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RURAL REGIONS WORKING PAPERS

Working Paper #2 – Understanding Regions With Economic Models

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Preface

Information is critical in communicating ideas, involving and engaging others, and informing decisions. In Manitoba, the recent multi-stakeholder report titled: Regional Economic Development Strategies (2015) calls for more information. These working papers are in part a response to that call. These five papers are intended to add ideas to the conversation about rural regions from an economic perspective.

The approach taken with these papers is to provide information on topics relevant to economic development and at the same time moving the conversation from a local discussion to one about rural regions. One starting point is to find out more about the importance of regions. Another topic adding to our understand of regions is that Manitoba is already divided up into regions. Governmental agencies and many organizations subdivide the province up into many different regions. Another way of defining regions is one based on established economic models. We have also developed eleven indicators to help you compare one community to another and one region to another. Finally, we end where we began with examples of how this data might be combined into information graphics to contribute to more effective communications.

We know these working papers are a beginning, not the end, but they do add to many different conversations about rural regions. Let us know what you think of these papers and what else is needed to contribute to you learning and your conversation.

The working papers can be read in any order you wish.

1. Regional is Rural
2. Understanding Regions with Economic Models
3. Administrative Regions in Manitoba
4. Manitoba Municipality Indicators Database
5. Applying Regional Understanding to Municipalities

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Synopsis

This technical paper will help researchers understand how different economic models were applied to Manitoba and provide maps of Manitoba that visually demonstrate their application. Applying the existing models for Functional Economic Areas (FEAs), Self-Contained Labour Areas (SLAs) and Population and Income Classification of Resource Dependent Economies to Manitoba required updates to reflect the recent amalgamation process. Applying the Creative Class model required matching Canadian National Occupational Classification (NOCS) codes with the occupation codes used by the United States Bureau of Labor Statistics (BLS) and Occupation Employment Survey (OES). The analysis of each economic model includes an overall background of the research papers examined, the rationale for the use of each model, and a methodology on how the model is applied to Manitoba, along with supporting tables and figures.

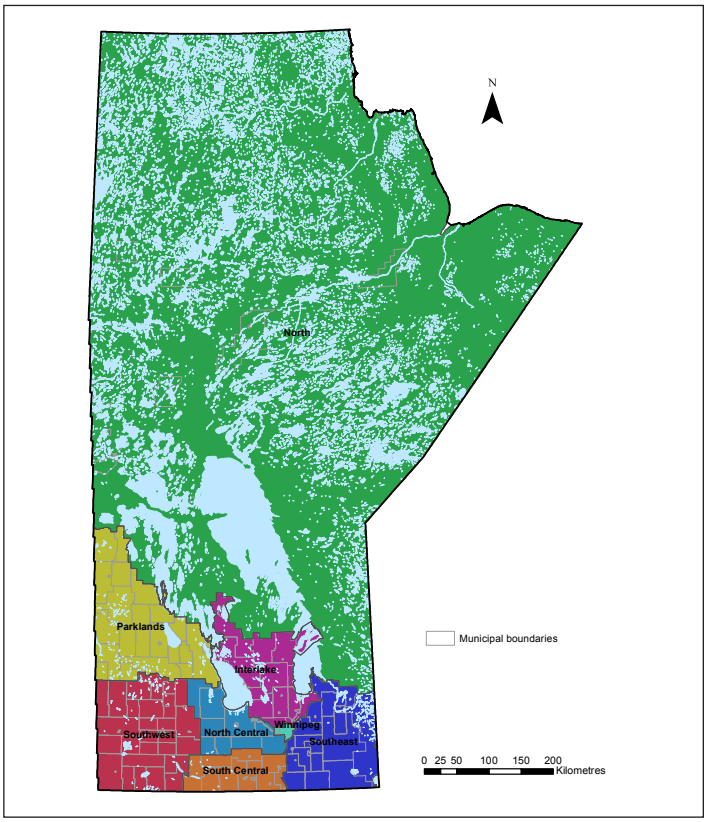
Introduction

The recent amalgamation process in Manitoba saw 107 small municipal governments merge into 47 new ones. These amalgamations reduced the number of municipalities in Manitoba from 197 to 137. The smaller municipalities, 85 municipalities with populations under 1,000, amalgamated with their neighbours, resulting in a bigger tax base and larger populations.

Research on strong municipalities conducted to inform the amalgamation process suggests that amalgamations did not go far enough to establish strong rural economies (Ashton et. al, 2013). The researchers argued that strong municipalities have two key indicators: (1) a minimum population of 3,000 and (2) a minimum tax base of $130 million. Not all of the amalgamations resulted in new municipalities that meet these minimums. This leads to the question that we seek to answer in this report: Is there a way to define geographic regions that is linked to the economy? To help answer this question, four economic models are applied to Manitoba, with varying success.

Currently, the eight economic regions (ER) in Manitoba are predominant. Statistics Canada's collects data based on the groupings of census divisions (CDs) in each ER ("Economic Region", 2016). For example, the Job Vacancy and Wage Survey provides job vacancy and wage information by economic region ("Labour Force Survey", 2016). These geographical units permit regional analysis while being large enough to include enough CDs so that a broad range of statistics can be provided ("Standard Geographical Classification", 2105).

Figure 1: Statistics Canada Economic Regions



Research Method

Since there is an entire academic discipline of Regional Science, we wanted to feature 3 or 4 examples of economic models that are both diverse and relevant to defining geographic regions in Manitoba. First, an internet search of rural economic development organizations and initiatives in each Canadian province and territory helped determine which ones use economic regions as a basis to establish collaborative partners on rural economic development activities. Based on this scan, there were no instances where economic development activities were organized based on an economic model. The second step was a review of academic literature on rural economic development that discusses functional economic regions or the establishment of regions based on economic statistics. Through this review, four possible economic models were identified for further investigation: (1) Functional Economic Areas (FEAs), (2) Self-Contained Labour Areas (SLAs), (3) Population and Income Classification of Resource Dependent Economies, and (4) Creative Class. Upon further investigation, it was determined that the Population and Income Classification and Creative Class economic models do not determine functional economic regions per se, they do provide valuable insight into the rural Manitoba economy and was included for sake of diversity as well. Each of the four models are explained (Table 1) and applied to Manitoba, with the hope to show there are at least four ways to answer the question: Is there a way to define geographic regions that is linked to the economy?

Table 1: Summary of Economic Models

Creating Regions	
Functional Economic Areas (FEAs)	**Self-contained Labour Areas**
FEAs are defined as regions of where people live, work and shop. **Regions:** 6 FEAs created in Manitoba: Parkland, Southwest, Southcentral, Central, Southeast, and Eastern **Based on** Stabler and Olfert (2002) **Analysis:** An Location Quotient (LQ) analysis reveals that the regions still hold their shoppers with an exception of Portage and Steinbach. The analysis accounted for the 2015 amalgamation. **Data used:** Statistics Canada data (1996 census) e.g., commuting to work patterns, retail-shopping patterns (Rural Dwellers' 1991 shopping patterns in Saskatchewan), multiplier effects of expenditures (estimated in two studies of Olfert and Stabler (1994, 1999)) are used to establish the six FEAs in Manitoba. Economic Modeling Specialists Inc.'s EMSI's occupation data was used for the year 2001, 2006 and 2014 to conduct the LQ analysis. **Notes:** Recent data can be used to reconfigure the FEAs in future research. Based on an LQ analysis, regions still hold with 2 exceptions. The model does not account for northern municipalities.	SLAs are regions where people live and work, that have a minimum population of 3,000 and a minimum tax base of $130 million. **Regions:** 65 regions: 34 municipal groupings, 7 cities, 24 stand-alone municipalities **Based on** Munro et al. (2011) & Ashton et al. (2013) **Analysis:** An analysis was conducted on commuting flows to delineate 11 municipal regions that were affected by the 2015 amalgamation. **Data used:** 2006 Census commuting flows (journey to work) data, 2011 Census population data and 2013 taxable assessment data **Notes:** Commuting flows are based on 1/5 of the census sample. Logical patterns were used when conclusions could not be drawn based on the commuting flows. By imposing different thresholds, e.g., change minimum population of 3,000 and a minimum tax base of $130 million - the SLA boundaries will change. This can be examined with further research The model does not account for northern municipalities.

Providing Additional Insight into Local Economies	
Population and Income Classification of Resource Dependent Economies	**Creative Class Occupations**
Insight into the local economy by using population and income outcomes. Aims to identify communities that are more likely to need localized intervention. **Based on** Olfert et al. (2010) **Analysis:** The Olfert et al. (2010) study classified resource dependent Manitoba communities in four classes based on their actual performance in terms of population change and poverty outcomes. Analysis was updated to include 2015 amalgamation. **Data used:** Statistics Canada Census data (1991, 2001 and 2006) on population, income, and occupations used to classify municipalities. **Notes:** The Olfert et al. (2010) study used CCS-level data, which included an incorporated town (i.e., a CSD) plus the surrounding incorporated rural municipality (i.e., another CSD). This analysis further increased analysis to the CSD level. Up-to-date data could be used in future research to re-assess the RD communities in Manitoba and create the classes based on Manitoba, rather than national averages.	Insight into the local economy by identifying areas in Manitoba with high concentration and diversity of creative class occupations (e.g. computer and mathematical, architecture and engineering, arts, design, entertainment). **Based on** the Stolarick (2012) and Florida (2002) **Analysis:** Four different types of analysis were conducted that provide different insights: 1) A LQ analysis at the CD level results in 23 CDs in Manitoba grouped under 4 quadrants; 2) A LQ analysis for Winnipeg, Thompson, Brandon, Steinbach and Portage la Prairie provides the performance of those cities; 3) A LQ analysis at the FEAs level allows comparisons for the 6 FEAs, 4) An analysis on the counts of creative occupations at a SCD level provides an insight into the diversity of creative occupations present in each community. **Data used:** 2011 National Household Survey on occupation - (NOC), EMSI's 2006 occupation data (based on EMSI's industry data, regional occupation data from the Labour Force Survey (LFS), and regional staffing patterns taken from the 2006 Census. **Notes:** Challenges with data availability at the CSD levels resulted in different approaches to analysis. Special request on 2011 NHS data on occupations at the CSD level will assist future research in this field.

Functional Economic Areas

The purpose of this economic model is to identify geographic areas where people live, work, and shop.

In the 2002 research paper, Functional Economic Areas in the Canadian Prairie Region, Stabler and Olfert, defined Functional Economic Areas (FEAs) for each of the Prairie Provinces, e.g., Alberta, Saskatchewan and Manitoba. "A Functional Economic Area (FEA) is an area that is relatively closed or bounded with respect to the income-producing activities of its residents. It is also relatively closed with respect to a cluster of everyday consumer-oriented business outlets and common public services" (2002, p.14).

Thus, a community's FEA shows the larger region in which there are potential employees, jobs, and consumers. Communities in an FEA are each a piece of the economy in these geographical areas and are potential partners for larger regional economic development efforts or other public or private initiatives.

Employing the same methodology as in the Stabler et al. (1996) study, the Stabler and Olfert (2002) paper develops Labour Market Areas (LMAs) for each province. Stabler and Olfert define LMAs as "an area that is large enough to contain the workplaces of most people who reside within it and the residence of most people who work within it" (2002). The LMAs, combined with information on retail shopping patterns and the multiplier effects of expenditures initiated at each level in the hierarchy of market areas (e.g. minimum convenience center to primary wholesale retail) are used to construct the FEAs in each prairie province.

Statistics Canada data (1996 census) that identify commuting to work patterns, retail shopping patterns (Rural Dwellers' 1991 shopping patterns in Saskatchewan), as well as the multiplier effects of expenditures (estimated in two studies Olfert and Stabler 1994, 1999) are used to establish the six FEAs in Manitoba. EMSI's occupation data was used for the year 2001, 2006 and 2014 to conduct a Location Quotient analysis on the number of employees in the NAICS codes "44-45 Retail Trade".

For the purpose of the current study, the research focused on the Manitoba case of the Stabler and Olfert (2002) report (Chapter Four, pages 53-66). For Manitoba, six FEAs were created based on the findings of the 2002 report: Southwest, Parkland, Southcentral, Central, Southeast, and Eastern. Our research used the six FEAs from the 2002 report and minor revisions were made to take into account the amalgamation that occurred in Manitoba in January 2015 and to ensure that amalgamated municipalities were included in the same FEA. For the municipalities that constitute each FEA see Figure 2.

Chapter two (pp. 5-15) of the Olfert and Stabler (2002) report describes the detailed methodology and data used to identify the FEAs in the Prairie Region. In summary, LMAs were first defined and their boundaries were identified based upon labour commutes to employment centres and by using Statistics Canada data for 1996 (Census subdivision -CSD data were aggregated into existing Rural Municipalities-RMs). Major centres were identified as potential "focal points" (urban centres that interact with the same rural space were combined to create a single composite focal point) and rural geographies were assigned "focal points" based upon the strength of the commuting flows. The LMAs then became building blocks, along with retail shopping market areas and local multipliers. Trade areas were imposed over the LMAs which assisted in assigning RMs on the boundary of two labour markets to one area or the other and assigning rural space not included in any LMA to an FEA.

Our research builds upon these regions and minor revisions were made to take into account the amalgamation that occurred in Manitoba in January 2015 and to ensure that amalgamated municipalities were included in the same FEA. This was the case for the RM of Harrison that was originally included in the Southwest FEA while the RM of Park was included in the Parkland FEA. By examining the 2006 commuting flows of the two RMs combined, the new amalgamated Municipality of Harrison Park seems to interact more with the Brandon FEA (170 commuter) rather than the Parkland FEA (50 commuters) therefore it was included in the Southwest FEA. The town of Roblin was originally included in the Southwest FEA. Roblin commuters do not seem to commute outside of the town of Roblin; however, both Hillsburg (75) and Shell River (215) commuters commute to Roblin. Hillsburgh and Shell River both belonged to Parkland FEA, so the new amalgamated municipality of Hillsburg-Roblin-Shell River is included in the Parkland FEA.

Each of the six FEAs were then tested using a Location Quotient (LQ) analysis on the number of employees in the NAICS codes "44-45 Retail Trade" and for the years 2000, 2006 and 2014 (see Table 2 for the analysis results). The purpose of that test was to identify whether the FEAs created by the 2002 study are still strong regions with respect to keeping their shoppers within the region. This was measured with the number of employees in retail shops (NAICS code 44-45) and

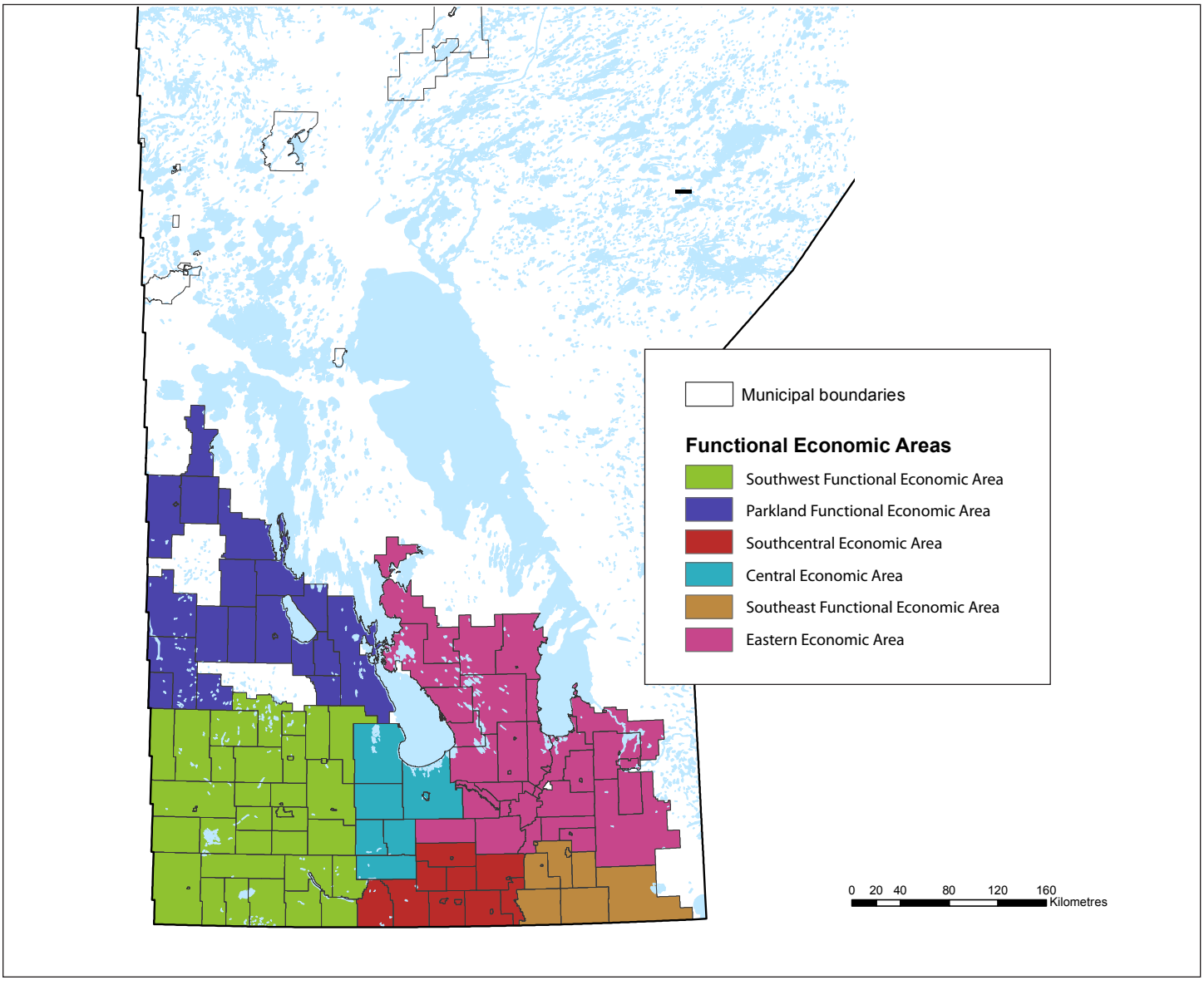
the intensity of retail employment in the FEA relative to the intensity of retail employment at the province level. A change in intensity of retail employment, relative to the intensity at the provincial level, is used as a proxy for changes in shopping patterns.

For each one of the FEAs a Location Quotient (LQ) analysis was completed to identify whether the FEAs created by the 2002 study are still strong regions in regards to keeping the number of employees in retail shops.

The algorithm used is $LQ = \frac{\left(\frac{\text{Employees in 44-45 Retail Trade-FEA}}{\text{All employees in FEA}}\right)}{\left(\frac{\text{Employees in 44-45 Retail Trade-All Manitoba}}{\text{All employees in Manitoba}}\right)}$

For this purpose LQs were calculated on the number of employees in the NAICS codes "44-45 Retail Trade" and for the years 2000, 2006 and 2014. The LQ close to or greater than one indicates that the FEA is not losing retail employment. The LQ greater than one (LQ>1) indicates that the region performs better in retail employment compared to other regions. An LQ of less than 1 indicates the FEA is losing retail employment. LQs in the number of employees in retail shops were used as a proxy for changes is shopping patterns within the region.

Figure 2: Functional Economic Areas in Manitoba



The LQ close to or greater than one indicates that the FEA is still strong and is not losing retail employment; on the contrary LQ greater than one (LQ>1) indicates that the region performs better in retail employment compared to other regions. An LQ of less than 1 indicates the FEA is losing retail employment and this is used as an indicator that shoppers are leaving the FEA to shop elsewhere. The analysis reveals that FEAs are still holding strong over time with respect to retail employment patterns, with an exception of Central FEA and Southeast FEA that have a slight decrease most likely due to proximity to Winnipeg. Interestingly, the Parkland FEA seems to be attracting shoppers to its region, most likely from northern communities, since the intensity of retail employment relative to the intensity at the provincial level is high. Further research could utilize up-to-date data and may cause a slight reconfiguration to the delineated FEAs in Manitoba.

In summary, six Functional Economic Regions are created in Manitoba based on commuting-to-work patterns and retail shopping patterns. Although these six regions were created in 2002, a Location Quotient analysis on employees in retail trade revels that the regions with the exception of Portage and Steinbach, are still in place. These regions provide a logical framework option for larger regional initiatives, using regions established based on economic data.

Table 2: Location Quotient Analysis for the 6 Functional Economic Areas Based on Employees in NAICS Code 44-45 Retail Trade

Location Quotient (LQ) calculations for employees in Retail Trade (NAICS code 44-45)			
Functional Economic Area (FEA)	**2001**	**2006**	**2014**
Southwest FEA	1	1.08	0.99
Parkland FEA	1.22	1.19	1.41
Southcentral FEA	0.94	0.93	1.01
Central FEA	0.97	0.88	0.93
Southeast FEA	1.03	0.94	0.83
Eastern FEA	1.01	1	1

Self-Contained Labour Areas

The purpose of this economic model is to identify local geographical areas of where people live and work, that have a minimum population of 3,000 and a minimum tax base of $130 million.

Self-contained labour areas (SLAs) were originally defined by Munro, et al. (2011) in the paper Self-contained Labour Areas: A proposed delineation and classification by degree of rurality as "A group of two or more census subdivisions (CDS) where at least 75% of the workers both live and work in the area". In other words, a territorial unit where most of the residents with jobs are working in the area and most of the jobs in the area are filled by workers residing in the area.

The above analysis used commuting flows (journey to work) data from the 2006 Census and delineated 349 SLAs in Canada, out of which 25 in Manitoba. SLAs created by the Munro et al. (2011) study offer a base for creating functional areas and can further be used by combining other data to build functional areas that fulfill other purposes (e.g., road network patterns, provision of health services).

Based on the above SLAs, three Rural Development Institute studies (Ashton et al., 2013) further examined the Manitoba cases with a focus on the 18 SLAs in the southern part of Manitoba. The *Indicators and Criteria for Strong Rural Municipalities in Manitoba* study developed a set of eight indicators to describe strong municipalities in Manitoba (Table 3). The report recommended that while growth is an important characteristic of strength, municipalities also need to focus on sufficient size or capacity in order to serve their population and to make development decisions. This capacity was reflected in the baseline threshold of a population level of 3,000 (2011 Census) or more 3 and a municipal taxable assessment threshold of $130 million (2013 taxable assessment data) or more. The *A Proposal to Identify "Strong" Municipalities in Manitoba* report imposed the two baseline thresholds on the Munro et al. (2011) SLAs and created sub-SLAs within the initial SLA boundaries. As a result, the Ashton et al. (2013) report delineated 66 (sub)SLAs in southern Manitoba, made up of 35 municipal groups, 7 cities that remained as standalone entities and 24 additional standalone municipalities (For a complete view see p.21-39 of the *A Proposal to Identify "Strong" Municipalities in Manitoba*).

Table 3: Indicators to Describe Strong Municipalities

Indicator Type	Indicators	Metric
BASELINE	Population	>= 3,000 and <7,500
	Tax Assessment	> $130 (million)
GROWTH	Population Change	> 0%
	Tax Assessment Change	> 0%
	Growth of female population age 20 to 39	> 0%
	Growth of elderly population (80+)	< 0%
CONTEXTUAL	Debt per capita	< $494
	% Debt change 2008-2012	< 5%

Source: Ashton et al. (2013), *Indicators and Criteria for Strong Rural Municipalities in Manitoba.*

After the amalgamation that took effect on January 1st 2015, 47 amalgamated municipalities were established in Manitoba. In most cases amalgamated municipalities fell within the boundaries of the sub-SLA regions identified by the Ashton et. al. (2013) study. The current study reviewed the 35 municipal groups to identify which regions had been affected by the 2015 amalgamation and identify amalgamated municipalities that were made up from municipalities previously delineated in different SLAs. The review identified 9 cases: Municipality of Glenella-Lansdowne, Municipality of Grassland, Municipality of Harrison Park, Municipality of North Cypress-Langford, Municipality of Two Borders, Prairie View Municipality, RM of Ellice-Archie, RM of Oakview, RM of Prairie Lakes.

The above 9 amalgamated municipalities affected 11 municipal groups (regions). Further analysis was taken to re-delineate the 11 municipal regions, ensuring the municipalities contributing the new amalgamated municipality were delineated in the same region and also ensuring the regions met the baseline thresholds of population and tax assessment. For each one of the 9 cases the commuting flows (journey to work) data from the 2006 Census were examined and analyzed. The new amalgamated municipality was perceived as a new entity and, based on the 2006 commuting flows to its neighboring municipalities, it was delineated to the region with the strongest commuting flow ties. In some cases conclusions could not be drawn based on the commuting flows. For example, the difference in the number of commuters to one region over the other was not of a great significance. A decision was then made based on logical patterns and on ensuring the two baseline thresholds of population and tax assessment were met. The analysis concludes with 34 groupings of municipalities, instead of 35 as identified in the Ashton et al. (2013) study. Of the 11 regions affected by the amalgamation two were merged together and the composition changed in the remainder. The 7 cities and 24 standalone municipalities remained as in the Ashton et al. (2013) study. For the municipalities that constitute each SLA (Figure 3).

Figure 3: Self-Contained Labour Areas in Manitoba

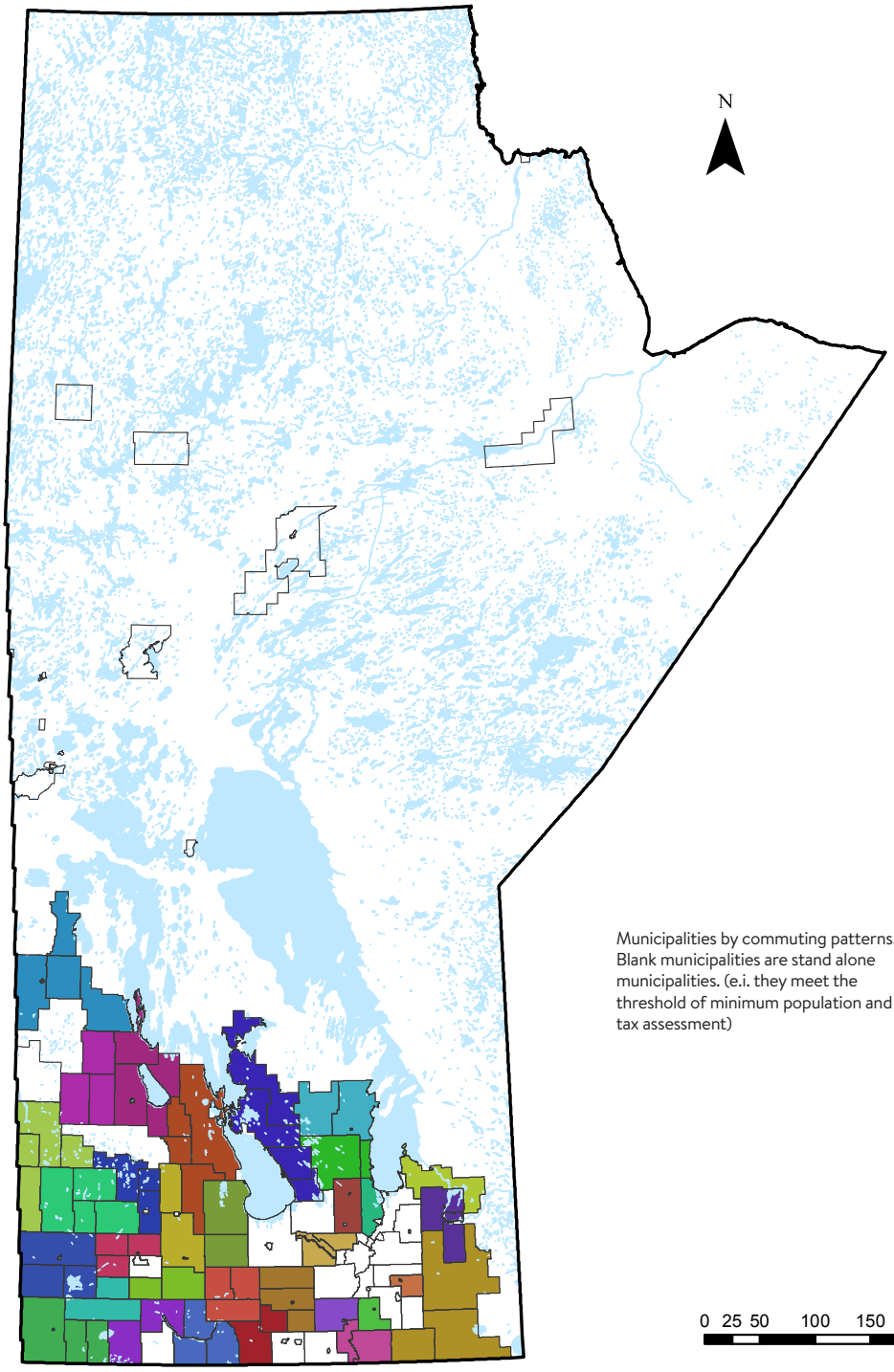


Table 4: Amalgamated municipalities that were created from municipalities delineated in different regions.

	Name of amalgamated municipality, January 1, 2015	Regions based on RDI's study "A Proposal to identify "strong" municipalities in MB"	CSD (2011)	Census Sub-division (CSD) name (2011)	CSD type,
Case I	Municipality of Glenella-Lansdowne	P13	4608054	Lansdowne	RM
	Municipality of Glenella-Lansdowne	P11	4608072	Glenella	RM
Case II	Municipality of Grassland	P17	4605061	Cameron	RM
	Municipality of Grassland	P3	4605067	Whitewater	RM
	Municipality of Grassland	P17	4605063	Hartney	T
Case III	Municipality of Harrison Park	P6	4615069	Harrison	RM
	Municipality of Harrison Park	P14	4615095	Park (South)	RM
Case IV	Municipality of North Cypress-Langford	P16	4607065	North Cypress	RM
	Municipality of North Cypress-Langford	P13	4615018	Langford	RM
Case V	Municipality of Two Borders	P1	4605050	Arthur	RM
	Municipality of Two Borders	P1	4605055	Edward	RM
	Municipality of Two Borders	P5	4605058	Albert	RM
Case VI	Prairie View Municipality	P6	4615041	Miniota	RM
	Prairie View Municipality	P7	4615055	Birtle	RM
	Prairie View Municipality	P7	4615057	Birtle	T
Case VII	RM of Ellice-Archie	P5	4615046	Archie	RM
	RM of Ellice-Archie	P7	4615048	Ellice	RM
	RM of Ellice-Archie	P7	4615051	St-Lazare	VL
Case VIII	RM of Oakview	P14	4615027	Saskatchewan	RM
	RM of Oakview	P6	4615033	Blanshard	RM
	RM of Oakview	P14	4615029	Rapid City	T
Case IX	RM of Prairie Lakes	P3	4605070	Riverside	RM
	RM of Prairie Lakes	P2	4605076	Strathcona	RM

Below is a case by case analysis of the 9 amalgamated municipalities.

Case I: Municipality of Glenella-Lansdowne

Based on the 2006 census commuting flows, Glenella does not have any commuters to or from the community. Lansdowne commuters commute to Neepawa (90), MacGregor (20) and within Lansdowne. Based on the commuting flows there is no significant assumption that the new municipality should be assigned to region P13 or P11. Seen together with case IV, it is suggested that the new municipality moves to group P11. Region P13 is also merged with P16 so all new regions are meeting the two baseline thresholds.

Case II: Municipality of Grassland

The only community that has commuters is Whitewater; 35 to Boissevain (P3) and 25 to Souris (P17). The difference in number of commuters between those two places is not of a great significance. It is suggested Whitewater moves to P17. The reverse would cause P17 being very weak in terms of population and tax assessment.

Case III: Municipality of Harrison Park

Municipality of Harrison Park seems to have a slightly stronger commuting connection to region P6 (60 commuters to Shoal Lake and Strathclair) than to region P14 (50 commuters in Erickson). However there are 20 commuters from Erickson that commute to M of Harrison Park. Additionally there is equally distributed commuting to both Rossburn (20) and Minnedosa (20) which are in different geographic directions (one closer to P6 and the other to P14). Most individuals commute within the municipality of Harrison park (175) and to an Unorganized division of 4617092 (85). Moving Park (south) to P6 makes P14 weaker in terms of population and tax assessments, however indicators still hold. Moving Harrison to P14 makes regions more evenly distributed in terms of population and tax assessment. Commuting flows are not strong enough to suggest which region the new municipality should be assigned to. However, seen together with RM of Oakview and Prairie View Municipality it is suggested that Harrison moves to P14.

Case IV: Municipality of North Cypress-Langford

Municipality of North Cypress-Landford is very strong linked to Carberry (320 commuters) mainly due to North Cypress commuters. It is suggested the municipality stays in the same region as Carberry, region P16. It is suggested P13 and P16 merge together to meet the two baseline thresholds (Lansdowne has moved to P11). By looking the commuting patterns of Rosedale there is a connection with region P16 (due to commuting to Carberry) but no connection to region P11. Suggested Rosedale stays with the merged group of P13-P16.

Case V: Municipality of Two Borders

The new Municipality of Two Borders is strongly linked to P1 because of commuting flows to Melita (200) and Deloraine (25). There is a weaker linkage to region P5 compared to P1 due to commuting to Pipestone (55). The new municipality is assigned to region P1.

Case VI: Prairie View Municipality

Prairie View Municipality is strongly linked to region P6 (65 commuters to Hamiota and 25 to Shoal Lake) rather than region P7 (only 20 to Russell). Most commuters commute within the new amalgamated municipality (400). It is suggested Birtle (RM and T) move to region P6 to join Miniota.

Case VII: RM of Ellice-Archie

RM of Ellice-Archie commutes mostly within itself (110) and to SK communities (75). It is mostly linked to P7 (due to Birtle 45) than to P5 (zero), however Birtle has now moved to region P6. It is suggested Archie moves to P7 to join Ellice and St-Lazare since most commuters commute within the new municipality.

Case VIII: RM of Oakview

This case was seen together with the Municipality of Harrison Park and Prairie View Municipality. Commuters of RM of Oakview commute mainly to Brandon (110) and within the RM of Oakview(80). The next strongest connection is Minnedosa (70 commuters; however Minnedosa is a standalone city) and Hamiota (35 commuters). It is suggested Saskatchewan and Rapid City move to P6 region to join Blanshard and the new RM of Oakview continues being linked to Hamiota.

Case IX: RM of Prairie Lakes

Commuters from RM of Prairie Lakes commute mostly within the RM (160) and the next strongest connection is with Killarney (105) which is not in either P2 or P3 regions. No conclusion can be drawn based on the above commuting patterns. It is suggested that Strathcona moves to region P3, since P3 is going to have less than 3,000 population if otherwise (taking into account that Whitewater moves out of P3 too). So the RM of Prairie Lakes is assigned to region P3.

In summary, Self-contained Labour Areas (SLAs) in Manitoba as defined in the Ashton et al.(2013) study and as were reconfigured with the current study to account for the January 1st 2015 municipal amalgamation, show local geographical areas of where people live and work that have a minimum population of 3,000 and a minimum tax base of $130 million. The study identified 65 SLAs in southern Manitoba. Thirty four SLAs comprise groupings of two or more municipalities and 31 SLAs are standalone municipalities. SLAs made up of groupings of communities show that there is a shared economy in that geographical area and the other communities in the SLA would be ideal partners on more localized economic development efforts.

Population and Income Classification of Resource Dependent Communities

The purpose of this economic model is to provide additional insight (by using population and income outcomes) into the local economy of a community and the economy of neighboring communities, rather than to suggest functional economic regions per se. The model aims to identify communities that are more likely to need localized intervention (place-based policies).

This economic model is based on a research paper, *Triage at the Periphery: Place-Based Policy in Resource-Dependent Rural Communities* (Olfert et al., 2010). Acknowledging that some communities will need place-based policies either alone or in combination with people-based policies the paper proposes a process to identify communities that are the best candidates for place-based policy.

As a first step, resource dependent (RD) rural communities are identified as the most likely candidates to require targeted intervention. Finding that RD communities are indeed statistically distinct, the report classifies them in four categories based on their actual performance in terms of population change and poverty outcomes. Population change in each RD community (1991 to 2001) was compared to the Canadian average of population change over the same time period (-4.27%). The percentage of households with a 2005 income of less than $20,000 in each RD community was compared to the national average percentage of 8.08%. The four categories (classes) emerged (Figure 4):

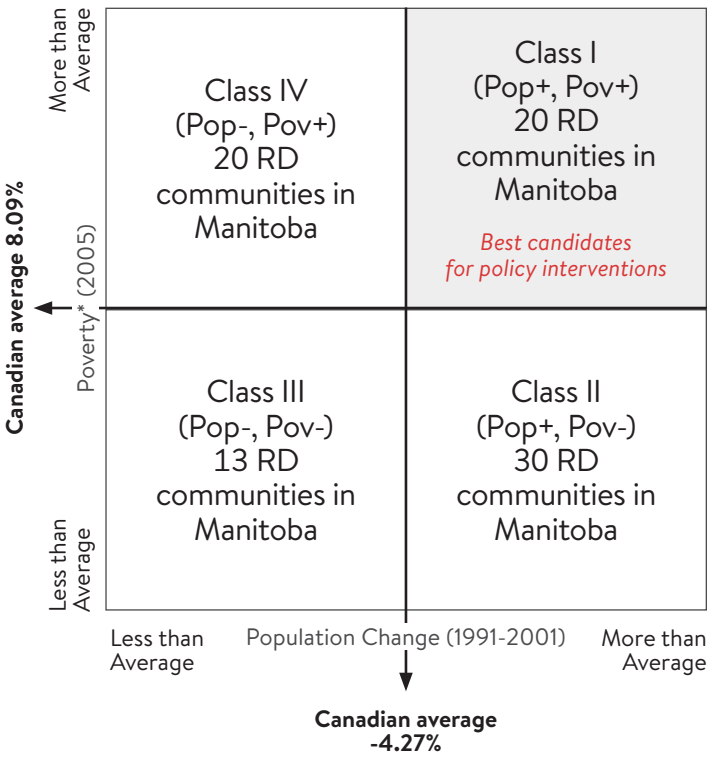
Class I: Growing population with a higher than average poverty, suggesting there are barriers to people leaving for higher incomes elsewhere. (pov+, pop+)

Class II: Growing population with a lower than average poverty, suggesting relatively successful RD communities.

Class III: Declining population with a lower than average poverty, suggesting outmigration and a mobile labour force.

Class IV: Declining population with a higher than average poverty, suggesting outmigration and/or naturally declining population.

Figure 4: Categories of Resource Dependent Communities Based on Population and Income



- Percentage of households with less than $20,000 income (2005)
- Sources: Statistics Canada Census data (1991, 2001 and 2006), Olfert et al., (2010)

Once the four classes were determined then a population change model and a poverty model were used and the findings showed that local job growth improves economic outcomes to a greater extent in RD communities than non-RD. Class I communities (above average population growth and above average poverty) are impacted more by job growth than Class II communities (above average population growth but lower than average poverty). Therefore some place-based policy intervention may be warranted in Class I type communities. A residual analysis on both models follows.

For the purpose of the current research the same data as in the Olfert et al., (2010) report was used (courtesy of Dr. Rose Olfert) to classify the RD communities in Manitoba using the above mentioned classes. The geographic unit of analysis of the Olfert et al., (2010) report is the consolidated census subdivisions (CCS), which consist of individual towns plus their immediate surrounding rural area. For the purpose of the current analysis the CSD level was used and the analysis took into account amalgamations that occurred in Manitoba in January 2015. There were 10 cases where the amalgamated municipalities were grouped under different classes. The amalgamated municipalities were treated as one entity and were classified under one of the four classes. To estimate the population change and the percentage of income below $20,000 for the amalgamated municipality the weighted average of these indicators and for the municipalities that constitute the new one was used.

Section 4 of the report describes the methodology used to classify and test resource dependent communities. The population change model and poverty model as described in the 2010 report were not examined, as further research and advance econometric analysis is needed; something that was beyond the scope of this study. The current analysis focused on section "4.2: Identifying Candidates for Place-Based Policy" of the Olfert etal (2010) report that classifies Resource Dependent (RD) 10 communities in Manitoba based on their actual performance in terms of population change and poverty outcomes.

The analysis used the same data as the Olfert etal (2010) report (courtesy of Dr. Rose Olfert). The Olfert et al. (2010) study used CCS-level data where a typical census consolidated subdivision (CCS) included an incorporated town (i.e. a CSD) plus the surrounding incorporated rural municipality (i.e. another CSD) and the two CSDs were "consolidated" for statistical purposes. Population change in each RD community (1991 to 2001) was compared to the Canadian average of population growth over the same time period (-4.27). The percentage of households with a 2005 income of less than $20,000 in each RD community was compared to the national average percentage of 8.09. Each community was classified as pop+ or pop- if the population change in the community was above or below the national average. Each community was classified as pov+ or pov- depending on its performance above the national average or below. Based on these classifications 4 community classes were created: Class I: pop+, pov+, Class II: pop+, pov-, Class III: pop-, pov-, Class IV: pop-, pov+.

Our analysis broke down the CCS to the CSD level and took into account the amalgamation that occurred in Manitoba in January 2015. Revisions were made in some cases to ensure that amalgamated municipalities were treated as one new municipality categorized under the same class. In order to accommodate the amalgamated municipalities some assumptions had to be made and for this the results should be taken with caution. In order for the new municipalities to be re-evaluated further research is needed, something that is beyond the scope of the this study.

In the case where from the two or more municipalities that got amalgamated one or more were grouped into a specific class, the assumption that the whole amalgamated municipality would fall under the same class was made with the rationale is that the Olfert et al. June 2010 study used CCS which would have included the surrounding rural areas.

There were 10 cases where the amalgamated municipalities were grouped under different classes. In those cases the weighted average of the population change and the percentage of income below $20,000 for the amalgamated municipality were used as indicators to evaluate the amalgamated municipality. Table 5 below shows the 10 cases and the classes they were grouped under:

Table 5: 10 cases where municipalities that amalgamated were grouped under different classes.
*Note some municipalities are not included because they are not considered resource dependent.

	Name	Total Population 1991	Population change 1991 to 2001	% below $20,000	Canadian average population growth	Average % below $20,000	Class
Case 1 - RM of Ellice-Archie							
4615046	Archie	495	-33.33	23.80953	-4.266998	8.08545	IV
4615048	Ellice	810	-4.32	0	-4.266998	8.08545	III
RM of Ellice-Archie		**1305**		**9.03**			**IV**
Population: Archie and Ellice are both (pop-) % below $20,000: Weighted average of Archie and Ellice is 9.03, greater than national average. Suggested the new municipality is classified as (pov+) (pop-,pov+) = Class IV							
Case 2 - Municipality of Grassland							
4605061	Cameron	935	-1.07	7.31707	-4.266998	8.08545	II
4605067	Whitewater	835	-13.17	9.09091	-4.266998	8.08545	IV
Municipality of Grassland		**1770**	**-6.78**	**8.15**			**IV**
Population: Weighted average of population change is-6.78, below national average. Suggesting the new municipality is classified as (pop-) % below $20,000: Weighted average is 8.15, a bit above the national average. Suggesting the new municipality is classified as (pov+) (pop-,pov+)= Class IV							
Case 3 - Municipality of Harrison Park							
4615069	Harrison	1085	0.92	18.18182	-4.266998	8.08545	I
4615095	Park (South)	955	-7.33	0	-4.266998	8.08545	III
Municipality of Harrison Park		**2040**	**-2.94**	**9.67**			**I**
Population: Weighted average is -2.9, above national average. Suggesting the new municipality is classified as (pop+) % below $20,000: Weighted average is 9.7, above national average. Suggesting the new municipality is classified as (pov+) (pop+,pov+)= Class I							

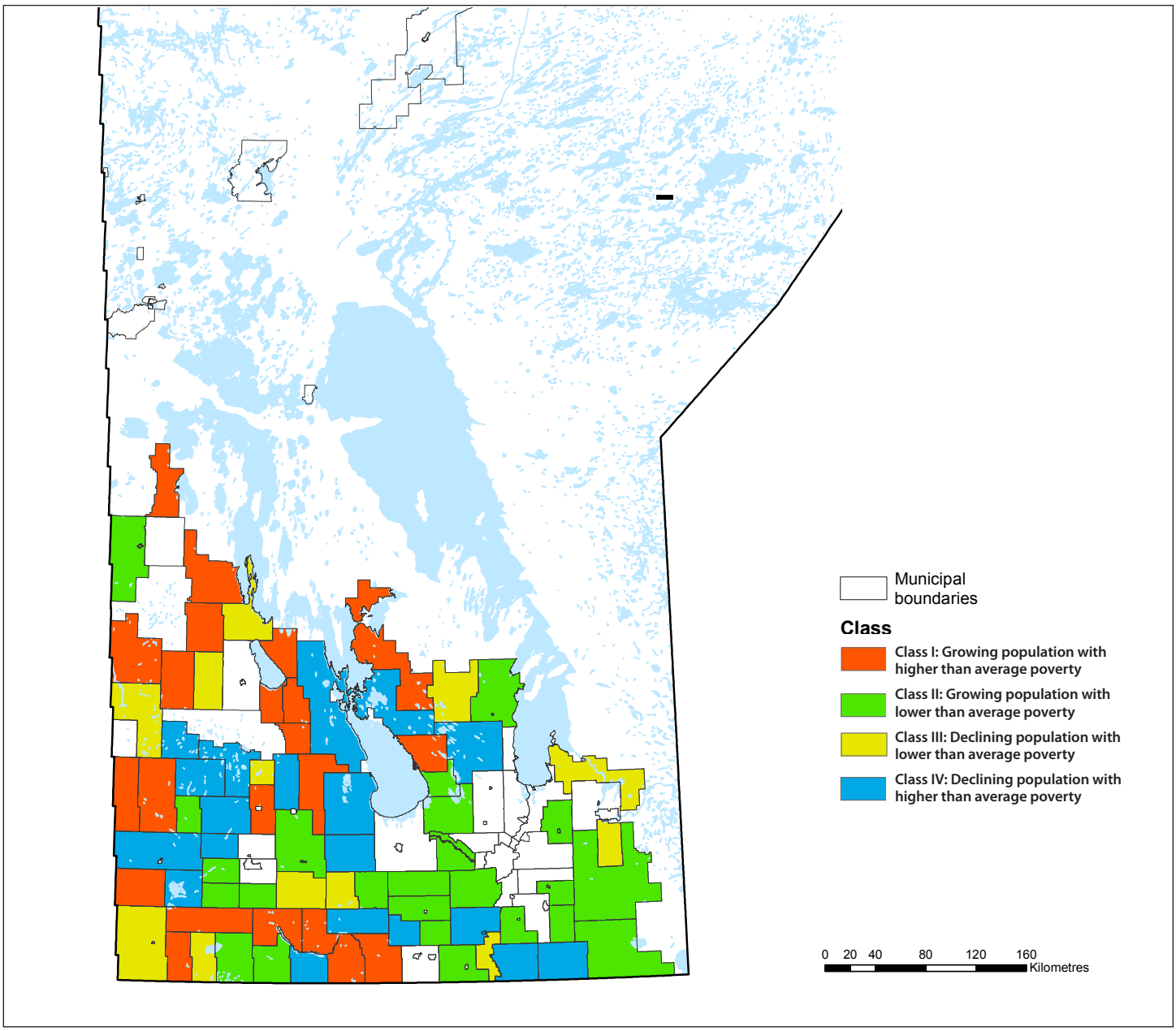
Case 4 - Municipality of Hillsburg-Roblin-Shell River							
4616045	Hillsburg	600	-20.83	7.40741	-4.266998	8.08545	III
4616049	Shell River	2970	-7.58	10.59603	-4.266998	8.08545	IV
4616063	Park (North)	400	-15.00	23.52941	-4.266998	8.08545	IV
Municipality of Hillsburg-Roblin-Shell River		**3970**	**-10.33**	**11.42**			**IV**
Notes: In 2007 Park North - 4616063 was deleted. Annexation by Shell River 4616049. Population: Weighted average is -10.3, below national average. Suggesting the new municipality is classified as (pop-) % below $20,000: Weighted average is 11.4, above the national average. Suggesting the new municipality is classified as (pov+) (pop-,pov+)= Class IV							
Case 5 - RM of Lakeshore							
4617045	Ochre River	1005	-5.47	0	-4.266998	8.08545	III
4617076	Lawrence	620	-12.90	28.125	-4.266998	8.08545	IV
RM of Lakeshore		**1625**	**-8.31**	**10.73**			**IV**
Population: Both municipalities are classified as (pop-) % below $20,000: Weighted average is 10.3, above national average. Suggesting the new municipality is classified as (pov+) (pop-,pov+)= Class IV							
Case 6 -RM of Prairie Lakes							
4605070	Riverside	885	-5.65	0	-4.266998	8.08545	III
4605076	Strathcona	795	-20.13	21.73913	-4.266998	8.08545	IV
RM of Prairie Lakes		**1680**	**-12.50**	**10.29**			**IV**
Population: Both municipalities are classified as (pop-) % below $20,000: Weighted average is 10.3, above national average. Suggesting the new municipality is classified as (pov+) (pop-,pov+)= Class IV							
Case 7 - Prairie View Municipality							
4615041	Miniota	1305	-1.15	27.94118	-4.266998	8.08545	I
4615055	Birtle	1665	-13.51	10.66667	-4.266998	8.08545	IV
Prairie View Municipality		**2970**	**-8.08**	**18.26**			**IV**
Population: Weighted average is -8.08, below national average. Suggesting the new municipality is classified as (pop-) % below $20,000: Both Miniota and Birtle are classified as (pov+) (pop-,pov+)= Class IV							

Case 8 - Municipality of Two Borders							
4605050		Arthur	1710	-8.19	3.84615	-4.266998	8.08545
4605055		Edward	835	-18.56	0	-4.266998	8.08545
4605058		Albert	520	-25.96	11.11111	-4.266998	8.08545
Municipality of Two Borders		3065	**-14.03**	**4.03**			**III**
(pop-,pov-)= Class III							
Case 9 - RM of Wallace-Woodworth							
4606028	Wallace	5170	-3.58	4.33213	-4.266998	8.08545	II
4606037	Woodworth	1875	4.27	23.80952	-4.266998	8.08545	I
RM of Wallace-Woodworth		**7045**	**-1.49**	**9.52**			**I**
Population: Both Wallace and Woodworth are classified as (pop+) % below $20,000: Weighted average is 9.5, above national average. It is suggesting that the new municipality is classified as (pov+) (pop+, pov+)= Class I							
Case 10 - RM of Yellowhead							
4615060	Shoal Lake	1410	-6.38	3.125	-4.266998	8.08545	III
4615064	Strathclair	1260	2.78	18.18182	-4.266998	8.08545	I
RM of Yellowhead		**2670**	**-2.06**	**10.23**			**I**
Note: In 2011 Shoal Lake RM and Shoal Lake T (codes 4615060 and 4615062 respectively) created a new CSD with code 4615061 - Shoal Lake RM Population: Weighted average is -2.06, above national average. It is suggesting the new municipality is classified as (pop+) % below $20,000: Weighted average is 10.2, above national average. It is suggesting the new municipality is classified as (pov+) (pop+,pov+)= Class I							

Based on the above analysis, 83 out of the 137 municipalities in Manitoba are classified as RD communities: 20 in Class I, 30 in Class II, 13 in Class III and 20 in Class IV. Figure 5 shows the RD Manitoba communities and the Class that they fall under. Class I communities are the most likely ones to need policy interventions and those policy interventions are more likely to have the greater effect in regard to job growth.

Classifying resource dependent CSDs based on population and income provides insight into the local economy of a community and the economy of neighboring communities. Communities with higher population outcomes and higher poverty than the mean (20 municipalities in Manitoba) are the ones most likely to require place-based policy intervention and the ones that local job growth will result in greater economic outcome improvement.

Figure 5: Population and Income Classification of Resource Dependent Communities in Manitoba



Creative Class Model

The purpose of this model is to identify areas in Manitoba with high concentrations of Creative Class professionals. Florida et al. (2008) acknowledge that the underlying driver of economic development is highly skilled and educated people. Places that have more of those people thrive, while others that do not become stable or decline. Therefore, this research attempted to identify the "hot spot" areas in Manitoba with high creative class occupations.

The initial idea for mapping the "hot spots" in Manitoba came from Stolarick's (2012) work on the distribution of creative workers. Using detailed demographic and geographic data for Ontario from Statistics Canada, Stolarick, (2012) investigates the relationship between population, density, proximity, and the share of the workforce in the creative class for all Ontario Census subdivisions (CSD). He concludes: "…only close proximity or a very large creative population is positively related to a larger creative class in small cities and rural areas. The results suggest that functional creative economies should be characterized by fairly limited spatial distances when considered on a provincial scale".

Florida (2002) defines the "creative class" as occupations that fall under the classifications in Table 6. According to Florida's definition, the creative class has two major sub-components: a Super-Creative Core and creative professionals. While other studies (Mcgranahan and Wojan, 2007) have argued that many occupations with low creativity requirements and those involved primarily in economic reproduction should be excluded from Florida's definition. In this research the general definition of Florida's Super-Creative Core (SCC) is used. Florida uses the occupation categories of the Bureau of Labor Statistics (BLS) and Occupation Employment Survey (OES) in the United States. These codes were matched with the National Occupational Classification (NOCS) codes used in Canada before any data collection and analysis started. This analysis focused on the super creative core of Florida's (2002) definition that is composed of the following occupation groups:

- Computer and mathematical occupations
- Architecture and engineering occupations
- Life, physical and social science occupations
- Education, training and library occupations
- Arts, design, entertainment, sports and media occupations

Each occupation group above is defined under the occupation categories of the Bureau of Labor Statistics (BLS) and Occupation Employment Survey (OES) in the United States (United States Department of Labour). To match the BLS occupation codes with the National Occupational Classification (NOCS) codes used in Canada, a comparison among the occupation titles was made. Table 7 contains the occupations by NOCS code classified under the super-creative core used in this analysis (Government of Canada).

Table 6: Creative Class Classifications

Super-Creative Core	Creative professionals
Computer and mathematical occupations	Management occupations
Architecture and engineering occupations	Business and financial operations occupations
Life, physical and social science occupations	Legal occupations
Education, training and library occupations	Healthcare practitioners and technical occupations
Arts, design, entertainment, sports and media occupations	High-end sales and sales management

Table 7: Super Creative Core Professionals

Classification Code - NOICS	Classification Code Description English
0014	Senior managers - health, education, social and community services and membership organizations
0015	Senior managers - trade, broadcasting and other services, n.e.c.?
0124	Advertising, marketing and public relations managers
0211	Engineering managers
0212	Architecture and science managers
0213	Computer and information systems managers
0413	Government managers - education policy development and program administration
0422	School principals and administrators of elementary and secondary education
0511	Library, archive, museum and art gallery managers
0512	Managers - publishing, motion pictures, broadcasting and performing arts
0513	Recreation, sports and fitness program and service directors
1123	Professional occupations in advertising, marketing and public relations
1213	Supervisors, library, correspondence and related information workers
1254	Statistical officers and related research support occupations
1451	Library assistants and clerks
1454	Survey interviewers and statistical clerks
2111	Physicists and astronomers
2112	Chemists
2113	Geoscientists and oceanographers
2114	Meteorologists and climatologists
2115	Other professional occupations in physical sciences
2121	Biologists and related scientists
2122	Forestry professionals
2123	Agricultural representatives, consultants and specialists
2131	Civil engineers
2132	Mechanical engineers
2133	Electrical and electronics engineers
2134	Chemical engineers
2141	Industrial and manufacturing engineers
2142	Metallurgical and materials engineers
2143	Mining engineers
2144	Geological engineers
2145	Petroleum engineers
2146	Aerospace engineers
2147	Computer engineers (except software engineers and designers)
2148	Other professional engineers, n.e.c.
2151	Architects

2152	Landscape architects
2153	Urban and land use planners
2154	Land surveyors
2161	Mathematicians, statisticians and actuaries
2171	Information systems analysts and consultants
2172	Database analysts and data administrators
2173	Software engineers and designers
2174	Computer programmers and interactive media developers
2175	Web designers and developers
2211	Chemical technologists and technicians
2212	Geological and mineral technologists and technicians
2221	Biological technologists and technicians
2222	Agricultural and fish products inspectors
2223	Forestry technologists and technicians
2224	Conservation and fishery officers
2225	Landscape and horticulture technicians and specialists
2231	Civil engineering technologists and technicians
2232	Mechanical engineering technologists and technicians
2233	Industrial engineering and manufacturing technologists and technicians
2241	Electrical and electronics engineering technologists and technicians
2243	Industrial instrument technicians and mechanics
2244	Aircraft instrument, electrical and avionics mechanics, technicians and inspectors
2251	Architectural technologists and technicians
2252	Industrial designers
2253	Drafting technologists and technicians
2254	Land survey technologists and technicians
2255	Technical occupations in geomatics and meteorology
2261	Non-destructive testers and inspection technicians
2262	Engineering inspectors and regulatory officers
2264	Construction inspectors
2271	Air pilots, flight engineers and flying instructors
2281	Computer network technicians
2283	Information systems testing technicians
4011	University professors and lecturers
4012	Post-secondary teaching and research assistants
4021	College and other vocational instructors
4031	Secondary school teachers
4032	Elementary school and kindergarten teachers
4033	Educational counsellors
4151	Psychologists
4161	Natural and applied science policy researchers, consultants and program officers

4162	Economists and economic policy researchers and analysts
4164	Social policy researchers, consultants and program officers
4166	Education policy researchers, consultants and program officers
4167	Recreation, sports and fitness policy researchers, consultants and program officers
4168	Program officers unique to government
4169	Other professional occupations in social science, n.e.c.
4214	Early childhood educators and assistants
4215	Instructors of persons with disabilities
4216	Other instructors
5111	Librarians
5112	Conservators and curators
5113	Archivists
5121	Authors and writers
5122	Editors
5123	Journalists
5125	Translators, terminologists and interpreters
5131	Producers, directors, choreographers and related occupations
5132	Conductors, composers and arrangers
5133	Musicians and singers
5134	Dancers
5135	Actors and comedians
5136	Painters, sculptors and other visual artists
5211	Library and public archive technicians
5212	Technical occupations related to museums and art galleries
5221	Photographers
5222	Film and video camera operators
5223	Graphic arts technicians
5224	Broadcast technicians
5225	Audio and video recording technicians
5226	Other technical and co-ordinating occupations in motion pictures, broadcasting and the performing arts
5227	Support occupations in motion pictures, broadcasting, photography and the performing arts
5231	Announcers and other broadcasters
5232	Other performers, n.e.c.
5241	Graphic designers and illustrators
5242	Interior designers and interior decorators
5243	Theatre, fashion, exhibit and other creative designers
5244	Artisans and craftspersons
5245	Patternmakers - textile, leather and fur products
5251	Athletes

5252	Coaches
5253	Sports officials and referees
5254	Program leaders and instructors in recreation, sport and fitness
7241	Electricians (except industrial and power system)
7242	Industrial electricians
7243	Power system electricians
7333	Electrical mechanics
7361	Railway and yard locomotive engineers
9212	Supervisors, petroleum, gas and chemical processing and utilities
9241	Power engineers and power systems operators
Total 128	

The analysis attempted to examine the creative class occupations by conducting a Location Quotient (LQ) analysis at the CSD level. The location quotient (LQ) provides a measure of the intensity of employment in a given sector (in this case super creative class) in a region relative to the level of employment in that sector at the national level (in this case Manitoba). In this analysis the algorithm used is:

$$\text{The algorithm used is } LQ = \frac{\left(\frac{\text{Employees in 44-45 Retail Trade-FEA}}{\text{All employees in FEA}}\right)}{\left(\frac{\text{Employees in 44-45 Retail Trade-All Manitoba}}{\text{All employees in Manitoba}}\right)}$$

The critical values of the LQ are as follows: LQ >1 indicates that the region has a higher intensity of creative class occupations relative to Manitoba as a whole. LQ = 1 indicates that the region has the same intensity of creative class occupations relative to Manitoba as a whole. LQ < 1 indicates that the region has a lower intensity of creative class occupations relative to Manitoba as a whole.

However, due to limitations with the 2011 NHS professional occupation data at the CSD level an LQ analysis at the Census Division (CD) level is offered instead. The 23 CDs in Manitoba were examined and grouped into four categories (quadrants) based on the results of the LQ analysis (Winnipeg – CD #11 had the highest concentration as anticipated and was excluded from the grouping).

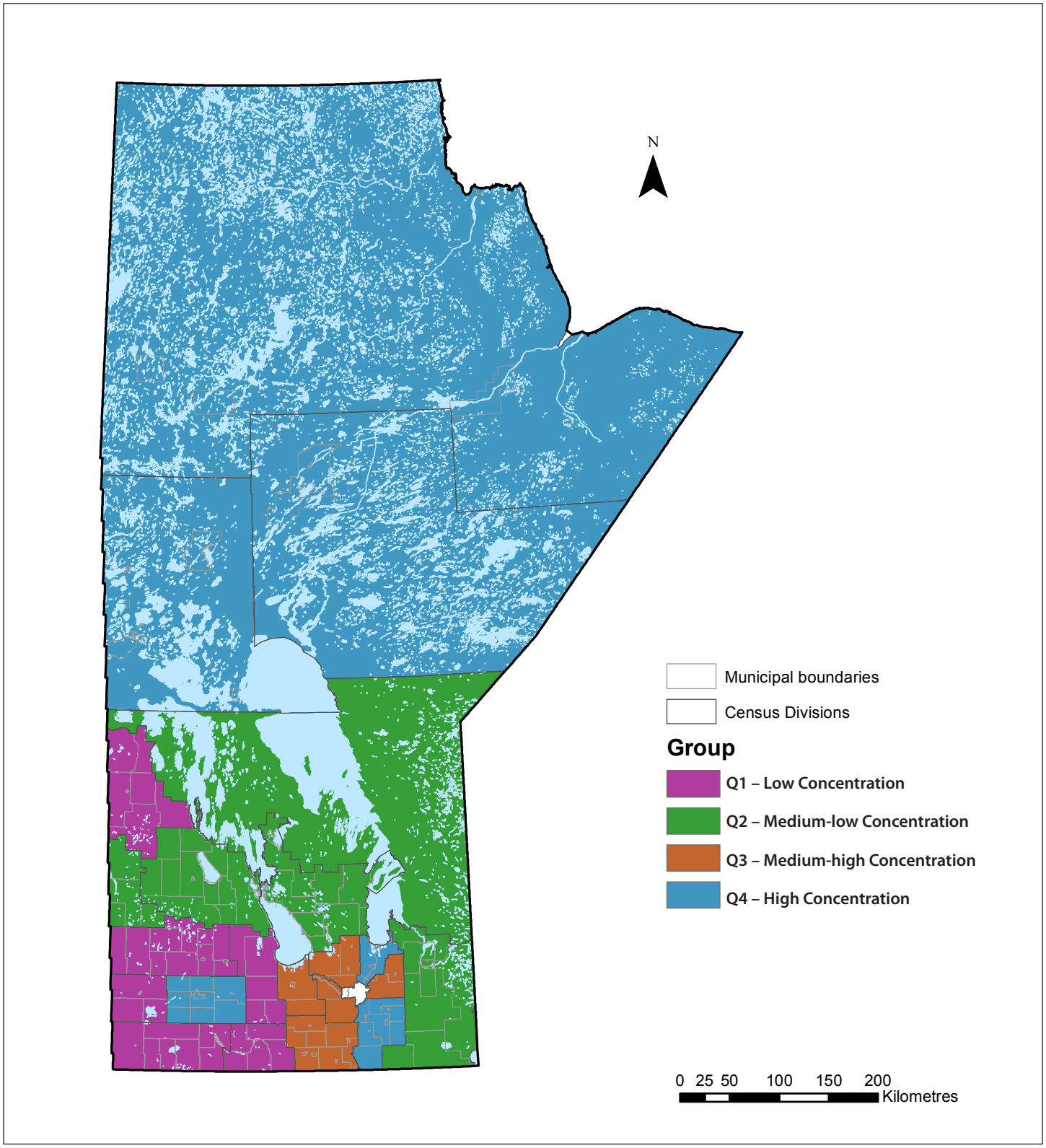
The analysis shows that SCC occupations are concentrated in CDs around Winnipeg, Brandon and in the north. The ones surrounding the Brandon CD have the lowest concentration of SCC occupations. See Figure 6 and Table 8 for the results under each of the 4 groups (group Q4 "Higher" concentration to group Q1 "Lower" concentration).

Table 8: Concentration of Super Creative Class Occupations by Census Division

Census Division Number	Super Creative Class LQ	Group
Man. Div. 22 (including Thompson)	0.96	Q4
Man. Div. 23 (including Churchill)	0.93	
Man. Div. 13 (including Selkirk)	0.86	
Man. Div. 7 (including Brandon)	0.79	
Man. Div. 2 (including Steinbach)	0.72	
Man. Div. 21 (including Flin Flon & The Pas)	0.71	
Man. Div. 10 (including St. Francois Xavier)	0.68	Q3
Man. Div. 12 (including Beausejour)	0.65	
Man. Div. 14 (including Stonewall)	0.63	
Man. Div. 9 (including Portage la Prairie)	0.60	
Man. Div. 3 (including Winkler, Mordon, Altona)	0.60	
Man. Div. 19 (including Berens River)	0.58	Q2
Man. Div. 18 (including Gimli)	0.57	
Man. Div. 17 (including Dauphin)	0.55	
Man. Div. 1 (including Lac du Bonnet)	0.53	
Man. Div. 16 (including Roblin & Russell)	0.53	
Man. Div. 15 (including Minnedosa & Neepawa)	0.49	Q1
Man. Div. 20 (including Swan River)	0.46	
Man. Div. 8 (including Gladstone & Treherne)	0.41	
Man. Div. 5 (including Killarney)	0.40	
Man. Div. 4 (including Pilot Mound & Somerset)	0.37	
Man. Div. 6 (including Virden)	0.30	

Source: 2011 National Household Survey: Data tables
Tabulation: Occupation - National Occupational Classification (NOC) 2011

Figure 6: Concentration of Super Creative Class Occupations by Census Division



Detailed 2011 NHS data was available for the five cities of Winnipeg, Thompson, Brandon, Steinbach and Portage la Prairie, and allowed for additional LQ analysis at the city level. Results are provided on Table 9, where (excluding Winnipeg) Thompson and Brandon have higher SCC concentrations than Steinbach and Portage la Prairie.

Table 9: Five Manitoba Cities listed from Higher to Lower Super Creative Class Concentrations

Cities	Super Creative class LQ analysis
Winnipeg	1.12
Thompson	0.81
Brandon	0.79
Steinbach	0.57
Portage la Prairie	0.51

Source: 2011 National Household Survey: Data tables
Tabulation: Occupation - National Occupational Classification (NOC) 2011

In addition, as part of the creative class model and by using EMSI's 20066 occupation data, a LQ analysis was conducted for the six FEAs created by the aforementioned Functional Economic Areas Economic model. Results of this analysis are shown on Table 10, where Southwest follows the Eastern FEA in the SCC concentration and Southeast, Southcentral and Central FEA seem to have very similar SCC concentrations. The Parkland FEA has the lowest concentration of all the other regions.

Table 10: Concentration of Super Creative Class Occupations by Functional Economic Area

Functional Economic Areas as defined in Model 2	Super Creative class LQ analysis
Eastern FEA	1.09
Southwest FEA	0.81
Southeast FEA	0.66
Southcentral FEA	0.63
Central FEA	0.62
Parkland FEA	0.55

Source: EMSI's 2006 occupation data

Finally, the current research also examined the diversity of SCC occupations at a CSD level by using EMSI's 2006 occupation data. By diversity we mean the counts of SCC occupations in each CSD out of a total 128 occupations identified as SCC occupations. All 137 municipalities were grouped in 4 categories (quadrants) according to the counts of SCC occupations categories present in each municipality (Group Q4 more SCC occupations to Q1 less SCC occupation reported in the community). The results are reflected in both Figure 6 and Tables 14 and 15 (see Appendix A). This analysis provides some additional information to the LQ analysis conducted above. For example, while Thompson scores very high in concentration of SCC occupations compared to Steinbach (LQ 0.81 versus LQ 0.57 for Steinbach), it seems that there are only 26 different SSC occupations that contribute to that versus 103 in Steinbach.

Figure 7: Diversity of Super Creative Class Occupations by Municipality

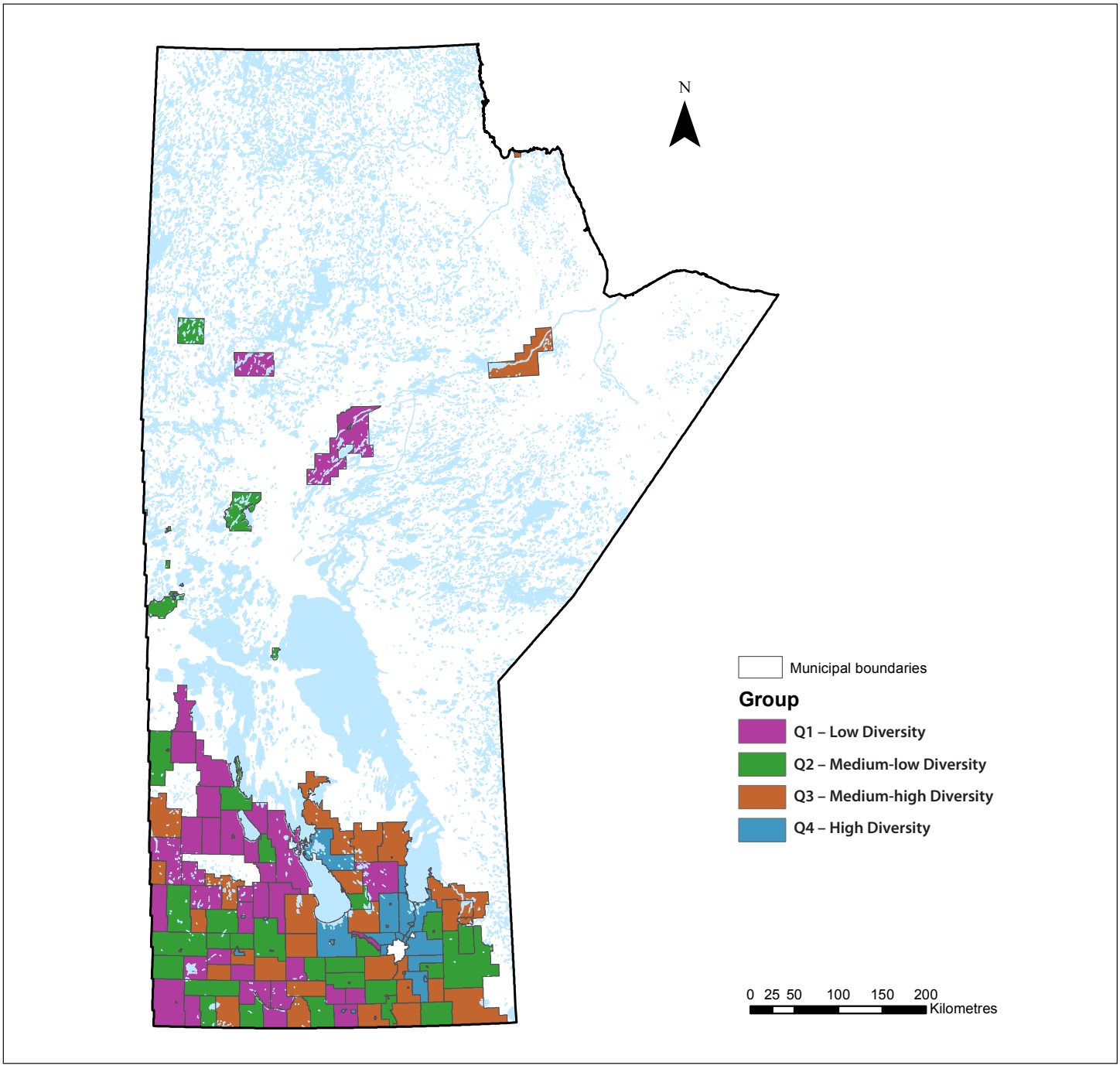


Table 10: Manitoba Census Subdivisions Listed in Groupings of Diversity of Super Creative Class Jobs

Q1 – Low Diversity | **Q2** – Medium-low Diversity | **Q3** – Medium-high Diversity | **Q4** – High Diversity

Municipalities	Counts (out of 128 SCC occupations)	Group
Steinbach	103	Q4
Brandon	101	
Selkirk	97	
St. Andrews	89	
Gimli	88	
Portage	85	
Stonewall	85	
Thompson	85	
Springfield	83	
Dauphin	81	
Headingley	81	
Rockwood	81	
Winkler	80	
The Pas	78	
East St. Paul	76	
Flin Flon	76	
Morden	76	
St.Clements	75	
Arborg	74	
Virden	74	
Beausejour	73	
Neepawa	73	
West St.Paul	72	
Swan River	71	
West Interlake	71	
Powervire-Pine Falls	70	
Minnedosa	69	
Teulon	68	
Carman	65	
Altona	64	
Hanover	64	
Portage	63	
Tache	63	
Rosser	62	

Municipalities	Counts (out of 128 SCC occupations)	Group
Bifrost-Riverton	61	Q3
Cornwallis	60	
MacDonald	60	
Lac du Bonnet	59	
Glenboro-South Cypress	58	
Souris-Glenwood	57	
Boissevain-Morton	55	
Lac du Bonnet	54	
Ritchot	54	
Emerson-Franklin	53	
Pinawa	53	
Russell-Binscarth	53	
Alexander	52	
Churchill	52	
Rhineland, Plum Coulee	51	
Fisher	50	
Morris	50	
Niverville	50	
Coldwell	49	
De Salaberry	49	
North Norfolk-MacGregor	49	
Carberry	48	
Woodlands	48	
Piney	47	
Gillam	45	
Lorne, Somerset, Notre	45	
Grahamdale	44	
Hamiota	44	
Harrison Park	43	
Hillsburg, Roblin	43	
La Broquerie	43	
Louise, Crystal City, Pil	43	
WestLake	43	
Yellowhead	43	

Municipalities	Counts (out of 128 SCC occupations)	Group
Grey, St. Claude	42	Q2
Melita	42	
St.Pierre-Jolys	42	
Cartier	41	
Kelsey	41	
Pempina,Manitou	40	
Morris	39	
Wallace-Woodworth-Elkhorn	39	
Whitemouth	39	
Prairie View	37	
Riverdale	37	
Killarney-Turtle Mountain	36	
Ste.Anne	36	
Snow Lake	35	
South Norfolk Treherne	34	
Oakview	34	
Deloraine-Winchester	33	
Lynn Lake	33	
Elton	32	
Pipestone	32	
Ste.Rose du Lac, St.Rose	32	
Dufferin	31	
St. Laurent	31	
Swan Valley West	31	
Mossey River-Winnipegosis	30	
Stuartburn	30	
Brokenhead	29	
Montcalm	29	
Reynolds	29	
North Cypress-Langford	28	
Ste. Anne	28	
Winnipeg Beach	28	
Grand rapids	27	
Grassland	27	

Municipalities	Counts (out of 128 SCC occupations)	Group
Cartwright-Roblin	26	Q1
Mystery Lake	26	
Oakland-Wawanesa	26	
Stanley	26	
Thompson	26	
Clanwilliam-Erickson	25	
Minitonas-Bowsman	25	
Victoria	25	
Lakeshore	24	
Rossburn	24	
Two Boarders	24	
Gilbert Plains	23	
Rosedale	23	
Prairie Lakes	22	
Sifton, Oak lake	22	
St. Francois Xavier	22	
Whitehead	22	
Armstrong	21	
Mountain (North& South)	21	
Ellice-Archie-St. Lazare	20	
Grandview	19	
Argyle	18	
Glenella-Lansdowne	18	
Leaf Rapids	18	
Minto-Odanah	18	
Brenda-Waskada	17	
McCreary	17	
Riding Mountain West	17	
Alonsa	13	
Dauphin	13	
Ethelbert	10	
Roland	6	
Victoria beach	4	
Dunnottar	3	

The creative class model provides an insight into the local economies by identifying areas in Manitoba that have a high concentration of Super Creative Core occupations as defined by Florida (2002). At the same time additional analysis taken shows the diversity of these SCC occupations present in each municipality. Creative class occupations should be considered in planning and decision making since their presence is positively associated with employment growth (McGranahan and Wojan, 2007).

Summary

The four economic models identified in this paper use statistical information to help better understand the geographical aspects of regional and local economies. The application of these models can be used as new census data is reported and researchers in other provinces may find them insightful as well. FEAs show where people live, work, and shop and they were updated and reveal that recently amalgamated municipalities are located in one Functional Economic Areas. Self-contained Labour Areas show where people live and work post 2015 amalgamation. The economic model, Population and Income Classification of Resource Dependent Communities, was also updated to reflect new municipal boundaries, and helps identify communities more likely to need localized intervention for economic development. Finally, the application of the Creative Class model to Manitoba resulted in the creation of a list of the NOCS codes for super-creative class occupations in Canada, as well as identified the levels of diversity and concentration of creative class occupations in Manitoba. However, these did not form into a geographic region, rather identified areas.

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