Places with a large amount of people travelling by foot and bicycle can inspire more opportunities for regular social interaction (CIP, 2012). "In the case of seniors, active living can prolong independent functioning by compressing the impairment period and diseases typically associated with aging. Physically active older adults tend to be one or two decades younger physiologically than their sedentary counterparts" (CIP, 2012). All of these ideas and elements have been discussed earlier, and this reiterates where Active Transportation Plans fit within the larger policy planning framework.

Functional Plans that concentrate on Parks and Recreation, or Open Space and Natural Areas look at opportunities for recreation as well as environmental health. Recreation & Parks Master Plans evaluate existing assets available to a community, and identify new resources needed to

keep up with community growth and change (CIP, 2012). This may involve various types of parks (such as Athletic/Sport Field Parks, Community Parks, or Dog Parks), trails, and recreation facilities. “Plans for Open Space and Natural Heritage Areas focus more on spaces selected for environmental conservation, wildlife habitat preservation, watercourse protection, management of hazardous areas, and view protection” (CIP, 2012).

Food systems are a fundamental component of community health. “Whether through traditional or non-traditional means, the ways in which food is produced, processed, transported, distributed, celebrated, and disposed of plays a key role in the health of community members” (CIP, 2012). Whether it be promoting a communities’ artisanal food reputation in order to attract visitors, addressing emergency resilience through a more self-sufficient food system, bringing healthier food options to “food deserts” in low-income neighbourhoods, or drawing on the significant economic power of farming, Functional Plans that focus on planning for the success of the food and agriculture in a community are an important contributor to its health (CIP, 2012).

Zoning

The relevance of land use zoning to public health lies in the origin of zoning as an instrument to promote public health, safety, and well-being and also to the numerous, however unintentional, negative health effects caused, at least in part, by the low density, segregated use urban configurations it has created. The term “zoning” is intended to include subdivision, development permit guidelines, landscaping, and any related “urban/built form” influencing by-laws (CIP, 2012). Housing diversity and accessibility is influenced by zoning by-laws to the extent that zoning is inherently based on segregation. “Significant portions of any Canadian town or City

are dominated by single-family residential uses, which frequently are the only major type of main use permitted. Many communities still restrict accessory dwellings or secondary suites in many of their zone districts" (CIP, 2012). There have been improvements and progressive changes such as the development of "Performance Zoning which focuses on an environmental carrying capacity model where the type and level of development must fit the unique characteristics of the individual property" (CIP, 2012).

Conclusion

Overall, a wide variety of concepts were discussed throughout this literature review. A new path was embarked on as described by Williams (2013), this review can be considered as part of "the broader shift towards addressing complex social problems and stimulating collective impact through collaboration, where researchers have taken steps towards opening the lines of communication between two important actors in this conversation about the built environment and health: public health practitioners and urban planners" – or more suitably rural planners. It is difficult to discern one specific solution to creating a "healthy rural community", therefore a wide-range of interesting and innovative concepts were presented in the hopes that these could be stepping stones to creating healthy rural communities. As stated by Thorbeck (2012), "the only effective way to deal with global rural issues is to look at them systematically and holistically". The various topic areas discussed throughout this literature review aim to give rural communities, ecological, social, cultural, and health prosperity, and continue the problem solving process for rural issues (Thorbeck, 2012).

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Appendix A –

Sandstrom Criteria for Green Infrastructure Goods and Services Planning - taken from Journal article, (Sandström 2006, 43-57) WITH MODIFICATION TO REFLECT RURAL AREAS AS OPPOSED TO URBAN AREAS

Recreation Criteria

Importance for everyday life - Daily use by citizens for walking, exercising, playing and social interaction

Accessibility - Location of green space within walking distance and without barriers (e.g. roads with heavy traffic)

Geographical distribution - Fair distribution of green spaces in all areas of the community

Interconnectedness between - Availability of greenways between green spaces

Pedagogical reason - Availability of green spaces for school excursions and for providing understanding of nature

Public health - Improves quality of life, and promote healthy habits

Surface water - Presence of lakes, ponds and streams improves the quality of green space

Appreciation - Different ways in which people appreciate parks, woods and other green spaces

Size of green space - Number and size of parks and other green spaces

Aesthetic functions -Role of parks and other green spaces to beautify the community

Public–private green spaces - Private gardens as an important complement to public green space

National interest - Preservation of specific green spaces of importance for the national heritage

Allotments - Leasehold of small plots in order to grow flowers and vegetables

Biodiversity Criteria

Biodiversity (ecosystem level) - Multiplicity of ecosystems in the rural environment

Biodiversity (species level) - Presence of a great variety of native species in the rural environment

Biodiversity (landscape level) - Variation of landscapes in the overall visual landscape

Presence of greenways - Presence of green passageways between habitats including connection with the community's land to facilitate migration of species

Valuable green cores - Green spaces with native habitats that can act as breeding grounds for species

Importance of surface water- Bodies of surface water increase ecosystem and species diversity

Green space management - Green plan has clearly stated management criteria for promoting biodiversity

Size of green spaces - Positive correlation between the size and number of green spaces and species

Habitat continuity - Older habitats develop higher species diversity compared with younger ones

Rare/threatened habitats - Importance of preserving rare/endangered species habitats and species

Barrier effects - Man-made obstructions in the landscape that prevent migration of species between habitats

Scientific values - Habitats of specific scientific values

Fragmentation and edge - Effects of subdividing a continuous habitat into effects smaller entities, which increase the amount of ecotones and number of species, and impact on local climate

Representativity - Habitats representative of a particular landscape

Metapopulation aspects - Aggregates of patch populations in the community landscape

Rural Community Structure Criterion

Identity and character-Each community has its characteristic green spaces that citizens recognize as important and unique

Structuring functions - Lines of trees, avenues and other vegetation along streets, roads and squares

Discerning component - A community becomes more comprehensible for the citizens because green spaces separate various landscapes found within the community into smaller districts

Unifying factor - Green space unites the community in a natural way

Linkage to surrounding hinterland - Green spaces provide a natural link between the community and the surrounding landscape

Cultural Identity Criterion

Specific cultural aspects - Single cultural features, e.g. cemeteries or mansion parks, not included in the other indicators

Historical heritage - Green spaces of historical importance, associated to special historical events

District features - Preserving ecosystems developed especially in particular landscapes of the community

Community character – Historical green planning is mirrored in the existing community landscape

National cultural interests - Green space of national cultural value

Local traditions - Green space, which is a result of particular cultivation traditions and/or techniques

Environmental Factor Criterion

Filter pollutants - Deciduous and other trees can act as a filter and clean the air

Protection zones - Vegetation shields houses and squares from wind

Improve local climate - Vegetation increases humidity, cools down the landscape and provides shaded areas

Ventilation system - By leading fresh air from the open space surroundings, greenways exchange and thereby improve the air in the community

Noise reduction - Vegetation reinforces the effects of noise

'Biological Solutions to Technical Problems' Criterion

Cleaning storm water - Green spaces are used to prevent polluted rainwater running directly into a recipient

Recipient for organic waste- Possibilities to take care of organic waste in green spaces

Importance for sustainability - Green spaces as an important element in local sustainable development policies

Appendix B.

Youth and Child Land Use and Transportation Guidelines (OPPI, 2009b)

1. *Give priority to the needs of children and youth* [Guidelines 1-3]. These three guidelines are the most important in that they call for a focus on the needs of young people and indicate processes whereby this can be achieved.

2. *Plan for children and youth as pedestrians* [Guidelines 4-7]. Walking is the most available mode of active transportation, and thus the most important. It can provide the maximum of exercise for the minimum financial outlay. Land uses should above all facilitate young people's walking.

3. *Plan for children and youth on bicycles (and other wheels)* [Guidelines 8-12]. Bicycling is the most common mode of mechanized, non-motorized transportation, and is available to most young people. It can be an important means of enhancing independence in youth; but, even more than adults, young people require a safe bicycling environment.

4. *Plan for children and youth as transit users* [Guidelines 13-15]. As with cycling, the availability of transit to young people can enhance their independence and social maturation. Young people will use transit if it is easy to use and particularly if they and their parents consider it to be safe.

5. *Focus on journeys to and from school.* [Guidelines 16-18]. During the school year, trips to and from school usually comprise the majority of young people's weekday travel. These trips should receive the highest priority when seeking to encourage active transportation (i.e., non-motorized transportation such as walking and bicycling).

6. *Reduce transport's adverse impacts on children and youth* [Guidelines 19-21]. Almost all of these impacts result from operation of the internal combustion engines that propel nearly all motorized vehicles. They are experienced mostly when travelling but also when near traffic.

Appendix C

Haliburton Highlands Food Coalition

The Haliburton Highlands Local Food Coalition will facilitate, through partnerships, the cultivation of a healthy local food system for the community. The coalition is a not-for-profit organization which allocates revenue produced through partnership activities, towards the support of the organization (County of Haliburton, 2011).

Through partnerships with food producers, retailers, restaurants, farmers' markets, schools, local food programs, distributors and consumers the Haliburton Highlands Food Coalition's overall vision aims to: identify and promote local food, encourage the production of more locally grown food, improve consumer awareness and access to local food, provide support to food producers, markets, schools and community businesses, engage the community in local food systems and issues, improve the health of their community, strengthen the local economy, assist with a distribution system for selling locally produced food and preserve the environment (County of Haliburton, 2011).

The goals of the Haliburton Highlands Food Coalition are:

- to ensure effective management of resources (time, people, money and information)
- to support educational opportunities that increase consumers' awareness and knowledge of growing, harvesting, preparing and storing local foods
- to operate a website and database which lists Farmers' Markets, Food Producers, Restaurants and Retailers, and Groups and Associations related to local food production
- to enhance the website to provide access to relevant information on topics such as agriculture and food production, food preparation, resources, and training opportunities for farmers and consumers (County of Haliburton, 2011).

Haliburton Fresh is a website that serves as a guide to local food production and sales in the Haliburton Highlands. It is a great tool for connecting farmers and consumers and it promotes local food events. It has been in existence for five years and each year the number of visits has been steadily increasing (County of Haliburton, 2011). The Haliburton Fresh website is located at www.haliburtonfresh.com which provides a directory/database for various entities, including:

- Local Food Producers
- Farmers' Markets
- Groups and Associations
- Retailers and Restaurants

The Haliburton Highlands Coalition believes that the only way to ensure that all residents of their community have access to healthy food is to improve policies for social programs and working opportunities, to encourage healthy community planning and local food growing systems, to protect the environment and to enable greater use of lands for growing and agriculture (County of Haliburton, 2011).