

Big Data 4 Small Places

Work Book

Capacity-building in data access and analysis
for rural community development

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Measuring
Rural Community
Vitality



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1 INTRODUCTION

This Big Data for Small Places workbook is intended to be used by individuals or groups who are looking for user-friendly starting points in accessing and using data for evidence-based decision-making in rural community development. The workbook was developed and field-tested with groups that were tackling specific challenges in rural communities, and the lessons from these experiences are included throughout the workbook. While the workbook was developed primarily for use with a series of Big Data for Small Places workshops, it may also be useful for individual or group self-study. In addition, experience with the Big Data for Small Places approach indicates that the workbook could be applied to a wide variety of community development initiatives, whether in a rural context or not.

This workbook is a companion to the Small Area Data Guide, which was also developed under the umbrella of the Measuring Rural Community Vitality Initiative of the Rural Ontario Institute, with financial assistance from the Government of Ontario. The workbook and the guide are intended to facilitate the advancement of data literacy - the effective utilization and dissemination of data for the benefit of rural communities and organizations.

The Big Data for Small Places program builds capacity in rural municipalities and organizations to access, analyse and disseminate relevant and reliable data in support of rural community development. The availability and complexity of huge volumes of data have resulted in challenges and opportunities in the use of data in support of evidence-based decision-making, planning, priority setting, performance tracking, and accountability measures relevant to rural community development. The Big Data for Small Places approach enables participants to access and use data and analytics to clarify community needs and concerns, to identify significant trends, to select appropriate indicators of success, and to communicate evidence-based recommendations to community members, decision-makers and funding partners.



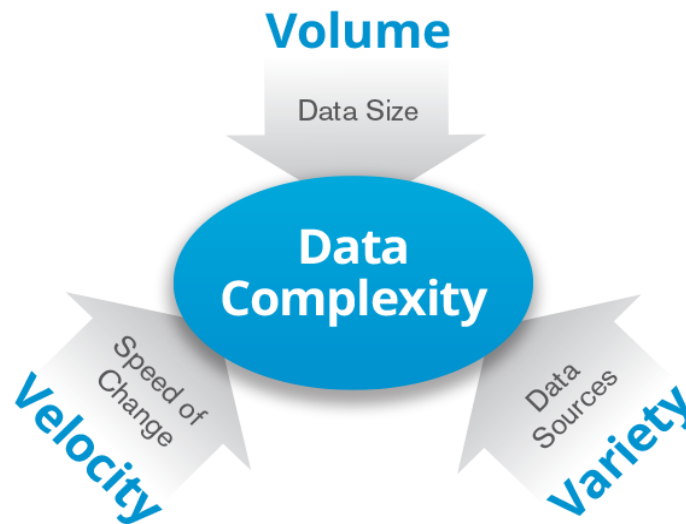
For More Information...



BD4SP Case Study



Worksheet – Think and reflect



1.1 About This Workbook

The Big Data for Small Places workbook is designed to guide the user through easy-to-follow steps in the process of building capacity to find, analyze, interpret, and communicate data in support of evidence-based decision-making, planning, priority setting, performance tracking, and accountability measures for rural community development.

The Big Data for Small Places program is a capacity-building program for people who already have experience in or a connection to rural community development. It is not a conventional training program with a fixed curriculum. The philosophy behind the Big Data for Small Places approach is based on principles of adult education, including assumptions that adult learners bring considerable knowledge and skills to the table, and that they are goal-oriented - they want to use learning opportunities to help them achieve specific outcomes. The Big Data for Small Places group workshops which led to the development of this workbook, begin with the identification of specific problems or issues in rural communities, and the existence or formation of working groups who want to tackle these challenges. The workshops are not designed to deliver a comprehensive curriculum about data and analytics, but rather to facilitate the progress of the working groups as they grapple with questions like "What do we know?", "What do we need to know?", and "What will we do with what we learn?". The general directions of the workshops are based on extensive research in the area of effective rural community development, and a broad menu of learning options are presented to the participants.

A key component of the workshops is the inclusion of guest speakers and facilitators who are able and willing to bring a user-experience perspective to the concerns of the working groups. The Big Data for Small Places workshops do not result in a graduation or a

credential, but provide significant contributions to the process of moving from concern about an issue to developing an evidence-based course of action in rural community development. It is anticipated that each future series of Big Data for Small Places workshops will result in adaptations of this workbook. It is very much a work-in-progress.



For a more in-depth examination of adult learning and capacity-building, as well as some insightful case studies in this field, see: G. Foley. (1999) *Learning in Social Action; A contribution to understanding informal education*. (Zed Books).

1.2 Lessons from the BD4SP Pilot and related workshops

A few recurring themes emerged from the groups that participated in the Big Data for Small Places pilot project and the related workshops involved in the development of this workbook.

Rural municipalities and community-based organizations:

- Prioritize community attractiveness and community wellbeing, and recognize the interconnectedness of economic development, health and social issues, although government programs typically require focus on a narrow aspect of an issue
- Usually have some business analytics expertise available, but use it for administration not strategic planning or community development
- Are unaware of many relevant data sources and indicator systems
- Have access to a library but rarely use it to find data sources, indicators, and related research
- Are being pushed into data access and analytics by requirements of grant applications and accountability measures
- Tend to dive into the data (get the numbers) with little preparation on fundamentals of analytics

Common Challenges:

- Redefining/reframing issues to determine what can/cannot be answered by data
- Mismatch of municipal boundaries and functional community areas – problems with data access and relevance
- Wide variation among organizations re: how data is collected, stored, shared (Ontario Non-Profit Network is working on this)
- Understanding how to answer “What do people need?” (expert opinion, demand, comparable, etc.)
- Project administration – burden of “accountability” (often not relevant to the overall goal of the project), arbitrary rules of funding agencies not adaptable to local context

1.3 Key Concepts

The core concepts of the Big Data for Small Places approach are based on an understanding of widely-accepted definitions of a few key terms.

What is community development?

Community development is a process to increase a community's assets, attributes or abilities in order to improve the lives of people in the community.



For more information on definitions and applications of community development, see: J.D.Brown & D.Hannis (2012) *Community Development in Canada*, Second Edition. (Toronto ON, Pearson Canada). D. J. A. Douglas (2010) *Rural Planning and Development in Canada*. (Toronto ON, Nelson Education).

What do we mean by small places? What is rural?

Small places are rural communities characterized by small population in a large geographical area – generally areas with no town centre over 10,000 people and not adjacent to urban areas.



For more information on definitions of rural, see: V. du Plessis, R Beshiri, R. D. Bollman, & H. Clemenson. (2001) "Definitions of Rural". *Rural and Small Town Canada Analysis Bulletin* V.3, N.3 (Ottawa, Statistics Canada. Cat. No. 21-006-XIE).



For a comprehensive overview of challenges and opportunities currently facing rural communities in Canada, see: *The State of Rural Canada 2015*, Canadian Rural Revitalization Foundation. <http://sorc.crrf.ca/>

What is data? What is Big Data?

In its simplest form data is simply information, but the term is most often associated with information that can be expressed in numbers. Big data refers to the compilation of complex information, where the complexity is largely due to a combination of velocity (speed of change), volume (large quantities of data), and variety (data in many forms and/or from various sources).



For a brief overview of the concept of big data, and its relationship to analytics, see: T. H. Davenport (2010) *The New World of Business Analytics*. International Institute for Analytics.

http://www.sas.com/resources/asset/IIA_NewWorldofBusinessAnalytics_March2010.pdf



To see a collection of short articles on issues and trends related to big data, see: Harvard Business Review Insight Center. *The Promise and Challenge of Big Data*.

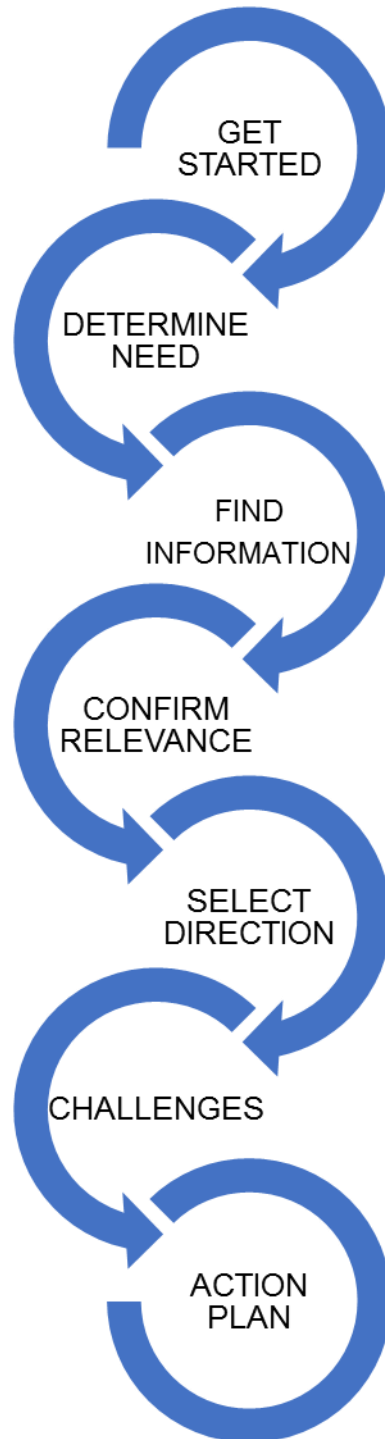
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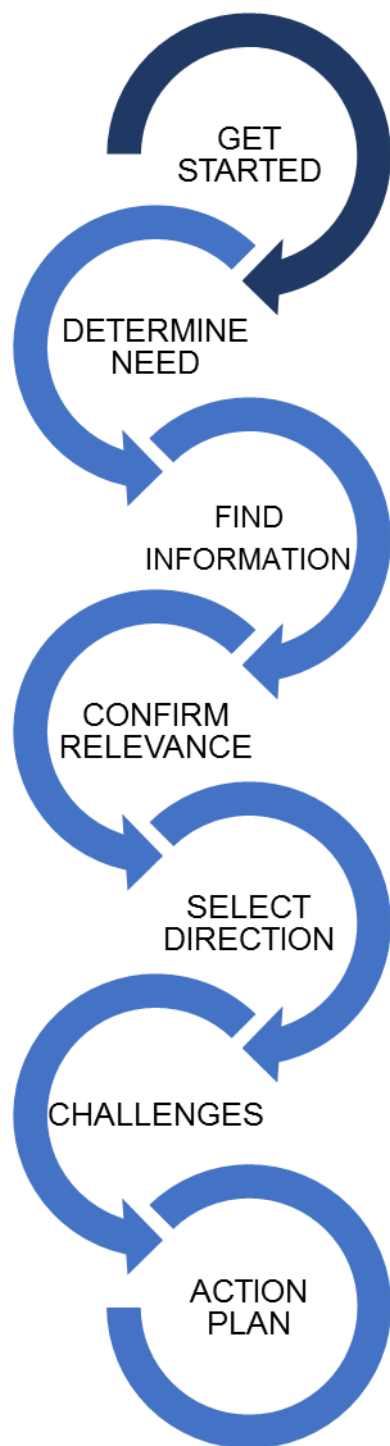
For more detailed information on the uses and impacts of big data, see: V. Mayer-Schonberger & K. Cukier. (2013). *Big Data; A revolution that will transform how we live, work, and think*. (New York NY. Houghton Mifflin Harcourt).

For a more detailed list of relevant concepts, definitions and terminology, see **Appendix A**

2 BD4SP PROCESS



2.1 Get Started



Identify a problem, question or issue and clarify why to get involved:

- Curiosity (What's happening in the community?)
- Problem-solving (What can be done about X?)
- Aspiration (How can the community become better/best in relation to X?)

At the end of the Get Started process, participants should be able to:

- clearly articulate their key question or issue
- why it is important
- who is likely to be interested in working on it.

A common motivation for getting involved in a community issue is curiosity – often resulting from widely varying opinions about the local situation. As Ipsos, the global market research company, has repeatedly shown with their “Perils of Perception” surveys, commonly held public opinions about community characteristics and issues are often very far off when compared with the facts as revealed by actual statistical analysis.

For more information on the Ipsos surveys, the “Perils of Perception” analysis, and the “Index of Ignorance” (ranking of various country’s public opinion accuracy), see: <http://perils.ipsos.com/>


People frequently become involved in an issue because they would like to help solve a community problem. Common types of community problems include: lack of services, community disagreements or fragmentation, lack of (or questionable use of) local decision-making authority, or population change (growth, decline, or turnover).


On the other hand, people may be motivated to launch a new initiative by a vision or aspiration to make the community better in some respect. Frequently this includes such items as: building or improving some physical asset (community centre, park, main street, etc.), promoting a new identity or reputation of the community, or achieving a goal that is championed by a voluntary or charitable organization.

Typically, there is some incident, event, or announcement that acts as a catalyst to inspire action among community members, and bring together those motivated by curiosity, problem-solving, and/or aspiration. As the group of concerned community members come together around a common issue, there may be considerable debate about the nature and extent of the problem or opportunity and the conceptualization of the desired outcome.


In the Big Data for Small Places approach, at this stage the concerned citizens are encouraged to form a working group and come to an agreement on a brief statement of their issue or concern and their vision or goal. It should be understood that this initial statement is likely to be revised many times as the process evolves, but without initial agreement on the general focus and direction it is unlikely that the working group will stay together and stick to the task long enough to see any significant results.

Very early in the process (either during the Get Started phase or soon after) the working group is encouraged to identify the strengths of each group member and begin to take on specific roles. The working groups that are most likely to be successful will designate roles that include: a champion or spokesperson, a researcher or investigator, and a subject matter specialist relevant to the task at hand. In many cases two or three people may share a role. In some situations, the role may be filled by an alliance with someone outside the working group, for example the designated researcher might be a librarian or a graduate student who is able and willing to provide research services to the working group without actually joining it. As the project evolves, the roles are also likely to change, but attention should be paid to the dangers of placing too much emphasis on one role or losing depth in another.

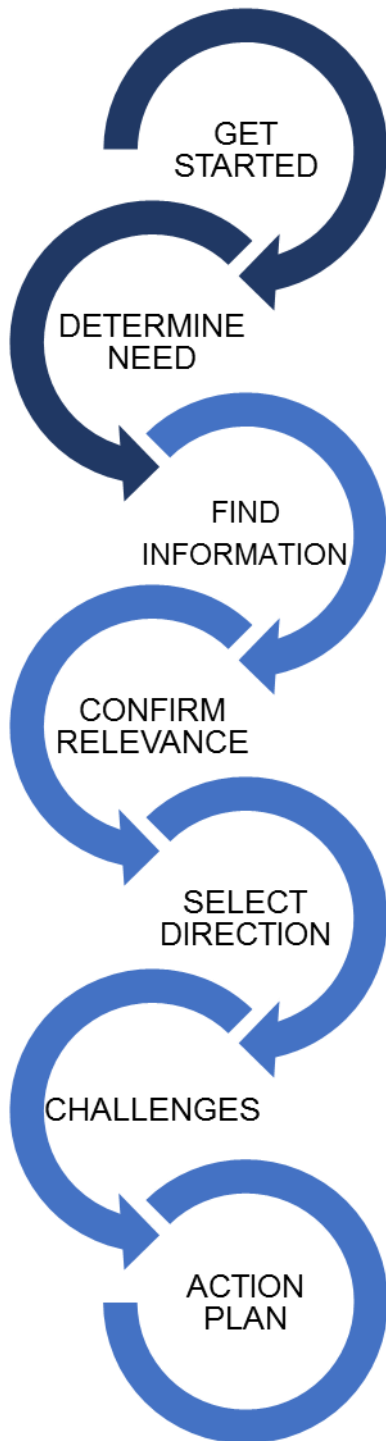
 For a more detailed discussion of the issues around getting started in community development, see: J.D.Brown & D.Hannis (2012) *Community Development in Canada*, Second Edition. (Pearson Canada).

 There are some excellent workbooks available to assist with the process of the formation and operation of an effective working group, such as: S. Pokras (2010) *Problem Solving for Teams; Make Consensus More Achievable*, Third Edition. (Axzo Press).

2.1.1 Get Started Worksheet

<p>Get Started</p> 	<p>Objective: Identify a problem, question or issue and clarify why to get involved:</p> <ul style="list-style-type: none"> • Curiosity (What's happening in the community?) • Problem-solving (What can be done about X?) • Aspiration (How can the community become better in relation to X?)
<p>Clearly articulate the key question or issue</p>	<p>Outcome: At the end of the Get Started process, you should be able to clearly articulate the key question or issue, why it is important, and who is likely to be interested in working on it.</p>
<p>Why is it important?</p>	
<p>Who's likely to be interested in working on it?</p>	

2.2 Determine Need – Why Does It Matter?



Understand frameworks for determining need and focus on one or more as appropriate:

- Expert Opinion
- Public Demand (expressed need)
- Group Opinion (felt need)
- Comparison with Others
- Resources (best use of assets available)

At the end of the Determine Need process, participants should be able to:

- articulate the major need upon which they will focus
- select the most relevant approach for determining the nature and extent of the need

Frameworks for understanding “need”

What does a framework do?


A framework does not provide a definition, but using a framework can help to clarify and understand different assumptions, or different approaches to a common issue. Often the source of disagreements about “What this community really needs is...” can be traced back to different perspectives on defining and determining need. A framework that incorporates a number of approaches can assist in developing coalitions among groups with different tactics but a common goal.


In the Big Data for Small Places approach, it is important for each working group to come to some agreement about the relative priority of various determinations of community need in order to focus on the research and data collection that will be most relevant.

Type of Need	Definition/ Determination	Example
Normative Need	Expert Opinion	Canada Food Guide
Felt Need	Personal feeling or opinion	Physical: stomach ache Preference: likes/dislikes
Expressed Need	Requests, demands	More speed bumps
Supplied Need	Supplier of product or service	Foreign Aid (where giver determines what is given)
Comparative Need	Difference between comparable groups	Low Income Cut Off

Implications for Data

Type of Need	Definition/ Determination	Implications for Data, Some Examples
Normative Need	Expert Opinion	Research to confirm expert opinion. Compare population to expert standard
Felt Need	Personal feeling or opinion	Opinion polls, surveys
Expressed Need	Requests, demands	Tracking requests, Counting petition signatures
Supplied Need	Supplier of product or service	Inventory of supply, Measurement of capacity
Comparative Need	Difference between comparable groups	Measurement of resources available to different population segments

 For more information on frameworks for understanding need, see: J. Bradshaw (1972) “A taxonomy of social need.” In McLachlan G (ed.) *Problems and progress in medical care*. Seventh series. (NPHT/Open University Press).

 For additional insight into social policy implications of social need, see: L. Mitton & M. Liddiard (2011) “Chapter 4: Social need and patterns of inequality.” In *Social Policy*. Fourth Edition. Edited by John Baldock, Nick Manning, Sarah Vickerstaff, and Lavinia Mitton. (Oxford University Press).

For an example of how frameworks for understanding need are used in public health policy discussions in the United Kingdom, see the UK Public Health Action Support Team (PHAST), Health Education initiative:

<http://www.healthknowledge.org.uk/public-health-textbook/medical-sociology-policy-economics/4c-equality-equity-policy/concepts-need-justice>




BD4SP Case Study – Determining Need

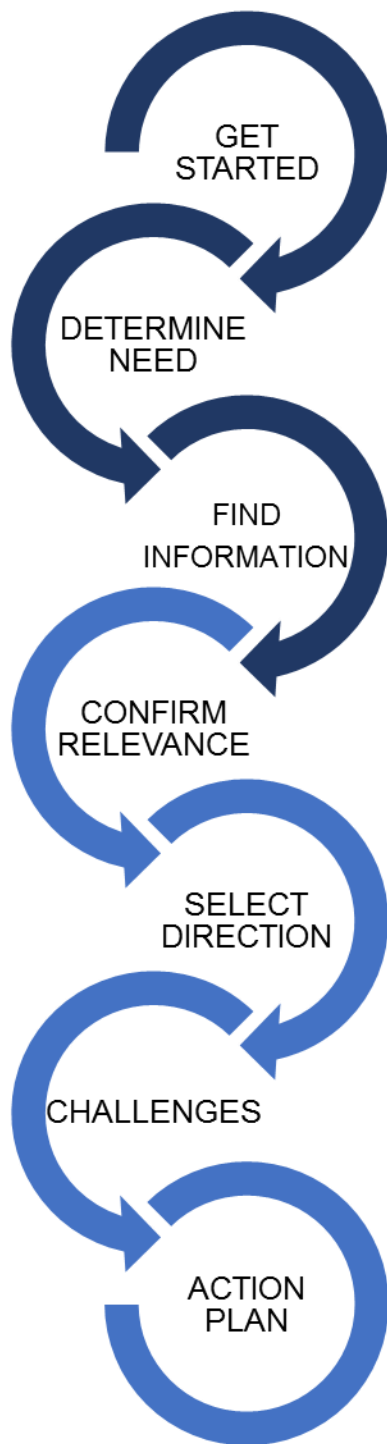
The Municipality of North Grenville, Ontario was in the process of developing a Parks, Recreation and Culture Master Plan.

Some of the Parks and Recreation staff participated in the Big Data for Small Places program in order to work toward an evidence-based perspective on community need. Fragmented and competing opinions about community need were more readily placed in context by using a framework for understanding need. The requests from new residents for additional services could be seen as “Felt Need”; the internal data on actual usage of facilities like soccer fields and hockey rinks were measures of “Expressed Need”; the limitations on the number of available usage hours for specific facilities fell under the category of “Supplied Need”. Through the Big Data for Small Places approach, the staff were also able to access information from the association, Parks and Recreation Ontario, including expert opinion on impacts of user fees on low-income usage of recreation (Normative Need), and analysis of provincial trends in participation in municipal recreation programs (Comparative Need). Although some consulting services were still required to assist with parks and recreation planning, the budget for these services could be substantially reduced due to the capacity-building of staff and the access to free data and analysis which resulted from participation in the Big Data for Small Places program.

2.2.1 Determine Need Worksheet

<p>Determine Need: Why Does It Matter?</p> 	<p>Objective: Understand frameworks for determining need and focus on one or more as appropriate:</p> <ul style="list-style-type: none"> • Expert Opinion • Public Demand (expressed need) • Group Opinion (felt need) • Comparison with Others • Resources (best use of assets available)
<p>Articulate the major need upon which you will focus</p>	<p>Outcome: At the end of the Determine Need process, you should be able to: articulate the major need upon which you will focus, and select the most relevant approach for determining the nature and extent of the need.</p>
<p>Select the most relevant approach for determining the nature and extent of the need</p>	

2.3 Find Information – Where to Look?



Find Information relevant to the need and approach:

- Select indicators, use existing indicators if relevant, develop indicators if necessary
- Select sources of data and analysis according to relevance and usefulness

At the end of the Information-Finding process, you should be able to:

- articulate a few key indicators
- explain their relevance to the need and approach
- identify data sources for each indicator

What is an “**indicator**”?

- a thing, especially a trend or fact, that indicates the state or level of something: "car ownership is frequently used as an indicator of affluence" or "the test is used as an indicator of performance"; a device providing specific information on the state or condition of something in particular.
- synonyms: measure, gauge, barometer, guide, index, mark, sign, signal, symptom; standard, touchstone, yardstick, benchmark, criterion, point of reference, guideline, test.

(Adapted from Google Dictionary)

The differences between outcomes, indicators, and measures are not widely understood, but it is important to clarify the relationship between these concepts, especially in the field of community capacity-building.

An **outcome** is a major change—in the lives of people, their organizations and/or their community—which demonstrates that something is happening. For example, to evaluate quality of life, one possible outcome would be good health.

An **indicator** is an actual activity or capacity that you can measure or assess in some way that shows that an outcome is being achieved. For example, an indicator of good health could be weight.

A **measure** is the actual bean-counting, or some kind of analysis that must be done in order to gauge an indicator. For example, number of pounds, or percent gain in pounds in the last 12 months

(Adapted from Aspen Institute, *Measuring Community Capacity Building*).

2.3.1 Selecting Indicators and Measures

In the Big Data for Small Places approach, there are a few key questions that can facilitate the selection of indicators and measures that are most useful to the particular focus that the group has agreed upon. Ask yourselves:

- What do we need to know? It is important to focus on the items that are most important for understanding the issue at hand. There is a great temptation to add many more indicators and measures to the list because they are interesting or because the data is readily available, whether or not they are particularly useful.
- Why do we want to know it? Ensure that there is a good fit of the selection of indicators with the vision and mission of any sponsoring or affiliated organization as well as with the goals of the working group.
- What will we do with what we find? At this stage, there should be a preliminary plan for how to use the selected indicators and measures, and how to communicate the findings from this process. The plan may evolve over time, but it is very helpful to come to some agreement on the general outline of a plan at this stage in the process.

A good indicator should have these characteristics:

- Reflects the well-being of the population
- General relevance and interest to the public or target audience
- Well defined, measurable and quantifiable
- Based on current, available data
- Provides comparison or context that is easy to understand

(Adapted from Victoria Foundation, Vital Signs Methodology:

<http://www.victoriafoundation.bc.ca/vital-signs/victoria/2012/methodology>)



For more information on developing appropriate indicators and measures related to community capacity-building, see the workbook on this topic from the Aspen Institute, a nonpartisan organization promoting values-based leadership and the exchange of ideas: <https://www.aspeninstitute.org/publications/measuring-community-capacity-building/>

2.3.2 Popular Indicator Systems

There are a number of well-researched indicator systems that are relevant to community development issues. The Canadian Index of Wellbeing, the Vital Signs reports, and the Newcomer and Youth Community Indicators tool are three established systems that have proven to be particularly useful in many contexts.

Canadian Index of Wellbeing

The Canadian Index of Wellbeing (CIW) provides Canadians with a fuller picture of wellbeing that measures real life, for real people. The CIW is composed of eight domains that focus on key aspects of life and uses them to measure what really matters to Canadians. Understanding the interconnectedness of many aspects of wellbeing, and using it to fuel evidence-based and community-focused decision-making, is why the CIW exists. The CIW regularly reports on the quality of life of Canadians – nationally, provincially, and locally – and advocates for social change that reflects our values and places wellbeing at the heart of policy.

The Canadian Index of Wellbeing measures what Canadians care about most: their health, living standards, leisure time, their kids' education, even the air they breathe. GDP does not. It just measures how much money is circulating in the economy. Using the CIW, regular national reports are produced, based on analysis of two decades of data, drawing from almost 200 valid data sources and tracking 64 indicators representing eight domains of vital importance to Canadian's quality of life. The framework is the result of Canadian and international experts consulting with Canadians to ensure the domains reflect their values. It is a revealing and comprehensive analysis of how Canadians are really doing in the areas of our lives that matter most and a call to action to put wellbeing at the heart of public policy.

The Canadian Index of Wellbeing is a project of the University of Waterloo, Faculty of Applied Health Sciences. In addition to national research, many communities collaborate with the University of Waterloo to produce customized reports on local wellbeing.

The 8 Domains (categories) of indicators examined by the Canadian Index of Wellbeing are:

- Community Vitality
- Democratic Engagement
- Education
- Environment
- Healthy Population
- Leisure and Culture
- Living Standards
- Time Use



For more information on the CIW, see: <https://uwaterloo.ca/canadian-index-wellbeing/>

Vital Signs

Vital Signs is a national program led by community foundations and coordinated by Community Foundations of Canada that leverages local knowledge to measure the vitality of our communities and support action towards improving our collective quality of life. Vital Signs aims to inspire civic engagement and provide focus for public debate in our communities and around the world. Vital Signs reports and Vital Conversations are used by residents, businesses, community organizations, universities and colleges, and government leaders to take action and direct resources where they will have the greatest impact.

Vital Signs reports use community knowledge to measure the vitality of communities – gathering data and sparking conversation about significant social and economic trends to tell the story of how Canadian communities are faring in key quality-of-life areas. Vital Conversation is a facilitated discussion with community members to learn more about the social and economic trends impacting local quality of life. The conversations are often used as a starting point to identify local priorities and mobilize a community into action. Vital Conversations can serve as a springboard to strengthen local relationships, develop new partnerships and begin to engage in the Vital Signs program.

The 10 Domains (categories) of indicators examined by the Vital Signs program are:

- Arts & Culture
- Belonging & Engagement
- Economy
- Environmental Sustainability
- Getting Started
- Health & Wellness
- Housing
- Learning
- Safety
- Sports & Recreation
- Standard of Living
- Transportation



For more information on the Vital Signs program, see:

<http://communityfoundations.ca/vitalsigns/>

The Victoria Foundation, which is based in the city of Victoria BC, has a particularly informative website with examples of various Vital Signs reports they have produced, a good description of their methodology, and related information. See:

<http://www.victoriafoundation.bc.ca/vital-signs/victoria>

Newcomer and Youth Community Indicators

The Newcomer and Youth Community Indicators (NYCI) is an analytical tool that provides information to help communities assess their attractiveness related to newcomers and youth. Communities of all sizes need factual and comparative data to support planning efforts and decision-making to assist in the creation of strategies for attracting newcomers and retaining youth. The tool allows communities to benchmark themselves against similar communities located across the Province.

The Newcomer and Youth Community Indicators is the new version of the Community Attractiveness Indicators for Newcomers tool, which was developed in partnership with the Rural Ontario Institute and the Conference Board of Canada. Using this tool, communities can understand how to build on their strengths and overcome barriers to successfully recruit and retain newcomers and youth, thereby increasing innovation and productivity in the local economy. The data for this tool is based on national and provincial statistics.

The Newcomer and Youth Community Indicators tool includes over 50 indicators in the following eight categories (domains) that help to identify community attractiveness including:

- Access to Healthcare
- Amenities
- Economy
- Education
- Housing
- Innovation
- Society
- Youth



For more information about the NYCI and for access to the tool, contact the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA):

<http://www.omafra.gov.on.ca/english/rural/edr/nyci/index.html>

Some users of the NYCI in rural contexts have found that the indicators that are based on estimates of average distance to certain services (hospitals, libraries, etc.) may not be particularly useful. The calculations are based on the geographic centre of the community under consideration, not the main population centres. In a large, sparsely populated rural municipality the “distance to service” indicators may not reflect the actual situation of local residents. However, in many cases it may be possible to get a NYCI report for a “functional community” (an area with common services and interactions) rather than a community defined by municipal boundaries. The local OMAFRA advisors can provide information about various ways the NYCI tool has been used in a particular area.

2.3.3 Selection of indicator systems and/or indicators

In the Big Data for Small Places approach, participants are encouraged to use an existing indicator system to examine their issue of concern. Using an established system usually simplifies the process of selecting relevant indicators, finding useful data, and accessing comparable data that can provide insight into the condition of the local community. In most cases, there will be only one or two domains (categories) of indicators that will be particularly relevant to the task at hand.

At this point in the process, each working group should:

- Determine whether a local organization (such as a social planning council or community foundation) has recently done a Canadian Index of Wellbeing, Vital Signs, Newcomer and Youth Community Indicators, or similar study that includes the community of interest.
- Select the indicator system that is likely to be most useful for the current issue of concern, based on the availability of information and the fit of the indicators with the goals of the working group.
- Identify the priority domains (categories) of indicators. Focusing on the most relevant one or two domains is likely to be a more effective use of time and effort than attempting to examine several domains with dozens of indicators.
- Identify the priority indicators from selected indicator system and domain. Typically, about six or eight key indicators will provide considerable insight into the issue. Reliance on too few indicators may skew the perspective in a particular direction (not necessarily helpful), while researching a great many indicators may be beyond the capacity of the working group.
- Add additional indicators if necessary. The unique nature of some projects may require the development or identification of a few indicators that are not components of any of the popular indicator systems. Refer to the relevant sections in this workbook: “What is an indicator?” and “Selecting Indicators and Measures”. Again, it is important to be aware that this process may require considerable time and effort, so the working group should carefully assess this commitment against the anticipated benefit that could be attained.
- Identify data sources for each indicator. Although each working group should have a member who has taken on the role of researcher, or have an affiliation with a suitable researcher, it will be of great benefit to the capacity-building of the group if each member researches the data sources and reports the findings for at least one indicator. Sharing the results of this research frequently among the group will facilitate the process of identifying useful data sources as well as dead ends.
- Based on the results of the research on data sources, it may be necessary to revise, delete, or substitute indicators at this stage.

A common problem that is likely to be encountered at this stage is the absence of data at the local community level relevant to the issue of concern. Typically, Canadian Index of Wellbeing and Vital Signs reports are produced for a region, and are based on data for a Census Division (a group of neighbouring municipalities, typically a county or regional municipality) or a Census Metropolitan Area (with an urban core of over 50,000 and a regional population of 100,000 or more). In many cases the organization that conducted

or sponsored the regional study is likely to possess the data at a much more local level than what is published in the main report. The organization may be willing to share the local data in their possession with a group that is working on a rural community development project.

In some cases, although the data for a particular indicator may be unavailable for the local community, there may be related data for the Census Division (county, or equivalent) and for the Census Subdivision that is the major city in the area. By taking the relevant numbers for a particular indicator, and subtracting the city from the county, arrive at a

number for the rural region. This may provide some insight into local conditions, although the regional average may not reveal the extent of an issue in a specific rural community. The relevance of regional data needs to be evaluated through the lens of local knowledge.

Using a shared reporting format such as the table below can help the working group keep track of what has been agreed upon, what tasks need to be completed, and who is responsible for completion.

For a more detailed table of Domains & Indicators see **Appendix B**



BD4SP Case Study – Selecting Indicators

Local Immigration Partnership of Lanark Renfrew (LIP) is funded by Citizenship and Immigration Canada (CIC), in cooperation with the Ontario Ministry of Citizenship and Immigration (MCI).

The Local Immigration Partnership of Lanark Renfrew (LIP-LR) works to strengthen the role of local communities in integrating and serving the newcomer population. LIP-LR participated in the Big Data for Small Places program in order to enhance their effectiveness in situating immigration services in the context of community attractiveness, and to use immigration funding to build community wellbeing. Participation in the Big Data for Small Places program built the capacity of staff to access and utilize relevant data and facilitated access to OMAFRA's custom data services for data reports by functional community areas instead of by municipal boundaries. In addition, several specific indicators within the Newcomer and Youth Community Indicators system provided highly useful information about the inter-relationship of welcoming communities, community attractiveness, and community prosperity. However, some NYCI indicators proved not to be useful since they were calculated on the basis of the location of geographic centres rather than the population centres – a large difference in many rural municipalities. Extensive knowledge of the local context enabled the LIP-LR staff to select and use only those indicators that were likely to be most useful.

2.3.4 Other indicator systems

Depending on the nature of the issue, there may be indicator systems or data-retrieval tools that are particularly relevant. Some examples include the Best Places to Live in Canada rankings, Entrepreneurial Communities, Tourism Performance Indicators, the Analyst tool for economic development, and many more. Contacting an industry association or non-government organization with a relevant mandate often reveals a wealth of information and related research. The following are a few sources of information that may be useful in some approaches to rural community development.

Best Places to Live in Canada

MoneySense's Best Places to Live 2016 is a comprehensive data-driven snapshot of Canadian cities. For 2016 eight cities and towns were added to bring the total to 219 communities. To identify the Best Places to Live in Canada each community was ranked across 35 separate categories—one more than in previous years—to get a detailed picture of what life is like in each community. To come up with the ranking, information was gathered on Census Metropolitan Areas (CMA), Census Agglomeration (CA) and Census Subdivisions, (CSD) as defined by Statistics Canada. All of the demographic data was supplied by Environics Analytics.



Additional data sources were also accessed – see the Methodology section for more information. <http://www.moneysense.ca/canadas-best-places-to-live-2016-full-ranking/>

Entrepreneurial Communities

In the fall of 2016, the Canadian Federation of Independent Business (CFIB) released its ninth annual report on what entrepreneurial characteristics Canada's cities possess. In many respects, the massive sectoral and regional economic restructuring seen in the past two years has shown up in the cities' entrepreneurship score. In other respects, however, the findings are reasonably stable. CFIB collects a wide range of data to try to capture the level of dynamism of each community and then place it on a measurable scale in order to identify the relative entrepreneurial strengths and weaknesses of cities across the full range of measures for the 121 cities with populations of roughly 20,000 or more (based on Statistics Canada's definitions of Census Metropolitan Areas and Census Agglomerations). CFIB assembled 14 indicators, drawing from published and custom tabulated Statistics Canada sources, as well as direct perspectives from CFIB's membership, which numbers more than 109,000 business owners across Canada. <http://www.cfib-fcei.ca/english/article/6656-entrepreneurial-communities-in-canada.html>

Ontario Tourism Performance Indicators

The Ontario Ministry of Tourism, Culture, and Sport works closely with the tourism sector to help stimulate economic growth and investment and create an environment that allows Ontario to compete successfully in the rapidly changing world of travel and leisure. The ministry undertakes vital market research in the areas of marketing, product development, and investment to aid business decisions by both governments and industry.



For more information on Ontario Tourism Performance Indicators, see:
<http://www.mtc.gov.on.ca/en/research/performance/performance.shtml>

Analyst – An Economic Development Analysis Resource from OMAFRA

Analyst is a web-based tool that provides data on regional economies and work forces. It was developed to help economic development professionals better understand their region so they can make informed decisions about how to build strong regional economies. Analyst combines multiple national data sources, harmonizing them to take advantage of the strengths of each source. Regional data is available for all Ontario Census Divisions, Census Subdivisions, and Census Metropolitan Areas, including the option to create custom regions.

Statistics Canada data sources include:

- Canadian Business Patterns (CBP)
- 2001, 2006, and 2011 Census data
- Survey of Employment, Payroll and Hours (SEPH)
- Labour Force Surveys (LFS)
- Canadian Occupational Projection System (COPS)
- CANSIM Demographics
- Postsecondary Student Information System Education Data (PSIS)



For more information about Analyst, or to request access to the tool, see:
<http://www.omafra.gov.on.ca/english/rural/edr/edar/#analyst>



BD4SP Case Study – Narrowing the Focus

The “Funnel” – Start with the big picture, but refine the focus to a component that is small enough to be manageable without losing sight of the big picture.

The Municipality of Mississippi Mills, Ontario recently went through a process of updating the Community Official Plan, Economic Development Plan, and Recreation Master Plan as well as developing a Transportation Master Plan. Active transportation (walking, running, cycling) emerged as a theme that fit many of the planning objectives related to community attractiveness and wellbeing. Under the umbrella of the Transportation Master Plan, the Big Data for Small Places approach revealed that active transportation issues impacted many areas, including commuting to work, infrastructure improvements (sidewalks, bike lanes, etc.), accessibility for the physically challenged, and more. The Big Data for Small Places process facilitated access to data in a number of these areas, as well as leading to the selection of the goal of attaining Bronze Status for Mississippi Mills in The Bicycle Friendly Community Award (BFC) Program of the Share the Road Cycling Coalition in Canada. Although the specific data access, analysis, and reporting requirements of the BFC program eventually necessitated the hiring of a consultant, the Big Data for Small Places approach enabled the municipality to make more effective use of the consultant’s work.

2.3.5 Project Overview Worksheet

Project Title:			
Project Description:			
Focus Statement:			
Data Requirements:			
Domain (Category):	Indicator:	Data Source:	Responsibility:
Next Steps:			
Further Research	Report to ...	Funding Application	Other

2.3.6 Other data sources

Rural Ontario Institute – Focus on Rural Ontario

Focus on Rural Ontario is a series of two-page fact sheets providing socio-economic data and trends for rural Ontario geographies. While data is available on a community basis directly from Statistics Canada, analysis across Ontario geographies requires a significant investment of time to differentiate any rural versus urban trends. Organizations or municipalities in rural and small town Ontario may not have the resources to compare local happenings with broader trends. ROI has commissioned Ray Bollman, former Chief of Statistics Canada Rural Research Group, to fill this gap by analyzing data and producing these resources. Focus on Rural Ontario fact sheets are available on a range of topics including: rural population, economic trends, demographic issues, philanthropy, and others. While the fact sheets are available in print or pdf formats, in many cases the data that informed the production of the fact sheet may be available by contacting ROI. The Rural Ontario Institute also publishes research and analysis on several topics from a rural perspective, including health, employment, and transportation.

<http://www.ruralontarioinstitute.ca/rural-reports/focus-on-rural-ontario>

Community Data Program

Led by the Canadian Council on Social Development (CCSD) the Community Data Program is a community data consortium that provides a gateway for municipalities and community sector organizations to access customized tables from Statistics Canada and other providers to monitor and report on social and economic development trends within their communities. Members access customized tables from Statistics Canada and other sources to get the evidence that supports sound decisions and social development programs. The Community Data Program is made up of a national network of over 30 community data consortia. The communities they represent account for almost 60 percent of the Canadian population. Consortium users rely on CDP data to monitor and report on social and economic development trends and conditions within their communities.

<http://communitydata.ca/about>

Small Area Data Guide

The Small Area Data Guide has been prepared for those who want to better understand what data is readily available about their community and about the regions where they live. This publication is one component of the Rural Ontario Institute's project on Measuring Rural Community Vitality and this Guide supplements the Focus on Rural Ontario Fact Sheet series that draw on the data described in this guide. The objective of

this “Guide” is to show the data from federal agencies that are available for geographic areas within a province – some of these are relatively small lower tier municipal geographies and others are large economic regions. The guide is organized by data source. Some users would likely have benefitted from a list of data sources organized by topic, such as all databases with data on the employment rate of youth. Unfortunately, there are too many possible topics or topic combinations to create a concise and understandable document. As a compromise, this guide provides a (summarized) list of the socio-economic characteristics (or “variables”) that are available from each data source. The Small Area Data Guide is available from the Rural Ontario Institute. <http://www.ruralontarioinstitute.ca/>




BD4SP Case Study – Local Indicators and Data

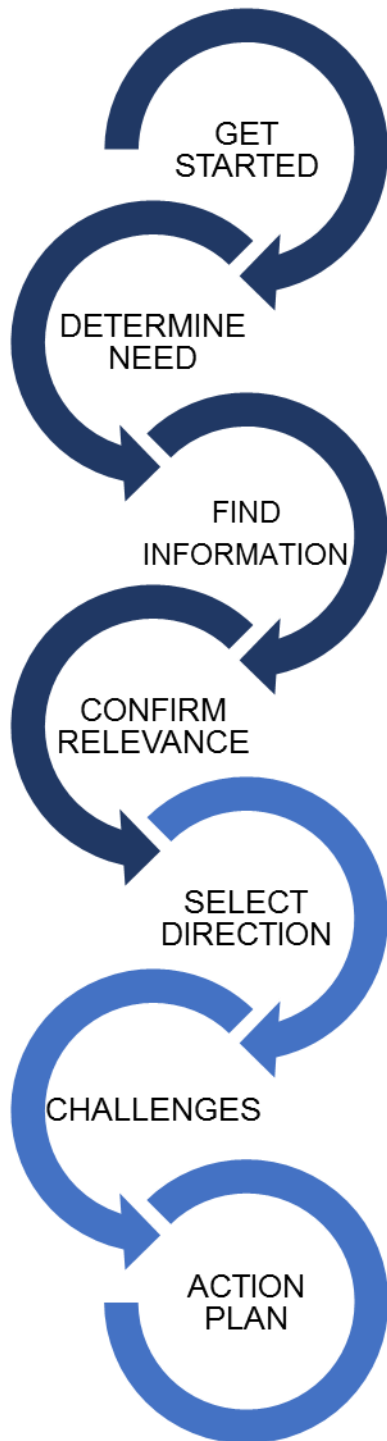
Frontenac Communal Services Working Group was composed of County of Frontenac and Frontenac Islands Township management and staff who were interested in issues around small, very local (village or subdivision scale) water and waste water systems.

The goal of the Communal Services Working Group was to use the Big Data for Small Places approach to access data and analysis of various approaches to these systems, in order to inform changes to Official Plan policies. The overall goal involved the encouragement of environmentally responsible residential development in village and waterfront areas, and ultimately to improve community attractiveness and viability, and lead to revitalization and economic growth. The Big Data for Small Places approach facilitated access to some demographic and economic data for the area, but in many instances recent local (township) data was not available due to issues with design of and response to the 2011 National Household Survey. In addition, there was interest among working group members in the development of unique local indicators that could be used to monitor future success of policy changes related to communal services. Since no such services were currently in operation in the county, there were no examples of current indicators and no baseline data. Although research was available on communal services in somewhat comparable communities, due to the wide variation in local policies, system design, and system operation, it was apparent that the selection or development of unique local indicators would need to wait until policies and systems were further along in the process.

2.3.7 Find Information Worksheet

<p>Find Information: Where to Look?</p> 	<p>Objective: Find Information relevant to the need and approach:</p> <ul style="list-style-type: none"> • Select indicators, use existing indicators if relevant, develop indicators if necessary • Select sources of data and analysis according to relevance and usefulness <p>Outcome: At the end of the Information-Finding process, you should be able to: articulate a few key indicators, explain their relevance to the need and approach, and identify data sources for each indicator.</p>
<p>Articulate a few key indicators</p>	
<p>Explain their relevance to the need and approach</p>	
<p>Identify data sources for each indicator</p>	

2.4 Confirm Relevance – What Does It Mean?



Confirm Relevance of information (indicators and data) to the question/task/need at hand:

- Use formal and informal networks
- Use formal and informal sources of knowledge

At the end of the Relevance Confirmation process, participants should be able to:

- prioritize indicators and data sources based on feedback received
- articulate the method and rationale for confirming relevance

A framework for understanding the operation of community resources (or “capital”) can be useful for selecting the most useful approaches to confirming the relevance of information, selecting directions, and developing action plans, as well as many other aspects of a rural community development project. In addition to economic capital and natural capital, the functions of social capital and cultural capital are particularly important. Social capital refers to resources (usually intangible) that can be accessed through networks and connections – who you know – whether the relationships are formal or informal. Cultural capital (knowledge and skills) – what you know – also has formal and informal aspects, often recognized in the differences between education and experiential learning.

Although access to social and cultural capital can bring many advantages, the potential negative aspects of these resources need to be recognized. Some networking and connections may include groups and individuals with goals or values that are

not compatible with those of a specific functional group. Likewise, some knowledge that may technically be cultural capital, whether formal or informal, could include information that is irrelevant or even counter-productive to the goals of the group. The key to effective use of

social and cultural capital, is to strategically access the resources that are most likely to further the goals of the group. In addition, reaching beyond a reliance on local social and cultural capital to access resources outside the community is often a pathway to increased likelihood of success.



For a more in-depth examination of the operation of formal and informal social and cultural capital in rural economic development, see: N. P. Rogers (2012). “Campus in the Country: Community college involvement in rural community development.” *Journal of Rural and Community Development*. V. 7, N. 3, p. 164-183.

<http://journals.brandonu.ca/jrcd/index>

**A Framework for Understanding the Operation of
Formal and Informal Social and Cultural Capital in Rural Economic Development**

Forms of Capital	Social	Cultural
Informal	Friends, Acquaintances	Know-how, Experience
Formal	Associations, Organizations	Professionals, Publications

In the Big Data for Small Places approach, each group is encouraged to locate one or two resources in each category (formal and informal social and cultural capital). These should be carefully selected based on the level of confidence that they will be compatible with the values and goals of the group. In some cases, this may be as simple as talking to a friend who has experience with a similar project. In other cases, it may require officially joining an association, or doing in-depth research to find relevant research publications.




BD4SP Case Study – Confirming Relevance

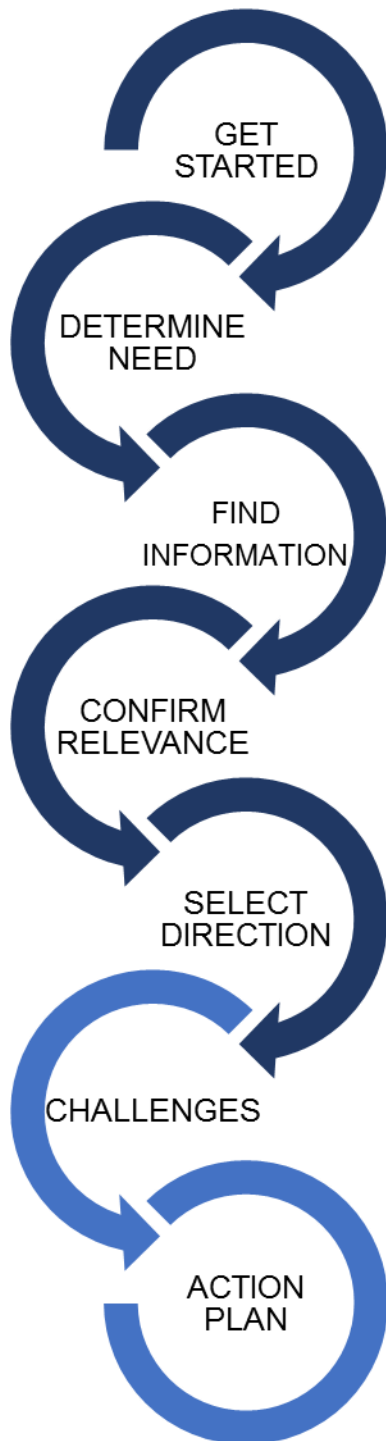
Frontenac Trails Hub Community Working Group participated in the Big Data for Small Places program to facilitate access to research on other successful trail hub communities, what initiatives they have undertaken, and evaluations of the economic impact of becoming a trail hub community.

The working group included representatives from the County of Frontenac, Township of Central Frontenac, and Tay Valley Township (Lanark County), but the focus was on the intersections of trails in the Sharbot Lake area, especially the K&P Trail (former Kingston and Pembroke Railway line). The BD4SP approach facilitated access of the working group to data on the local demographics and economy, as well as to related research on community benefits of trails such as promotion of healthy lifestyles and environmental protection, from organizations like Parks and Recreation Ontario. In addition, one of the BD4SP facilitators contacted an acquaintance who had been involved in research on the economic impact of trails in a similar context. The result of the inquiry was access to a recent and detailed report on this very topic for a nearby municipality (Highlands East, Haliburton County), as well as some feedback of the usefulness of the report in prioritizing local activities. The process that resulted in obtaining this research report illustrates the operation of informal social capital (acquaintances), formal social capital (connections with staff in associations and municipalities), formal cultural capital (research reports) and informal cultural capital (user's perspectives on the research).

2.4.1 Confirm Relevance Worksheet

<p>Confirm Relevance: What Does It Mean?</p> 	<p>Objective: Confirm Relevance of information (indicators and data) to the question/task/need at hand:</p> <ul style="list-style-type: none"> • Use formal and informal networks • Use formal and informal sources of knowledge
	<p>Outcome: At the end of the Relevance Confirmation process, you should be able to: prioritize indicators and data sources based on feedback received, and articulate the method and rationale for confirming relevance.</p>
<p>Prioritize indicators and data sources based on feedback received</p>	
<p>Articulate the method and rationale for confirming relevance</p>	

2.5 Select Direction – What to do now?



Select Direction: (focus on one or more as appropriate):

- Inform the community/general public
- Inform decision-makers (councils, representatives, government agents, etc.)
- Request assistance (policy change, service availability, funding, etc.)
- Develop or improve program or service

At the end of the Direction-Setting process, you should be able to:

- identify the intended use(s) of the information that has been collected on need and indicators
- articulate the anticipated results from the communication of this information.

At this stage, each working group should be evaluating potential uses for the information that has been gathered. Generally, these uses involve informing a target audience in order to make a change in opinions, actions, policies, or programs.

Communicating for Impact

Following a few key principles of effective communication can greatly enhance the impact of the message. Some tried-and-tested principles for communicating about community development include:

- Focus on the specific action are you taking
- Briefly explain why your plan for impact is viable
- Tell stories that link strongly to core outcomes
- Demonstrate willingness to collaborate and learn
- Build focused and consistent outcome messages
- Build messages that connect with your audience

Communicating for impact is compelling because it answers the questions “So what?” and “Why should I care?” Key things to remember:

- Focus – Talk consistently about core outcomes
- Listen – Use local data, know your niche and show how you enhance what others are doing
- Share – Show commitment to ongoing feedback
- Engage – Seek opportunities to talk about impact

At this point, each working group should have a key message statement and/or an impact statement, that may follow a pattern like one or more of these:

- Our work is focusing on helping ... which will have an impact on ...
- Our program/project helps people with ... and supports ... which will have an impact on ...
- Here’s information about the impact we’ve been able achieve to date ... with your support we’d be able to ...

Adapted from *6 Simple Tips for Communicating about Impact*. Ontario Nonprofit Network. <http://theonnc.ca/simple-tips-for-communicating-about-impact-part-1/>

In addition to the Simple Tips for Communicating about Impact, the Diffusion of Innovation Process (how an innovation/new idea is adopted or rejected) can also be helpful when introducing an innovation/new idea to a target audience. The Innovation-Decision paradigm is a mental process through which an individual or group passes from first knowledge of the new idea, to some period of persuasion where a favourable or unfavourable attitude is formed toward the new idea, to the adoption or rejection of the innovation to confirmation or discontinuance of it. As the individual or group goes through this process their rate of adoption or rejection will determine the rate of the diffusion of the new idea in their social system.


Ask yourself:

- What factors contribute to adoption or rejection?
- What are the causes of resistance to change?
- Who are the Opinion Leaders and Change Agents?
- How to I improve the rate of adoption and continuance?

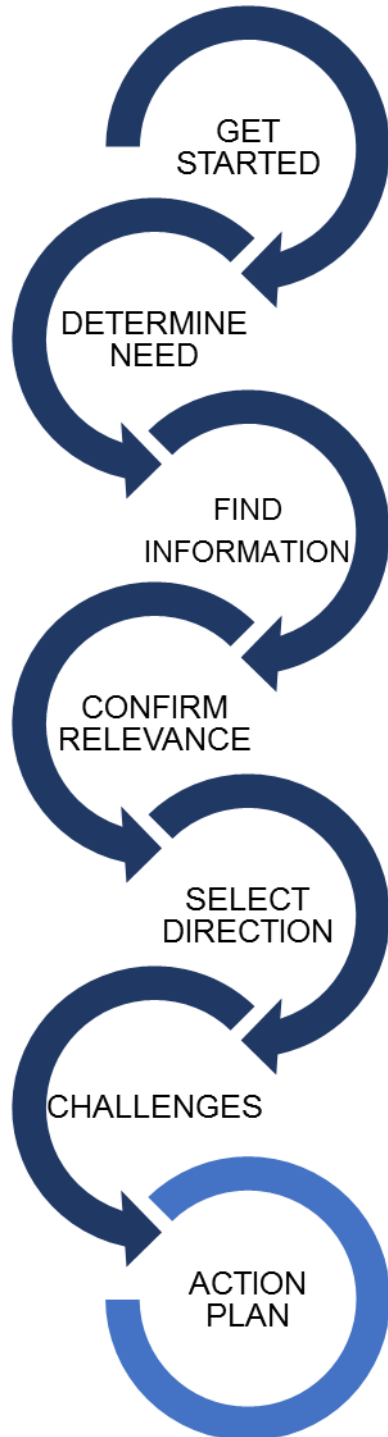
Here are some resources to help you visualize and present your data effectively:

- Presenting Data Visually <http://bit.ly/2kqmKeG>
- Prezi <http://bit.ly/2kwttDl>
- 38 Best Tools for Data Visualization <http://bit.ly/1aZmoSV>
- Edraw Visualization Solutions <https://www.edrawsoft.com/>

2.5.1 Select Direction Worksheet

<p>Select Direction: Who Needs to Know?</p> 	<p>Objective: Select Direction: (focus on one or more as appropriate):</p> <ul style="list-style-type: none"> • Inform the community/general public • Inform decision-makers (councils, representatives, government agents, etc.) • Request assistance (policy change, service availability, funding, etc.) • Develop or improve program or service
	<p>Outcome: At the end of the Direction-Setting process, you should be able to: identify the intended use(s) of the information that has been collected on need and indicators, and articulate the anticipated results from the communication of this information.</p>
<p>Identify the intended use(s) of the information that has been collected on need and indicators</p>	
<p>Articulate the anticipated results from the communication of this information</p>	

2.6 Challenges – What Could Possibly Go Wrong?



Be Aware of Challenges in data access, analysis and utilization:

- Ethical issues
- Complexity issues (variety, velocity, volume)
- What “counts” as evidence (validity and reliability, social construction of evidence)

At the end of the Challenges process, you should be able to:

- articulate the relevant ethical issues related to the information collection and dissemination
- articulate the measures that have been taken to ensure compliance with ethical standards
- articulate a rationale for what types of information have been included or not included in the process.

Data Ethics

There are a lot of gray areas when it comes to the ethical collection, use, and analysis of data. Consider these issues organizations should ponder when assessing their data use practices. The volume and types of data describing individuals and organizations continue to expand, and this trend will continue as sensors make their way into more of the everyday items we use. There are fine lines that separate the use and misuse of data, and some industry associations are addressing the issue head-on with ethical guidelines. While organizations usually have stated privacy policies, more could be done to ensure the ethical use of data.

Although obvious offenses such as fraud are clearly unethical, there is a lot of gray area when it comes to the collection, use, and analysis of data. Ethical guidelines, laws, statutes, and regulations may draw many lines. Even so, questionable situations can arise

at various stages of the data life cycle that can confound reasonable people and expose their organizations to risks. Ethical data practices are a means of gaining trust, demonstrating organizational integrity, and reducing risks. However, what is considered ethical can change with time, location, the legal and regulatory climates, sociological

changes, and personal opinion, leaving considerable room for interpretation. Meanwhile, technology is moving fast, enabling finer-grained profiling of individuals and companies. While most people may want to do the right thing, what's "right" may not be crystal clear.

Existing Guidelines Help

The Data Science Association, American Statistical Association, and Digital Analytics Association guidelines were developed with their target audiences in mind. (Visit the individual industry association websites, to see each organization's guidelines.) There are some commonalities that merit general consideration.

- Protect confidential, personally identifiable, and privileged information.
- Prevent the inadvertent or unauthorized disclosure of confidential, personally identifiable, and privileged information.
- Do not misrepresent the quality of data.
- Do not misrepresent the completeness of data (note that many data collection methods privilege some sources over others – often with ethical implications).
- Do not misuse data or statistics in a way that misrepresents the truth.
- Do not misrepresent the scope of what data science or statistical analysis can do.
- Understand (or if you're the expert, communicate) the options available and their associated risks.
- Use scientific methods if you're a data scientist or statistician. Understand the importance of scientific methods if you have other responsibilities.

Be Considerate

A survey of business professionals about the ethical issues related to data revealed a few themes that were substantially similar. The recommendations included:

- The Golden Rule: Don't collect or use personal data in a manner you wouldn't consider acceptable if it were your personal data.
- Do no harm (inspired by medical ethics).
- Make sure the use of data is consistent with your brand image.
- Make sure your customers or clients -- not just your company or organization -- get value from the data they provide you.

Adapted from “Big Data Ethics: 8 Key Facts To Ponder” by Lisa Morgan

<http://www.informationweek.com/big-data/big-data-analytics/big-data-ethics-8-key-facts-to-ponder/d/d-id/1322143>



For further information, see:

Ethics for Big Data and Analytics (IBM)

http://www.ibmbigdatahub.com/sites/default/files/whitepapers_reports_file/TCG%20Study%20Report%20-%20Ethics%20for%20BD%26A.pdf

Data Science Association – Code of Conduct

<http://www.datascienceassn.org/code-of-conduct.html>

For a user-friendly overview of research ethics policies and practices, see Niagara College, Research and Innovation – Research Ethics


<http://www.niagaracollege.ca/research-ethics-board/>

Complexity Issues

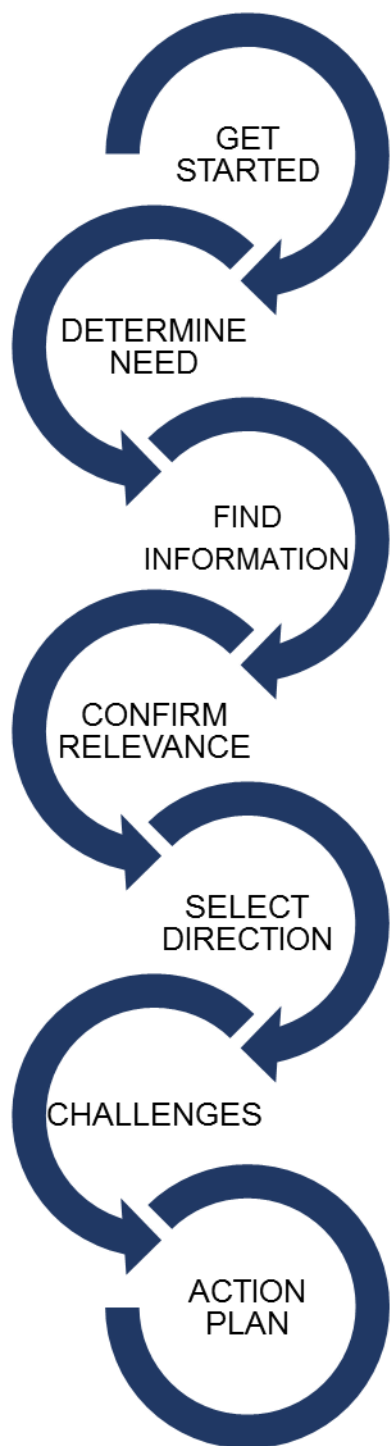
Big data involves the compilation of complex information, where the complexity is largely due to a combination of velocity (speed of change), volume (large quantities of data), and variety (data in many forms and/or from various sources). During the processes involved understanding community need, selecting indicators and data sources, and using networks and connections to obtain formal and informal knowledge about an issue, it is likely that a complex collection of information will emerge. At some point this may become overwhelming, even counter-productive.

In the Big Data for Small Places approach, each working group is encouraged to revisit their core problem statements and intended direction, for the purpose of confirming or revising these based on the information that is now available. At this stage it is usually helpful to reach out beyond the working group, utilizing key resources from formal and informal sources, in order to come to a functional agreement on which information is most useful for the task at hand and what can be set aside for future reference. In some cases it may be advisable for the group to seek funding to hire specialized help such as a researcher, data analyst, technical expert, or project manager.

2.6.1 Challenges Worksheet

<p>Challenges: What Could Possibly Go Wrong?</p> 	<p>Objective: Be Aware of Challenges in data access, analysis and utilization:</p> <ul style="list-style-type: none"> • Ethical issues • Complexity issues (variety, velocity, volume) • What “counts” as evidence (validity and reliability, social construction of evidence)
	<p>Outcome: At the end of the Challenges process, you should be able to: articulate the relevant ethical issues related to the information collection and dissemination, articulate the measures that have been taken to ensure compliance with ethical standards, and articulate a rationale for what types of information have been included or not included in the process.</p>
<p>Articulate the relevant ethical issues related to the information collection and dissemination</p>	
<p>Articulate the measures that have been taken to ensure compliance with ethical standards</p>	
<p>Articulate a rationale for what types of information have been included or not included in the process</p>	

2.7 Action Plan – Where to next?



Develop an Action Plan based on need, information, direction, and challenges:

- Communicate need, information, direction
- Implement appropriate action
- Monitor progress/success

At the end of the Action Plan process, you should be able to:

- describe the intended actions that will result from the process, including:
 - what will be done, by whom, by what date, with what expected result, as well as
 - when and how the expected results will be evaluated.

There are many excellent resources available in print and online to help groups evaluate options and agree on a course of action. Working groups are encouraged to select a specific format or method to arrive at consensus about their next steps.

For example, among the “classics” in this field are the writings of Edward de Bono, especially *Six Thinking Hats* and *Six Action Shoes*. The thinking hat approach encourages groups to look at a problem from six perspectives:

- white hat – objectivity, data, information
- red hat – feelings, hunches, intuition
- black hat – negatives, cautions, judgments
- yellow hat – positives, feasibility, benefits
- green hat – new ideas, creativity, innovation
- blue hat – organize the process, prioritize perspectives

The action shoe approach encourages groups to carefully consider several types of actions, and to be aware that often more than one type of action may be necessary. The six action shoes of de Bono are:

- navy formal shoes – routines, formalities, processes
- grey sneakers – investigation, exploration
- brown brogues – practicality, pragmatism
- orange boots – danger, caution, emergency
- pink slippers – compassion, sensitivity
- purple riding boots – leadership, trailblazing




For more information about these decision-making tools, see:
E. de Bono (1985) *Six Thinking Hats*. (Little, Brown and Company)
E. de Bono (1991) *Six Action Shoes*. (Harper Collins Publishers)
<http://www.debonogroup.com/>

Experience with the Big Data for Small Places approach indicates that the most frequent types of action for rural community development groups are:

- additional research (typically on a much narrower aspect of the original focus),
- additional training (skill development of group members for a specific challenge or opportunity),
- a report or presentation to a target audience (general public, stakeholder group, decision-makers),
- a funding application (fund-raising, or grant, or investment), or
- a concrete project (build or renovate something, improve a local asset).

2.7.1 Action Plan Worksheet

<p>Action Plan: Where to next?</p> 	<p>Objective: Develop an Action Plan based on need, information, direction, and challenges:</p> <ul style="list-style-type: none"> • Communicate need, information, direction • Implement appropriate action • Monitor progress/success 	
	<p>Outcome: At the end of the Action Plan process, you should be able to: describe the intended actions that will result from the process, including: what will be done, by whom, by what date, with what expected result, as well as when and how the expected results will be evaluated.</p>	
Describe the intended actions that will result from the process: What will be done?		
	By Whom	By When
Expected Result		
Describe when and how the expected results will be evaluated		

3 APPENDICES

3.1 Appendix A: Concepts, Definitions, Terminology

Adapted from a variety of Internet sources:

Analytics: method of logical analysis

Analysis: a careful study of something to learn about its parts, what they do, and how they are related to each other: an explanation of the nature and meaning of something

Business Analytics: the practice of methodical exploration of an organization's data with emphasis on statistical analysis; the foundation of data-driven decision-making; answers questions like: Why is this happening? What if these trends continue? What will happen next? (that is, predict), What is the best that can happen? (that is, optimize), What is the worst that can happen? (that is, prevent).

Decision Analytics: supports human decisions with visual analytics the user models to reflect reasoning.

Descriptive Analytics: gains insight from historical data with reporting, scorecards, clustering etc.

Predictive Analytics: employs predictive modeling using statistical and machine learning techniques

Prescriptive Analytics: recommends decisions using optimization, simulation, etc.

Business Case: a presentation or a proposal to an authority by an organization seeking funding, approval, or both, for an activity, initiative, or project - justification for a proposed project or undertaking on the basis of its expected commercial benefit

Business Intelligence: a discipline made up of several related activities, including data mining, online analytical processing, querying and reporting - a philosophy which includes the strategies, processes, applications, data, products, technologies and technical architectures used to support the collection, analysis, presentation and dissemination of business information

Correlation: a statistical measure that indicates the extent to which two or more variables fluctuate together. A positive correlation indicates the extent to which those variables increase or decrease in parallel; a negative correlation indicates the extent to which one variable increases as the other decreases

Data: facts or information used usually to calculate, analyze, or plan something; information that is produced or stored by a computer.

Big Data: a term for data sets that are so large or complex that traditional data processing applications are inadequate to deal with them. Challenges include analysis, capture, data curation, search, sharing, storage, transfer, visualization, querying, updating and information privacy.

Data Mining: an interdisciplinary subfield of computer science. It is the computational process of discovering patterns in large data sets involving methods at the intersection of artificial intelligence, machine learning, statistics, and database systems. The overall goal of the data mining process is to extract information from a data set and transform it into an understandable structure for further use.

Data Visualization: a general term that describes any effort to help people understand the significance of data by placing it in a visual context - patterns, trends and correlations that might go undetected in text-based data can be exposed and recognized easier with data visualization such as infographics, dials and gauges, geographic maps, sparklines, heat maps, and detailed bar, pie and fever charts.

Dashboard: a control panel located in front of the driver of a vehicle. Dashboard may also refer to: Dashboard (business), a web page which collates information about a business. Dashboard (management information systems), a management tool used to get an overview of enterprise health. In real-world terms, "dashboard" is another name for "progress report" or "report." Often, the "dashboard" is displayed on a web page that is linked to a database which allows the report to be constantly updated.

Fever Chart: a graphical representation showing change of a variable over time. Fever charts are used for data that changes continuously, like stock prices. They allow for a clear visual representation of a change in one variable over a set amount of time. Fever charts are sometimes called time-series charts.

Indicator: a thing, especially a trend or fact, that represents the state or level of something; a device providing specific information on the state or condition of something in particular.

Infographic: a visual image such as a chart or diagram used to represent information or data.

Statistics: the study of the collection, analysis, interpretation, presentation, and organization of data; numerical statements of facts in any department of inquiry placed in relation to each other. In applying statistics to a problem, it is common practice to start with a population or process to be studied. Populations can be diverse topics such as "all persons living in a country" or "every atom composing a crystal". Ideally, statisticians compile data about the entire population (an operation called census). When a census is not feasible, a chosen subset of the population called a sample is studied. To still draw meaningful conclusions about the entire population, inferential statistics is needed. It uses patterns in the sample data to draw inferences about the population represented, accounting for randomness.

Sparkline: a very small line chart, typically drawn without axes or coordinates. It presents the general shape of the variation (typically over time) in some measurement, such as temperature or stock market price, in a simple and highly condensed way.

Web Analytics: a generic term meaning the study of the impact of a website on its users, such as how many people visited the site, how many of those visitors were unique visitors, how they came to the site (i.e., if they followed a link to get to the site or came there directly), what keywords they searched with on the site's search engine, how long they stayed on a given page or on the entire site and what links they clicked on and when they left the site.

Data-Related Roles:

Data Scientist: is someone who makes value out of data. Duties typically include creating various Machine Learning-based tools or processes within an organization, such as recommendation engines or automated lead scoring systems. Data Scientists provide expertise on mathematical concepts for the broader applied analytics team and inspire the adoption of advanced analytics and data science across the entire breadth of the organization. People within this role should also be able to perform statistical analysis. Qualifications: Ph.D. or Master's Degree in operations research, applied statistics, data mining, machine learning, physics or a related quantitative discipline.

Data Analyst: is someone who translates numbers into plain language. Most businesses and organizations collect data on activities, research, logistics, or operational costs. A data analyst's job is to take that data and use it to help organizations make more informed decisions. Qualifications: Bachelor's degree is needed for most entry-level jobs, and a master's degree will be needed for many upper-level jobs. Most analysts will have degrees in fields like math, statistics, computer science, or something closely related to their field. Strong math and analysis skills are needed.

Data Entry Clerk: sometimes referred to as a key entry operator, data entry specialist, data entry clerk, database administrator or an information processing worker these are the common core functions and data entry skills of the job. Qualifications: College level diploma. Good organization, typing, and data entry skills, attention to detail, confidentiality, thoroughness, decision-making, independence, analyzing information, results driven, energy level.

Data User: is someone who controls the collection, holding, processing, or the use of data. *Data* by itself or numbers by themselves offer little *meaning* without contexts.

3.2 Appendix B: Domains & Indicators

Canadian Index of Wellbeing - Domains & Indicators

Indicator Domains (Categories) Canadian Index of Wellbeing	Canadian Index of Wellbeing Community Vitality
<ul style="list-style-type: none">• Community Vitality• Democratic Engagement• Education• Environment• Healthy Population• Leisure and Culture• Living Standards• Time Use	<ul style="list-style-type: none">• Percentage reporting participation in organized activities• Percentage with 6 or more close friends• Property crime rate per 100,000 population• Violent crime rate per 100,000 population• Percentage who feel safe walking alone after dark• Percentage disagreeing that they worry less about the needs of others• Percentage who provide unpaid help to others on their own• Percentage reporting very or somewhat strong sense of belonging to community

Canadian Index of Wellbeing Democratic Engagement

- Percentage of voter turnout at federal elections
- Percentage that are not interested in politics at all
- Percentage strongly agree it is every citizen's duty to vote in federal Elections
- Percentage reporting they are satisfied with the way democracy works in Canada
- Percentage reporting that policies of federal government made them better off
- Ratio of registered to eligible voters
- Percentage of women in Parliament
- Net official development aid as a percentage of gross national income

Canadian Index of Wellbeing Education

- Ratio of childcare spaces to children aged 0 to 5 years of age
- Percentage of children doing well on five developmental domains
- Ratio of students to educators in public schools
- Average of 5 social and emotional competence scores for 12 to 13 year olds
- Basic knowledge and skills index for 13 to 15 year olds
- Percentage of PISA scores explained by socio-economic background
- Percentage of 20 to 24 year olds in population completing high school
- Percentage of 25 to 64 year olds in population with a university degree

Canadian Index of Wellbeing Environment

- Ground level ozone (population weighted in parts per billion)
 - Absolute GHG emissions (megatons of CO2 per year)
 - Primary energy production (petajoules)
- Water yield in Southern Canada
- Viable Non-Renewable Energy Reserves Index
- Viable Metal Reserves Index
- Canadian Living Planet Index
 - Marine Trophic Index

Canadian Index of Wellbeing Healthy Population

- Percentage self-rated health as excellent or very good
- Percentage with self-reported diabetes
- Life expectancy at birth, years
- Percentage of daily or occasional smokers among teens aged 12 to 19
 - Percentage with probable depression
- Percentage rating patient health services as excellent or good
- Percentage aged 65 years or more getting influenza immunization
- Avg. number of remaining years expected to be lived in good health (avg. HALE 15+)

Canadian Index of Wellbeing Leisure and Culture

- Average percentage of time spent on the previous day in social leisure activities
- Average percentage of time spent on the previous day in arts and culture activities
- Average number of hours in the past year volunteering for culture and recreation organisations
- Avg. monthly frequency of participation in physical activity lasting over 15 minutes
- Average attendance per performance in past year at all performing arts performances
- Average visitation per site in past year to all National Parks and National Historic Sites
- Average number of nights away per trip in the past year on vacation trips to destinations over 80 km from home
- Expenditures in past year on all aspects of culture and recreation as a percentage of total household expenditures

Canadian Index of Wellbeing Living Standards

- Ratio of top to bottom quintile of economic families, after tax
- After tax median income of economic families
- Percentage of persons in low income
- Scaled value of CSLS economic security
- Percentage labour force with long-term unemployment
- Percentage of labour force employed
- CIBC index of employment quality
- RBC housing affordability index

Canadian Index of Wellbeing Time Use

- Percentage of 20 to 64 year olds working over 50 hours per week
- Percentage of 20 to 64 year olds reporting high levels of time pressure
- Percentage of 20 to 64 years old giving unpaid care to seniors
- Percentage of 65 years and older reporting daily active leisure activities
- Percentage of 65 years and older reporting annual formal volunteering activities
- Percentage of 12 to 17 year olds spending two hours or more per day on TV or video games
- Percentage of 6 to 9 year olds having weekly or more structured activities
- Percentage of 3 to 5 year olds read to daily by parents

Vital Signs - Domains & Indicators

<p>Indicator Domains (Categories) Vital Signs</p> <ul style="list-style-type: none">• Arts & Culture• Belonging & Engagement• Economy• Environmental Sustainability• Getting Started (Early Years)• Health & Wellness• Housing• Learning• Safety• Sports & Recreation• Standard of Living• Transportation	<p>Vital Signs Arts & Culture</p> <ul style="list-style-type: none">• Public Sector Funding for Arts Groups• Employment Up In Cultural Industries• Public Library Use• Film and Media Production• Creativity Index Ranking
<p>Vital Signs Belonging & Engagement</p> <ul style="list-style-type: none">• Volunteer Rate• Charitable Donations• Happiness Index• Sense of Belonging	<p>Vital Signs Economy</p> <ul style="list-style-type: none">• Employment Rate• Unemployment Rate• Employment Growth• Employment by Sector• Average Weekly Hours Worked• Entrepreneurial Index• Competitiveness

Vital Signs Environmental Sustainability

- Waste Diversion Rate
- Greenhouse Gas Emissions
- Green Buildings
- Locally Grown Options
- Ocean-Friendly Seafood Options
- Bird Count
- Water Consumption

Vital Signs Getting Started

- Child Care Spaces
- Child Care Fees
- Youth Unemployment
- New Immigrant Employment
- Population Increase (Birth/Death Ratio)
- Children in Government Care

Vital Signs Health & Wellness

- Low Birth Weight Babies
- Access to Doctors
- Surgery Wait Time for Children
- Hip Surgery Wait Time
- Heavy Drinking
- Mental Health

Vital Signs Housing

- Ratio of Residential Prices and Median Family Income
- Rental Vacancy Rate
- Average Rent for a Private Apartment
- Rental Supply
- Single-Family Home Price

Vital Signs Learning

- High School Non-Completion Rate
- Aboriginal High School Completion Rate
- Post-Secondary Education Completion
- Tuition Fees
- Internet Access
- Summer Reading (12 and under)

Vital Signs Safety

- Satisfied with Personal Safety
- Feel Worried Using Transit After Dark
- Police Officers Per Capita
- Violent Crime Rate
- Property Crime Rate

Vital Signs Sports & Recreation

- Sports Tourism
- Investment in Sport & Recreation Infrastructure
- Athletes in Olympic and Paralympic Teams
- Household Spending on Recreation
- Physically Active
- Youth Screen Time

Vital Signs Standard of Living

- Highest 10% Income / Lowest 10% Income Ratio
- Living Wage
- Median Hourly Earnings
- Cost of Food
- Food Security
- Poverty Rate
- Child Poverty Rate
- Seniors' Poverty Rate

Vital Signs
Transportation

- Transit System
Passengers Per Capita
- Cycling Network (km)
- Cycle to Work Rate
- Price of Gas
- Ferry Traffic
- Airport Passengers

Newcomer & Youth Community Indicators

Newcomer & Youth Community Indicators

- **Economy**
- **Amenities**
- **Education**
- **Health**
- **Housing**
- **Innovation**
- **Society**
- **Youth**

Economy

- Employment Income per Capita
- Economic Diversity
- Employment Growth (%)
- Participation Rate (%)
- Unemployment Rate (%)
- Proportion of Workforce Travelling Outside the Community for Work (%)
- **Average (Group)**
- **Average (Province)**

Amenities

- Proportion of Workforce Employed in Cultural Industries (%)
- Proportion of Workforce Employed in Tourism Industries (%)
- Number of Seasonal Dwellings per 1,000 people
- Average Distance to Libraries (km)
- Average Distance to Airports (km)
- Average Distance to Museums (km)
- Per Capita Parks and Recreation Spending
- **Average (Group)**
- **Average (Province)**

Education

- Proportion of Population with College Education (%)
- Proportion of Population with Bachelors Degree (%)
- Proportion of Population with Advanced Degree (%)
- Growth of Educated Population
- Number of Elementary and Secondary School Teachers for School Age Population
- Average Distance to Post Secondary Institution (km)
- Average Distance to High School (km)
- OSSLT Test Scores
- **Average (Group)**
- **Average (Province)**

Health

- Number of Specialist Physicians per 100,000 Population
- Number of General Practitioners per 100,000 Population
- Number of Dentists per 100,000 Population
- Proportion of Population Employed in Health Care Services Occupations (%)
- Average Distance to Hospital (km)
- **Average (Group)**
- **Average (Province)**

Housing

- Proportion of Income Spent on Mortgage (%)
- Proportion of Income Spent on Rent (%)
- Housing Affordability
- Proportion of Homes in Need of Major Repair (%)
- Proportion of Rental Units (%)
- **Average (Group)**
- **Average (Province)**

Innovation

- Productivity
- Productivity Growth
- Proportion of Population Employed in Natural and Applied Science Occupations (%)
- Proportion of Population Employed in Computer and Information Systems Occupations (%)
- Proportion of Creative Class Workers (by place of work) (%)
- Proportion of the Population Educated in Engineering, Math and Science (%)
- New Firm Density
- **Average (Group)**
- **Average (Province)**

Society

- Proportion of Population Aged 25 - 39 (%)
- Proportion of Population Foreign Born (%)
- Success of Foreign Born Population
- Diversity of Population
- Proportion of Population Below LICO (%)
- Gender Income Equality
- Senior Dependency Ratio
- Net Migrants per 1,000 Population
- **Average (Group)**
- **Average (Province)**

Youth

- Youth Employment Income
- Youth Unemployment Rate (%)
- Youth Participation Rate (%)
- Proportion of Youth not Employed, in Education or in Training
- Proportion of Youth that are Self Employed
- Proportion of Youth with a High School Diploma
- Proportion of Migrants Aged 15 to 19 per 1,000 Population
- Proportion of Migrants Aged 20 to 24 per 1,000 Population
- Proportion of Migrants Aged 25 to 29 per 1,000 Population
- **Average (Group)**
- **Average (Province)**