3.0 Human Interaction with the Natural Environment

3.1 Smart Growth

Introduction

Smart Growth in the Cowichan Valley Regional District

"Smart growth" is a concept that encourages compact, higher density community development, leaving rural areas for agriculture and forestry as well as ecosystem protection.[119] A smart growth community mixes residential and commercial uses, making it easy for people to walk or bicycle to jobs and services. Higher density residential areas are typically better served by public transit, schools, libraries, and other services.

While the Cowichan Valley Regional District (CVRD) has higher density nodes in communities such as Ladysmith, Duncan, Lake Cowichan, Chemainus, and Mill Bay, most of its population is quite dispersed. To achieve more smart growth, new growth and development should focus on nodal, higher density developments that gradually shift the balance away from sprawl. At this time, much of the development pressures are particularly intense around Cowichan Lake, Shawnigan Lake and just to the north in the Regional District of Nanaimo.

Growth in the region is managed by municipal governments within their jurisdiction (City of Duncan, District of North Cowichan, Town of Lake Cowichan and Town of Ladysmith). In the electoral areas, planning is the responsibility of the CVRD. Decisions made by these local governments – such as where to allow new subdivisions or infill development, what density of development to permit, and where to provide services such as piped water, sewers and roads – will influence the type of growth that occurs.

Measuring Smart Growth

To be able to tell the story of smart growth in the region, it would be ideal to be able to report on how land use has changed over time (and is expected to change in the near future), population density, how and where growth is occurring, whether people are within walking distance of shops and services (including public transit stops), and how they move around the region (for work and other purposes).

119 For more information on smart growth, see Smart Growth BC: www.smartgrowth.bc.ca

Statistics Canada tracks several relevant measures, including population and population density, housing type, and journey to work. Indicators included in this report are:

> Population density

> Compact housing

> Walkability of communities

> Proximity to transit

> Transportation modes: journey to work

> Maximum allowable parcel coverage

Population Density

Indicator and Measures

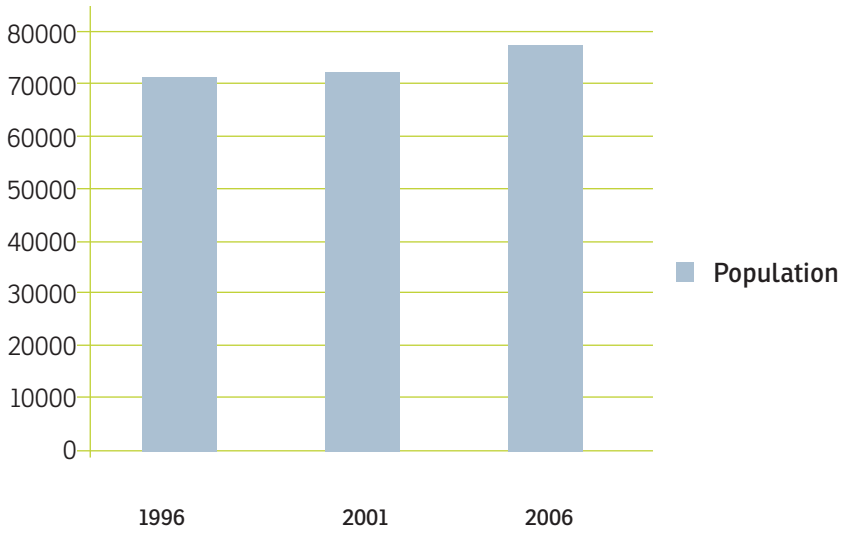
Statistics Canada tracks population data in its five-year census, both for the region as a whole and by census subdivision. Generally, the more densely populated a community, the better it meets smart growth criteria. For example, Smart Growth BC recommends having at least 15 residences per ha (1,500 residences/km^2) in order to make public transit a feasible option.

The census information is accurate and reliable, but incomplete for this report's purposes. For large electoral areas, an increase in population will show as increased density, but this does not indicate whether the additional population is being accommodated in higher density nodes or in a sprawled growth pattern. As well, census subdivision boundaries may change over time, making multi-year comparisons less reliable.

Findings

The Cowichan Valley Regional District has a land base of 3,473 km^2 with a population of 76,929 (2006 census). This gives an average population density of 22.1 people per km^2, much higher than the BC average of 4.4 people per km^2 but considerably lower than the Regional District of Nanaimo's 68.1 people per km^2.

FIGURE 3.1: CVRD Population, 1996–2006

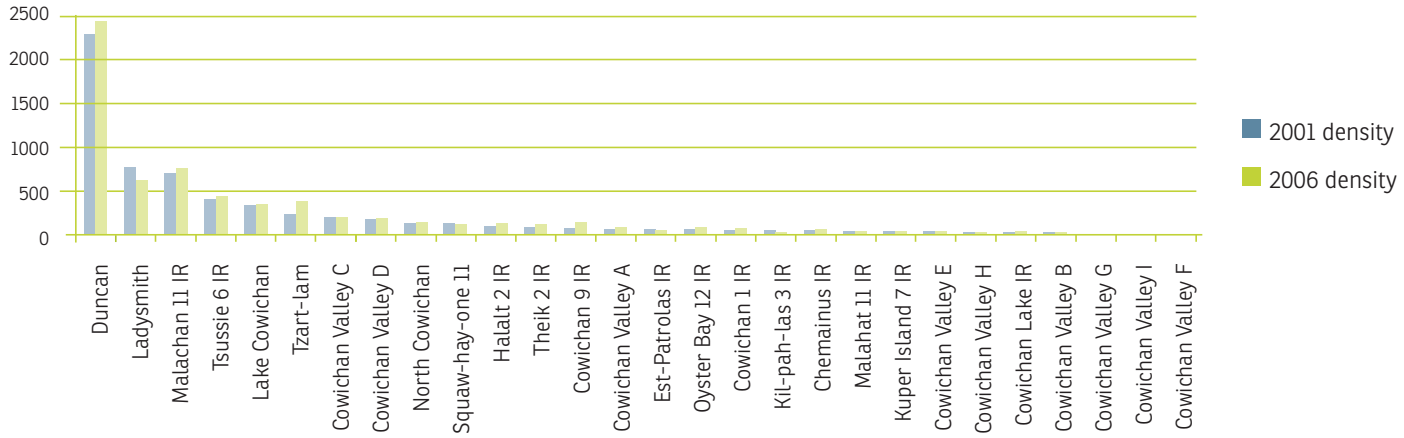


Source: Statistics Canada Census 1996, 2001, 2006

Population density of course varies considerably across the region. Figure 3.2 shows that the Town of Duncan has by far the highest density (2,430 people per km^2), with all other census subdivisions well under 800 people per km^2. Most of the electoral areas have very low density (below 200 people/km^2). [120]

120 For a map of electoral areas, see Figure 1.1 in Section 1.

FIGURE 3.2: Population density by census subdivision, 2001–2006



Note: Ladysmith shows a decline in density from 2001 to 2006 – this is due to a change in the area of the census subdivision.
Source: Statistics Canada Census 2001, 2006.

Compact Housing

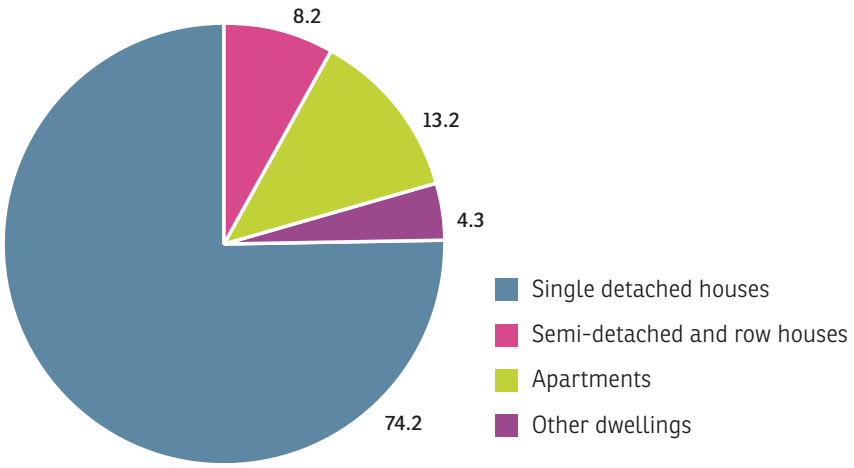
Indicator and Measures

Compact housing is a measure of dwelling unit type: single-family homes vs. duplexes vs. apartments or other forms of dwelling (e.g., trailers). A trend toward fewer single-family dwellings indicates an increase in residential density, which can help to reduce transportation-related energy use and emissions. Single-family detached housing makes up 49% of housing in BC.

Findings

About three-quarters (74%) of the housing stock in the Cowichan Valley region is single-family detached housing, with about 13% in apartments and 8% in semi-detached housing (Figure 3.3).

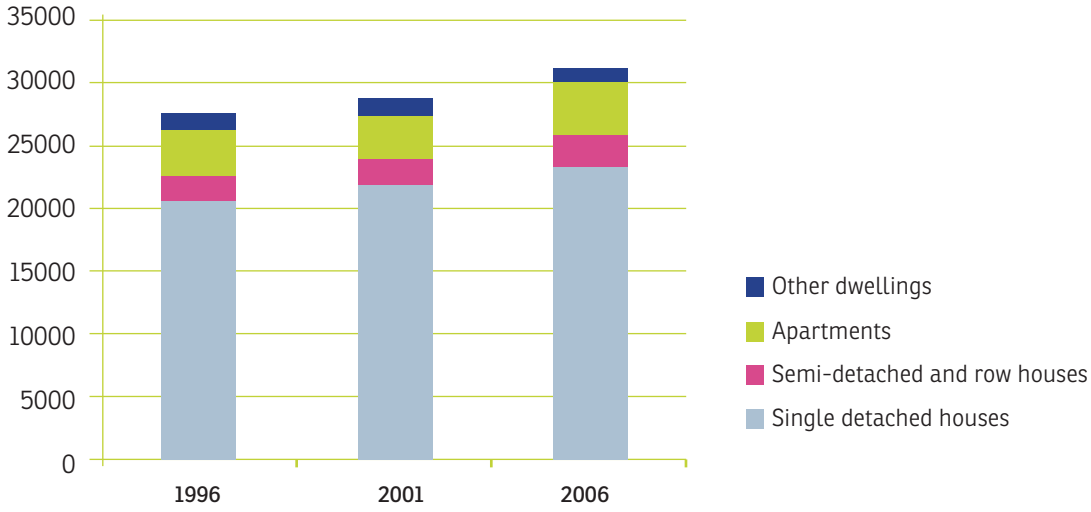
FIGURE 3.3: Housing stock (percentage of occupied dwelling type), CVRD 2006



Source: Statistics Canada Census, Community Profiles, 2006.

This overall percentage changed very little between 1996 and 2006, although the percentage of single family homes declined slightly (from 76.3% to 74.3%), with corresponding increases in apartment dwellings (11.9% to 13.2%) and semi-detached homes (6.7% to 8.2%) during this period (Figure 3.4). However, population growth continues to result in a growing number of single detached homes in the region.

FIGURE 3.4: Housing stock (by occupied dwelling type), CVRD 1996–2006



Source: Statistics Canada Census, Community Profiles, 2006.

Walkability of Communities

Walkable communities offer a lifestyle choice where people are less dependent on cars for their daily needs. Research[121] shows that walkable (and cyclable) communities are also healthier communities, as residents will incorporate more exercise into their daily routines.

Indicator and Measures

Walkscore.com provides an online ranking of the walkability of a given location, based on its proximity to services such as grocery stores, restaurants and coffee shops, cinemas, parks, libraries, drug stores and fitness facilities. This is based on Google data and shown in map form. Locations are given a ranking from a high of 100 to a low of zero.

Walkscore describes its rankings as follows:

> 90–100 = Walkers' Paradise: Most errands can be accomplished on foot and many people get by without owning a car.

> 70–89 = Very Walkable: It's possible to get by without owning a car.

> 50–69 = Somewhat Walkable: Some stores and amenities are within walking distance, but many everyday trips still require a bike, public transportation, or car.

> 25–49 = Car-Dependent: Only a few destinations are within easy walking range. For most errands, driving or public transportation is a must.

> 0–24 = Car-Dependent (Driving Only): Virtually no neighbourhood destinations within walking range. "You can walk from your house to your car."[122]

For the purposes of this report, a sample of locations across the region was entered into this program to rate their walkability. By its nature, this information is only as good as the data available from Google, and the sample locations do not provide a complete picture of the region. In addition, this information does not provide any trend data to show if walkability is improving or not. A preferred indicator would be one that measures the percentage of the region's population within walking distance of a defined suite of key services. However, in the absence of other more reliable data, it does provide some measure of the relative walkability of communities.

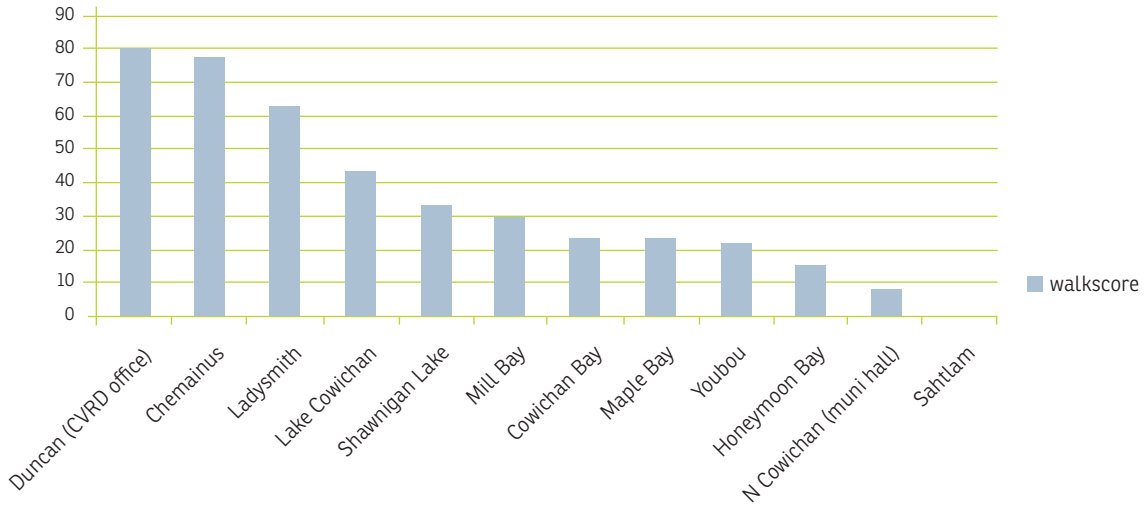
121 Frank et al, 2004.

122 www.walkscore.com/how-it-works.shtml

Findings

Data from walkscore.com show that the communities of Duncan, Chemainus and Ladysmith are considered very or somewhat walkable, while most other communities in the region are car-dependent (Figure 3.5).

FIGURE 3.5: Walkability of sample locations in the CVRD



Source: www.walkscore.com, accessed January 21, 2010.

Proximity to Transit

Indicator and Measure

People living close to public transit are much more likely to use transit services, especially if the routing and frequency of service meets their needs. BC Transit's annual performance summary (2008-09)[123] provides a summary of the population living within 400 m of transit routes. This information is generated by using the number of census blocks within 400 m each side of a transit route. Since most people start their journey with a walk from home to a bus stop, 400 m or less is deemed to be about the distance that most people are willing to walk to catch the bus (about a 10-minute walk).

Data to measure trends were not available for this report.

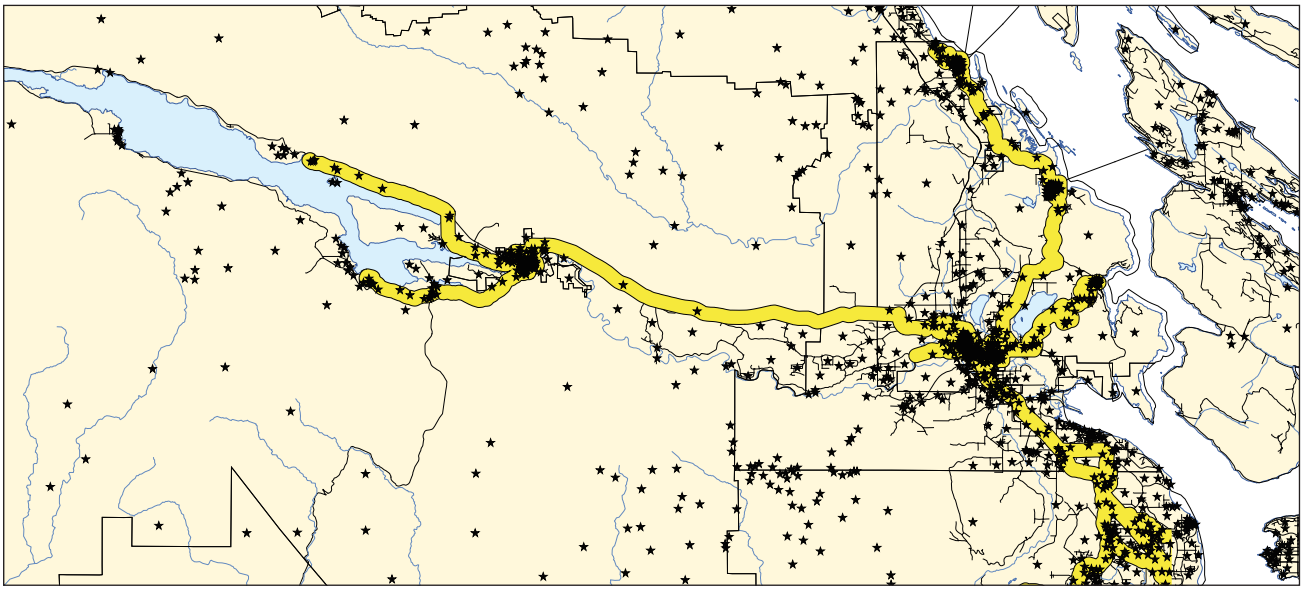
123 BC Transit, 2008/2009.

Findings

In 2008, about 38,100 people (half the region's population) lived within a 400m buffer around transit routes. This is mapped in Figure 3.6. This information does not indicate how far people would have to travel to a bus stop, nor the frequency of service along that route, both of which influence an individual's decision to take the bus instead of driving. For much of this area, bus frequency is well below the desired frequency (every 15-20 minutes during peak hours) that provides people with a realistic option to personal vehicle travel.

Also note that this map shows only part of the Cowichan Valley Regional District, since much of the region has no BC Transit service. The map does not include the new Duncan–Shawnigan–Victoria service that was started in 2008.

FIGURE 3.6: Population within 400 m of transit service, CVRD (Cowichan Lake east) 2008



Note: Each star represents a census block; not all census blocks are the same population. The yellow band is the 400m buffer around existing BC Transit routes.

Source: Peter Murray, Senior Transportation Planner, BC Transit.

Transportation Modes: Journey to Work

In a "smart growth" community, homes and places of work are close together, so that many residents can get to work by walking, biking or taking public transit. Where there are low- or medium-density settlement patterns – as seen throughout much of the Cowichan Valley Regional District – it is often impractical to offer a frequent transit service and most residents are too far from their workplace to be able to walk or cycle to work. However, communities such as Duncan and Ladysmith offer opportunities to walk or bicycle to work, or to car-pool with others.

The journey to work indicator provides insight both on the sprawl vs. smart growth nature of the region's land use, and on whether the trend is tending towards using lower-carbon methods to travel to work. Transportation is a significant contributor to greenhouse gas emissions, and this can be reduced by encouraging alternatives to automobile use.

Indicator and Measures

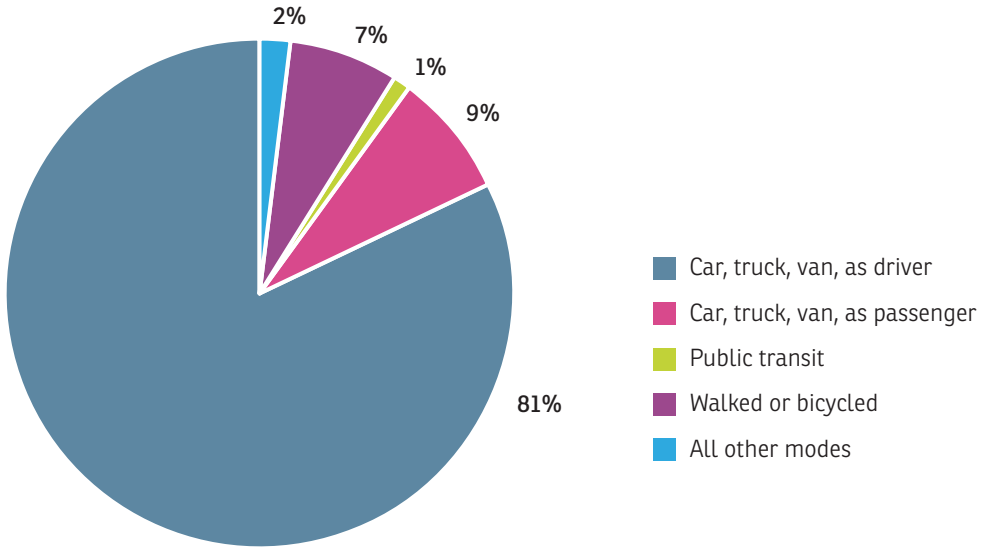
This indicator measures the mode of travel used by people as they journey to work: driving, riding as a passenger, walking/bicycling, via public transit, or other means. Statistics Canada tracks the mode of transportation to work by residents 15 years of age and over who worked at some time in the prior year (2001 and 2006 census). Census respondents are asked to identify the mode of transportation they most frequently use to commute from home to work.

This data is gathered by Statistics Canada as part of the five-year census. Journey to work data are not available for 1996. As well, the census tracks only the journey to work, and does not include data for other trips, e.g., for recreation or social purposes or to access services. This additional information would provide a more complete picture of total transportation activity in the region.

Findings

In 2006, by far the most common mode of transport to work was "vehicle driver" (81% of commutes). About 7% journeyed as a vehicle passenger, and a further 7% walked or bicycled (Figure 3.7).

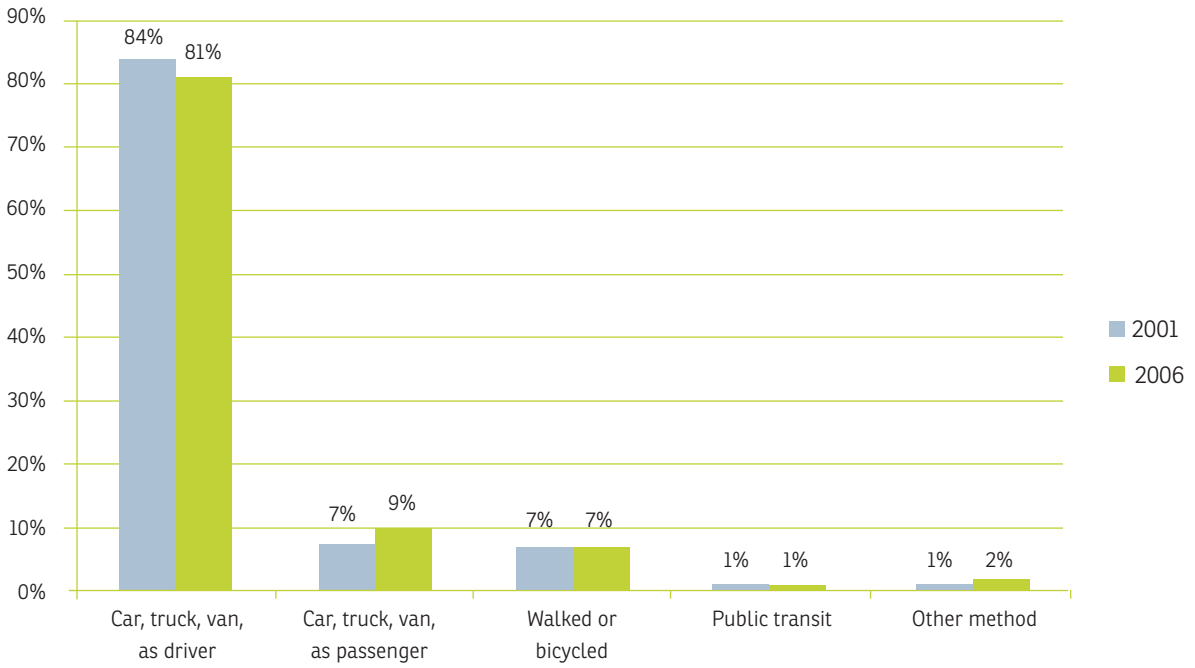
FIGURE 3.7: Journey to work mode share, CVRD, 2006



Source: Statistics Canada, 2006 Census.

When compared to 2001 census results, there has been a slight decline in the number of drivers (from 84% to 81%), with a consequent increase in the number of passengers (from 7% in 2001 to 9% in 2006) and a very small (less than one percent) increase in transit users (Figure 2). On average, more men than women travelled by private vehicle, women were more likely than men to take transit or walk/bike.

FIGURE 3.8: Journey to work mode share, CVRD 2001 and 2006



Source: Statistics Canada, Census 2001 and 2006.

Results varied across the region, however. In the City of Duncan, the percentage of drivers dropped from 72% in 2001 to 66% in 2006, while journeys by walking or bicycling increased from 16% to 19%. In the Town of Lake Cowichan, the percentage of drivers remained constant (71%), while transit users increased (from 1% to 2%) and those walking/bicycling decreased from 14% in 2001 to 10% in 2006.

Many residents of the Cowichan Valley region work in Victoria, and the Jack Bell Foundation provides vanpool and carpool vehicles for these commuters. Table 3.1 provides a summary of the number of vans and cars leaving various destinations in 2002 and 2009. It should be noted that the number of vans leaving Duncan and Cobble Hill/Shawnigan Lake has dropped in response to the launch of BC Transit's Malahat commuter bus service in 2008.

TABLE 3.1: Jack Bell Vehicles 2002 and 2009

From	To	2002 Vans 8 Pass.	2002 Cars 4 Pass.	2009 Vans 8 Pass.	2009 Cars 4 Pass.
Nanaimo	Victoria- Downtown	3		1	
Ladysmith	Victoria- Downtown	0		1	
Cowichan Bay	Victoria- Downtown	2		2	
Lake Cowichan	Victoria- Downtown	1			1
Duncan	Victoria- Downtown	8		6	1
Duncan	Esquimalt	1		1	1
Shawnigan Lake	Victoria- Downtown	3			1
Cobble Hill	Victoria-Downtown	6	1	2	1
	Total	24	1	13	5

Source: Leon Teubes, 2010.

Maximum Allowable Parcel Coverage

The various land-use zoning designations within the CVRD permit buildings to cover up to a certain percentage of a property. Buildings – and the roads, sidewalks, parking lots and other features that accompany them – create impervious surfaces that do not allow water to soak into the soil.

Under natural forest conditions, about 55% of the water from a rainfall will soak into the ground (the rest is absorbed by plants or evaporates). This water soaks into the soil, either recharging groundwater or gradually travelling through the ground to reach streams and lakes. Only a very small amount (about 1%) runs over the land surface.[124] Changes to the landscape create more impervious surfaces, where almost all of the rainfall runs over the land (picking up oils and other pollutants) and is then collected via storm drain systems which pipe the polluted water directly to creeks. In a suburban development, as much as 25% of rainwater becomes overland runoff, and in paved parking lots it can be close to 100% runoff.[125] Lawns, clearcut forest areas and agricultural lands can also increase overland runoff, especially on slopes.

124 Ministry of Water, Land and Air Protection and Environment Canada, 2002.

125 Ibid.

These changes create harmful impacts to waterways and property. Water reaches streams and creeks more quickly than under natural conditions, eroding streambeds and banks and resulting in the loss of fish habitat such as salmon spawning areas. There is less water soaking into the soil, resulting in less aquifer recharge for drinking water, and less groundwater to supply streams during dry summer months. It is estimated that significant changes to streams occur when impervious surface cover exceeds 10%, and significant damage to streams occurs when impervious surface cover is more than 30%.[126]

This indicator is an important aspect of smart growth because how we develop communities affects how much impervious surface is created, which in turn affects the health of the Cowichan Region's waterways.

Measures

The Cowichan Valley Regional District has calculated the impervious surface that could be created if all properties were built out to the maximum allowable in the current OCP zoning, by watershed. This allowable amount of impervious cover varies by zone.

Note that the results show the amount of impervious surface that could be created if full build-out were to occur, not the actual amount of impervious surface, which is unquantified a this time.

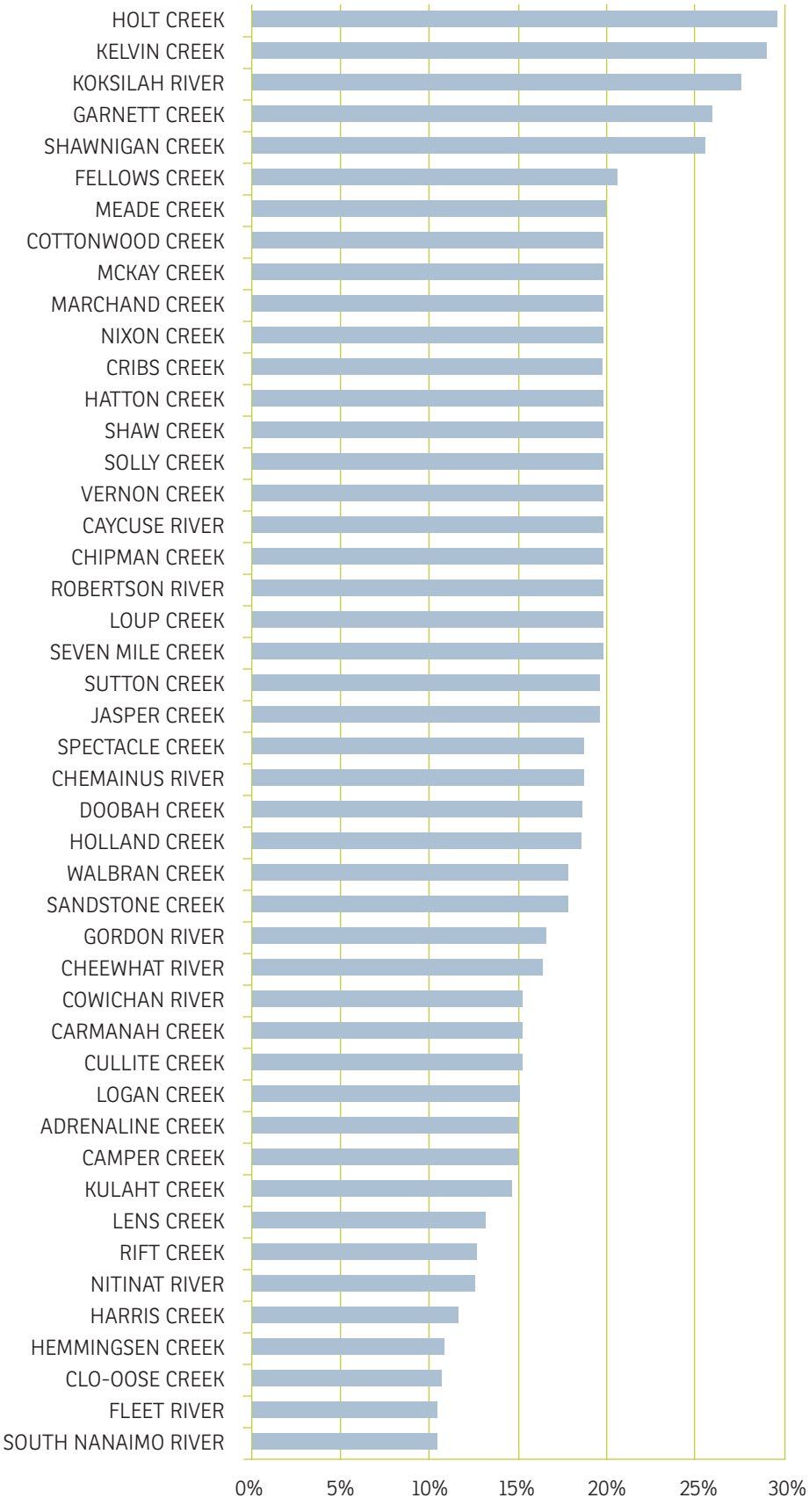
Findings

The results show that maximum allowable parcel coverage could create very high levels of impervious surface for many watersheds. Of the region's 68 watersheds, only 23 (one-third) of the watersheds would be below 10% impervious cover if maximum build-out were to occur. The rest would be between 10% and 30% impervious, with Holt Creek, Kelvin Creek, the Koksilah River, Garnett River and Shawnigan Creek coming very close to levels that would result in significant damage to stream ecology.

If such build-out were to occur, the impacts on the region's streams and waterways could be devastating.

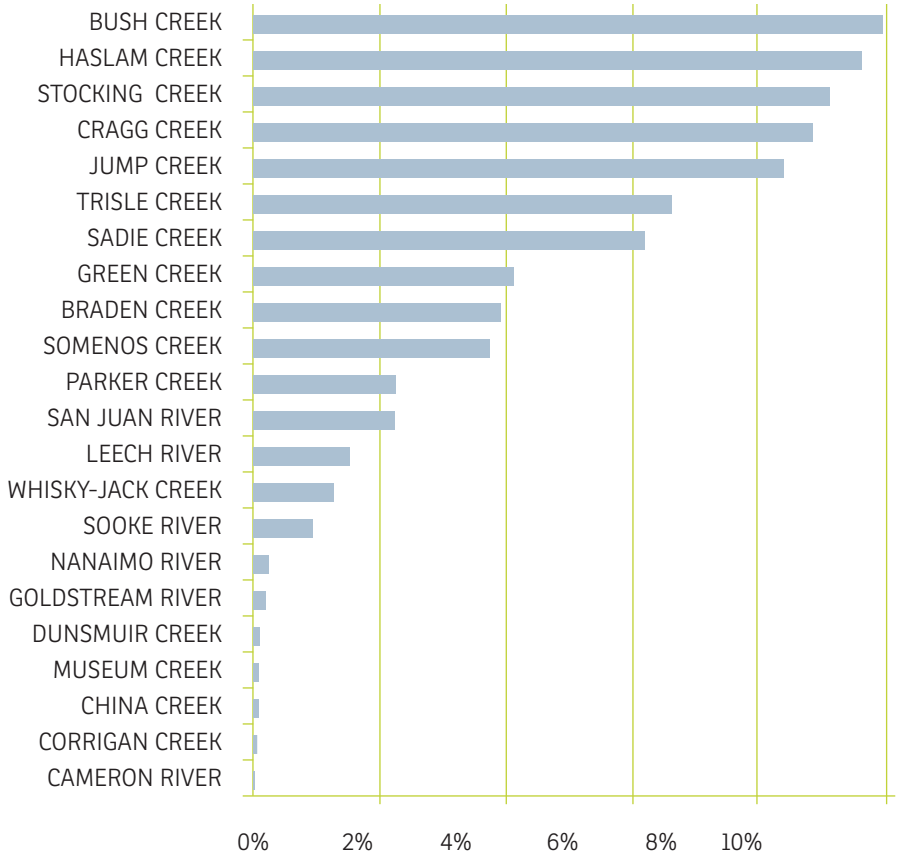
126 Schueler, 1995.

FIGURE 3.9: CVRD watersheds with 10–30% impervious cover based on zoning



Source: CVRD, 2010.

FIGURE 3.10: CVRD watersheds with less than 10% impervious cover based on zoning



Source: CVRD, 2010.

It would be helpful to be able to compare the actual impervious surface areas to these figures, so that more meaningful information on the current impact of impervious surfaces could be analyzed.

Summary

The Cowichan Valley Regional District has a population of about 77,000, and this number continues to grow. While some of the population is concentrated in higher density areas (such as Duncan), much of it is dispersed, with fewer than 200 people/km^2 in most parts of the region. This makes "smart growth" development very hard to achieve. About three-quarters of the population lives in single detached homes, and in communities where they are dependent on cars for most daily needs and errands. And, while many

people live close to a transit route, the frequency of service along these routes does not always make transit a practical option. The exceptions are the new bus services to the Victoria area, which together with the Jack Bell vanpool service helps to take several vehicles off the road. However, about 90% of commuters travel to work by personal vehicle, with the vast majority of these as single occupant drivers.

Of considerable concern is the impact that could occur as a result of maximum build-out of allowable parcel coverage. While this is unlikely to happen to its full extent, it does raise the question of future impervious surface cover and the potential for impacts on streams and waterways.

Missing Information

At this time there is no reliable, regionally-consistent data on the location of new growth (is new development supporting density or sprawl?) and proximity to services such as food stores, schools, libraries, etc. (are people living close to services?). Also, it would be useful to be able to report on actual impervious surface cover, as this would give a better indication of the potential for harm to the region's streams and waterways.

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