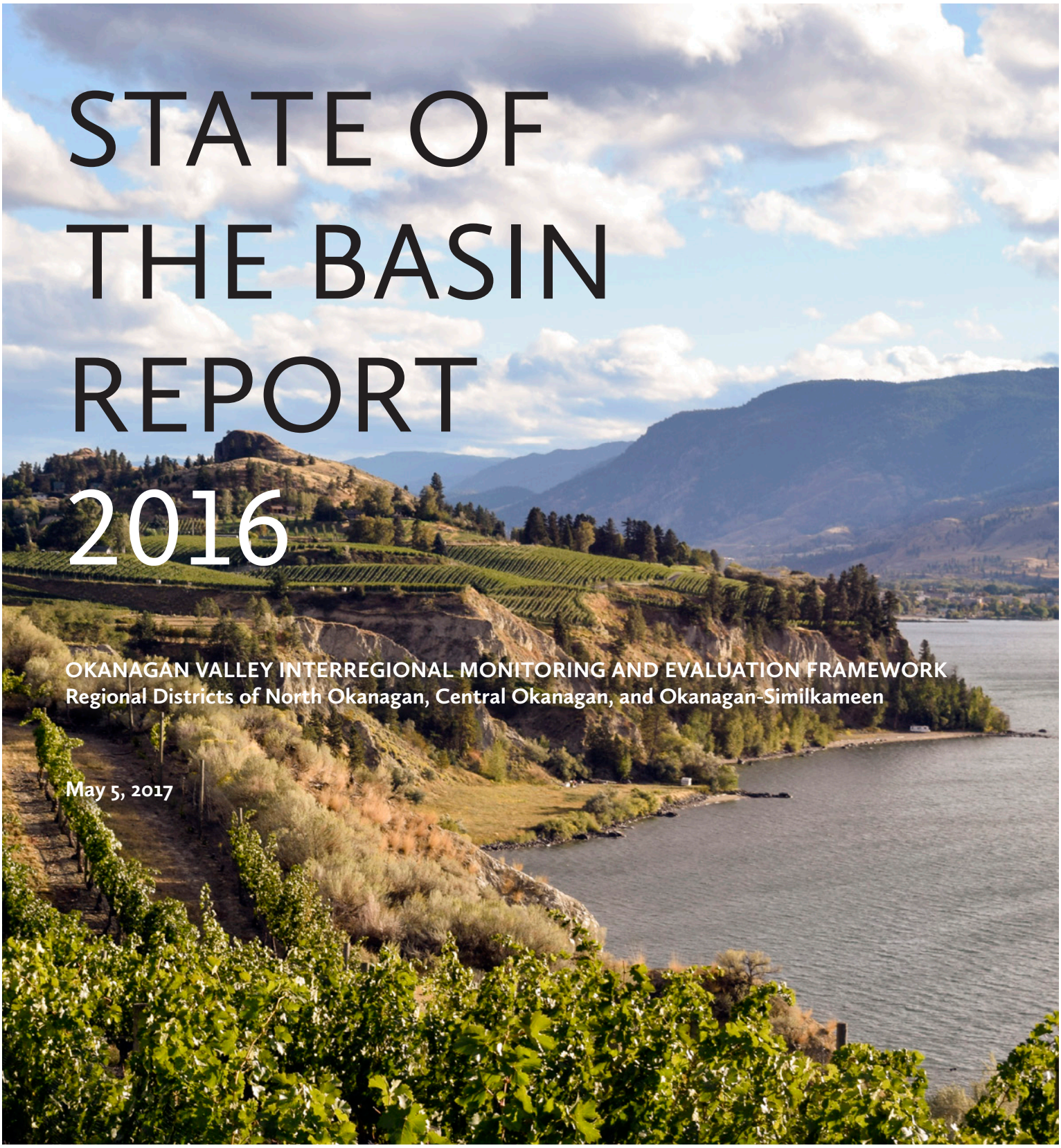


STATE OF THE BASIN REPORT 2016

OKANAGAN VALLEY INTERREGIONAL MONITORING AND EVALUATION FRAMEWORK

Regional Districts of North Okanagan, Central Okanagan, and Okanagan-Similkameen

May 5, 2017

real estate foundation BRITISH COLUMBIA

REGIONAL DISTRICT NORTH OKANAGAN

RDCO REGIONAL DISTRICT of CENTRAL OKANAGAN

REGIONAL DISTRICT RDOS OKANAGAN-SIMILKAMEEN

Okanagan Basin WATER BOARD

Okanagan Collaborative Conservation Program

SOUTH OKANAGAN-SIMILKAMEEN CONSERVATION PROGRAM

Contents

Executive Summary

The **State of the Basin Report** is the product of an inter-regional initiative to develop a monitoring and evaluation framework intended to track progress on matters which are important to the Okanagan Valley as a whole. Partners in this initiative include the Regional Districts of North Okanagan (RDNO), Central Okanagan (RDCO), and Okanagan-Similkameen (RDOS).

The monitoring and evaluation framework addresses the following Policy Areas:

1) ***Urban Containment & Rural Protection***
2) ***Agriculture***
3) ***Water Stewardship***
4) ***Environment & Natural Lands***
5) ***Economic Development***
6) ***Transportation & Infrastructure***
7) ***Housing***
8) ***Climate Change & Greenhouse Gas Emissions***
9) ***Community Health and Wellbeing***
10) ***Governance & Shared Services***

The 36 indicators represented in this report are supported by data from a variety of sources to identify trends, commonalities, and distinctions evident between the three Okanagan regional districts. The results reveal both successes and policy areas that may benefit from additional attention.

As this is the first concerted effort to establish a uniform series of measures applicable across the three Okanagan regional districts, several indicators are populated with 'baseline' data representing a single point in time. Over time, as data for each indicator is gathered year to year, baselines will be replaced with comparable data and trends will be revealed.

The "Indicator Framework at a Glance" lists all indicators represented in the **State of the Basin Report** and uses symbols to identify how well each regional district is doing in relation to various Policy Areas.

Each Policy Area addressed in this report presents the indicators and data using graphics and tables for ease of reference. Given the myriad of factors influencing a regional district's performance in any given Policy Area, this report does not speculate or suggest rationale behind the data presented. The results presented in the State of the Basin Report should not be interpreted as a 'scorecard' of performance as each Regional District is impacted by a multitude of variables, many of which are beyond local government control. However the results are intended to help guide local government decision-makers as they consider priorities for further attention in their communities.

Preparation of the **State of the Basin Report** was made possible with funding assistance provided by the Real Estate Foundation of British Columbia and the Okanagan Basin Water Board. The partners also acknowledge and appreciate the professional consulting services provided by EcoPlan International Inc. and assistance provided by the South Okanagan Similkameen Conservation Program, the Okanagan Collaborative Conservation Program, the Interior Health Authority, and numerous other agencies and individuals who contributed their time and expertise to this project.

Introduction

About this Project

The Okanagan Valley is home to a diversity of ecosystems, communities, and political jurisdictions. At the same time, there are a number of valley-wide systems (ecological, economic, and social) that link these diverse places together. With development pressure growing across the valley and new stresses resulting from climate change, alterations to these systems could have major implications for economic, ecological, and social goals. Developing a cohesive picture of changes across the Okanagan is increasingly important for coordinating decision-making and planning initiatives to address common sustainability challenges.

With support from the Real Estate Foundation of British Columbia, the Okanagan Basin Water Board, the Regional Districts of North Okanagan (RDNO), Central Okanagan (RDCO) and Okanagan-Similkameen (RDOS) developed a framework for monitoring change across the entire Okanagan Valley. While an ambitious project—with no direct precedents in B.C. or Canada—participants recognized the significant potential benefits in supporting a more collaborative approach to sustainability challenges that traverse the entire Okanagan Valley.

Monitoring has long been recognized as a best practice in the field of planning. By exploring the development of transferable frameworks for monitoring changes at the regional and interregional level, this project may also provide other districts and areas with the tools to more easily incorporate this critical element of planning into their work.

The final framework has 36 indicators monitoring performance across the following 9 planning Policy Areas:

- Urban Containment & Rural Protection
- Agriculture
- Water Stewardship
- Environment & Natural Lands
- Economic Development
- Transportation & Infrastructure
- Housing
- Climate Change & Greenhouse Gas Emissions (GHGs)
- Community Health and Wellbeing

For each indicator, data was collected for each regional district wherever possible, with the exception of the RDOS, where data collection was focused on the study area for the South Okanagan Regional Growth Strategy.

The scope of the South Okanagan RGS includes Electoral Areas A,C,D,E,F and the municipalities of Osoyoos, Oliver, Penticton, and Summerland. However, data limitations often required collecting data for the entire RDOS.

Data was analyzed to establish baselines and, where possible, identify trends. Results have been assembled as part of this State of the Basin report. It is expected data will be collected on an ongoing basis and the State of the Basin report will be updated on a five-year cycle. More details about the process for developing indicators can be found in the Okanagan State of the Basin Indicator Project: Process Summary Report, which will be available from the Regional District of North Okanagan or online at rdno.ca. This Process Summary Report provides information on the approach and process taken in developing the State of the Basin Report, as well as project challenges and recommendations.

With the exception of 2016 population data, the most recent Census data available for this Monitoring & Evaluation framework was from 2011. Given that the release of 2016 Canada Census data is occurring periodically until late 2017, consideration should be given to updating the State of the Basin Report in 2018. Looking ahead, the next comprehensive update of the State of the Basin Report should be initiated in 2022-23 in order to access 2021 Census data

Without the use of indicators, Policy Area 10 - Governance and Shared Services provides an overview of the many, and diverse, collaborative efforts currently undertaken by multiple local governments and other partners throughout the Okanagan Valley.

This project was made possible by generous funding support of the Real Estate Foundation of B.C. and both monetary and in-kind support from the Okanagan Basin Water Board (OBWB), RDNO, RDCO, and RDOS. Extensive input was also received from representatives of the OBWB, Okanagan Collaborative Conservation Program, the South Okanagan Similkameen Conservation Program, the Central Okanagan Economic Development Commission, and the Interior Health Authority.

It is hoped that the collaborative process by which this work was conducted will be maintained in the future and will encourage continued cooperation between local and regional governments across the Okanagan Valley.

Indicator Framework at a Glance

The intent of the "Indicator Framework at a Glance" table is to provide a quick overview of the report. To fully understand what each indicator represents we recommend that the reader reviews the more detailed data found in the body of the report.

↑ = *increase* ↓ = *decrease* = = *little or no change* ■ = *change in desired direction* ■ = *change in undesired direction* ■ = *neutral*

Indicator	How are we doing?		
	RDNO	RDCO	RDOS, SOUTH OK
Policy Area 1: Urban Containment & Rural Protection			
1.1 Change in percent of new housing located inside designated areas	↑	=	↓
1.2 Hectares of OCP revisions and amendments from rural to more urban designations	↓	*Baseline*	*Baseline*
Policy Area 2: Agriculture			
2.1 Percent change in Agricultural Land Reserve annually and cumulatively	↑	↓	↓
2.2 Percent of total land base that is actively farmed	*Baseline*	*Baseline*	*Baseline*
2.3 Agriculture farm receipts: total value of gross farm receipts	↑	↑	↑
2.4 Profitability (% gross margin) for all agriculture	↑	↑	↓
Policy Area 3: Water Stewardship			
3.1 Water consumption per connection	*Baseline*	*Baseline*	*Baseline*
3.2 Water consumption per use	*Baseline*	*Baseline*	*Baseline*
3.3 Unaccounted for water	*Baseline*	*Baseline*	*Baseline*
3.4 Percentage of observational wells that show declining levels	↓	↓	↑
3.5 Total number of water systems registered with health authority per jurisdiction	↑	↑	↑
3.6 Annual days on advisories per regional district	↑	↓	↑
Policy Area 4: Environment & Natural Lands			
4.1 Hectares with conservation rankings 'very high' and 'high' (context indicator)	*Baseline*	*Baseline*	*Baseline*
4.2 Percentage and hectares of private land in conservation rankings 'very high' and 'high' covered by DPA	*Baseline*	*Baseline*	*Baseline*
4.3 Number of surveyed parcels by size intersecting with land categorized with conservation rankings 'very high' and/or 'high'	*Baseline*	*Baseline*	*Baseline*
4.4 Municipal solid waste disposed per capita	↓	↑	↑
4.5 Percent of disturbed Okanagan Lake shoreline		Okanagan Lake ↑	

Indicator	How are we doing?		
	RDNO	RDCO	RDOS, SOUTH OK
Policy Area 5: Economic Development			
5.1 Median household income relative to provincial median	=	↑	↓
5.2 Percent change in growth in employment	↓	↑	↓
5.3 Percent growth in number of businesses with employees	↑	↑	↑
5.4 Total value of building permits issued for residential, commercial, industrial and institutional	↑	↑	↓
Policy Area 6: Transportation & Infrastructure			
6.1 Share of commute by mode	↑	↓	↓
6.2 Total metres of active transportation facilities (sidewalks and bike lanes)	*Baseline*	*Baseline*	*Data unavailable*
6.3 Annual total ridership per region	↑	↑	↑
6.4 Annual total ridership on select interregional routes		Interregional ↑	
Policy Area 7: Housing			
7.1 Percentage of owner and renter households spending 30% or more of gross income on housing	↑	↑	↑
7.2 Average home prices relative to provincial average	↓	↓	↓
7.3 Number of new homes by structural type	↑	↑	↑
Policy Area 8: Climate Change & Greenhouse Gas Emissions			
8.1 Percent change in non-transportation GHG (CO_2) emissions from 2007 levels	↓	↓	↑
8.2 Average emissions per dwelling unit	↓	↓	↑
8.3 Number of drought response plans in place within the basin	*Baseline*	*Baseline*	*Baseline*
Policy Area 9: Community Health & Wellbeing			
9.1 Crime rates	↑	=	↑
9.2 Body mass index: Self-reported as "overweight" or "obese"		Okanagan ↑	
9.3 Stress levels		Okanagan ↑	
9.4 Physical activity levels		Okanagan ↑	
9.5 Air quality: Annual average of daily mean PM2.5 Levels	↑	↓	↑

CONTEXT

Changes to population size and composition can support changes in policy areas such as the urban containment, the economy, and community health and wellbeing. These population changes are tracked as "context" since there are no preferred directions of change. In other words, changes in either direction to these indicators are not considered good or bad, desirable or undesirable.

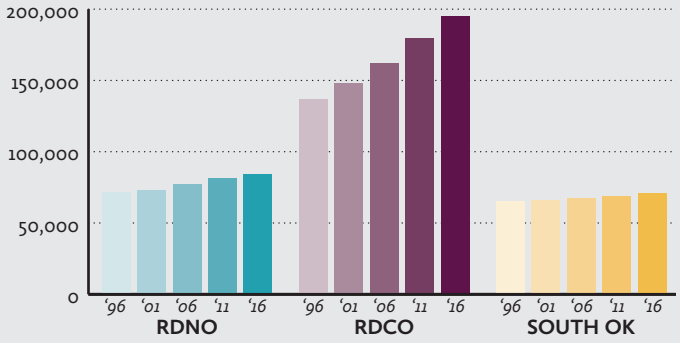
C1 Total population by region

RDNO: ↑ ***Increased.*** Population increased from 81,237 in 2011 to 84,354 in 2016.

RDCO: ↑ ***Increased.*** Population increased from 179,839 in 2011 to 194,882 in 2016.

SOUTH OK: ↑ ***Increased.*** Population increased from 68,852 in 2011 to 70,595 in 2016.

Total Population by Region



Source: Census 1996, 2001, 2006, 2011, 2016.

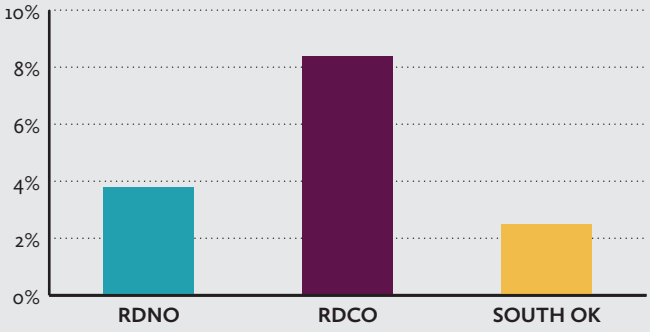
C2 Percentage population growth over 5-year period

RDNO: ↑ ***Increased.*** Population grew by 3.8% between 2011 - 2016.

RDCO: ↑ ***Increased.*** Population grew by 8.4% between 2011 - 2016.

SOUTH OK: ↑ ***Increased.*** Population grew by 2.5% between 2011- 2016.

Percentage Population Growth, 2011-2016



Source: Census 2011, 2016.

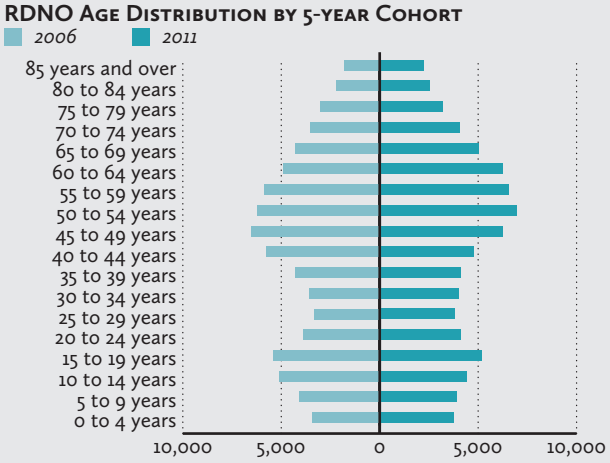
C3 Population age distribution

RDNO: The population of the RDNO is aging, but with the largest proportion of residents still 10-15 years from retirement (45 to 64 years of age).

RDCO: The RDCO also has a sizeable cohort nearing retirement, but with a larger proportion of people aged 20 - 39.

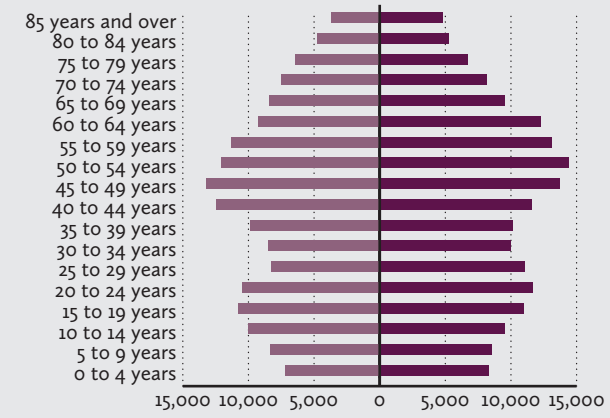
SOUTH OK: The population of the South Okanagan is aging, with youth (5-19), and older working- age adults (35- 50) a decreasing proportion of the population.

RDNO Age Distribution by 5-year Cohort



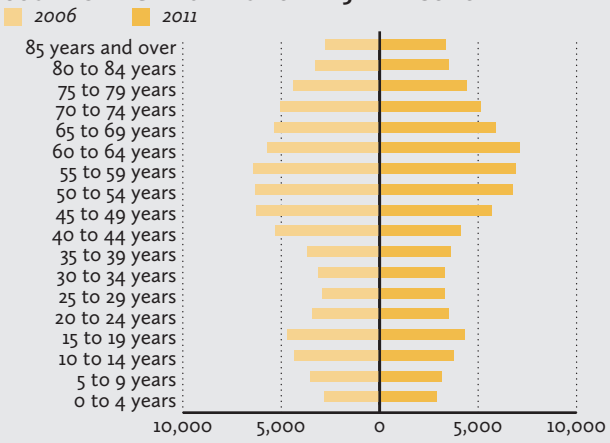
Source: Census 2006, 2011.

RDCO Age Distribution by 5-year Cohort



Source: Census 2006, 2011.

South OK Age Distribution by 5-year Cohort



Source: Census 2006, 2011.

C4 Percent of firms with employees by industry sector (NAICS)[1]

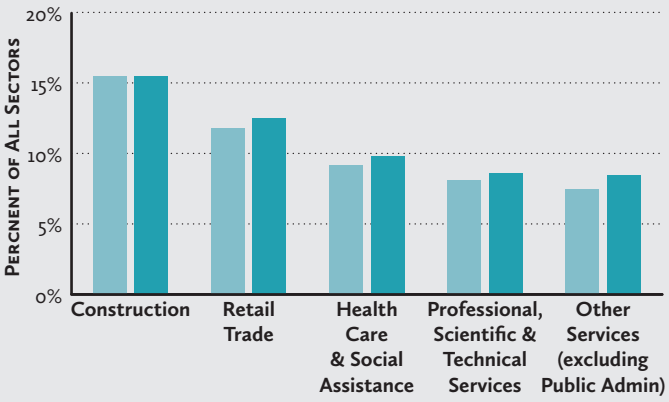
Examining the percentage of firms with employees by industry provides information on the composition of the economy and the top industry sectors for each region.

RDNO: From 2006 to 2011, agriculture dropped from 9% to 7.5% of all businesses in the RDNO, moving from the sector with the 4th largest number of businesses to the 6th.

RDCO: In the RDCO, the top five sectors with the largest number of businesses in 2011 is the same as it was in 2006, but the difference between them decreased. For example, "Construction" decreased from 17.8% to 16.9% of all businesses over the time period, and "Other Services" increased from 6.7% to 9.2%.

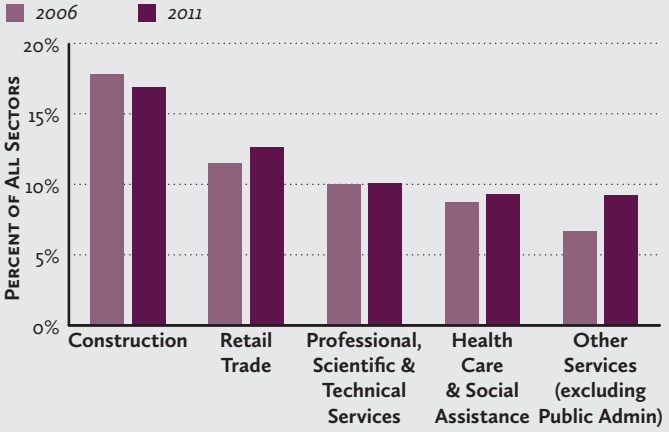
RDOS: Unlike the other regions, construction was not the most dominant sector in the RDOS in 2011; there were more businesses in agriculture (13.9%) than in any other sector. This represents an increase of 1.6% from 2006 when agricultural businesses were the second most numerous. In fact, all of the top five sectors have increased their share of total businesses during the time, suggesting a concentration of the economy in fewer areas.

RDNO Top 5 Industry Sectors (2011)



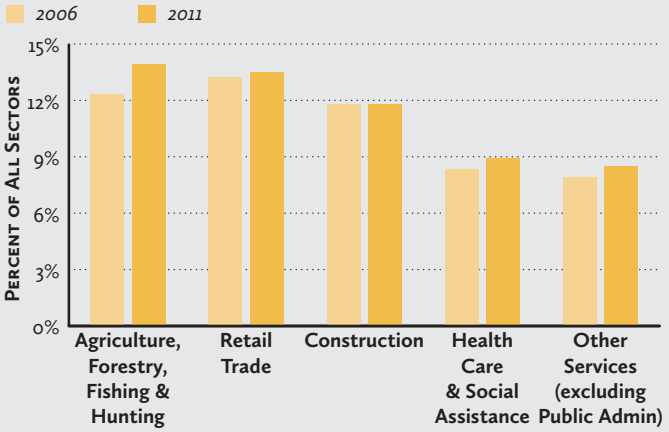
Source: BC Stats, Location Counts 2011.

RDCO Top 5 Industry Sectors (2011)



Source: BC Stats, Location Counts 2011.

RDOS Top 5 Industry Sectors (2011)



Source: BC Stats, Location Counts 2011.

1 North American Industry Classification System

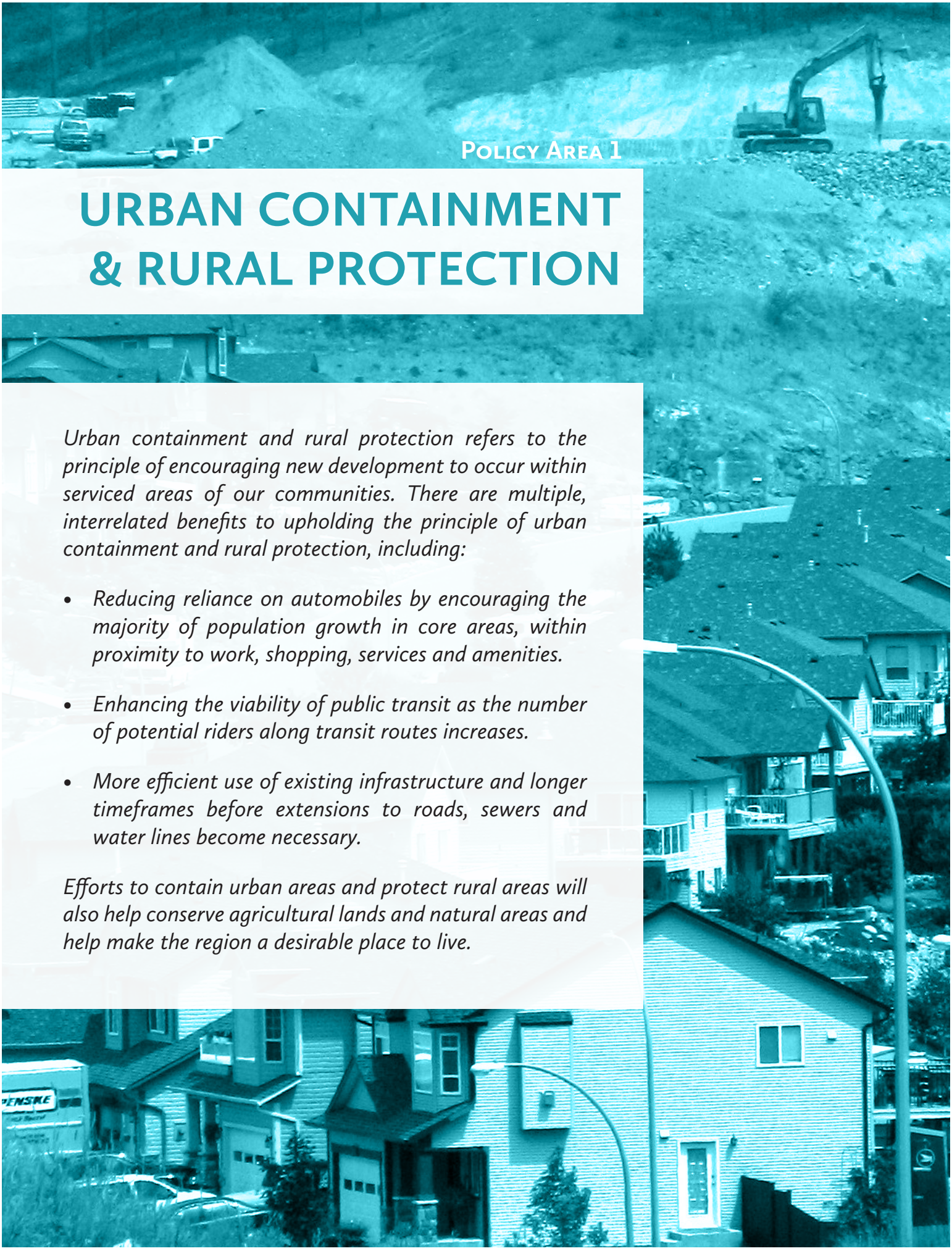
Policy Area 1

URBAN CONTAINMENT & RURAL PROTECTION

Urban containment and rural protection refers to the principle of encouraging new development to occur within serviced areas of our communities. There are multiple, interrelated benefits to upholding the principle of urban containment and rural protection, including:

- *Reducing reliance on automobiles by encouraging the majority of population growth in core areas, within proximity to work, shopping, services and amenities.*
- *Enhancing the viability of public transit as the number of potential riders along transit routes increases.*
- *More efficient use of existing infrastructure and longer timeframes before extensions to roads, sewers and water lines become necessary.*

Efforts to contain urban areas and protect rural areas will also help conserve agricultural lands and natural areas and help make the region a desirable place to live.



1.1 Change in percent of new housing located inside designated areas

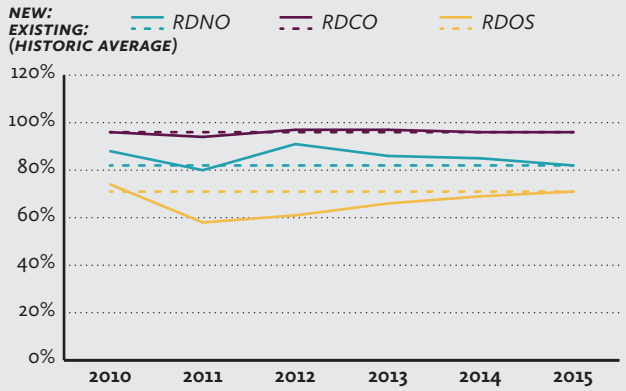
Part of managing growth and protecting rural and natural land from encroachment is directing new development to preferred locations. This indicator uses the number of building permits for new dwelling units each year to show where residential growth is occurring and whether or not growth is happening in designated areas. As designated growth areas have not been established equally across all three regions, incorporated municipal boundaries are being used here as provisional "designated areas". To measure progress, the proportion of new building permits inside designated areas is compared to the proportion of the existing housing as of 2011 (i.e. the historic average).

RDNO: ↑ ***Increased.*** From 2011 - 2015, approximately 84% of residential building permits were for housing inside designated areas, which is higher than the historic average, at 82%. However, the trend in recent years shows this number decreasing – in 2015 only 82% of new residential building permits were for locations within designated areas.

RDCO: = ***Stable.*** In 2011 and 2015, approximately 96% of residential building permits were for housing inside designated areas, which is the same as the historic average. This percentage remained relatively stable during that period.

RDOS: ↓ ***Decreased.*** Compared to the historic average (69%), the percentage of residential permits issued inside designated areas is somewhat lower, at 66%. However, this number has steadily increased over the past five years reaching 71% in 2015.

% of Housing Located Inside Designated Areas
(new housing vs existing housing stock)



Source: BC Stats Building Permits 2010-2015, Census/National Household Survey 2011.

1.2 Hectares of land redesignated through official community plan (OCP) amendment from rural to more urban designations (defined by each RD)

OCP amendments that change rural land to more urban designations represent urban encroachment and potentially a loss of agricultural and natural lands. In tracking the hectares (ha) of land that are changed through such amendments, regional districts will be able to monitor trends in the redesignation of rural land, important for containing sprawl and protecting rural and urban lifestyles.

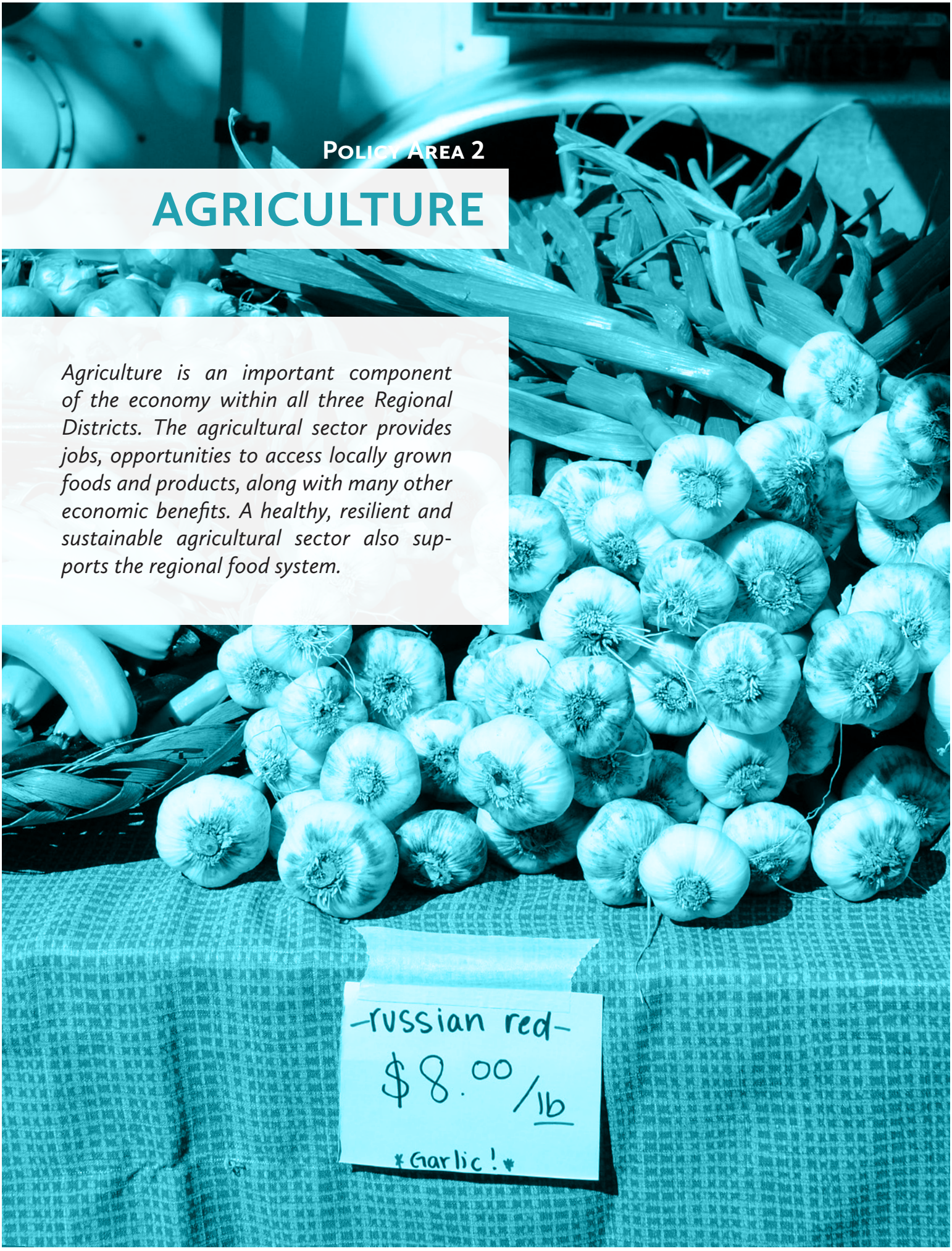
RDNO: ↓ ***Decreased.*** Between 2011 - 2015, only 17.71 ha were changed to more urban OCP designations. This is compared to 177.9 ha between 2006 – 2010.

RDCO: *Baseline.* Between 2011- 2015, 24.3 ha were changed from rural to more urban OCP designations. 2.41 ha were changed from urban to more rural designations, leading to a total change of 21.89 ha of land.

SOUTH OK: *Baseline.* Between 2011- 2015, 21.64 ha were changed from rural to more urban designations in the South OK.

2011-2015	RDNO	RDCO	SOUTH OK
Rural land removed	-17.71 ha	-24.3 ha	-21.64 ha
Rural land added	0 ha	+2.41 ha	0 ha
Total change	**-17.71 ha**	**-21.89 ha**	**-21.64 ha**

Source: Regional District OCP applications, 2006-2010 & 2011-2015.



Policy Area 2

AGRICULTURE

Agriculture is an important component of the economy within all three Regional Districts. The agricultural sector provides jobs, opportunities to access locally grown foods and products, along with many other economic benefits. A healthy, resilient and sustainable agricultural sector also supports the regional food system.

2.1 Percent change in Agricultural Land Reserve over 5-year period

Conserving agricultural land is key to sustaining the agricultural sector and protecting the regional food system. Given the pressures of development, maintaining the net area of the Agricultural Land Reserve (ALR) can be seen as a victory in the conservation of agricultural lands. Calculations here use the base year of 2011.

RDNO: ↑ ***Increased.*** The 26-hectare increase in ALR land between 2011 and 2016 represents a small change (+0.04%) of total ALR land in the region.

RDCO: ↓ ***Decreased.*** The 116-hectare decrease in ALR land between 2011 and 2016 represents a small change (-0.43%) of total ALR land in the region.

SOUTH OK: ↓ ***Decreased.*** The 107.7-hectare decrease in ALR land between 2011 and 2016 represents a small change (-0.25%) of total ALR land in the region.

	RDNO	RDCO	SOUTH OK
Total ALR land (2016)	68,897 ha	27,162 ha	43,837 ha
Change in ALR land 2011-2016	+25.84 ha	-116.4 ha	-107.7 ha
	+0.04%	-0.43%	-0.25%

Source: Agricultural Land Commission.

2.2: Percent of total land base that is actively farmed

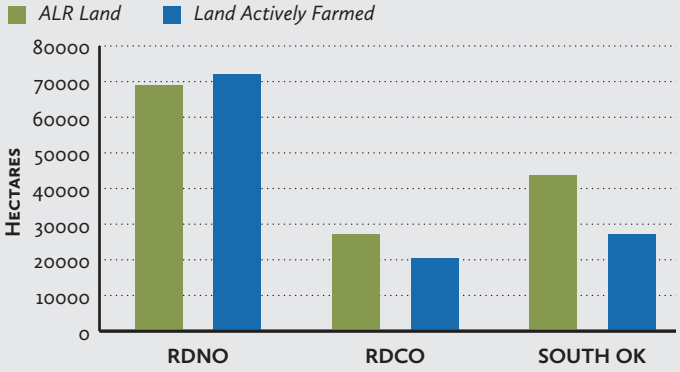
Ensuring that land with the potential to be farmed is in production is important to both regional food security and furthering regional economic opportunities. Actively farming agricultural land is also the best way to protect it against encroachment from development.

RDNO: *Baseline.* In 2016, 72,133 ha, or 9.60% of the total area of the RDNO (751,258 ha) was actively farmed. This is especially impressive as it is more than 5,000 ha more than the total amount of ALR land in the region.[1]

RDCO: *Baseline.* In 2016, 20,259 ha, or 6.45% of the total area of the RDCO (314,261 ha) was actively farmed.

SOUTH OK: *Baseline.* In 2016, 27,217 ha, or 8.23% of the total area of the South Okanagan (330,831 ha in the Regional Growth Strategy area) was actively farmed.

Total ALR Land Compared to Actively Farmed Land, 2016



Source: BC Assessment, 2016.

1 It is important to note that there is agriculturally designated land outside of the ALR.

2.3 Agricultural farm receipts: total value of gross farm receipts

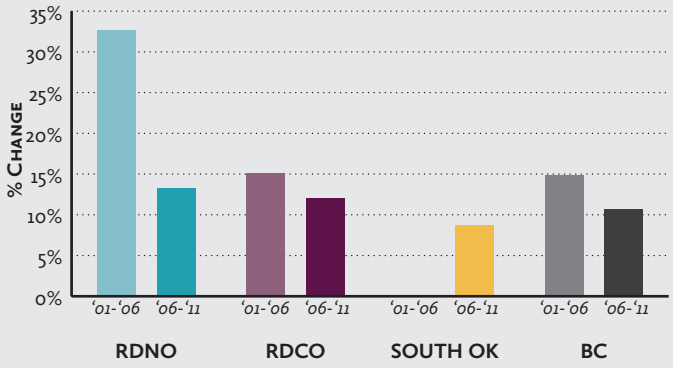
The total value of gross farm receipts indicates, in a general sense, the size of the agricultural economy. Farm receipts represent the income received from the sale of agricultural commodities as well as direct payments made to support or subsidize the agriculture sector. This indicator uses data from the Census of Agriculture to provide a picture of how agriculture is growing or shrinking within the Regional Districts. Between 2006 - 2011, all regions saw growth in the total value of farm receipts.

RDNO: ↑ ***Increased.*** The total value of farm receipts increased by about 13% ($15 million) between 2006 – 2011, from $111,383,177 to $126,150,927. This percent change is slightly higher than the province as a whole, which was 11% from 2006 – 2011.

RDCO: ↑ ***Increased.*** The total value of farm receipts in the RDCO increased over $10 million between 2006 – 2011, to $96,546,394, an increase of about 12%. Again, this is slightly higher than the province's 11% increase during this time.

SOUTH OK: ↑ ***Increased.*** Between 2006 - 2011, the total value of farm receipts increased over $8 million to $104,444,684 in the South OK. This represents an increase of about 8.7%.

% Change in Total Gross Value of Farm Receipts[2]



Source: Statistics Canada, Census of Agriculture 2001 - 2011.

2.4 Profitability (% gross margin) for all agriculture

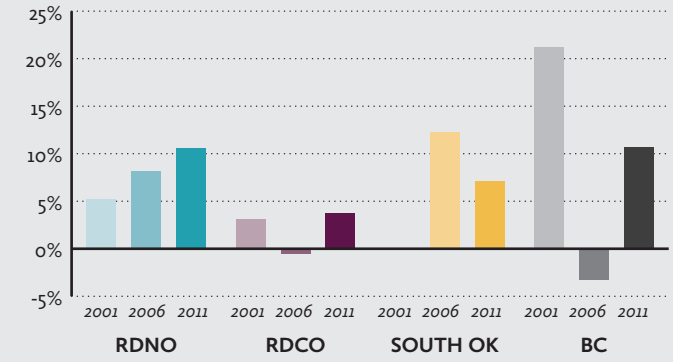
Gross margin is the percentage dollar value remaining after subtracting total operating expenses from total gross farm receipts for all agriculture in a region. It is a means of comparing profitability across regions.

RDNO: ↑ ***Increased.*** The gross margin increased about 2.5%, from 8.2% to 10.6%, between 2006 - 2011, growing from $9,148,511 to $13,393,056. This is in comparison to a provincial increase of 14%, moving from -3.3% to 10.7%.

RDCO: ↑ ***Increased.*** The gross margin for all agriculture rose 4% between 2006 - 2011, from -0.5% to 3.7% (-$419,576 to $3,590,582). However, this increase is less than the provincial increase which grew from -3.3% to 10.7% from 2006 - 2011.

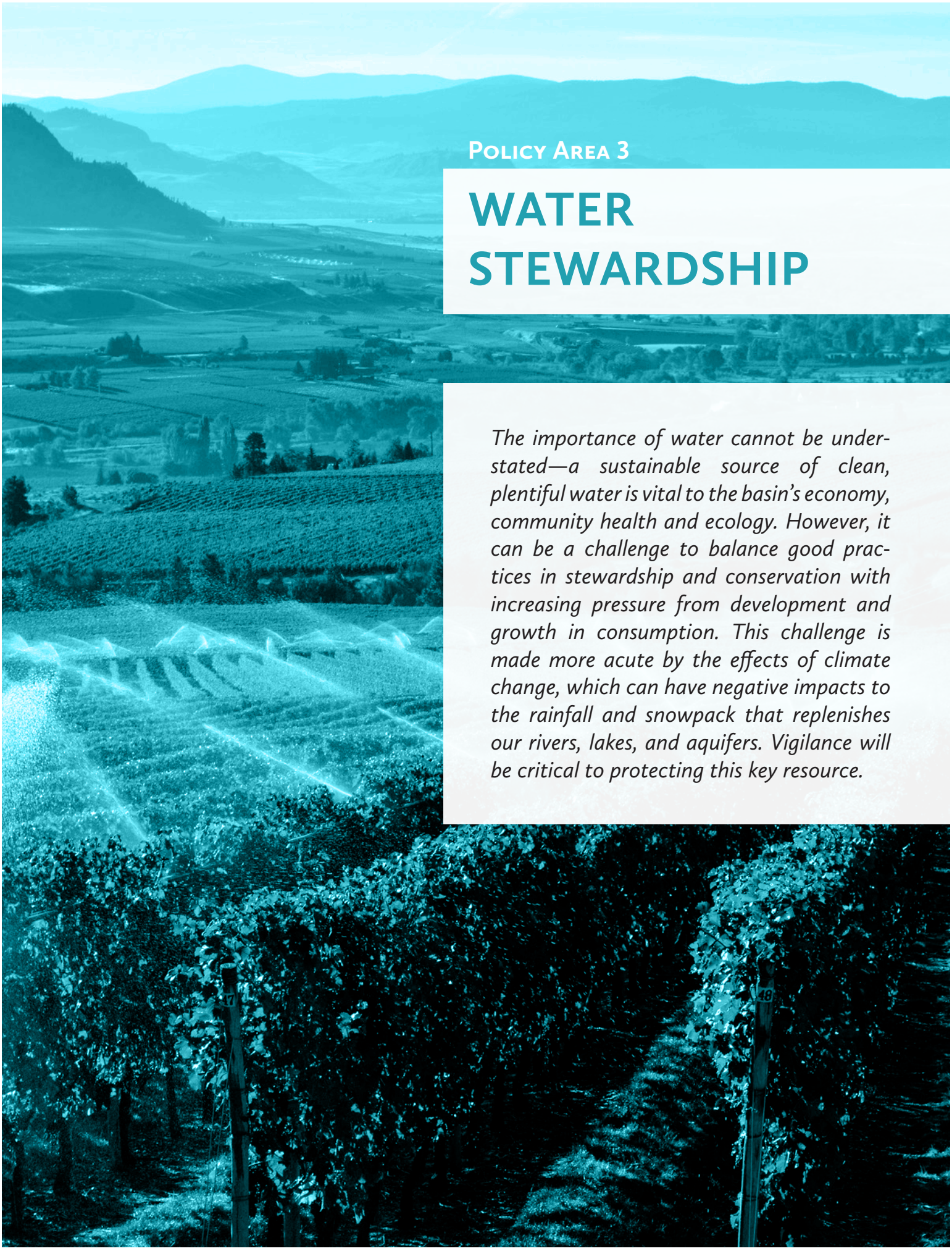
SOUTH OK: ↓ ***Decreased.*** The gross margin decreased between 2006 - 2011, down from 12.3% to 7.1% ($11,857,673to $7,450,574).

Gross Margin for All Agriculture



Source: Statistics Canada, Census of Agriculture 2001 - 2011.

2 Total Gross Farm Receipts data not available for the South Okanagan in 2001, therefore percent change between 2001- 2006 could not be calculated.



Policy Area 3

WATER STEWARDSHIP

The importance of water cannot be understated—a sustainable source of clean, plentiful water is vital to the basin's economy, community health and ecology. However, it can be a challenge to balance good practices in stewardship and conservation with increasing pressure from development and growth in consumption. This challenge is made more acute by the effects of climate change, which can have negative impacts to the rainfall and snowpack that replenishes our rivers, lakes, and aquifers. Vigilance will be critical to protecting this key resource.

Within each regional district, there are many large and small utilities providing water to its users. The water suppliers listed below provided data for this policy area and the listed indicators.

Water suppliers who supplied data for indicators 3.1 – 3.3

Y = data supplied

SUPPLIER	INDICATOR 3.1 Water Consumption per Connection	INDICATOR 3.2 Water Consumption per Use	INDICATOR 3.3 [1] Unaccounted for Water
RDNO			
GVW	Y	Y	Y
Lumby	Y	Y	
Armstrong [2]	Y	Y	
Enderby	Y		
Silver Star Mtn	Y		
Grindrod	Y		
Mabel Lake	Y		
Steele Springs	Y		
Lansdowne	Y		
Highland Park	Y		
Stardel	Y		
Larkin	Y	Y	
Eagle Rock	Y	Y	
RDCO			
Kelowna	Y	Y	Y
West Kelowna	Y	Y	Y
Lake Country	Y	Y	Y
Peachland	Y	Y	Y
BMID	Y		Y
RWW	Y	Y	Y
GEID	Y	Y	Y
SEKID	Y	Y	Y
RDCO [3]	Y	Y	
SOUTH OK			
Penticton	Y	Y	Y
Summerland	Y	Y	
Osoyoos	Y		
Oliver	Y	Y	
West Bench	Y	Y	
Faulder	Y		
Naramata	Y	Y	
Sage Mesa	Y	Y	

1 Though data is only available for unaccounted for water for GVW in the RDNO and Penticton for the South OK, these utilities represent a large percentage of connection in their respective regional districts (79% of connections in the RDNO and 41% of connections in the South OK).

2 Unaccounted for water was reported by Armstrong as "low". Because they didn't provide a specific percentage, this information was not used in calculating the percentage of unaccounted for water in the RDNO.

3 Various small utilities administered by RDCO.

Water supplier acronyms

GVW	Greater Vernon Water
RWW	Rutland Waterworks District
BMID	Black Mountain Irrigation District
GEID	Glenmore Ellison Improvement District
SEKID	South East Kelowna Irrigation District
RDNO	Regional District of North Okanagan
RDCO	Regional District of Central Okanagan
SOUTH OK	South Okanagan

A note on data collection

All regional districts implemented a new water survey in 2016 to provide information for many of the indicators within this policy area. Due to its recent implementation, comprehensive historical data is not available for most utilities (prior to 2015). As a result, the data provided will serve as a baseline for years to come.

3.1 Water consumption per connection

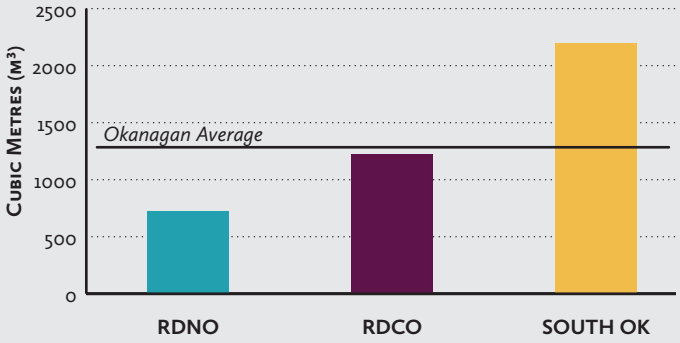
This indicator is useful in determining long terms trends in water consumption; it is based on water suppliers reporting total water consumption and number of connections for all water user types (residential, agricultural, and other). This data should be read in the context of precipitation, for example, 2015 was considered a drought year. At this time, it is not possible to reliably determine the population within each water system service area therefore data on 'per capita water consumption' is not currently available.

RDNO: *Baseline.* In 2015 in the RDNO, average water consumption per connection was 723m³ with a total of 30,581 connections and 22,123,062m³ of water consumed. The RDNO's average was below the Okanagan's average annual consumption per connection of 1284m³.

RDCO: *Baseline.* In 2015 in the RDCO, average water consumption per connection was 1,221m³ with a total of 58,322 connections and 71,199,717m³ of water consumed. The RDCO's average was below the Okanagan's average annual consumption per connection of 1284 m³.

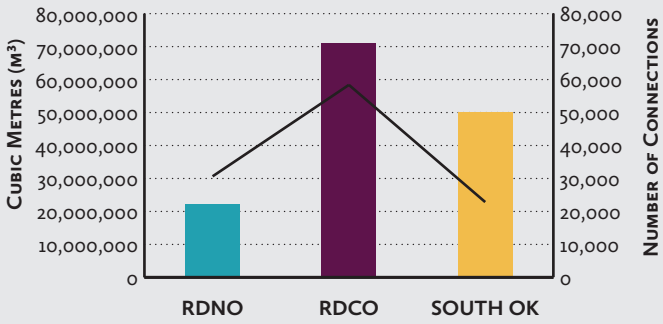
SOUTH OK: *Baseline.* In 2015 in the South OK, average water consumption per connection was 2,201m³ with a total of 22,780 connections and 50,132,402m³ of water consumed. The South OK's average was above the Okanagan's average annual consumption of 1284 m³.

Annual Water Consumption per Connection



Source: Water Supplier Correspondence, 2016-2017.

Total Connections (line) and Annual Water Consumption (bars)



Source: Water Supplier Correspondence, 2016-2017.

Water consumption data

SUPPLIER	VOLUME (m^3)	CONNECTIONS	AVERAGE m^3 PER CONNECTION
RDNO			
GVW	19,139,107	24,500	781
Lumby	309,769	773	401
Armstrong	1,164,673	2,013	579
Enderby	623,185	1,707	365
Silver Star Mtn	129,376	744	174
Grindrod	32,274	57	566
Mabel Lake	65,000	382	170
Steele Springs	39,694	53	749
Lansdowne	71,024	84	846
Highland Park	22,910	37	619
Stardel	5,634	11	512
Larkin	133,471	127	1051
Eagle Rock	386,945	93	4161
Total	**22,123,062**	**30,581**	**723**
RDCO			
Kelowna	13,582,000	16,178	840
West Kelowna	10,987,200	10,846	1013
Lake Country	9,621,594	4,010	2399
Peachland	1,359,374	2,101	647
BMID [4]	13,100,000	9,392	1395
RWW	3,446,671	3,922	879
GEID	7,510,000	8,767	857
SEKID	11,364,693	2,220	5119
RDCO	228,185	886	258
Total	**71,199,717**	**58,322**	**1221**
SOUTH OK			
Penticton	10,612,000	9,413	1127
Summerland	10,452,428	5,085	2056
Osoyoos	9,905,964	3,357	2951
Oliver	16,722,829	3,148	5312
West Bench	402,308	352	1143
Faulder	37,177	76	489
Naramata	1,737,846	1,102	1577
Sage Mesa	261,850	247	1060
Total	**50,132,402**	**22,780**	**2201**

4 BMID 2015 water consumption as given in BMID annual report

3.2 Water consumption use

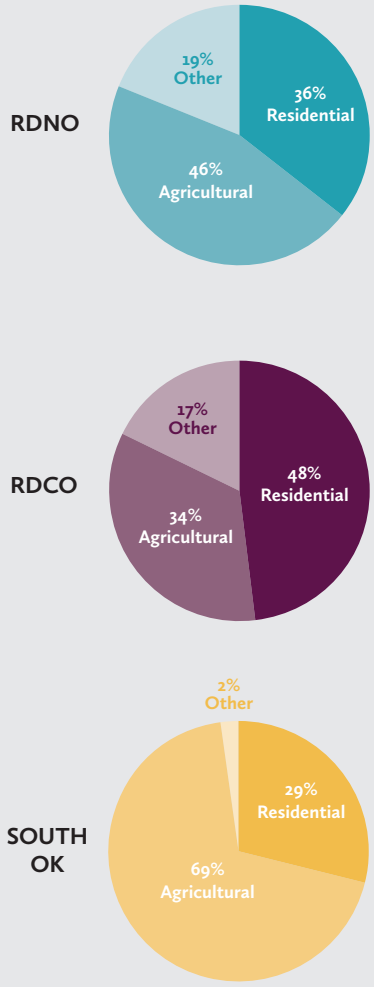
In looking at water consumption by land-use types, this indicator illustrates the consumption patterns of different types of water users, including residential, agricultural and other (industrial, commercial, institutional and other).

RDNO: *Baseline.* In 2015, 46% of recorded water in the RDNO was consumed by agricultural uses. This was followed by residential uses at 36% and other uses at 19%.

RDCO. *Baseline.* In 2015, 48% of recorded water in the RDCO was consumed by residential uses, followed by 34% consumed by agricultural uses and 17% consumed by other uses.

SOUTH OK. *Baseline.* In 2015, 69% of recorded water in the South OK was consumed by agricultural uses, 29% was consumed by residential uses and 2% consumed by other uses.

2015 Water Consumption per Use



Source: Water Supplier Correspondence, 2016-2017.

Water consumption data per use type (m^3)

	RESIDENTIAL	*AGRICULTURAL*	*OTHER*	*TOTAL*
RDNO				
GVW	4,594,081	7,420,927	2,212,052	14,227,060
Lumby	263,304		46,465	309,769
Armstrong	850,979		313,694	1,164,673
Larkin	64,357	13,108	56,006	133,471
Eagle Rock	10,684		376,261	386,945
Percent of Total	**36%**	**46%**	**19%**	**100%**
Total	**5,783,405**	**7,434,035**	**3,004,478**	**16,221,918**
RDCO [5]				
Kelowna	8,595,000		4,987,000	13,582,000
West Kelowna	9,037,250	1,949,950		10,987,200
Lake Country	4,329,717	5,291,877		9,621,594
Peachland	936,567	226,775	196,031	1,359,373
RWW	3,102,004		344,667	3,446,671
GEID		2,897,000	4,613,600	7,510,600
SEKID	1,704,704	9,659,989		11,364,693
RDCO	228,185			228,185
Percent of Total	**48%**	**34%**	**17%**	**100%**
Total	**27,933,427**	**20,025,591**	**10,141,298**	**58,100,316**
SOUTH OK				
Penticton [6]	6,987,000	3,625,000		10,612,000
Summerland [7]	5,283,902	5,168,526		10,452,428
Osoyoos	2,240,806	7,665,158		9,905,964
Oliver	1,815,619	23,403,231	710,414	25,929,264
West Bench	104,978	284,843	12,487	402,308
Naramata	611,601	926,293	199,952	1,737,846
Sage Mesa	201,437		60,413	261,850
Percent of Total	**29%**	**69%**	**2%**	**100%**
Total	**17,245,343**	**41,073,051**	**983,266**	**59,301,660**

5 This indicator does not include BMID. GEID "Other" is comprised of Residential and ICI (industrial/commercial/institutional). West Kelowna "Residential" is comprised of Residential and ICI.

6 Penticton identified consumption for residential & agricultural uses.

7 Summerland "Residential" is comprised of Residential and ICI (industrial/commercial/institutional).

3.3 Unaccounted for Water

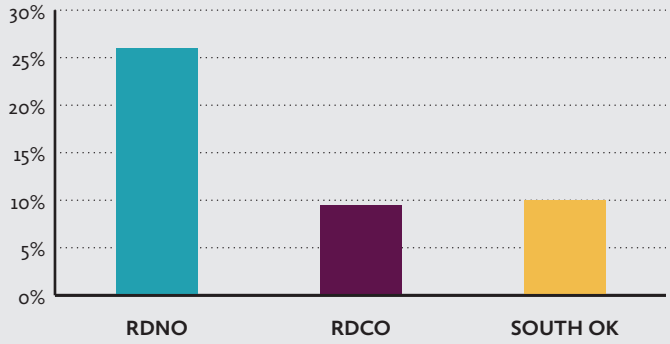
Unaccounted for water accounts for leakage and theft, legitimate authorized unmetered uses such as firefighting[8] and water main flushing, and any other water losses between a distribution centre and the final user's meter. In some areas, this number can be quite high. A trend in unaccounted for water consumption is helpful in identifying which utilities may need infrastructure improvements or changes to data collection practices, which could lead to cost savings and water conservation. Data for this indicator has been compiled from three different sources dated between 2015 – 2017. See sources for more details.

RDNO. *Baseline.* 26% of RDNO's water was unaccounted for. This percentage is based on data available for the Greater Vernon Water District, representing 79% of the water connections in the RDNO.

RDCO. *Baseline.* The averaged percentage of water unaccounted for in the RDCO was 9.5%. The water suppliers providing data for this percentage represent 98% of water connections in the RDCO.

SOUTH OK. *Baseline.* 10% of the South OK's water was unaccounted for. This percentage is based on data available for Penticton, representing 41% of connections in the South OK.

Percent of Unaccounted for Water (averaged) (m^3)



Sources: Water Supplier Survey, October 2016, OBWB; Greater Vernon Water Annual Report, 2015; and Water Supplier Correspondence, 2016 – 17.

8 Fire hydrants do not have meters as they impede water flow.

Unaccounted for water data

SUPPLIER	UNACCOUNTED FOR WATER (AVERAGED)	# OF CONNECTIONS	% OF REGIONAL WATER CONNECTIONS REPRESENTED
RDNO			
GVW	26%	24,500	79%
Lumby	unknown	773	
Armstrong	low	2,013	7%
Enderby	unknown	1,707	
Silver Star Mtn	unknown	774	
Grindrod	unknown	57	
Mabel Lake	unknown	382	
Steele Springs	unknown	53	
Lansdowne	unknown	84	
Highland Park	unknown	37	
Stardel	unknown	11	
Larkin	unknown	127	
Eagle Rock	unknown	93	
Stepney	unknown	50	
Grandview	unknown	103	
Whitevale	unknown	93	
Gunter Ellison	unknown	11	
Total	**26%**	**30,868**	**86%**
RDCO			
Kelowna	10%	16,178	29%
West Kelowna	19.5%	10,846	19%
Lake Country	3.5%	4,010	7%
Peachland	15-24% (20%)	2,101	4%
BMID	7.2%	9,392	17%
RWW	8%	3,922	7%
GEID	2-3% (2.5)	6,871	12%
SEKID	5-6% (5.5%)	2,220	4%
RDCO [9]	unknown	914	
Total	**9.5%**	**56,454**	**98%**
SOUTH OK			
Penticton	10%	9,413	41%
Summerland	unknown	5,085	
Osoyoos	unknown	3,357	
Oliver	unknown	3,148	
RDOS [10]	unknown	2,045	
Total	**10%**	**23,048**	**41%**

9 Various small utilities administered by RDCO
10 Various small utilities administered by RDOS

3.4 Percentage of observation wells that show declining levels

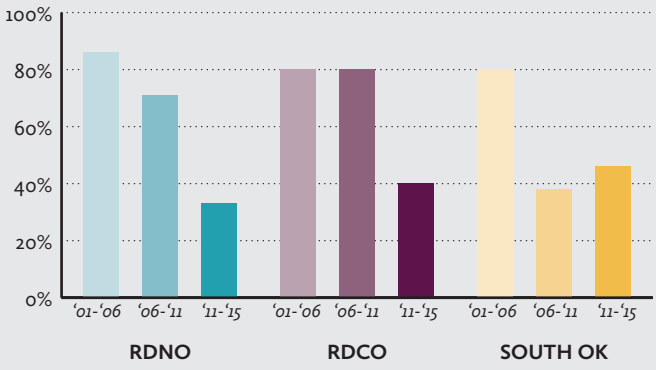
Groundwater is an important source for many water utilities and private groundwater well users. Monitoring observation wells can show when aquifer levels are dropping, indicating the need to restrict or regulate the use of groundwater in a given area, and the long-term need to explore other water source options. It is to be noted that water levels in groundwater wells are correlated with rainfall and water usage. Groundwater levels may rise during periods of snow melt and wet weather and correspondingly decline during dry spells and in relation to the amount of water being pumped from wells.

RDNO[11]: ***Decreased.*** The percent of observation wells that showed declining levels dropped significantly from 2006 - 2011 to 2011 - 2015. 71% of observation wells showed declining levels between 2006 - 2011 while 33% of observation wells showed declining levels between 2011 - 2015. The average change in groundwater levels also changed during this time frame, from -0.76 metres to 0.38 metres.

RDCO: ***Decreased.*** Between 2006 - 2011 and 2011 - 2015, the percentage of observation wells that showed declining levels decreased in the RDCO from 80% between 2006 - 2011 to 40% between 2011 – 2015. During this time, average change in groundwater levels moved from -0.71 metres (2006 – 2011) to -0.16 metres (2011 – 2015).

SOUTH OK[12]: ***Increased.*** The percentage of observation wells that showed declining levels increased between 2006 – 2011 and 2011 – 2015, from 38% to 46%. The average change in groundwater levels changed from -0.21 metres between 2006- 2011 to -1.25 between 2011- 2015.

% of Observations Wells that Show Declining Levels



Source: British Columbia Groundwater Observation Well Network, 2001- 2016.

11 The number of observation wells has increased in the RDNO in recent years which influences the total percentages and average change. More wells increase the odds of having more wells reporting declining levels.

12 The number of observation wells has increased in the South Okanagan in recent years which influences the total percentages and average change. More wells increase the odds of having more wells reporting declining levels.

Observation well levels data

	Five Year Change (metres)		
	2001 to 2006	2006 to 2011	2011 to 2015
RDNO			
Vernon no.311	-0.33	-0.24	1.12
Silverstar no.47	-0.22	0.17	0.23
Armstrong no.117	-0.29	0.12	-0.21
Spallumcheen no.409			0.88
Armstrong no.384			-0.25
Lumby no.294	0.20	-0.16	0.22
Armstrong no.180	-3.07	-0.55	1.24
Enderby no.122	-0.58	-2.28	-0.07
Armstrong no.118	-0.34	-2.35	0.21
% of Observation wells that show declining levels	**86%**	**71%**	**33%**
Average change in groundwater level (metres)	**-0.66**	**-0.76**	**0.38**
RDCO [13]			
Kelowna (Mculloch and KLO) no.262	-1.49	-0.62	-1.66
Rutland no.236	-3.13	-1.57	-0.95
Winfield (Jim Bailey Rd) no.356	0.74	-1.10	0.96
Oyama (Trewhitt Rd) no.162	-0.29	0.12	0.44
Oyama (Sawmill Rd) no.172	-0.02	-0.38	0.40
% of Observation wells that show declining levels	**80%**	**80%**	**40%**
Average change in groundwater level (metres)	**-0.84**	**-0.71**	**-0.16**
SOUTH OK [14]			
Osoyoos (Wren Place) no.096	0.07	-0.21	0.19
Osoyoos (Bullmoose Rd) no.401			-0.33
Osoyoos (Anarchist Moutain Summit) no.402			-0.17
Osoyoos (160th Ave & Hwy 97) no.101	-0.22	-2.07	-0.70
Oliver (87th St.) no.332	-0.56	-0.40	0.54
Oliver (101 St & 338 Ave) no.405			0.23
Oliver (Tuc-El-Nuit Rd) no.407			-0.08
Willowbrook/Meyers Flats (Meyers Rd.) no.282	-1.53	1.30	2.73
Twin Lakes (Eastview Rd) no.404			1.48
Twin Lakes (Twin Lakes Rd) no.403			1.73
Summerland (Hwy 97 & Thornber St.) no.154	-0.03	-0.11	-0.06
Summerland (Bathville Rd.) no.366		-1.25	3.12
Penticton Creek Watershed no.387			-24.88
% of Observation wells that show declining levels	**80%**	**38%**	**46%**
Average change in groundwater level (metres)	**-0.46**	**-0.21**	**-1.25**

13 The following RDCO wells were not measured until more recently (between 2012-2014) therefore it was not possible to calculate five-year change: West Kelowna – 411, SE Kelowna (Bemrose Rd) – 413, Joe Rich (Goudie Rd) – 410, Kelowna (Black Rd) – 442.

14 Mt. Kobau -264 and Summerland (Upper Trout Creek) - 412 were not measured until 2013 therefore it was not possible to calculate five-year change.

3.5 Total number of water systems[15] registered with health authority per jurisdiction

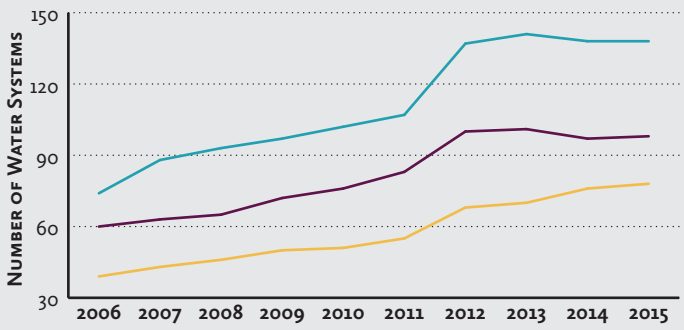
While much of the drinking water in the valley is provided through large water utilities, many small and private water systems also exist. Small and private water systems typically have less resources to conduct system improvement, less sophisticated reservoir, filtering and monitoring systems and a higher number of water quality advisories. The Drinking Water Protection Act outlines general requirements for water suppliers, and the Drinking Water Protection Regulation sets out some more specific requirements. Private water utilities have a responsibility to provide safe, clean water under the Water Utility Act and the Utilities Commission Act. A notable increase in the number of registered water systems occurred in all three regional districts in 2011-2012. While the basis for this increase has not been determined, it may, in part, be due to an increase in the number of existing systems becoming registered as well as an increase in the actual number of water systems. Ideally, the tracking of water systems should indicate whether the systems are new or recently registered existing water systems. As this distinction is not available at this time, it is debatable whether an increase in the number of registered water systems is a positive or negative indicator. Given the challenges faced by small water systems in particular, an increasing number of water systems could be interpreted as a negative indicator. On the other hand, if the increase is due, in part, to a greater number of existing systems becoming registered, that could be considered positive given the standards of professionalism and accountability required of registered water systems.

RDNO: ↑ ***Increased.*** The total number of water systems in the RDNO increased from 2010 – 2015, from 102 systems in 2010 to 138 systems in 2015. However, the number of water systems reached a high in 2013 at 141 water systems, and has decreased slightly since.

RDCO: ↑ ***Increased.*** The total number of water systems in the RDCO has increased since 2010 by about 22 registered water systems, increasing from 76 to 98. Much like the RDNO, the number of registered water systems reached a high 2013 and has since decreased slightly.

SOUTH OK: ↑ ***Increased.*** Registered water systems have steadily increased in the South Okanagan, growing from 51 water systems in 2010 to 78 water systems in 2015.

Number of Water Systems Registered with Health Authority



Source: Health Authority, 2006-2015; Interior Health, 2006-2015.

3.6 Annual days on advisories reported by registered water systems

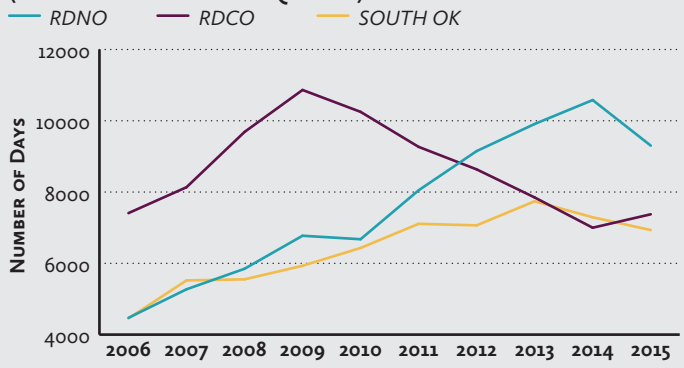
As one of the ways to measure safe and healthy drinking water, this indicator tracks the number of boil water and water quality advisories issued by water utilities in a year. These advisories indicate that there is a health risk determined to be in the drinking water or that there is a level of risk associated with consuming the drinking water[16], thus negatively impacting water system users. In future years, data may be available to report on annual people-days on advisories. People-days is a measure that accounts for the length of an advisory (in days) and the number of people it covers. For example, a five-day advisory for an area with 1000 people, would equate to 5000 people-days.

RDNO: ↑ ***Increased.*** Of the 138 registered systems in the RDNO in 2015, 82 reported a total of 9303 advisory days. As a result, the number of advisory days increased from 2010 – 2015 by 2627, growing from 6676 days in 2010. However, advisories decreased from 2014 to 2015.

RDCO: ↓ ***Decreased.*** Of the 98 registered systems in the RDCO in 2015, 62 reported a total of 7376 advisory days. This is 2874 less than the 10,250 advisory days reported in 2010.

SOUTH OK[17]: ↑ ***Increased.*** Of the 78 registered systems in the South Okanagan in 2015, 54 reported a total of 6934 advisory days. This is an increase from the number of water advisories days in 2010, which was 6431.

Total Number of Days on Advisories Annually (Boil Water and Water Quality)

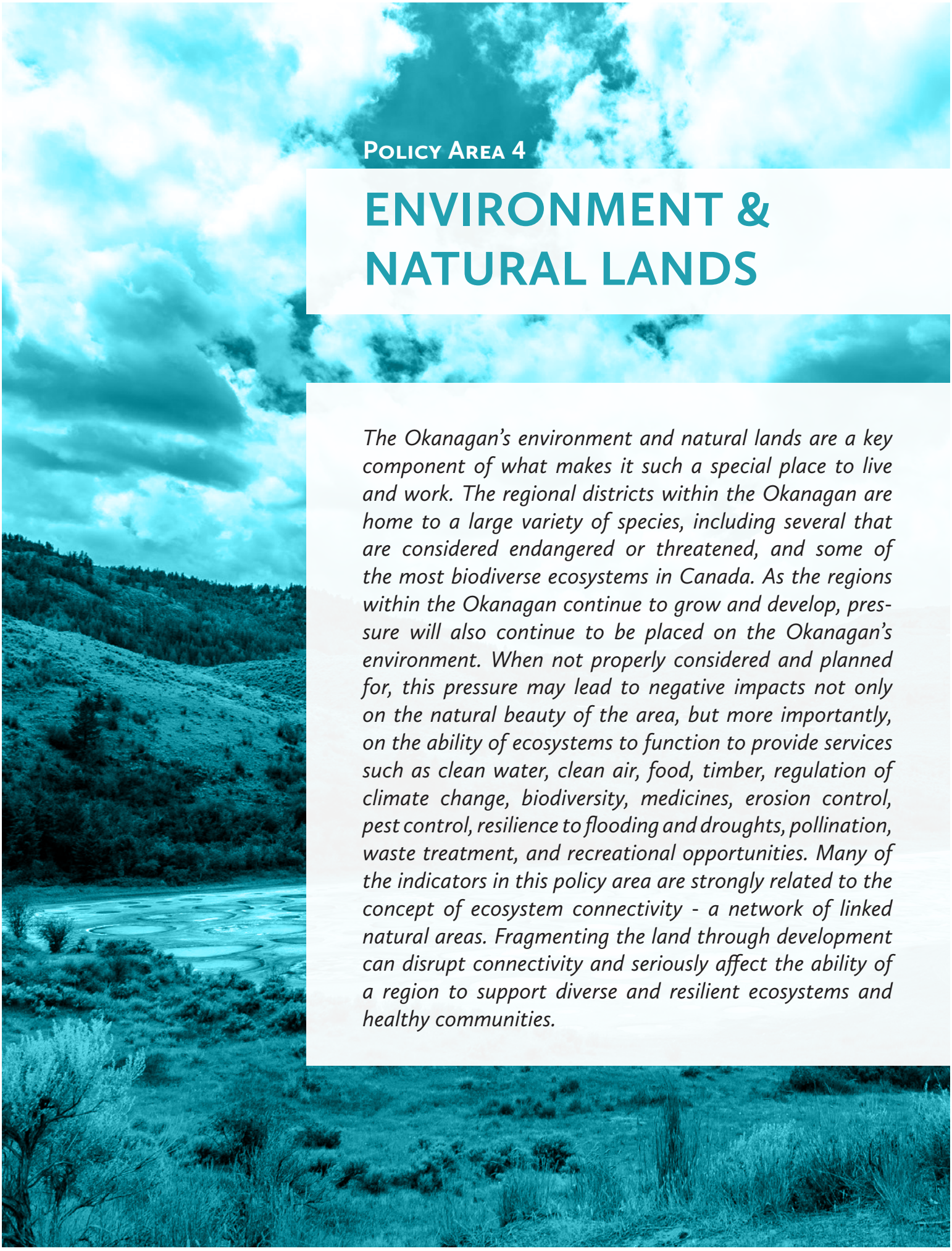


Source: BC Health Authority, 2006-2015.

15 The Drinking Water Protection Act defines a water supply system as any domestic water system other than those that serve only one single-family residence (or other facilities specifically excluded by regulation).

16 Interior Health, Drinking Water- Notifications and Sampling Results. https://www.interiorhealth.ca/YourEnvironment/DrinkingWater/Pages/AdvisoriesNotifications.aspx

17 "People days on advisories" will generally increase as larger utilities take over smaller systems. For example, when the RDOS acquires a water system, they overlay their own vigilant monitoring and sampling protocols. Often, this results in samples that exceed IHA thresholds and advisories are issued until the issue is rectified.



Policy Area 4

ENVIRONMENT & NATURAL LANDS

The Okanagan's environment and natural lands are a key component of what makes it such a special place to live and work. The regional districts within the Okanagan are home to a large variety of species, including several that are considered endangered or threatened, and some of the most biodiverse ecosystems in Canada. As the regions within the Okanagan continue to grow and develop, pressure will also continue to be placed on the Okanagan's environment. When not properly considered and planned for, this pressure may lead to negative impacts not only on the natural beauty of the area, but more importantly, on the ability of ecosystems to function to provide services such as clean water, clean air, food, timber, regulation of climate change, biodiversity, medicines, erosion control, pest control, resilience to flooding and droughts, pollination, waste treatment, and recreational opportunities. Many of the indicators in this policy area are strongly related to the concept of ecosystem connectivity - a network of linked natural areas. Fragmenting the land through development can disrupt connectivity and seriously affect the ability of a region to support diverse and resilient ecosystems and healthy communities.

4.1 Hectares with conservation rankings 'Very high' and 'High' (context indicator)

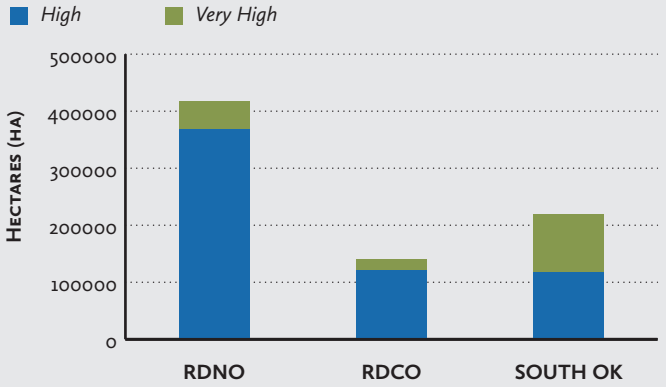
Conservation rankings provide information on which ecosystems are the most important for conservation. Conservation rankings were generated and mapped for the Okanagan Biodiversity Strategy prepared by the South Okanagan Similkameen Conservation Program and Okanagan Collaborative Conservation Program. These rankings are based on data from Terrestrial Ecosystem Mapping (TEM), Sensitive Ecosystems Inventory (SEI), and Vegetation Resource Inventory (VRI), as well as other biophysical criteria. Ecosystems were classified into four conservation rankings: low, moderate, high and very high, indicating their relative importance to conservation.[1] This indicator provides data on the hectares of land ranked as 'high' or 'very high' importance and will be used as a baseline to determine if development pressures affect these areas.

RDNO: *Baseline.* In 2016, a total of 416,959 ha of land in the RDNO had a conservation ranking of 'very high' or 'high'. About 88% of this total was ranked 'high' (368,209 ha) while about 12% (48,750 ha) was ranked 'very high.'

RDCO: *Baseline.* In 2016, the RDCO had a total of 140,647 ha of land with a conservation ranking of 'very high' or 'high'. About 87% of this total was ranked 'high' (121,748 ha) while about 13% (18,899 ha) was ranked 'very high.'

SOUTH OK: *Baseline.* In 2016, the South Okanagan had a total of 220,318 ha of land with a conservation ranking of 'very high' or 'high'. About 53% of this total was ranked 'high' (116,998 ha) while about 47% (103,320 ha) was ranked 'very high.'

2016 HECTARES OF CONSERVATION RANKING 'VERY HIGH' & 'HIGH'



Sources: A Biodiversity Conservation Analysis Summary for the Okanagan Region, 2013; Keeping Nature in our Future: Volume 1 - A Biodiversity Conservation Analysis for the South Okanagan-Similkameen Region, 2011

4.2 Percentage and hectares of private land in conservation rankings 'Very high' and 'High' covered by DPA

Development permit areas (DPA) provide guidelines for how proposed development can address objectives related to supporting the protection of the natural environment, ecosystems and biodiversity. This indicator tracks the amount of high quality habitat (i.e., land with Conservation Rankings of 'Very High' and 'High') in private land that is managed by an environmental DPA.

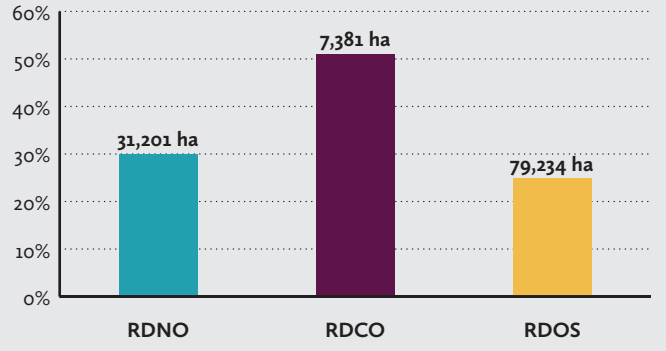
RDNO: *Baseline.* In 2016, 30% or 31,201 ha of private land in conservation rankings 'very high' and 'high' were covered by a DPA.

RDCO: *Baseline.* In 2016 in the RDCO, 51% or 7,381 ha of land with conservation rankings of 'very high' and 'high' were covered by DPAs.

RDOS: *Baseline.* In 2016, 79,234 ha or 25% of land in the RDOS with conservation rankings of 'very high' and 'high' were covered by DPAs.

1 Biodiversity Conservation Strategy for the Okanagan Region: Summary, 2014.

Percentage and hectares of private land in conservation rankings 'very high' and 'high' covered by a DPA



Source: Regional District Geographic Information System (GIS) Departments.

4.3 Number of surveyed parcels by size intersecting with land categorized with conservation rankings 'very high' and/or 'high'

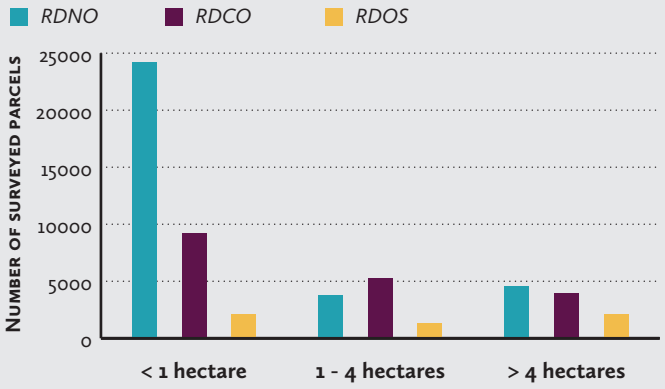
The number of surveyed parcels within land categorized with conservation rankings 'very high' and/or 'high' is representative of the fragmentation of quality habitat. The smaller the parcels and the higher the number of parcels, the more likely it is that there is disruption to the habitat of native plants and animals. Habitat fragmentation is a main contributor to the decline of biodiversity and connectivity between remaining habitats. As habitats are reduced in size and become increasingly isolated, the ongoing viability of ecosystems is affected. Unsurveyed Crown Land is not included in this data.

RDNO: ***Baseline.*** In 2016, there were a total of 32,565 surveyed parcels intersecting with land categorized with conservation rankings 'very high' and 'high'. When separated by parcel size, the largest proportion of surveyed parcels were less than 1 ha, totaling 24,224.[2]

RDCO: ***Baseline.*** In 2016, the RDCO had a total of 18,338 surveyed parcels intersecting with land with conservation rankings of 'very high' and 'high'. Of these 18,338, the majority (9187) were less than 1 ha in size.

RDOS: ***Baseline.*** In the RDOS in 2016, there were 5,609 surveyed parcels intersecting with land categorized with conservation rankings 'very high' and 'high'. When categorized by parcel size, there was a relatively even distribution, with 2,128 lots less than 1 ha, 1,349 lots between 1 and 4 ha and 2,132 lots more than 4 ha. This indicator does not include data from RDOS municipalities.

Number of surveyed parcels by size intersecting with land categorized as conservation rankings 'very high' & 'high' in 2016



Source: Regional District Geographic Information System (GIS) Departments.

4.4 Municipal solid waste disposed per capita

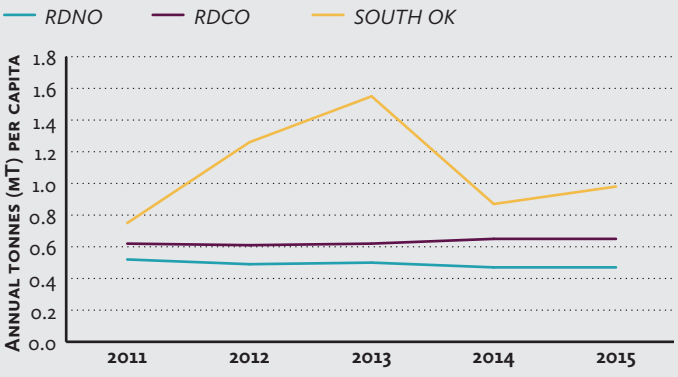
Solid waste is a concern to the environment for several reasons. The amount of land available for storing disposed waste is a limited resource and waste often contains pollutants that have a negative impact on land, water and air. Through monitoring the amount of municipal waste disposed of per capita, regional districts will be able to track whether or not they are making progress on waste reduction. For the purposes of this report 'solid waste' does not include materials diverted from the landfill through recycling and composting programs.

RDNO: ↓ ***Decreased.*** Between 2011 and 2015, municipal solid waste disposed of per capita decreased in the RDNO from 0.52mT to 0.47mT.

RDCO: ↑ ***Increased.*** In the RDCO, the amount of municipal solid waste per capita increased from 0.62mT to 0.65mT.

SOUTH OK: ↑ ***Increased.*** Between 2011 and 2015, annual tonnes of waste per capita increased in the South OK, moving from 0.75mT to 0.98mT per capita. However, the amount of waste per capita reached a high in 2013, at 1.55 mT per capita and has since decreased.

Municipal Solid Waste to Landfill Per Capita, Per Year, After Diversion



Source: Regional District Waste Management Reporting, 2011-2015.

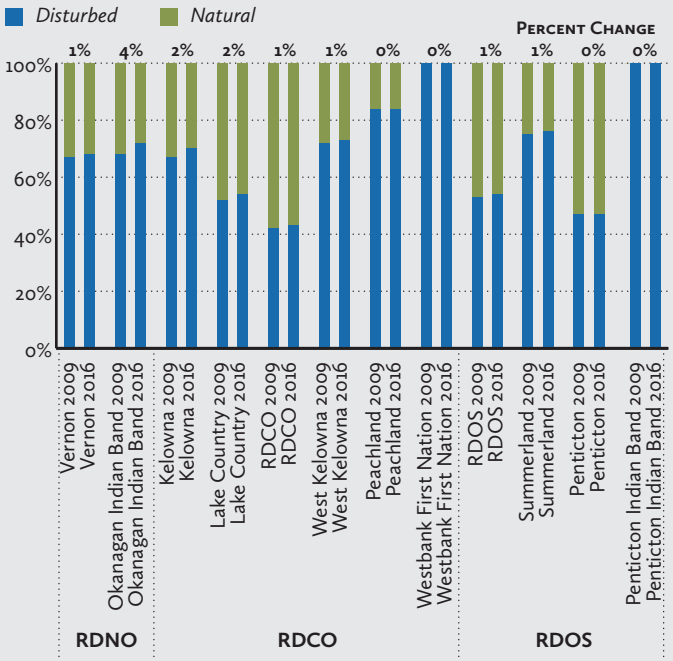
2 85% of parcels <1ha in High/Very High ranked areas are within municipalities while only 15% are in the Electoral Areas.

4.5 Percent of disturbed Okanagan Lake shoreline

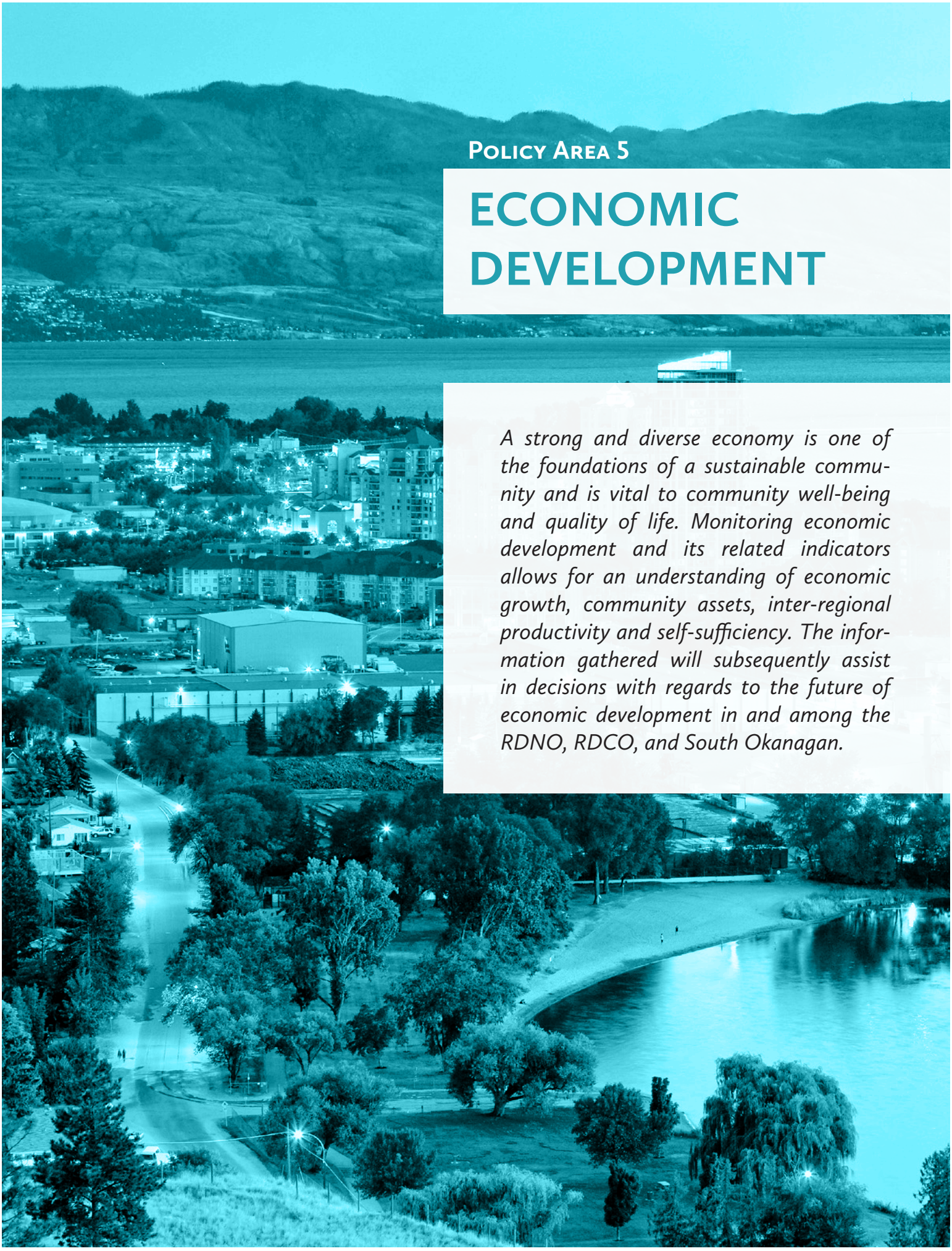
The foreshore of Okanagan Lake is an important area for fish and other wildlife species, and development in this area can be very disruptive to habitat and its species. The figure to the right compares the percentage of natural and disturbed shoreline within various jurisdictions along the lake as determined through Foreshore Inventory Mapping (FIM) undertaken in 2009 and 2016. Though a single digit percentage change does not seem like a lot, this rate of shoreline transition from natural to disturbed is significant especially when projected over the longer term. For example, if we take the Okanagan Lake as a whole, and not per individual segment, 1% of the lake's 290 km length equates to almost 3 km of shoreline. The Okanagan Lake Foreshore Inventory and Mapping Update 2016 was in DRAFT form at the time of writing this State of the Basin Report. The reader is encouraged to review the final foreshore inventory mapping when it becomes available

OKANAGAN LAKE: ↑ ***Increased.*** Of the 12 jurisdictions along the lake which are shown in the graph, 8 saw an increase in the percentage of disturbed Okanagan Lake shoreline between 2009 – 2016. 4 communities saw no change in the percentage of disturbed and natural Okanagan Lake shoreline during this time period.

Percent Disturbed & Natural Okanagan Lake Shoreline



Source: Schleppe, J. and R. Plewes, 2017, Okanagan Lake Foreshore Inventory and Mapping Update 2016 (Draft), Ecoscape Environmental Consultants Ltd. Prepared for the Regional District Central Okanagan, 2017.



Policy Area 5

ECONOMIC DEVELOPMENT

A strong and diverse economy is one of the foundations of a sustainable community and is vital to community well-being and quality of life. Monitoring economic development and its related indicators allows for an understanding of economic growth, community assets, inter-regional productivity and self-sufficiency. The information gathered will subsequently assist in decisions with regards to the future of economic development in and among the RDNO, RDCO, and South Okanagan.

5.1 Median household income relative to provincial median

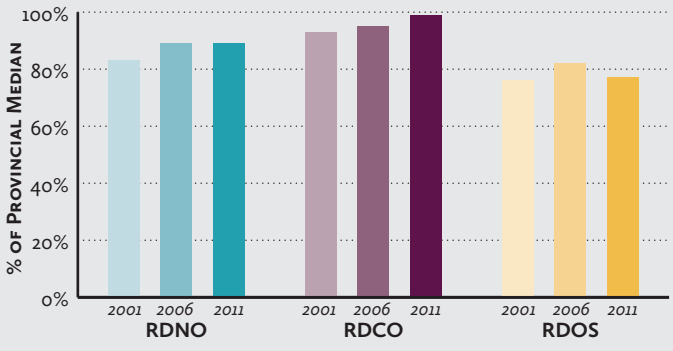
Median household income provides important information on the relative prosperity of each region. This indicator provides a percentage of median household income for each area relative to the provincial median.

RDNO: → ***Stable.*** Median income increased from $46,948 in 2006 to $53,647 in 2011 but remained stable relative to the provincial median at 89%.

RDCO: ↑ ***Increased.*** Median income increased from $50,308 to $59,456 between 2006 - 2011, and also increased relative to the provincial median, from 95% to 99%.

RDOS[1]: ↓ ***Decreased.*** Median income increased from $43,035 in 2006 to $46,157 in 2011, however relative to the province median income, it decreased from 82% to 77%.

Median Household Income Relative to Provincial Median



Source: Census 2001, 2006; National Household Survey 2011.

5.2 Percent change in growth in employment

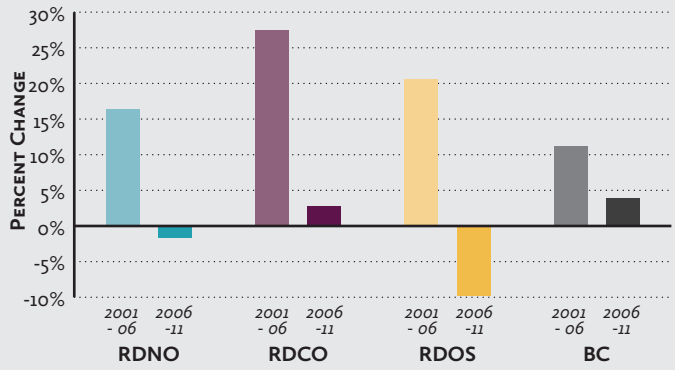
The percentage of overall growth in employment is used as a proxy for overall economic growth.

RDNO: ↓ ***Decreased.*** While there was overall growth in employment from 2001 to 2011, the latter five years showed a decrease in employment growth by 1.6% (a loss of 580 jobs).

RDCO: ↑ ***Increased.*** There has been a significant increase in employment, with much of this increase happening between 2001 and 2006. Between 2006 and 2011, employment grew by 2.7% (2345 jobs).

RDOS: ↓ ***Decreased.*** Despite an overall increase in employment from 2001 to 2011, the latter five years saw a decrease of 9.7% (a loss of 3605 jobs).

% Change in Growth in Employment



Source: Census 2001, 2006; National Household Survey 2011.

1 South Okanagan data could not be calculated, as data from the National Household Survey (2011) was suppressed for Areas A,C,E, and Oliver. Data for the Regional District of Okanagan-Similkameen was used in its place.

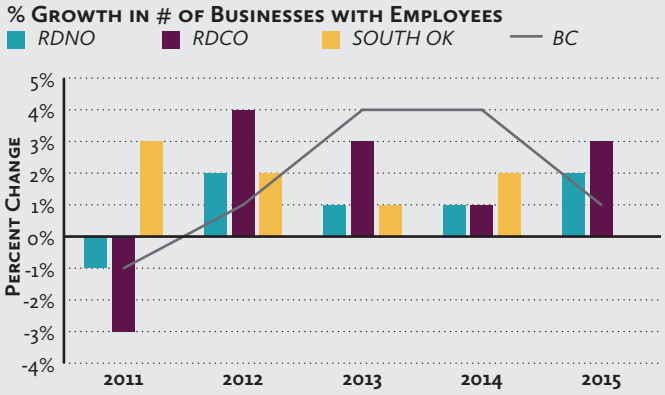
5.3 Percent growth in number of businesses with employees

Growth in number of businesses with employees is an indicator of economic activity and employment opportunity within the Regional Districts.

RDNO: ↑ ***Increased.*** Between 2010 and 2015, the number of businesses with employees grew by 5%, equivalent to 154 businesses.

RDCO: ↑ ***Increased.*** Between 2010 and 2015, the number of businesses with employees grew by 7%, an increase in 562 businesses.

SOUTH OK: ↑ ***Increased.*** Between 2010 and 2015, there was an 8% increase in business with employees (241 businesses).



Represents the percent change from previous year. Change for South OK in 2015 was 0%.
Source: BC Stats, Business Counts and Employment by Industry 2010-2015.

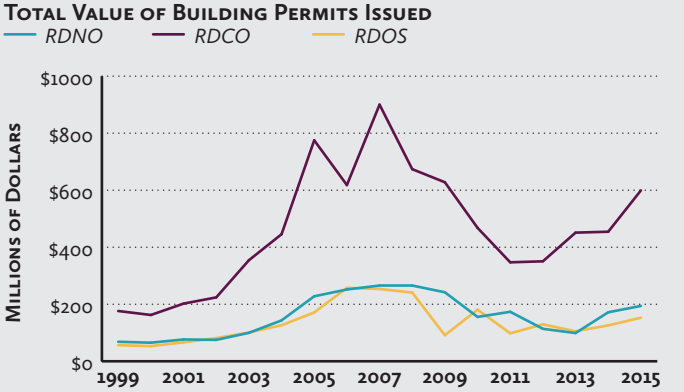
5.4 Total value of building permits issued for residential, commercial, industrial and institutional

Measuring the total value of building permits provides insight into development investment, as well as which types of development are growing and shrinking.

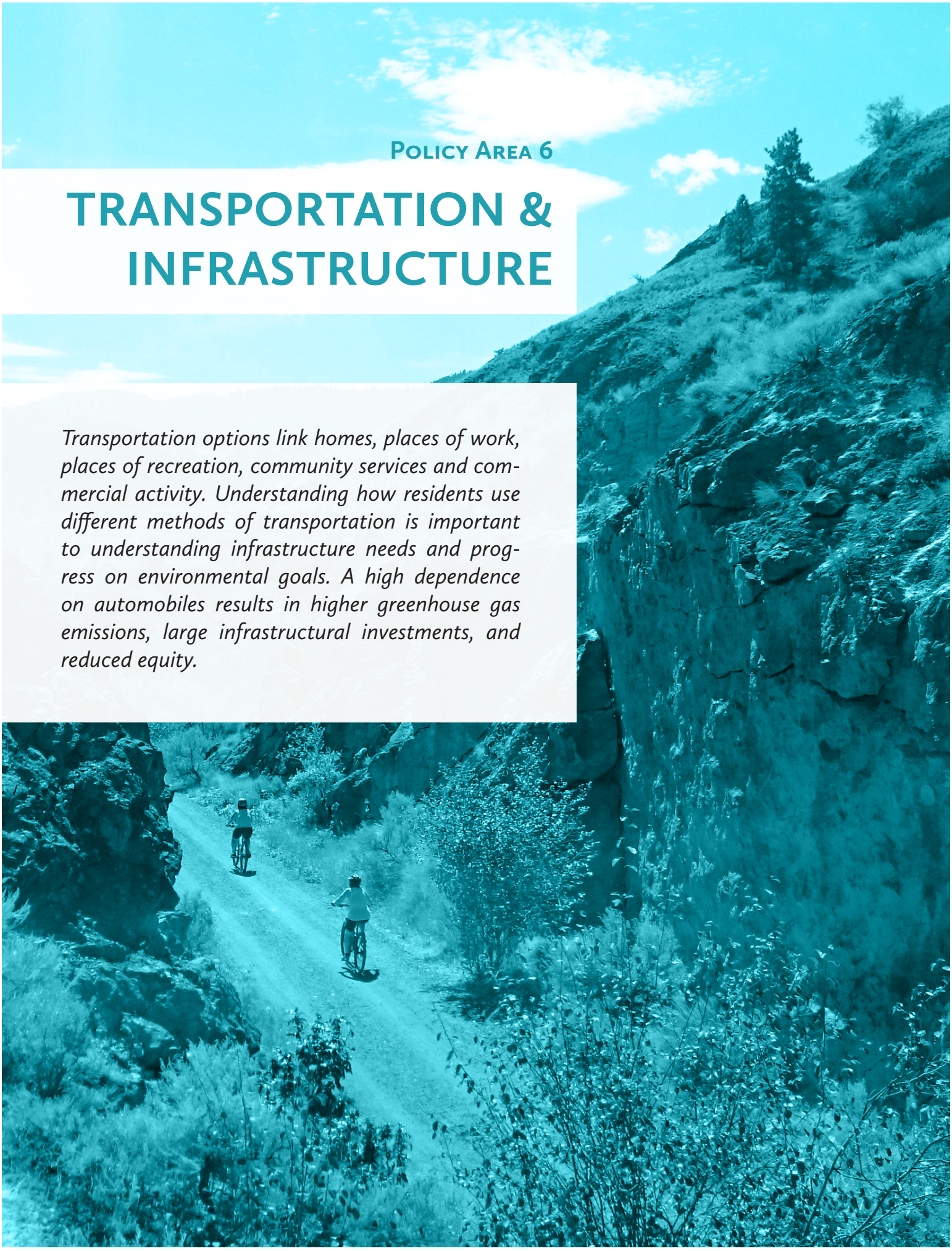
RDNO: ↑ ***Increased.*** Building permits values increased between 2010 - 2015, growing from $155,497,000 in 2010 to $194,176,000 in 2015, though values are still below the region's 2008 high of around $266,000,000.

RDCO: ↑ ***Increased.*** Building permit values increased significantly between 2011 - 2015 to nearly $600,000,000 (73%) following a decline in value between 2007 - 2010. However, the 2015 values are still below the region's 2007 high of a little over $900,000,000.

RDOS: ↓ ***Decreased.*** Building permit values decreased in the RDOS between 2010 - 2015, from $181,031,000 to $152,749,000. The region has not again reached its 2006 high of around $257,500,000. The decline in building permit values following the recession is a trend similar amongst the regions as well as the province. However, unlike the province as a whole, all regions have not again reached or exceeded its highest building permit value.



Total value of building permits issued for residential, commercial, industrial and institutional.
Source: BC Stats, Building Permits, Housing Starts and Sales 1999- 2015.



Policy Area 6

TRANSPORTATION & INFRASTRUCTURE

Transportation options link homes, places of work, places of recreation, community services and commercial activity. Understanding how residents use different methods of transportation is important to understanding infrastructure needs and progress on environmental goals. A high dependence on automobiles results in higher greenhouse gas emissions, large infrastructural investments, and reduced equity.

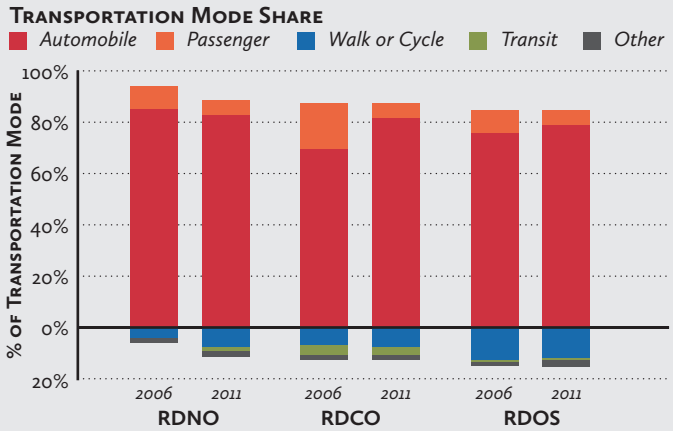
6.1 Share of commute by mode

Mode share indicates the share of the regional districts' travel to and from work by different types of transportation. It is generally desirable to decrease the share of automobile travel[1], and increase transit ridership, walking and cycling, as these are more sustainable modes of travel. Understanding mode share also supports an understanding of the regional districts' infrastructure needs.

RDNO: ↑ ***Increased.*** The overall share of more sustainable, environmentally- friendly modes of transport, including carpooling, walking, and transit, increased between 2006-2011. The share of automobile travel (as a driver), decreased from 85% to 82.5%.

RDCO: ↓ ***Decreased.*** Mode share of commuters travelling as automobile passengers decreased substantially in the RDCO between 2006 - 2011, from 17.6% to 5.5% of overall transportation. This was mirrored by an increase in single-occupancy automobile commuters.

RDOS[2]: ↓ ***Decreased.*** The share of automobile passengers decreased in the RDOS, from 9.3% in 2006 to 5.8% in 2011. This was mirrored by an increase in single-occupancy automobile commuters.



Source: Census 2006; National Household Survey 2011.

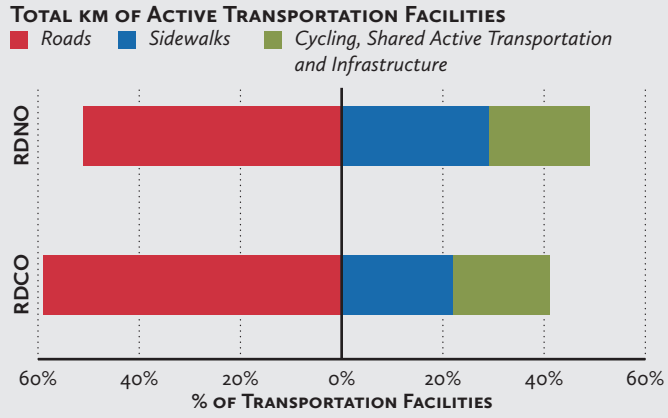
6.2 Total kilometres of active transportation facilities

Supplying facilities for active transportation, such as sidewalks and bike lanes, supports the use of these modes of transportation above other, less-sustainable methods. Active transportation also supports the health of the region's residents and provides recreational opportunities, such as the Okanagan Rail Trail and Kettle Valley Railway Trail.

RDNO: ***Baseline.*** In 2015, the RDNO had a total of 602 km of active transportation facilities. 51% (304km) of these facilities were roads, 29% (174km) were sidewalks and 20% (123km) were on-road bike lanes and shared use pathways.

RDCO: ***Baseline.*** In 2016, the RDCO had a total of 2262 km of active transportation facilities. Roads without highways made up 59% (1338km) of this 2262km, while 22% (506 km) was sidewalks and 19% (418km) was cycling and shared active transportation infrastructure.

RDOS: ***Data unavailable.***



Source: Municipal GIS Departments; City of Vernon 25 Year Master Transportation Plan, 2015.
**Note on RDNO data: Data only available for the City of Vernon and the Village of Lumby.*

1 Commutes by automobile include both those as drivers and those as passengers.
2 Data was not available for the South Okanagan area.

6.3 Annual Total Ridership per Region

Total annual ridership counts the number of conventional rides (not health connection, attendant/ escort, or wheelchair rides) on BC Transit bus routes.[3]

RDNO: ↑ ***Increased.*** Total ridership increased by 26,782 rides overall between 2010 - 2015 (+5.6%).

RDCO: ↑ ***Increased.*** Total increased by 156,953 rides overall between 2010 - 2015 (+3.2%).

SOUTH OK: ↑ ***Increased.*** Total ridership increased by 37,014 rides overall between 2010 - 2015 (+8.2%).

	RDNO	RDCO	SOUTH OK
Total ridership (2015)	501,824	5,088,061	488,609
Change since 2010	+26,782 rides	+156,953 rides	+37,014 rides
	+5.6%	+3.2%	+8.2%

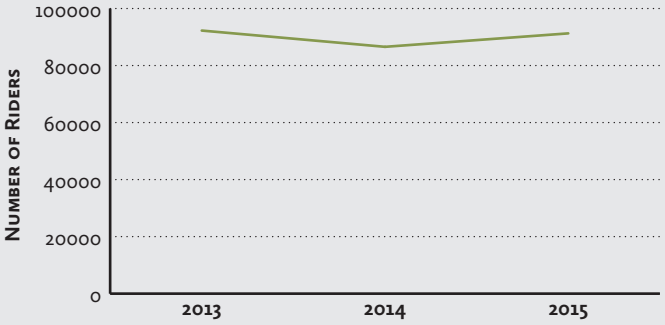
Source: BC Transit.

6.4 Annual Total Ridership on Select Interregional Routes

Currently, two BCTransit routes offer inter-regional bus service in the Okanagan. The UBCO Connector (Route 90) offers weekday bus service between downtown Vernon in the North Okanagan and the UBC Okanagan campus located in the Central Okanagan. The Osoyoos - Kelowna bus (Route 3) currently offers one round trip per week from the south Okanagan and provides service as far north as the Kelowna International Airport located approximately 14 km north of downtown Kelowna.

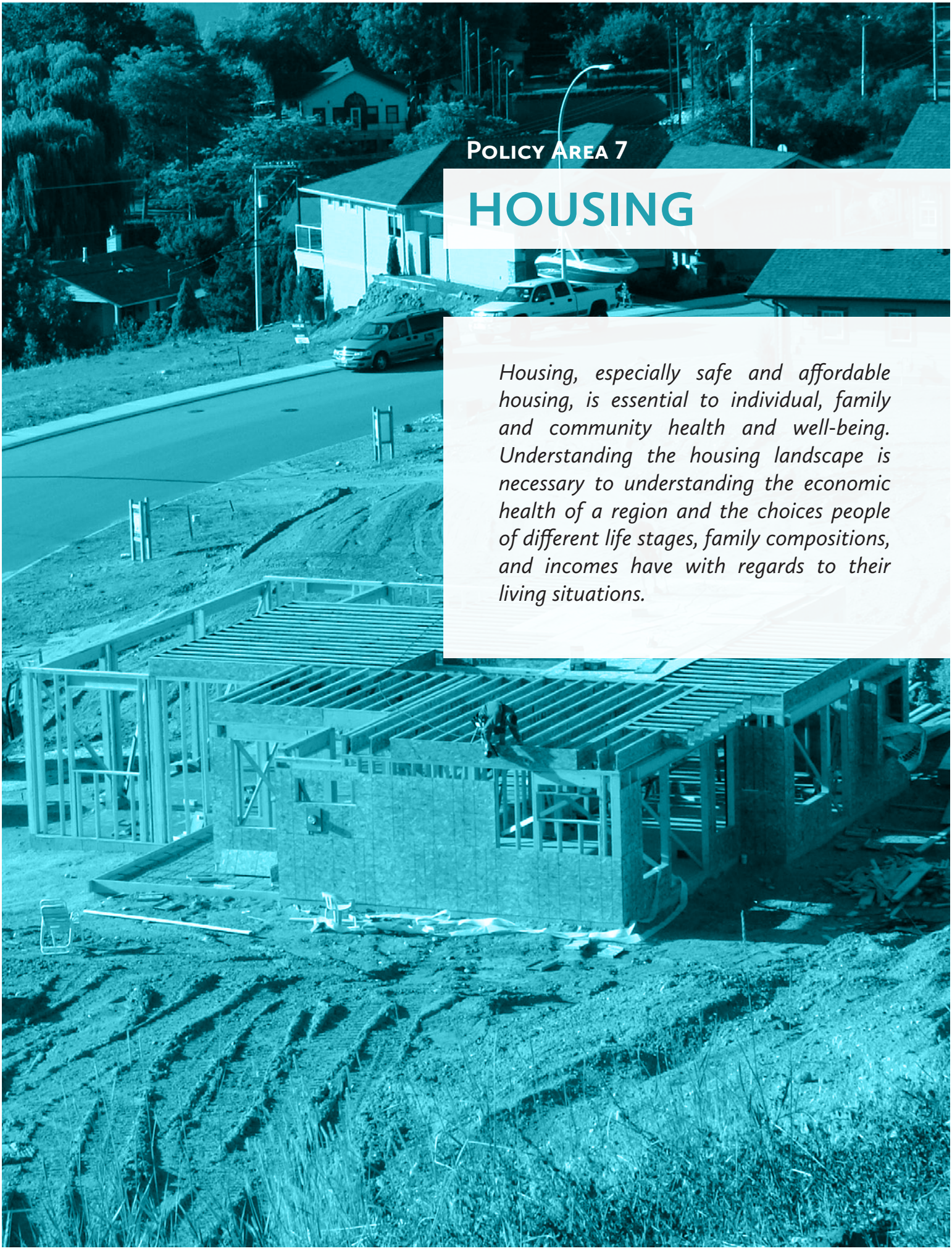
INTERREGIONAL: ↑ ***Increased.*** Total ridership on the UBCO Connector in 2015 was up 4,718 rides over the previous year, though still down approximately 1,000 rides since its high in 2013. BC Transit reports that there are approximately 30 rides per month on Route 3 - Osoyoos to Kelowna.[4]

North Okanagan - UBCO Connector Total Annual Ridership



Source: BC Transit.

3 Population increase has not been accounted for when considering total ridership per region.
4 M. Boyd, BCTransit Planning Manager, pers. comm. March 29, 2017.



Policy Area 7

HOUSING

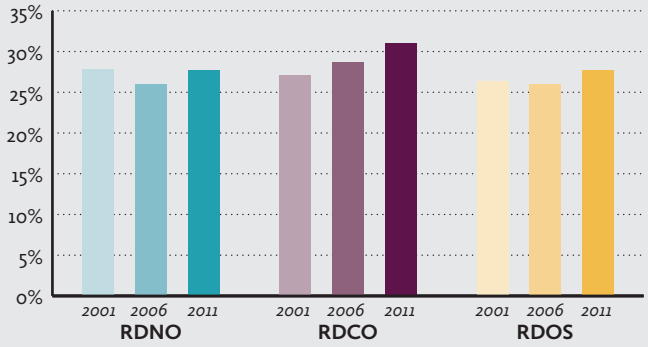
Housing, especially safe and affordable housing, is essential to individual, family and community health and well-being. Understanding the housing landscape is necessary to understanding the economic health of a region and the choices people of different life stages, family compositions, and incomes have with regards to their living situations.

7.1 Percentage of owner and renter households spending 30% or more of gross income on housing

Spending 30% or more of gross income on housing is a commonly used definition of "unaffordability." For renters, this percentage includes rent along with payments for electricity, fuel, water and municipal services. For owners, this includes mortgage payments, property taxes, condominium fees as well as municipal services.[1]

RDNO: ↑ ***Increased.*** Between 2006 – 2011, the percentage of households spending 30% or more of household income on gross/rent major payments in the RDNO increased from 26% to 27.7%. When owner households and rental households are considered separately, the percentage of rental households spending 30% or more of gross income on housing is greater and increased more significantly, from 44.8% to 50.8% compared to owner households, which increased from 20.1% to 20.7%. However, renters make up a smaller proportion of all households (about 24% in 2006 and 23% in 2011).

Percentage of Renter and Owner Households Spending 30% or More of Gross Income on Housing



Source: Canada Housing and Mortgage Corporation,Housing in Canada Online, 2001-2011.

RDCO: ↑ ***Increased.*** Between 2006 – 2011, the percentage of households spending 30% of more of household income on gross/rent major payments in the RDCO increased from 28.7% to 31%. When considered separately, owner households spending 30% or more of gross income on housing increased by about 2% from 22.8% to 24.7%, while renters increased by about 3%, from 47.7% to 50.4%.

RDOS[2]**:** ↑ ***Increased.*** Between 2006 – 2011, the percentage of households spending 30% or more of household income on gross/rent major payments in the RDOS increased from 26% to 27.7%. When considered separately, rental households spending 30% or more of gross income on housing increased more, from 46.8% to 52.3% while owner households increased from 19.1% to 19.7%. Like the other regional districts, rental households in the RDOS make up a small proportion of all households compared to owner households – about 25% of all households in both 2006 and in 2011.

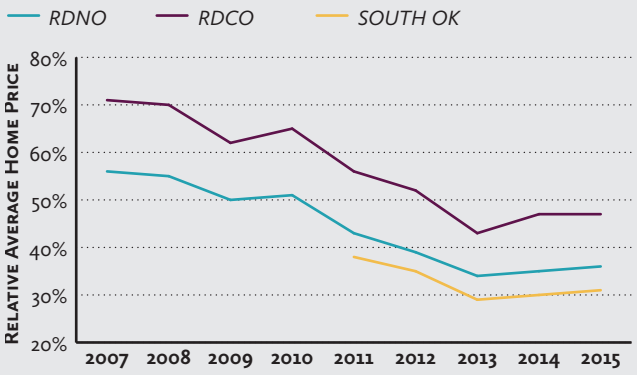
7.2 Average home prices relative to provincial average

Monitoring average home prices is important for observing trends in the housing market; when compared to the provincial average cost of home, it is also an indicator of relative housing affordability. The relative price is calculated by dividing the average home price of a regional district by the provincial average, producing a percentage. For example, in 2015 the average price of a home in the RDNO was $386,451, 36% of the provincial average from the same year ($1,084,276).

RDNO: ↓ ***Decreased.*** Like the RDCO, the average home price relative to the provincial average has decreased since 2010, from 51% to 36%. The average price of homes rose by about $7,000 during this time to $386,451 in 2015.

RDCO: ↓ ***Decreased.*** The average home price in the RDCO as a ratio of the provincial average has declined overall between 2010 and 2015, from 65% to 47%, seeing a small increase since 2013. However, the average price itself has risen in the RDCO by about $30,000 in this same time frame, to $511,073.

SOUTH OK: ↓ ***Decreased.*** Showing a similar trend to the RDCO and RDNO, average home prices as a ratio of the provincial average have decreased between 2011 and 2015 in the South Okanagan, from 38% to 31%. In dollars, the average home price in the South Okanagan increased by roughly $17,000, to $337,871 in 2015.



**No data available for South Okanagan prior to 2011.*

Sources: Okanagan Mainline Real Estate Board, December Statistics, 2007-2015 (RDNO and RDCO statistics); South Okanagan Real Estate Board, 2011-2015 (South OK statistics). Canadian Mortgage and Housing Corporation, Housing Market Information

1 Canada Housing and Mortgage Corporation, Housing in Canada Online.
2 When data for the South Okanagan could not be collected, data for the RDOS was used in its place.

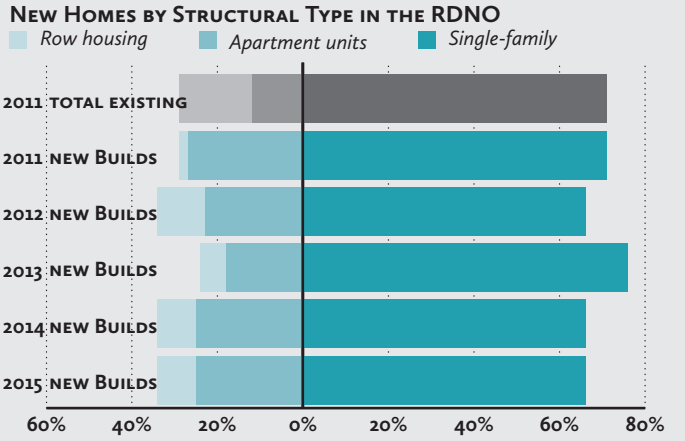
7.3 Diversity of housing: number of new homes by structural type

The number of new homes and the mix of its structural type is indicative of whether or not there is enough diversity in housing stock to meet a variety of housing needs. To measure the diversity of housing stock, this indicator compares the composition of existing housing stock in 2011 to the composition of new builds in subsequent years.

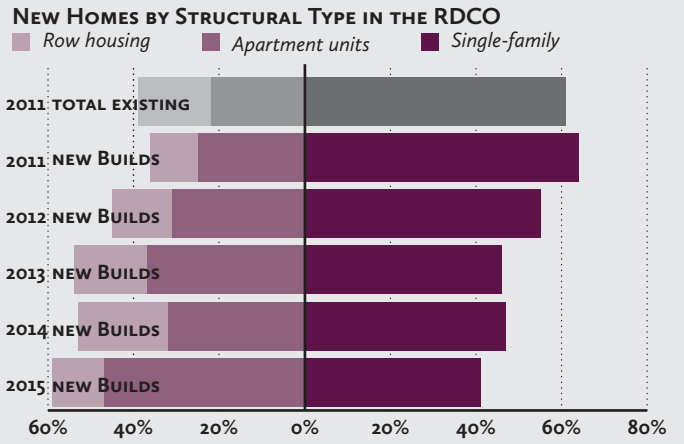
RDNO: ↑ ***Increased.*** There was a small increase in the diversity of housing stock in the RDNO between 2011 - 2015. In 2011, 71% of the 33,740 existing homes were single-family homes. Since 2011 the percentage of single-family homes has generally decreased and in 2015 single-family homes were about 66% of the 343 new builds, with apartment units making up about 25% of new builds.

RDCO: ↑ ***Increased.*** Diversity in the RDCO's housing stock has increased between 2011 and 2015. In 2011, single-family homes were roughly 60% of the 74,945 existing homes. Since 2011, the number of new single-family homes built has decreased, with a greater number of apartment units being built; approximately 40% of the 1181 new builds were single family homes.

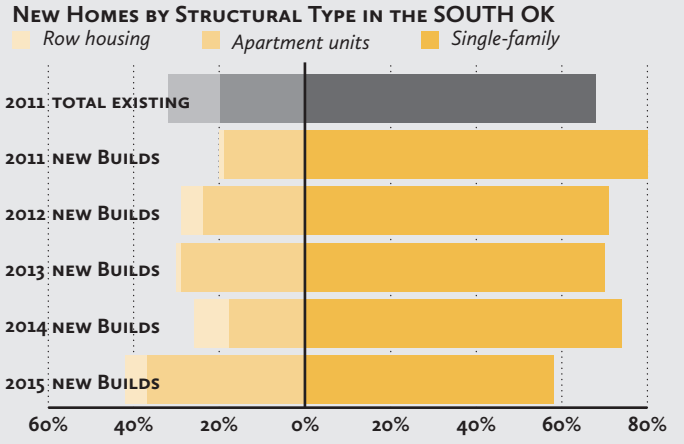
SOUTH OK: ↑ ***Increased.*** In 2011, single-family homes accounted for about 68% of the 32 960 existing homes. Since 2011, the composition of new builds has shown a greater diversity in housing stock, and in 2015, single-family homes were about 58% of the 386 new homes built. In 2015, apartment units made up about 37% of new builds, compared to only 20% of existing homes in 2011.



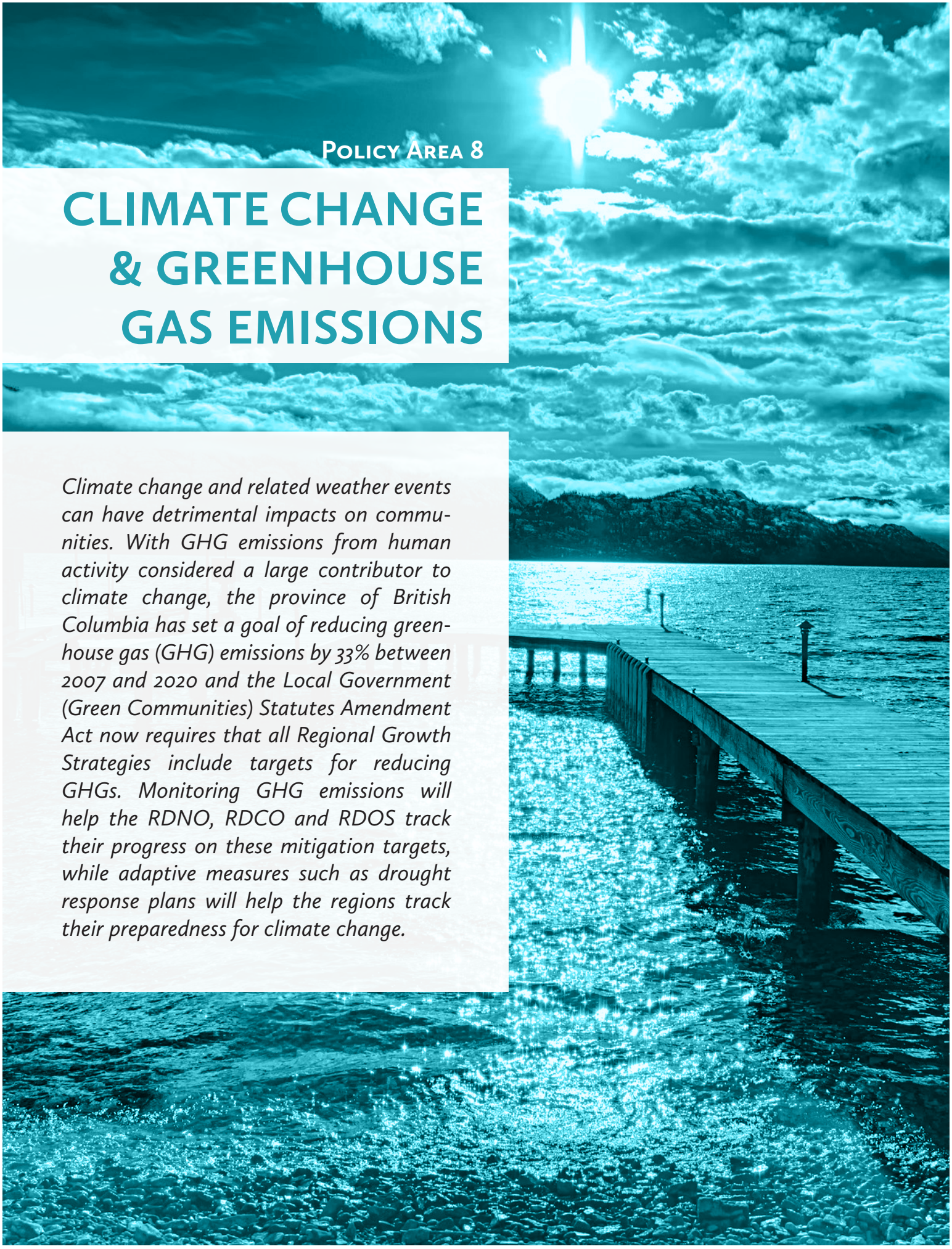
Source: BC Stats, Building Permits, Housing Starts and Sales 2011-2015; Statistics Canada, Census 2011.



Source: BC Stats, Building Permits, Housing Starts and Sales 2011-2015; Statistics Canada, Census 2011.



Source: BC Stats, Building Permits, Housing Starts and Sales 2011-2015; Statistics Canada, Census 2011.



Policy Area 8

CLIMATE CHANGE & GREENHOUSE GAS EMISSIONS

Climate change and related weather events can have detrimental impacts on communities. With GHG emissions from human activity considered a large contributor to climate change, the province of British Columbia has set a goal of reducing greenhouse gas (GHG) emissions by 33% between 2007 and 2020 and the Local Government (Green Communities) Statutes Amendment Act now requires that all Regional Growth Strategies include targets for reducing GHGs. Monitoring GHG emissions will help the RDNO, RDCO and RDOS track their progress on these mitigation targets, while adaptive measures such as drought response plans will help the regions track their preparedness for climate change.

8.1 Percent change in non-transportation GHG (CO_2) emissions from 2007 levels

Measuring carbon dioxide (CO_2), the most common GHG, is an important indicator for measuring the influence of human activity on climate change and whether or not the regions are contributing to an overall reduction in emissions.

RDNO: ↓ ***Decreased.*** Between 2007 -2012, GHG emissions in the RDNO decreased by 15%, about 60,000 tonnes of emissions. During this time, energy use also decreased, but only by about 2%, or 173,000 GJ of energy.

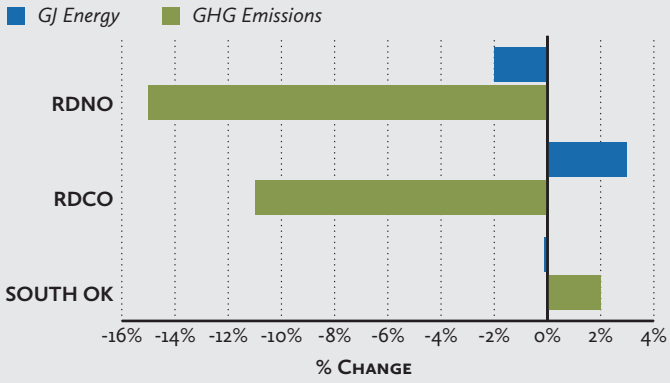
RDCO: ↓ ***Decreased.*** Between 2007 - 2012 in the RDCO, GHG emissions decreased by about 11%, which is the equivalent of about 63,000 tonnes of emissions. During this time, energy use increased by about 3% or 450,000 GJ of energy.

SOUTH OK: ↑ ***Increased.*** GHG emissions in the South Okanagan increased slightly between 2007-2012 by about 2% or 9,500 tonnes of emissions. In this time frame, energy use remained relatively stable, decreasing by about 0.1% or 15,000 GJ or energy.

* Note on South OK data: South Okanagan data includes data from unincorporated areas in the Okanagan Similkameen.

** Data does not include transportation data due to a limited sample size of real odometer readings in regional districts outside of Metro Vancouver and the Fraser Valley.

Percent Change in Non-transportation Energy and GHG Emissions 2007-2012



Source: Province of British Columbia, Community Energy and Emissions Inventory, 2007 – 2012.

8.2 Average emissions per dwelling unit

Measuring average CO_2 emissions per dwelling unit provides insight into the relative efficiency of the housing stock over time. It can also provide some additional detail on what sources are contributing to overall CO_2 emitted in our communities.

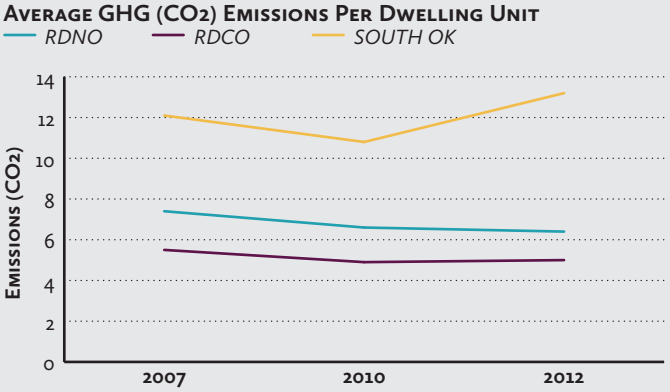
RDNO: ↓ ***Decreased.*** Average emissions per dwelling unit decreased in the RDNO from 2007 - 2012, moving from 7.4 to 6.4 tonnes of emissions per dwelling unit.

RDCO: ↓ ***Decreased.*** In the RDCO, average emissions per dwelling unit decreased by 0.5 tonnes of emissions between 2007 - 2012, moving from 5.5 to 5 tonnes of emissions per household.

SOUTH OK: ↑ ***Increased.*** Average emissions per dwelling unit increased in the RDOS, moving from 12.1 tonnes of emissions in 2007 to 13.2 tonnes of emissions per household in 2012. This overall increase was following a decrease in average emissions per dwelling unit between 2007 - 2010.

* Note on South OK data: South Okanagan data includes data from unincorporated areas in the Okanagan Similkameen.

Average GHG (CO_2) Emissions Per Dwelling Unit



Source: Province of British Columbia, Community Energy and Emissions Inventory, 2007 – 2012.

8.3 Number of drought response plans in place within the basin

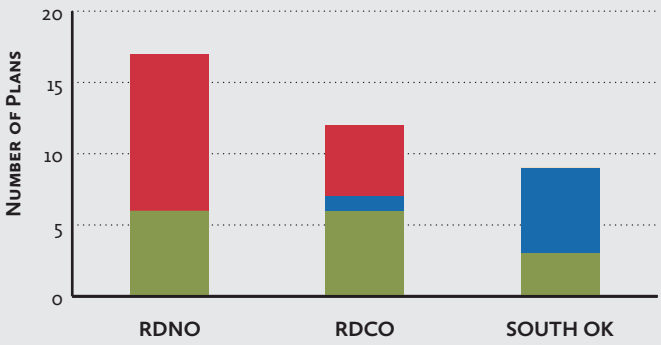
Drought Response plans indicate the level of preparedness for extreme weather events related to climate change, as well as general climate change adaptation in the Okanagan. These plans contain triggers for water conservation measures and protocols for communication methods within a community, as well as externally. The more coordinated regional drought response plans become, the more resilient the Okanagan will be to climate change. This indicator tracked the number of drought response plans in place and in progress.

RDNO: *Baseline.* Out of the 17 water utilities who provided data, six reported that they have drought response plans at the time of data collection in 2016 while 11 utilities did not report having drought response plans.

RDCO: *Baseline.* Out of 12 water utilities who participated in data collection in the RDCO, 6 utilities reported having drought response plans complete, five did not report a drought response plan and one reported a drought response plan was in progress.

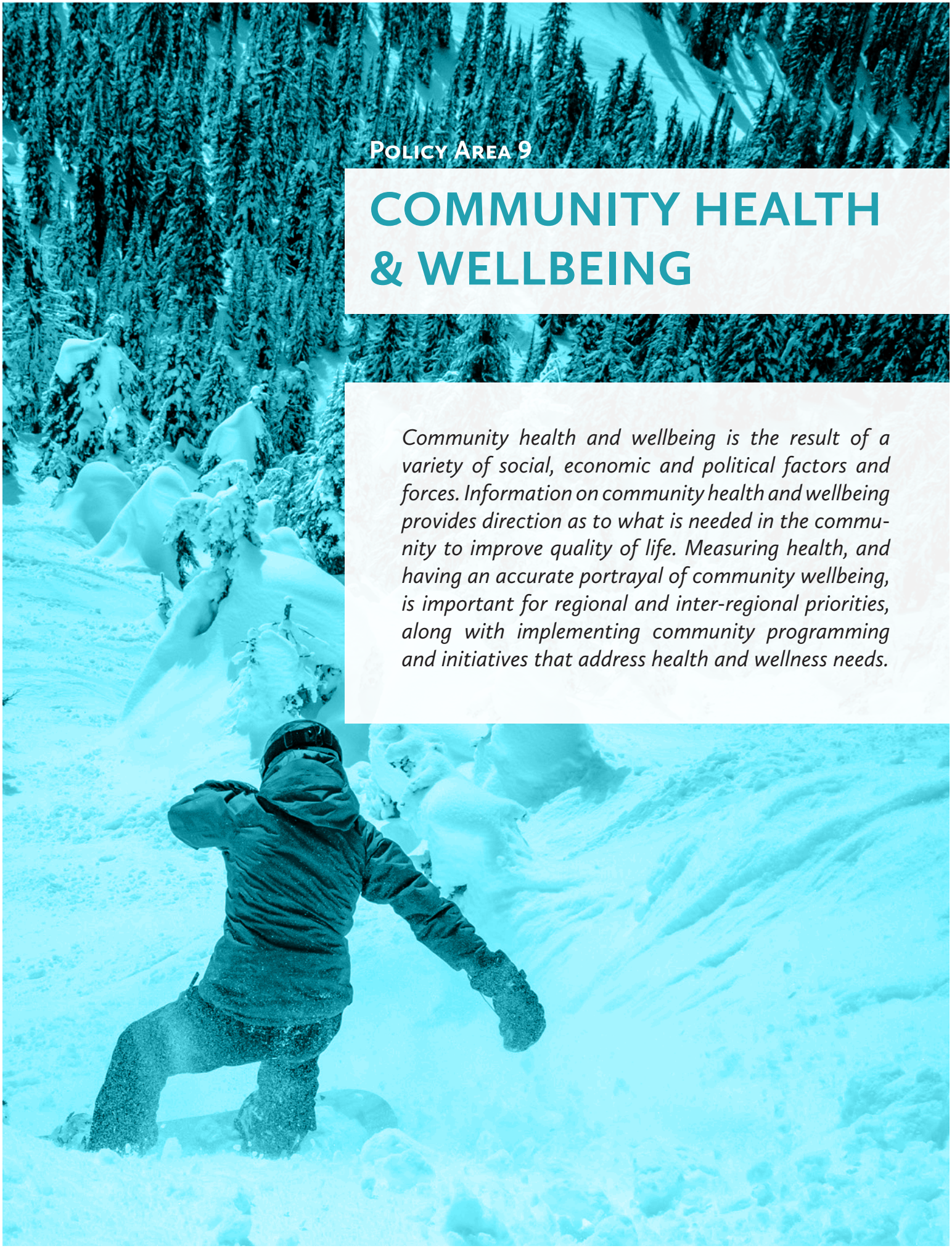
SOUTH OK: *Baseline.* Of the nine utilities who provided data in Policy Area 3, three reported having drought response plans in place while six utilities reported that a drought response plan was "in the works."

Reported Number and Status of Drought Response Plans



Source: Regional Water Surveys, 2016.

Drought response plans reported as 'complete' by Okanagan water suppliers may vary in scope and comprehensiveness. Information which may be of assistance to water suppliers and individuals seeking to improve their drought preparedness, including key considerations for developing a comprehensive drought response plan, is available through the BC Ministry of Environment and from OBWB. Developing a comprehensive drought response plan can help water suppliers to lessen the impacts of drought and build resilience into their systems.



Policy Area 9

COMMUNITY HEALTH & WELLBEING

Community health and wellbeing is the result of a variety of social, economic and political factors and forces. Information on community health and wellbeing provides direction as to what is needed in the community to improve quality of life. Measuring health, and having an accurate portrayal of community wellbeing, is important for regional and inter-regional priorities, along with implementing community programming and initiatives that address health and wellness needs.

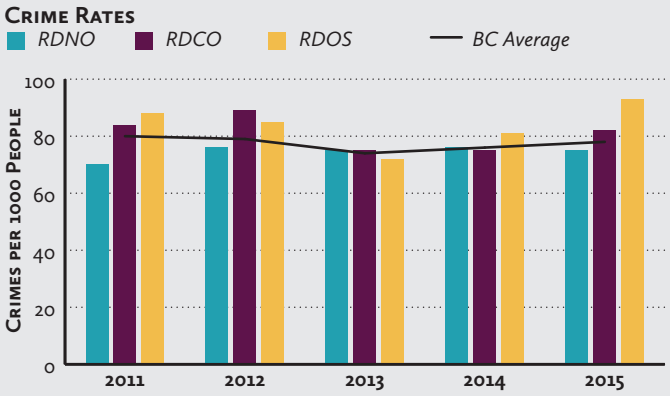
9.1 Crime rates

Crime rates, by providing information on the number of criminal offences that have occurred in a community, are an indication of general community safety. The frequency of crimes is likely to cause stress and unease in a community, influence feelings of safety and in turn, health and wellbeing.

RDNO: ↑ ***Increased.*** From 2011 to 2015, crime rates hovered around 75 crimes per 1000 people, with a low of 70 crimes per 1000 people in 2011. In this time period, the RDNO's crime rates were either similar to, or below the provincial crime rates (80 crimes per 1000 people in 2011 and 78 crimes per 1000 people in 2015).

RDCO: → ***Stable.*** From 2011 to 2015, crimes rates per 1000 people slightly decreased from 84 to 82. However, the rate fluctuated a fair amount between a high of 89 in 2012 and a low of 75 in 2013/2014. With the exception of 2014, the RDCO's crime rates remained above provincial crime rates during this time.

RDOS: ↑ ***Increased.*** From 2011 to 2015, crime rates per 1000 people increased from 88 in 2011 to a five-year high of 93 in 2015. During this time, the RDOS's crime rates remained above provincial crime rates with the exception of 2013, with a difference in crime rates ranging from 5-15 crimes per 1000 people.



Source: B.C. Policing Jurisdiction Crime Trends, 2005 – 2014.
Data from B.C. Policing Jurisdiction Crime Trends are only available up to 2014.

Indicators 9.2 - 9.4 *use data from the Canadian Community Health Survey which collects data by Health Regions. These indicators use data from the Okanagan Health Service Delivery Area, as defined in 2013, which includes:*

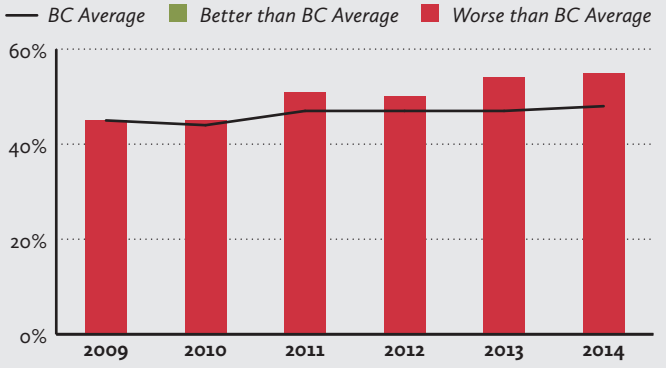
- *Osoyoos (Town)*
- *Keremeos (Village)*
- *Oliver (Town)*
- *Okanagan-Similkameen A (Regional district electoral area)*
- *Princeton (Town)*
- *Okanagan-Similkameen B (Regional district electoral area)*
- *Okanagan-Similkameen C (Regional district electoral area)*
- *Summerland (District municipality)*
- *Penticton (City)*
- *Okanagan-Similkameen D (Regional district electoral area)*
- *Okanagan-Similkameen E (Regional district electoral area)*
- *Okanagan-Similkameen F (Regional district electoral area)*
- *Okanagan-Similkameen G (Regional district electoral area)*
- *Okanagan-Similkameen H (Regional district electoral area)*
- *Lower Similkameen 2 (Indian reserve)*
- *Osoyoos 1 (Indian reserve)*
- *Penticton 1 (Indian reserve)*
- *Chopaka 7 & 8 (Indian reserve)*
- *Blind Creek 6 (Indian reserve)*
- *Chuchuwayha 2 (Indian reserve)*
- *Alexis 9 (Indian reserve)*
- *Ashnola 10 (Indian reserve)*
- *Kelowna (City)*
- *Central Okanagan (Regional district electoral area)*
- *Lake Country (District municipality)*
- *Peachland (District municipality)*
- *Central Okanagan J (Regional district electoral area)*
- *Duck Lake 7 (Indian reserve)*
- *Tsinstikeptum 9 (Indian reserve)*
- *Tsinstikeptum 10 (Indian reserve)*
- *Lumby (Village)*
- *Coldstream (District municipality)*
- *Vernon (City)*
- *North Okanagan B (Regional district electoral area)*
- *North Okanagan C (Regional district electoral area)*
- *North Okanagan D (Regional district electoral area)*
- *North Okanagan E (Regional district electoral area)*
- *Spallumcheen (District municipality)*
- *Armstrong (City)*
- *Enderby (City)*
- *North Okanagan F (Regional district electoral area)*
- *Okanagan (Part) 1 (Indian reserve)*
- *Enderby 2 (Indian reserve)*
- *Priest's Valley 6 (Indian reserve)*
- *Harris 3 (Indian reserve)*
- *Salmon River 1 (Indian reserve)*

9.2 Body Mass Index: self-reported as "overweight" or "obese"

Body mass index (BMI) is a measure of body fat based on the self-reported height and weight of an individual and can be used to determine whether an individual may be considered overweight or obese. These classifications are relevant to indicating general health as being overweight or obese has been found to be associated with an increased risk for negative health effects.

OKANAGAN: ↑ ***Increased.*** With some fluctuation, since 2009 the number of adults reporting as "overweight" or "obese" has increased from 45.2% to 54.9%. In general, percentages have increased more steeply in the Okanagan as compared to BC as a whole, which increased from 45.1% in 2009 to 48% in 2014. By 2014, self-reported obesity rates among adults in the Okanagan is 7% higher than the provincial average.

Adult Obesity Rates, Okanagan relative to BC



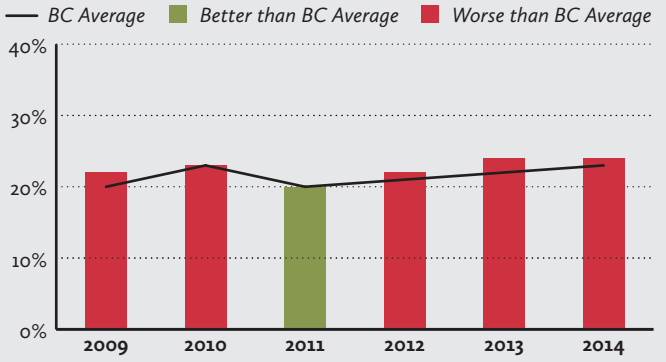
Source: Statistics Canada, Canadian Community Health Survey 2003-2014.

9.3 Stress levels

Stress is an important measure of community health and wellbeing because of the many negative health and life consequences associated with high levels of stress. Statistics Canada reports that heart disease, stroke and high blood pressure are just some of the associated negative health impacts of stress, along with the over-consumption of alcohol and poorer healthy-eating habits.[1]

OKANAGAN: ↑ ***Increased.*** Despite a decrease between 2010 and 2011, those reporting their life stress as "quite a lot" has increased slightly overall between 2009 and 2014, from 22% to 24%. Other than 2011, the Okanagan has had a slightly higher percentage of those reporting high stress levels as compared to the Province as a whole during this time period.

% Individuals reporting stress level as "quite a lot", Okanagan relative to BC



Source: Statistics Canada, Canadian Community Health Survey 2003-2014.

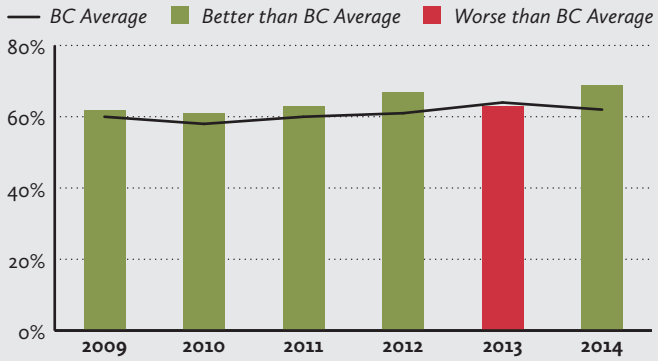
1 Statistics Canada. 2001. "Stress and well–being." Health Reports. Vol. 12, no. 3.

9.4 Physical activity levels

There is a great deal of research that supports the link between increased physical activity and health, and many benefits have been reported, including but not limited to, a reduced risk of cardiovascular disease, diabetes, obesity and high blood pressure. As a result, this indicator considers self-reported physical activity level during leisure time as an indicator of general health and well-being.

OKANAGAN: ↑ ***Increased.*** The percentage of those reporting that they are moderately-active or active in their leisure time has increased since 2009, from approximately 62% to 69%. The overall trend in reported physical activity was the same for BC, though at a slower rate. Physical activity levels among Okanagan individuals appears to be increasing more quickly than in the province at large.

Moderately active/active individuals, Okanagan relative to BC



Source: Statistics Canada, Canadian Community Health Survey 2003-2014.

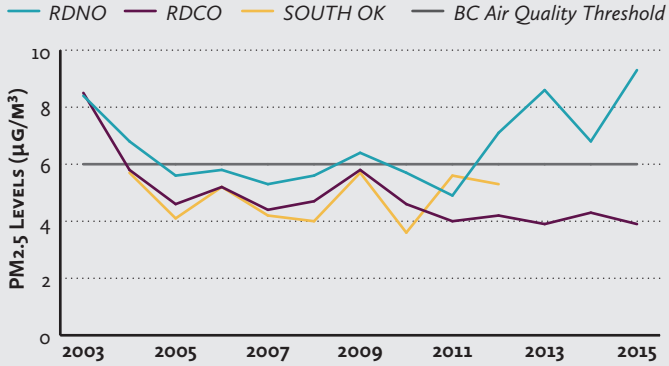
9.5 Air quality: Annual average of daily mean $PM_{2.5}$ levels

PM2.5 is particulate matter measuring 2.5 microns or smaller in diameter; it is a component of smog and a form of air pollution that has adverse impacts on human health. As a result, it is an important measure of air quality. The Provincial Air Quality threshold is set at 6 micrograms/m³ and serves the purpose of a "voluntary target to guide airshed planning efforts and encourage communities to maintain good air quality in the face of economic growth and development".[2] It is important to note that variables such as proximity of the measuring station to roads may influence readings. For example, the RDNO station in Vernon is located near a main downtown intersection including a provincial highway.

RDNO: ↑ ***Increased.*** Measured at the Vernon Science Centre, levels of PM2.5 increased between 2010 and 2015 in the RDNO from 5.7 to 9.3 micrograms/m³ in 2010. Since 2012, PM2.5 levels have remained above the Provincial Air Quality threshold by up to 3.3 micrograms/m³.

RDCO: ↓ ***Decreased.*** Measurements taken at Kelowna College Station show that PM2.5 levels have decreased slightly between 2010 and 2015, from 4.6 to 3.9 micrograms/m³. These levels are well below the Provincial Air Quality Threshold of 6 by up to 2.1 micrograms/m³.

Annual Average of Daily Mean PM2.5 Levels (µg/m³)



No data is available for the South Okanagan for 2003 and 2013-2015.
Source: BC Air Data Archive Website 2003-2015.

SOUTH OK: ↑ ***Increased.*** Measured at the Osoyoos Canada Customs, there is no data for PM2.5 levels from 2013-2015 as this air quality monitoring station is no longer operational. Considering data available between 2010 and 2012, PM2.5 levels have increased from 3.6 micrograms/m³ to 5.3 micrograms/m³. Despite this increase, PM2.5 levels for the South Okangan remained below the Provincial Air Quality Threshold.

2 New Ambient Air Quality Criteria for PM2.5: http://www.bcairquality.ca/regulatory/pm25-objective.html

Policy Area 10

GOVERNANCE & SHARED SERVICES

Regional Districts and their work

Regional districts have three basic roles:

1. *they are the local government for Electoral Areas;*
2. *they provide a political and administrative framework for their member municipalities and Electoral Areas to collaborate in the provision of services; and*
3. *they are responsible for providing important regional services to, and undertaking initiatives on behalf of, their entire region.*

Regional districts provide a broad range of services which may vary according to local circumstances and preferences. Interests and objectives often extend across jurisdictional boundaries and in this regard partnerships may be established between local governments, senior levels of government, First Nations, and/or non-governmental organizations. Economic and administrative efficiencies stand to be gained through inter-agency cooperation.

The three Okanagan regional districts: RDNO, RDCO, and RDOS, collaborate both financially and administratively, with each other and with other agencies, to provide important services, implement planning initiatives, and to undertake projects with an inter-regional scope, interest, or influence.

The following list identifies some of the many collaborative efforts and partnerships in which the Okanagan regional districts play a key role.

- Okanagan Basin Water Board
- Okanagan Regional Library
- Sterile Insect Release Program
- Starling Control Program
- Okanagan Valley Goose Management Program
- Okanagan – BC Agriculture & Climate Change Regional Adaptation Strategies
- Regional Transit
- Okanagan Rail Trail
- Kettle Valley Railway Trail
- BC Product Stewardship Council
- South Okanagan Similkameen Conservation Program
- The Okanagan & Similkameen Invasive Species Society
- Okanagan Collaborative Conservation Program

The **OBWB** was instituted in 1970 as a collaboration of the three Okanagan regional districts to provide leadership on water issues spanning the valley. Governed by a Board of Directors, including representatives from the three Okanagan regional districts, the jurisdiction of OBWB is defined by the borders of the Okanagan watershed, or basin which is almost 200 km long, 8,000 km2 in area and stretches from the City of Armstrong to the US border. On an annual basis, the three Okanagan regional districts collectively contribute over three million dollars which OBWB applies towards water research, wastewater infrastructure funding, milfoil control, promoting water stewardship, and sharing resources in the form of grants or funding partnerships with local governments, other agencies, researchers, or universities.[1]

Established in 1936, the **Okanagan Regional Library** (ORL) serves over 370,000 people across through 29 branches.[2] The three Okanagan regional districts, the Columbia Shuswap Regional District, the Penticton Indian Band, and Westbank First Nation each contribute funding to the ORL. While property taxes contribute 86% of the ORL's funding, other sources of revenue include grants, and 'Friends of the Library' fundraising efforts. In return, the ORL offers much more than books and has changed with advances in technology and evolving community expectations. In 2015, the ORL recorded almost three million library visits and over three million materials were circulated. Over 115,000 people attended adult and children's programs, over 361,000 eMagazines, eBooks, and eAudiobooks were borrowed or downloaded, and over 341,000 hours of free Wi-Fi was used. The ORL strives to maximize accessibility by providing materials in various formats and borrowing options, making meeting room and exam writing space available, and providing educational opportunities and programs for all ages.

The **Sterile Insect Release Program** serves all or portions of the three Okanagan regional districts and the Columbia Shuswap Regional District.[3] Sterile Insect Release (SIR) is an environmentally friendly approach to managing the codling moth population. The codling moth was accidentally introduced into British Columbia from Europe in the early 1900s. Soon after its arrival, the moth began to inflict extensive damage in apple and pear orchards. The moth's ability to build resistance to even the most toxic pesticides limited the effectiveness of chemical spray treatments. Sterile insect technology works by pairing sterile male insects with wild female insects so that the females are unable to produce viable offspring. The release of sterile codling moths began in 1994 in the South

1 www.obwb.ca
2 www.orl.bc.ca
3 www.oksir.org

Okanagan, and in the Central and North Okanagan in 2002. The total annual cost of the SIR program is slightly more than $3 million with funding for the program split between local property taxpayers (60%) and commercial apple and pear growers (40%). In 2015 the SIR parcel tax rate was $139.26 per acre of planted host trees. All urban properties, regardless if they have host trees, paid an average of $10.00 per year. The program's state-of-the-art rearing facility in Osoyoos has an annual production capacity of 780 million sterile codling moths, and the program is a major seasonal employer for the region.

The **Starling Control Program** aims to reduce the number of starlings, which are considered to be an invasive species. Starlings displace native birds from cavity nesting sites and bird houses, and their nests and droppings can create considerable mess should the birds gain entry to the attic spaces or ventilation openings of buildings. In winter, starlings consume tonnes of livestock feed, contaminate the feed and water with their droppings, and may also transfer disease among livestock operations. In summer, starlings feed on berries, tree fruits and grapes causing damage in the Okanagan Similkameen conservatively estimated at over $4 million annually.[4] A pilot project aimed at reducing starling populations began in 2003. Various agricultural commodity organizations, environmental funding programs and regional districts funded this project and the BC Fruit Growers' Association provided administrative support. The three Okanagan regional districts provide funding for the Starling Control Program which includes a research component that investigates starling population dynamics aimed at improving starling control measures.

The Okanagan Valley is coping with a serious goose management issue. The current non-migratory goose population are the descendants of geese that were transplanted to the area decades ago. Over the years goose populations have increased and they are fouling parks and contaminating lakes to such an extent that they pose a risk to human health and negatively impact tourism and recreation. In 1995 communities and stakeholders formed the **Okanagan Valley Goose Management Committee** to implement a coordinated approach to goose management throughout the valley. A key component of the goose management strategy is egg addling, a procedure which involves shaking eggs or coating them with corn oil to make them non-viable. Once addled, eggs are returned to the nest however they will not hatch. Adult geese are not harmed in this process and continue with their regular life cycle. In 2016, partners contributing to this program included the Regional Districts of Central Okanagan and Okanagan-Similkameen, Westbank First Nation, the communities of Vernon, Kelowna, Lake Country, West Kelowna, Peachland, Penticton, Summerland, Oliver, Osoyoos, Naramata, Okanagan Falls, as well as the Glenmore-Ellison Improvement District and Western Canada Turfgrass Association.

4 www.grapegrowers.bc.ca

The **Okanagan - BC Agriculture and Climate Change Regional Adaptation Strategies** began with a province wide assessment of the potential impacts of climate change on agricultural production in 2011-2012. The assessment revealed that the diverse characteristics of BC's geography and climate necessitated a regional approach to developing adaptation strategies. Since 2012, projects focussing on local impacts, priorities, and strategies intended to better prepare the agricultural sector to cope with the challenges of climate change have been completed in Delta, Peace River, Cowichan Valley and most recently in the Cariboo, Fraser Valley and the Okanagan.[5] The Okanagan adaptation strategy was a collaborative effort between the three Okanagan regional districts, senior government agencies, agricultural organizations, and producer participants who volunteered their time and expertise. The regional district partners contributed staff time and expertise and funded a series of workshops. The resulting plan offers specific actions tailored to suit the regional context both with respect to potential climate change impacts and local capacity and resources. The highest priority impacts affecting agriculture in the Okanagan were determined to be:

- warmer, drier summer conditions;
- changing pest populations, i.e. insects, disease, weeds, and invasive species;
- extreme precipitation events; and
- heightened wildfire risk.

The strategy identifies short-term implementation tasks, key participants, timeframes, and cost estimates.

In BC, **Regional Transit** services are funded by local governments and BC Transit under a cost-sharing arrangement based primarily on ridership. Decisions on fares, routes, and service levels are made by the service partners with information and planning provided by BC Transit.[6] The Vernon Regional Transit System is cost-shared between RDNO, its member municipalities, and BC Transit. This system operates an inter-regional route which moves people between Vernon, in the North Okanagan, and the University of British Columbia - Okanagan campus located in the Central Okanagan community of Kelowna. This transit route also stops at the Kelowna International Airport and within the District of Lake Country. The South Okanagan Transit System provides bus service within the Town of Osoyoos, located in the Okanagan-Similkameen Regional District near the US border, and offers inter-regional service linking Osoyoos to points as far north as the Kelowna International Airport. This service is funded by the Town of Osoyoos, RDOS, the Interior Health Authority and BC Transit. The Okanagan-Similkameen Transit System provides bus service within RDOS linking the communities of Naramata, Okanagan Falls, and Penticton with funding shared by RDOS and BC Transit.

In 2013, Kelowna Pacific Railway went into receivership and discontinued service on the section of CN rail line extending from Kelowna to Coldstream. Almost immediately, interested citizens rallied and encouraged the province and local governments to acquire the decommissioned rail corridor, now known as the **Okanagan Rail Trail**. With financial support from the province, the local governments ultimately purchased the former CN land and in doing so they made a long-term commitment to secure the corridor as a multi-modal regional transportation route, including use of the corridor as a recreational trail. Passing through the jurisdictions of RDNO, Coldstream, Lake Country, Kelowna, and the Okanagan Indian Band, all jurisdictions are working together to design and build the trail. Community-based fundraising is underway to support construction of the trail which will be suitable for people of all ages and abilities to walk, run or cycle. The level 48.5 km route has the potential to become a world class recreational pathway with over 24 km adjacent to lakeshores, creeks, and unique natural areas.[7]

In the south Okanagan, an inter-regional trail has been developed along extensive portions of the decommissioned **Kettle Valley Railway** (KVR). Beginning in the early 20th century, the KVR provided both freight and passenger rail service through the southern interior of British Columbia. The core portion of the KVR began in Hope, where it connected to the CPR mainline, and passed through Princeton, Penticton, and Beaverdell to its terminus in Midway. Spur lines branched off the core portion to Merritt and Spences Bridge and linked Osoyoos, Oliver and Okanagan Falls with Penticton. High track maintenance costs, declines in the mining and forestry industry, and a shift towards truck transportation contributed to the demise of the KVR. Rail service from Midway to Penticton ended in 1973 and the final segment of the railway was abandoned in 1990. The rails have been removed and the KVR has become a popular recreation corridor, forming part of the Trans-Canada Trail system. The province of BC has jurisdiction over the KVR corridor which passes through multiple local government jurisdictions including the RDOS, RDCO, the Kootenay Boundary Regional District, and several municipalities.[8]

The RDOS Board actively supports the maintenance and enhancement of trails in the region through the Regional Trails Program. In this regard, the province and RDOS have entered into a partnership agreement for management

5 www.bcagclimateaction.ca
6 www.bctransit.com
7 www.okanaganrailtrail.ca
8 wikipedia.org/wiki/Kettle_Valley_Railway

and maintenance of the KVR trail. In addition to the 200 kilometers of the rail trail presently maintained by the RDOS, the Regional District Board has endorsed an application to the province to take on maintenance and improvements of the KVR South Spur trail between Penticton and Osoyoos.[9]

The **British Columbia Product Stewardship Council** (BCPSC) is a coalition of regional districts, provincial agencies, and trade organizations that promotes extended product stewardship in BC. Extended product stewardship (EPR) is an environmental management strategy guided by the principle that whoever designs, produces, sells, or uses a product takes responsibility for minimizing that product's environmental impact. Costs are absorbed by producers and consumers, not taxpayers, often through a deposit or levy that's charged at the time of product purchase. The BCPSC was established in 2001 and currently serves 27 of BC's 28 regional districts including the three Okanagan regional districts. Local governments may provide facilities or operational services for products to be collected or processed. They inform the public of the stewardship program, and may regulate or impose bans on the landfilling of particular products, when appropriate.[10]

In 2009, the **South Okanagan Similkameen Conservation Program** (SOSCP) together with RDOS and other partners, initiated an assessment of the status of biodiversity, including recommendations to help maintain biodiversity, in the RDOS.[11] The South Okanagan Regional Growth Strategy, adopted in 2010, further supported the need for a regional biodiversity strategy. Building on the work of the SOSCP and following a similar methodology, the **Okanagan Collaborative Conservation Program** (OCCP)[12] began an analysis of biodiversity for the Central and North Okanagan Regional Districts in 2011. The OCCP and SOSCP then worked collaboratively to establish the biodiversity conservation strategy for the entire Okanagan Region. Both the SOSCP and OCCP are working towards the implementation of the biodiversity strategies and all three Okanagan regional districts support these biodiversity projects, along with many other partners, foundations, and agencies.

The **Okanagan and Similkameen Invasive Species Society** (OASISS) has been actively participating in prevention, detection, and management of invasive plants in the Okanagan-Similkameen since 1996. OASISS cooperates with multiple stakeholders, including the Okanagan-Similkameen and Central Okanagan regional districts, to target invasive plant species and quell their proliferation, to engage in public education and outreach initiatives, and to undertake stewardship programs that involve hands-on action. Part of the success of OASISS over the past 20 years has been attributed to its cooperative and collaborative partnerships with neighbouring jurisdictions, including Washington State. Prevention and education are considered priority management activities.[13]

9 Pers. comm., Justin Shuttleworth, RDOS Parks & Facilities Coordinator, 17.02.06
10 www.bcproductstewardship.org
11 *Keeping Nature in our Future, A Biodiversity Conservation Strategy for the Okanagan Region*, Okanagan Collaborative Conservation Program and South Okanagan Similkameen Conservation Program, 2014
12 www.okcp.ca
13 www.oasiss.ca

Conclusion

The **State of the Basin Report** is the outcome of a collaborative effort undertaken by the three Okanagan regional districts together with invaluable participation from various agencies, organizations, and individuals.

The framework of indicators established in this report represent policy areas generally consistent with the North, Central, and South Okanagan Regional Growth Strategies. The purpose of this initiative was to provide consistent measures by which the three Okanagan regional districts could evaluate their progress towards achieving the goals of their Regional Growth Strategies. As the results reveal both successes and challenges, the report will assist Okanagan local governments to identify policy areas requiring attention and to set priorities for action.

The results presented in the **State of the Basin Report** should not be interpreted as a 'scorecard' of performance. Each Okanagan regional district is impacted by a multitude of variables many of which are beyond local government control. In general, the Okanagan as a whole is doing well in aspects of agriculture, water stewardship, active transportation, and housing diversity, while challenges remain in areas such as economic development, housing affordability, community health and wellbeing and impacts on the natural environment and air quality.

As a tool to guide decision-making, this report has immediate value to local governments throughout the Okanagan Valley. However it is not intended to remain static and its value over the longer term can only be maintained if the indicator data is collected and reported on an ongoing basis for future iterations of this report. Consideration should be given to updating the State of the Basin Report in 2018 to incorporate the 2016 Census data once it has been fully released. Looking ahead, given the timing of the release of Canada Census statistics, consideration should be given to initiating the next comprehensive update of the **State of the Basin Report** in 2022-23 in order to access 2021 Census data.

As a key component of the project team, EcoPlan International Inc. provided consultant services which helped to guide process, define the indicators, gather data, and produce the graphics and final document. Funding assistance from the Real Estate Foundation of British Columbia and the Okanagan Basin Water Board helped to make this project possible.

The **State of the Basin Report** should be shared with local governments, service agencies, community organizations, and the public for information and for consideration within future planning processes.


real estate
foundation
BRITISH COLUMBIA


REGIONAL DISTRICT
NORTH OKANAGAN


RDCO
REGIONAL DISTRICT
of CENTRAL OKANAGAN


REGIONAL DISTRICT
RDOS
OKANAGAN-
SIMILKAMEEN


Okanagan Basin
WATER BOARD


Okanagan
Collaborative
Conservation
Program


SOUTH OKANAGAN-SIMILKAMEEN
CONSERVATION PROGRAM