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1.0 MEMO OVERVIEW

This memo summarizes the results of research and analysis undertaken to support future liquid waste management planning in the South Sector of the Cowichan Valley Regional District (CVRD). In particular, content herein focuses on population statistics and growth projections. It should be noted, that additional details on the servicing potential for liquid waste management as it relates to land use and environmental policy, including area-wide sewer systems and infrastructure strategies have been provided in subsequent memos of this study and should be reviewed concurrently.

Analysis outlined herein relies heavily on *population centre* data from Statistics Canada. The data is used as it is readily available and because the outline of the population centres often has some alignment with local perceptions of the geographic-extent of the community. The use of Statistics Canada data is common and generally reliable for projections and analysis.

2.0 POPULATION REVIEW AND GROWTH PROJECTIONS

Population statistics and growth analysis including demographic information generally follow the three Electoral Areas (A, B and C), the three UCBs (Mill Bay, Shawnigan Lake and Cobble Hill) and Arbutus Ridge.

2.1 Population Overview

The total population of the CVRD South Sector was 18,310 people in 2016 which represents a 5.9% increase in population since the previous census in 2011 (population 17,316). The population growth rate of the South Sector exceeds the overall growth rate for the CVRD (4.2%) and represents almost 30% of the total growth in the Regional District. **Table 2.1** (below) shows the total growth for each Electoral Area (A, B and C) in the South Sector and the CVRD as a whole. Electoral Area A demonstrates the highest proportionate growth at 7.7% (340 people) and Electoral Area B provides the greatest population gain with 431 people (5.3% growth).

Table 2.1 – CVRD Population by Electoral Area

	CVRD Electoral Area A	CVRD Electoral Area B	CVRD Electoral Area C	South Sector Total	CVRD Total
Population 2016	4,733	8,558	5,019	18,310	**83,739**
Population 2011	4,393	8,127	4,796	17,316	**80,332**
Pop. Change (People)	340	431	223	994	**3,407**

% Change (2011 – 2016)	**7.7%**	**5.3%**	**4.6%**	**5.9%**	**4.2%**
Area (km^2)	49.31	306.47	22.59	378.37	**3,474.52**
Population Density (ppl / km^2)	96.0	27.9	222.2	48.4	**24.1**

CVRD land use policy explicitly encourages growth within three urban containment boundaries in each Electoral Area (reported on under separate cover). In order to determine the degree to which this is occurring, populations and recent growth are highlighted for each of the three UCB (Mill Bay Village, Shawnigan Lake Village and Cobble Hill Village) and Arbutus Ridge (below).

There are two Statistics Canada defined Population Centres in the area which represent the combination of the urban extent of the four communities above by combining urban areas:

1) Shawnigan Lake Village and Mill Bay Village; and

2) Cobble Hill Village and Arbutus Ridge.

Table 2.2 – South Sector Population by Define Urban Centre

	Mill Bay, UCB	Shawnigan Lake, UCB	Cobble Hill, UCB	Arbutus Ridge	Shawnigan - Mill Bay, Pop. Centre	Cobble Hill, Pop. Centre
Population 2016	2,881	3,945	955	1,063	7,021	3,580
Population 2011	2,593	3,868	868	987	6,543	3,337
Population Change (People)	288	77	87	76	478	243
Percent Change (2011 – 2016)	**11.1%**	**2.0%**	**10.0%**	**7.7%**	**7.3%**	**7.3%**
Area (km^2)	6.46	7.29	1.48	1.48	13.31	6.64
Population Density (ppl / km2)	426.0	541.1	645.1	717.5	527.5	539.0

Table 2.3 provides the breakdown for within UCB or outside UCBs to illustrate to what extent development patterns have followed land use, growth and LWMP policies in the last five years (2011 - 2016).

Table 2.3 - Percent (%) of New Population Growth within UCBs by Electoral Area

	Electoral Area A		Electoral Area B		Electoral Area C		
	Mill Bay, UCB	Rural Electoral Area A	Shawnigan Lake, UCB	Rural Electoral Area B	Cobble Hill, UCB	Arbutus Ridge	Rural Electoral Area C
Population Growth (number of people)	288	52	77	354	87	76	70
Dwelling Unit Growth (estimated number of Units)	133	24	42	192	25	22	17
Percent Growth in UCB / Electoral Area	**85%**	**15%**	**18%**	**82%**	**39%**	**34%**	**27%**

Note: Arbutus Ridge is a large stratified development that does not have a defined UCB. However, in the context of Liquid Waste Management it represents a substantial community that functions as somewhat independent compact urban centre with a defined community boundary. It is also defined as a 'Population Centre' by Statistics Canada.

Table 2.4 outlines new population growth within Shawnigan Lake / Mill Bay Population Centre and the Cobble Hill / Arbutus Ridge Population Centre; however, it's important to note that Population Centers can cover two electoral areas simultaneously which can result in growth percentages above 100%.

Table 2.4 - Percent (%) of New Population Growth within Population Centres by Electoral Area

	Electoral Areas A and B		Electoral Area C	
	Shawnigan - Mill Bay, Pop. Centre	**Rural Electoral Areas A and B**	**Cobble Hill, Pop. Centre**	**Rural Electoral Area C**
Population Growth (number of people)	478	771	243	223
Dwelling Unit Growth (estimated number of Units)	242	391	70	64
Percent Growth in Population Centre	62%	38%	109%	Nil

Appendix A includes maps that illustrate the population distribution and relative population increases within Population Centers. T**able 2.5** compares growth in urban and rural areas for the entire South Sector.

Table 2.5 - Percent (%) of New Population Growth within Population Centres by Electoral Area (2011-2016)

	South Sector		South Sector	
	Total UCBs and Arbutus Ridge	**Rural Areas Electoral Areas A, B and C**	**Total Population Centres**	**Rural Areas Electoral Areas A, B and C**
Population Growth (2011-2016) (number of people)	528	994	721	994
Dwelling Unit Growth (2011-2016) (estimated number of Units)	242	455	330	455
Percent Growth in Population Centre	**53%**	**47%**	**73%**	**27%**

Overall, the results of the population statistics review reveal that:

- growth in some areas is being achieved in the UCBs (or population centres) while in others, growth in rural areas continues to proliferate outside of UCBs which misaligns with LWMP and local land use policy;
- growth in Electoral Areas A and C appears to be largely focused in the Mill Bay Village UCB (85%) and Cobble Hill Village UCB / Arbutus Cove (73%);
- growth in the Cobble Hill / Arbutus Cove Population Centre appears to comprise nearly 100% of growth in Electoral Area C;
- growth in Electoral Area B demonstrates a large percentage of its growth (82%) occurring in rural areas with only 18% occurring in Shawnigan Lake Village UCB; and
- growth is evenly split between development in UCBs (53%) and development in rural areas of the South Sector (47%), when looking at the UCBs (including Arbutus Ridge) as defined by the CVRD; but, when growth is viewed through population centers, only 27% of growth occurred outside a defined settlement area.

A substantial amount of growth still occurs outside UCBs in the South Sector despite CVRD policies to limit rural sprawl. Sewer servicing, a core element of liquid waste management, is typically required to achieve the maximum density permitted by zoning for each UCB. Therefore, the existing land base will be used up quickly unless higher densities are permitted. Moving forward, sewer servicing within the three UCBs will be critical for focusing growth in these areas and maximizing the utilization of their limited land bases. Further, sewer servicing will help to mitigate existing environmental concerns in areas with extensive development by providing an alternative to septic systems in Village Centres.

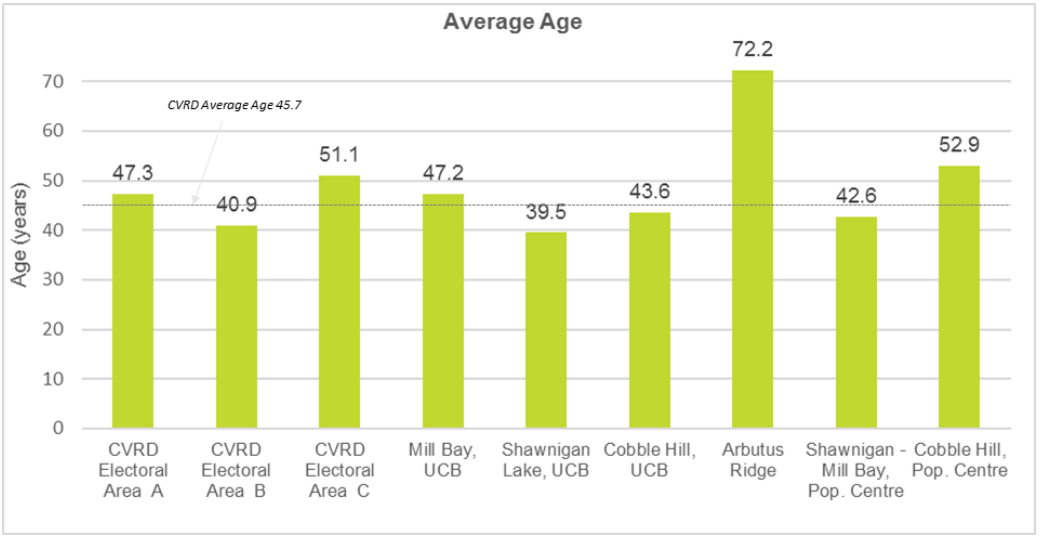
2.2 Age of Residents and Dwelling Composition

The current demographic trends in the south sector also provide insight into the composition of each defined UCB, *Population Centre* and Electoral Area. Notably, this demographic analysis summarizes the age, income, and dwelling characteristics of each geography.

2.2.1 Age

As shown by **Figure 2.6** (below), the average age of each geography varied widely (note: the average age of the whole CVRD is 45.7). The oldest community by far was Arbutus Ridge, which had an average age of 72.2 years, which greatly exceeded the provincial average of 43.2 years and the oldest electoral area was Electoral Area C (51.1 years). Electoral Area B was the youngest area with and average age of (40.9 years), including Shawnigan Lake Village at (39.5 years). Electoral Area A (47.3 years) and Mill Bay UCB (47.2 years) were in the middle of the pack, but still high by provincial standards (43.2 years).

Figure 2.6 – Average Age of Each Population

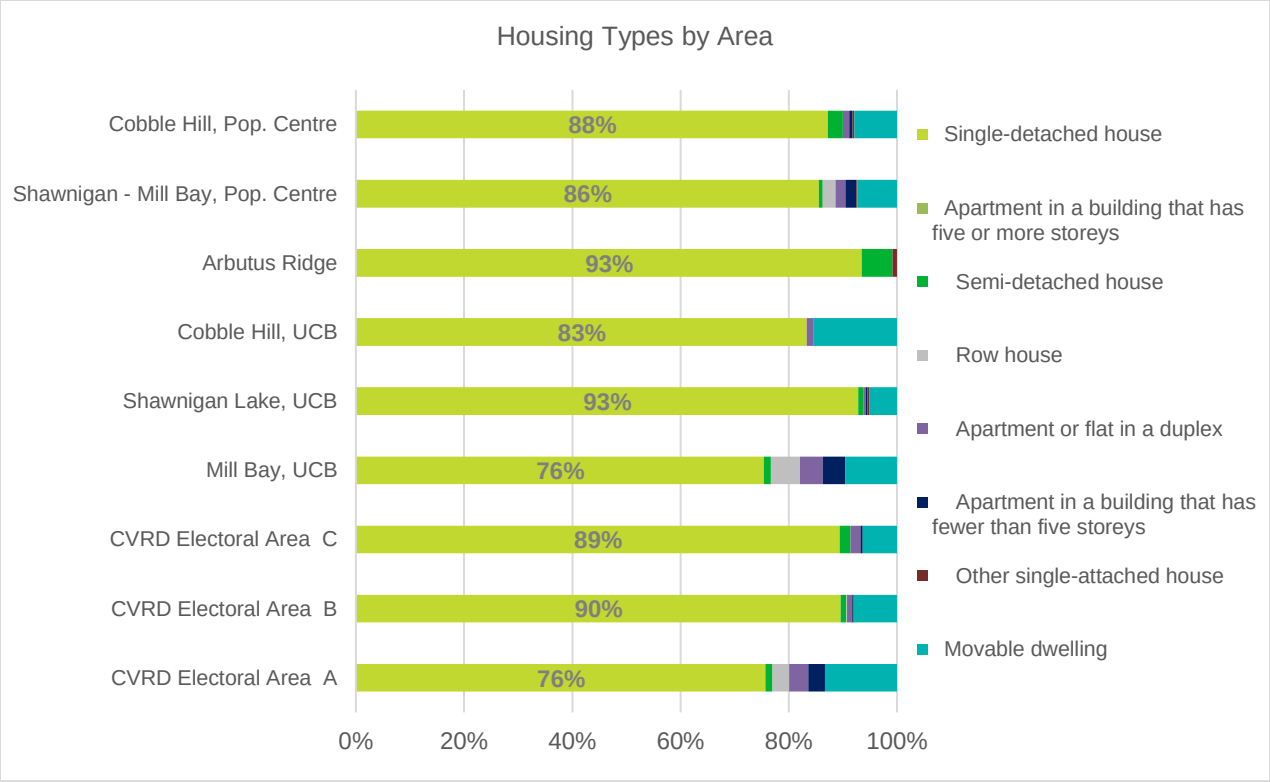


In general, the population of the South Sector, with the exception of Electoral Area B appears to be substantially older than the provincial average with a large proportion likely retired or reaching retirement age. This has the potential to influence housing choices and demand in a number of ways, including greater migration away from rural centers to urban areas with more accessible health services and/or an increase in age-accommodating housing types, among others.

2.2.2 Housing by Dwelling Type

As shown by **Figure 2.7** housing in the South Sector remains predominantly single-detached in nature. Mill Bay and Electoral A as a whole had the highest number of multi-family (apartment) units along with a substantial component of housing classified as moveable housing. There is a distinct lack of housing variety in Electoral Areas B and C with single-detached units making up 90% of all housing compared to CVRD as a whole with 76% single-detached housing. Moveable dwellings represented the second most common housing type in all areas, with the exception of Arbutus Ridge.

Figure 2.7 – Average Age of Each Population



With the exception of Mill Bay, there is a distinct lack of housing diversity in the South Sector, notably there is a lack of multi-family (apartment) housing in all areas. This reflects a trend toward low-density housing

throughout the study area, which could be partially due to the lack of servicing needed to achieve higher density growth.

2.3 Growth Projections

Population projections in the South Sector provide a sense of scale and location for future service demands (e.g. sewer systems) for liquid waste management in the South Sector of the CVRD. Estimates are broken down to show projected growth in each UCB, as well as rural areas of each Electoral Area. While the actual growth to occur is difficult to project, these projections encourage reflection and refinement to ongoing techniques to implement existing land use policies and to ultimately achieve the densities required for sustainable sewer systems.

Two growth scenarios provide fundamental bookends for assessing potential population distribution and their impacts on UCBs and servicing potential. The first growth scenario (Scenario 1; Current Trends) provides an estimate of growth in each community given current trends in population growth and assumes that growth will continue to be distributed at a ratio of 53% to the UCBs and 47% to rural areas of Electoral Areas A, B and C (as shown by the analysis in Section 2.1). The second growth scenario (75% Growth in UCBs) is based off the assumption that the CVRD will support the expansion of sewer systems within the three UCBs and direct 75% of all growth to these areas by 2021 – growth in the first five years of this model will follow current trends. These scenarios were developed to provide a sense of capacity of UCBs to absorb growth and how much growth they may be required to sustain if the CVRD UCB policies were to be more strictly enforced.

The projection methodology used to generate growth estimates was based on the use of historical census data from Statistics Canada (2006, 2011 and 2016 census) and building permit information provided by the Regional District. Data for existing development permits was also used to get a high-level understanding of what the existing land base in each UCB could support in terms of growth. However, it should be understood that these are high-level estimates based on the available data. These are primarily for discussion purposes but can be refined for use in servicing analysis. If warranted, additional analysis should be focused towards how much developable land remains in each UCB; notably how these UCBs might be developed and the number of units (both single- detached and multi-family) that could be sustained in each UCB both with and without a community sewer system. Additional information regarding the location and scale of future commercial, industrial, and institutional growth should also be developed to provide an understanding of how non-residential uses may also influence growth patterns and demand for liquid waste management.

The following section provides a summary of projected growth for each UCB and rural areas of Electoral Areas A, B and C based on the two scenarios described above, beginning with a review of the projections methodology.

2.3.1 Methodology Overview

The methodology for population projections is outlined below, across six parameters.

- Apply 2016 Statistics Canada data was used to determine the populations and growth rates for all electoral areas, village centers Shawnigan Lake, Cobble Hill and Mill Bay (which followed UCB boundaries virtually exactly), as well as the two Population Centers which combined urban areas: 1) Shawnigan Lake Village and Mill Bay Village; and 2) Cobble Hill Village and Arbutus Ridge **(Links to each census page including maps are provided in Appendix A.2)**.
- Base growth rates for all geographic areas used in the population projections were developed historical census data from Statistics Canada. This was based primarily on the 5-year population changes between 2011 and 2016 as longer term historical data was not available for the following geographies - Shawnigan Lake, Cobble Hill and Mill Bay UCBs, as well as the two Population Centres: 1) Shawnigan Lake Village and Mill Bay Village; and 2) Cobble Hill Village and Arbutus Ridge.
- To compare growth inside UCBs versus growth in rural areas of each Electoral Areas the data for these two geographies was separated by subtracting the UCB populations from each Electoral Area – effectively creating Urban and Rural population grouping. A similar exercise was done using the two population centers 1. Shawnigan Lake Village and Mill Bay Village; and 2) Cobble Hill Village and Arbutus Ridge by subtracting them from the Electoral Areas. Tables 2.3 – 2.5 provide a breakdown were growth is occurring (i.e. within UCB or outside UCBs) and this is mapped in Appendix A.1.
- Two projections were created based on the amount of growth occurring within rural areas of each electoral areas as well as within each of UCBs:
    a. The first growth scenario (current trends) provides an estimate of future growth in each community assuming the current trends in population growth over the last 5 years are carried forward. Meaning growth continued to be distributed at a ratio of 53% to the UCBs and 47% to rural areas of Electoral Areas A, B and C (as it was between 2011 and 2016).
    b. The second growth scenario (75% Growth in UCBs) is based off the assumption that the CVRD would support the expansion of sewer systems within the three UCBs and direct 75% (increased from the current 53%) of all growth to the UCBs by 2021. Therefore, growth in the first five years of this model follows current trends over the past 5 years (extrapolated

for each geography) then shifts 75% of the total growth in the South Sector into the UCBs in the proceeding 5 - 20 years and beyond (up to 40 years).

- To create the second growth scenario all future growth for each Electoral Area (inclusive of each UCB) was extrapolated out using historical growth rates. Then from 2021 on 75% of the total growth from all Electoral Areas was shifted proportionately over to the corresponding UCBs in each Electoral Areas using an adjusted growth rate for both the EAs and the UCBs. This adjusted growth rate increased the proportionate growth rate for all EAs and UCBs to achieve the 75% UCB growth target.
- The growth rates were determined by taking the total growth in all electoral areas between 2011 and 2016 (994 people) and breaking this into the portion occurring inside UCBs (528 people or 53%) and the portion occurring outside UCBs (466 people or 47%). Using this as a baseline, it was then determined how much growth would have had to occur in the UCBs between 2011 and 2016 to reach the 75% target and then how this would change the average growth rates of each UCB and each Electoral Area. Thus, if 75% percent of the new growth between 2011 and 2016 occurred within the defined UCBs then the portion occurring inside UCBs shifted to 746 people (75% of 994) and the portion occurring outside the UCBs shifted to 429 people (25% of 994). The new populations for each UCB and EA was then used to back calculated what growth rates would be required to reach these targets and the population was then shifted proportionately over to the corresponding UCBs and EAs based on the proportion of the 994 people they each contributed to the south sectors growth. This resulted in UCBs with a greater proportion of the total growth growing faster.

  *For example, according to the base 2016 census data the Mill Bay UCB growing at a rate of **2.13%** represented **55%** of the total population growth amongst all the UCBs in the South Sector between 2011 and 2016 or **288 of the 528 people** moving to UCBs (out of the **994 total people** that moved to the South Sector). If the proportion of growth for all of the UCBs is then increased to **75%** then the Mill Bay UCB at **55%** of the total UCB growth would have attracted **407 of the 746 people** moving to UCBs (out of the **994 total people** that moved to the South Sector). This would have required a higher growth rate of **2.96%.***

  In Scenario 2, for Mill Bay the actually growth rate of 2.13% from 2011-2016 was applied for the first 5 years then the adjusted growth rate of 2.96% was applied for all years after 2021. The remaining UCBs and EA's were adjusted in the same manner until new growth rates and projections were developed for each geographic area.

- Land availability was then reviewed to determine whether, or not, the land base of each UCB was able to meet the associated demands population growth associated with each projection.

2.3.2 Growth Projections – Scenario 1 (Current Trends):

Scenario 1 is based on the assumption that current growth trends will continue over the next 20 years and that 53% of the growth will continue to occur within the UCBs as explored in Section 2.1(above).

Table 2.8 (below) includes annual growth rates between 11% and 1.63% in Electoral Areas A, B and C. In total, the South Sector will grow by approximately 1.23% annually resulting in a total population increase of 4,723 people by 2037 and 11,250 by 2057; with the most growth occurring in the Electoral Area B (1,997 people).

Table 2.8: Scenario 1 – Total Growth in South Sector by Electoral Area

Year	Total Electoral Area A (UCB + Rural)	Total Electoral Area B (UCB + Rural)	Total Electoral Area C (UCB + Rural)	South Sector Total
2018	4,878	8,739	5,113	18,730
2019	4,953	8,831	5,160	18,944
2020	5,029	8,925	5,209	19,163
2021	5,106	9,020	5,258	19,384
2022	5,186	9,116	5,308	19,609
2023	5,266	9,214	5,358	19,838
2024	5,348	9,313	5,409	20,070
2025	5,432	9,413	5,461	20,306
2026	5,517	9,515	5,514	20,546
2027	5,604	9,619	5,567	20,790
2028	5,693	9,723	5,621	21,037
2029	5,783	9,830	5,676	21,289
2030	5,875	9,938	5,732	21,544
2031	5,969	10,047	5,788	21,804
2032	6,064	10,158	5,846	22,068
2033	6,162	10,270	5,904	22,336
2034	6,261	10,384	5,963	22,608
2035	6,363	10,500	6,022	22,885
2036	6,466	10,617	6,083	23,166

Year	Total Electoral Area A (UCB + Rural)	Total Electoral Area B (UCB + Rural)	Total Electoral Area C (UCB + Rural)	South Sector Total
2037	6,571	10,736	6,145	23,452
2038	6,678	10,857	6,207	23,742
2039	6,787	10,979	6,270	24,035
2040	6,898	11,102	6,333	24,331
2041	7,010	11,226	6,397	24,632
2042	7,124	11,352	6,462	24,936
2043	7,240	11,479	6,527	25,243
2044	7,358	11,608	6,593	25,555
2045	7,478	11,738	6,660	25,870
2046	7,600	11,870	6,727	26,190
2047	7,723	12,003	6,795	26,513
2048	7,849	12,138	6,864	26,840
2049	7,977	12,274	6,933	27,171
2050	8,107	12,411	7,004	27,507
2051	8,239	12,550	7,074	27,846
2052	8,373	12,691	7,146	28,190
2053	8,510	12,833	7,218	28,538
2054	8,648	12,977	7,291	28,890
2055	8,789	13,123	7,365	29,246
2056	8,932	13,270	7,440	29,607
2057	9,078	13,419	7,515	29,973
Total Growth	**4,200**	**4,680**	**2,402**	**~11,250**
Growth Rate (%/yr)	1.63%	1.12%	1.01%	

Tables 2.9 and 2.10 provide the next level of detail for population projections by separating out growth projections in rural areas and UCBs. Table 2.9 includes annual growth rates between 0.40% and 2.13% within the three UCBs (and Arbutus Ridge) in Electoral Areas A, B and C. In total all UCBs will grow by approximately 1.38% annually resulting in a total population increase of 2,579 people by 2037 and 6,445 by 2057, with by far the most growth happening in the Mill Bay UCB (1,479 people).

Table 2.9: Scenario 1 – Growth in UCBs

Year	Mill Bay, UCB	Shawnigan Lake, UCB	Cobble Hill, UCB	Arbutus Ridge	Sum of UCBs/yr
2018	3,005	3976	992	1,095	9,068
2019	3,069	3992	1011	1,111	9,184
2020	3,134	4008	1031	1,128	9,301
2021	3,201	4024	1051	1,145	9,420
2022	3,269	4039	1071	1,162	9,542
2023	3,339	4055	1092	1,179	9,665
2024	3,410	4071	1113	1,197	9,791
2025	3,482	4087	1134	1,215	9,919
2026	3,557	4104	1156	1,233	10,049
2027	3,632	4120	1178	1,251	10,182
2028	3,710	4136	1201	1,270	10,317
2029	3,789	4152	1224	1,289	10,454
2030	3,869	4169	1248	1,308	10,594
2031	3,952	4185	1272	1,328	10,737
2032	4,036	4202	1296	1,348	10,882
2033	4,122	4218	1321	1,368	11,029
2034	4,209	4235	1347	1,388	11,180
2035	4,299	4252	1373	1,409	11,333
2036	4,390	4269	1399	1,430	11,489
2037	4,484	4285	1426	1,452	11,647
2038	4,579	4,302	1,454	1,473	11,809
2039	4,677	4,319	1,482	1,495	11,973
2040	4,776	4,336	1,511	1,518	12,141
2041	4,878	4,354	1,540	1,540	12,312
2042	4,982	4,371	1,569	1,563	12,485
2043	5,088	4,388	1,600	1,587	12,662
2044	5,196	4,405	1,630	1,610	12,843
2045	5,307	4,423	1,662	1,635	13,026
2046	5,420	4,440	1,694	1,659	13,213
2047	5,535	4,458	1,727	1,684	13,403

Year	Mill Bay, UCB	Shawnigan Lake, UCB	Cobble Hill, UCB	Arbutus Ridge	Sum of UCBs/yr
2048	5,653	4,475	1,760	1,709	13,597
2049	5,773	4,493	1,794	1,734	13,795
2050	5,896	4,511	1,828	1,760	13,996
2051	6,022	4,529	1,864	1,787	14,201
2052	6,150	4,547	1,900	1,813	14,410
2053	6,281	4,565	1,936	1,840	14,622
2054	6,415	4,583	1,974	1,868	14,839
2055	6,551	4,601	2,012	1,896	15,060
2056	6,691	4,619	2,051	1,924	15,284
2057	6,833	4,637	2,090	1,953	15,513
Total Growth	**3,828**	**661**	**1098**	**858**	**6,445**
Growth Rate (%/yr)	2.13%	0.40%	1.93%	1.49%	

Table 2.10 (below) includes annual growth rates between 0.40% and 1.61% within rural areas of Electoral Areas A, B and C. In total all rural area will grow by approximately 19% annually results in a total population increase of 2,144 people by 2037 with by far the most growth occurring in rural areas of Electoral Area B (1,688 people).

Table 2.10: Scenario 1 - Total Growth in Rural Areas

Year	Rural: Area A	Rural: Area B	Rural: Area C	Sum of Rural EAs/yr
2018	1,873	4,763	3,025	9,661
2019	1,884	4,839	3,038	9,761
2020	1,895	4,917	3,050	9,862
2021	1,906	4,996	3,062	9,964
2022	1,916	5,077	3,075	10,068
2023	1,927	5,159	3,087	10,173
2024	1,938	5,242	3,100	10,280
2025	1,949	5,326	3,112	10,388
2026	1,961	5,412	3,125	10,497
2027	1,972	5,499	3,137	10,608

Year	Rural: Area A	Rural: Area B	Rural: Area C	Sum of Rural EAs/yr
2028	1,983	5,587	3,150	10,720
2029	1,994	5,677	3,163	10,834
2030	2,006	5,769	3,176	10,950
2031	2,017	5,862	3,188	11,067
2032	2,029	5,956	3,201	11,186
2033	2,040	6,052	3,214	11,306
2034	2,052	6,149	3,227	11,428
2035	2,064	6,248	3,240	11,552
2036	2,075	6,349	3,253	11,678
2037	2,087	6,451	3,267	11,805
2038	2,099	6,555	3,280	11,934
2039	2,111	6,660	3,293	12,065
2040	2,123	6,767	3,306	12,197
2041	2,135	6,876	3,320	12,332
2042	2,148	6,987	3,333	12,468
2043	2,160	7,100	3,347	12,606
2044	2,172	7,214	3,360	12,746
2045	2,185	7,330	3,374	12,889
2046	2,197	7,448	3,388	13,033
2047	2,210	7,568	3,401	13,179
2048	2,222	7,690	3,415	13,327
2049	2,235	7,813	3,429	13,477
2050	2,248	7,939	3,443	13,630
2051	2,261	8,067	3,457	13,784
2052	2,273	8,197	3,471	13,941
2053	2,286	8,329	3,485	14,100
2054	2,300	8,463	3,499	14,261
2055	2,313	8,599	3,513	14,425
2056	2,326	8,738	3,527	14,591
2057	2,339	8,878	3,542	14,759
Total Growth	**466**	**4,115**	**517**	**5,098**
Growth Rate (%/yr)	0.57%	1.61%	0.40%	

2.3.3 Growth Projections – Scenario 2 (75% South Sector Growth in UCBs):

Scenario 2.0 is based on the assumption that the CVRD will aim to further support expanded sewer servicing in the UCBs and begin to prioritize growth in these areas through refined land use policies coupled with aligned decision-making. In this hypothetical scenario, current growth trends over the next 40 years will assume that 53% of the growth will continue to occur within the UCBs (and Arbutus Ridge) over the first 5 years and then increase to 75% in the proceeding 5 - 40 years. To achieve actual population growth in-line with Scenario 2 and more consistent with local policies that direct new growth inside UCBs would create favorable conditions to expand sewer systems and supports higher density growth in these areas.

Table 2.11 outlines the growth trends if 75% of future growth were focused in UCBs (and Arbutus Ridge) based on total annual growth rates between 0.74% and 2.19% in Electoral Areas A, B and C.

Table 2.11: Scenario 2 - Total Growth in South Sector by Electoral Area

Year	Total Electoral Area A (UCB + Rural)	Total Electoral Area B (UCB + Rural)	Total Electoral Area C (UCB + Rural)	South Sector Total
2018	4,878	8,739	5,113	18,730
2019	4,953	8,831	5,160	18,944
2020	5,029	8,925	5,209	19,163
2021	5,106	9,020	5,258	19,384
2022	5,186	9,116	5,308	19,609
2023	5,288	9,183	5,367	19,838
2024	5,394	9,250	5,428	20,072
2025	5,502	9,318	5,490	20,311
2026	5,614	9,387	5,554	20,554
2027	5,728	9,455	5,619	20,803
2028	5,846	9,525	5,685	21,056
2029	5,968	9,595	5,753	21,315
2030	6,092	9,665	5,822	21,580
2031	6,221	9,736	5,893	21,850
2032	6,352	9,808	5,965	22,126
2033	6,488	9,880	6,039	22,407
2034	6,627	9,952	6,115	22,695
2035	6,771	10,026	6,192	22,989
2036	6,918	10,099	6,271	23,289

Year	Total Electoral Area A (UCB + Rural)	Total Electoral Area B (UCB + Rural)	Total Electoral Area C (UCB + Rural)	South Sector Total
2037	7,070	10,174	6,352	23,596
2038	7,225	10,249	6,434	23,908
2039	7,383	10,324	6,517	24,224
2040	7,545	10,400	6,601	24,546
2041	7,711	10,477	6,686	24,873
2042	7,880	10,554	6,772	25,206
2043	8,053	10,631	6,859	25,543
2044	8,229	10,710	6,948	25,887
2045	8,409	10,789	7,037	26,235
2046	8,594	10,868	7,128	26,590
2047	8,782	10,948	7,220	26,950
2048	8,975	11,029	7,313	27,316
2049	9,172	11,110	7,407	27,688
2050	9,373	11,192	7,502	28,067
2051	9,578	11,274	7,599	28,451
2052	9,788	11,357	7,697	28,842
2053	10,003	11,440	7,796	29,239
2054	10,222	11,525	7,897	29,643
2055	10,446	11,609	7,998	30,054
2056	10,675	11,695	8,101	30,471
2057	10,909	11,781	8,206	30,896
Total Growth	**6,031**	**3,042**	**3,093**	**12,166**
Growth Rate	2.19%	0.74%	1.29%	

In total, the South Sector will grow by approximately 1.32% annually resulting in a total population increase of 4,866 people by 2037 and 12,166 by 2057, with by far the most growth occurring in Electoral **Area** A. In comparison to Scenario 1, by directing more growth to the UCBs, growth shifts toward Electoral Area A and Mill Bay, which currently has the highest proportion of growth within the established Mill Bay Village UCB.

Table 2.12 outlines the growth trends if 75% of future growth were to be focused in UCBs (and Arbutus Ridge) based on annual growth rates between 0.56% and 2.96% within UCBs in Electoral Areas A, B and C. In total all UCBs (and Arbutus Ridge) will grow by approximately 1.97% annually producing a total

population increase of 3,561 people by 2037 and 10,006 by 2057; most growth occurs in the Mill Bay Village UCB (2,058 people).

Table 2.12: Scenario 2 - Total Growth in UCBs

Year	Mill Bay, UCB	Shawnigan Lake, UCB	Cobble Hill, UCB	Arbutus Ridge	Sum of UCBs/yr
2018	3,005	3,976	992	1,095	9,068
2019	3,069	3,992	1,011	1,111	9,184
2020	3,134	4,008	1,031	1,128	9,301
2021	3,201	4,024	1,051	1,145	9,420
2022	3,269	4,039	1,071	1,162	9,542
2023	3,366	4,062	1,100	1,186	9,714
2024	3,465	4,085	1,129	1,211	9,890
2025	3,568	4,107	1,160	1,236	10,071
2026	3,674	4,130	1,191	1,262	10,256
2027	3,782	4,153	1,223	1,288	10,446
2028	3,894	4,176	1,256	1,315	10,641
2029	4,009	4,200	1,289	1,342	10,840
2030	4,128	4,223	1,324	1,370	11,045
2031	4,250	4,247	1,360	1,398	11,255
2032	4,376	4,270	1,396	1,428	11,470
2033	4,505	4,294	1,434	1,457	11,690
2034	4,639	4,318	1,472	1,488	11,916
2035	4,776	4,342	1,512	1,518	12,148
2036	4,917	4,366	1,552	1,550	12,386
2037	5,063	4,391	1,594	1,582	12,630
2038	5,213	4,415	1,637	1,615	12,880
2039	5,367	4,440	1,681	1,649	13,136
2040	5,526	4,464	1,726	1,683	13,399
2041	5,689	4,489	1,772	1,718	13,669
2042	5,857	4,514	1,820	1,754	13,945
2043	6,031	4,540	1,869	1,790	14,229
2044	6,209	4,565	1,919	1,828	14,520

Year	Mill Bay, UCB	Shawnigan Lake, UCB	Cobble Hill, UCB	Arbutus Ridge	Sum of UCBs/yr
2045	6,393	4,590	1,970	1,866	14,819
2046	6,582	4,616	2,023	1,904	15,125
2047	6,777	4,642	2,078	1,944	15,440
2048	6,977	4,667	2,133	1,984	15,763
2049	7,184	4,693	2,191	2,026	16,094
2050	7,396	4,720	2,249	2,068	16,433
2051	7,615	4,746	2,310	2,111	16,782
2052	7,840	4,772	2,372	2,155	17,140
2053	8,072	4,799	2,436	2,200	17,507
2054	8,311	4,826	2,501	2,245	17,883
2055	8,557	4,853	2,568	2,292	18,270
2056	8,810	4,880	2,637	2,340	18,667
2057	9,071	4,907	2,708	2,388	19,074
Total Growth	**6,066**	**931**	**1,716**	**1,293**	**10,006**
Growth Rate (%/yr)	2.96%	0.56%	2.69%	2.08%	

By shifting 75% of new growth in the South Sector to established UCBs we increase population growth in these UCBs by approximately 982 people in total by 2037 and significantly more by 2057.

Table 2.13 outlines growth trends if 75% of future growth were to be focused in UCBs based on annual growth rates between 0.22% and 0.87% within rural areas of Electoral Areas A, B and C. In total all rural areas in the South Sector will grow by approximately 0.58% annually resulting in a total population increase of 1,305 people by 2037 and 2,671 by 2057; most growth occurs in rural areas of Area B.

Table 2.13 outlines the growth conditions when 75% of future growth to UCBs we still observe substantial growth in rural areas of Electoral Area B; however, there is an overall decrease of 839 people in rural areas when compared to Scenario 1.

Table 2.13: Scenario 2 - Total Growth in Rural Areas

Year	Rural: Area A	Rural: Area B	Rural: Area C	Sum of Rural
2018	1,873	4,763	3,025	9,661
2019	1,884	4,839	3,038	9,761
2020	1,895	4,917	3,050	9,862

Year	Rural: Area A	Rural: Area B	Rural: Area C	Sum of Rural
2021	1,906	4,996	3,062	9,964
2022	1,916	5,077	3,075	10,068
2023	1,922	5,121	3,081	10,125
2024	1,928	5,166	3,088	10,182
2025	1,934	5,211	3,095	10,240
2026	1,940	5,256	3,101	10,298
2027	1,946	5,302	3,108	10,356
2028	1,952	5,348	3,115	10,415
2029	1,958	5,395	3,122	10,475
2030	1,964	5,442	3,128	10,535
2031	1,970	5,490	3,135	10,595
2032	1,976	5,537	3,142	10,656
2033	1,983	5,586	3,149	10,717
2034	1,989	5,634	3,156	10,779
2035	1,995	5,684	3,162	10,841
2036	2,001	5,733	3,169	10,903
2037	2,007	5,783	3,176	10,966
2038	2,013	5,834	3,183	11,030
2039	2,020	5,884	3,190	11,094
2040	2,026	5,936	3,197	11,158
2041	2,032	5,988	3,204	11,223
2042	2,038	6,040	3,211	11,289
2043	2,045	6,092	3,218	11,355
2044	2,051	6,146	3,225	11,421
2045	2,057	6,199	3,232	11,488
2046	2,064	6,253	3,239	11,556
2047	2,070	6,308	3,246	11,624
2048	2,077	6,363	3,253	11,692
2049	2,083	6,418	3,260	11,761
2050	2,089	6,474	3,267	11,830
2051	2,096	6,531	3,274	11,900

Year	Rural: Area A	Rural: Area B	Rural: Area C	Sum of Rural
2052	2,102	6,588	3,281	11,971
2053	2,109	6,645	3,288	12,042
2054	2,115	6,703	3,295	12,114
2055	2,122	6,762	3,302	12,186
2056	2,128	6,821	3,309	12,258
2057	2,135	6,880	3,317	12,332
Total Growth	**262**	**2,117**	**292**	**2,671**
Growth Rate	0.31%	0.87%	0.22%	

2.3.4 Summary Discussion of Alternative Population Scenarios Identified by Staff

Two alternative growth scenarios were put forward for consideration given their potential impacts on the region and each UCB. Each scenario is described below.

Alternative 1: A Sanitary Sewer Pipe Around Shawnigan Lake

A sanitary sewer main which extends around Shawnigan Lake would effectively provide the opportunity for sewer services to existing residents adjacent to the pipe. There is no sewer system in the Shawnigan area poised to accommodate hundreds of additional customers and there would be significant financing challenges for large infrastructure in a rural area with few customers. If the pipe triggered significant development interest, given the low-density residential makeup of existing properties, the CVRD would be faced with challenging choices as to whether to plan for and administer significant densification via new zoning of the parcels adjacent the new pipe. The population potential for that scenario requires development-yield assessments and detailed zoning analysis. The feasibility of implementing the pipe is very low unless it was front-ended by either senior government (low feasibility) or one or multiple developers following public deliberations on a comprehensive, new vision for growth and development in Shawnigan Lake. Population projections were not completed given the available resources for this project and the challenges with overall feasibility and implementation**.**

Alternative 2: An Additional 1,000 Units in Mill Bay

Population projections herein account for 1,000 units by means of the 40-year figures. The practicality of meeting this density in Mill Bay given existing land capacities based on existing or required zoning has not been tested. Overall, greater densities and larger populations generally yield cost-effective sewer services meaning the feasibility for a consolidated service (i.e. combining one or multiple systems already in Mill

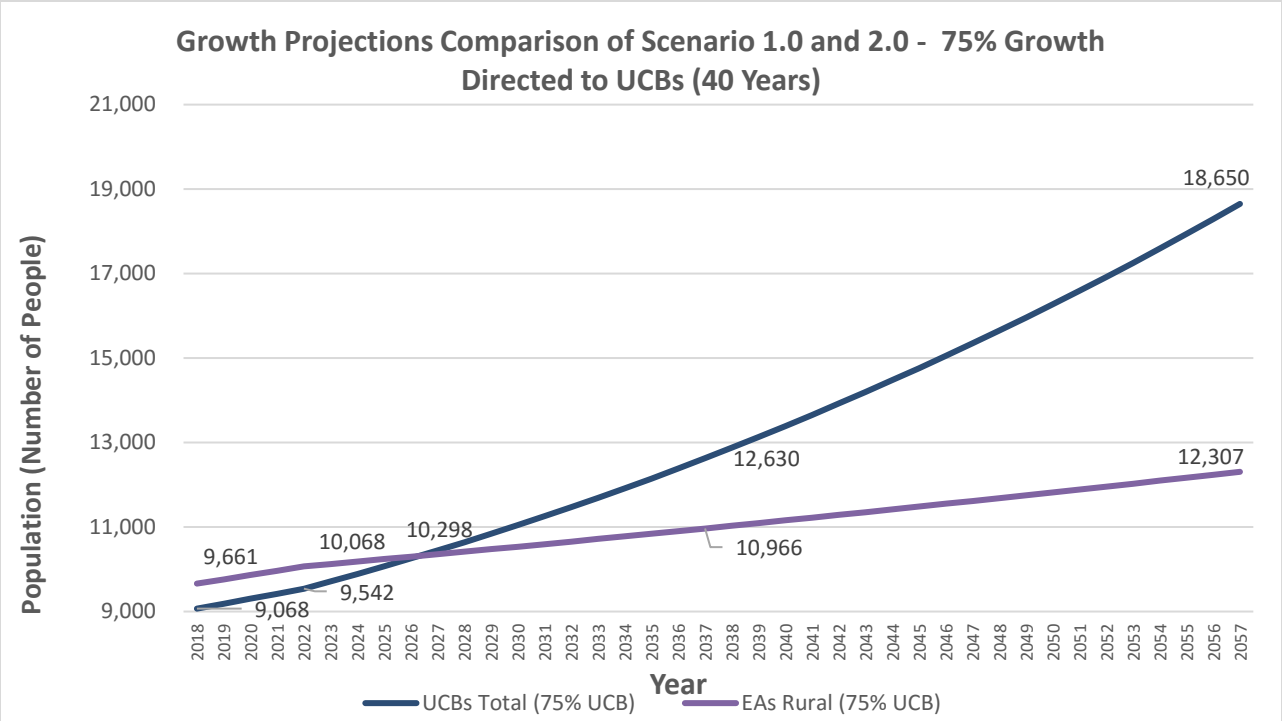
Bay) increase significantly; however, as populations increase so too does the loading on the receiving environment which can create challenges for a suitable discharge location and or increase the effluent treatment requirements. It appears that there is adequate densities and population in Mill Bay today to support a consolidated sewer service; an additional 1,000 units is likely to improve economies of scale for that proposition.

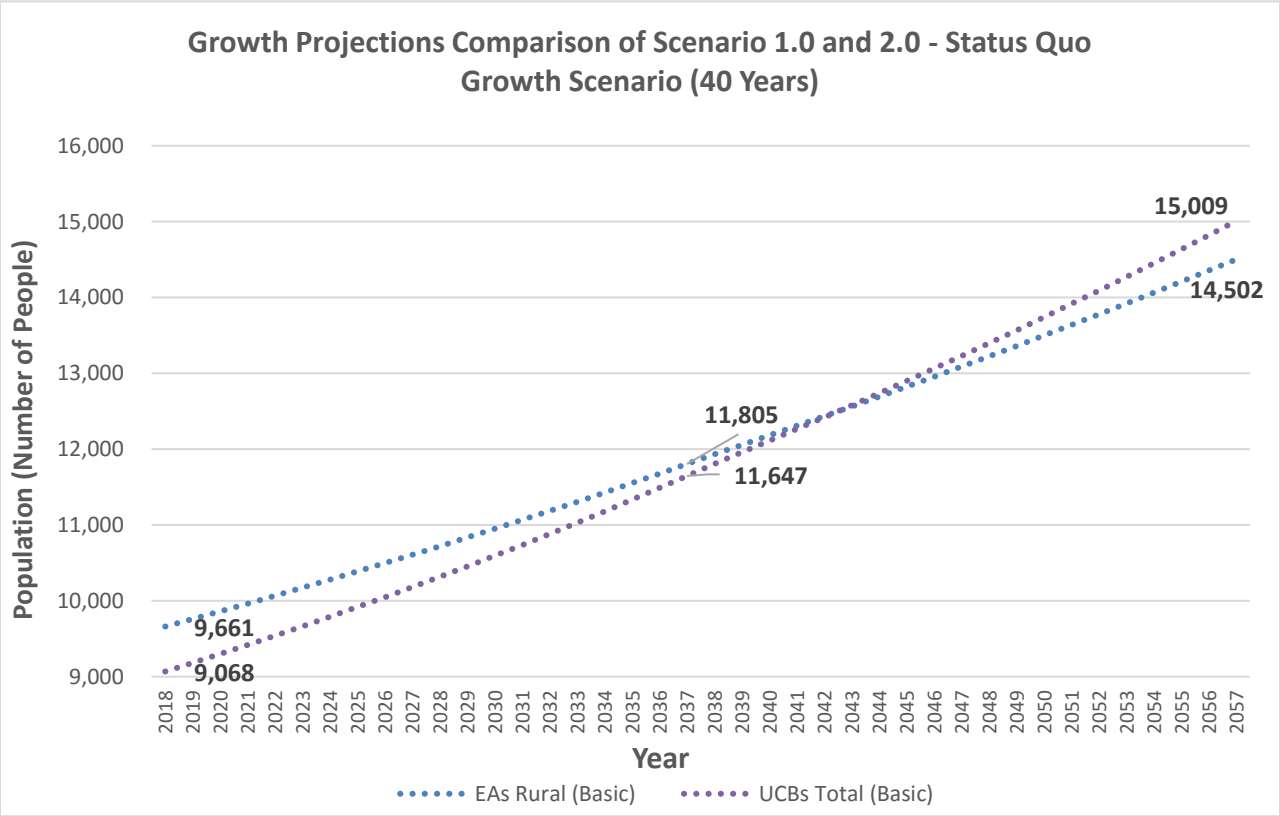
Alternative 3: Increased Densification in the Cobble Hill UCB

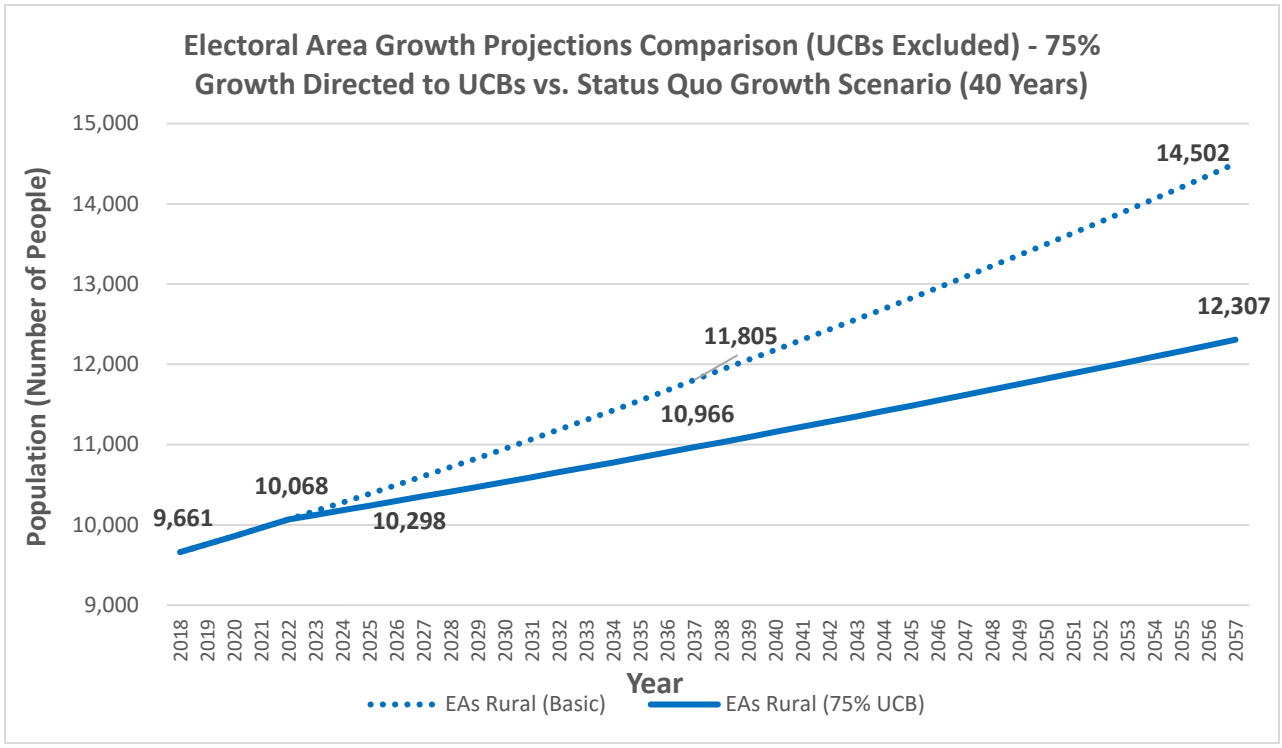
Population projections herein account for high-density development in the Cobble UCB in order to meet the 40-year figures. The practicality of meeting higher-order densities with respect to existing or required zoning has not been tested. However, similar to Mill Bay, greater populations and higher densities increases the feasibility of a consolidated, affordable community sewer system while simultaneously can also stress the receiving environment by way of additional effluent loadings. There should be further consideration to adjust the UCB to more closely align with the population center extents given that the local, built and developed area exceeds the UCB: this approach may yield more opportunities for the CVRD to achieve its local goals efficient sewer services and highest and best land use.

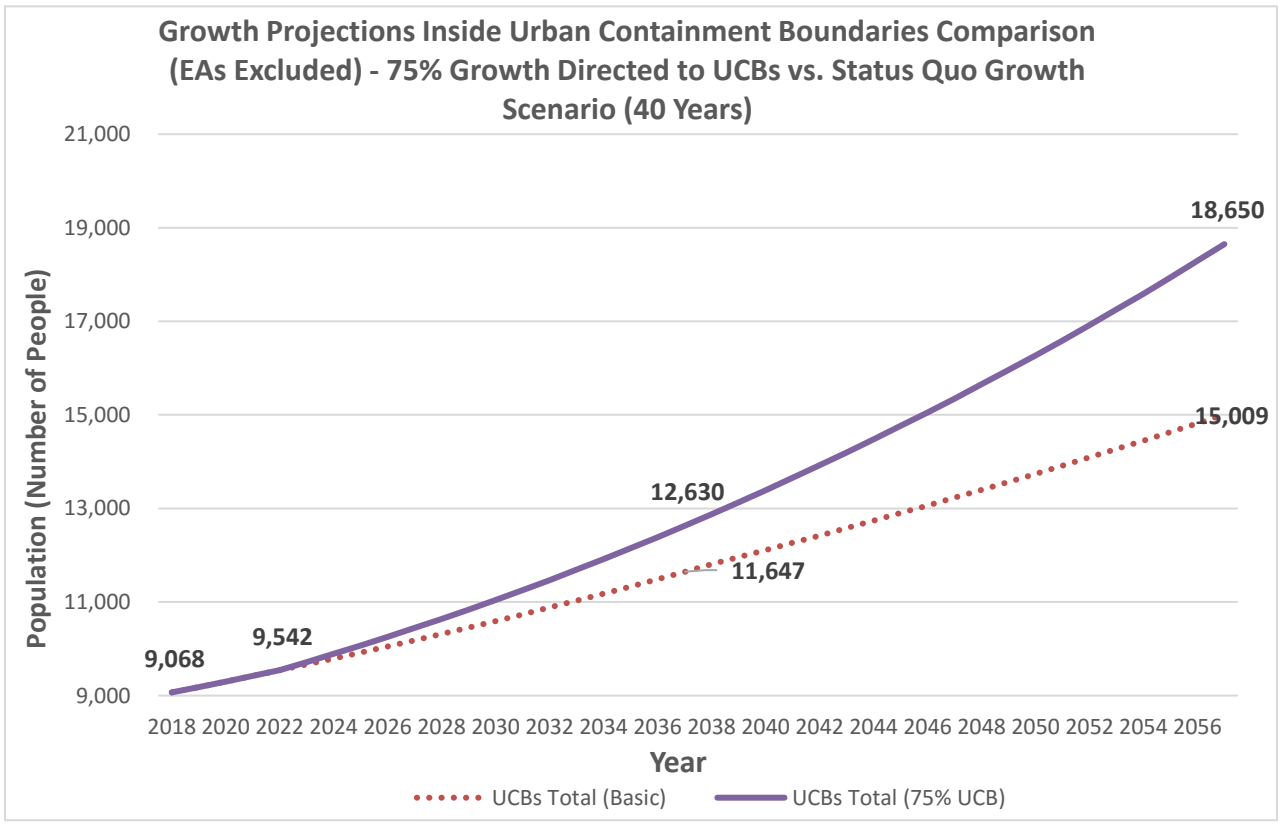
2.3.5 Summary of Growth Projections

Scenarios 1 and 2, explore two hypothetical growth trends. The first (Scenario 1) largely mirrors recent growth trends (similar to a status quo scenario) with only 53% of new growth being directed to the three UCBs (Mill Bay Village, Shawnigan Lake Village and Cobble Hill Village) and Arbutus Ridge, despite CVRD policies to promote growth in these areas. Scenario 2 provides a potential growth scenario whereby CVRD growth policies are being enforced and greater servicing within UCBs results in 75% of new growth being directed to UCBs (Mill Bay Village, Shawnigan Lake Village and Cobble Hill Village) and Arbutus Ridge. A comparison of these two scenarios is shown in Figures 2.14 (below).


Growth Projections Comparison of Scenario 1.0 and 2.0 - 75% Growth Directed to UCBs (40 Years)
Population (Number of People)
21,000
19,000
17,000
15,000
13,000
11,000
9,000
18,650
12,630
12,307
10,966
10,298
10,068
9,661
9,542
9,068
2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057
Year
UCBs Total (75% UCB)
EAs Rural (75% UCB)


Growth Projections Comparison of Scenario 1.0 and 2.0 - Status Quo Growth Scenario (40 Years)
Population (Number of People)
16,000
15,000
14,000
13,000
12,000
11,000
10,000
9,000
15,009
14,502
11,805
11,647
9,661
9,068
2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057
Year
EAs Rural (Basic)
UCBs Total (Basic)


Electoral Area Growth Projections Comparison (UCBs Excluded) - 75% Growth Directed to UCBs vs. Status Quo Growth Scenario (40 Years)
Population (Number of People)
15,000
14,000
13,000
12,000
11,000
10,000
9,000
14,502
12,307
11,805
10,966
10,068
9,661
10,298
2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057
Year
EAs Rural (Basic)
EAs Rural (75% UCB)


Growth Projections Inside Urban Containment Boundaries Comparison (EAs Excluded) - 75% Growth Directed to UCBs vs. Status Quo Growth Scenario (40 Years)
Population (Number of People)
21,000
19,000
17,000
15,000
13,000
11,000
9,000
18,650
15,009
12,630
11,647
9,542
9,068
2018 2020 2022 2024 2026 2028 2030 2032 2034 2036 2038 2040 2042 2044 2046 2048 2050 2052 2054 2056
Year
UCBs Total (Basic)
UCBs Total (75% UCB)

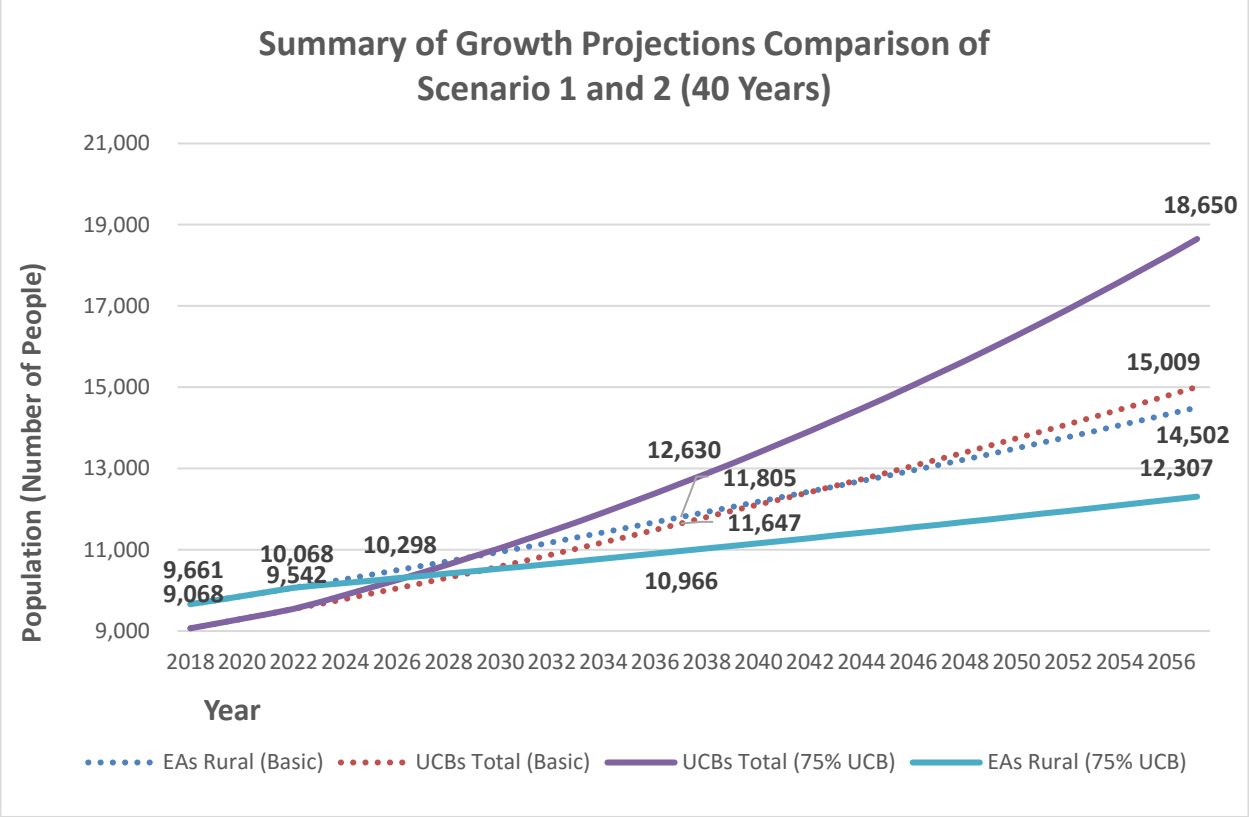


Figure 2.14 – Summary of Growth Projections of Scenario 1 and 2

A comparison of Scenarios 1 and 2 (figures above) illustrates how providing sewer servicing and supporting current OCP policy directions (i.e. directing growth to UCBs) could substantially alter growth in the South Sector of the CVRD and the potential for these actions to substantially reduce rural sprawl over the next 20 years and beyond. Overall, in Scenario 2 the majority of growth in Electoral Areas A and C is occurring in Mill Bay Village UCB, Cobble Village UCB / Arbutus Ridge. However, the majority of growth in Electoral Area B continues to occur in rural areas, though at a slower pace.

When these growth projections are compared to active development and subdivision applications in the South Sector it was shown that Mill Bay Village did have the largest amount of new development potential with several large development applications located within the Mill Bay Village UCB. In contrast Shawnigan Lake Village only had a few small subdivisions 1-5 lots within the UCB. Active Development Applications are displayed in **Figure 2.15** (below). Further, **Figure 2.15** also shows the extent to which development is occurring outside of the village UCBs, notably the existence of several large pieces of land scheduled for development in rural areas of Electoral Area B. Electoral areas A and C also have several large parcels

slated for development. Overall, **Figure 2.15**, provides a snapshot of where future development is likely to occur, at least in the in the short-term. This snapshot of active development applications shows that development and growth trends in the South Sector are likely to maintain their current trajectory at least over the next five years, possibly longer. Moving forward, **a substantial expansion of sewer servicing in village centres and the strict enforcement of the Regional District's UCB policies would encourage a more feasible (read: likely) situation for consolidated sewer servicing** (i.e. Scenario 2) and allow local communities and the CVRD realize their targets for densification and UCB potential. Alternatively, there is much lower feasibility for community-wide sewer servicing and in turn, less likelihood of effective environmental management due to insufficient wastewater treatment, if sewer servicing and or growth policies are not adhered to.

Table 2.16 (below) provides a summary breakdown of servicing potential by area based on projected growth. The comments incorporated within the table conclude this memo and provide a technical segue to environmental and land use policy reviews in subsequent memos.

Table 2.16 – Breakdown of Servicing Potential by Area Based on Growth Projections

Area	Growth 2018-2037 Scenario 1 (People / %)	Growth 2018-2037 Scenario 2 (People / %)	Estimated Build-out Scenario 1* (Year)	Estimated Build-out Scenario 2* (Year)	Potential for Sewer Capacity Expansion
Mill Bay Village	1479 people 2.13% annual growth	2058 people 2.96% annual growth	2032	2029	High – Existing capacity and several systems that could be combined. Potential for expanding ground disposal. High levels of development expected.
Shawnigan Lake Village	309 people 0.40% annual growth	414 people 0.56% annual growth	2046	2038	Low – Few existing systems and no excess capacity. Disposal options are very limited. Low levels of development expected.
Cobble Hill and Arbutus Ridge (average)	791 people 1.71% average annual growth	1089 people 2.39% average annual growth	10- 20 years	< 10 years	Medium – Some existing systems in a compact area. Excess capacity and disposal options to be reviewed. Moderate levels of development expected.
Rural Electoral Area A	214 people 0.57% annual growth	134 people 0.31% annual growth	Unknown	Unknown	Low – Systems and growth are too widely distributed. Low levels of development expected.
Rural Electoral Area B	1688 people 1.61% annual growth	1020 people 0.87% annual growth	Unknown	Unknown	Low – High levels of development expected, but systems and growth are too widely distributed.

Area	Growth 2018-2037 Scenario 1 (People / %)	Growth 2018-2037 Scenario 2 (People / %)	Estimated Build-out Scenario 1* (Year)	Estimated Build-out Scenario 2* (Year)	Potential for Sewer Capacity Expansion
Rural Electoral Area C	241 people 0.40% annual growth	151 people 0.22% annual growth	Unknown	Unknown	Low – Review options for servicing Cobble Hill / Arbutus Ridge *Population Centre.*** Moderate levels of development expected.

** Based on current capacity as described by the SCOCP (where available).*

*** As described by Statistics Canada.*

We trust the information provided in this memo, including the population projections, land use implications and servicing considerations becomes a fundamental input to next steps in the analysis and planning for the SSLWMP.

Urban Systems Ltd.

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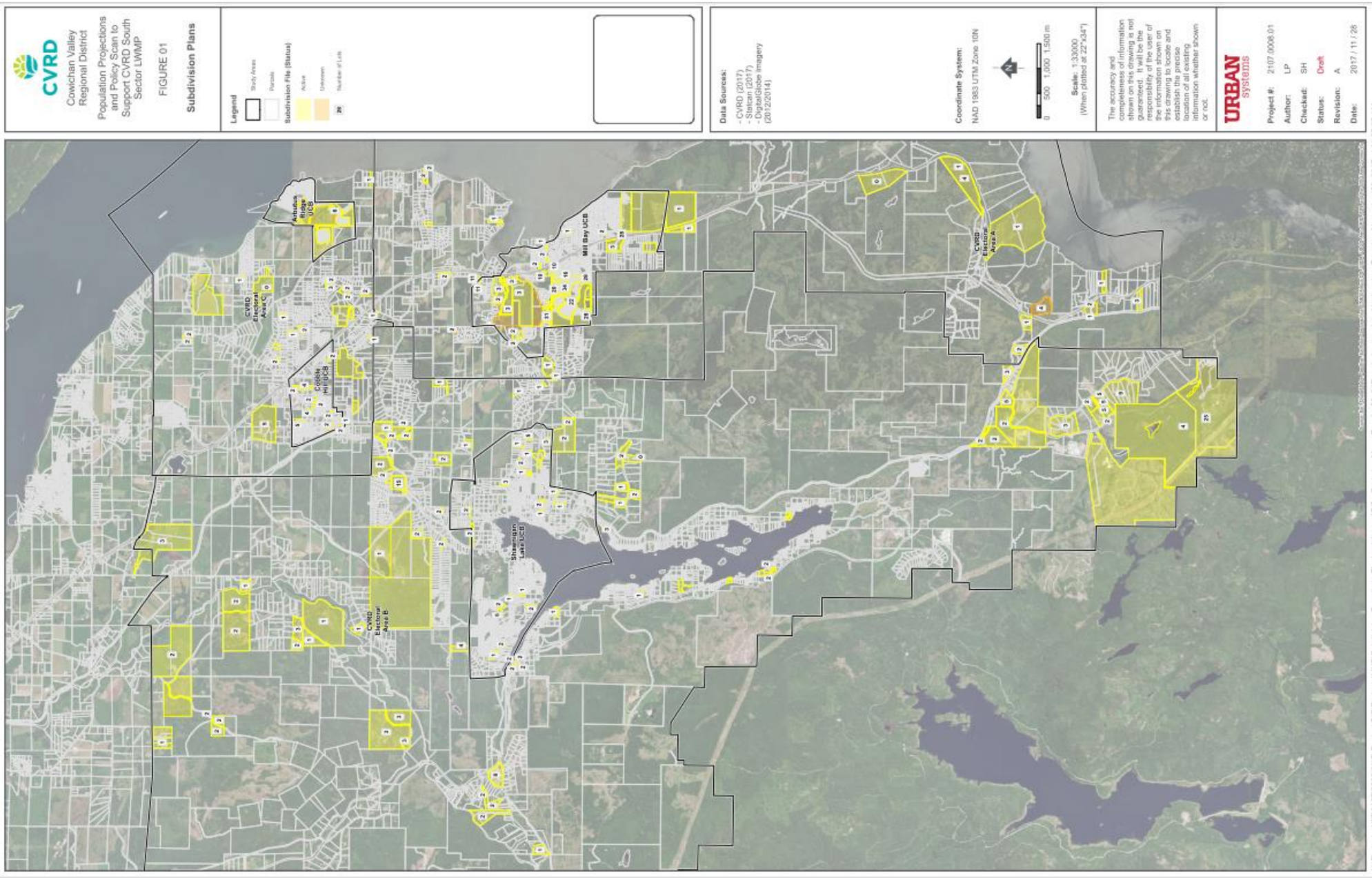
Victoria, BC

Figure 2.15 - South Sector Active Development Applications



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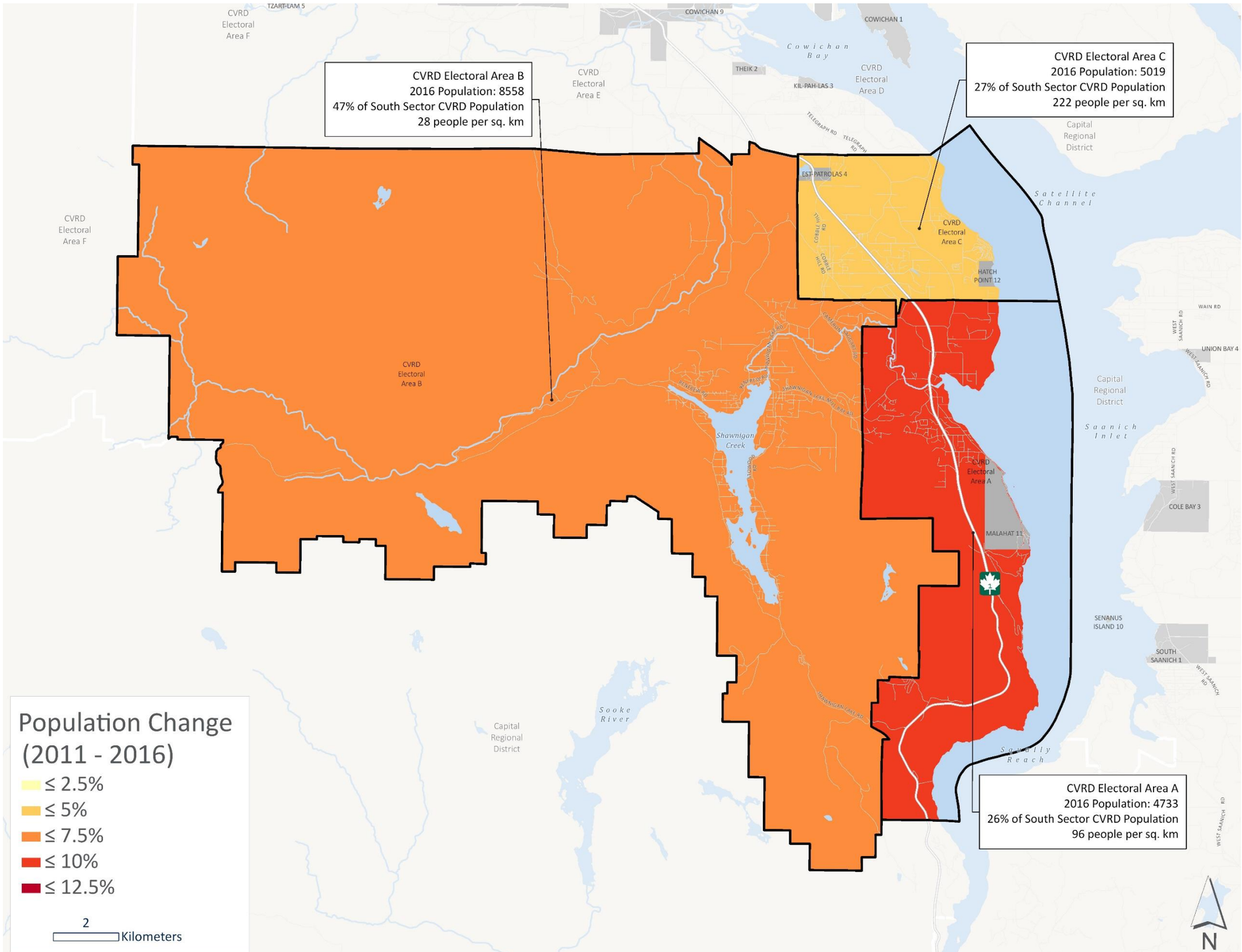
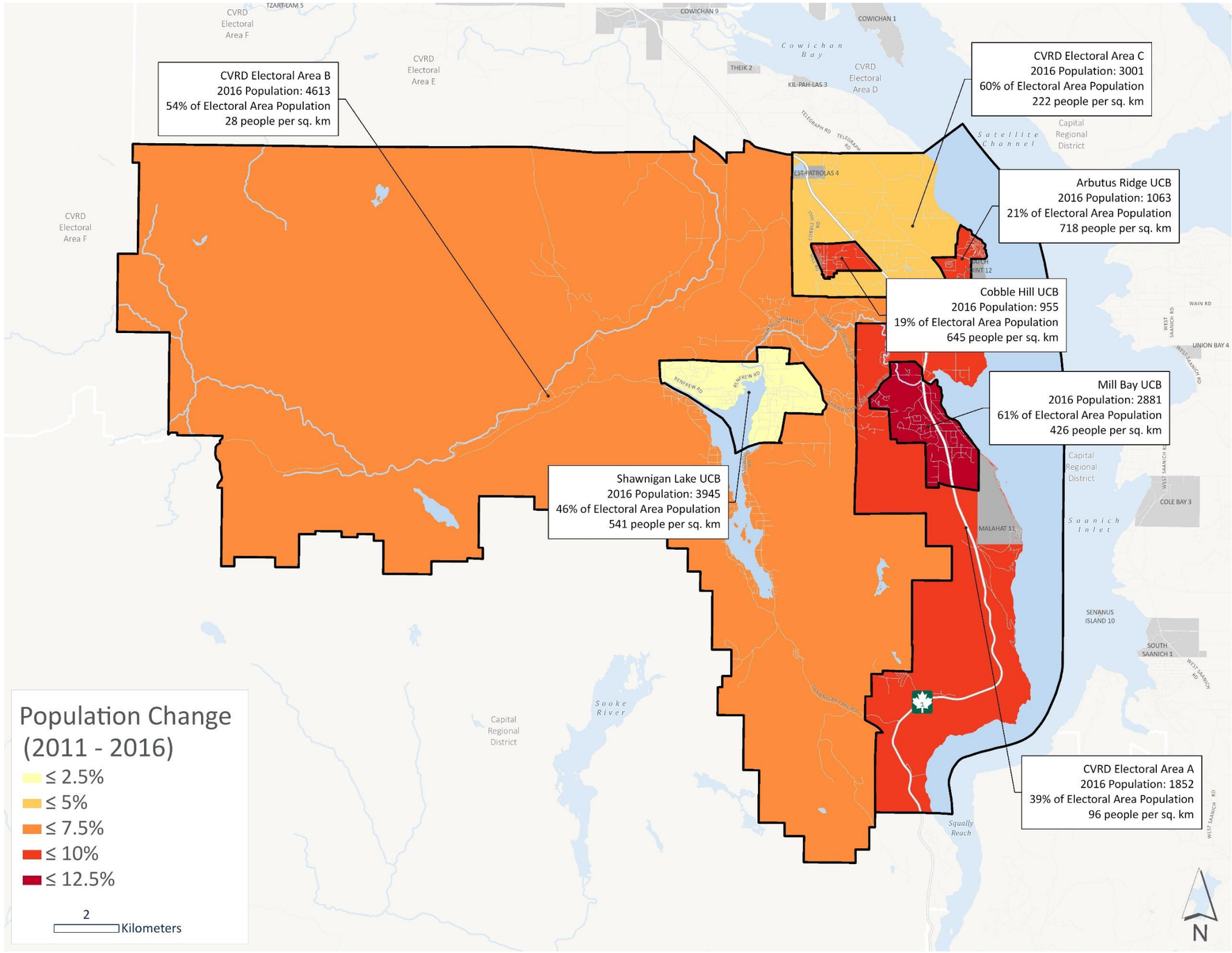
APPENDIX

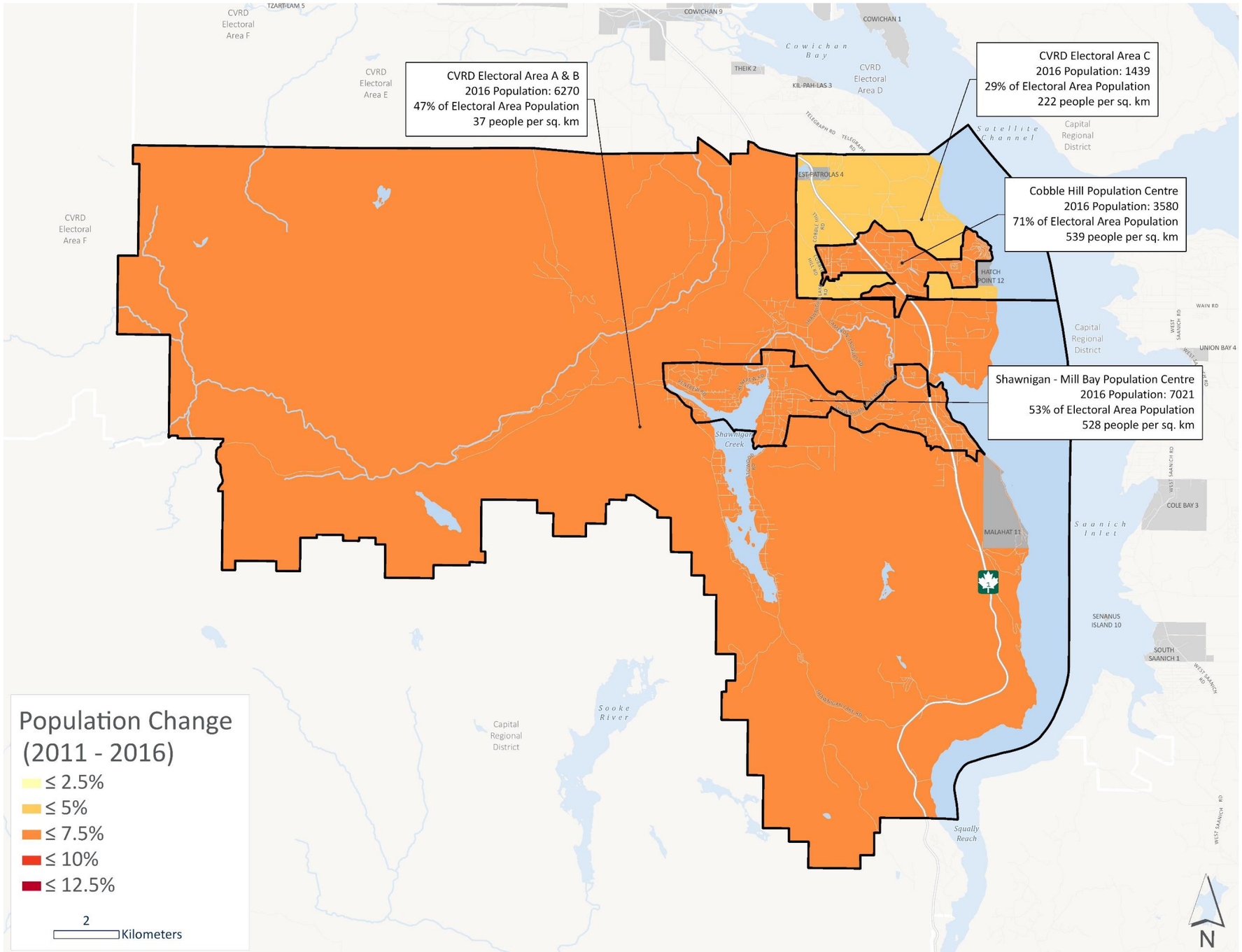
Map A1 – Population Change - Electoral



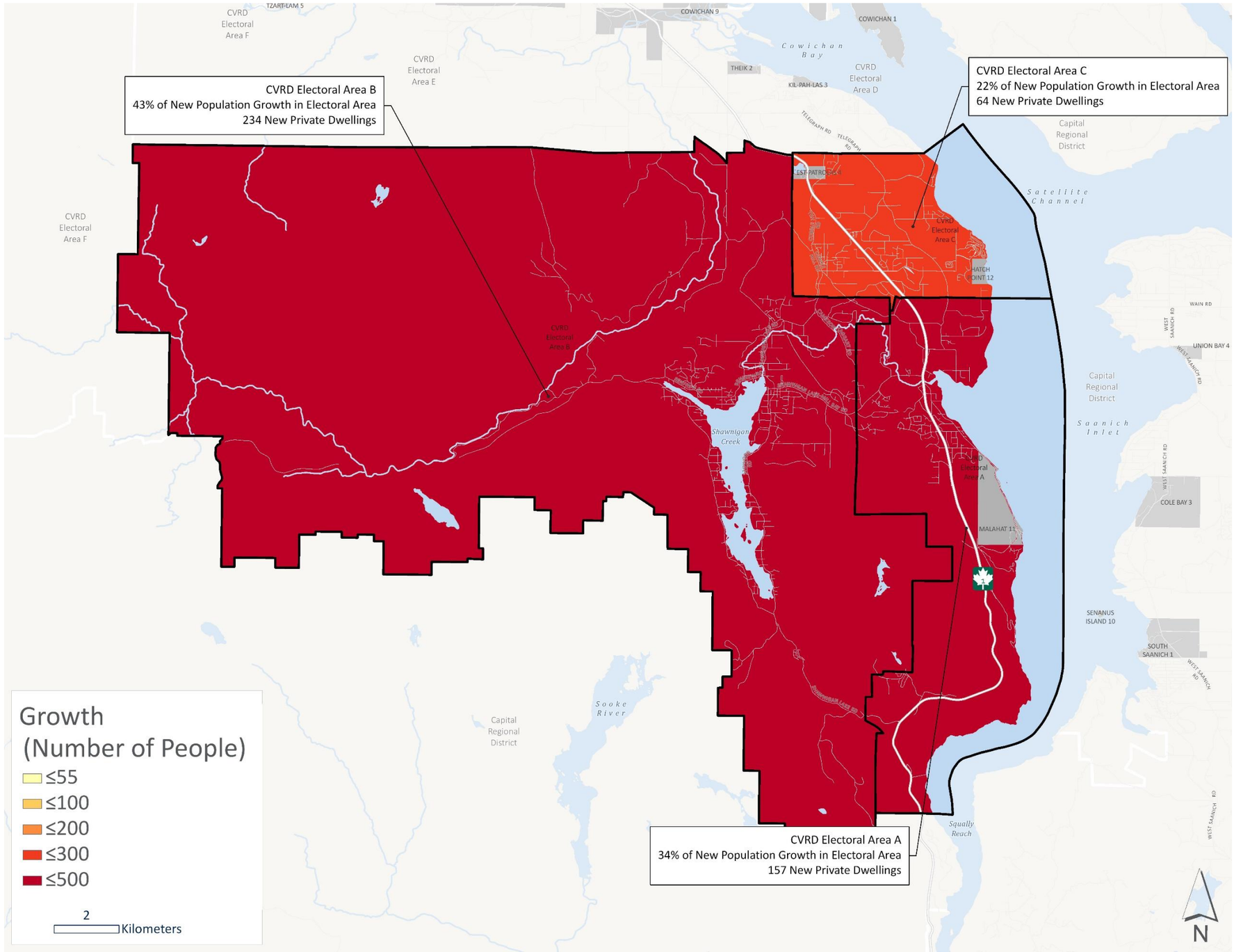
Map A2 – Population Change - UCB



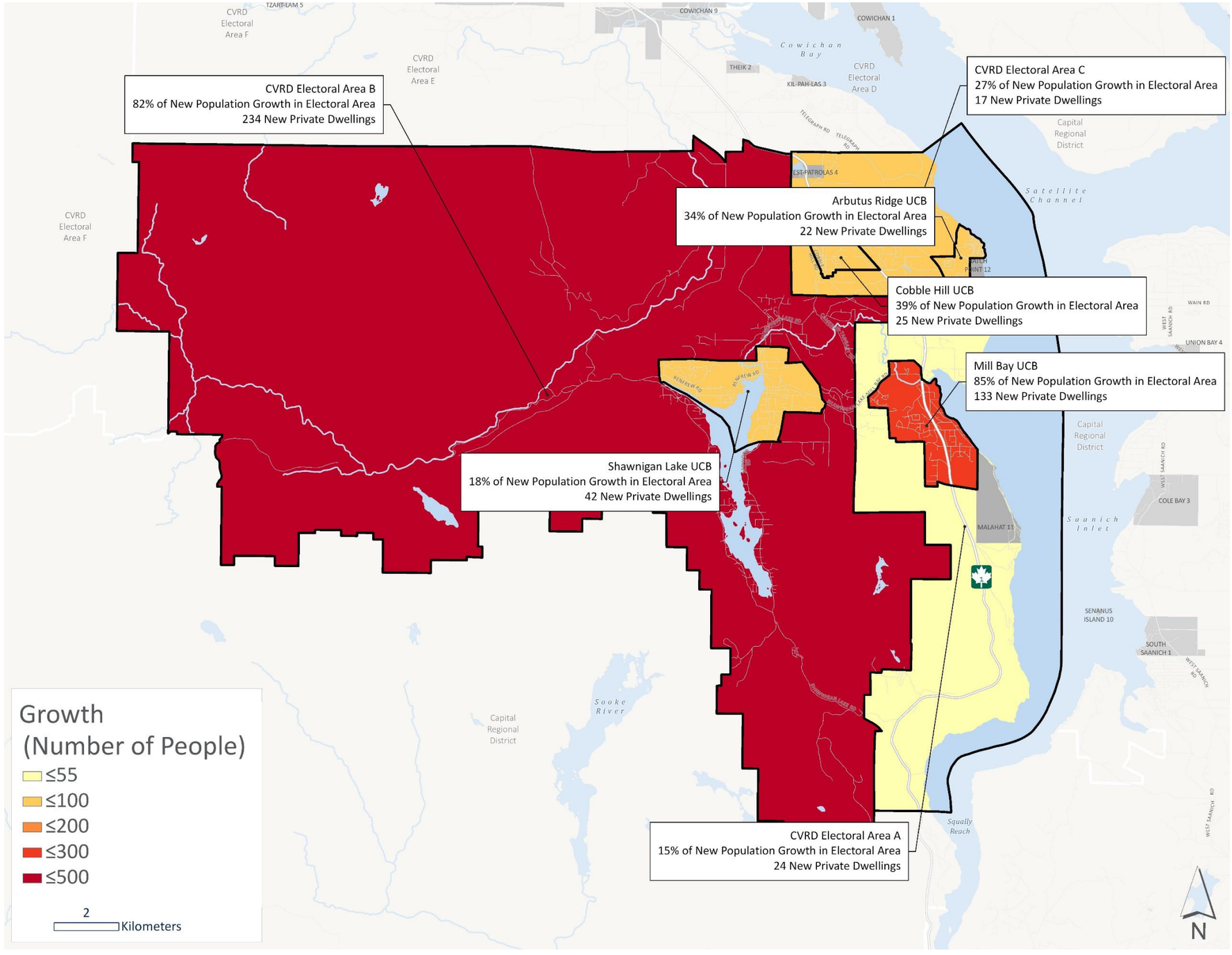
Map A3 – Population Change - PC



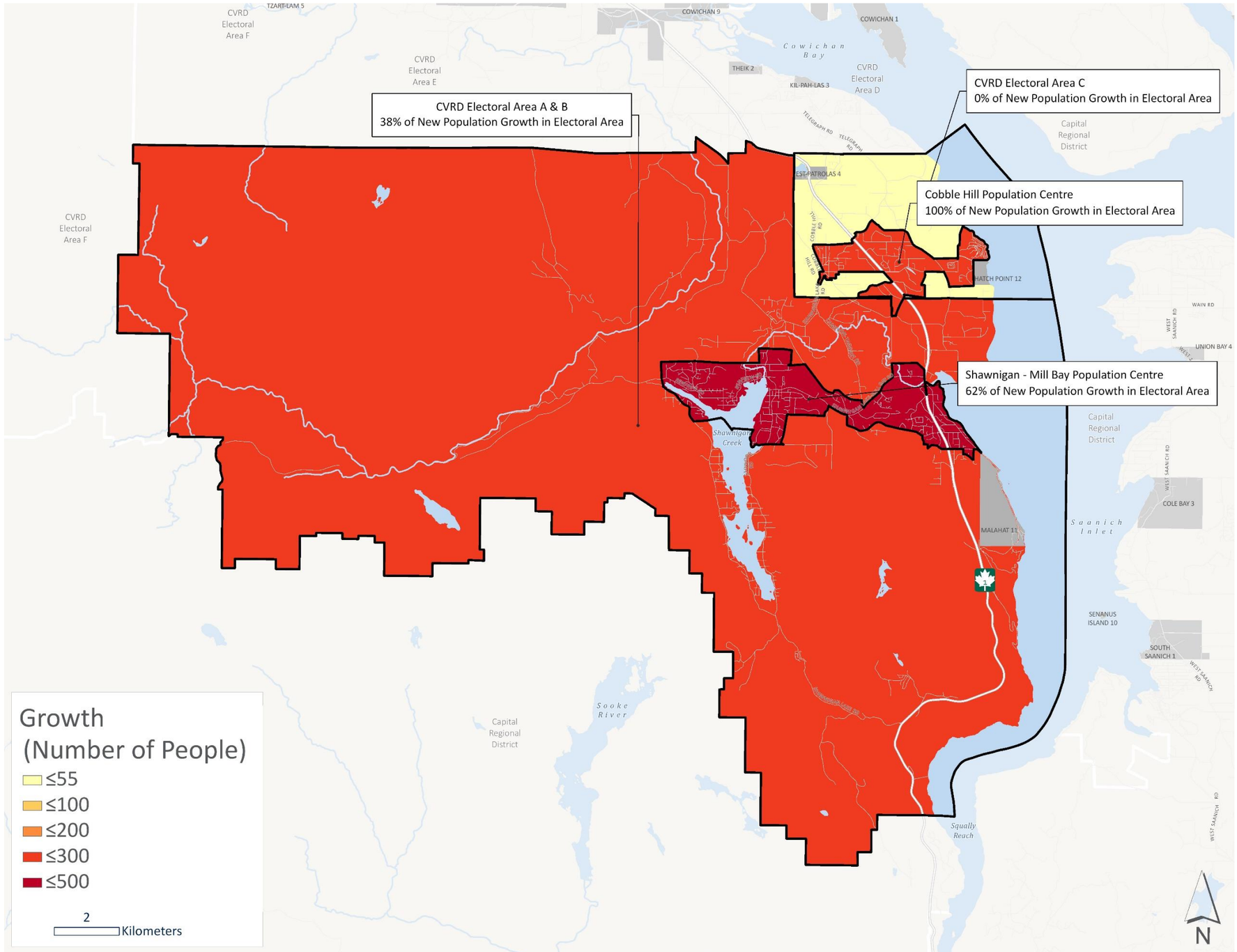
Map A4 – Growth - Electoral



Map A5 – Growth - UCB



Map A6 – Growth - PC



A.2 Statistics Canada – CVRD Population Data Tables – 2016

Mill Bay:

http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=DPL&Code1=590065&Geo2=PR&Code2=59&Data=Count&SearchText=Mill%20Bay&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=590065&TABID=2

Cobble Hill and Arbutus Ridge:

http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=POPC&Code1=1557&Geo2=PR&Code2=59&Data=Count&SearchText=Cobble%20Hill&SearchType=Begins&SearchPR=01&B1=All

Cobble Hill 2 unincorporated:

http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=DPL&Code1=590063&Geo2=PR&Code2=01&Data=Count&SearchText=Cobble%20Hill&SearchType=Begins&SearchPR=01&B1=All&wbdisable=true

Shawinigan Lake:

http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=DPL&Code1=590066&Geo2=PR&Code2=61&Data=Count&SearchText=Shawnigan%20Lake&SearchType=Begins&SearchPR=01&B1=All

Arbutus Ridge:

http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=DPL&Code1=590064&Geo2=PR&Code2=59&Data=Count&SearchText=Arbutus%20Ridge&SearchType=Begins&SearchPR=01&B1=All&TABID=1

Shawinigan and Mill Bay:

http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=POPC&Code1=1567&Geo2=PR&Code2=35&Data=Count&SearchText=Shawnigan%20-%20Mill%20Bay&SearchType=Begins&SearchPR=01&B1=All

Cowichan Valley Electoral Area A and RD:

http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5919043&Geo2=CD&Code2=5919&Data=Count&SearchText=cowichan%20valley&SearchType=Begins&SearchPR=01&B1=All&TABID=1

Cowichan Valley Electoral Area B and RD:

http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5919046&Geo2=CD&Code2=5919&Data=Count&SearchText=cowichan%20valley&SearchType=Begins&SearchPR=01&B1=All&TABID=1

Cowichan Valley Electoral Area C and RD:

http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5919049&Geo2=CD&Code2=5919&Data=Count&SearchText=cowichan%20valley&SearchType=Begins&SearchPR=01&B1=All&TABID=1