Economic Indicators Review – Housing and Infrastructure

DEVELOPING THE COLUMBIA BASIN RURAL DEVELOPMENT INSTITUTE'S ECONOMIC RESEARCH PILLAR

Part of a series of research papers on indicator development for the State of the Basin project in the Columbia Basin Boundary Region

APRIL 2013

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THE STATE OF THE BASIN INITIATIVE

The State of the Basin is an indicator and monitoring program originally developed by Columbia Basin Trust (CBT). Now a project of the Columbia Basin Rural Development Institute (RDI), the State of the Basin initiative involves collecting, analyzing and reporting on indicators in order to build an up-to-date and dynamic picture of the vitality of communities in the Basin Boundary region.

OBJECTIVES

When originally envisioning the State of the Basin, CBT developed the following four goals. These goals collectively define the purpose of the initiative:

- ***inform*** citizens and organizations about the people, natural environment, communities, and economy of the Basin by providing access to accurate, credible, and timely information,
- ***encourage*** understanding of complex issues and trends over time, including into the future when possible,
- ***signal*** whether conditions are similar or different within the Basin, and in comparison to other areas to highlight and celebrate areas of achievement, and to identify significant issues, ideally before they become critical, and
- ***motivate*** discussion, information sharing, strategic evidence-based decisions and collective action.

HISTORY

In 2006, CBT responded to long-standing requests for information on social, economic, environmental and other trends in the Basin by launching the State of the Basin initiative. Resulting from the work of project consultants, a volunteer working group, CBT staff and more than 50 expert advisors, the first State of the Basin report was released in 2008. This report was accompanied by a website that provided access to updated trend analyses and raw data. In order to support the application of available information, the State of the Basin initiative also provided support to individuals and communities interested in understanding and using the data. The purpose of the 2008 State of the Basin Initiative was to test the concept of indicator reporting in the region by presenting a sample of credible, locally relevant information.

Response to the 2008 project indicated that the State of the Basin initiative addressed an important need for information in the region, and that future iterations would be of benefit to local communities and organizations. Acknowledging the links between the objectives of the State of the Basin project and the mandate of the RDI, CBT transferred responsibility for the project to the RDI in 2011. Because the RDI's service area includes the entire Basin Boundary region of BC, the geographic scope of the State of the Basin has expanded beyond the area defined by CBT as "the Basin" to include a portion of the Regional District of Kootenay Boundary referred to as "the Boundary region" (figure 1).

Figure 1: The Basin Boundary Region

In 2012, the RDI developed an updated State of the Basin report using the same, or similar, indicators that were used in the 2008 version. However, the 2013 State of the Basin project will incorporate a significant revision to the suite of indicators monitored through the initiative. The future focus of the State of the Basin will be on researching and reporting on information that is of the highest value to Basin Boundary communities. In order to ensure the State of the Basin achieves maximum relevance and utility, consultation with key stakeholders and user groups will be an important component of the indicator development and reporting process.

INDICATOR MODEL

The State of the Basin uses an indicator model to report on the status of well-being in the Basin Boundary region. Indicator reporting is a growing trend among organizations that operate at various geographic scales (from global to neighbourhood-specific) and with varying scopes of interest (from those as broad as well-being to those as specific as financial performance). By distilling complex information into easily understandable measures, indicators help diverse audiences, with widely ranging backgrounds, to understand important trends.

As part of the 2013 State of the Basin update, the RDI completed research on best practices in indicator reporting and on lessons learned from the 2008 report development process. This literature review adds context-specific discussion to that research.

RESEARCH FRAMEWORK

The RDI has developed a new State of the Basin research framework which, similar to the 2008 framework, is centred on the concepts of well-being and sustainable development. The new framework organizes research efforts into four "pillars" – society, culture, the environment, and the economy—each of which have several defined sub-themes (figure 2).
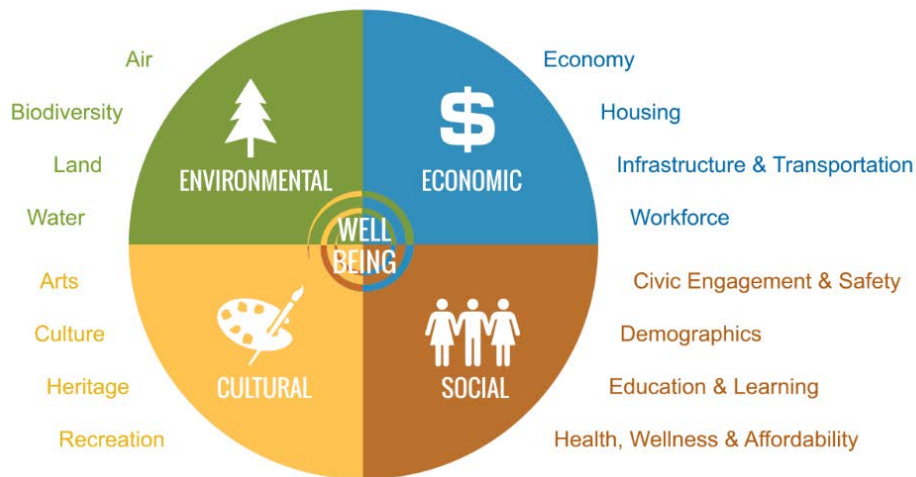

Figure 2: Revised State of the Basin research framework

Many indicator projects adopt a similar approach to research, understanding that "well-being" or "sustainability" are difficult concepts to measure in themselves. Instead, progress toward achieving those goals can be measured through an assessment of conditions in more narrowly-defined realms of influence.

In the literature on indicator reporting, a strong case is made for linking environmental, economic, social, and cultural indicators through a common lens such as well-being or sustainability. By adopting this approach, the State of the Basin initiative explicitly acknowledges that community vitality is dependent on the strength of all four pillars and that the environment, the economy, culture and social systems are very much interconnected. A change in conditions in one pillar or sub-theme not only affects the overall measure of well-being, but it can also affect the status of other pillars or sub-themes. Exploring these inter-pillar relationships will be a priority for State of the Basin research.

INFORMATION PRODUCTS, TOOLS, AND SUPPORT

State of the Basin research will be made available to Basin Boundary communities in a variety of formats:

1. A snapshot report will provide an overview of the project and quick, interesting research findings in a format that will be accessible to a wide audience.
2. A full report will provide in-depth discussion of each indicator, including its relevance, current status and an analysis of regional trends.
3. The "Digital Basin" will provide web-based data tools, including:

a. an interactive and customizable map displaying spatial features of all relevant indicators, as well as environmental, economic, social and cultural assets in the region,
b. a customizable data viewer that allows for analysis and comparison of indicator data over time and space, and
c. a resource library that will allow users to download supporting documents (plans, reports by other organizations, etc.) for independent analysis.

In addition, the RDI will support development and use of State of the Basin research in Basin Boundary communities by:

- liaising with key economic, social, cultural and environmental stakeholders to better understand their information needs and research capacity (such as the ability to collect and use related information),
- identifying opportunities for local data collection by key stakeholder groups,
- providing direct research support, standardized data templates, training and support materials focused on the collection and use of indicator data,
- promoting and facilitating the sharing of information and best practices across key stakeholder groups, and
- exploring opportunities to link the State of the Basin initiative with K-12 and post-secondary student learning.

DEVELOPING HOUSING AND INFRASTRUCTURE INDICATORS

This paper, produced as part of a series on indicator reporting in the Basin Boundary Region of BC, addresses the subject areas of Infrastructure/Transportation and Housing, under the Economic research pillar of the State of the Basin project. The objectives of this paper are fourfold:

1. discuss justifications for measuring trends in infrastructure, transportation and housing in the State of the Basin report,
2. briefly review the literature on indicator reporting for these subject areas,
3. discuss and evaluate potential indicators to include for the Infrastructure/Transportation and Housing components of the State of the Basin report, and
4. recommend a draft suite of indicators to guide the stakeholder engagement strategies that will help determine the final suite of indicators.

WHY MONITOR HOUSING AND INFRASTRUCTURE/TRANSPORTATION DATA?

Housing and infrastructure are essential building blocks for all communities. A mix of adequate shelter options attracts the residents, workers and families that together create a community's vibrant social systems. Affordable, accessible and well-maintained infrastructure supports healthy populations, fuels economic growth, and links the community with the outside world. Despite, or

perhaps because of, the strong links between infrastructure, housing and well-being, these aspects of development are some of the most frequent subjects of community-level debates.

INFRASTRUCTURE AND TRANSPORTATION

Shen et al. (2011) state that "infrastructure is the foundation for social and economic development" (p. 441) and identify utilities (including energy, telecommunications, drinking water, sewer and solid waste) and public works (including roads, dams, canals, railways, transportation, waterways and airports) as key considerations for this theme. Public infrastructure investments enable economic growth (Daniels et al., 2007) and can represent a significant contribution to the economy themselves (Shen et al., 2011). This is evidenced locally through the Waneta Expansion project, which is expected to create the equivalent of 400 full-time jobs over 4.5 years (Columbia Power Corporation, n.d.).

Within the realm of infrastructure, several sub-themes are of particular interest to the Basin Boundary Region. For example, drinking water systems are a concern in this region, given the disperse nature of its communities and residences. Due to this dispersion, there is a proliferation of small drinking water systems, many of which struggle to meet regulatory treatment and distribution standards. Because many Basin Boundary communities are isolated, the availability of advanced telecommunications infrastructure is also a concern. Guidry's (2011) review of the literature on the importance of fibre optic availability to economic growth confirms that telecommunications infrastructure supports businesses by promoting efficiency, enhancing decision-making capabilities and improving customer service. Transportation networks are also of interest to the region given its strength in manufacturing and dependence on export markets. Daniels et al. (2007) confirm that proximity to major transportation routes and good airport facilities is a major determinant of economic growth in rural communities.

HOUSING

Appropriate housing has been recognized as a necessity for human well-being through the Universal Declaration of Human Rights, which states:

> *"Everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food, clothing, housing and medical care and necessary social services" (Article 25(1)).*

Housing affects, and is affected by, nearly all aspects of well-being, including economies, the environment, social systems and culture. Jackson (2004) imparts that housing systems are closely tied to spacial qualities of society. Further, they are both an indicator and determinant of wealth equality in communities. Providing a mix of housing types that meets the needs of residents in various economic situations and stages of life has been shown to help revitalize small towns and ensure suitable conditions for economic growth. Yet, maintaining a strong housing stock in the wake of economic decline and population loss is a key challenge for many small and rural communities (Daniels et al., 2007). For this reason, housing is a top-of-mind issue in the Basin Boundary Region.

WHAT SHOULD WE MEASURE AND HOW SHOULD WE MEASURE IT?

INFRASTRUCTURE AND TRANSPORTATION

Calderon and Chong (2004) review the importance of assessing both quantity measures (including supply/access and demand/utilization) and quality measures (including condition and level of service) in assessments of the adequacy of infrastructure. Daniels et al. (2007) add that affordability is a key consideration, especially in a rural context.

Many similar community indicator projects have reported primarily on quantity measures, specifically those relating to utilization or demand. For example, waste disposal rates and average water use per capita are two indicators tracked by Sustainable Seattle, the Fraser Basin Council and Winnipeg's Peg project. Some also track transit ridership (Calgary Vital Signs, Peg) and energy consumption (Sustainable Seattle, Fraser Basin Council). On the supply or access side, the Vancouver Vital Signs project reports on hours of transit service offered, the Montreal Vital Signs project reports on the number of kilometers of cycling trails in the region, and the Fraser Basin Council reports on the percentage of the population with access to primary, secondary and tertiary waste water treatment.

Infrastructure quality measures have historically been less of a focus for community indicator projects, perhaps because of the limited availability of the type of data that would be necessary to develop these indicators. The Fraser Basin Council reports a water quality index for monitored water bodies in that region; however, this measure refers to raw water and not that processed through water treatment infrastructure.

HOUSING

Daniels et al. (2007) discuss three aspects of housing assessments that are important to measure:

- stock (including types of dwelling units, tenure and vacancy),
- condition, and
- affordability.

Many community indicator projects focus on the latter aspect of housing research (Finkle, 2004). For example, projects in Calgary, the Fraser Basin, Montreal, Whistler and Seattle all track an affordability rate, typically defined as the percentage of the population that is spending more than 20 or 30 percent of their income on housing. Many of these projects also report on homelessness or waitlists for social housing.

Winnipeg's Peg project focuses more on the stock and condition aspects of housing research, reporting on vacancy rates, housing starts and the percentage of dwellings in need of major repair. The Fraser Basin Council's sustainability indicators project also reports on vacancy rates and housing starts.

DISCUSSION AND EVALUATION OF POTENTIAL INDICATORS

Below, a list of potential housing and infrastructure/transportation indicators is presented. For each indicator, a discussion of data sources and linkages to other themes is provided. Each indicator is also run through the TURC test, which asks if an indicator is **t**echnically sound, **u**nderstandable, **r**elevant and **c**ost effective. This methodology has been proposed by De Vries (2001) and used by other authors (see: Mac Ginty, 2004 and Crawford et al., 2004). For a discussion of the criteria used by the TURC test to measure indicator suitability, see the document, *Economic Indicator Review - Economy and Workforce*, which is part of this same series of papers presenting research on indicators for the 2013 State of the Basin report. For a discussion of the types of indicators commonly used in indicator reporting, see the document, *Environmental Indicators Literature Review*, also produced as part of this series.

INFRASTRUCTURE AND TRANSPORTATION

1. *Access to broadband internet*

Sub-theme: Quantity (supply)

Description: This indicator would measure the percentage of households with the option to connect to broadband internet (i.e., the percentage of total households that are within the service area of a broadband internet provider.)

Data sources: Selkirk College's geospatial data inventory already includes house points for the region. Broadband service areas could be obtained from internet service providers, including Telus, Shaw and Columbia Basin Broadband Corporation. Spatial analysis could be completed by the Selkirk College Geospatial Research Centre (SGRC). Data could be updated on an annual basis and disaggregated by community, census subdivision or trade corridor.

Links to other research pillars: Broadband access is an important determinant of economic growth, but it also enables communication for other purposes. This indicator therefore has links to the *cultural and social* research pillars.

TURC test:

Criteria	Discussion
Technically sound	This indicator is well-defined and the data would be robust and repeatable.
Understandable	This is a direct indicator that would be easy for the general population to understand.
Relevant	A recent Basin Boundary Business Retention and Expansion pilot project revealed that access to broadband infrastructure is an important issue for businesses in the region, many of whom believe that broadband, and especially fibre-optic, internet is a basic requirement for a competitive economy. Data will likely show an interesting trend over time as Columbia Basin Broadband Corporation implements its plan to improve broadband availability in the region.
Cost effective	With cooperation from utilities, data should be freely available and simple to update on an annual basis.

2. Drinking water quality (regulatory standards)

Sub-theme: Quality (level of service)

Description: This indicator would measure the number of households or people served by a water system that is under a Water Quality Advisory or Boil Water Notice as of June 1 each year (choosing a date that typically falls during freshet ensures that the indicator captures Water Quality Advisories or Boil Water Notices that arise seasonally due to issues related to runoff.)

Data sources: Interior Health maintains a public database of active Water Quality Advisories and Boil Water Notices on its [website](#). Interior Health could be approached for population or connection numbers associated with each water system. Data could be updated on an annual basis and disaggregated by community, census subdivision or trade corridor.

Links to other research pillars: Drinking water is an inherent consideration for human health issues and therefore links to the *social* research pillar. Because drinking water provision requires withdrawls of raw water from the environment, this indicator also links to the *environmental* research pillar.

TURC test:

Criteria	Discussion
Technically sound	This indicator is well-defined and data would be robust and repeatable. Data for this indicator would capture water systems regulated by Interior Health (i.e., those consisting of more than one connection) but would not capture private wells or informal water systems. Using this measure as an indicator of drinking water quality may evoke some controversy, as there is debate in the region regarding the appropriateness of drinking water regulations for small, rural water systems.
Understandable	This is a performance indicator that would be easy for the general population to understand.
Relevant	Potable water is an important issue to the Basin Boundary Region given the number of small water systems that, due to ageing infrastructure and lack of economies of scale, struggle to achieve regulated drinking water objectives.
Cost effective	With the cooperation of Interior Health, data should be freely available and simple to update on an annual basis.

3. Drinking water quality (public perception)

Sub-theme: Quality (level of service)

Description: This indicator would measure the percentage of residents who perceive their drinking water, as delivered by household taps, to be safe to drink on a consistent annual basis.

Data sources: Data would be collected through a public perception poll, administered by a research company to a statistically significant sample of Basin Boundary Region residents.

Links to other research pillars: See discussion for previous indicator.

TURC test:

Criteria	Discussion
Technically sound	This indicator would be considered technically sound only if results are clearly framed as a measure of public perception.
Understandable	This is a direct indicator that will be easy for the general population to understand.
Relevant	Comparing this indicator to the previous indicator (which tracks potability according to regulatory definitions) will make for interesting discussion on perceptions vs. reality. It will also help to understand the size of the debate, referred to above, surrounding the relevance of BC's drinking water regulations.
Cost effective	Data for this indicator would have a higher cost to collect due the reliance on perception polling. Therefore, the frequency with which this indicator is updated may be reduced to once every two or five years.

4. Energy demand

Sub-theme: Quantity (demand)

Description: This indicator would measure average annual kilowatt hours of electricity delivered to serviced households in the region. By providing a comparison to the BC average (or that of other regions), readers will be able to understand the relative energy footprint of their community.

Data sources: Data for this indicator would be gathered from electrical utilities operating in the region, including BC Hydro, Nelson Hydro and FortisBC. The update frequency and potential level of disaggregation would depend on the quality of data available, and the willingness of the utilities to provide data on a regular basis.

Links to other research pillars: Energy generation has impacts on land and natural resources, and is therefore an important consideration for the *environmental* research pillar.

TURC test:

Criteria	Discussion
Technically sound	This indicator is well-defined and data would be robust and repeatable.
Understandable	This is a comparative indicator that would be easy for the general public to understand.
Relevant	Given the history of this region, Basin Boundary residents are more familiar than most with the impacts of energy generation on the environment, economy, culture and social systems. Therefore, it is not surprising that energy consumption and conservation are at the centre of many important debates in local communities.
Cost effective	With the cooperation of local utilities, data should be freely available and simple to update on an annual basis.

5. Energy costs
Sub-theme: Affordability

Description: This indicator would measure the average annual electricity bill for residential customers in several communities across the region. By providing a comparison to electrical service areas across the country, readers will be able to understand how Basin Boundary energy costs stack up against other regions.

Data sources: Data for this indicator would be gathered from electrical utilities operating in the region, including BC Hydro, Nelson Hydro and Fortis BC. Data would be disaggregated by study community. The update frequency would depend on the willingness of the utilities to provide data on a regular basis. Frequent updates may be especially difficult for comparison communities that are located outside of the region.

Links to other research pillars: Costs to access infrastructure are closely tied to a community's cost of living and are therefore linked to the *social* research pillar.

TURC test:

Criteria	Discussion
Technically sound	This indicator is well-defined and data would be robust and repeatable
Understandable	This is a comparative indicator that will be easy for the public to understand, especially when presented as a comparison to other regions.
Relevant	Results from a recent Business Retention and Expansion survey indicated that energy costs are an important factor affecting business competitiveness in the region. The relevance of this indicator is also supported by Basin Boundary communities' general interest in energy consumption and conservation.
Cost effective	With the cooperation of local utilities, data should be freely available and easy to update on an annual basis.

6. Traffic levels

Sub-theme: Quantity (demand)

Description: This indicator would measure the percentage change in the 3-year mean annual traffic count at key Basin Boundary monitoring locations as compared to the 3-year annual mean from 5 years ago (i.e., the 2010-2012 average over the 2005-2007 average). Logical monitoring sites include Crowsnest Pass, Rogers Pass, Highway 3 at Rock Creek and Highway 3 at Yahk.

Data sources: The Ministry of Transportation and Infrastructure maintains a network of traffic count sites that provide extensive data on volumes, speeds and vehicle sizes. These data are freely available on the Ministry's website and could be updated annually.

Links to other research pillars: Tourism has a significant impact on traffic patterns in the Basin Boundary region; this indicator is therefore linked to the *cultural* research pillar. Traffic volumes can also help understand usage patterns of personal vehicles, which links to the *environmental* pillar.

TURC test:

Criteria	Discussion
Technically sound	This indicator is well-defined and data would be robust and repeatable, contingent on the continuation of Ministry monitoring activities. Use of a three year average buffers anomalies in the data that may be due to uncharacteristic weather, etc.
Understandable	Framing this indicator as a 5-year comparison will give context to traffic counts and help readers understand trends over time.

Relevant	Traffic issues are less relevant in rural areas than in urban ones. Nonetheless, this indicator relates to tourism and export of manufactured goods, and is therefore an important component of the suite of economic indicators.
Cost effective	Data is freely available and simple to update on an annual basis.

7. Access to public transit

Sub-theme: Quantity (supply)

Description: This indicator would measure the percentage of Basin Boundary households within 1 kilometer of a transit route. The indicator would consider conventional bus services across the region. Health Connections and handyDART services would therefore be excluded.

Data sources: Selkirk College's geospatial data inventory already includes house points for the region. Locations for regional transit routes are available at the BC Transit website. Spatial analysis could be completed by the Selkirk College Geospatial Research Centre (SGRC). Data could be updated on an annual basis and disaggregated by community, census subdivision or trade corridor.

Links to other research pillars: Transit services offer travel options for populations with mobility issues, either due to income or disabilities. This indicator therefore links to the *social* research pillar. More and more, transit services are also being promoted as an option to help commuters reduce their carbon footprint, linking this indicator to the *environmental* pillar.

TURC test:

Criteria	Discussion
Technically sound	This indicator is well-defined and data would be robust and repeatable.
Understandable	This is a direct indicator that will be easy for the general public to understand.
Relevant	As evidenced by the significant West Kootenay transit planning project that is currently underway, this indicator would track an important issue to Basin Boundary residents. One potential disadvantage of this indicator relates to its static nature; though ridership or schedules may change over time, the routes themselves are likely to shift less significantly.
Cost effective	Data is freely available and simple to update on an annual basis.

8. Landfill lifespan

Sub-theme: Quality (condition)

Description: This indicator would measure the remaining lifespan of active landfills using present waste generation rates. There are 12 active landfills in the Basin Boundary Region.

Data sources: Regional Districts are required to report on waste generation rates and landfill lifespan in their annual report for each landfill. Therefore, this data should be simple to acquire.

Links to other research pillars: Waste generation relates to resource consumption, land use and contamination. This indicator therefore links to the *environmental* research pillar.

TURC test:

Criteria	Discussion
Technically sound	This indicator is well-defined and data would be repeatable.
Understandable	The indicator, as a snapshot of any moment in time, would be easy to understand; however, the trend over time may show patterns that would be less intuitive for a member of the general public. One would expect lifespan to be a linear relationship, but certain factors (e.g., shift in waste reduction rates, change in recycling programs or new landfill operation technology) can interrupt the curve. To ensure that this indicator's temporal trends are understood, figures should be accompanied by an explanation of any factors that contribute to a non-linear change in lifespan.
Relevant	Waste management is an important issue for local governments. With significant changes to the provincial recycling system expected over the next 1-10 years (i.e., expansion of extended producer responsibility programs), this indicator should show trends that would make for interesting discussion.
Cost effective	With the cooperation of regional districts, data would be freely available and simple to update on an annual basis.

9. *Use of emergency services*

Sub-theme: Quantity (demand)

Description: This indicator would measure per capita annual pre-hospital events (emergency calls) recorded by the BC Ambulance Service for the Basin Boundary Region. Comparing this figure to other years or regions would give some context to the data.

Data sources: The BC Ambulance Service reports on total annual pre-hospital events at a provincial scale each year. Further investigation would clarify whether these data are available at the regional or sub-regional scale. Statistics Canada data would be used to establish population counts for the per capita calculation.

Links to other research pillars: Ambulance services are an important component of the healthcare system. This indicator therefore links to the *social* research pillar.

TURC test:

Criteria	Discussion
Technically sound	In this circumstance, data on demand for ambulance services would act as a representative indicator for usage of all emergency services. Of course, ambulances are only one component of emergency infrastructure, which also includes fire (household and forest) and police.
Understandable	This indicator would be easy for the general public to understand, especially when provided with contextual information (i.e., comparisons across time or space).
Relevant	Though highly relevant to governments, this indicator would be less relevant to the average reader of the State of the Basin report. Emergency services are not a top-of-mind issue in most Basin Boundary communities.
Cost effective	With the cooperation of the BC Ambulance Service, data would be freely available and simple to update on an annual basis.

10. Infrastructure expenditures

Sub-theme: Condition/affordability

Description: This indicator would measure public expenditures on infrastructure upgrade, repair or replacement over time. It would provide an indication of:

a) the extent to which Basin Boundary infrastructure is degrading (and in need of replacement) due to age;
b) the scale of infrastructure damage due to weather events;
c) the extent to which regulations are driving infrastructure investment; and
d) how affordable infrastructure payments (taxes, user fees) are for Basin Boundary residents.

Data sources: Data would have to be gathered from individual local governments or provincial government departments in the region. At this time, the ease with which this data could be acquired is unknown, as is the potential level of disaggregation.

Links to other research pillars: This indicator may help readers understand the economic impacts of climate change and extreme weather events, which often affect infrastructure. It is therefore linked to the *environmental* research pillar. Because infrastructure projects are funded by residents and taxpayers, this indicator also links to cost of living and, therefore, the *social* research pillar.

TURC test:

Criteria	Discussion
Technically sound	The technical soundness of this indicator would depend on the quality and availability of data from local and provincial governmental agencies.
Understandable	This indicator has the potential to provide valuable insight into economic issues related to infrastructure. To realize that potential, however, figures for this indicator must be accompanied by a discussion of the factors that precipitated infrastructure investments in the study year.
Relevant	As evidenced by the growing concern among Basin Boundary residents regarding service charges for essential infrastructure, this topic is highly relevant to the region. Because the theme of infrastructure includes many components with significantly different investment requirements or funding mechanisms, it may be more appropriate to focus on one or two of these components (e.g., drinking water systems, roads) for in-depth discussion.
Cost effective	With cooperation from local and provincial government agencies, data should be freely available. Without strong cooperation, data would have to be acquired through *Freedom of Information and Protection of Privacy Act* mechanisms, which may or may not have an associated cost.

HOUSING

1. Shelter to income ratio

Sub-theme: Affordability

Description: This indicator would track the Shelter to Income Ratio for census subdivisions in the region. The shelter to income ratio measures average household income (before tax income from all household members over 15) over average shelter cost (including payments for rent/mortgage, utilities, property taxes and condo fees). A variation of this indicator was included in the 2008 State of the Basin report.

Data sources: The Shelter to Income Ratio is tracked by Canada Mortgage and Housing Corporation and is based on data collected by Statistics Canada. With the elimination of the long-form census, housing costs will be gathered using the National Household Survey, which will be administered once every 5 years. Housing data from the 2011 National Household Survey will not be available until August 2013.

Links to other research pillars: Housing affordability is a key consideration in poverty issues. Therefore, this indicator links to the *social* research pillar.

TURC test:

Criteria	Discussion
Technically sound	Given that the National Household Survey is a new initiative, data quality, suppression and sample sizes for the Basin Boundary Region are not yet known.
Understandable	This indicator would be easy for the general public to understand, especially when provided with contextual information (e.g., comparisons with other regions).
Relevant	Housing affordability is a critical issue in many Basin Boundary communities. The Basin Boundary Business Retention and Expansion project confirmed that cost of living is a key concern for employees in this region.
Cost effective	Data would be freely available every 5 years following the census and National Household Survey. More frequent updates would require primary research and increase the cost of reporting on this indicator.

2. Housing types

Sub-theme: Stock

Description: This indicator would compare the percentage of each structural type of occupied private dwelling. Structural categories include single detached house, apartment building with more than 5 storeys, movable dwelling, semi-detached house, row house, duplex apartment, apartment building with fewer than 5 storeys and other single-attached houses. A variation of this indicator was included in the 2008 and 2012 State of the Basin reports.

Data sources: Data for this indicator are collected and analyzed by Statistics Canada as part of the census, which is administered every 5 years.

Links to other research pillars: A region's housing stock affects, and is affected by, a population's demographics. This indicator is therefore linked to the *social* research pillar. In addition, housing is a key land use issue, linking this indicator to the *environmental* research pillar.

TURC test:

Criteria	Discussion
Technically sound	This indicator is well-defined and data would be robust and repeatable. These data are gathered via the census and therefore represent almost the entire population.
Understandable	While the average reader will easily understand the figures related to this indicator, they may not understand whether those figures represent a suitable housing stock for their community. To aid in this understanding, some contextual discussion will be required.
Relevant	Housing affordability, density and ownership are all important issues to Basin Boundary communities.
Cost effective	Data would be freely available every 5 years in accordance with the census cycle. More frequent updates would require primary research and increase the cost of reporting on this indicator.

3. *Vacancy rate*

Sub-theme: Stock

Description: This indicator would compare the total number of private dwellings in a census division to the number of private dwellings occupied by usual residents. It would provide a measure of vacancy and seasonal residency. A variation of this indicator was included in the 2012 State of the Basin report.

Data sources: Data for this indicator are collected and analyzed by Statistics Canada as part of the census, which is administered every 5 years.

Links to other research pillars: As, in some ways, a measure of seasonal residency, this indicator links to the *cultural and economic* research pillars.

TURC test:

Criteria	Discussion
Technically sound	This indicator is well-defined and data would be robust and repeatable. These data are gathered via the census and therefore represent almost the entire population.
Understandable	This indicator would be easy for the general public to understand.
Relevant	A reasonable amount of housing vacancy helps keep a community's housing stock affordable, and enables population and economic growth. However, a vacancy rate that is too high signals a struggling economy or significant influence of seasonal residency. Both housing affordability and seasonal residency are important issues for many Basin Boundary communities.
Cost effective	Data would be freely available every 5 years in accordance with the census cycle. More frequent updates would require primary research and increase the cost of reporting on this indicator.

4. Housing prices (sales figures)

Sub-theme: Affordability

Description: This indicator would measure the average selling price of a residential home in the Kootenay region, as defined by BC Statistics.

Data sources: BC Statistics reports on housing prices annually and posts data to its website. Data are gathered through the Multiple Listing Service. Data are only reported at the regional scale. There is a 1-year lag time in data reporting.

Links to other research pillars: Housing affordability is a key consideration in poverty issues. Therefore, this indicator links to the *social* research pillar.

TURC test:

Criteria	Discussion
Technically sound	This indicator is well-defined and data would be repeatable. However, any housing sales not processed through the Multiple Listing Service would be excluded from this analysis. Due to the level of data aggregation, some portions of the Basin Boundary Region would also be excluded.
Understandable	This indicator would be easy for the general public to understand, especially when provided with contextual information (e.g., comparisons with other time periods or regions).
Relevant	Housing affordability is a critical issue in many Basin Boundary communities. The Basin Boundary Business Retention and Expansion pilot project confirmed that cost of living is a key concern for employees in the region.
Cost effective	Data would be freely available and simple to update on an annual basis.

5. Housing prices (public perception)

Sub-theme: Affordability

Description: This indicator would measure the percentage of residents who perceive housing prices in their community to be affordable.

Data sources: Data would be collected through a public perception poll, administered by a research company to a statistically significant sample of Basin Boundary Region residents.

Links to other research pillars: See discussion for previous indicator.

TURC test:

Criteria	Discussion
Technically sound	This indicator would be considered technically sound only if results are clearly framed as a measure of public perception.
Understandable	This is a direct indicator that would be easy for the general public to understand.
Relevant	Comparing this indicator to the previous indicator (which tracks housing prices by sales) or to the first indicator reported in this section (which tracks housing expenditures as a percentage of household income) will make for interesting

	discussion on perceptions vs. reality.
Cost effective	Data for this indicator would have a higher cost to collect due the reliance on perception polling. Therefore, the frequency with which this indicator is updated may be reduced to once every two or five years.

6. Housing condition

Sub-theme: Condition

Description: This indicator would measure the percentage of dwellings falling within one of several age categories.

Data sources: Data for this indicator are gathered using the National Household Survey, which will be administered once every 5 years. Housing data from the 2011 National Household Survey will not be available until August 2013.

Links to other research pillars: None

TURC test:

Criteria	Discussion
Technically sound	Given that the National Household Survey is a new initiative, data quality, suppression and sample sizes for the Basin Boundary Region are not yet known. This indicator uses age of dwellings as a representative measure of housing condition. Of course, many other factors contribute to the condition of dwellings.
Understandable	This indicator would be easy for the general public to understand, especially when provided with contextual information (e.g., comparisons with other regions).
Relevant	Though not as relevant to the general public as some of the other indicators proposed in this report, the condition of housing in a community is an important consideration for land use planners and utility service providers.
Cost effective	Data would be freely available every 5 years following the National Household Survey. More frequent updates would require primary research and increase the cost of reporting on this indicator.

7. Core housing need

Sub-theme: Condition/stock

Description: This indicator tracks the percentage of households in the region that are in 'core housing need'. According to BC Housing, "a household is said to be in core housing need if its housing falls below at least one of the adequacy, affordability or suitability standards and it would have to spend 30% or more of its total before-tax income to pay the median rent of alternative local housing that is acceptable". The 'adequacy' standard requires that a home is not in need of major repairs, the 'affordability' standard requires that a home costs less than 30% of a household's before-tax income and the 'suitability' standard requires that a home has enough bedrooms for the number of residents.

Data sources: Core housing need is reported by Canada Mortgage and Housing Corporation using information gathered by Statistics Canada. Data is updated with the census cycle, once every 5 years.

Links to other research pillars: The core housing need statistic is an indicator of a population's ability to afford suitable housing. Poverty is a theme addressed by the *social* research pillar.

TURC test:

Criteria	Discussion
Technically sound	Given that the National Household Survey is a new initiative, data quality, suppression and sample sizes for the Basin Boundary Region are not yet known. In addition, there is notable disagreement in Canada over the concept of core housing need, specifically regarding where it draws the line in determining standards for adequacy, affordability and suitability (Westhues, 2006). As such, using this concept as an indicator of the suitability of the Basin Boundary housing stock may elicit some debate.
Understandable	Due to the complexity of the definition of core housing need, this indicator may not help the average reader develop a detailed understanding of its community's housing issues. However, core housing need should at least provide a quick indication of the percentage of Basin Boundary residents that are experiencing a significant housing 'problem.'
Relevant	As discussed above, housing suitability and affordability are important issues for many Basin Boundary communities.
Cost effective	Data would be freely available every 5 years following the National Household Survey. More frequent updates would require primary research and increase the cost of reporting on this indicator.

RECOMMENDED INDICATORS

Given the considerations discussed above, the following is recommended as an initial list of indicators to pursue for the 2013 State of the Basin report. This list includes indicators that:

- represent a cross section of the sub-themes within each subject area;
- are likely to show interesting trends over time; and
- fared well on the TURC test and would therefore be technically sound, understandable, relevant and cost effective.

This list should be reviewed with stakeholders to determine its appropriateness given Basin Boundary communities' priorities and expectations.

INFRASTRUCTURE AND TRANSPORTATION

Indicator	Sub-theme
Access to broadband internet	Quantity (supply)
Drinking water quality (regulatory standards)	Quality (level of service)
Drinking water quality (public perception)	Quality (level of service)
Infrastructure expenditures	Quality (condition)/Affordability
Energy costs	Affordability
Traffic levels	Quantity (demand)
Landfill lifespan	Quality (condition)

HOUSING

Indicator	Sub-theme
Shelter to income ratio	Affordability
Housing types	Stock
Vacancy rate	Stock
Housing prices (sales figures)	Affordability
Housing condition	Condition

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Fraser Basin Council – Sustainability Indicator Reports:
http://www.fraserbasin.bc.ca/resources_indicators.html

Greater Montreal's Vital Signs – A Project of the Fondation du Grand Montréal:
http://www.fgmtl.org/en/vitalsigns2010/index.php

Sustainable Seattle – Historical Indicator Work:
http://sustainableseattle.org/programs/regional-indicators

Whistler2020 – Community Monitoring Program:
http://www.whistler2020.ca/performance/Overview

Peg – A project of United Way Winnipeg and the International Institute of Sustainable Development:
http://www.mypeg.ca/home

Metro Vancouver Vital Signs – A project of the Vancouver Foundation:
http://www.vancouverfoundationvitalsigns.ca/