

Mapping Opportunities for Healthy Eating and Healthy Physical Activity in Grey-Bruce, Ontario

Spring 2012

Prepared for the
Grey-Bruce Health Unit

Prepared by the
Human Environments Analysis Laboratory (HEAL), UWO



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Preface

Reference:

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Executive Summary

Results of this report suggest opportunities for improvements in the built environment of Grey-Bruce which would enhance the landscape of healthy food and physical activity. Based on a calculation of high socioeconomic distress, poor pedestrian access, and high population density, some parts of Grey-Bruce could be considered 'food deserts'.

Residents in a distressed neighbourhood in northwestern Owen Sound are not within walking distance of a grocery store, meaning this area could be a food desert. Grocery stores are also absent from some rural regions where distress levels are higher than average. These areas should be of immediate concern to regional officials when planning future food-related programs.

In most rural areas of the region, which are very sparsely populated, grocery stores can only be conveniently accessed by automobile. Residents in smaller settlements have good access to one, but not two, grocery stores. These residents are particularly vulnerable in the event of the closure of any of their local grocery stores.

Opportunities for healthy physical activity are easier to find throughout Grey-Bruce; only a few areas are greater than 10 kilometres from a recreational opportunity. Additionally, unlike healthy food, healthy physical activity may also be found informally, in the form of hiking along trails or bicycling along roads. Still, more attention can be paid to both healthy eating and healthy physical activity to enhance Grey-Bruce's built environment.

Executive Summary

Several recommendations are proposed for improving access to opportunities for healthy eating and physical activity in Grey-Bruce as part of an overall 'healthy environments' strategy to enhance public health. Based on the findings of this report, we recommend that:

- any policy or environmental interventions aimed at improving access to healthy food should target potential 'food deserts' as priority areas for reinvestment by retail
- small communities with only one nutritious food option should be considered for proactive strategies to maintain a profitable economic environment for existing retail
- the development of a sustainable food master plan should be a part of the official plan review process
- any policy or environmental interventions aimed at improving access to physical activity should target potential 'recreation deserts' as priority areas
- when new development occurs, the importance of walkability should be considered, including street connectivity, appropriate densities, and land use mix
- existing developments should be retrofitted with safe and aesthetically pleasing sidewalk environments to promote active modes of travel

Executive Summary

Additional recommendations are also made for moving beyond this report, to expand the current level of knowledge and collaboration around healthy environments in Grey-Bruce. To work toward the enhancement of health among residents throughout the region, we recommend that the Grey-Bruce Health Unit, the Grey Bruce Healthy Communities Partnership and other stakeholders:

- more actively cooperate and collaborate with one another to achieve the common goal of enhancing health and quality of life
- strengthen the ongoing work of the Grey-Bruce Healthy Communities Partnership to support the “Grey-Bruce Community Picture” report
- generate and maintain a high quality database of public parks, other recreation opportunities, and food retail outlets
- conduct field surveys of public parks and food retail outlets to inventory and assess the quality of different features in each location
- conduct on-going surveys of residents to gain a better understanding of how health-related behaviours are influenced by access to and perceptions of elements of the built environment
- conduct further accessibility studies based on the needs and desires of specific population subgroups (e.g. children, seniors, rural populations)

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Introduction

The purpose of this report is to examine opportunities for healthy eating and healthy physical activity in the built environment of Grey-Bruce, Ontario.

The objectives are: 1) to map and assess levels of access to nutritious food retailers and opportunities for healthy physical activity; 2) to discuss the implications of this access in regards to socioeconomic distress levels; and 3) to make recommendations regarding the built environment of Grey-Bruce to enhance opportunities for healthy living.

To properly interpret the distribution of opportunities for healthy eating and physical activity in the built environment, it is necessary to first gain a better understanding of the population under study, and how that population varies in different areas throughout Grey-Bruce. Access to healthy food and physical activity may be evaluated within this local context.

Introduction

This report is broken down into three sections beyond this introduction:

- Section 1 presents a profile of the Grey-Bruce region, including maps and data on population density and socioeconomic characteristics across the county. These data were collected from the 2006 Canadian Census, with key variables identified that help predict areas of high socioeconomic distress.
- Section 2 includes maps, data, and discussion on access to nutritious food outlets in Grey-Bruce. Data for this section were collected from various food databases, and spatial analysis was conducted to pinpoint their locations.
- Section 3 includes maps, data, and discussion on access to opportunities for healthy physical activity in Grey-Bruce. Data for this section were collected from the Grey-Bruce Health Unit, and spatial analysis was conducted to pinpoint their locations.

For sections 2 and 3, analysis consisted of calculating the distance to various food sources from every road midpoint, which allowed for a precise level of analysis. To understand road midpoint accessibility at the community level, aggregate statistics are shown at the municipal level.

*Note: Census dissemination areas for First Nations Neyaashiinigiing 27 and Saugeen 29 are omitted from demographic analysis due to high non-response rates.

Section 1

Socio-demographic Profile

To understand how the food environment affects residents throughout Owen Sound and Grey-Bruce, it is important to undertake an evaluation of sociodemographic characteristics of the population. In this section, these characteristics will be mapped, and four key variables will be combined to form a composite index of socioeconomic distress.

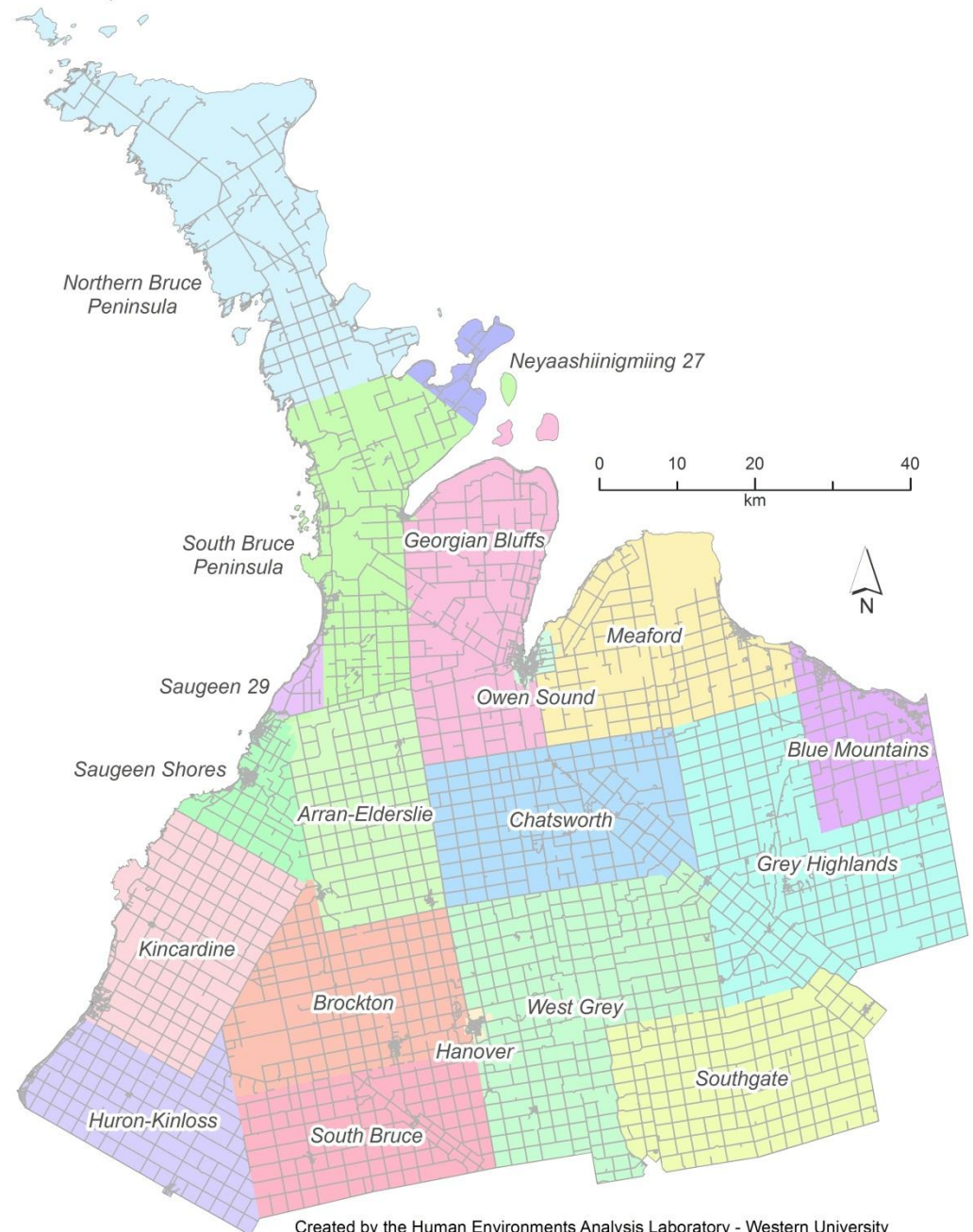


Figure 1.1 Communities of Grey-Bruce, 2012

Population Density

As might be expected, population densities are highest in Owen Sound and other population centres like Kincardine, Hanover, Meaford, Walkerton and Port Elgin. The implications of this are that since most of the region’s population lives in just a few population centres, access to services will be best in these places and considerably lower in rural areas distant from them.

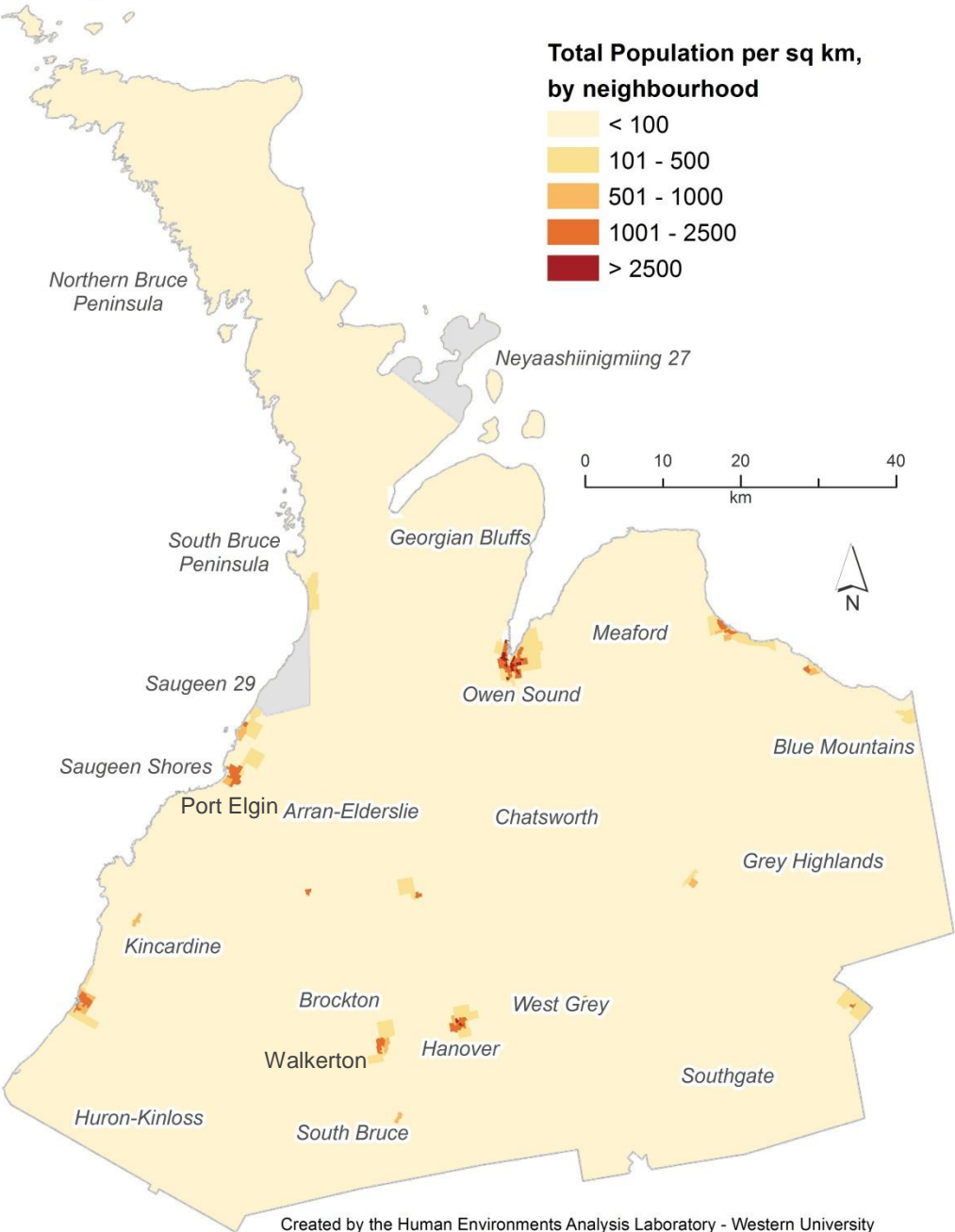


Figure 1.2 Population Density, Grey-Bruce, 2006

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Proportion of Children & Youth

Unlike density, the proportion of children indicates where children make up relatively higher or lower percentages of the population.

Areas with the highest proportions of children and youth tend to be found in rural farming communities distant from main population centres. Areas near Georgian Bay and Lake Huron tend to have the lowest proportion of children, likely due to these areas being popular retirement destinations.

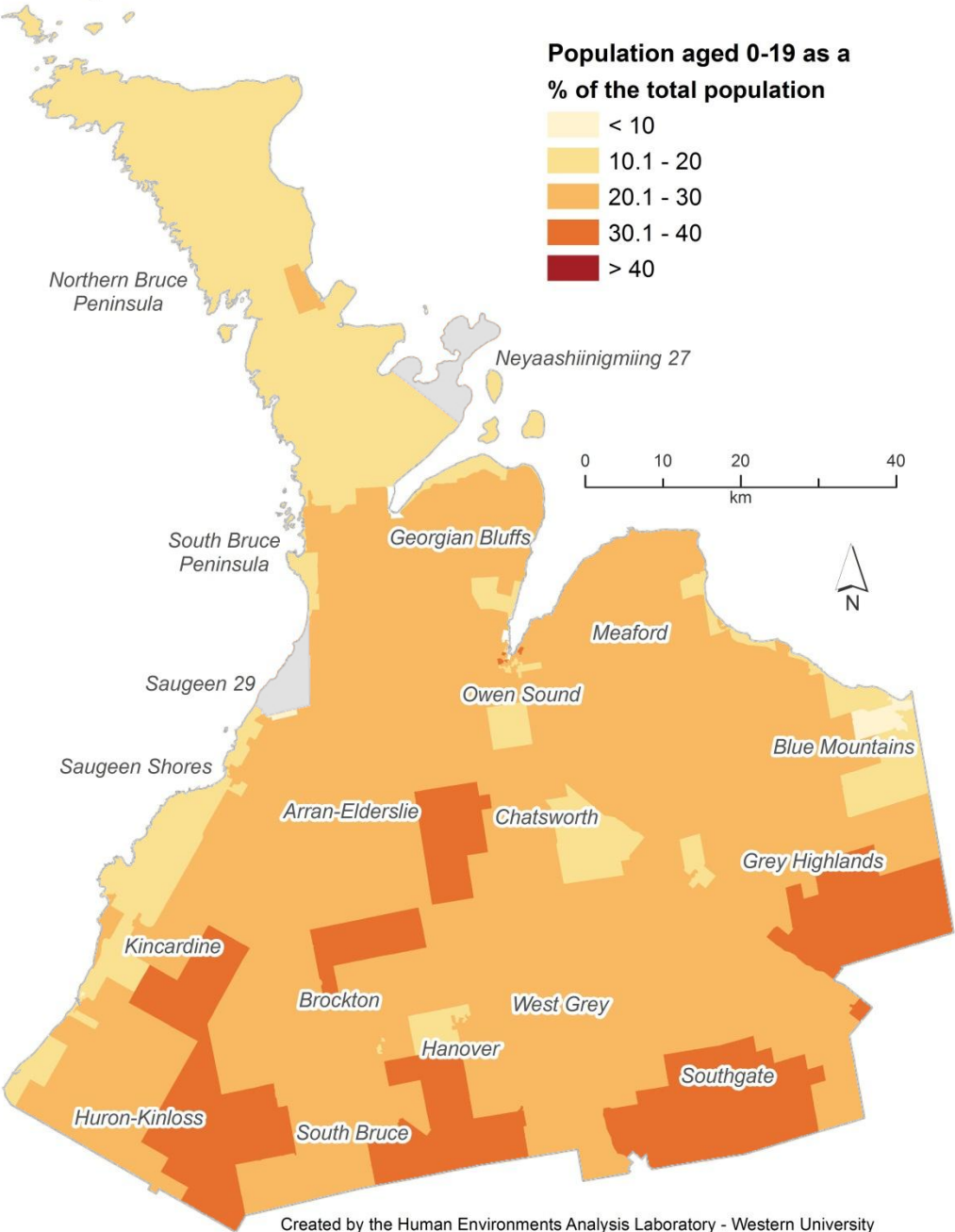


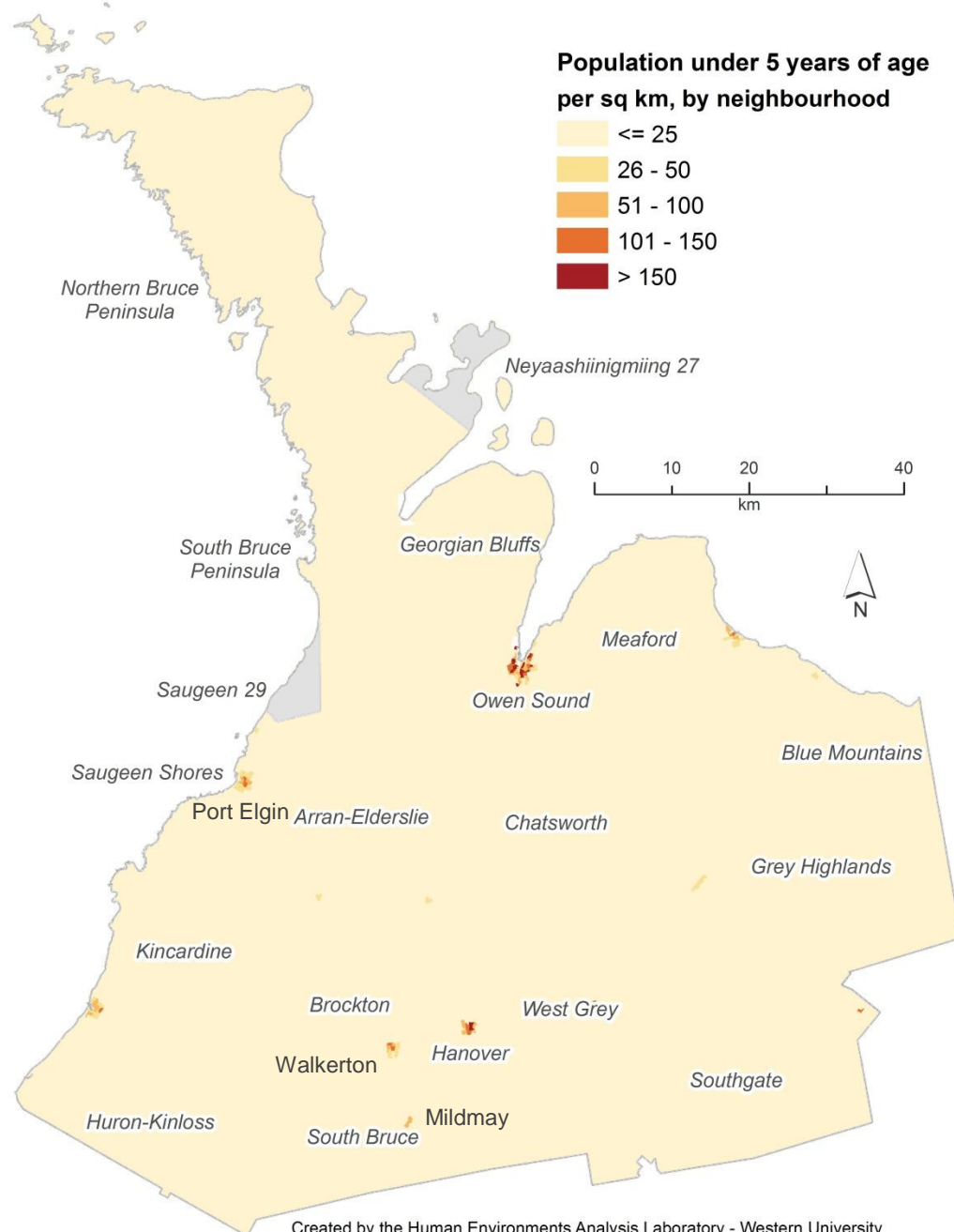
Figure 1.3 Proportion of Children under 19 years, Grey-Bruce, 2006

Created by the Human Environments Analysis Laboratory - Western University

Density of Children Under 5

While rural areas have high proportions of children, the areas with the highest densities of children under 5 years of age are found in Owen Sound and Hanover. Additionally, Walkerton, Mildmay, Dundalk, Kincardine, Port Elgin and Meaford show higher than average densities. Despite relatively high population densities in some rural communities, most do not have many children under the age of 5.

Figure 1.4 Density of Children under 5 years, Grey-Bruce, 2006



Density of Children & Youth

As with the density of children under 5, the areas with the highest density of children under 19 years of age are found in Owen Sound and Hanover, as well as a few other main population centres including Port Elgin, Kincardine, Walkerton, Mildmay, Meaford, and Dundalk.

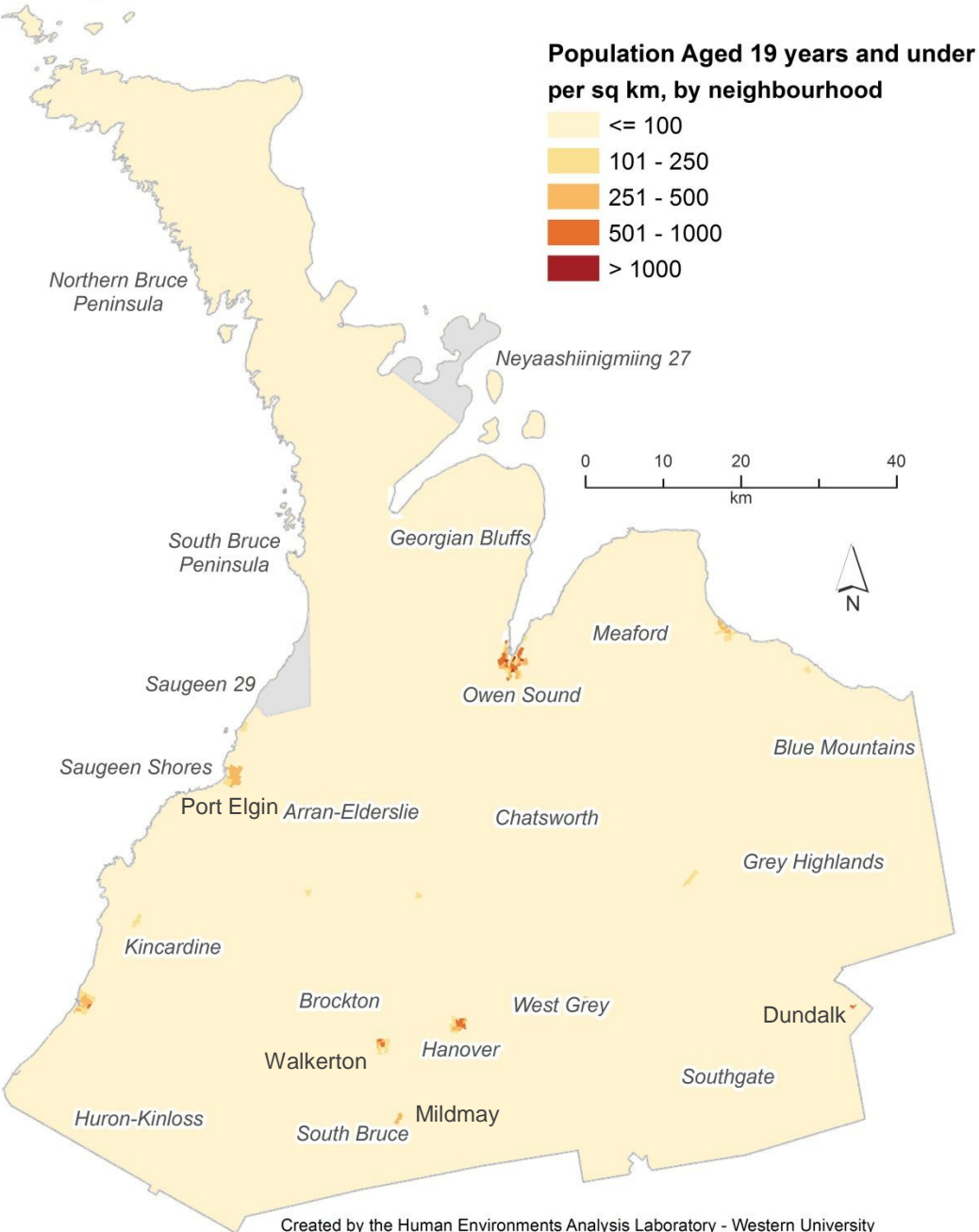


Figure 1.5 Density of Children under 19 years, Grey-Bruce, 2006

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Proportion of Seniors

In contrast to the areas with the most children, senior citizens (ages 65 and over) are found more frequently in certain dissemination areas where senior citizen accommodations are more prevalent—not just in Owen Sound. Also high on the list are Lucknow, Markdale, Thornbury, Walkerton, Hanover, Southampton and Lion’s Head.

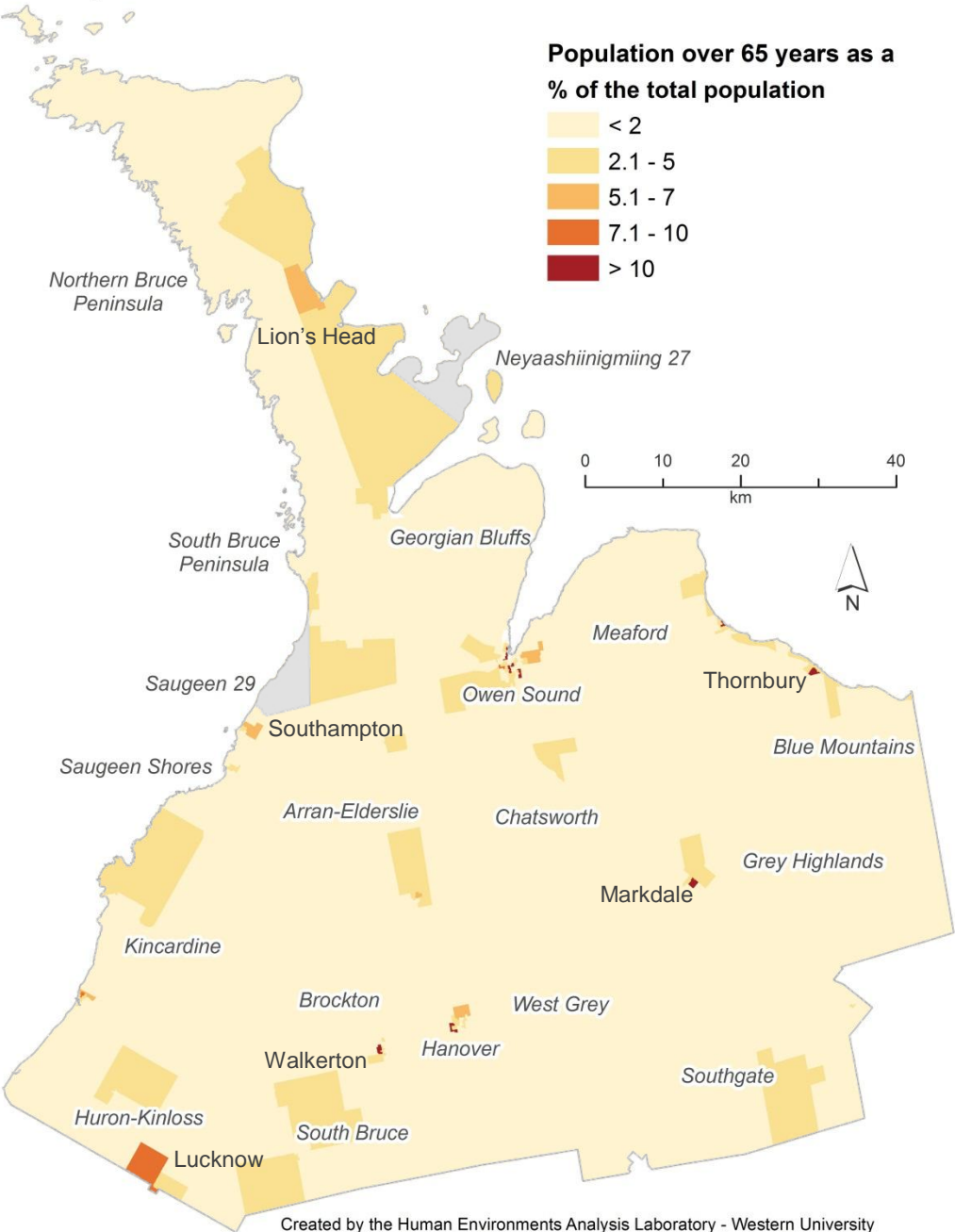


Figure 1.6 Proportion of Adults 65 and Older, Grey-Bruce, 2006

Created by the Human Environments Analysis Laboratory - Western University

Density of New Immigrants

Unlike in many other regions of Canada, Grey-Bruce has a very low immigration rate, resulting in low concentrations of new immigrants throughout the region. Owen Sound is the only place in the region where the immigrant population density is higher than 100 people per square kilometre. Kincardine, Port Elgin, Chesley, Hanover, and Meaford also have small immigrant populations.

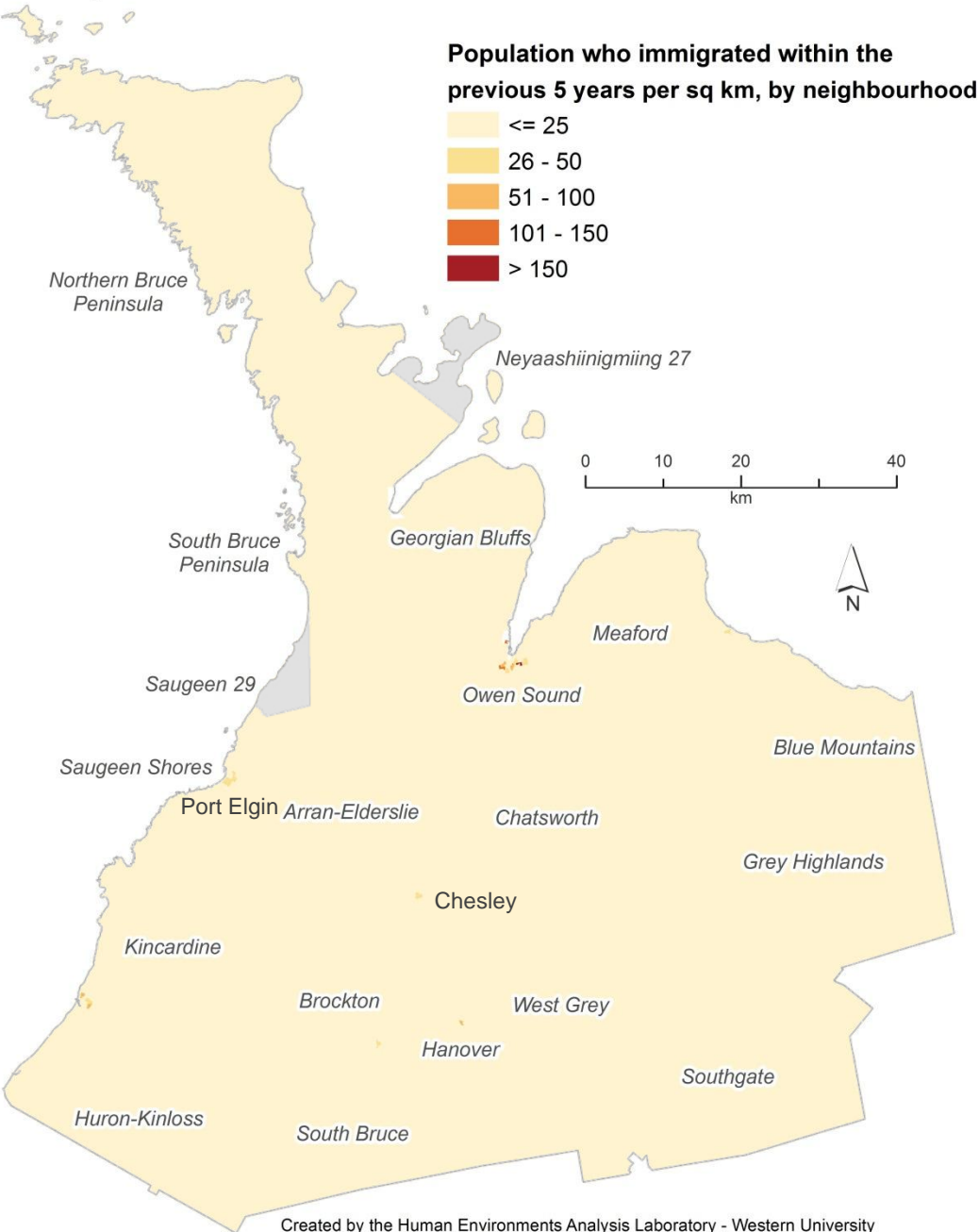


Figure 1.7 Density of New Immigrants, Grey-Bruce, 2006

Median Household Income

Matching the distribution of senior citizens, median household income is highest along the coast in Blue Mountains, Saugeen Shores, Kincardine, and Huron-Kinloss. The lowest incomes are seen in rural areas throughout Grey-Bruce, as well as around downtown Owen Sound.

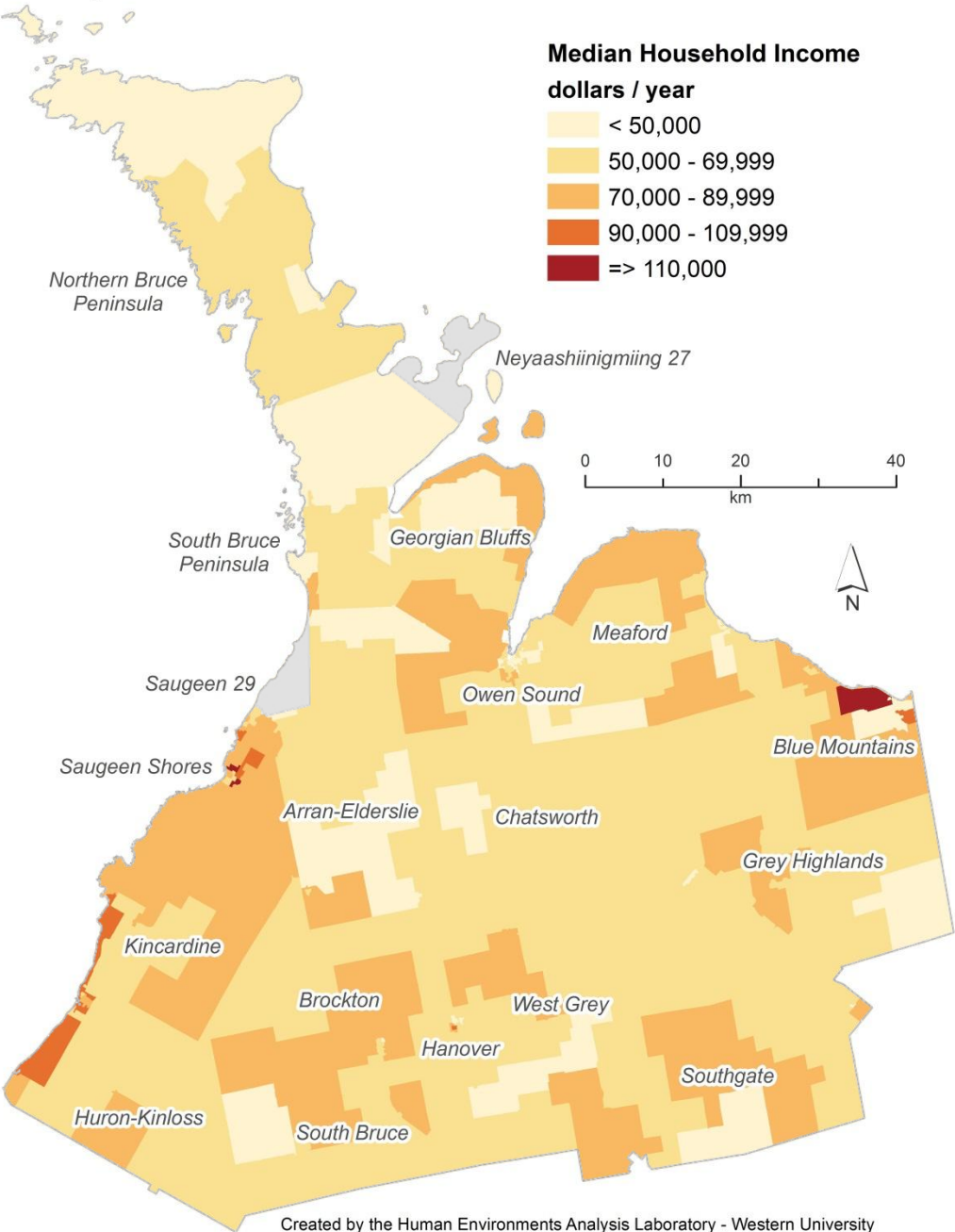


Figure 1.8 Median Household Income, Grey-Bruce, 2006

Low-Income Families

Western Chatsworth, West Grey near Durham, and Meaford have the highest proportion of households falling below the low-income cutoff set by Statistics Canada (termed 'straitened conditions').

Note: This characteristic is considered because the presence of low-income puts a direct strain on the ability of families to purchase adequate nutritious food.

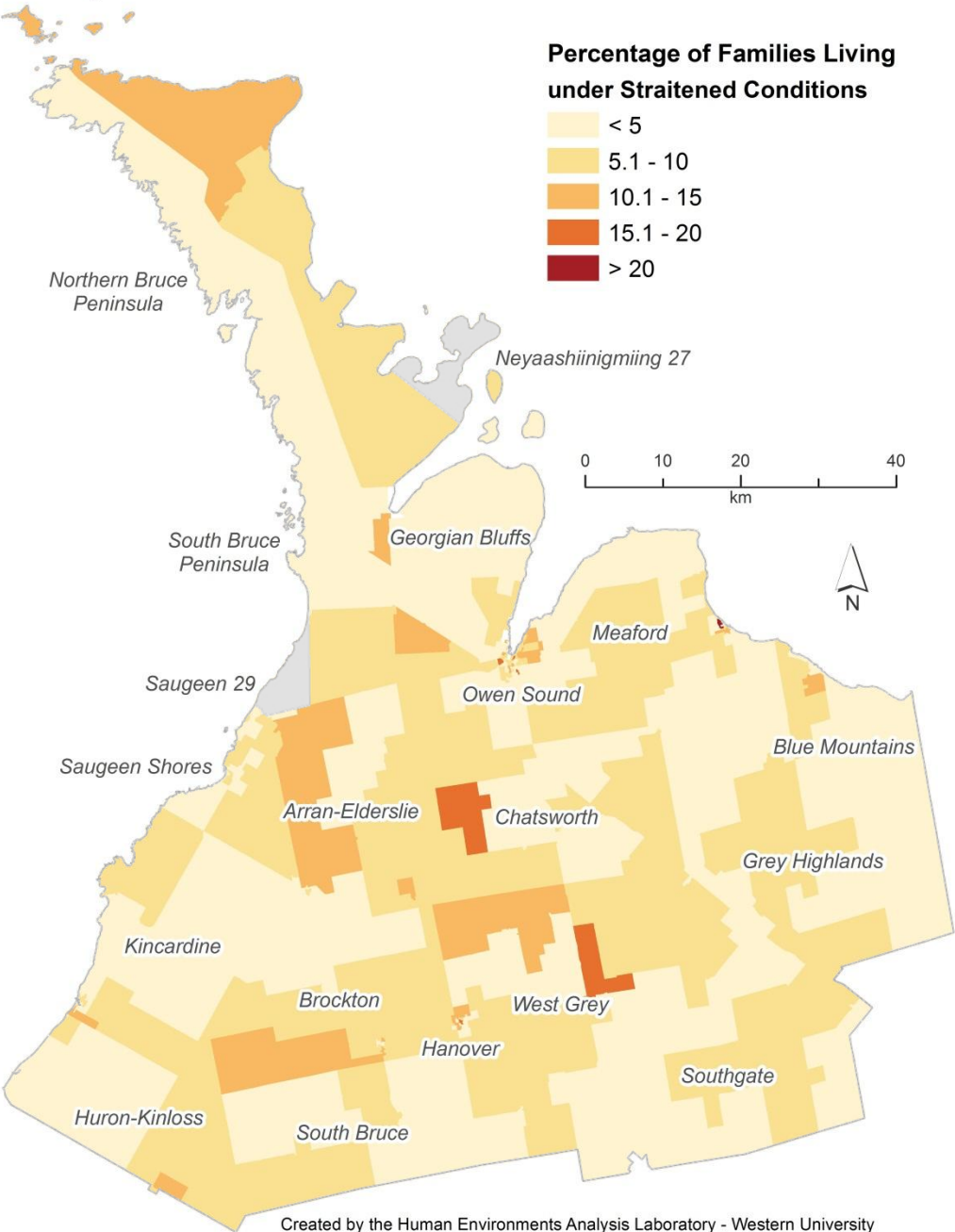


Figure 1.9 Low-Income Population Levels, Grey-Bruce, 2006

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Lone Parent Families

High lone parenthood rates are scattered throughout rural regions including Grey Highlands, West Grey, and Chatsworth. Wiarton, Hanover, Walkerton, Meaford and Owen Sound also exhibit high rates of lone parenthood.

Note: This characteristic is considered because of the relationship between lone parenthood and inadequate nutrition.

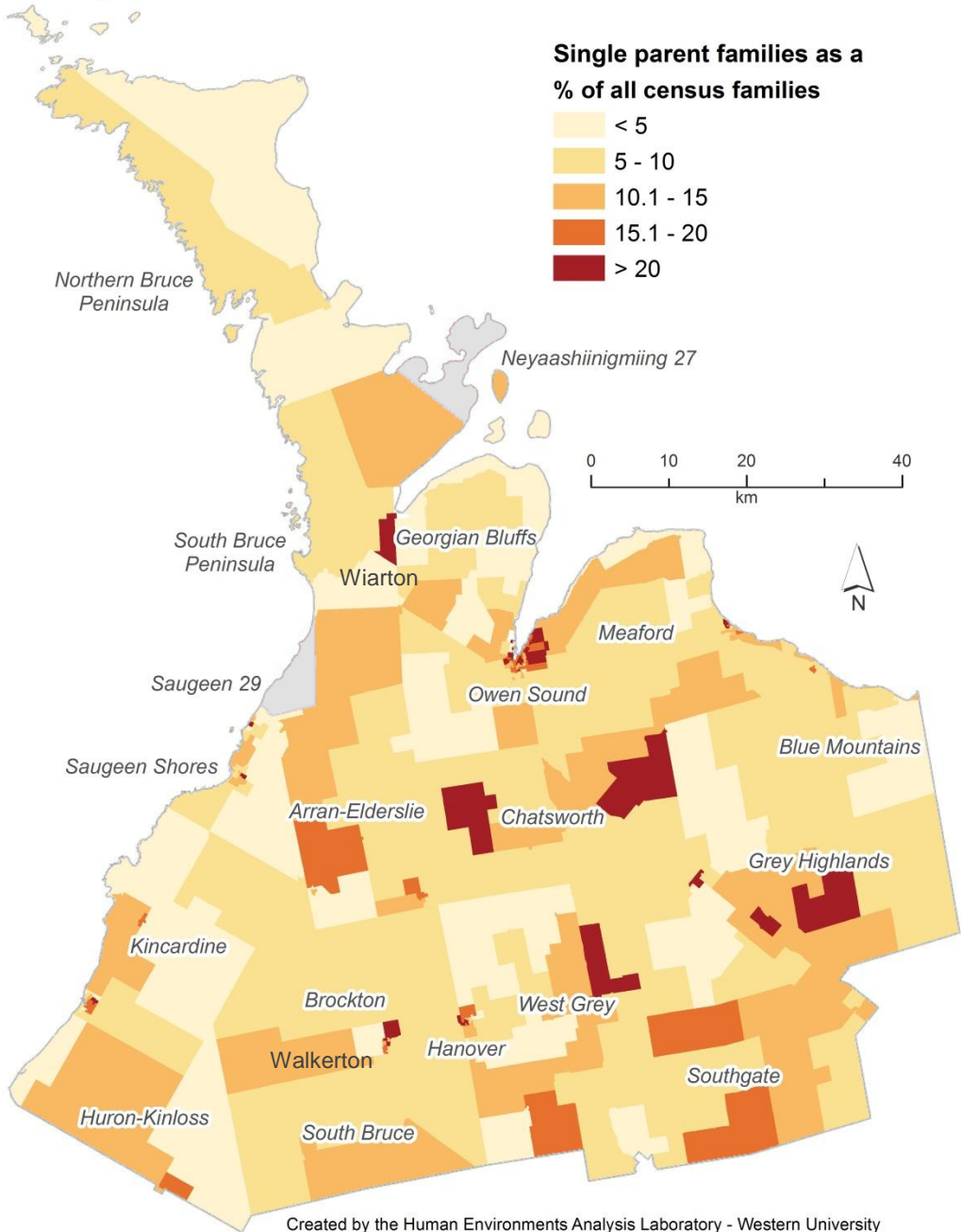


Figure 1.10 Lone Parenthood Levels, Grey-Bruce, 2006

Educational Attainment

The lowest educational attainment rates are seen in Southgate, Chatsworth, and Huron-Kinloss, while the highest rates are in Blue Mountains.

Note: This characteristic is considered because poor dietary habits have frequently been correlated with low educational attainment levels.

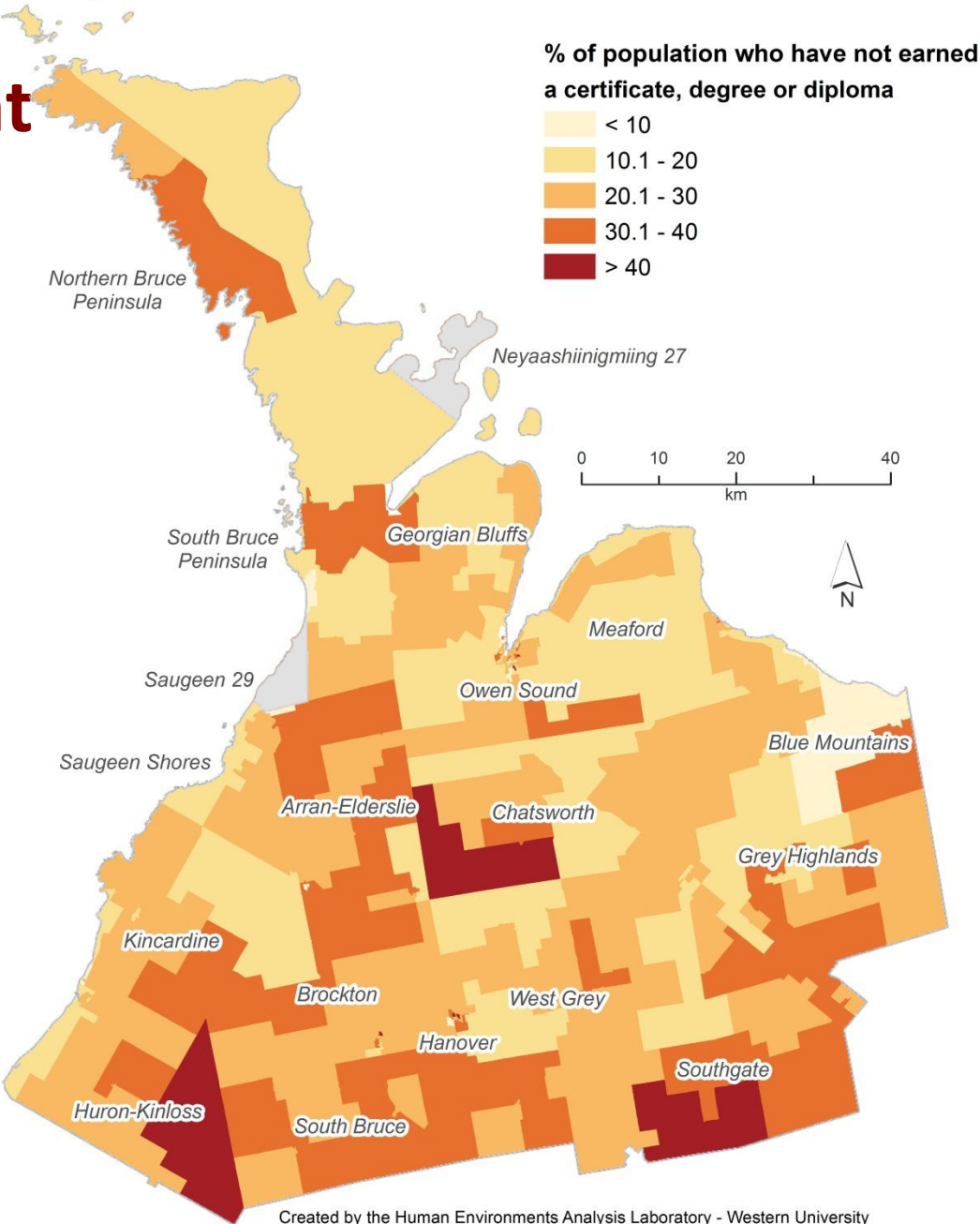


Figure 1.11 Educational Attainment Levels, Grey-Bruce, 2006

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Unemployment

High unemployment rates are concentrated in Arran-Elderslie and Northern Bruce Peninsula.

Note: This characteristic is considered because of the indirect effect it has on purchasing power, which influences food security.

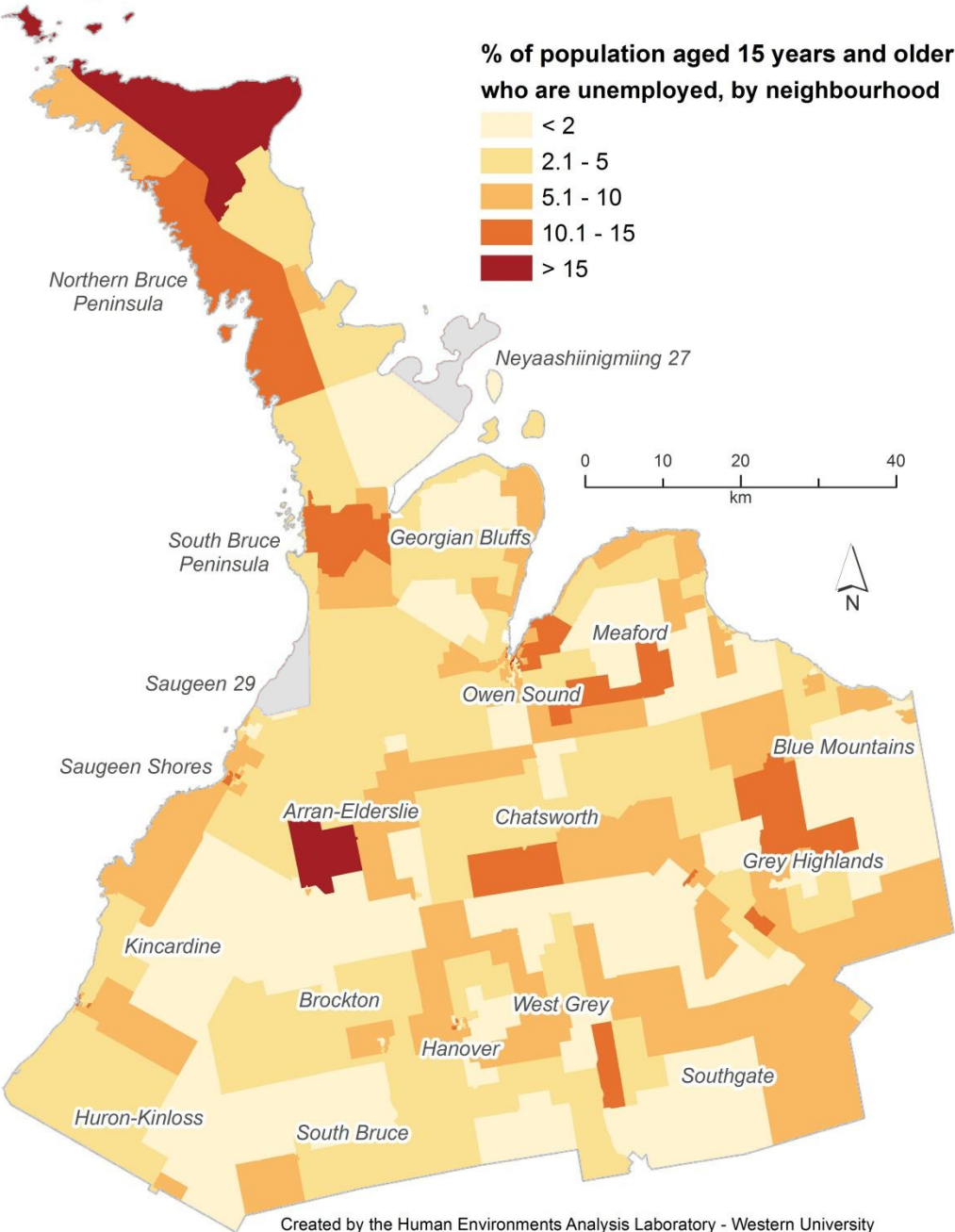


Figure 1.12 Unemployment Levels, Grey-Bruce, 2006

Socioeconomic Distress

Community	Lone Parenthood	Unemployment Rate	Low Income	Low Education	Distress Score
South Bruce	7.5	2.7	3.4	28.6	-0.94
Huron-Kinloss	7.0	3.3	5.2	29.5	-0.38
Kincardine	9.0	4.9	2.7	18.9	-1.19
Brockton	11.6	3.8	6.3	27.5	0.22
Arran-Elderslie	10.3	4.5	6.9	28.8	0.81
Saugeen Shores	11.0	6.2	2.3	17.3	-0.84
South Bruce Pen.	9.8	5.8	4.7	22.0	-0.38
Northern Bruce Pen.	4.3	9.2	4.6	19.9	-0.10
West Grey	8.6	3.2	5.8	27.0	-0.55
Southgate	10.0	5.0	2.5	32.0	0.40
Grey Highlands	11.1	5.1	3.2	24.2	0.13
Hanover	14.8	5.5	5.5	27.5	1.10
Chatsworth	10.9	5.1	4.5	27.7	0.34
Blue Mountains	7.3	3.3	3.4	15.0	-2.24
Meaford	10.9	4.8	4.5	22.5	-0.15
Georgian Bluffs	5.7	3.8	2.7	20.5	-1.70
Owen Sound	18.7	6.7	6.9	23.8	2.00

Table 2.1 Socio-economic Distress Indicators by Community, Grey-Bruce

Socioeconomic Distress

Socioeconomic distress was assessed by combining four key variables which contribute to food insecurity (low income, lone parenthood, low education, and unemployment) into a composite distress index for dissemination areas (see Appendix). Distress levels are highest in Arran-Elderslie, Hanover, Owen Sound and in the village of Meaford. The lowest levels exist along the Lake Huron shore as well as South Bruce, Blue Mountains and Georgian Bluffs.

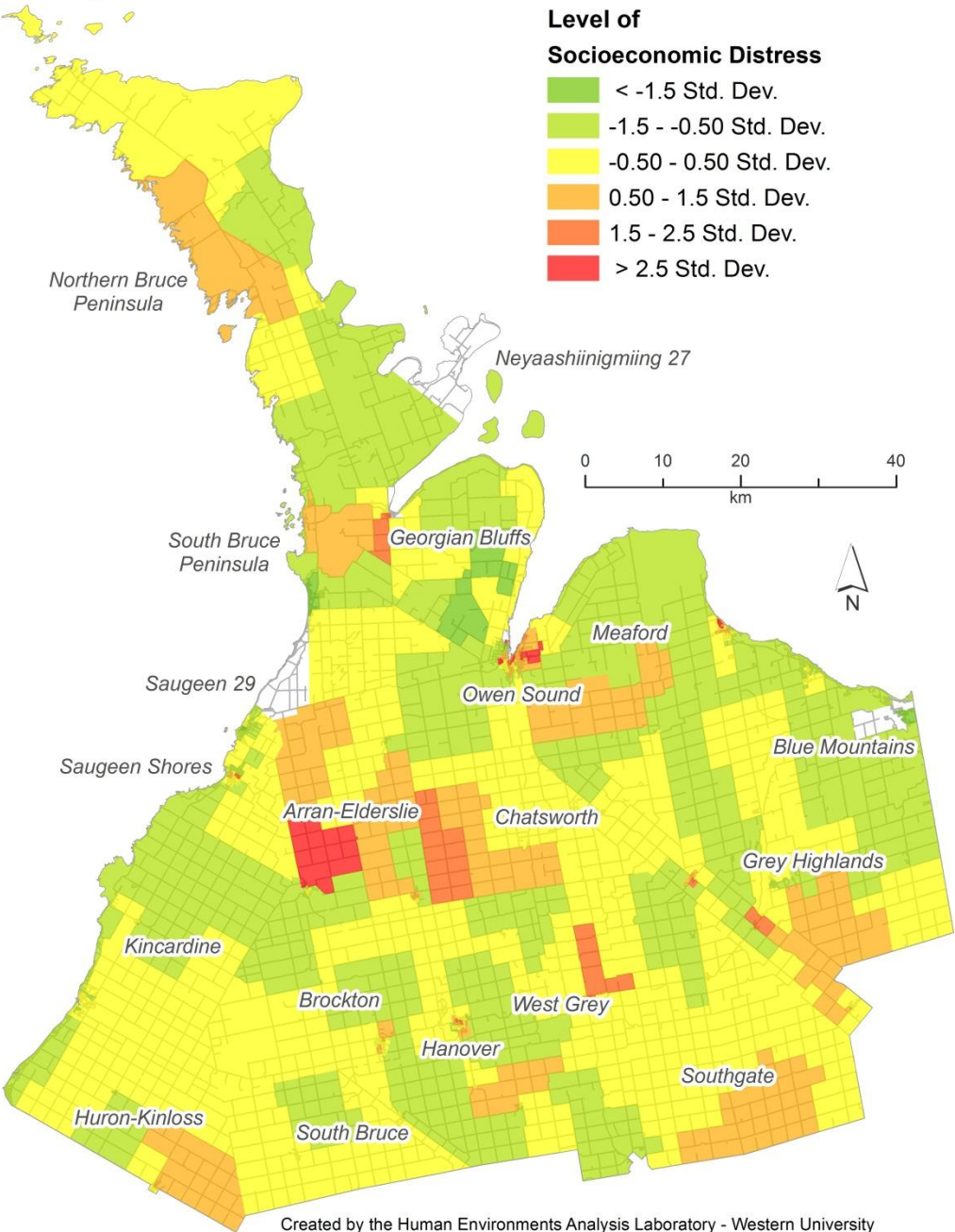
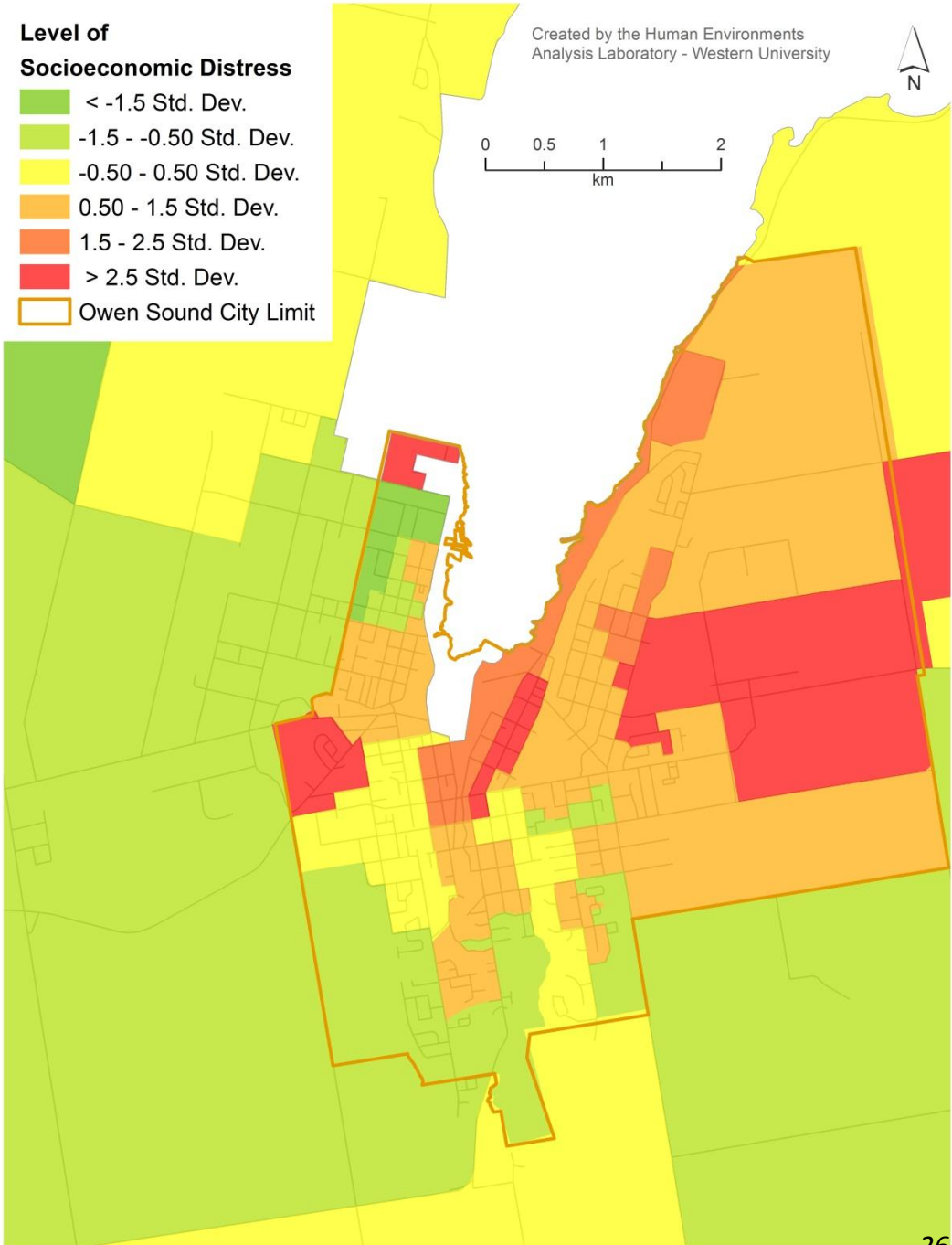


Figure 1.13 Socioeconomic Distress Levels, Grey-Bruce, 2006

Socioeconomic Distress

In Owen Sound, high distress relative to the region is widespread. The areas near Alpha Street, 28th Street West, 16th Street East, and downtown showcase the highest distress. Only portions of the south and northwest ends of town are sufficiently below the mean distress score to be considered low distress.

Figure 1.14 Socioeconomic Distress Index Levels, Owen Sound, 2006



Socioeconomic Distress

The value of characterizing socioeconomic distress lies in the way this information can be combined in a geographic information system (GIS) with other neighbourhood information (like accessibility to healthy eating or healthy physical activity) to indicate where highly distressed neighbourhoods might be distant from important amenities.

As discussed, only the last four socioeconomic variables were considered to build the distress index. Additional variables may be considered, for instance, the maps of population density are useful in determining high distress neighbourhoods where future investment in retail or recreational opportunities would be most needed.

Section 2

Opportunities for Healthy Eating & Potential Food Deserts

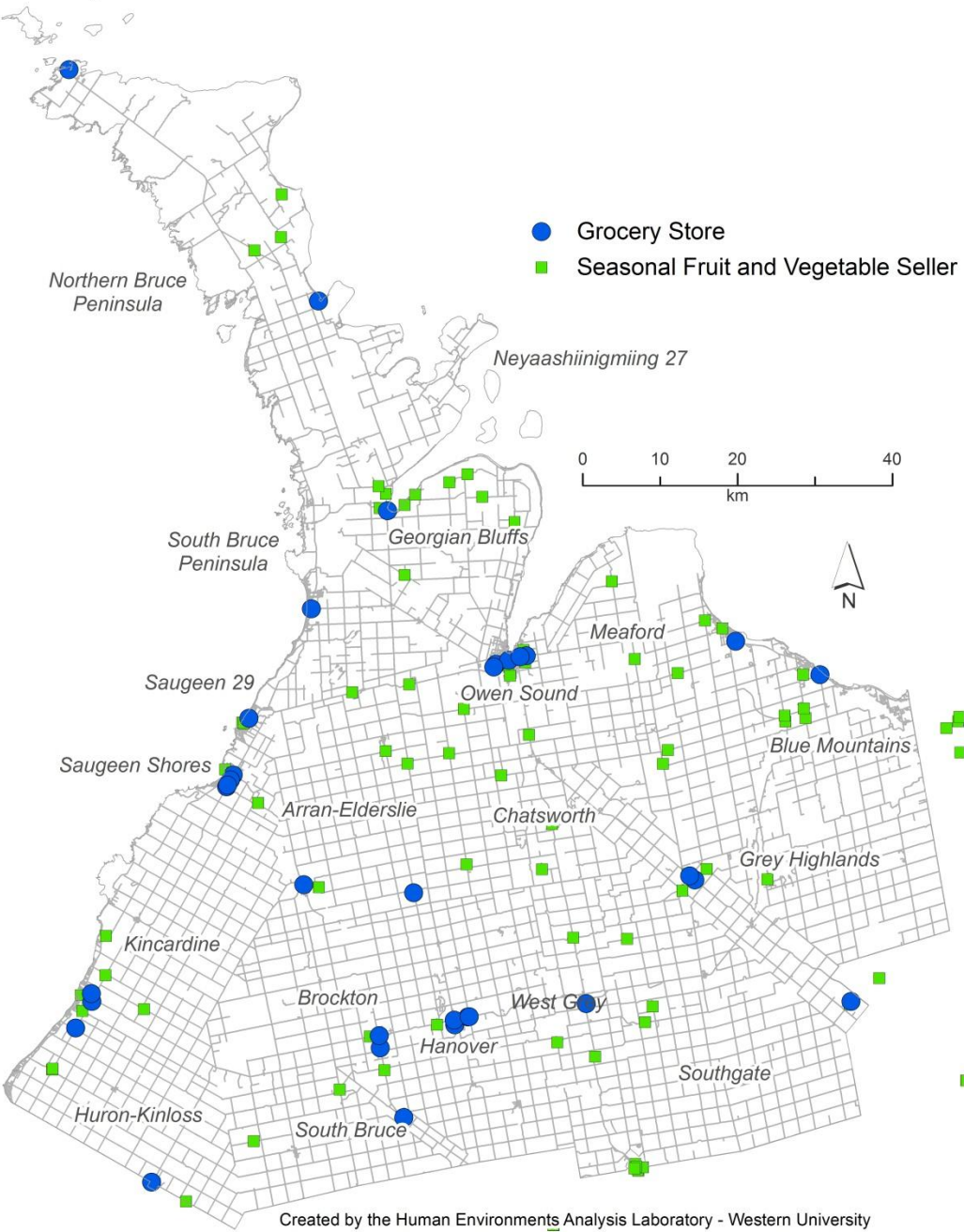
Evaluating the food environment is important to gain a full understanding of the opportunities for nutritious and unhealthy eating in Grey-Bruce. In this section, GIS analysis pinpoints the location of food stores (as defined by the local health inspector and by the Foodlink Grey-Bruce database) and determines absolute levels of accessibility to different food types. Average accessibility to these types is also computed for the communities of Grey-Bruce.

Analysis consisted of calculating the distance to various food sources from road midpoints, which allowed for a high level of precision in analysis. These maps paint an overall picture of accessibility across the region. To make sense of individual accessibility at the community level, aggregate statistics are shown in graph form for each municipality in Grey-Bruce.

Nutritious Food

A portion of the population in southern Grey County, the Township of Chatsworth and northern Bruce County are a significant distance from a grocery store. When considering seasonal fruit and vegetable sellers, from the Foodlink Grey-Bruce database, opportunities for healthy eating are enhanced. Many of these seasonal facilities are present in rural areas, with poor access to grocery stores, and some may serve to provide local residents with easily accessible fresh food.

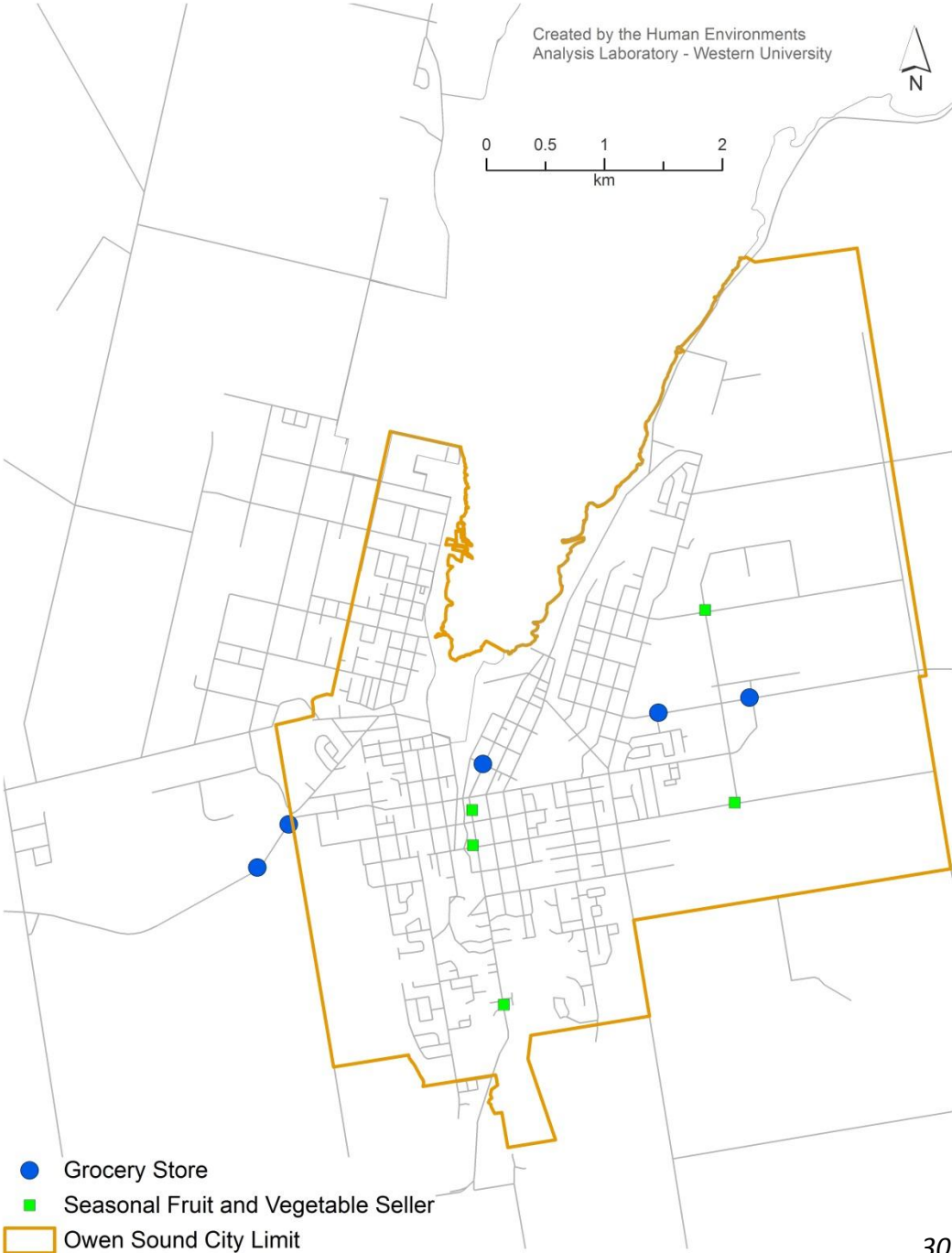
Figure 2.1 Locations of Nutritious Food Retailers, Grey-Bruce, 2012



Nutritious Food

In Owen Sound, grocery stores are located downtown, and in southern and eastern neighbourhoods. Foodlink Grey-Bruce facilities are present throughout the community, many in areas where grocery stores are absent. Nutritious food opportunities are noticeably absent from the northwestern side of Owen Sound.

Figure 2.2 Locations of Nutritious Food Retailers, Owen Sound, 2012



Access to Food by Network Analysis

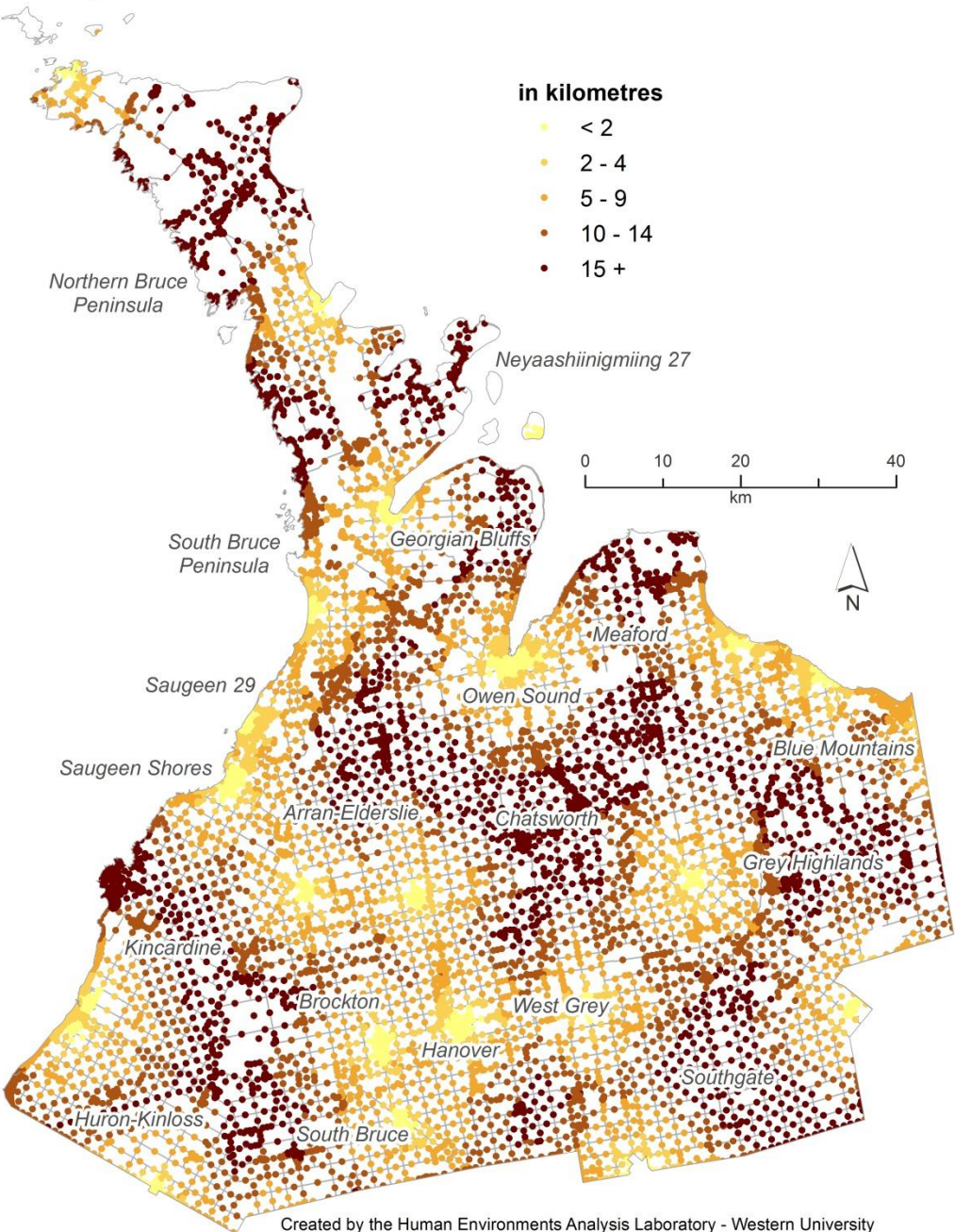
One of the most effective ways to show overall accessibility to different types of food stores is to use a process called “Closest Facility” in the Network Analysis toolbar of ESRI’s ArcMap 10.

This process allows an exact calculation of distance from every road midpoint to the nearest food store type (or ‘facility’). By displaying each midpoint with the corresponding distance value, one can easily see neighbourhoods where few or no residents can easily access nutritious food. Thus, the goals of this section are to show accessibility to nutritious food stores, and evaluate where potential problem areas may lie.

Access to Grocery Stores

Pedestrian accessibility to grocery stores (within 1000 m) is limited to the core areas of population centres. Even within these areas, residents in some neighbourhoods are still outside of walking distance. In rural areas, the distance is so great that even with an automobile, accessing nutritious foods like those found at a grocery store would require traveling a great distance (over 10 kilometres in many cases).

Figure 2.3 Distance to Nearest Grocery Store, Grey-Bruce, 2012



Created by the Human Environments Analysis Laboratory - Western University

Access to Grocery Stores

Many residents in Owen Sound are within walking distance of a grocery store. Still, some neighbourhoods are as far as 2 kilometres away. These include suburban areas in the northeastern and southern parts of Owen Sound. For residents without access to an automobile, this may constrain their ability to purchase nutritious food.

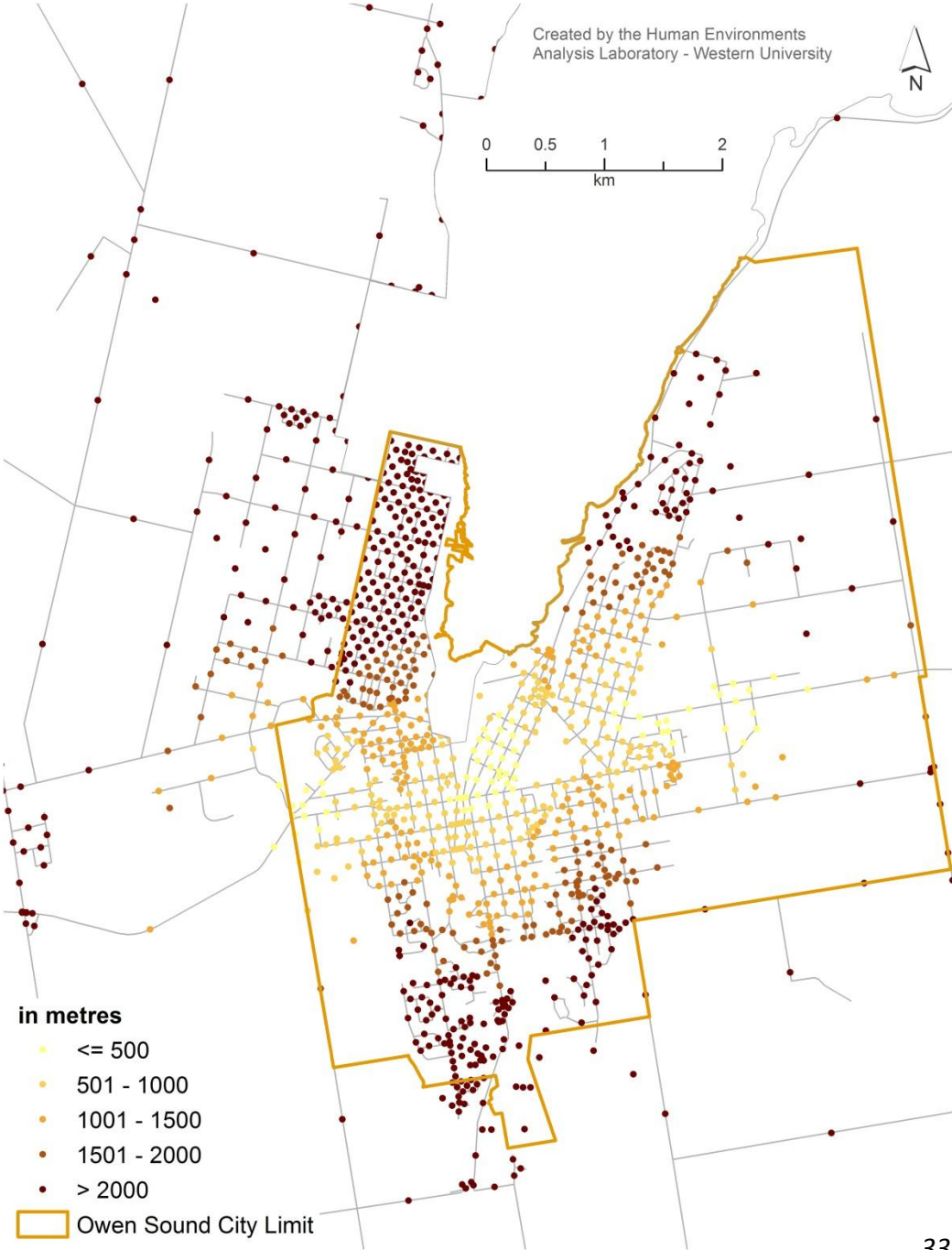
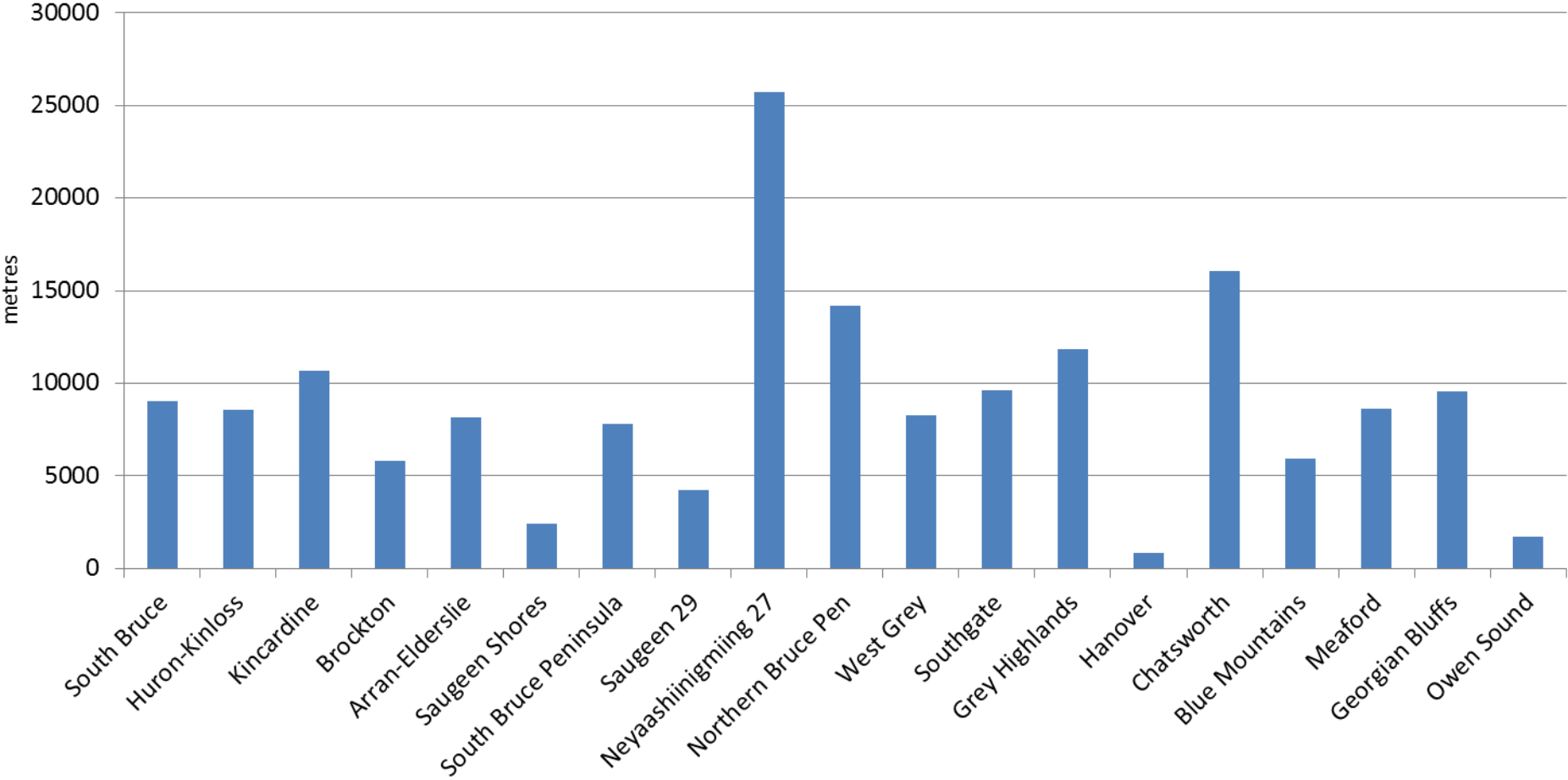


Figure 2.4 Distance to Nearest Grocery Store, Owen Sound, 2012

Distance to Grocery Stores by Community



Graph 2.1 Average Distance to Grocery Stores, by Community, Grey-Bruce

Distance to Grocery Stores by Community

Graph 2.1 illustrates the trend discussed in Figures 3.5 and 3.6. Residents in places like Owen Sound, Saugeen Shores, and Hanover tend to be able to access a grocery store within about 2 kilometres. Many more communities have grocery stores, but the rural character of many communities means that most people are outside of walking or easy driving distance.

In other population centres and in rural areas, however, the distance travelled is considerably higher (15 kilometres or over in many cases), as in much of Northern Bruce Peninsula, Chatsworth, and Neyaashiinigmiing. Even for people with automobiles, shopping for nutritious food can be a time-consuming task.

Access to Nutritious Food Retailers

Accessibility to nutritious food is relatively good throughout Grey-Bruce, except in parts of Southgate, the Grey Highlands, and on the Bruce Peninsula. Still, since many of these food outlets are only seasonal, the best picture of year-round accessibility to nutritious food would be to consider grocery stores only.

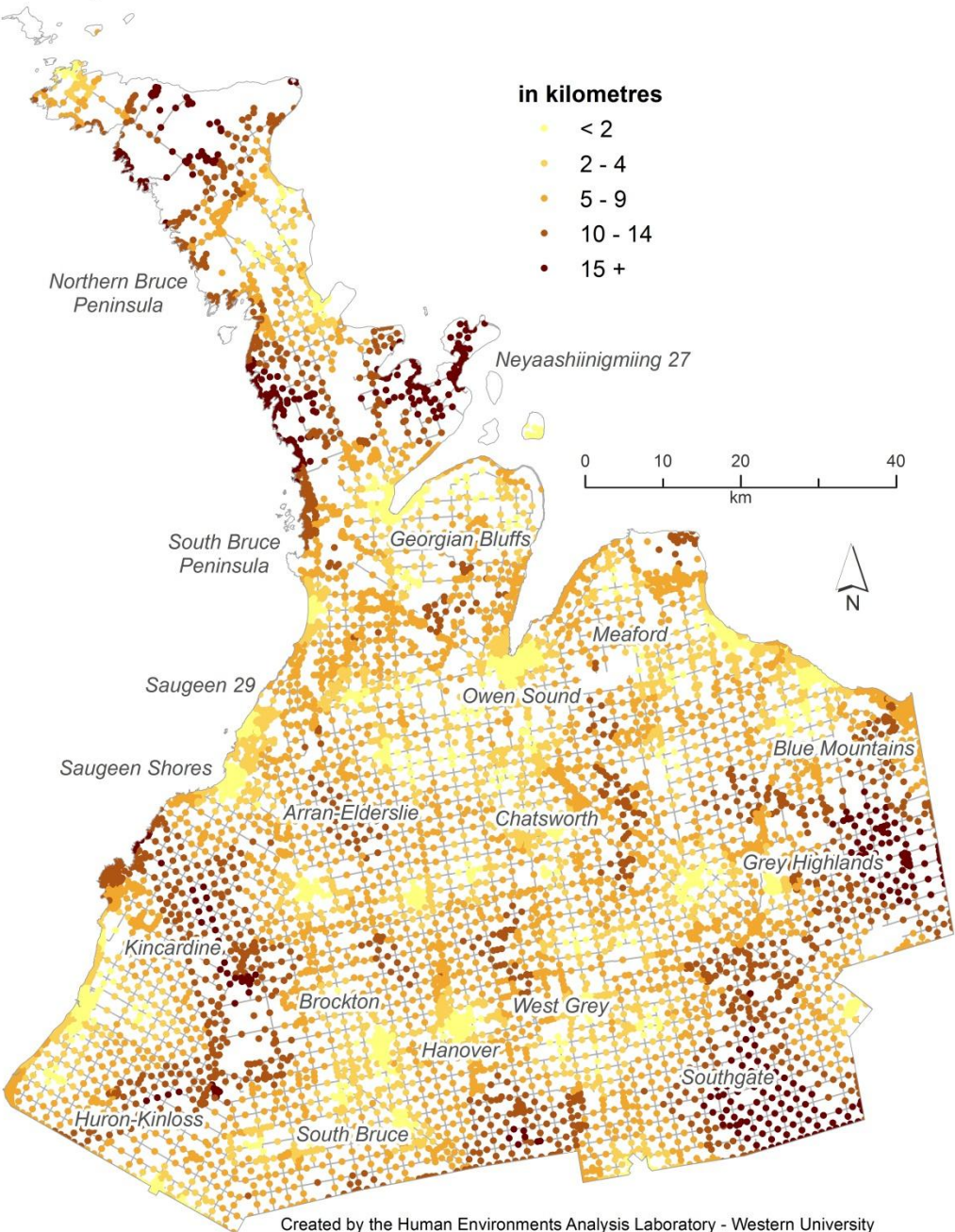


Figure 2.5 Distance to Nearest Nutritious Food Retailer, Grey-Bruce, 2012

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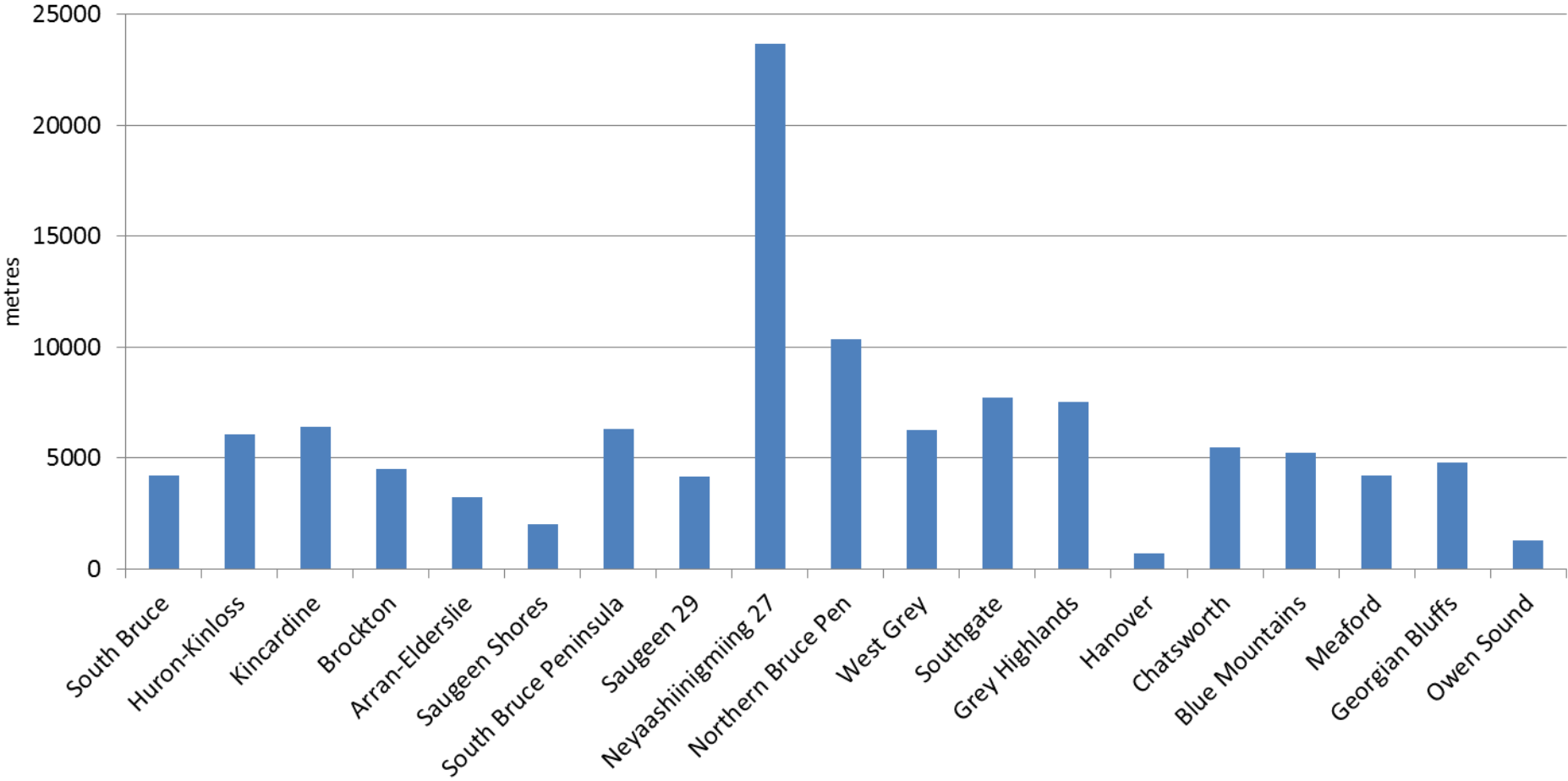
Access to Nutritious Food Retailers

When considering both types of nutritious food, most areas of Owen Sound with poor access are found in the northwestern side of the city. The presence of public transportation in Owen Sound may eliminate the disadvantage seen in neighbourhoods that do not have easy access to nutritious foods.



Figure 2.6 Distance to Nearest Nutritious Food Retailer, Owen Sound, 2012

Distance to Nutritious Food Retailers by Community



Graph 2.2 Average Distance to Nutritious Food Retailers, by Community

Distance to Nutritious Food Retailers by Community

Graph 2.2 illustrates how, when combining grocery stores and seasonal fruit & vegetable sellers to obtain all nutritious food retailers, more sections of Grey-Bruce fall within a few minutes' drive of nutritious food. Northern Bruce Peninsula and especially Neyaashiinigiing remain outliers in this regard. Many other communities are within easy driving distance of nutritious food.

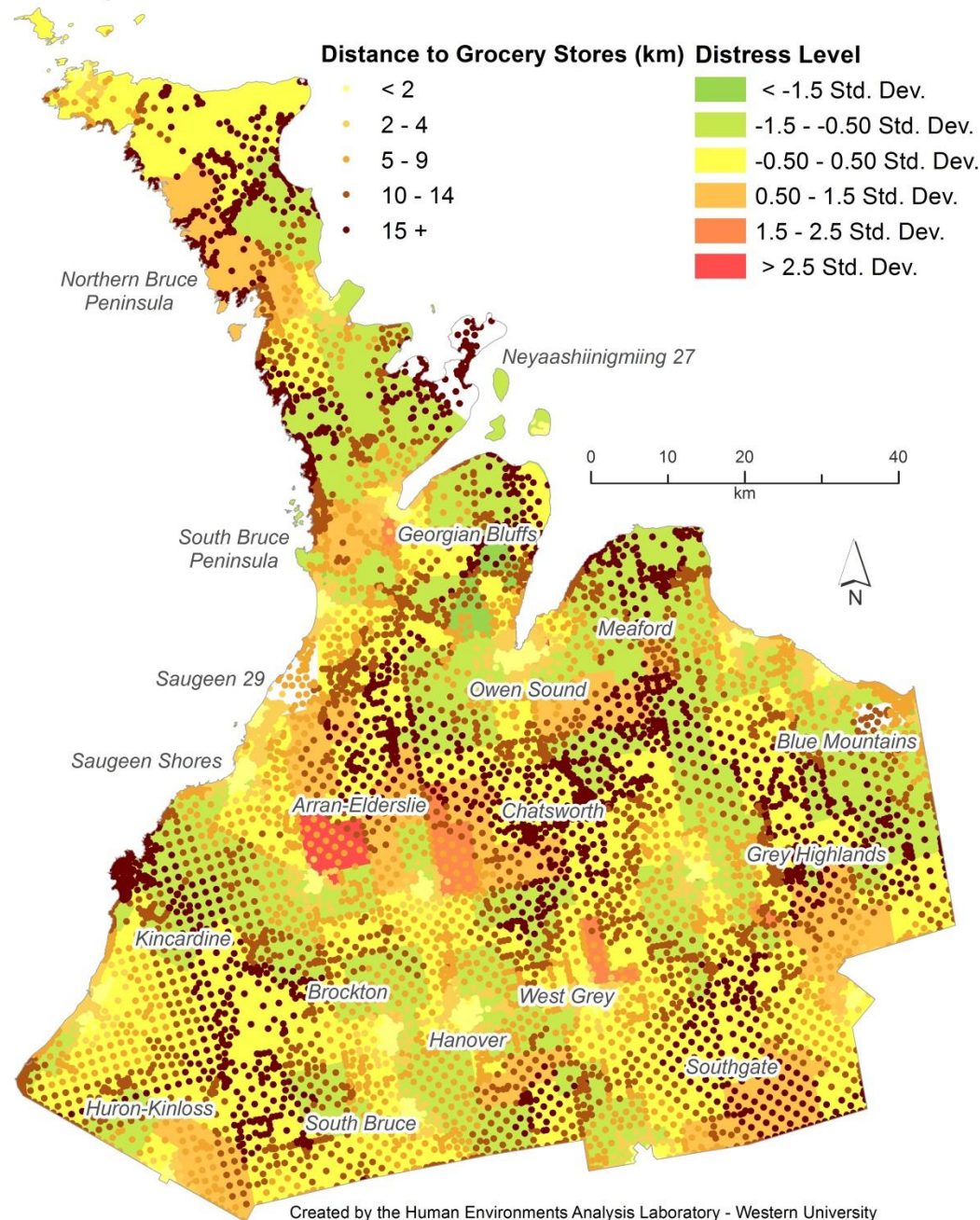
In general, Figures 2.3 to 2.6 show that nutritious food is relatively easy to come by, so long as an automobile is used as the means of travel. Although grocery stores make up the primary source of nutritious food, however, it is important to remember that grocery stores frequently offer unhealthy food as well. For those without access to an automobile, or for those more inclined to purchase unhealthy food from grocery stores, an unhealthy diet remains easy to find in Grey-Bruce, despite the opportunities for healthy eating.

Access to Nutritious Food and Distress

By combining map features from Section 1 and Section 2, it is possible to see where high distress (red polygons) and poor accessibility (brown circles) intersect geographically. In Grey-Bruce, these areas include parts of Arran-Elderslie, West Grey and Chatsworth.

Areas of relatively low distress (green polygons overlaid by brown circles) are less likely to be food deserts.

Figure 2.7 Distance to Nearest Grocery Store and Socioeconomic Distress, Grey-Bruce



Potential Food Deserts

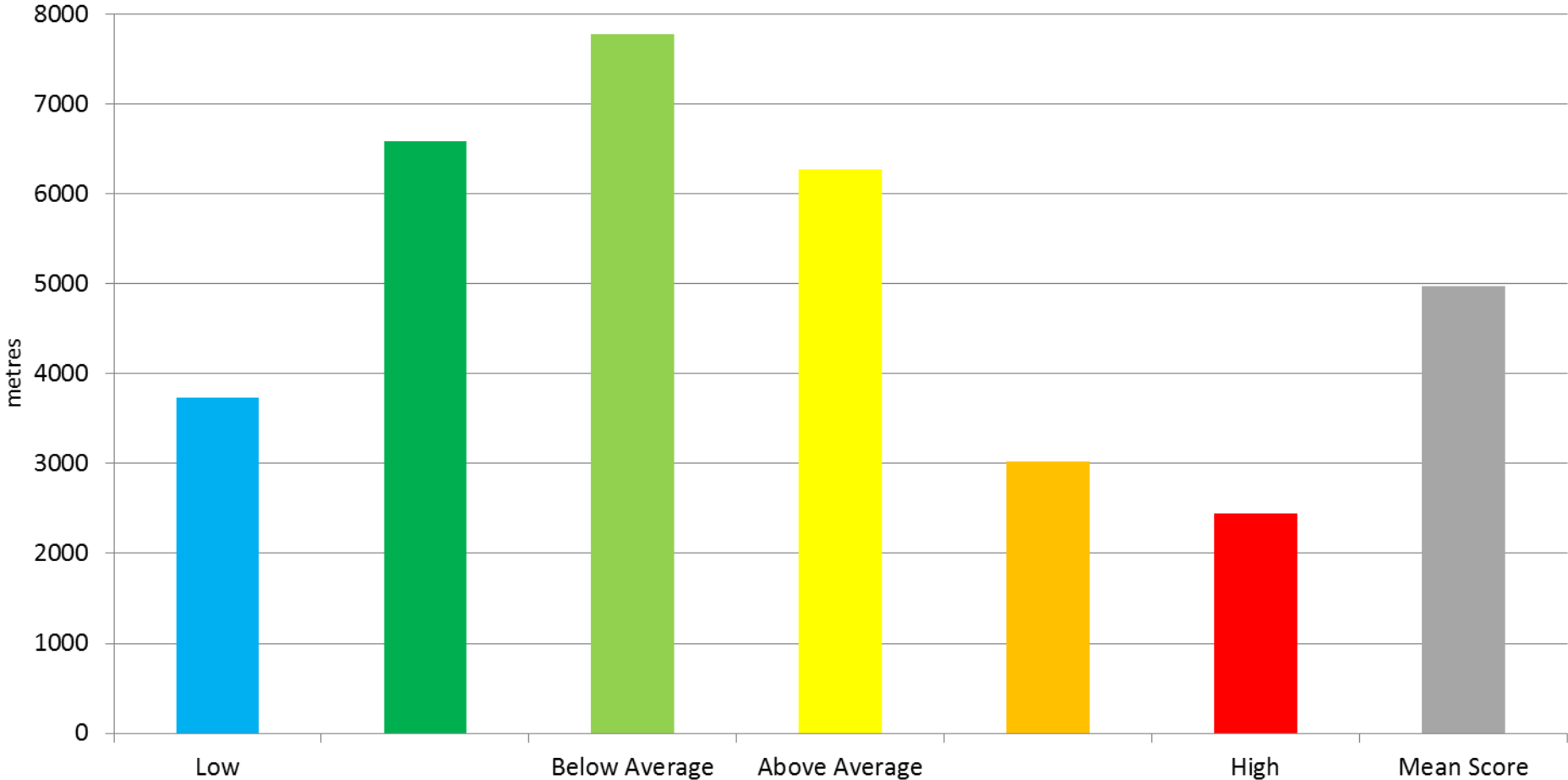
Access to Nutritious Food and Distress

In Owen Sound, areas of high distress (red polygons) and poor accessibility (brown circles) are noticeable. These are mainly confined to the northwestern and southern ends of Owen Sound. It is clear, for instance, that although downtown Owen Sound is distressed, the residents tend to be able to access nutritious food without difficulty.

Figure 2.8 Distance to Nearest Grocery Store and Socioeconomic Distress, Owen Sound

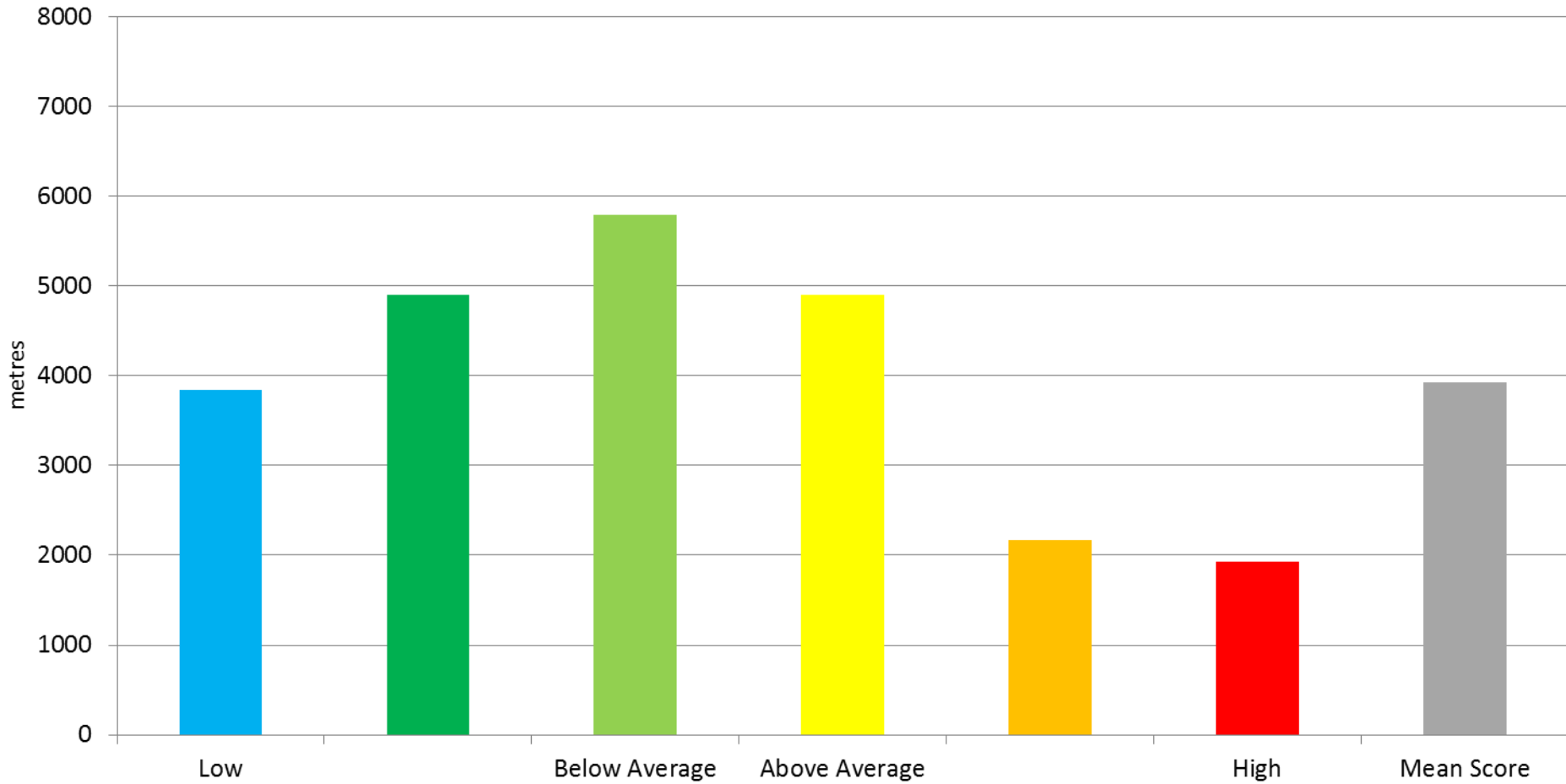


Distance to Grocery Stores by Area Distress Level



Graph 2.3 Average Distance to Grocery Stores, by Distress Level, Grey-Bruce

Distance to Nutritious Food by Area Distress Level



Graph 2.4 Average Distance to Nutritious Food Retailers, by Distress Level, Grey-Bruce

Access to Nutritious Food by Area Distress Level

There are no systematic socio-spatial inequalities when it comes to accessing nutritious food in Grey-Bruce. Graphs 2.3 and 2.4 indicate that when considering the distance to grocery stores or any type of nutritious food, the most distressed neighbourhoods actually have better access to these food sources. This is encouraging, since it means the most at-risk populations are frequently within a short distance to nutritious food.

Despite distressed neighbourhoods having 'better' access, however, many in these neighbourhoods are not within walking distance to a grocery store. This may pose a considerable problem, since distressed populations are less likely to own automobiles. The fact that unhealthy food options are also closer to distressed neighbourhoods (in the form of cheap junk food at grocery stores) also means that many people can walk to these food sources. The diets of distressed populations in Grey-Bruce could be compromised by the combination of these two facts, potentially contributing to a critical public health issue around diet and obesity.

Section 3

Opportunities for Healthy Physical Activity & Potential Recreation Deserts

Evaluating opportunities for healthy physical activity is important to understand where disparities may exist in access to facilities. In this section, GIS analysis pinpoints the location of recreational opportunities (as provided by the Grey-Bruce Health Unit) and determines absolute levels of accessibility to physical activity. Average accessibility to these spaces is also computed for the communities of Grey-Bruce.

Analysis consisted of calculating the distance to various recreational opportunities from road midpoints, which allowed for a high level of precision in analysis. These maps paint an overall picture of accessibility across the region. To make sense of road midpoint accessibility at the community level, aggregate statistics are shown in graph form for each municipality in Grey-Bruce.

Recreational Opportunities

Unlike access to nutritious foods, access to recreational opportunities exist in most communities of Grey-Bruce. Obvious gaps exist only in sparsely populated rural areas.

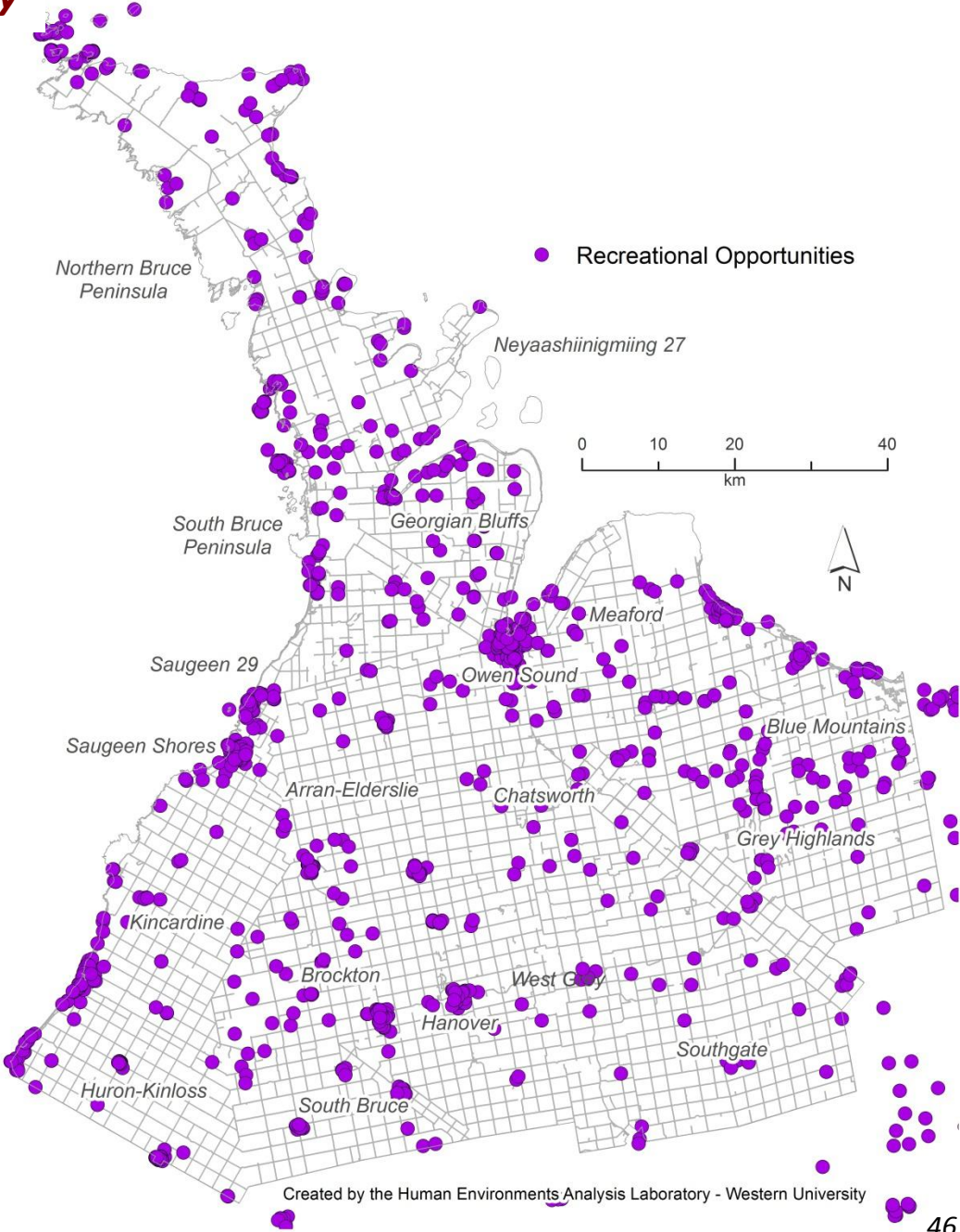


Figure 3.1 Locations of Recreational Opportunities, Grey-Bruce, 2012

Recreational Opportunities

In Owen Sound, recreational opportunities are present in every neighbourhood, and many neighbourhoods can access more than one recreational opportunity within walking distance.

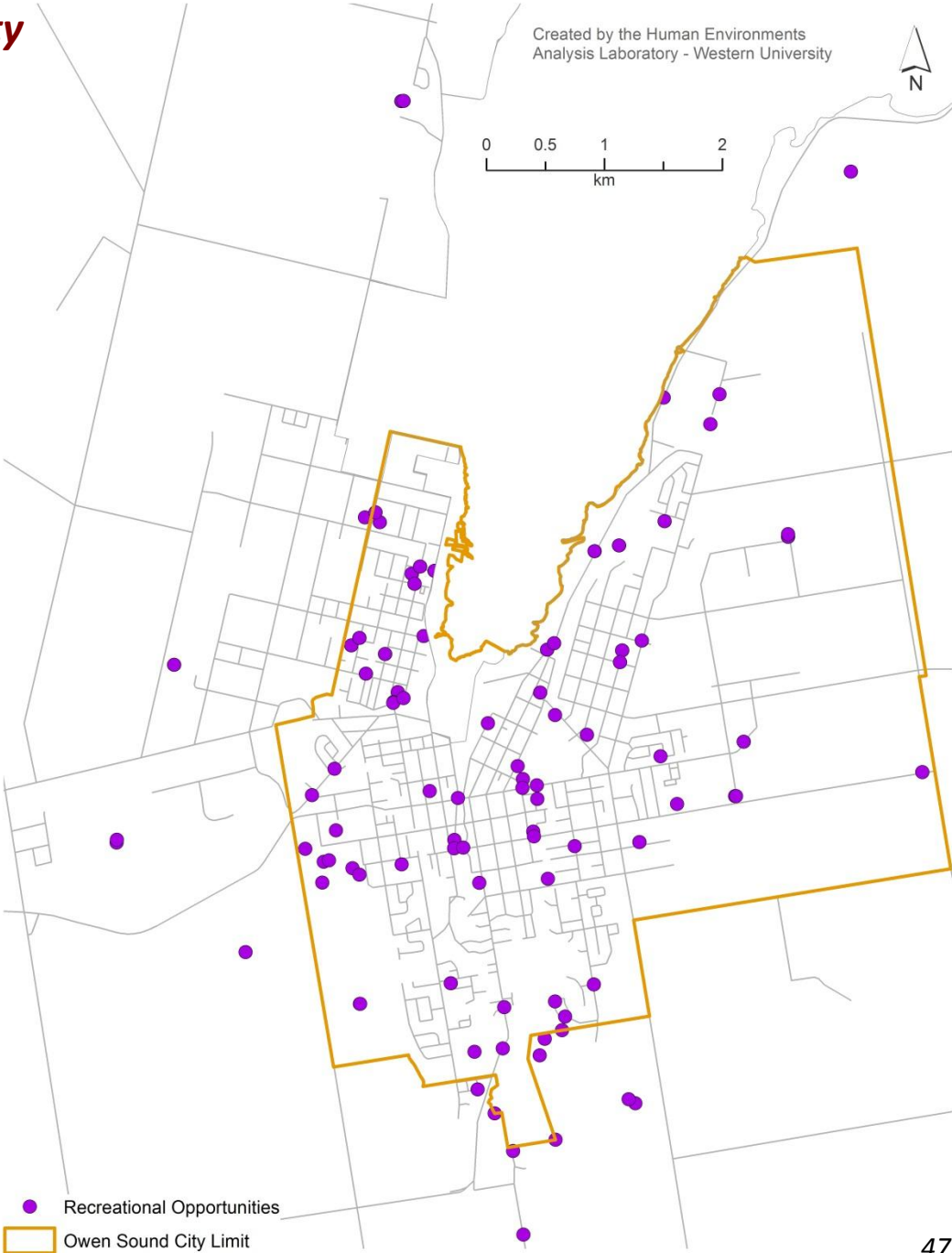


Figure 3.2 Locations of Recreational Opportunities, Owen Sound, 2012

Access to Recreation by Network Analysis

As before, the use of “Closest Facility” in the Network Analysis toolbar of ESRI’s ArcMap 10 will be used to calculate overall accessibility to recreational opportunities.

This process allows an exact calculation of distance from every road midpoint to the nearest opportunity for physical activity (or ‘facility’). By displaying each midpoint with the corresponding distance value, one can easily see neighbourhoods where few or no residents can easily access recreational opportunities. Thus, the goals of this section are to show accessibility to healthy physical activity opportunities and evaluate where potential problem areas may lie.

Access to Recreation

Pedestrian accessibility to recreational opportunities can be found in the core of nearly every community. This map does not, however, indicate places of informal recreation, such as backyards, water bodies, or rural roads.

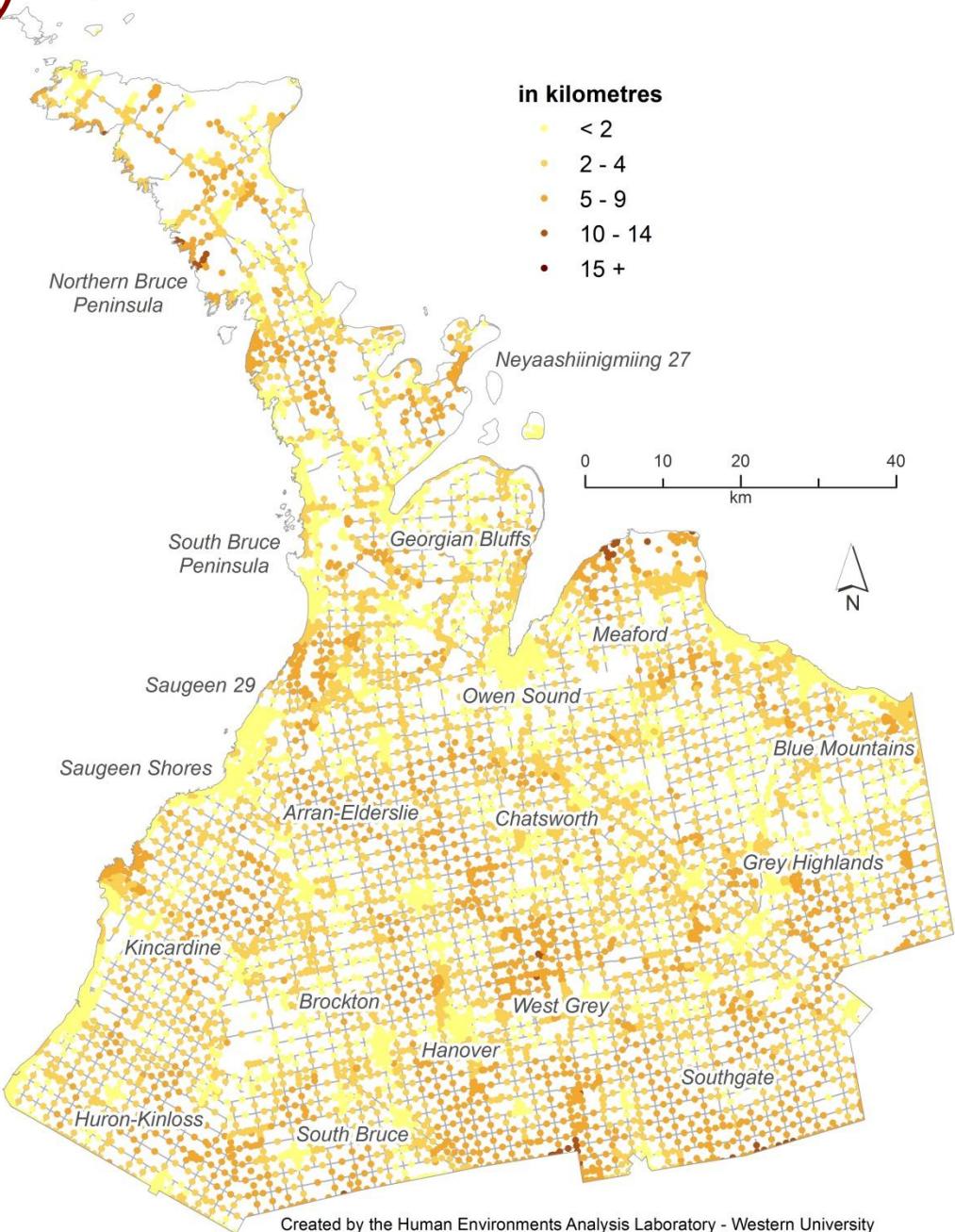


Figure 3.3 Distance to Nearest Recreational Opportunity, Grey-Bruce, 2012

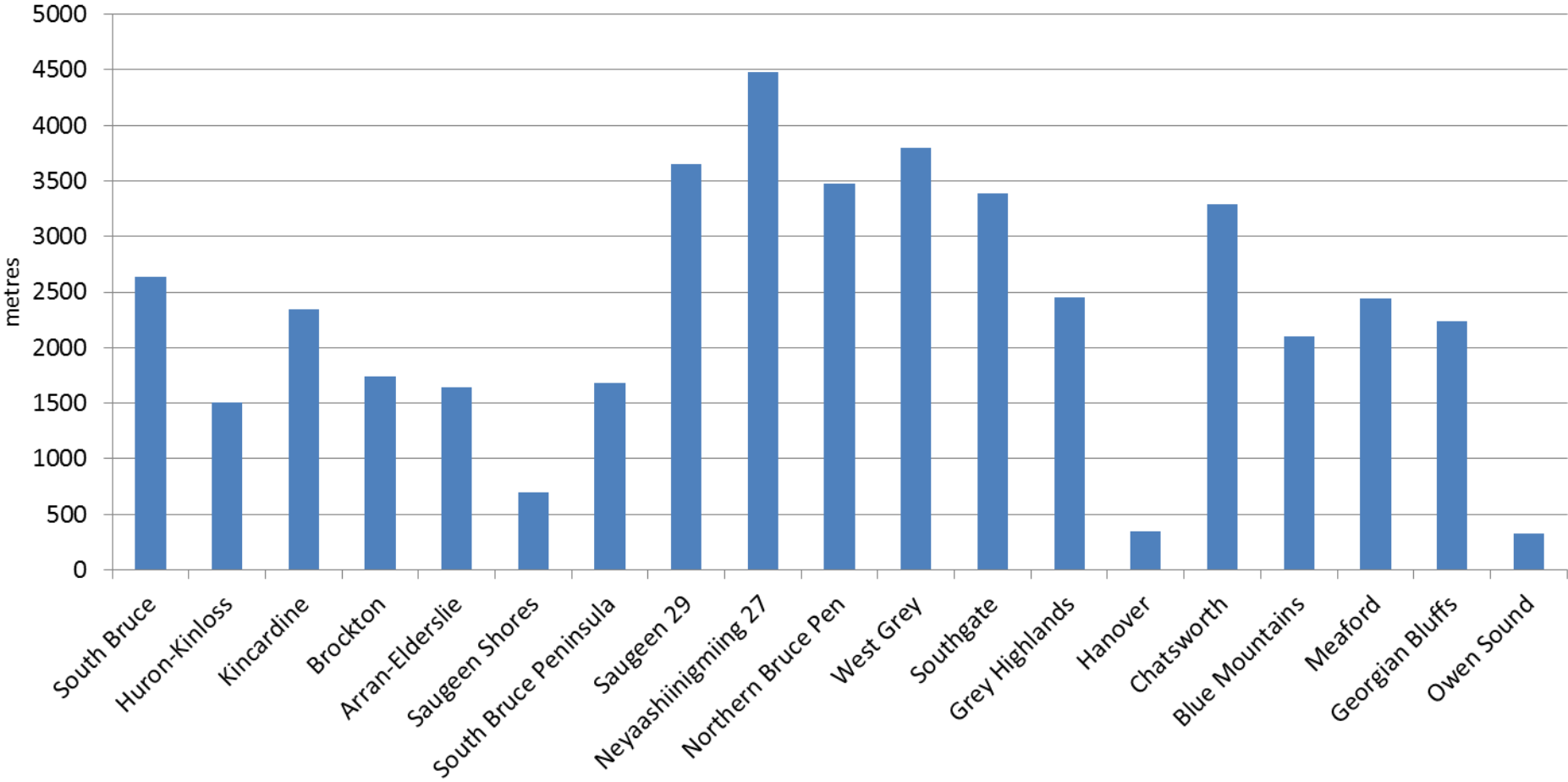
Access to Recreation

Most residents of Owen Sound are within walking distance of a recreational opportunity. Still, some neighbourhoods are as far as 2 kilometres away. These include rural areas on the edge of town. These areas, however, are more likely to have private yards in which to partake in recreation.



Figure 3.4 Distance to Nearest Recreational Opportunity, Owen Sound, 2012

Distance to Recreation by Community



Graph 3.1 Average Distance to Recreational Opportunities, by Community, Grey-Bruce

Distance to Recreation by Community

Graph 3.1 illustrates the trend discussed in Figures 3.3 and 3.4. A number of communities like West Grey, Saugeen and Neyaashiinigiing exhibit an average value that is greater than walking distance. Places like Saugeen Shores, Hanover and Owen Sound exhibit average values well within walking distance, meaning that most people can easily reach a recreational opportunity. These low values also tend to mean that the variety of recreational opportunities is greater in these communities.

Even in communities where the average distance is high, however, the multitude of informal opportunities for recreation in these communities means that finding venues for physical activity is not a particularly daunting task. The key to increasing physical activity, rather, lies in improving the quality of existing services, and encouraging residents to take part in activities held at these sites.

Access to Recreation and Distress

By combining map features from Section 1 and Section 3, it is possible to see where high distress (red polygons) and poor accessibility (brown circles) intersect geographically. In Grey-Bruce, these two features do not intersect; that is, high distress neighbourhoods tend to have good access to recreational opportunities.

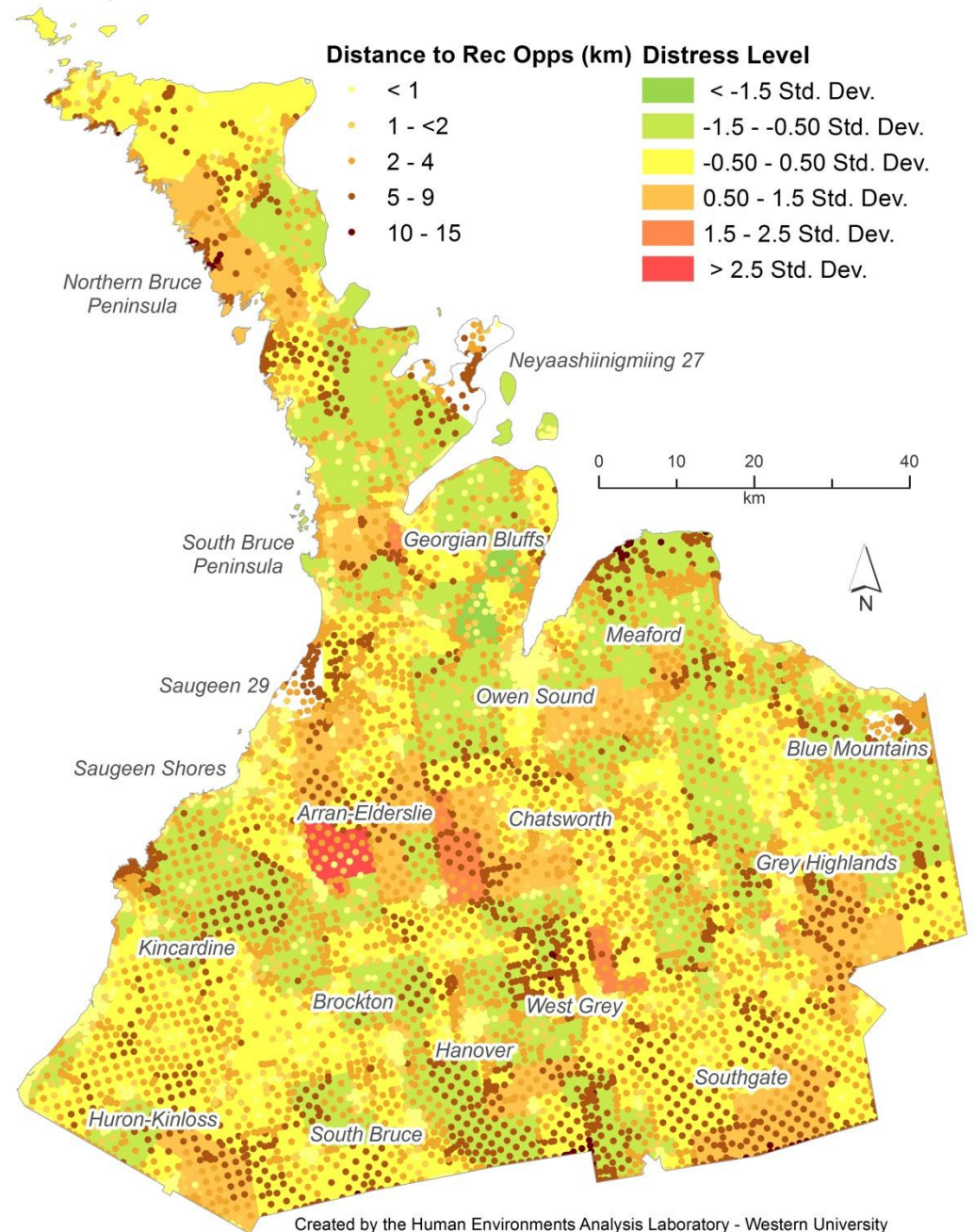


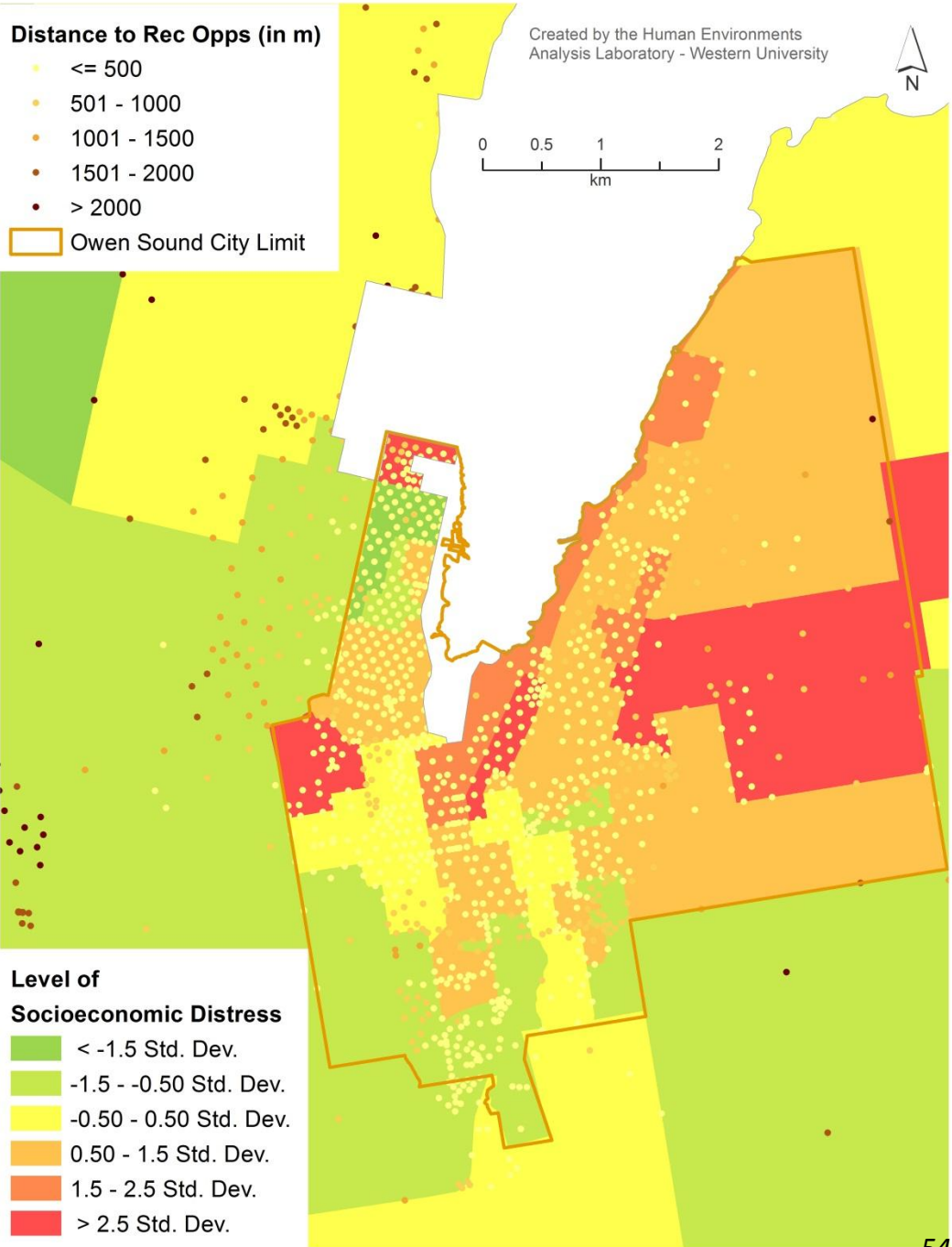
Figure 3.5 Distance to Nearest Recreational Opportunity and Socioeconomic Distress, Grey-Bruce

Potential Recreation Deserts

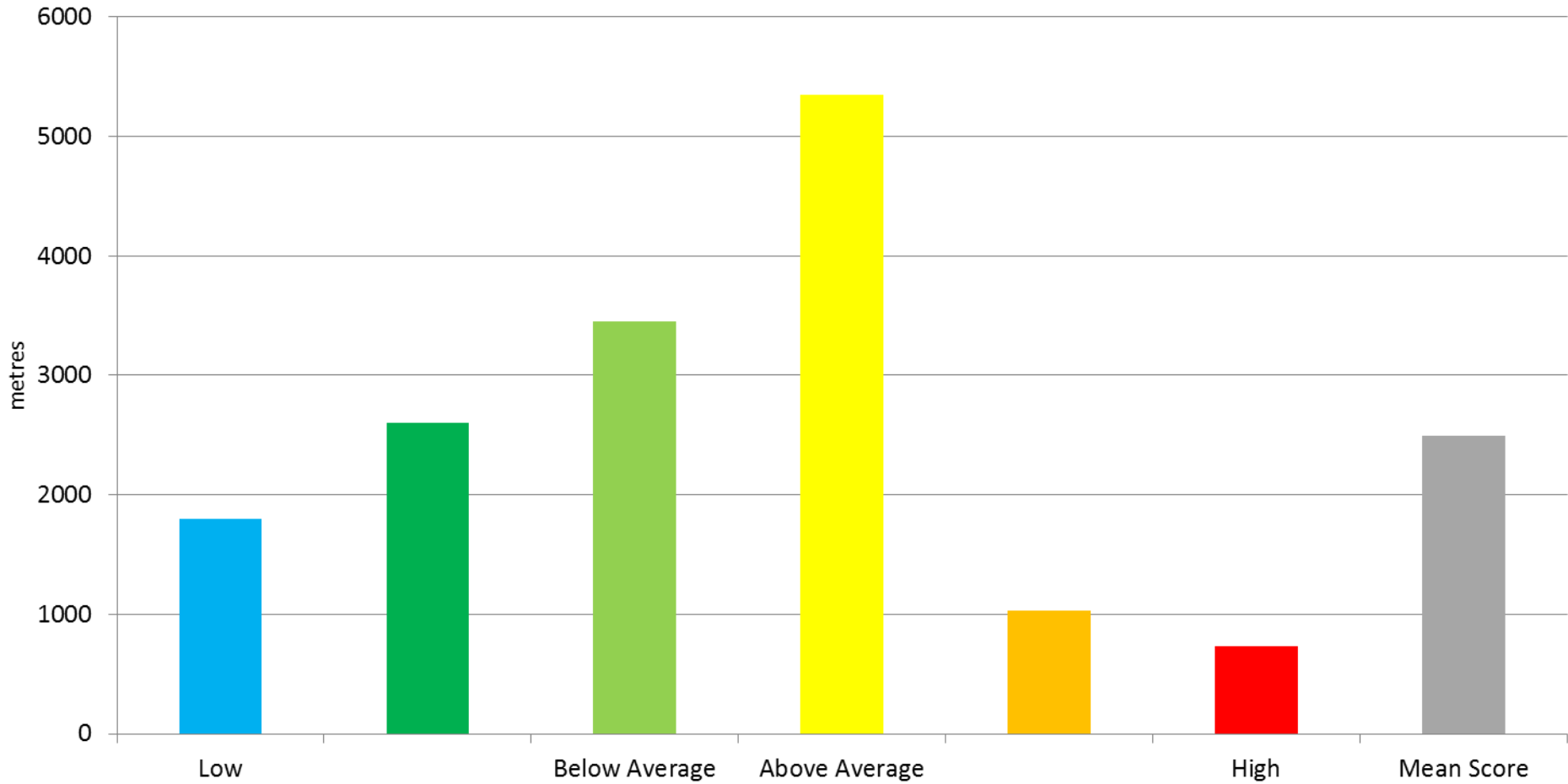
Access to Recreation and Distress

In Owen Sound, additional areas of high distress (red polygons) and poor accessibility (brown circles) are noticeable. But as with Grey-Bruce overall, these areas do not overlap with one another. More important is encouraging residents in distressed neighbourhoods to make use of available recreational facilities, and improving the quality of these facilities to attract greater use.

Figure 3.6 Distance to Nearest Recreational Opportunity and Socioeconomic Distress, Owen Sound



Distance to Recreation by Area Distress Level



Graph 3.2 Average Distance to Recreational Opportunities, by Distress Level, Grey-Bruce

Access to Recreation by Area Distress Level

There are no systematic socio-spatial inequalities when it comes to accessing recreational opportunities in Grey-Bruce. Graph 3.2 indicates that, when accessing the nearest recreational opportunity, the most distressed residents are actually travelling a shorter distance than less distressed residents. While the quality of these facilities is not considered here, the findings of Graph 3.2 and Figures 3.5 and 3.6 are at least encouraging in that all types of neighbourhoods (especially the most distressed) can access recreational opportunities.

Conclusions

Throughout the report, sociodemographic characteristics were plotted alongside data on opportunities for healthy eating and healthy physical activity. Direct observations were made linking areas where high socioeconomic distress and poor access to healthy living intersected. This report may thus be used to identify the characteristics of individual communities. Future recommendations should make use of local-level data on these topics.

For instance, places with high populations of senior citizens might be considered for shuttle services to parks or stores (especially in communities lacking these facilities). Communities with higher immigrant populations might be more likely to host ethnic food stores in the future. Communities with high concentrations of children and youth might be considered for improvements to regional or local parks and other recreational facilities.

Future work may include the deployment of behavioural surveys, with the aim being to link behaviour on dietary habits or physical activity with the information presented in this report. The results of surveys such as these will provide information to better shape policy on healthy living across the region.

Methodological Appendix

Data Sources

The roads file used was generated by DMTI. These roads align exactly with census and political boundaries. All census boundary files were generated by the Canadian Census of 2006, the most recent census for which local level information is available. All socioeconomic information was generated by the Canadian Census of 2006. The food database was generated by HealthSpace as used by the Grey-Bruce Health Unit Public Health Inspector. The recreational opportunities were provided by the Grey-Bruce Health Unit.

Calculating access

Access was calculated by taking the network distance from every individual address point to the nearest facility, whether focused on healthy or unhealthy food outlets. These values were cross-referenced with socioeconomic characteristics (and the distress index) for each dissemination area. The distance values were also averaged by community, and by distress category.

Methodological Appendix

Socioeconomic distress index

The composite “socioeconomic distress” index takes into consideration that indicators or descriptors such as “disadvantage”, “deprivation”, or “distress” are multi-faceted in nature, just as physical and psychological well-being are dependent on a number of social and economic factors besides income.

The socioeconomic distress index was comprised of four variables: educational attainment (% of adults who did not graduate from high school), unemployment rate, incidence of lone parenthood, and incidence of low income (proportion of economic households that fall below the low-income cutoff according to Statistics Canada).

The socioeconomic distress index score was calculated for every dissemination area in Grey-Bruce by converting the raw data values (percentages) for each of the four component variables into *z-scores* (based on the standard deviation and un-weighted mean of the indicators), and then summing the four *z-scores* into a final composite index score. Greater composite scores correspond to higher levels of socioeconomic distress.

Methodological Note

Health Inspector Database

Potential inaccuracies exist in the health inspector database for the Grey-Bruce region. In this database, facilities were frequently listed as more than one type (e.g. both a variety store and a grocery store). When mapping these stores, many were inaccurately placed in the wrong primary category. While every effort has been made to confirm the preferred categorical classification for each facility, data issues may still exist. The results of this report are thus to be considered with some caution.

Recreational Opportunity Databases

While every attempt was made to procure a complete listing of parks, arenas, and other recreational opportunities, the accuracy of these facilities cannot be guaranteed. Some facilities were not located due to missing addresses or a lack of information about the facility. An explanation of facilities used for these analyses can be found in the Glossary of Terms.

Glossary of Terms

Built environment

The human-built parts of the urban and rural environment; includes streets, buildings, parks, and other infrastructure.

Straitened conditions

Used by Statistics Canada to refer to individuals characterized by poverty. Often found where individuals fall below the low-income cutoff for their region.

Unemployment

Describes the state of being without paid work or self-employment during the reference week, as well as being available for work during that week and one of the following:

1. Having actively sought paid work in the past four weeks;
2. Being on temporary lay-off and expecting to return to the same job;
3. Having definite arrangements to start a new job in 4 weeks or less.

Note: Retired persons are excluded from this category.

Glossary of Terms

Grocery store

As defined by the Grey Bruce Health Unit Public Health Inspector—typically a store selling a wide range of fresh produce and meats.

Nutritious food retailer

Any seasonal fruit and vegetable seller or grocery store (as defined above). Emphasis on the fact that the average nutritious food retailer may not be open year-round.

Recreational opportunity

Recreational opportunities are compiled from various sources including the Bruce County Recreational Database, the Meaford Recreational Database, the DMTI database for parks and recreation, the National Parks Database and the Grey Bruce Health Unit database.

All schools in the counties are also considered locations of recreational space and were thus included in the analysis.