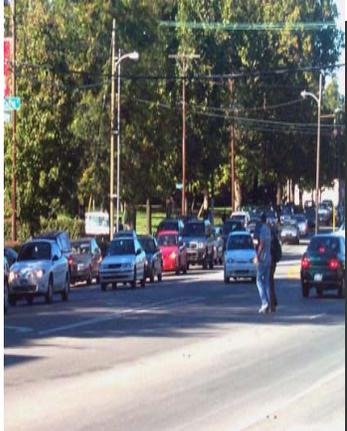


Indicators for a Healthy Built Environment in BC

Final Report
July 2008



Background and Introduction

The characteristics of our human-constructed physical environment—*the built environment*—have significant effects on population health. Overweight and obesity, which are increasing in British Columbia and contributing to a burden of chronic disease, are influenced by physical activity and nutritional intake, for example. These behavioural factors, and others, are themselves influenced by the particular formation of the built environment.

Several key areas, which intersect population health and the built environment, have been identified for intervention:

- Physical activity
- Access to healthy foods
- Healthy body weight
- Air quality
- Injury and safety
- Housing and homelessness
- Crime prevention
- Well-being and recreation
- Child and age friendliness
- Public infrastructure

In order to support the implementation of intervention programs and evaluate their effectiveness, indicators for the healthy built environment are needed. Indicators are a way to assess the status and progress of activities related to the healthy built environment. They are the measured and self-reported numerations of health-related phenomena and the determinants of health—healthy built environment indicators give evidence of the state of population health within the context of the built environment.

The BC Healthy Built Environment Alliance, an intersectoral network providing a venue for the coordination of knowledge and key activities around the built environment, has recognized and attempted to address this need for relevant indicators.

Indicator Criteria and Selection

The selection of indicators was based predominantly on their relevance to population health and the built environment in BC. The economic aspect of the healthy built environment was also considered when choosing certain indicators. Indicators were required to have acceptable methodological standards and representative and available data sources for BC or at least the Greater Vancouver Regional District (GVRD). These indicators provide data based on academic evidence, which are measurable, valid and reliable. An index of healthy built environment indicators (see Appendix 1) with their associated definitions and data sources was also tabulated. In total, 67 indicators met the inclusion criteria and have been selected for this initial list.

Indicators and Framework

The healthy built environment indicators are set within a framework (Figure 1) of 10 best practices that relate to the abovementioned intervention areas. These best practice areas have been identified through research conducted by Dr. Lawrence Frank and are detailed in his report, *Creating a Healthier Built Environment in BC*¹. The framework and indicator index also include a category for health outcomes, which are tied to population health and the built environment. However, not all outcomes are correlated with the listed healthy built environment indicators. It is anticipated that future updates to this draft list will include a more detailed discussion of healthy built environment indicator and its associated outcome. Also, although indicators are listed only once, several of them have relevance in other best practice areas—their placement represents the primary area to which they relate.

Limitations

In order to make this initial effort more manageable, these indicators are biased towards urban settings—rural-focused indicators will be identified in a subsequent update to this list. Also, this collection of indicators does not embody a complete set of relevant healthy built environment indicators for BC, as selection was limited by the availability of data sources and acceptable methodology. For instance, important indicators of issues such as *sprawl* and *walkability* are not available, although development is underway through Smart Growth BC and other key stakeholders. When looking at this indicator framework one must also consider that this initial effort is *not* meant to provide complete picture of the

¹ Creating a Healthier Built Environment in BC, www.phsa.ca/PopulationHealth

healthy built environment and population health, but one that offers more clarification on those key areas that require further data and indicator development.

Next Steps

It is expected that this initial list of indicators will be further developed over time, through an iterative process. Potential next steps include the following:

- Applying and assessing the use of indicators at the local level
- Identifying further data and indicator development needs
- Identifying appropriate rural indicators
- Identifying appropriate indicators for First Nations communities
- Aligning this list with indicators to be developed through the Healthy Community Environments Core Program

The BC Healthy Built Environment Alliance hopes that this and subsequent efforts to identify and develop indicators will increase the capacity of its members to chart progress and contribute to healthier built environments in BC.

Figure 1: Healthy Built Environment Indicator Framework

Healthy Built Environment Indicators

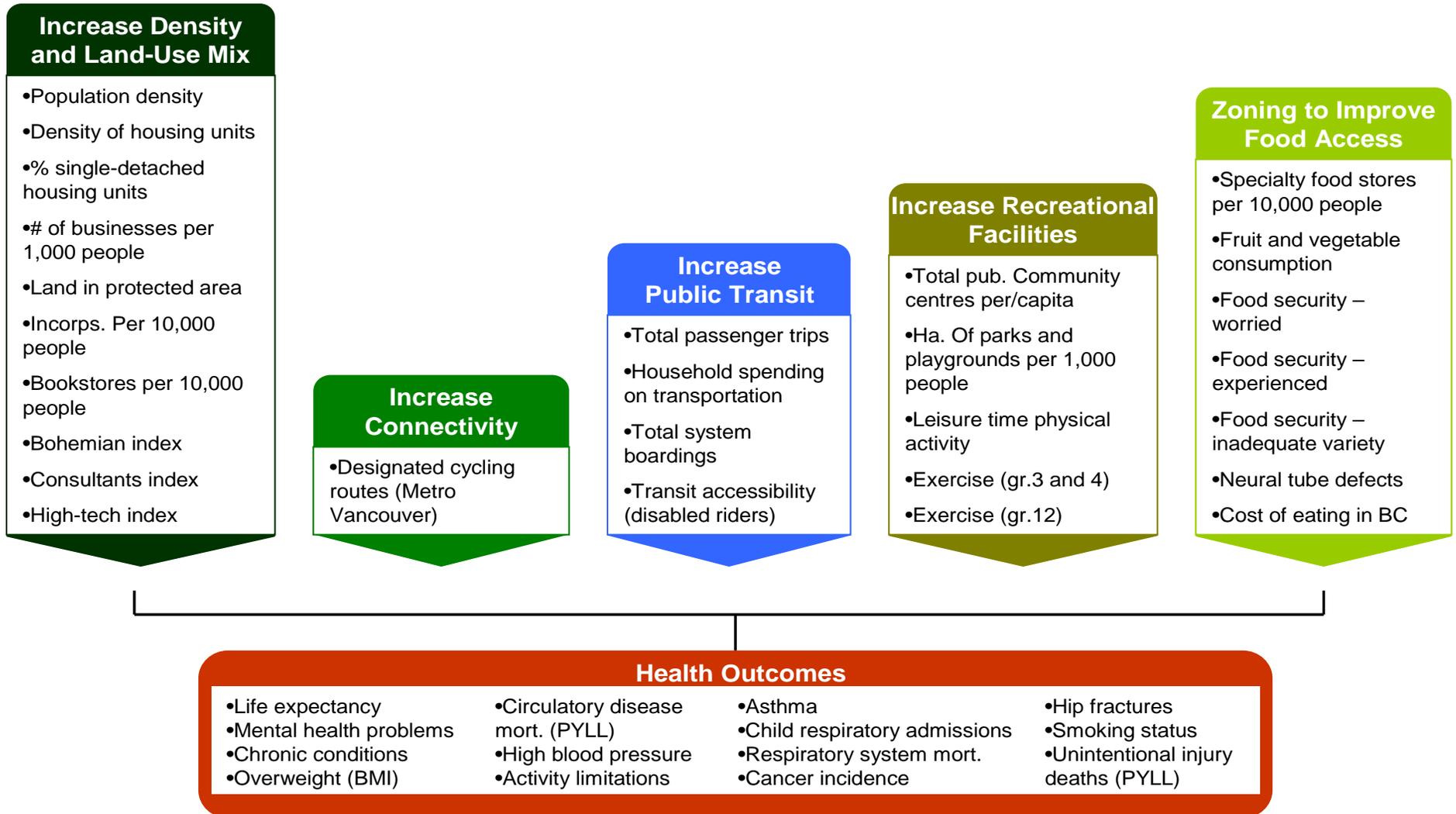
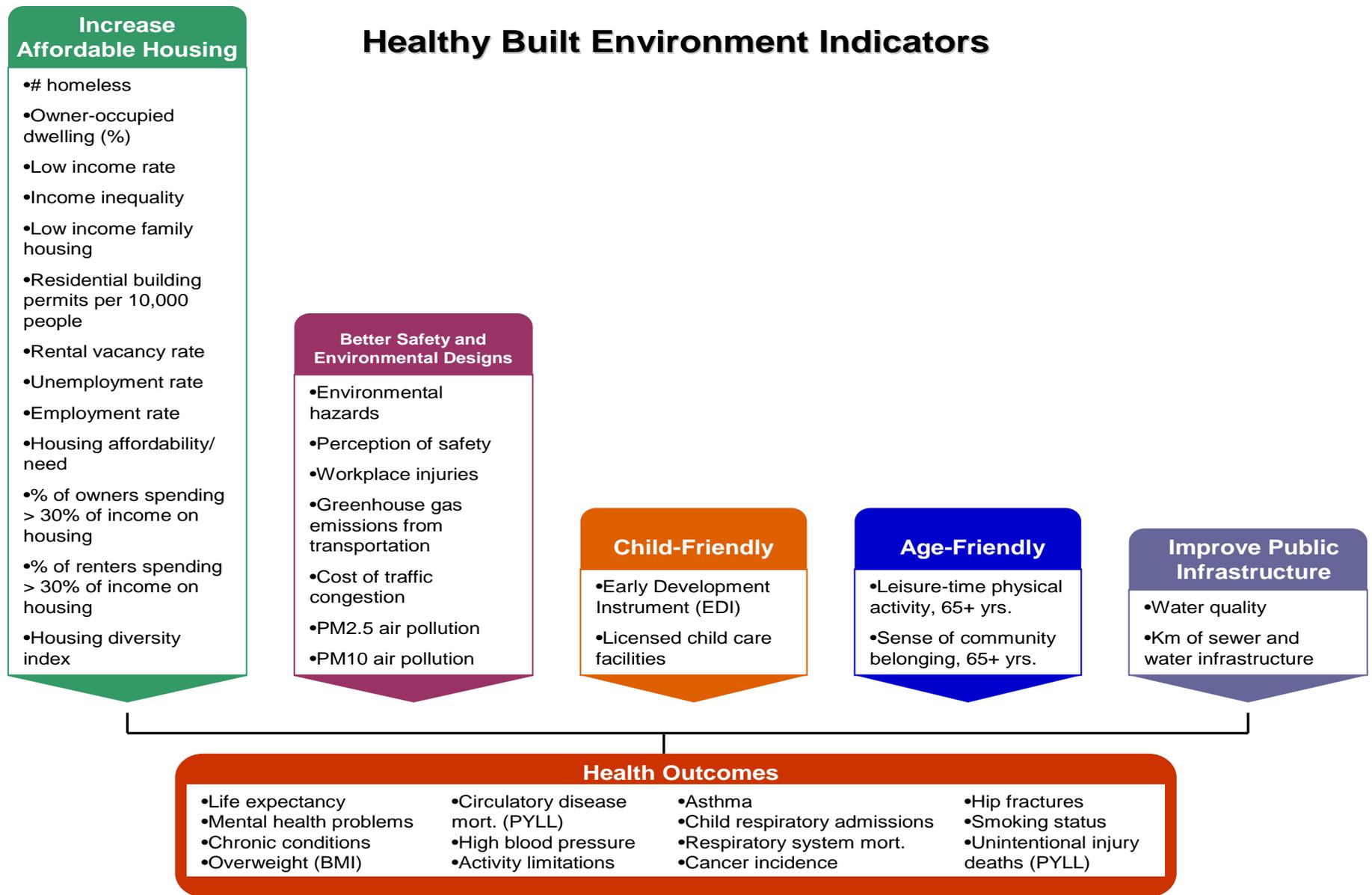


Figure 1: Healthy Built Environment Indicator Framework



Appendix 1: Healthy Built Environment Indicator Index

Intervention Area	Indicator	Definition	Source
Population health outcomes	Life expectancy	Life expectancy is the number of years a person would be expected to live, starting from birth	StatsCan, Vital Stats, Death database and demography div. (pop. Est.)
	Mental health problems	Individuals reporting mental health issues or problems with their emotional well-being in the past month	National Population Health Survey, StatsCan
	Chronic conditions	Those reporting long-term conditions that have lasted or are expected to last 6 months of more and have been diagnosed by a health professional	National Population Health Survey, StatsCan
	Overweight (BMI)	A BMI of greater than 30 is associated with high health risk. BMI is calculated by dividing body weight (in kilograms) by height (in metres)	National Population Health Survey, StatsCan
	Circulatory disease mortality (PYLL)	The rate of potential years of life lost before age 75 per 1,000 person-years at risk for death from circulatory disease	StatsCan, Vital Stats, Death database and demography div. (pop. Est.)
	Cancer incidence	Age-standardized rate of new primary sites of cancer (malignant neoplasms) per 100,000 population, for all cancers.	StatsCan, Canadian Cancer Registry
	High blood pressure	Proportion of population 12 and up who reported a diagnosis, by a health professional, of high blood pressure	Canadian Community Health Survey, 2003

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Intervention Area	Indicator	Definition	Source
	Activity limitation	Population aged 12 and over who report being limited in selected activities (home, school, work and other) because of a physical condition, mental condition, or health problem which has lasted or is expected to last six months or longer.	National Population Health Survey, StatsCan
	Asthma	Proportion of population 12 and up who reported a diagnosis, by a health professional, of asthma	Canadian Community Health Survey, 2003
	Child respiratory admissions	Age-standardized rate of hospitalizations per 1,000 among persons 0-14 for respiratory diseases, 2003-2004	BC Stats, Regional Profiles
	Respiratory system mortality	Crude rate and age-standardized rate of death from diseases of the respiratory system per 100,000 population:, for all respiratory diseases (ICD-10 J00-J99), pneumonia and influenza (ICD-10 J10-J18), bronchitis/emphysema/asthma (ICD-10 J40-J43, J45-J46) and all other diseases of the respiratory system (ICD-10 J00-J06, J20-J22, J30- J39, J44, J47, J60-J70, J80- J84, J85-J86, J90-J94, J95-J99).	StatsCan, Vital Stats, Death database and demography div. (pop. Est.)

Appendix 1: Healthy Built Environment Indicator Index

Intervention Area	Indicator	Definition	Source
		BC Vital Stats: J00-J99, Age Standardized Mortality Rate per 10,000 standard populations (Canada 1991 Census). Total percentage may not add up to 100 due to rounding. + Denotes the number of cases is less than five. Non-residents are excluded. Total includes unknown gender	
	Hip fractures	Age-standardized acute care hospitalization rate for fracture of the hip, per 100,000 population age 65 and over	Hospital morbidity database, CIHI; discharge abstract database, CIHI
	Smoking status	Proportion of population aged 12 and up or aged 12 to 19, who reported being a current smoker on either a daily or occasional basis	Canadian Community Health Survey, 2003
	Unintentional injury deaths (PYLL)	Crude rate and age-standardized rate of death from unintentional injuries per 100,000 population. Unintentional (“accidental”) injuries includes injuries due to causes such as motor vehicle collisions, falls, drowning, burns, and poisoning, but not medical misadventures/complications	StatsCan, Vital Stats, death database and demography div. (pop. Est.)
Increase density and land-use mix	Population density	To analyze compact development trends in British Columbia, Sightline (www.sightline.org) analyzed	1991, 1996, 2001, and 2006 Canadian censuses

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Intervention Area	Indicator	Definition	Source
		<p>data from the 1991, 1996, 2001, and 2006 Canadian censuses. For each census period, Sightline divided the landscape of Greater Vancouver into a 30-by-30 meter grid. For each location in that grid, Sightline calculated the population density of the smallest circle centered on that location containing at least 500 residents—a rough proxy for a residential neighbourhood. Based on this fine-grained dataset of neighbourhood densities, Sightline determined the number of residents living in each density grouping: rural, suburban, compact neighbourhood, and pedestrian-oriented neighbourhood. These density classes do not necessarily correspond to particular transportation outcomes; yet they do provide a consistent gauge against which the smart-growth performance of different jurisdictions can be judged.</p>	
	Density of housing units	Total number of housing units divided by the municipality's taxable land-base, minus lands in the Agricultural Land Reserve	Canada census, 2001
	% single-detached housing units	This is one measure of the efficiency with which land and infrastructure are being used.	Canada census, 2001

Appendix 1: Healthy Built Environment Indicator Index

Intervention Area	Indicator	Definition	Source
		However, the indicator does not take into account the number of secondary suites.	
	# of businesses per 1,000 people	A proxy for the health of the local business climate.	Canada Business Patterns, June 2001, StatsCan
	Land in protected areas	Areas protected, as a per cent of British Columbia's land base. In British Columbia, protected areas include national parks, ecological reserves, class A and C parks, recreation areas, and protected areas that fall under the Environment and Land Use Act.	BC Land Use Coordination Office and BC Parks
	Incorporations per 10,000 people	A proxy for the health of the local business climate. Consistent data on business bankruptcy rates would have been helpful but were not available.	BC Stats, community fact sheets\population; 2001Canada Census
	Bookstores per 10,000 people	One indication of the kinds of cultural services available, especially important from the perspective of the "creative class"	Canada Business Patterns, June 2001, StatsCan
	Bohemian index	A measure of the number of "cultural creatives," as defined by Richard Florida - Measures the potential critical mass of creative people who are a big attractor for the new economy industries.	StatsCan, 2001: National Occupational Classification for Statistics (CD ROM)

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Intervention Area	Indicator	Definition	Source
	Consultants index	Consulting businesses as a % of total businesses - One measure of the number of knowledge-intensive firms in a community.	Canada Business Patterns, June 2001, StatsCan
	High-tech index	Tech businesses as % of total businesses - A measure of the strength of these "new economy" sectors in the local economy.	Canada Business Patterns, June 2001, StatsCan
Increase connectivity	Designated cycling routes	Total directional kilometres of cycling routes in Vancouver, whereby 1 km of a one way route is counted as 1 km; and 1km of a two way route is counted as 2 km.	Greater Vancouver Transportation Authority (www.translink.bc.ca), by request. 2004 to 2007
Increase recreational facilities	Total public community activity centres per/capita (1,000 population)	Community centres are facilities where the public may gather and engage in activities, social support, receive public information, etc.	BCPRA with per capita calc. using pop. Estimates from BC Stats
	Ha. of parks and playgrounds per 1,000 people	Within the municipality - a measure of green space within a community. However, it does not give an indication of a community's proximity to other recreational lands.	"area and population of incorporated municipalities as of december 31,2001, local government services and infrastructure, BC ministries of community aboriginal and women's affairs
	Leisure time physical activity	Proportion of population 12 and up reporting active or moderately active levels of physical activity, based on responses to questions about the frequency, duration and	Canadian Community Health Survey, 2003

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Intervention Area	Indicator	Definition	Source
		intensity of their participation in leisure time physical activity over past 3 months	
	Exercise (grade 3 and 4)	% of students who did not respond “many times” or “all of the time” to- At school, do you get exercise (for example, physical activity or sports)? 2005	Department of Education Satisfaction Survey 2005
	Exercise (grade 12)	% of students who did not respond “many times” or “all of the time” to- At school, are you learning about how to stay healthy? 2005	Department of Education Satisfaction Survey 2005
Child friendliness	Early Development Instrument (EDI)	The Early Development Instrument assesses physical health and well-being, social competence, emotional maturity, language and cognitive development; and communication skills and general knowledge in children.	UBC, Human Early Learning Program
	Licensed child care facilities	The proportion of licensed child care facilities in the population	BC Ministry of Child and Family Development
Age friendliness	Leisure-time physical activity, 65+ years	Proportion of population 65 years and older reporting active or moderately active levels of physical activity, based on responses to questions about the frequency, duration and intensity of their participation in leisure time physical activity over past 3 months	Canadian Community Health Survey, 2003

Appendix 1: Healthy Built Environment Indicator Index

Intervention Area	Indicator	Definition	Source
	Sense of community belonging, 65+ years	Proportion of population 65 years and older who have a very or somewhat strong sense of belonging to their local community	Canadian Community Health Survey, 2005
Zoning to improve food access	Specialty food stores per 10,000 people	One measure of the diverse products and experiences which are available in a community.	Canada Business Patterns, June 2001, StatsCan
	Fruit and vegetable consumption	% of population aged 12 and over who eat less than five servings of fruits and vegetables per day	StatsCan & CIHI: Health Indicators 2007 (CCHS 2005, 2003, 2000/01)
	Food security – worried	% of persons 18+ who indicated that they “sometimes” or “often” worried that there would not be enough food because of a lack of money during the previous 12 months, 2003	Canadian Community Health Survey 2.1, 2003
	Food security – experienced	% of persons 18+ who indicated that someone in their household “sometimes” or “often” did not have enough to eat because of a lack of money during the previous 12 months, 2003	Canadian Community Health Survey 2.1, 2003
	Food security – inadequate variety	% of persons 18+ who indicated that someone in their household “sometimes” or “often” did not have enough variety to eat because of a lack of money during the previous 12 months, 2003	Canadian Community Health Survey 2.1, 2003

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Intervention Area	Indicator	Definition	Source
	Neural tube defects	Interference in the closure of neural tubes occurring around the 30 th day of human embryonic development	BC Vital Stats, Health status Registry
	Cost of eating in BC	The average cost for a family of 4, including a breakdown of the cost of eating (using multipliers based on economies of scale) to account for variances in the cost of eating by age and gender.	Dietitians of Canada, BC (2006)
Increase affordable housing	# homeless	Number of homeless without a place of their own to stay for 30+ days (Point-in-Time or Annual Prevalence), by Census Metropolitan Area (CMA)	Canadian Population Health Initiative
	Owner-occupied dwelling (%)	The proportion of dwelling owned by the current occupant	StatsCan, Census 2001
	Low income rate	The annual proportion of families and unattached individuals below the low income cut-off (LICO).	StatsCan, 1996-2001 census (20% sample)
	Income inequality	The income share of the bottom half (poorest) families. That is, the proportion of the population's household income that accrues to households earning less than the median income.	Census, StatsCan (special tabulations)
	Low income family housing	Proportion of housing targeting families below the low income cut-off	Canadian Mortgage and Housing Corp. and Census, StatsCan

Appendix 1: Healthy Built Environment Indicator Index

Intervention Area	Indicator	Definition	Source
	Residential building permits per 10,000 people	Level of activity in the housing sector reflects on the health of the economy as a whole.	BC Stats, community fact sheets\population; 2001Canada Census
	Rental vacancy rates	The rate of vacancy or availability for rental accommodations, including 1, 2, and 3 bedroom dwellings	Canada Mortgage and Housing corporation, Housing Market Information: Rental Market Statistics, Tables 9 and 10 on pages 27 and 28, respectively. (April 2007)
	Unemployment rate	The rate of unemployment for those aged 15 and up reporting having no job during the reference period (those who haven't worked in past week but were available to work)	StatsCan, Labour force survey, special tabulations
	Employment rate	The rate of employment for those aged 15 and up, reporting positive job status	StatsCan, Census 2001
	Housing affordability/need	Nature of obtaining adequate, affordable housing where rent or mortgage plus taxes are 30% or less of the household's gross income	Canadian Mortgage and Housing Corporation, data from Census, StatsCan
	% of owners spending > 30% of income on housing	A measure of housing affordability. However, some communities spending a smaller proportion of their income on housing may also be more affluent.	Canada census, 2001
	% of renters spending > 30% of income on housing	A measure of housing affordability.	Canada census, 2001

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Intervention Area	Indicator	Definition	Source
	Housing diversity index	Based on mix of single-detached, ground-oriented units, and apartments - a measure of the kinds of housing options that will be available for a variety of individuals and families.	Canada census, 2001 (CUSTOM ANALYSIS BY STATSCAN)
Increase public transit	Total passenger trips	Passenger trips counts riders on the system by mode where the fare was paid (i.e. number of system users).	Translink, 1987-2007
	Transit accessibility (disabled riders)	Number of buses and shuttles accessible to disabled riders in the Metro Vancouver area	2006, Transit Planning TransLink (Greater Vancouver Transportation Authority) By request.
	Household spending on transportation	Average expenditure per household on transportation (\$) and % of total percent of household consumption on transportation	Statistics Canada. Catalogue no. 62F0026MIE
	Total system boardings	System boarding counts all riders using the system including transferees from other modes (i.e. number of trips).	Translink, 1987-2007
Better safety and environmental designs	Environmental and traffic hazards	Hazards in the surrounding environment that increase the risk of injury	Inventory of Federal, Provincial and Territorial Environmental and Occupational Health Data
	Perception of safety	Population 15 and over perception of personal safety when waiting for or using public transit alone after dark, when walking alone in neighbourhood at dark, and when home alone in the evening or at night	Statistics Canada, General Social Survey, 2004. Cycle 18 Overview: Personal Safety and Perceptions of the Criminal Justice System. Information for provinces from the General Survey on Victimization, Cycle 18: An Overview of Findings, 2004 ,Table

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Intervention Area	Indicator	Definition	Source
	Workplace injuries	No. of Workplace BC Claims Per 1,000 Population, 2005	Workers' Compensation Board of BC
	Greenhouse gas emissions from transportation	Total GHG emissions (kt) and annual per/capita GHG emissions (t) from automobiles and trucks for select CMAs	"The Impact of Transit Improvements of GHG Emissions: A National Perspective." March, 2005 Transport Canada
	Cost of traffic congestion	Traffic congestion is the inconvenience and increased costs that travelers impose on each other while using their vehicles, attempting to use the road network at the same time. It results in time loss, productivity loss and higher vehicle operating costs for individuals and goods traveling within the region. Traffic congestion also impacts those not on the roads by increasing air pollutants and greenhouse gas (GHG) emissions. Estimates considered three of the main components in their analysis: delay costs (time wasted in congested periods), fuel costs (fuel wasted due to congested conditions), and an imputed cost for GHG emissions due to traffic congestion for passenger vehicles.	Transport Canada, The Cost of Urban Congestion in Canada, 2006.
	PM2.5 air pollution	Particles 2.5 micrometres or less pose a serious risk to health	Air Resource Branch, BC Min. of Environment, Lands and Parks

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Intervention Area	Indicator	Definition	Source
	PM10 air pollution	Percentage of monitored communities exposed to health risks from fine particulates for more than 18 days. Fine particulate (PM10) levels exceeding 25 micrograms per cubic metre, are known to have adverse health effects. Data are based on measurements taken at sampling stations at locations throughout the province. Monitoring sites are often in communities where air quality is a concern; therefore, data do not necessarily reflect the average air quality in British Columbia.	Air Resource Branch, BC Min. of Environment, Lands and Parks
Improve public infrastructure	Water quality	Water quality index: Per cent of water bodies rated excellent or good based on a composite index that measures the degree to which the various water uses are protected.	BC Ministry of Water, Land and Air Protection; water management Branch, BC Min. of Environment, Lands and Parks
	Kilometres of Sewer and Water Infrastructure Per 1,000 People	Compact communities generally require fewer kilometres of sewer and water mains per capita.	Canada census, 2001