

Homelessness Partnering Strategy (HPS)

HOMELESSNESS KNOWLEDGE DEVELOPMENT PROGRAM HOMELESSNESS PARTNERING SECRETARIAT

Pilot Cybercartographic Atlas of the Risk of Homelessness Tracey P. Lauriault and D. R. Fraser Taylor

Executive Summary

The Pilot Cybercartographic Atlas of Risk of Homelessness (<http://gcr.ccarleton.ca/homelessness>) is the first national and city scale mapping endeavour that represents risk of homelessness data in an interactive fashion using timelines, different scales and associated text and charts including regional and local scales. The Pilot Atlas of the Risk of Homelessness renders in maps and interactive graphs well defined and accepted Canadian risk indicators such as vacancy rates and rental markets, rent geared to income units, families spending 50% of their income on rent and housing starts. When these indicators are visualized in an engaging manner readers can more readily distinguish trends, patterns and issues that cannot be conveyed in static data tables. Atlas modules include the visualization of indicators across time at three scales: Canada, 23 municipalities and 3 featured cities/metropolitan areas. The City of Toronto provides data to show their aging social housing stock; poverty and the disproportionate spending on rent are explored in City of Calgary neighbourhoods while la Communauté métropolitaine de Montréal (CMM) tells the story of social housing and housing affordability for lower-income renting populations. An interactive GraphoMap shows vacancy rates, housing starts, and 50%+ spent on rent for 24 cities at three time points while the Canada map shows the rate of change between renters and owners over time. A map of Canada shows the rate of change between renters and owners and clearly demonstrates data issues associated with Canada's ever changing and incompatible statistical geographic units.

The Atlas is intended as a pilot to demonstrate to a variety of stakeholders that cartographers, geographers and subject matter specialists can work together to create engaging, understandable and useful visual content representing the structural issues of homelessness in Canada. Modules are created with stakeholders so that they may use these to inform public policy. The Atlas is designed using the Nunaliit Cybercartographic Atlas Framework which is an open source software designed at the GCRC specifically to ensure that others can add content to it. For example, a research group, a community group or other cities may have data they have collected during the course of their work or research that could easily be rendered into maps of this kind and be added as a module. This is a living Atlas created specifically for that purpose – to continuously expand on this story and to disseminate the data in a way that is easily understandable. The Atlas could expand to include not only risk of homelessness data but also population health and homelessness, absolute homelessness and housing themes along the continuum of homelessness. Finally, access to and cost of public statistical data were considered barriers to the creation of some content, especially in the social sector.

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Section 1 - Introduction

Atlas URL

Pilot Cybercartographic Atlas of the Risk of Homelessnessv: <http://gcr.ccarleton.ca/homelessness>

Lead Organization:

Geomatics and Cartographic Research Centre (GCRC), Carleton University, an official Research Centre in the Department of Geography and Environmental Studies at Carleton University.

(<http://gcr.ccarleton.ca>)

Partners:

Federation of Canadian Municipalities, Quality of Life Reporting System, City of Toronto, City of Calgary and Communauté métropolitaine de Montréal.

Objective:

Create a Pilot Cybercartographic Atlas of Risk of Homelessness in Canadian Cities Prototype. Cybercartography is a new method of collecting, organizing, analyzing and presenting information in an online, multimedia, multisensory and multimodal fashion based on location as an integrating mechanism (Taylor 1997, 2003). The Atlas provides researchers, municipalities and policy makers with the means to interactively engage and visualize maps of the distribution and complexity of risk of homelessness variables across time and space within selected municipalities across Canada and at a federal scale. The atlas prototype includes some modules uniquely in French or English.

Aim

Create a prototype atlas representing a select set of risk of homelessness indicators. The indicators are mapped at a national, city (i.e. FCM QOLRS CSD) and intra city scales (i.e. 3 self selected FCM QOLRS Cities). The atlas includes modules of at risk variables and modules include maps, charts, metadata and explanatory text. Data sources include city or metropolitan region data, Census data and Quality of Life Reporting System data. The Atlas is an open source technology based on open standards. It is also interactive (e.g. timelines, hyperlinked content, etc.), can include multimedia (e.g., video, reports, and can include photographs, audio, etc.) with functionally for cities or community groups to add content in the future.

Rationale:

To increase understanding of the topic of the risks of homelessness, more specifically structural issues by the general public and provide decisions makers with new ways of seeing the impact of policy interventions. Homelessness is a complex problem with considerable variation both across Canada and within individual urban areas. The proposed Atlas will present this variability in ways in which people can

better understand the issues. The Atlas framework is designed in such a way as to facilitate visual story telling as opposed to simply data delivery without context.

Why Maps?

Generally homelessness and at risk of homelessness data and information are represented in static time contingent reports or PDF maps and documents (see Figures 11-21 in the Literature review). The numbers are generally counts that represent a series of numbers for a city, province or the country as a whole at a particular point in time. However, over the years community based organizations, researchers, municipalities, provinces and the federal government have created a large body of research and reports that clearly demonstrate that the face of homelessness varies in terms of numbers and demographics across the country and within cities and metropolitan areas. These data are very location specific and are most often found after the rigorous search of municipal and community based-organizations' databases or websites. At risk of homelessness variables also change over time, and vary according to region, province, city and within cities. Research on social housing and the risk of homelessness has demonstrated that there are clear geographic dimensions to the distribution of affordable housing, social housing and shelters within a city (Communauté métropolitaine de Montréal, 2005; Community Information Exchange on Homelessness, 2000). The ability to access this type of knowledge in maps and unique visualizations interactively and across time and space provides the public with a better understanding of the issue both in their communities and in Canada as a whole. This also provides policy and decision makers with a new way to visualize, understand and target their interventions, to conduct spatial location analysis for programming purposes and also to use these to inform public policy issues. Also, historically, maps were created to inform and also reform. Maps are shaped by the social world and also reshape it, in the case of this Pilot Atlas of the Risk of Homelessness, it is hoped that the maps will inform public policy, shift perceptions on the issue of homelessness and demonstrate a new way to collaboratively work toward achieving its prevention and to end it.

Specific goals of this project:

(1) To create a prototype Cybercartographic Atlas of Risk of Homelessness in Canada utilizing at risk of homelessness data and information for illustrative purposes. This Atlas will serve as a visual repository for at risk of homelessness data from three agencies (e.g., Statistics Canada, Canada Housing and Mortgage Corporation and Federation of Canadian Municipalities), three selected municipalities and metropolitan areas (e.g. City of Toronto, Communauté métropolitaine de Montréal and the City of Calgary). The Atlas prototype will form a framework upon which all levels of government and community-based organizations in Canada can build further content.

(2) Translate these at risk of homelessness datasets into highly interactive and engaging visual multimedia narratives for educational purposes and public policy decision-making. Transmission of structured knowledge on the topic of homelessness is difficult to communicate as the public does not fully appreciate the nature, complexity and variability of this problem across Canada and within individual urban areas. Further, decision makers are currently neither provided with a picture of the change of homelessness in Canada over time nor with regional variability of at risk of homelessness at different scales. New technologies, including multimedia cartographic techniques, are seen as ways to improve the organization and transmission of this knowledge and to engage people on the issue in new ways. This will also help decision makers to more effectively target their efforts.

(3) To work with the Federation of Canadian Municipalities, interested metropolitan areas and cities to coordinate the collection and representation of data of at risk of homelessness and collaborate to develop a location specific story on this issue using local data and reports.

Atlas Creators:

- ***Lead Applicant***, D. R. Fraser Taylor, Distinguished Research Professor, Royal Society Fellow and the Director of the Geomatics and Cartographic Research Centre (GCRC)

(<http://www.carleton.ca/geography/faculty/taylor.html>)

- **Lead Researcher**, Tracey P. Lauriault, PhD Student and Subject Matter Specialist on Homelessness at the GCRC. Her dissertation is on Access to Geospatial Data in Canada. (<https://gcrs.carleton.ca/confluence/display/GCRCWEB/Lauriault>)
- **Cartographer**, Dr. Sebastien Caquard, GCRC Research Associate and is the Lead Cartographer with the Centre. He is also an Invited Researcher at the Département de Géographie de l'Université de Montréal and a Lecturer at Concordia University (Montréal). (<https://gcrs.carleton.ca/confluence/display/~sebastiencaquard/S.+Caquard.>)
- **Geomatician**, Christine Homuth, Master Student at the GCRC. Her Thesis is on the application of cybercartography for education.
- **GCRC Technical Manager**, Amos Hayes, guiding the development of the Nunaliit Cybercartographic Atlas Framework and atlases being produced as part of research projects at the GCRC.
- **Technical Services**, Jean-Pierre Fiset, ClassOne Technologies Inc. (<http://www.classone-tech.com/>)
- **Technical Researchers**, Glenn Brauen, PhD Student (<https://gcrs.carleton.ca/confluence/display/~glennbrauen/Home>) and Peter L. Pulsifer (<https://gcrs.carleton.ca/confluence/display/GCRCWEB/Pulsifer>) Post Doctoral Fellow, both at the GCRC are thanked for trouble shooting assistance.
- **FCM Liaison**, Michel Frojmovic, Acacia Consulting and Research, lead consultant to the Federation of Canadian Municipalities' Quality of Life Reporting System, providing comprehensive support since 2002.
- **Administrator and Project Manager**, Barbara George, GCRC
- **City of Toronto Module**, Harvey Low, City of Toronto, Social Development Finance and Administration Division, Social Policy Analysis and Research Section; Sylvia Novak, (Ph.D.), Research Manager, Toronto Community Housing Corporation; Raphael Yanqui, Housing Connections.
- **Communauté métropolitaine de Montréal Module:** Nathalie Chicoine, Direction des Politiques et interventions de développement; Philippe Rivet, Analyste, Politiques et interventions de développement; Michel Rochefort, Conseiller à la direction générale.
- **City of Calgary Module:** Sharon M. Stroick, Ph.D., MCIP, Research Social Planner, Community and Neighbourhood Services; Derek Cook, Research Social Planner, Community and Neighbourhood Services, Social Policy and Planning Division
- **Maps, Data, & Government Information (MADGIC) Carleton University Library:** Wendy Watkins, Data Librarian; David Sharp, GIS Coordinator; Joel Rivard, GIS/Data Technician

Theoretical Framework:

The creation of the Pilot Atlas of the Risk of Homelessness did not have a specific research question but was guided by the theory and application of cybercartography which is the "the organization, presentation, analysis and communication of spatially referenced information on a wide variety of topics of interest and use to society in an interactive, dynamic, multimedia, multisensory and multidisciplinary format" (Taylor 1997, 2003). Cybercartography is a new paradigm that sees the map as central to knowledge integration in the emerging information society. This approach is at the cutting edge of the exponentially growing domain of maps on the Internet. The prototype utilizes the existing Cybercartographic Atlas Framework and functionalities and applies them to the subject area of homelessness.

Cybercartographic atlases are often called “living atlases” as they are designed in a modular fashion to facilitate the inclusion of new content. They are easy to update (e.g. include new Census Data, community based data or Housing Registry Count) and are developed in open source formats using interoperable standards to enable the creation of new functionalities to meet user requirements. Most importantly, they enable communities of practice to add their own data and multimedia content. The unique features of the Cybercartographic Atlas Framework allow individuals and communities with some technical skills, with an Internet connection and access privileges to access the system, to customize it or add information for their own use. As the use of the Atlas does not require advanced technical skill the cybercartographic approach is particularly well suited to the needs of policy makers, researchers, public and community based organizations.

The objective was to create an Atlas that would visually represent in an engaging and interactive fashion a variety of commonly known risk of homelessness indicator data. The Pilot Atlas of Risk of Homelessness provides researchers, municipalities and policy makers with the means to interactively engage and visualize maps of the distribution and complexity of risk of homelessness variables across time and space within selected municipalities across Canada. The Atlas renders in 5 modules structural issues associated with the Risk of Homelessness as defined by the FCM Quality of Life Reporting System and as selected by the City of Toronto, Communauté métropolitaine de Montréal and the City of Calgary. Intended users are the public and decision-makers who wish to use the content to inform public policy. Also, the intent was to show that homelessness is not simply an individual’s story but a collective Canadian story created by changes in the political economy of Canada and its cities. Finally, the Atlas was designed to illustrate the potential of the Cybercartographic Atlas Framework to the social sector, municipalities and policy makers and expose them to this new way of conceptualizing, visualizing, accessing and disseminating data on the Risk of Homelessness with the hope that they may contribute their results and stories into new atlas modules.

Methodology

GCRC researchers chose to use readily available data sets and known indicators associated with the risk of homelessness. This was done to simplify data acquisition issues at local scales. The GCRC partnered with the Federation of Canadian Municipalities (FCM) Quality of Life Reporting System (QOLRS) as a new fledgling working group on data visualization of the QOLRS was emerging and because the QOLRS team went through a rigorous process to select their reported housing and homelessness indicators (FCM 2004, 2008, 2009).

A call was made to seek cities that would be willing to participate in the creation of Atlas modules. Two QOLRS cities and one metropolitan area came forward. GCRC researchers with city and metropolitan area officials brainstormed ideas for modules and discussed potential datasets that could help with telling those stories. Officials discussed these ideas with their colleagues (e.g. analysts, data creators, GIS experts), local housing authorities and community groups. Once a general module story was developed, the acquisition of datasets to tell those stories began.

Since the stories were to be specific to those involved, it was essential to select a geographic unit of significance to their public. Both the City of Toronto and the City of Calgary contributed their neighbourhoods boundary files to the Atlas and the Communauté métropolitaine de Montréal (CMM) contributed its 82 municipality geography files. These types of files are only

available from cities. These were shared with the GCRC on the understanding that they would only be used for the Atlas and will not be shared with anyone else. Each module is iteratively designed with officials and GCRC researchers. With each iteration changes are made to the maps, text, etc. based on suggestions, comments or the emergence of new ideas. This is important as GCRC researchers are not experts on the subject, the specificities of the local context and how these stories might be received by stakeholders and the public locally. Local and content knowledge from experts to validate the maps and representations are key to the methodology. As the process unfolds eventually a module's content congeals and satisfies the design, aesthetic, messaging and representation ideals of all those involved in its creation.

All the maps are interactive. A series of tabs at the bottom can be selected and these will change the map view. The scroll bar on the right moves up and down to enable the reading of the full text and the text within is hyperlinked to other related content. The map itself is also interactive as the cursor scrolls over municipal/neighbourhood/social housing data pop up in a window to provide more information. Also a region can be selected and will stay highlighted as the user navigates across topics in the tabs. This allow for the comparison of across variables or time. The user can also zoom in and out to see the data at different scales. Other multimedia content can be added such as video, images, audio and these can also be accessed from the map.

The user arrives at the Atlas Introduction as seen in figure 1. The text on the map links to thematic modules. The modules are also available in the text window on the right of the map. The text also provides a variety of administrative information related to the Atlas. Additional cities and themes could easily be added to this page as the Atlas grows.

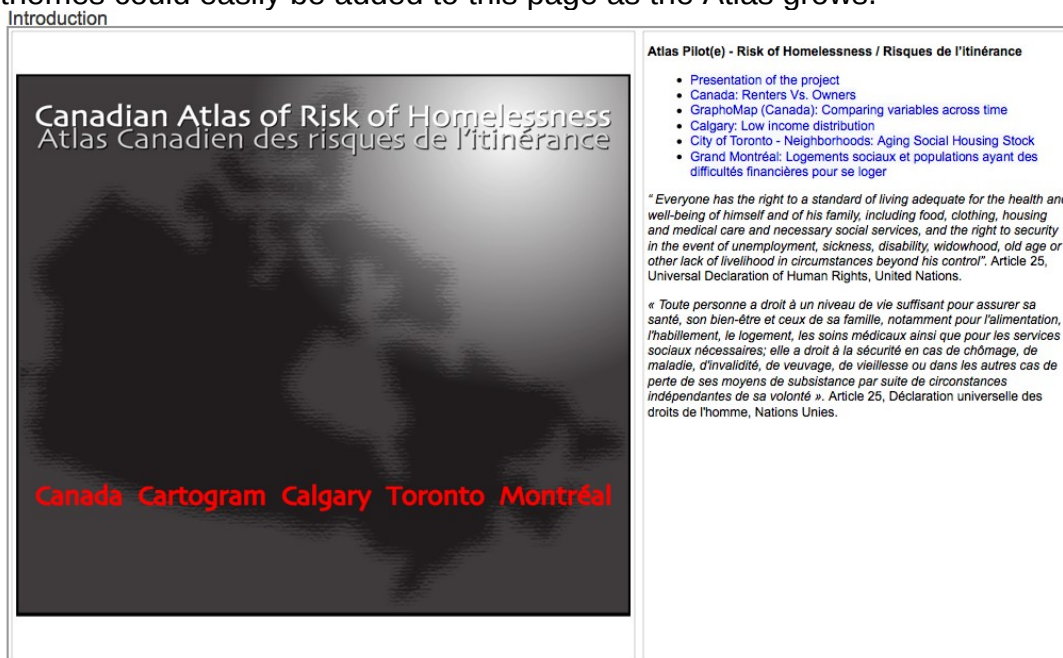


Figure 1. Atlas Introduction Page

CMM Atlas Module tells the story of social housing and housing affordability for lower-income renting populations. As seen in the static screen capture below, the demand for and the supply side of social, affordable and different types of housing providers and programs are part of this module. Affordability remains an issue for many in the CMM while the supply does not meet the

demand. This module shows the distribution of these data in both real numbers and proportionally for all 82 CMM municipalities. The CMM contributed these data to the project and crafted the text to accompany the interactive map as seen in figure 2.

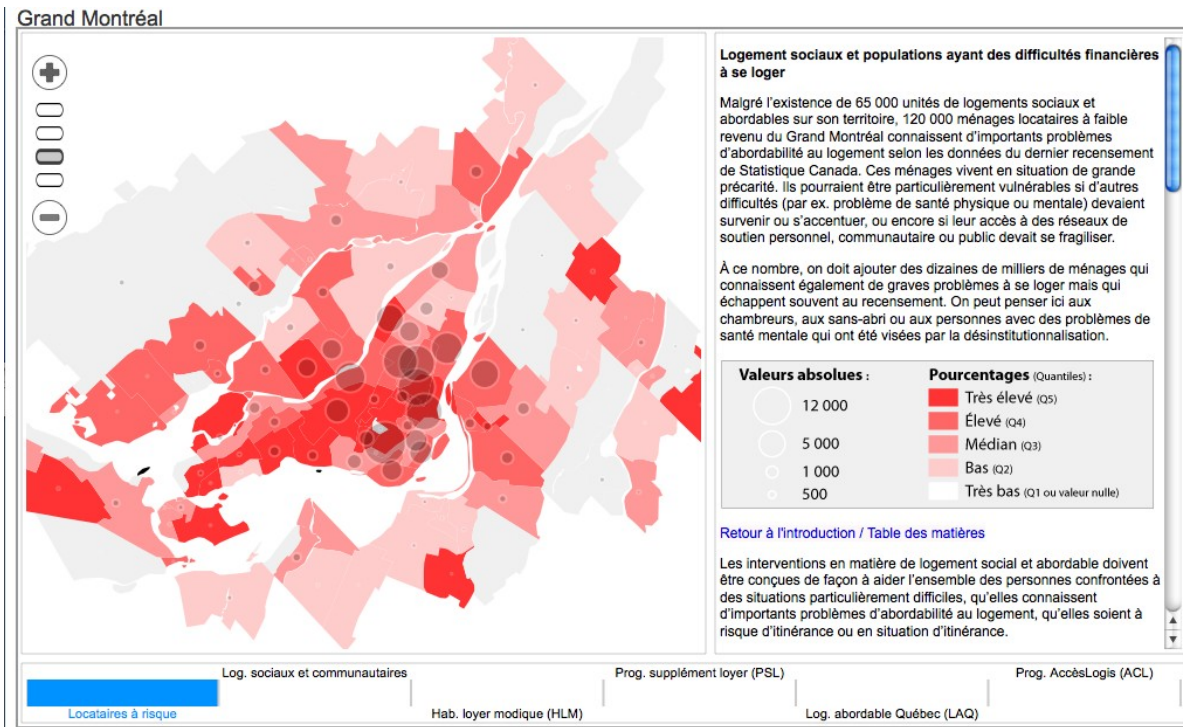


Figure 2. CMM Logement sociaux et populations ayant des difficultés financières à se loger Atlas Module

The City of Toronto Atlas Module tells the story of its aging social housing stock. The City is faced with the daunting and expensive task of managing a large inventory of social housing that is aging, in need of repair and refurbishing to meet current energy efficiency and heating standards. It also has a large social housing waiting list, indicating that it cannot fully meet the current demand. The City contributed their Toronto Community Housing data. This dataset includes the location, name, number of rent geared to income (RGI) units and the year of construction for all city managed social housing. The data were aggregated by city neighbourhood and by decade as seen in the static screen capture below in figure 3. On this map the dark green circles represent the decade selected and the lighter green represent the construction of social housing prior to that. The first iteration as seen in figure 4. included the location of social housing by building and the decade of construction. This was considered to be useful but less informative than the former (figure 3.) and also very slow to load on the Internet. Both are made available to users while figure 3. is the primary module. The story quickly becomes obvious as the construction boom for social housing appears in the 60s and 70s, which much stock built earlier, and drops in the 90s and tapers to only one new construction in 2003. We therefore get both an ageing story and imagine the repair issues of a stock built according to old standards and generally very cheaply. The images also reveal some of the political changes in the priorities for social housing in the City of Toronto.

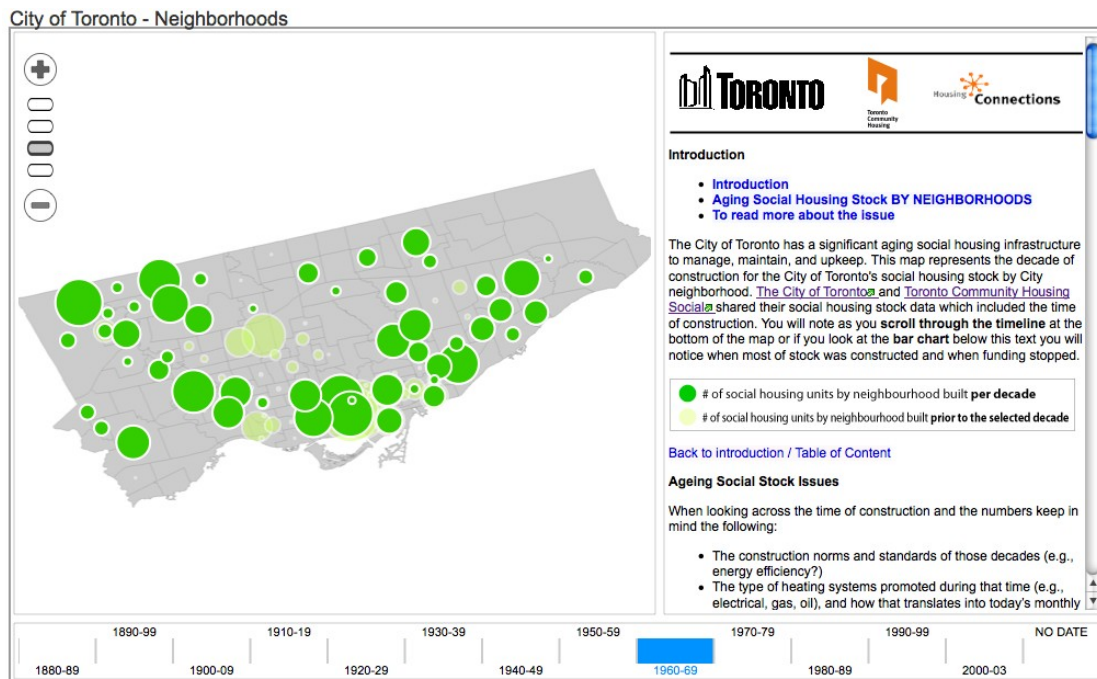


Figure 3. City of Toronto Ageing Social Housing Stock by Neighbourhood Atlas Module

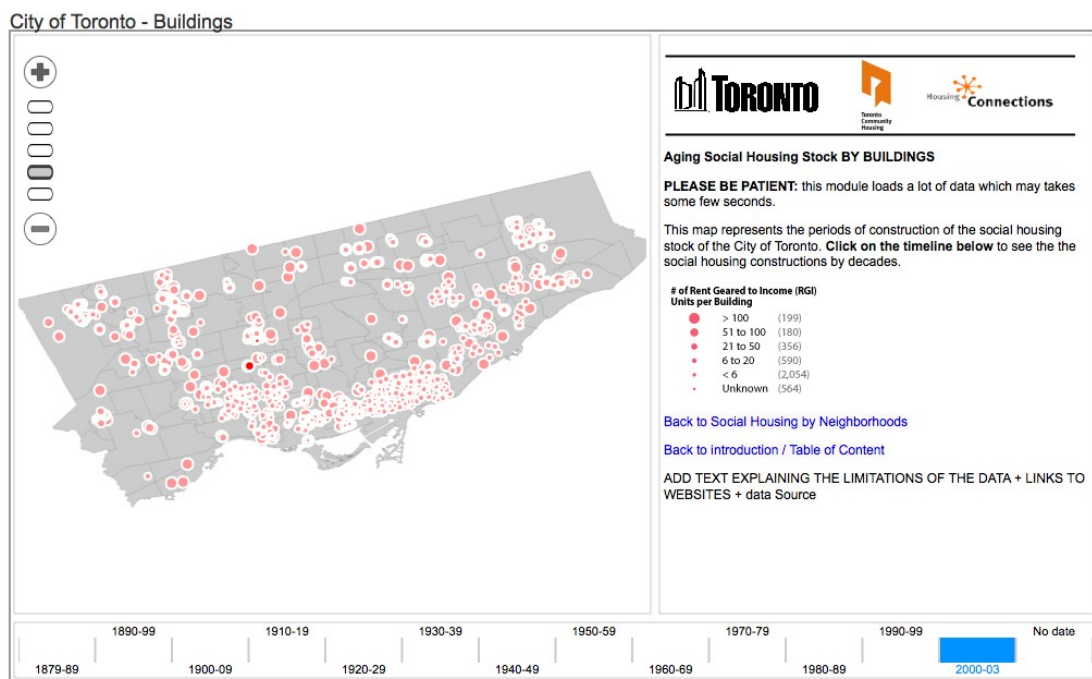


Figure 4. City of Toronto Ageing Social Housing Stock by Building Atlas Module

The City of Calgary Module tells the story of the economic risk of becoming homeless. The variables shown are Low Income (LICO) and also those who spend 30% + of their income on rent as seen in the close up view in figure 5. Figure 6 keeps the same locate selected but provides a full view of the City and shows the 30%+ variable. The city wanted to see if these economic risk data could be rendered in such a way as to demonstrate variability within City of Calgary neighbourhoods. Often it is perceived that neighbourhoods show contiguous population groupings while the reality is that neighbourhoods depending on their historical evolution and where they are located vary. These maps clearly demonstrate this. The GCRC Researchers

interpolated these data using Dissemination Area (DA) geographies and superimposed the neighbourhood boundaries above these. Unfortunately 1991 and 1996 Census data were collected at Enumeration Area (EA) geographies and are not comparable with 2001 and 2006 DA geographies. This map was most interesting since local Calgarian experts had never seen their neighbourhoods in this way, and early interactions with the maps yielded much interesting discussion.

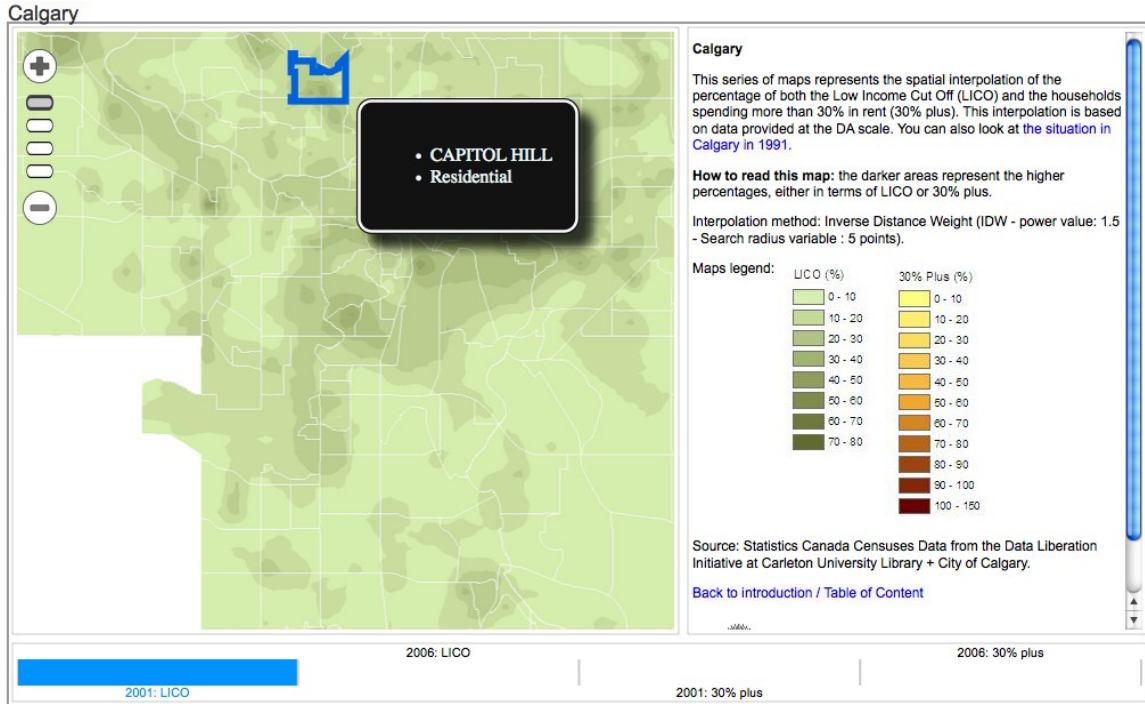


Figure 5. City of Calgary Economic Risk Atlas Module (detailed view)

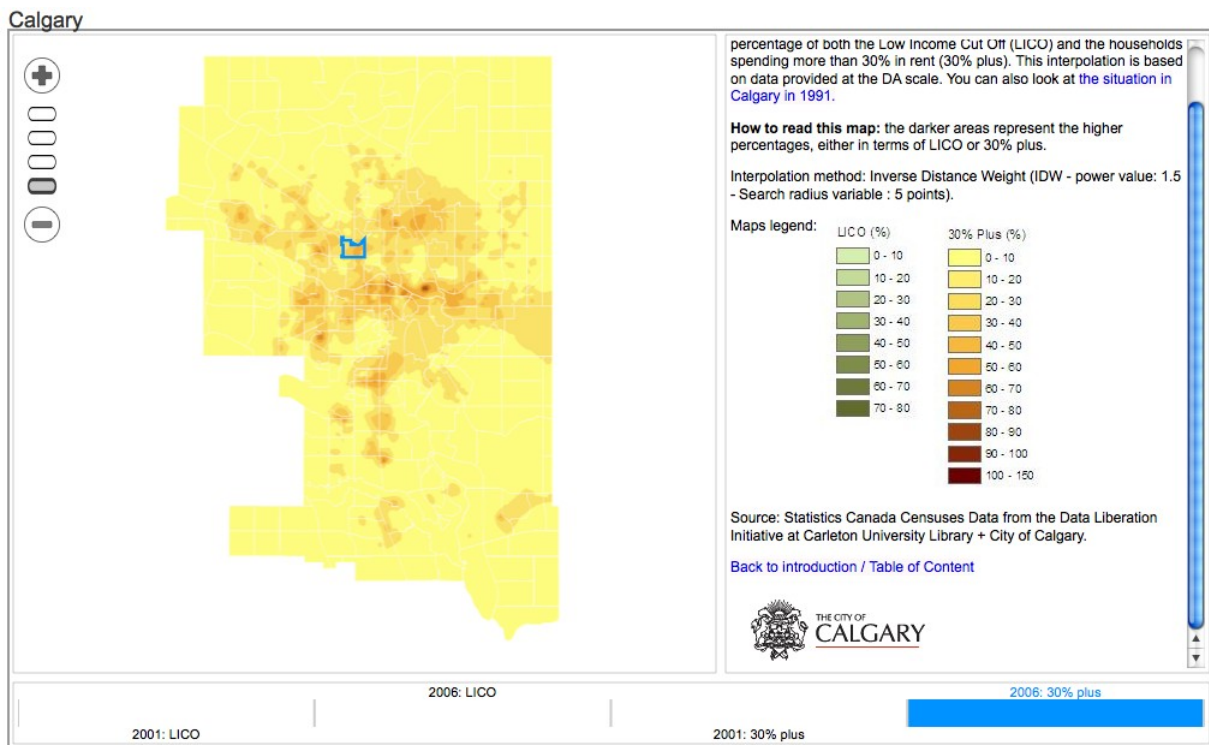
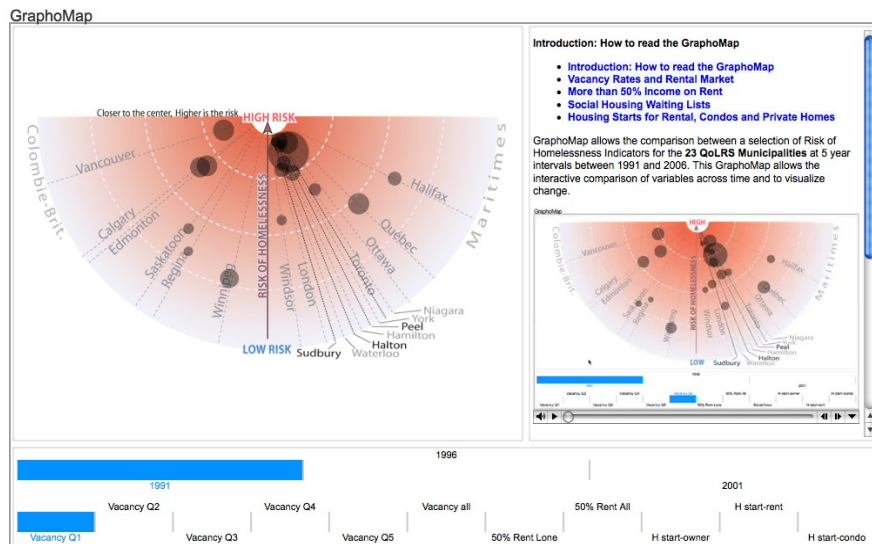


Figure 6. City of Calgary Economic Risk Atlas Module

The GraphoMap Module as seen in figures 7, 8 and 9 includes 3 FCM risk of homelessness indicators, 11 data variables for 22 cities, at three time intervals. The GraphoMap visualization was designed by Dr. Sebastien Caquard, and it abstracts Canada's geography into a 180° semi circle with QOLRS cities located relationally and distance wise from east to west. Circles proportionally represent the value of a particular variable in real numbers. For instance, the circles on the Vacancy Rate indicator represent the Total Number of Rented Dwellings for a particular QOLRS municipally and year. The Position of the Point on the Radial Line works as follows: the closer a point is to the centre of the semi circle, the higher the risk of homelessness for that particular variable. For instance the location of the proportionally sized dots on the Lone Parent Families Spending variable represents the Percent of Lone-Parent Family Households spending 50% or more of Household Income Spent on Rent for a given year as a proportion of the total number of Lone-Parent Family Renters that same year. The higher the proportion of these Lone Parent Households being over extended the higher the risk of homelessness for that year. It sounds more complicated than it looks! A video accompanies the GraphoMap to explain how it works just in case a user needs some pointers. Interactivity and a well-designed visualization can make accessible great complexity relatively easily when compared to data tables on multiple pages in a PDF report. Regarding data, the GraphoMap included the number of households on social waiting lists. City officials and local experts recommended that those data be removed since there was too much variability across Canada in how those data are collected making comparability meaningless. As seen in the images below, the risk of homelessness is increasing across time as vacancy rates decrease.



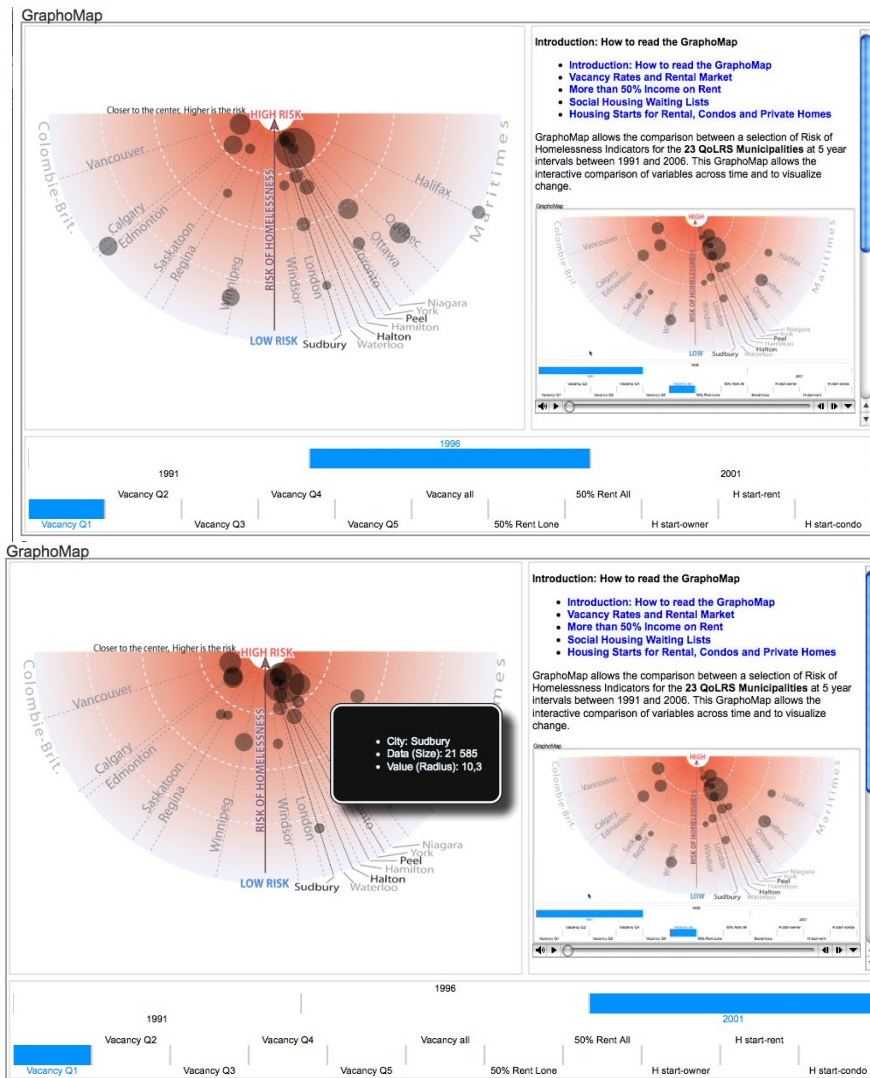


Figure 7., Figure 8., & Figure 9. GraphoMap Atlas Module view of the 1991, 1996 and 2001 Vacancy Rates for the most affordable rental accommodations.

The **Canada Module** as seen in figure 10 was created to assess data variability of Census Subdivisions (CSDs) in Canada across time. CSDs are the Statistics Canada geographic units that represent the administrative boundaries of cities and municipalities. The points on the map represent the current 24 QOLRS cities. Researchers also wanted to develop a rate of change map series to show change in terms of units available for sale and for rent by CSD. MADGIC Data Liberation Initiative Census data were used to create these maps. We had another theme in mind but we were informed by Statistics Canada that those data would cost upwards of \$60 000. We dutifully declined and experimented. We believe the Rate of Change methodology we developed is useful, albeit difficult to understand. However, since CSD geographies have radically changed across time due to the wave of amalgamations across the country and with the advent of Nunavut, we have concluded that the results of this experiment are inaccurate. We would have liked to have been able to acquire data adjusted to 2001 boundaries. However, those are terribly expensive and are not part of the Data Liberation Initiative. Finally, because we are not housing experts, and we do not have experts positioned locally across the country, we could not explain the variations we were seeing in the maps. We have decided to keep this map in as a cautionary tale for other researchers and to discuss issues of data access in

Canada. As we joked, one may need to mortgage the house to afford to study homelessness at the scale of Canada if one wants to use Statistics Canada data!

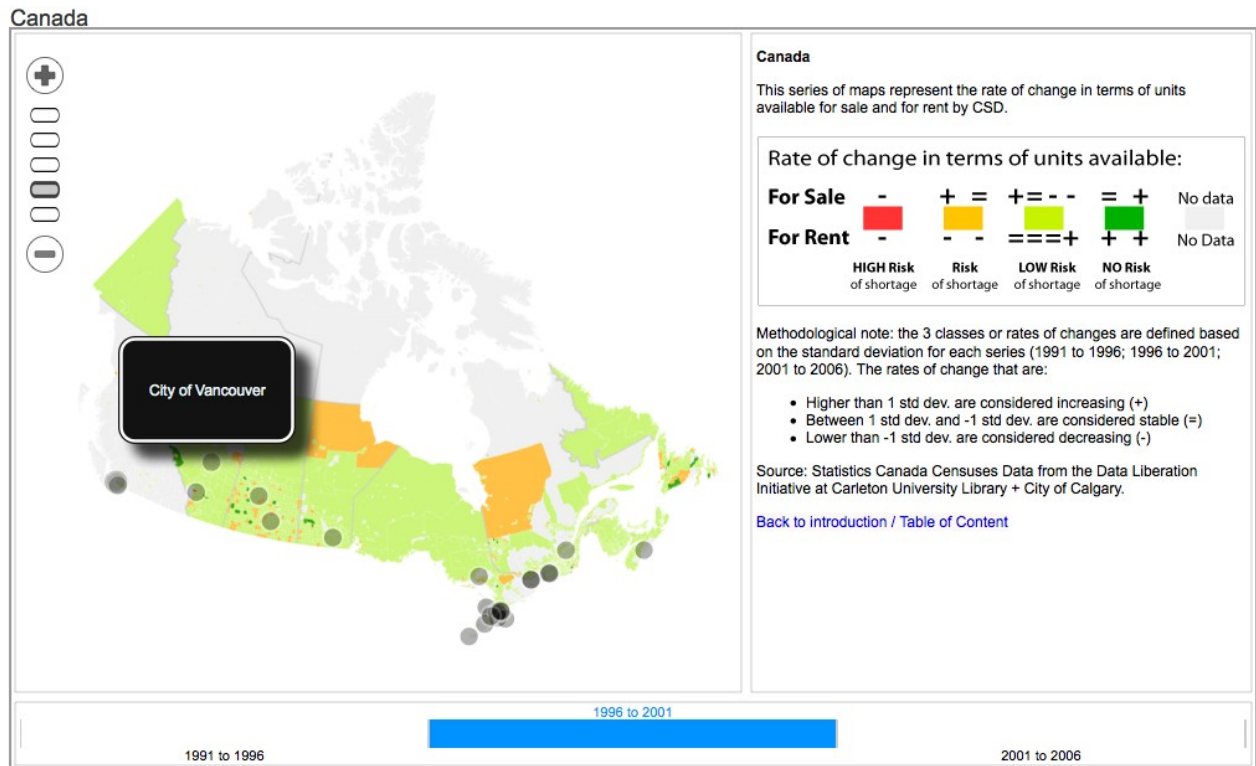


Figure 10. Canada Module

Literature Review

It is understood that the risk of homelessness is related to structural factors associated with becoming shelterless. Homelessness is not a simple issue only associated with personal issues (e.g. addiction or mental health). A household that pays 50% of its gross income or more on housing is considered at risk of homelessness (City of Hamilton 2006:5; Halifax Regional Municipality 2004a). This same population is also considered to be in core need of housing as are households spending more than 30% of their gross income on housing. There are many other at risk factors such as: being in arrears with rent payments, living in precarious housing, experiencing serious health issues, family conflict and/or domestic abuse (City of Hamilton 2006:5). Other economic factors include those on fixed incomes such as social assistance, disability support programs; employment insurance or seniors' pensions. In most cases the portion allotted for housing is far below the value of market rents and social housing and Rent Geared to Income (RGI) rental unit supply has not kept pace with growing need (see Figures 2., 3, and 7). Job security is another factor. Many people are only working part-time, seasonally, or juggling several part-time jobs to make ends meet as are individuals and families working full-time earning minimum wages which have not increased with inflation and rents. Low education levels are also associated with low income jobs and/or lower income categories. Other associated variables are renters versus owners where renters often pay more than 30% or 50% of their income on rent. Family status such as single parent families, particularly female led, are also considered at greater risk of homelessness (see Figures 7, 8, 9). In many cities visible minorities, the aboriginal population or immigrants are paying more than 50% of their income on rent. In Halifax, for example, "18% of persons of Aboriginal identity, 19% of visible minorities,

22% of non-official language speakers and 30% of recent immigrants pay more than 50% of their income on rent. This is much higher than the 9% average for the population as a whole” (Halifax Regional Municipality 2004a:24). In British Columbia people of Aboriginal identity were over-represented among those at risk of homelessness compared to the Greater Vancouver Regional District (GVRD) especially in renter households (SPARC BC 2003:6). Further in the GVRD most at risk persons were Caucasian, yet 40% were also members of a visible minority with the largest visible minority group being Chinese (SPARC BC 2003:6). Family status, visible minority, aboriginal and new comers face a number of structural barriers to entry in the job market or access to services such as: a lack of affordable childcare spaces, discrimination, lack of Canadian experience, or an inability to speak an official language. The imminent homeless may also include those who may be in the process of losing their homes because they are being evicted or their homes are being converted into condominiums – a growing phenomenon in boom towns such as Calgary (see figures 7, 8 and 9). This affects a large number of renter seniors as well as people being discharged from a public institution (e.g. hospitals, prisons, mental institutions, detention centres, etc.) who have nowhere else to go (Halifax Regional Municipality 2004a:12). Potentially people on social housing registry waiting lists and those who are using food banks fall into this category. Finally there is a category that falls into the zone of at risk of homelessness, imminent homelessness and homeless such as the invisible homeless. The hidden homeless are individuals or families who stay with family and friends for lengthy periods of time because they cannot access or maintain their own housing or are experiencing difficult circumstances involving housing instability (Halifax Regional Municipality 2004a:27).

Clearly, the risk of homelessness is complex, multilayered and multifaceted. This Pilot Atlas of the Risk of Homelessness cannot represent all of the variables associated with at risk of homelessness since this would require a massive data collection and standardization endeavour from a number of sectors, jurisdictions and community-based organizations. Such a task is well beyond the scope of this study. The Pilot Cybercartographic Atlas of the Risk of Homelessness project, does however illustrate in an engaging and interactive some key data variables (see Figures 1-10). Also, the Atlas is designed in such a way that additional modules can be added as new partners emerge and wish to add their content. In addition, many research projects have compiled videos, photos and audio clips on the topic of homelessness and these to could be added as well.

Until the creation of the Pilot Cybercartographic Atlas of the Risk of Homelessness there were no existing atlases that discussed the topic of homelessness in an integrated fashion. There are some maps and mapping initiatives that cover some absolute homelessness themes, some provide the location of services for the homeless (e.g. figure 12 – Dublin, figure 13 - City of Toronto, figure 14 - York Region,) and a few represent risk of homelessness indicators but do not necessarily label them as such (e.g. figures 20 & 21 Atlas of Canada, figure 19 - HRM maps) while others have maps embedded in reports (e.g. figure 13 – HRSDC report map, figure 14 – York Map, CMM, 2007). Some are one off projects that are not scalable, some have a minimal amounts of interactivity, data cannot easily be added (except for the figure 12 - Dublin City mashup), none are open source, most are in Flash or PDF formats and therefore cannot modularly be expanded as new data or content become available or new partners wish to add new modules or themes. The exception is the Atlas of Canada which is created using MapServer an open source online mapping tool.

The most interesting map examples are currently in the US (e.g. figure 11 - LA Hotspot Map, figure 15 – San Francisco Haunts) or the Dublin Mashup, which provides the ability to add data to the map and to get interactive and multimedia format information about the location. There

are a few Canadian PDF map examples and the Atlas of Canada examples, while not specifically about homelessness do provide some degree of interactivity. Most are city specific, some do provide an overview of a particular type of homelessness at a country scale (e.g. figure 16 - Homeless Veterans in the US).

Again, the Pilot Atlas of the Risk of Homelessness is the first initiative that aims to integrate both community based and national scale datasets, to provide analysis on how to interpret the data and to tell a story about the structural factors associated with homelessness. These map examples below are informative, but do not necessarily provide the reader with a spatial context of neither where things are nor explanatory text to explain the issue more deeply.

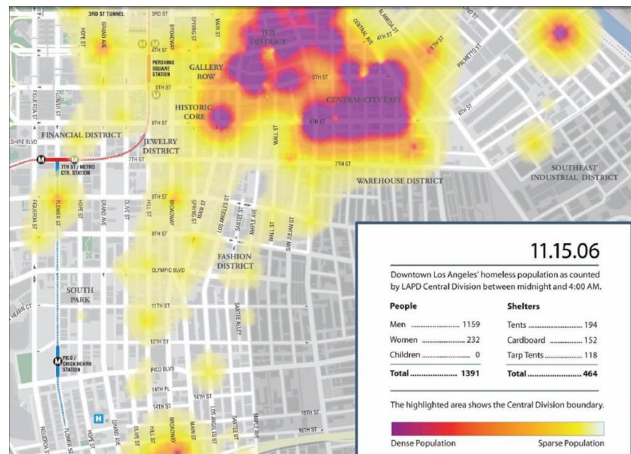


Figure 11. City of Los Angeles Homelessness Hotspot Map

“The purpose of the downtown Los Angeles Homeless Map is to visually tell the story of downtown's homeless population. Before a problem can be solved it must be understood. These maps exist to convey the situation on the streets to City leaders, the Police Department and all those who are concerned with homelessness in our city”. The Map is also animated and features homelessness hotspots. Street count data were systematically collected by the LAPD on a bi-weekly basis. The data were mapped by Artefact. “The system geocodes each address to produce coordinates for the address. The plotted points are then placed onto a map of downtown Los Angeles and styled to better convey the information.” Mapping this type of data brings to the fore many ethical questions around whether or not any map that renders this type of data should be public.

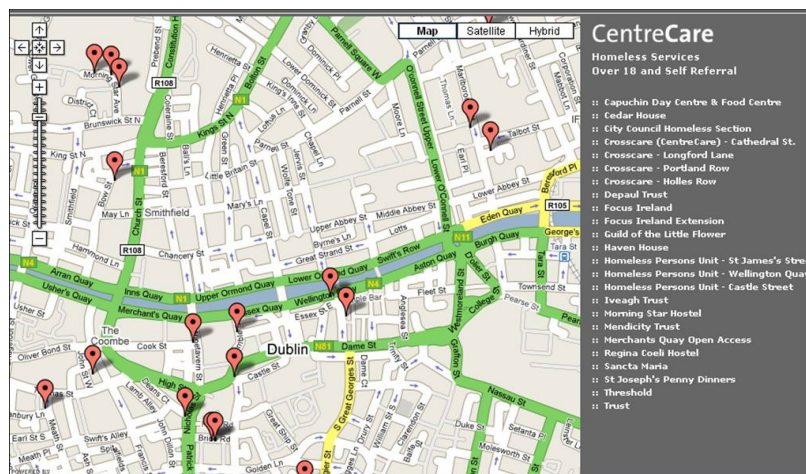


Figure 12. Dublin City Centre Care Google Mashup

“CentreCare map of self-referral services for homeless people over 18 in Dublin City. You can click on the name of the organisation in the right-hand column to see its location and get contact information. Further detail is available by clicking on the 'more' link in the information window”.

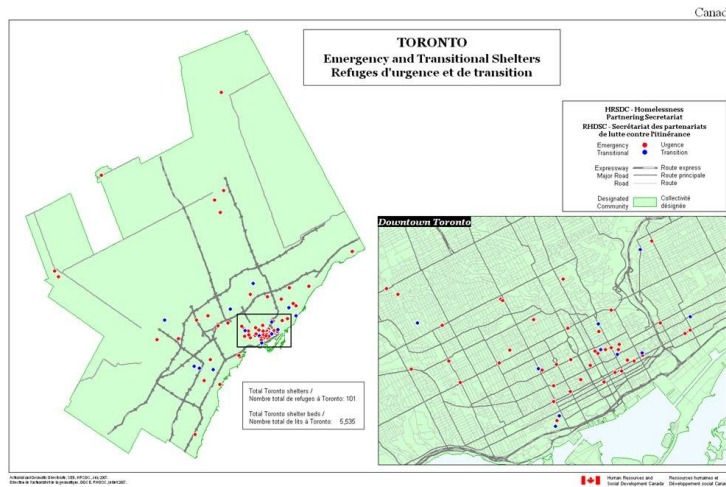


Figure 13. HRSDC Homelessness Secretariat, City of Toronto Homelessness Services Asset Map
 This is a PDF map that was found as part of an HRSDC presentation *Community Plan, 2007-2009 Homelessness Partnering Strategy*.

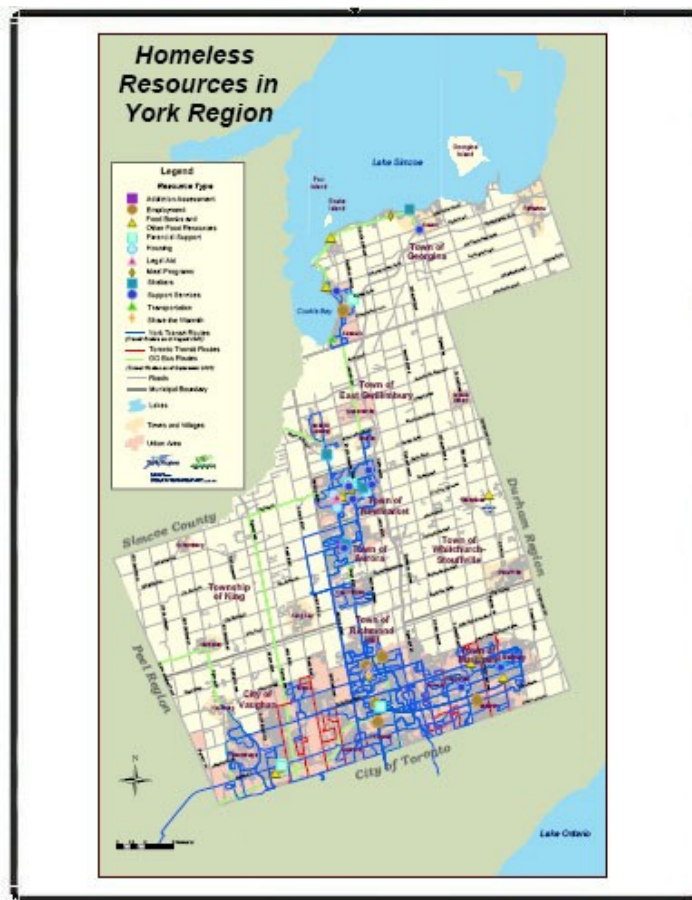


Figure 14. Homelessness Resources in York Region Map

The maps are in PDF format and are part of the York Region series of published maps found under the theme of Society.



Figure 15. City of San Francisco Homeless Haunts

“Layered over the city's familiar streets and neighborhoods is a separate map seen from the vantage point of the homeless: Market Street is Main Street, the daytime hub; the Mission is a place to buy heroin; Golden Gate Park is the wild frontier - and the area around Pac Bell Park is a campground for people with pets”.

This interactive Flash map is part of the San Francisco Chronicle's Newspaper 5 part series on "Homelessness entitled Shame of the City (<http://www.sfgate.com/gate/special/pages/2003/homeless/>).

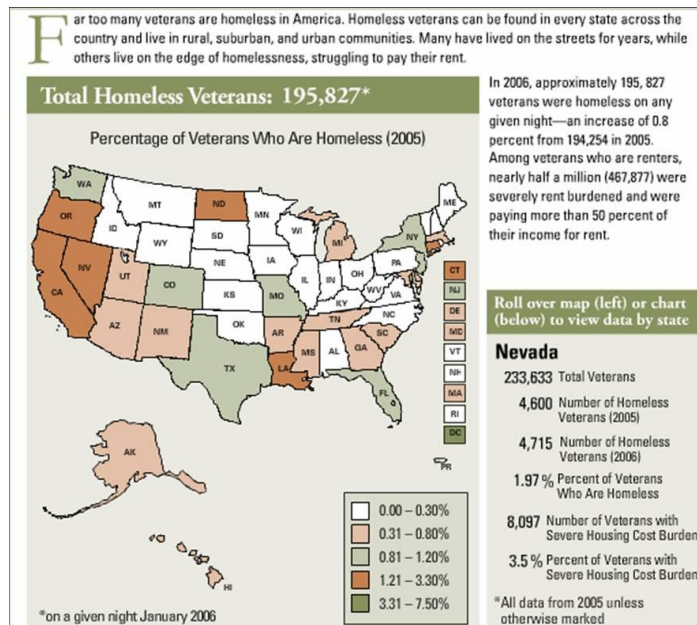


Figure 16. Homeless Veterans in America

This special feature map of homeless veterans was created as a theme of US National Alliance to End Homelessness.

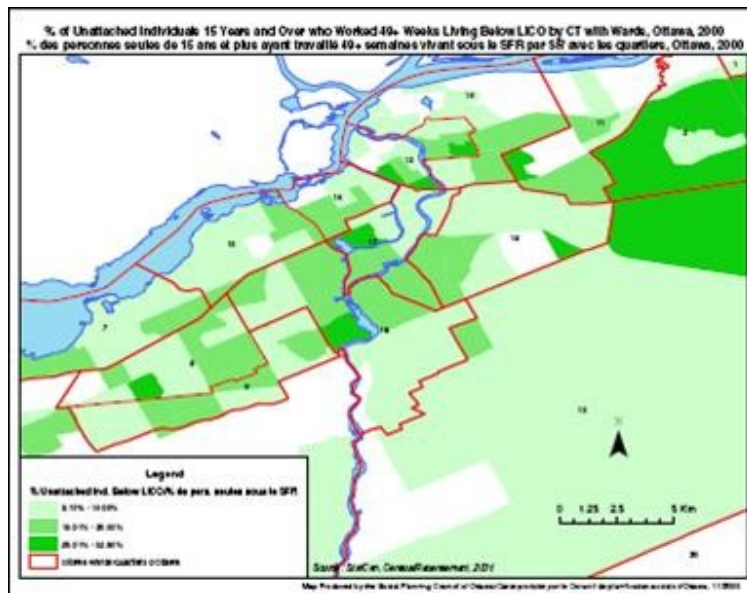


Figure 17. Social Planning Council of Ottawa at Risk of Homelessness LICO Map as part of the Community Information Exchange on Homelessness

This is a PDF map that was found as part of an HRSDC presentation *Community Plan, 2007-2009 Homelessness Partnering Strategy*. This map was created as part of the Community Information Exchange on Homelessness project funded by the Trillium foundation (CIEH) and in collaboration with the City of Ottawa. A large number of at risk variables were mapped to inform community developers and city officials of the various issues at a neighbourhood scale. In addition, a number of community based data sets such as Registry List addresses and Family Shelter family addresses along with maps that located services and other housing variables such as the location of rooming houses in the city.

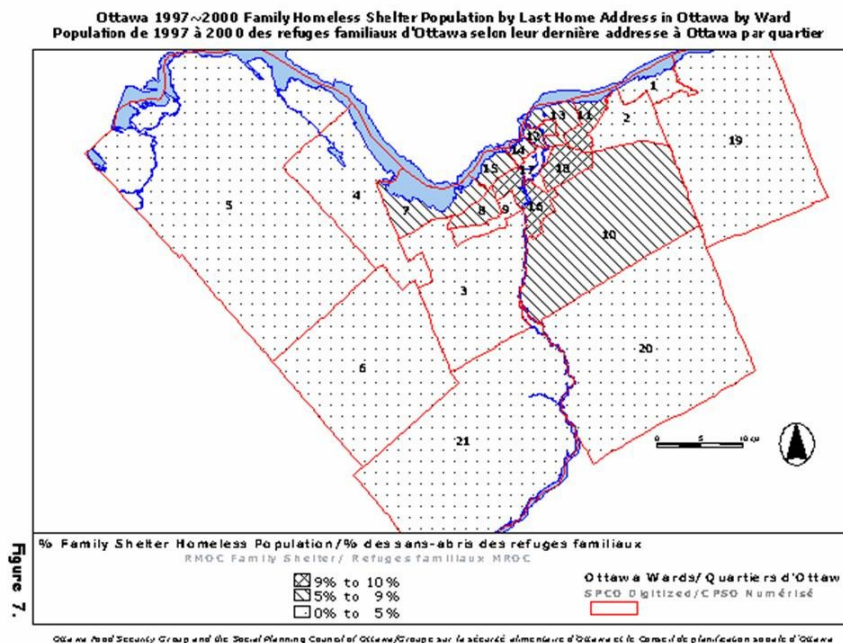


Figure 18. Ottawa map of the Family Homeless Shelter Population by Last Home address

This not so attractive but informative PDF map was created as part of the Community Information Exchange on Homelessness project funded by the Trillium foundation (CIEH) and in collaboration with the City of Ottawa and conducted by the Social Planning Council of Ottawa. This map was created for printing on a black and white printer and was included in the *Food Security In Ottawa: A Community*

Profile (<http://www.perc.ca/library/resources/food/food-security/index.en.html>) for the City of Ottawa. While this report was not about the risk of homelessness, however the report included a number maps depicting the locations of food insecurity services (e.g. soup kitchens, food banks etc.) which demonstrate the power of combining community based and demographic data that show areas of need, absolute homelessness or the risk of homelessness in the city.

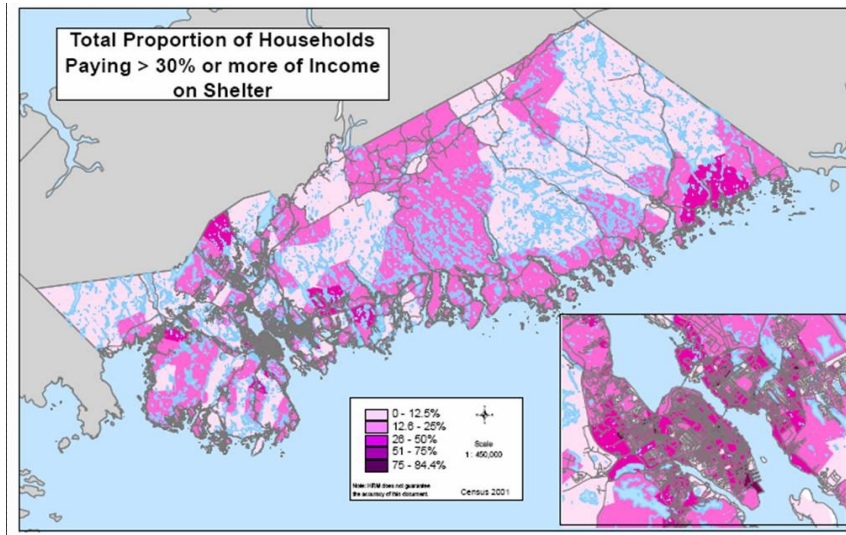


Figure 19. The Halifax Regional Municipality PDF Map of Risk of Homelessness Variable of the proportion of the population spending 30% of their income on shelter

This PDF map is part of a series on the topic of Homelessness include on the HRM website under the theme of *Housing in HRM: Maps and Statistics* (<http://www.halifax.ca/gol/Maps.html>). This theme includes a number of maps regarding the risk of homelessness and other reports.

Map Showing Distribution of Overall Quality of Life in Southern Ontario

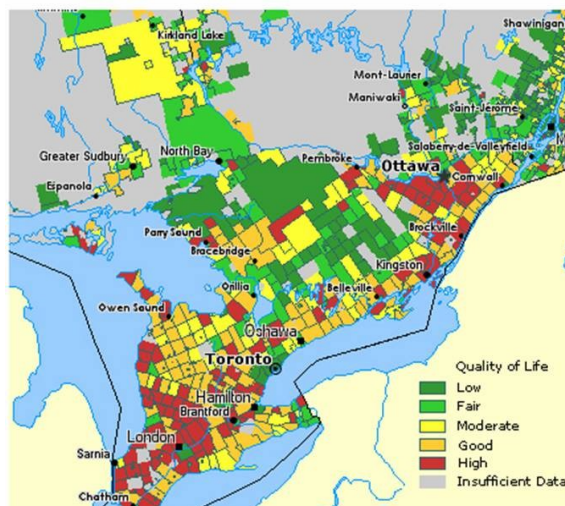


Figure 20. Atlas of Canada Quality of Life Indicator Map

“The individual indicators (and their domains) were categorized into three broad groups called the social environment, economic environment and physical environment. The indicator data were compiled, transformed and analyzed to generate three quality of life maps for each environment, and then combined in a fourth map to show the overall quality of life. A fifth map, prepared in partnership with the Canadian Policy Research Networks’ Quality of Life Indicators Project, shows various national indicators of quality of life”.

While this map is not depicting a risk of homelessness indicator, it demonstrates a method that can be used to show some variables organized into interesting categories. The maps are interactive, you can zoom into a location, and metadata explain details about the map and the data used.

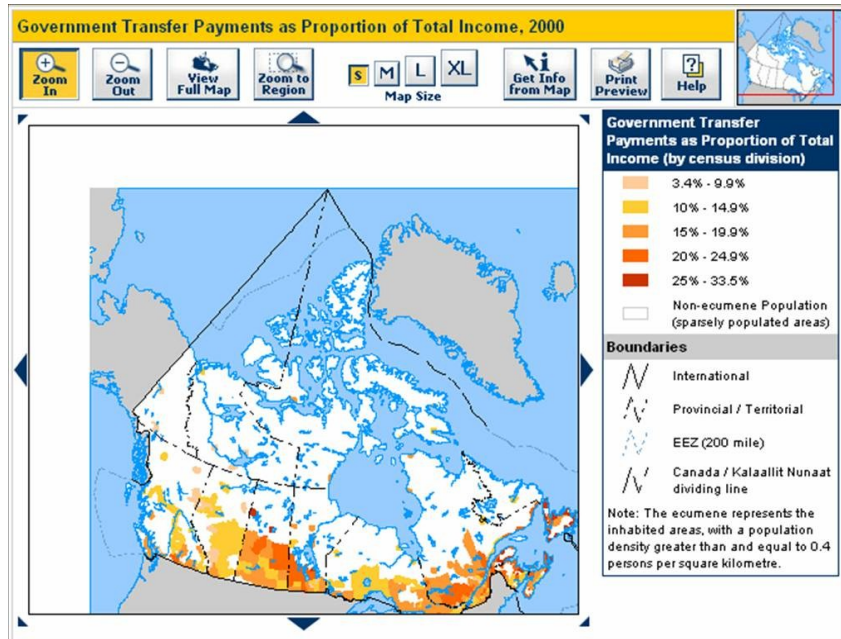


Figure 21. Atlas of Canada Government Transfer Payments Map

“The Atlas of Canada uses a dynamic mapping interface to show geographic information. By using the tools provided, users can zoom in and out, and query the map for more information on specific areas of interest (using Get Info from Map located above the map), and read about the maps in the associated text. Two levels of data aggregation are presented, census division data and census subdivision data, which usually require different class intervals, mapped at appropriate zoom levels”.

(http://atlas.nrcan.gc.ca/site/english/maps/peopleandsociety/dataandmappingnotes_2001.html)

This map depicts a Risk of Homelessness Variable at a national scale. The map is accompanied by much metadata but not much analysis on how to interpret these data.

Section 2 – Atlas Data

Data for the Atlas were collected from a number of locations and provided to the project by a number of agencies as seen below in Table 1. A number of Data Issues Emerged and some data were inaccessible.

Atlas Module	Data Sets & Calculations	Data Source
Communauté Métropolitaine de Montréal - Logement sociaux et populations ayant des difficultés financières à se loger (Figure 2.)	<ul style="list-style-type: none"> - # Locataires à risque: Ménages locataires ayant un taux d'effort de 50% et dont le revenu est de 50 % et moins du revenu médian CMM (valeur max. 12 120). - # Log. sociaux et communautaires : Un logement est qualifié d'abordable lorsque son loyer est inférieur au loyer médian du marché et correspond à la capacité de payer des ménages à revenus modestes. Le logement abordable s'adresse généralement à une clientèle ayant des revenus modestes, mais néanmoins supérieurs à ceux de la clientèle des logements sociaux. (valeur max. 7 264) - HLM : habitations à loyer modique - PSL : Programme de supplément au loyer - LAQ : Programme Logement Abordable Québec - Volet social et communautaire - ACL : Programme AccèsLogis 	<p>Recensement 2006 de Statistique Canada pour les données sur l'abordabilité.</p> <p>La Société d'habitation du Québec (SHQ) et la Société canadienne d'hypothèques et de logement (SCHL) pour les données sur les logements sociaux et communautaires (traitement CMM).</p>

	<ul style="list-style-type: none"> - CMM Municipal Map Info Files 2008 - Toutes les valeurs relatives (pourcentages) sont calculées par rapport à l'ensemble des logements locatifs par secteur géographique, mis à part pour la Part des ménages locataires ayant un taux d'effort de 50% (et dont le revenu est de 50 % et moins du revenu médian CMM) qui est calculée par rapport à l'ensemble des ménages locataires. - La méthode des quantiles utilisée pour classier les % (couleurs), facilite la comparaison de séries de cartes (ex. pour chaque critère on peut rapidement voir comment se situe chaque secteur géographique par rapport aux autres et comment ils évolue d'un critère à l'autre). Néanmoins, pour certains critères tels que les logements abordables du Québec (LAQ), le nombre élevé de valeurs nulles affecte la classification et donc le résultat final. 	- CMM
City of Toronto - Ageing Social Housing Stock (Figures 3. & 4.)	<ul style="list-style-type: none"> - City of Toronto Neighbourhood Shape Files, 2008 - TCHC Housing Geocoded HR Shape Files, includes - TCHC Housing Geocoded Walkups Shape Files - TCHC Scattered Units Geocoded Shape Files - Projection: SRS is UTM6 NAD27 Zone 17N Rotation -17.5 - Data were combined to create a map of the # of Social Housing Units built per decade aggregated at the City of Toronto Neighbourhood scale (Figure 3.) - Data were combined to create a geocoded map of the # of Social Housing Units built per decade (Figure 4) 	City of Toronto
City of Calgary – Economic Risk of Homelessness (Figures 5. & 6.)	<ul style="list-style-type: none"> - Low Income Cut Off (LICO) - Households spending more than 30% in rent (30% plus) - Neighbourhood Boundary Shape Files - Interpolation method: Inverse Distance Weight (IDW - power value: 1.5 - Search radius variable : 5 points) for Dissemination Area Geographies 	<ul style="list-style-type: none"> - Statistics Canada 2001 and 2006 Census; MADGIC, Data Liberation Initiative, Carleton University Library - City of Calgary
GraphoMap – 24 Cities and the Risk of Homelessness (Figures 7., 8., & 9.)	<ul style="list-style-type: none"> - Vacancy Rates by Quartile, 1991, 1996, 2001, 2006 data not available yet. - Total Number of Rental Unites, 1991, 1996, 2001, 2006 data not available yet. -The Circles represent the total number of Rental Units for a municipality for a particular year. The Radial Line represents Vacancy Rates, which reflects the number of units that are available for rental in a given municipality for a particular year. The closer the circle is to the top centre of the GraphoMap the lower the vacancy rate is for that particular municipality. NOTE: As the Vacancy Rate decreases the risk of Homelessness Increases. - Households spending 50%+ of Income Spent on Rent, 1991, 1996, 2001, 2006 data not available yet. - Lone Parent Households spending 50%+ of Income Spent on Rent, 1991, 1996, 2001, 2006 data not available yet. - Total Number of Private Households Renters for each year. - The Circles represent the total Number of Lone-parent family households with 50% or more of HH Income Spent on Rent for each year for a given municipality. The Radial Line represents 	<ul style="list-style-type: none"> - CMHC data for the FCM QOLRS - StatCan Census, for the FCM QOLRS - StatCan Census special tabulation, for the FCM QOLRS

	<p>% of these private households over the total number of Private Households Renters for each year.</p> <ul style="list-style-type: none"> - Total Number of Housing Starts for Rental Unit, Condo and Private Homes and total Housing Starts, 1991, 1996, 2001, 2006 data not available yet. - The Circles represent either the total Number of Housing Starts for Rental Unit, or Condo or Private Homes over time for a given municipality. The Radial Line represents the percentage of a type of Housing Starts over the Total Housing Starts for a particular municipality at a particular time. NOTE: In this example the less Rental housing starts the are the higher the risk while the higher the Condo and Private House starts there are the higher the risk. In the former it mean less increase in the supply of affordable housing and the latter it means an increase in more expensive and owned or higher rent housing. 	- StatCan Census, for the FCM QOLRS
Canada Module – Rate of Change between Renters and Owners (Figure 10.)	<ul style="list-style-type: none"> - Map of Provinces and Territories – Shape files 1991, 1996, 2001, 2006 - Map of CSDs – Shape files 1991, 1996, 2001, 2006 - # of Renters - # of Owners - # all Occupied Households <p>- Methodological note: the 3 classes or rates of changes are defined based on the standard deviation for each series (1991 to 1996; 1996 to 2001; 2001 to 2006). The rates of change that are:</p> <ul style="list-style-type: none"> * Higher than 1 std dev. are considered increasing (+) * Between 1 std dev. and -1 std dev. are considered stable (=) * Lower than -1 std dev. are considered decreasing (-) 	- Statistics Canada 1991, 1996, 2001 and 2006 Census; MADGIC, Data Liberation Initiative, Carleton University Library
Data Sets Acquired that were inadequate		
GraphoMap	<ul style="list-style-type: none"> - Social Housing Registry – only 2001 data were available for some cities and these data were not consistently collected in the same way in each municipality - 2006 Data were not available yet from the FCM special order 	FCM QOLRS Municipal Data Collection Tool
Calgary Module	<ul style="list-style-type: none"> - 1996 LICO Data + Shape files at the EA – LICO data were not produced for that level of geography by Statistics Canada for that year - 1991 and 1996 EA Shape files – these differed from the 2001 and 2006 DA shape files. Interpolation models cannot be compared if done on different geographical units - 1991 & 1996 30%+ Income Spent on rent – were not included because only available at the EA level and could not be compared to 2001 & 2006 data. <p>NOTE: Changing geographies and a lack of backward compatible data make accurate trend analysis in Canada very cost prohibitive and therefore rare at the City Scale</p>	- Statistics Canada 1996, Census; MADGIC, Data Liberation Initiative, Carleton University Library
Canada Module	<ul style="list-style-type: none"> - CSD geographies have radically changed with amalgamation, the creation of new cities and the appearance of Nunavut. <p>NOTE: Changing geographies and a lack of backward compatible data make accurate trend analysis in Canada very cost prohibitive and therefore rare at the National Scale</p>	- Statistics Canada 1996, Census; MADGIC, Data Liberation Initiative, Carleton University Library
Data wanted but could not afford or access was refused		
Canada Module	<ul style="list-style-type: none"> - Wanted a cross tabulation of new and long term immigrants in Canada by housing tenure and Income at the DA level for Canada. These data were to tell the story of how new Canadians are primarily renters when they arrive to Canada but outpace non immigrants in terms of house ownership once established, but once they do become homeowners they spend 	- Statistics Canada 2006, Census

	often 70%+ of their income on a Mortgage putting them at higher risk of homelessness. This dataset was not available as part of the Data Liberation Initiative and the cost from Statistics Canada was more than \$60 000 (Statistics Canada 2008).	
Calgary Module	- Wanted in addition to 30% of Income spent on rent, 50% of Income spent on rent. This dataset was not available as part of the Data Liberation Initiative and a cost estimate was not sought from Statistics Canada as it can take upward to 2 months for a response and this would have delayed progress	- Statistics Canada 2006, Census
Canada Module	- Wanted HIFIS Demographic data in order to map the 2 previous residences of shelter users prior to entering the shelter. This provides an indication of which parts of the City many people who have become homeless have predominantly come from which becomes a risk of homelessness indicator when matched with other data. See Figure 18. Ottawa map of the Family Homeless Shelter Population by Last Home address. - These data are not available to the public	- HRSDC, HIFIS
Canada Module	- CMHC In core Housing Need data. These data communicate housing and income. - CMHC Canada Housing Survey Data - These data are too expensive to acquire.	CMHC

Table 1 Pilot Atlas of the Risk of Homelessness Data

Section 3 – Discussion

Relevance of research

As discussed the Pilot Atlas of the Risk of Homelessness is the first of its kind worldwide. There are maps of absolute homelessness and some variables associated with the risk of homelessness but there has never been an attempt to look at this issue from multiple angles and scales as does this Atlas.

Also, it is the first time that these data have ever been mapped in an interactive fashion. The partners, homelessness researchers and the public who have seen this atlas are very surprised at how easy it is to see the trends and assess a situation or a theme. Many of the datasets included in the Atlas are notoriously difficult to access and/or very expensive to purchase. This leaves a national and city story often left untold and unseen. In other cases, it is too expensive to experiment, as was the case of the Calgary (figure 6) and Canada modules (figure 10). Yet often it is through experimentation that we make the most interesting discoveries. It takes some expertise to create a good interpolation or to develop an indicator. Also, many mapping projects have GIS specialists attached to them but very few have cartographers. This project had the good fortune to be able to mobilize some very creative thinking, as seen in the GraphoMap (figures 7-9), the City of Toronto (figures 3-4), the CMM Modules (figure 2) and the Calgary (figures 5-6). That thinking is due to the presence of an excellent cartographer, a superb geomatician and great partners to work with. Also, the Atlas we created is in a research lab, which provides access to many educated eyes that provide useful and critical feedback. Finally, the Atlas is a multidisciplinary endeavour, this is a key element of the practice and theory of Cybercartography. It is a way of thinking and a way of working that creates an environment conducive to the reception of critical feedback and to listening to try to get the story right.

The Atlas was created using the Nunaliit Cybercartographic Atlas Framework, which is an open source one that adheres to interoperability and web mapping standards. The Atlas is therefore

flexible and can grow if additional cities would like to join, if other research projects related to the topic would like to disseminate their findings in a different way or if a Federal or Provincial/Territorial government wishes to make accessible its datasets. In addition, other themes can be added such as population health, absolute homelessness, mental health and homelessness, etc. Resources to do this kind of work would have to be sought and this could be done in a number of creative ways.

The social sector is often accused of being a laggard on the adoption of innovation of technologies by no fault of its own. Resources are scarce, mandates delimit and skill sets are attuned to innovative social practices and not technology and communication. In addition, there are no non-governmental organizations in Canada that have a National scale mandate to do this kind of research. Some provinces and cities are doing some mapping work, but again mandates delimit the scale of analysis. Questions arise as to who in Canada can do multiscale, multisectoral and multithematic analysis on the issue of housing and homelessness as well as poverty and social issues in general. This Atlas, we believe, marks the beginning of a conversation about finding ways to facilitate the dissemination of information on these important issues that is engaging, accessible, understandable and dynamic between and among many. It is also a way to demystify and depersonalize the issue of homelessness in Canada. It is individuals who are homeless, but there are underlying structural issues in the political economy that have led them there. As stated earlier, maps are shaped by and in turn shape society and it is hoped that this pilot informs and reforms public policy.

Potential significance of research results

We hope the Pilot Atlas of The Risk of Homelessness will help change perceptions about the issues of homelessness and will be an example of multidisciplinary, multiscale, multisectoral and cross-institutional collaboration in action. In addition, it is expected that many other researchers in the social sector will be able to think about and visualize their research findings in a new way. Interactions with researchers at the Growing Home Conference in Calgary were certainly an indicator of people rethinking what they were doing and how they were communicating their findings. These interactions also spearheaded conversations on potential future collaborations. The FCM QOLRS Team is expected to develop ways to use this tool to inform public policy and the Visualization working group will be exploring ways to incorporate some of these ideas in the QOLRS. Data access, geography and cost issues are a serious impediment to this type of research outside of an academic setting, this Atlas shows what is possible and it is expected that a few more data pipelines may open once it is acknowledged that many important stories remain untold.

New Linkages or partnerships

The Pilot Atlas of The Risk of Homelessness has already spearheaded a number of conversations on potential future collaborations. Other QOLRS cities have identified an interest in participating. Much deeper relationships were developed with the CMM, which sparked a meeting with the City of Montreal. Other housing advocates in the City of Toronto have indicated they would like to share their data and new ideas are coming in from the City of Calgary. A series of meetings and presentations are scheduled in the coming months where the Atlas will be showcased.

Section 4 - Conclusions and Recommendations

Specific recommendations for services, policy, programs, etc.

- Provide assistance for research projects which would like to undertake multidisciplinary, multiscale, multisectoral and cross-institutional collaborations of this kind. The issue of homelessness crosses many boundaries and it critical that we find ways to work together.
- Encourage government agencies to consider using cybercartography and cybercartographic atlases as methods and practices for disseminating the research they have paid for.
- Provide support for projects to allocate a small portion of their research toward the creation of atlas content or to disseminate their finding in this way
- Provide support to negotiate access to national public statistics and other public datasets at no cost for this type of research
- Work with statistical agencies to collect data relevant to the issues and to make these standard products available to the sector at no cost.
- Encourage greater allocation of resources toward the production of mapping service and technologies for the social sector

Areas for future research

- To develop more modules with more organizations to expand the Atlases Content.

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RS-09_Updated Trends in Homelessness

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