

Population, Dwelling Unit, &
Employment Projections
for the Capital Region's
Growth Strategy Alternatives
1996-2026

Volume 2 - Methodology

J U N E 2 0 0 0



Foundations For Our Future

Capital Regional District
Regional Growth Strategy

Population, Dwelling Unit, &
Employment Projections
for the Capital Region's
Growth Strategy Alternatives
1996-2026
Volume 2 - Methodology

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EXECUTIVE SUMMARY

This report outlines the methodology used by CRD staff and consultants to develop population, dwelling unit and employment projections and allocations for 1996 and 2026 as part of the technical assessment of the Regional Growth Strategy (RGS) Alternatives¹. For 2026, population, dwelling units, and employment were forecast at the regional scale, then broken down or allocated at several smaller scales so that more detailed analysis could take place at later stages of the technical evaluation. This report is the second of two volumes on the projections and allocations – Volume 1 – Results, described the results of this work in detail.

The information developed was used to project future travel in the Region using the Emme/2 Regional Transportation Model, and as basic data for other parts of the technical analysis, such as estimating infrastructure costs and air quality impacts in the Region.

Population

The Region's 1996 population was determined by the 1996 Census (adjusted for undercount). The BC Stats PEOPLE 24 population forecast was used as the regional population forecast to 2026 for the Victoria Metropolitan Area (including Port Renfrew) – known hereinafter as the study area, and as the VMA+.

The population is forecast to increase from about 318,010 in 1996 to 407,900 by 2026. The forecast is particularly sensitive to changes in migration - if migration was 50% higher or lower than forecast, the population would be about 56,000 people higher or lower than forecast.

Housing Demand

The regional housing demand for new units between 1996 and 2026 was projected using the Regional Housing Demand Spreadsheet (RhoDeS), which identifies the annual demand for housing for each of three dwelling types: Single-family Detached/Duplex, Other Ground Oriented units (mainly townhouses), and Non-Ground Oriented units (apartments). The regional housing demand forecast was based on the BC Stats PEOPLE 24 population forecast. An additional 52,400 units will be required to house new residents by 2026. Of these, 53% would be Single-family Detached/Duplex, 13% would be Other Ground Oriented Units, and 34% would be Non-Ground Oriented Units.

Housing Supply

The number, location and types of dwelling unit capacity vary with each Alternative. All four Alternatives assume infill of existing neighbourhoods and development of areas currently designated for new neighbourhoods. For the Base Strategy, these are the sole sources of additional housing supply. The three remaining Alternatives also rely on redevelopment or intensification within the centres identified for each. For all the Alternatives, practical residential capacity was assumed to be 90% of total possible buildout under the densities specified.

¹ The four Alternatives approved by the CRD Board as the basis for a technical analysis were: The Base Strategy; Alternative 1: Metropolitan Core & Major Centres; Alternative 2: Transit-Linked Towns; and Alternative 3: Hierarchy of Walkable Centres. For further information on these Alternatives see *Growth Strategy Alternatives for the Capital Region* (October 1999). For information on the process for developing the Alternatives and the RGS, see *Development of the Growth Strategy Alternatives* (December 1999) and *A Guide to the Capital Region's Growth Strategy Project* (April 2000).

The residential capacities for the Base Strategy and for the areas outside the designated centres described in the other Alternatives were determined using the Urban Capacity Inventory System (UCIS). This Geographic Information System-based application uses the land use designations and densities of the official community plans (1995/96 data) to determine existing and potential dwelling units developable within small geographic areas called Sub-Land Use Polygons.

A Geographic Information System was used to incorporate the Proposed Urban Containment Boundary for the Base Strategy into the Sub-Land Use Polygon configuration.

GIS was also used to “cut” in the areas of the centres specified in the other Alternatives. The centre polygons were then assigned a density and mix of land uses, including dwelling unit type. These characteristics were then used to derive practical capacities by dwelling type for the centre polygons.

Matching Supply and Demand

For each Alternative, the Housing Allocation Tool (HAT) was then used to allocate the regional housing demand to each municipality. HAT uses an attraction score allocation method, and in this case two factors were scored: availability and affordability. The total dwellings allocated to each municipality were then further allocated to Traffic Zones, based on each Traffic Zone’s share of that municipality’s remaining practical capacity. As demand exceeded supply for certain dwelling types, the housing supply/demand balance had to be adjusted. Excess demand in the Single-family Detached/Duplex category was assumed to shift first to Other Ground Oriented and then to Non-Ground Oriented units.

Population Allocations

The population in 2026 in the Traffic Zones was calculated using an average persons per household by dwelling type value for each municipality, based on 1996 values and adjusted to 2026. The population at the Traffic Zone level was then distributed to the seven age groups required by the Emme/2 model, using the BC Stats PEOPLE 24 age composition forecast for the applicable Local Health Area.

Employment Estimate and Forecast

The adjusted 1996 Census estimated total employment for 1996 at 155,850. To forecast total employment² in 2026, it was assumed that the ratio of total employment to total population in the Region will remain at the 1996 level of 0.49. Based on this assumption, and using the BC Stats PEOPLE 24 population forecast, total employment in the VMA+ was forecast to be 199,900 in 2026.

Employment Allocations

The total new employment growth between 1996 and 2026 was first allocated to employment geographies, in some cases an entire municipality and in other cases a special area which was thought to have different employment growth characteristics, such as Keating Business Park. Employment was allocated to these geographies using a number of different methods:

- a) *New Home-Based Business* - estimated at 10% of the new employment, which is slightly higher than the share of home-based businesses in 1996. The new home-based businesses were distributed according to the new population between 1996 and 2026 at the Traffic Zone level.
- b) *City of Victoria’s Share of New Employment* - The City’s share of total Regional employment has declined over the past 20 years to 49% in 1996.
 - For the Base Strategy, it was assumed that 27% of new employment growth would occur in the City of Victoria in the absence of any new policies to attract employment growth to Downtown.

² Employment and jobs in this report refers to employed labour force, full-time or part-time, and not positions available.

- It was assumed that 40% of the new employment growth would be located in the City of Victoria for Alternative 1 as it includes a Metropolitan Core that would be larger in size and more dense than under the Base Strategy or the other Alternatives.
 - For Alternatives 2 and 3, it was assumed that only office and retail employment would significantly differ under these Alternatives at 28% and 23% respectively.
- c) *Special Employment Geographies* - various assumptions were made to allocate new employment to those areas. For example, employment at the hospitals and UVic were assumed to grow at the regional population growth rate. Employment growth at Keating Business Park and Victoria International Airport was calculated by estimating the remaining available capacity in those areas using air photos and assuming that there would be greater demand for the use of these lands due to the chronic shortage of industrial land in the Region.
- d) *Remaining Areas* - Various methods were used to forecast employment growth in the remaining areas. These methods included using the percentage increase in population between 1996 and 2026 and existing jobs-to-population ratios as a guide. For developing areas, such as Langford, job-to-population ratios from the District of Saanich were used as a guide.

The employment totals for the above areas were then allocated to Traffic Zones. This was done using one or more of the following data sources: 1996 census; an air photo mosaic of the Region to determine locations of potential remaining employment capacity; and the Urban Capacity Inventory for the percentage of the land area of each Traffic Zone designated as industrial, commercial, or institutional.

The main difference between the Alternatives for the employment distribution is the location of office, retail, elementary school, and high school jobs. These categories of jobs and home-based businesses follow each Alternative's distribution of population growth, while taking into account the City of Victoria's estimated share of the Region's new employment growth. New hospital, post-secondary school, and industrial employment, on the other hand, occur in the same locations as in 1996 for all the Alternatives.

Limitations

- Since all population growth is from net migration, the population forecast is particularly sensitive to assumptions about changes in migration.
- The Urban Capacity Inventory estimation of the percentage of the area that was developed (as of 1996) is subjective, and is based on the professional knowledge of the municipal planners who provided the information. Based on a municipal-level comparison with 1996 census results, the data in the Urban Capacity Inventory is considered to be accurate to within +/- 10%.
- The Housing Allocation Tool used factor data at the municipal level. For the Traffic Zone allocations within a municipality, allocations were based on each Traffic Zone's percentage share of the municipality's remaining capacity. Since the locations of some of the centres are conceptual, particularly the neighbourhood villages in Alternative 3, the distribution of population and employment within a municipality could change.
- Employment projections and allocations are generally less reliable than those for population and dwellings as they are complicated by factors that are difficult to predict, such as market forces that dictate business location and expansion decisions, trends in interest rates, global economic conditions, technological change, growth or decline in economic sectors, and public sector and corporate policy, investments and expenditures. Employment projections and allocations are based to a large degree on population and housing projections and allocations, which in turn rely on many assumptions, such as average household size, and housing preferences. In addition, the CRD does not have a database of commercial and industrial floor space and remaining capacity.

1.0 Introduction

1.1 Background

Between September 1999 and January 2000, a process was carried out by various consultants and staff of CRD Regional Planning Services to project and allocate population, dwellings, and employment for the Capital Region's Growth Strategy Alternatives. This exercise is part of the CRD's process to develop a Regional Growth Strategy (RGS) for the Capital Region to the year 2026. The RGS project was initiated by the CRD Board in 1996 in accordance with the Regional Growth Strategies legislation in the *Municipal Act*. The RGS, when adopted, will guide planning, servicing, and development policy used by local municipal councils, the Regional Board, and other public decision makers in the Region.

In September 1999, the CRD Board approved four Growth Strategy Alternatives for further technical assessment and public discussion. The Growth Strategy Alternatives were developed to address the vision and priorities set out in the CRD Board's adopted *Framework for Our Future Agreement* (September 1998). These four Growth Strategy Alternatives, developed over the previous year, received extensive review by member councils, participating governments and agencies, and interested citizens. The four Growth Strategy Alternatives, which are described in the report *Growth Strategy Alternatives for the Capital Region* (October 1999), are:

A **Base Strategy** of rural protection and urban containment to efficiently achieve the current designated development capacity of the region's official community plans;

Alternative One: Metropolitan Core and Major Centres – new growth is directed to downtown Victoria and eleven other major centres;

Alternative Two: Transit-Linked Towns – new development is concentrated in designated mixed-use, complete communities along a high-capacity transit corridor linking Downtown Victoria with the Western Communities; and,

Alternative Three: Hierarchy of Walkable Centres – new growth is directed to a hierarchy of pedestrian-oriented villages, local hubs, and larger centres throughout the urban parts of the Region.

As part of the technical assessment of these Growth Strategy Alternatives, population, dwelling and employment projections and allocations are needed to the year 2026. The baseline data year for the project is 1996. One of the requirements in the *Municipal Act* for developing an RGS is that it must cover a period of at least 20 years from the time of its initiation and it must include population and employment projections for this period. In addition, a major part of the technical assessment involves transportation modelling of the Alternatives using the Emme/2 Regional Transportation Model. This model requires the distribution to Traffic Zones of population by age cohort and employment by general job types so that future travel in the Region can be estimated. The results of the transportation model also feed into other parts of the technical analysis, such as estimating infrastructure costs and air quality impacts in the Region.

This report describes the population and employment projection and allocation method for the four Growth Strategy Alternatives. A companion volume to this report, Volume 1 – Results, presents the results using this method at subregional and municipal geographies and compares the results by Alternative.

Unrounded regional control totals are included in this report for information and are not to be reported in an unrounded format. **When reporting any of the regional or municipal totals for 2025/26, the numbers should be rounded to the nearest hundred, as in Volume 1 - Results.**

1.2 Geographies Used

The population and employment projection and allocation method uses various geographies for calculation purposes. These geographies are represented as polygon layers in CRD Regional Planning Services' Geographic Information System (GIS), which was used to conduct spatial queries and analysis in this study. The following are descriptions of each level of geography:

Study Area: The study area includes the Victoria Metropolitan Area (VMA) and the area around Port Renfrew. The acronym VMA+ will be used in this report to denote the VMA *plus* Port Renfrew. The RGS study area does not include Saltspring Island and the Outer Gulf Islands Electoral Areas as they fall within the planning jurisdiction of the Islands Trust. The VMA+ total in this report will refer to the VMA+ area including the local Indian Reserves. While the First Nations are neighbouring jurisdictions for the purpose of the Regional Growth Strategy, they are included in the population and employment totals as they impact the transportation system.

Subregions and Municipalities: There are three subregions used in this report: The Saanich Peninsula (The District of North Saanich, Town of Sidney, and District of Central Saanich); the Core Municipalities (District of Saanich, District of Oak Bay, City of Victoria, and Township of Esquimalt); and the Western Communities (Town of View Royal, City of Colwood, District of Langford, Langford Electoral Area, District of Highlands, and District of Metchosin, and Sooke Electoral Area). Although Sooke was incorporated as a municipality in 1999 with the creation of the District of Sooke and the Juan de Fuca Electoral Area, the 1996 boundaries of the Sooke and Langford Electoral Areas are used in this study since this was the basis of the 1996 Census.

Traffic Zones: The Emme/2 transportation model uses population and employment data in Traffic Zones, in addition to data about the road and transit network, to estimate future travel in the Region. There are 394 Traffic Zones within the study area (to obtain a map of the Traffic Zones, please contact CRD Regional Planning Services). Data at the Traffic Zone level aggregate to the municipal level except in the case of North Saanich, Central Saanich, and Sooke Electoral Area where part of a Traffic Zone contains part of an Indian Reserve. When aggregating to the municipal level, the data from within these special Traffic Zones must be split for proper reporting of population and employment results.

Urban Containment Area: An urban containment boundary (UCB) is proposed as a strategic element in all four alternatives. The UCB is a proposed boundary delineating the defined urban growth areas in the region from the rural and resource areas, where growth would be more limited. The UCB was digitized by Westland Resource Group in the Fall of 1998 using land use information from the Urban Capacity Inventory System (UCIS). CRD Regional Planning Services revised the proposed boundary in 1999 to incorporate changes included in an updated Local Area Plan for Sooke (which has an urban containment area already in place) and changes requested by the District of Central Saanich. The location of the Proposed UCB is included in the map of the Base Strategy in the *Growth Strategy Alternatives* report (October 1999).

Urban Centres in the Alternatives: Alternatives 1, 2, and 3 each include various types of urban centres. Each type of centre is composed of a primary and secondary area. The secondary area, which is a ring around the primary area, has a lower defined density than the primary area, but is

higher than the surrounding area. Each centre type has different characteristics: size, average density, mix of dwelling types, and land use. The centre types and their key characteristics are presented in Table 2-1. The location of major centres in Alternative 1 and 2 and the major centres for Alternative 3 are based on existing centre locations. While the locations of some of the village and local hub centres are based on existing locations for Alternative 3, conceptual locations were identified for potential locations of new centres. These locations were digitized into a GIS by Westland Resource Group in 1998 and were revised by CRD Regional Planning Services in 1999 based on input from municipal planners. The conceptual locations shown do not constitute any policy of the municipalities and are only used for generating population, dwelling, and employment projections and allocations for the technical evaluation of the Alternatives.

Sub-land Use Polygons: Sub-Land use polygons or ‘SLUPs’ are used in the CRD Regional Planning Services’ Urban Capacity Inventory System (UCIS³), which was developed to assess the existing degree of development and remaining potential dwelling unit generation in the Region and to test RGS scenarios. The UCIS links a relational database to the RPS regional map base. A SLUP is a polygon defining a land area which has a single land use and (if the designation is residential) a single residential density, and which is not crossed by any Traffic Zone boundary (i.e. they nest to Traffic Zones). The UCIS database contains information on the land use designation, and for residential development also density class and degree of existing development (in this case as of May 1996, based on municipal planners’ expert knowledge of their jurisdictions). Calculated fields for each SLUP include land area, the number of dwelling units existing, and remaining available capacity at the present density.

Special Employment Geographies: Special employment geographies were created for use in projecting and allocating employment to Traffic Zones. Customized employment geographies were defined by CRD Regional Planning Services staff using the ArcView GIS at the slup level. The special employment geographies were thought to have different employment growth characteristics than the surrounding area. The special employment geographies used are listed in the employment section of this report.

1.3 Data Overview

The following are the primary data sources used for the population and employment projection and allocation for 1996 and 2026:

Estimating Population Distribution, 1996:

- Statistics Canada – 1996 census of population in private households (adjusted for the undercount) by age cohort by Traffic Zone custom data run

Projecting Population, 1996-2026:

- BC Stats – PEOPLE 24 by Local Health Area (which incorporates information from the 1996 census)

³ The UCIS does not use zoning or existing land use information, but a set of land use designations derived specifically for the UCIS, which is based on a regionalization of the land use classes described in the municipal Official Community Plans. A range of densities is available for each land use designation, and these densities also vary by municipality. At the time of the present work, data on available capacity was available for only residential development, though the calculation for the area devoted to commercial, industrial and institutional land uses was also available.

Estimating Dwelling Unit Capacities Outside the Urban Centres:

- Urban Capacity Inventory System, 1995 – distribution, density, location and area by land use types based on the OCPs to determine potential residential capacity for the area outside the urban centres at slup level

Estimating Dwelling Unit Capacities Inside the Urban Centres:

- Westland Resource Group, 1998 (Development of Growth Strategy Alternatives contract) – definitions of centre densities, dimensions, and land use mix

Estimating Employment Distribution, 1996:

- Statistics Canada – 1996 Census Home-based business and Usual Place of Work By Emme/2 Job Type Categories by Traffic Zone custom data run

Primary GIS Files Used:

- Municipal Boundaries and Traffic Zone Boundaries
- SLUP Boundaries and Attributes (land use and density)
- UCB Boundary
- Centroids of Urban Centres
- Transportation Centreline Network
- CRD Parks Green/Blue Spaces Data (parks and ecological reserves, unprotected green/blue space core areas, Agricultural Land Reserve, Forest Land Reserve, and CRD Water lands)
- Air photo mosaic of the VMA, 1996

2.0 Population Estimate and Regional Forecast

2.1 Purpose

The purpose of this part of the exercise is to estimate population for 1996 by age cohort and by Traffic Zone and to determine an overall population forecast for the VMA+ to 2026 which is then allocated to the Traffic Zone level for each of the four alternatives using the method described in the next section.

In particular, the following information on population is required:

- 1) estimate of population by Traffic Zone by Emme/2 Age Categories for 1996 for use in the Emme/2 Transportation Model
- 2) forecast of population for the VMA+ to the year 2026
- 3) forecast of population for the VMA+ to the year 2026 under conditions of 50% lower and higher migration.

2.2 Emme/2 Age Cohort Categories

For the purpose of populating the Emme/2 model, population distribution by age cohort is required. The seven age cohort categories used in the CRD's Emme/2 transportation model are:

- 0-4 years of age
- 5-12
- 13-17
- 18-24
- 25-44
- 45-64, and
- 65+

2.3 Estimation of 1996 Population by Age Cohort

Objective: To estimate the 1996 population by Traffic Zone by the seven Emme/2 age cohort categories, adjusting for the census undercount

Sources: Custom Statistics Canada 1996 Census Data Run of Population by Traffic Zone and by Emme/2 Age Cohort Categories

Method:

- 1) A custom Statistics Canada data run of 1996 Census Population by Traffic Zone by Emme/2 Age Cohort Categories was ordered.
- 2) Regional Planning Services adjusted the 1996 Census Population data by Traffic Zone for the census undercount. The adjustment was first made at the VMA level and then at the municipal level. The data at the Traffic Zone level was factored by using the ratio of adjusted population at the municipal level to the unadjusted population at the municipal level.
- 3) Regional Planning Services added total population for Port Renfrew and the surrounding area west of Jordan River as it falls outside the VMA.

1996 VMA+ Control Total Population Adjusted for Census Undercount (unrounded total):
318,010

2.4 Forecast of Total Population for the VMA+, 1996-2026

Objective: To forecast a control total population in 2026 for the VMA+

Sources:

- BC Stats PEOPLE 24 Projection (June 1999)

1) The BC Stats PEOPLE model is a “Component/cohort-survival” population model that includes separate forecasts of the three components of population change in an area: fertility, mortality and migration. PEOPLE 24 incorporates the 1996 census information and extends to the year 2026.

2) The BC Stats PEOPLE 24 forecast for the CRD less the projection for the Gulf Islands Local Health Area was used.

Limitations:

BC Stats qualifies its forecast stating that “...It is certainly possible that unforeseen changes in factors such as economic development, government policy, land use and zoning will affect future populations. Consequently, the projections should only be regarded as one possible scenario of the future size and age-sex structure of the population.” The population forecast is particularly sensitive to assumptions regarding migration, which is the component of population growth that is most difficult to predict. There is a negative natural increase for the VMA+ over the 30 year period, therefore, all the population growth is due to a positive net migration.

The control total population in 2026 for the VMA+ is forecast to be (rounded to nearest 10)
407,930.

2.5 Forecast of Total Population for the VMA+ under 50% Higher or Lower Migration, 1996-2026

Objective: To forecast a control total population in 2026 for the VMA+ if the migration rate was 50% higher than or 50% lower than forecast.

Sources:

- BC Stats PEOPLE 24 forecast (June 1999)

Due to the sensitivity of the population forecast to migration, the technical analysis of the alternatives includes a task to undertake a sensitivity analysis of the four RGS alternatives that considers the implications for the results of the analysis of each alternative, of population migration rates 50% lower or higher than forecast.

1) As the PEOPLE 24 forecast separates out the migration component of growth, a lower or higher rate of migration can be calculated.

2) Regional Planning Services multiplied the migration rate by a 50% lower and higher rate for migration occurring between 1996 and 2026 and added it to the natural increase estimated over that period.

Under 50% lower migration, the control total population for 2026 for the VMA+ would be about (rounded to nearest 10) 351,640 (about 56,000 people lower than forecast).

Under 50% higher migration, the control total population for 2026 for the VMA+ would be about (rounded to nearest 10) 464,220 (about 56,000 people higher than forecast).

3.0 Dwelling and Population Allocations

3.1 Purpose

The purpose of dwelling and population allocations is to take the regional population forecast for 2026 from the previous section, and allocate the population to dwellings by type at the Traffic Zone level.

The following information is required:

- 1) An estimate of dwelling capacities (practical) by type by Traffic Zone for each of the alternatives
- 2) An estimate of demand for housing by dwelling type for the projected population for 2026
- 3) Allocation of housing demand by dwelling type by Traffic Zone for each of the alternatives for 2026
- 4) Conversion of dwellings into population for 2026, and
- 5) Distribution of population by Emme/2 age cohort categories by Traffic Zone for 2026.

Note that the Emme/2 model only uses population, not dwelling type information.

3.2 Dwelling Type Categories

The following three dwelling type categories are used for the estimation of capacities and for the dwelling allocations:

Single-family Detached/Duplex Units (ground-oriented, or go): includes single-family detached houses, semi-detached houses and apartments in a detached duplex

Other Ground-Oriented Units (ogo): includes row houses, other single-attached houses, and moveable dwellings/mobile homes

Non Ground-Oriented Units (ngo): includes apartments that are 5 or more stories and apartments that are less than 5 stories.

3.3 Method Overview

Estimates for dwelling capacities by type for the Base Strategy and for the areas outside the urban centres for the other alternatives was derived using the scenario-development capability of the UCIS, which in this case involved changing the ‘% developable’ of residential SLUPs to 90%, if they were not already at or above that level. Land use designation codes were not changed for the Base Strategy. The SLUPS from the base case were overlaid by Cloverpoint Cartographics in Arc/Info with the proposed Urban Containment Boundary to create a new UCI/UCB SLUP file. This allowed calculation of capacity within and outside the UCB, and will assist in the monitoring program of the RGS in future.

GIS was used to analyse and report on the residential capacities for the centre areas for Alternatives 1, 2, and 3. Polygons were created for the centres using the BUFFER feature of Arc/Info, specifying the radius for the circles for the primary and secondary areas of the centres. The UCI/UCB SLUP file for the base strategy was overlaid with the urban centre polygons to create a new UCI/UCB/Urban Centre SLUP file for each of Alternative 1, 2, and 3. Each centre was defined to have specific dimensions, potential residential capacities, and land use mix. New

land use designation codes and densities were assigned to these new urban centre SLUPs. The UCIS Base Strategy data continued to be used for the SLUPs outside the centers. The residential capacity data was then provided to Urban Systems Ltd. for analysis in the HAT (Housing Allocation Tool) model.

The RhoDeS model was used to estimate regional housing demand for new units by dwelling type for 2026. The regional housing demand was then compared with the remaining available housing supply by dwelling type. As demand exceeded supply for certain dwelling types, the housing supply/demand was adjusted.

Adjustments were made to the dwelling capacities to ensure that the estimated capacity was equal to or greater than the 1996 census of existing dwelling units.

The HAT model was used to allocate the regional housing demand to municipalities using an attraction score allocation method. Two factors were used to operationalize the method: housing availability and affordability. The municipal allocated dwellings were then allocated to Traffic Zones based on each Traffic Zone's share of that municipality's remaining practical capacity.

The population in 2026 in the Traffic Zones was calculated using an average population per household by dwelling type by municipality, adjusted from 1996 to 2026. The population at the Traffic Zone level was distributed to age groups using the age composition projected in the PEOPLE 24 model for 2026 for the local health area where the Traffic Zone is located.

3.4 Estimation of Dwelling Capacities for the Base Strategy

Objective: To obtain dwelling capacities by the three dwelling type categories for the SLUPs in the Base Strategy.

Data sources:

- Urban Capacity Inventory System
- Proposed Urban Containment Boundary polygon file

In Arc/Info, Cloverpoint Cartographics conducted a polygon intersection with the UCI SLUPs and the proposed Urban Containment Boundary to create new SLUPs that aggregate to the Urban Containment Boundary as well as to Traffic Zones with the attributes from each file being carried to the new file. Adjustments were made to the SLUP boundaries to ensure that no newly created SLUP was divided by the UCB. This allowed calculation of capacity within and outside the UCB, and will assist in the monitoring program of the RGS in future. An area field was calculated in hectares for each of the newly created SLUPs.

The scenario-building capabilities of the UCIS was used to estimate dwelling capacities for the Base Strategy. The scenario was created using the 1998 Archive UCI database, and was amended by changing the 'Percent Developable' field for all residential SLUPs to either:

- 90% if the 1998 UCI Archive showed a '% Developable' of less than 90%; or
- not changing the '% Developable' if the 1998 UCI Archive figure was already greater than or equal to 90%.

This resulted in an overall '% Developable' value of 93.4% for the Region as a whole.

Dwelling unit capacities are calculated based on land use designations from the municipal OCPs. The UCIS has 20 land use designations, of which the following eight have potential to contain residential units:

Table 3-1: Residential Land Use Designation Codes in the Urban Capacity Inventory

UCI Land Use Designation Code	Land Use Description	Dwelling Type Category
1	Attached: Non ground-oriented	Non ground-oriented
2	Attached: Ground-oriented	Other ground-oriented
3	Commercial/Ancillary Residential	Non ground-oriented
4	New Neighbourhood	50% Single-family detached/duplex 40% Non-ground oriented 10% Other-ground oriented
5	Large-lot rural (4+ ha min. lot size)	Single-family detached/duplex
6	Medium-lot rural (1-4 ha min. lot size)	Single-family detached/duplex
7	Small-lot rural (0.2-1.0 ha min lot size)	Single-family detached/duplex
8	Detached & Duplex	Single-family detached/duplex

The unit capacities are calculated by dwelling type at the SLUP level from the following fields:

Dwelling Unit Capacity = Area (ha) x percent developable x density

The dwelling unit capacities by dwelling type from the UCIS are also used for the other Alternatives, but only for those areas that are outside a centre.

3.5 Estimation of Dwelling Capacities for the Urban Centres

Objective: To obtain dwelling capacities by the three dwelling type categories for the SLUPs in the urban centres of Alternative 1, 2, and 3

Data sources:

- the spreadsheet on urban centre characteristics prepared by Westland Resources
- the spreadsheet of land use areas and existing capacity unit counts by land use type, prepared by Cloverpoint for the centre areas (primary and secondary area, by centre type), and
- centroid locations (points) for the centres

The following procedure was used for Alternatives 1, 2, and 3 for the areas that contain an urban centre. First, the land use types being used in the GIS system, which were based on the UCIS land use designation types were collapsed into the following six groups:

Table 3-2: New Land Use Types Used in the Urban Centres

New land use type	Old UCIS Land Use Designation Code ID and Description
Single-family Detached/ Duplex (go)	5, 6, 7 – all rural types (Detached), 8 – Detached & Duplex
Attached Ground Oriented (ogo)	2 – Attached Ground-Oriented
Apartment/Ancillary Commercial (ngo)	1 – Attached, non-ground oriented; 3 – commercial/ancillary residential
Institutional	11 – institutional; 12 – utility
Open Space	13 – park; 14 – constrained from development; 16 – golf course
Commercial	9 – commercial; 10 – industrial

Note the new land use types are applied in the **centre areas ONLY** (not outside centres).

The residential densities described in the Westland spreadsheet were selected and recorded on the form and calculated as follows depending on whether the area is residential or non-residential.

Residential Areas

Westland’s area for each residential land use (detached, townhouse, etc.) was divided by the ‘developable area’ of the average centre of that type (major, metro, etc.). This proportion was applied to the ‘total area’ for the average centre.

Example: Calculation of Residential Area for the Colwood Corners Primary area:

Total primary area = 60 ha

Developable Area = 48 ha

Apartment Area = 12 ha

Proportion of Apartments to developable area: $12 \text{ ha}/48 \text{ ha} = 25\%$

Proportion of Apartments to total area: $.25 * 60 \text{ ha} = 15 \text{ ha}$

The last step was performed by the GIS system.

Non-residential Areas

Some judgements about these uses had to be made because in some cases the Westland spreadsheet assumed mixed uses, so areas shown overlapped with others (i.e. totals were greater than 100%; e.g. commercial and residential must be mixed).

The same institutional and open space proportions included in the Westland spreadsheet were used.

Stand-alone Commercial was computed as the residual left after proportion of all other uses were determined. Note that in primary areas of all centre types, all apartments are considered to include ground-floor commercial. The results from these allocations are depicted in Table 3-3:

Table 3-3: Assumed Land Use Type Mix in the Urban Centre Types by Alternative

Alternative:	Urban Centre Type	Land Use Type	Primary Area	Secondary Area
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			Proportion of Total Area (%)	Dwelling Density by Type (units/ha)	Proportion of Total Area (%)	Dwelling Density by Type (units/ha)
Alt. 1: Metropolitan Core and Major Centres	Metropolitan Core	Go (detached/duplex)	5%	21	15%	18
		Ogo (attached ground-oriented):	15%	42	25%	35
		Ngo (apt./ancillary comm.):	45%	120	25%	90
		Institutional	10%		10%	
		Open Space:	10%		20%	
		Commercial	15%		5%	
	Colwood Corners Major Centre	Go (detached/duplex)	8%	20	35%	15
		Ogo (attached ground-oriented):	27%	40	21%	25
		Ngo (apt./ancillary comm.):	25%	100	14%	70
		Institutional	10%		10%	
		Open Space:	20%		20%	
		Commercial	10%		0%	
	Other Major Centres	Go (detached/duplex)	10%	20	24%	15
		Ogo (attached ground-oriented):	20%	40	25%	25
		Ngo (apt./ancillary comm.):	30%	100	21%	70
		Institutional	10%		10%	
		Open Space:	20%		20%	
		Commercial	10%		0%	
Alt 2: Transit-Linked Towns	Regional Centre	Go (detached/duplex)	10%	21	15%	18
		Ogo (attached ground-oriented):	15%	42	25%	35
		Ngo (apt./ancillary comm.):	45%	120	25%	90
		Institutional	10%		10%	
		Open Space:	10%		20%	
		Commercial	10%		5%	
	Corridor Major Centre	Go (detached/duplex)	5%	21	20%	16
		Ogo (attached ground-oriented):	20%	42	30%	30
		Ngo (apt./ancillary comm.):	35%	100	20%	80
		Institutional	10%		10%	
		Open Space:	20%		20%	
		Commercial	10%		0%	
	Non-Corridor Major Centre	Go (detached/duplex)	10%	20	30%	15
		Ogo (attached ground-oriented):	30%	40	25%	25
		Ngo (apt./ancillary comm.):	20%	80	15%	70
		Institutional	10%		10%	
		Open Space:	20%		20%	
		Commercial	10%		0%	
Alt 3: Hierarchy of Walkable Centres	Regional Centre	Go (detached/duplex)	10%	20	15%	18
		Ogo (attached ground-oriented):	15%	40	25%	35
		Ngo (apt./ancillary comm.):	45%	100	25%	90
		Institutional	10%		10%	
		Open Space:	10%		20%	
		Commercial	10%		5%	
	Colwood Corners Major Centre	Go (detached/duplex)	8%	20	34%	15
		Ogo (attached ground-oriented):	27%	40	22%	25
		Ngo (apt./ancillary comm.):	25%	100	14%	70
		Institutional	10%		10%	
		Open Space:	20%		20%	
		Commercial	10%		0%	
	Other Major Centres	Go (detached/duplex)	10%	20	24%	15
		Ogo (attached ground-oriented):	20%	40	25%	25
		Ngo (apt./ancillary comm.):	30%	100	21%	70
		Institutional	10%		10%	
		Open Space:	20%		20%	
		Commercial	10%		0%	
	Local Hub Centre	Go (detached/duplex)	6%	18	35%	15
		Ogo (attached ground-oriented):	27%	30	20%	25
		Ngo (apt./ancillary comm.):	27%	80	15%	70
		Institutional	10%		10%	
		Open Space:	20%		20%	
		Commercial	10%		0%	
	Neighbourhood Village	Go (detached/duplex)	17%	18	35%	15
		Ogo (attached ground-oriented):	25%	30	25%	25

Alternative:	Urban Centre Type	Land Use Type	Primary Area		Secondary Area	
			Proportion of Total Area (%)	Dwelling Density by Type (units/ha)	Proportion of Total Area (%)	Dwelling Density by Type (units/ha)
		Ngo (apt./ancillary comm.):	18%	80	10%	70
		Institutional	10%		10%	
		Open Space:	20%		20%	
		Commercial	10%		0%	

To compare the results of the above exercise to the unit creation shown on the Westland spreadsheet, the proportions were applied to the total land area of the centre, then multiplied by the density.

Calculation of Centre densities

Cloverpoint required a single number to apply as a density for each centre type. To derive these densities, the proportion of each residential type was applied to the total (gross) centre area to determine the gross residential area. Because they varied slightly in size, for the 'Other Major Centres' type, the areas of all primary and all secondary areas were totalled and an average obtained. Then the density for that particular residential type was applied. The number of units of each residential type was totalled, then divided by the total centre area to give the centre density.

The results of these calculations for each centre type for each alternative are shown in Table 3-4 along with the dimensions of each of the centre types.

Table 3-4: Area, Dimensions, Average Density, and Mix of Dwelling Types of Urban Centre Types Used in the Alternatives

Alternative	Urban Centre Type	Primary or Secondary Area	Area (ha)	Dimensions	Average Density at Capacity (units/ha)	Mix of dwelling types(1)
Alt. 1: Metropolitan Core and Major Centres	Metropolitan Core	Primary Area	Approx. 521 ha	Mapped polygon bounded by: N: Bay St. S: Dallas Rd. E: Linden Ave./ Ormond St./Chambers St. W: Bay St. (Vic West), Catherine St., Dallas Rd.	71 units/ha	14.8% go 8.9% ogo 76.3% ngo
		Secondary Area	Approx. 521 ha	An area equiv. to the size of the primary area generated as a polygon buffer	34 units/ha	7.8% go 25.8% ogo 66.3% ngo
	Colwood Corners Major Centre	Primary Area	60 ha	R=437 m	37.4 units/ha	4.3% go 28.9% ogo 66.8% ngo
		Secondary Area	120 ha	R=757 m	20 units/ha	25.9% go 25.9% ogo 48.2% ngo
	Other Major Centres	Primary Area	35 ha	R=334 m	40 units/ha	5% go 20% ogo 75% ngo
		Secondary Area	70 ha	R=578 m	25 units/ha	14.7% go 25.4% ogo 59.9% ngo
Alt. 2: Transit-Linked Towns	Regional Centre	Primary Area	Approx. 180 ha	Mapped polygon bounded by: N: Bay St. E: Cook St. S: Belleville St./Beacon Hill Park boundary W: Inner Harbour	62.4 units/ha	3.4% go 10.1% ogo 86.5% ngo

Alternative	Urban Centre Type	Primary or Secondary Area	Area (ha)	Dimensions	Average Density at Capacity (units/ha)	Mix of dwelling types(1)
		Secondary Area	Approx. 180 ha	Area equal to primary area generated as a polygon buffer	33.95 units/ha	8% go 25.8% ogo 66.2% ngo
	Corridor Major Centre	Primary Area	60 ha	R=437 m	44.45 units/ha	2.4% go 18.9% ogo 78.7% ngo
		Secondary Area	120 ha	R=757 m	28.2 units/ha	11.3% go 31.9% ogo 56.8% ngo
	Non-Corridor Major Centre	Primary Area	40 ha	R=357 m	30 units/ha	6.7% go 40% ogo 53.3% ngo
		Secondary Area	80 ha	R=618 m	21.25 units/ha	21.2% go 29.4% ogo 49.4% ngo
Alt. 3: Hierarchy of Walkable Centres	Regional Centre	Primary Area	Approx. 180 ha	Same as Regional Centre in Alt 2	53 units/ha	3.8% go 11.3% ogo 84.9% ngo
		Secondary Area	Approx. 180 ha	Same as Regional Centre in Alt 2	33.95 units/ha	8% go 25.8% ogo 66.2% ngo
	Colwood Corners Major Centre	Primary Area	50 ha	R=399 m	37.4 units/ha	4.3% go 28.9% ogo 66.8% ngo
		Secondary Area	100 ha	R=691 m	20.4 units/ha	25% go 27% ogo 48% ngo
	Other Major Centre	Primary Area	35 ha	R=334 m	40 units/ha	5% go 20% ogo 75% ngo
		Secondary Area	70 ha	R=578 m	24.55 units/ha	14.7% go 25.5% ogo 59.8% ngo
	Local Hub Centre	Primary Area	20 ha	R=252 m	30.78 units/ha	3.6% go 26.3% ogo 70.1% ngo
		Secondary Area	40 ha	R=437 m	20.75 units/ha	25.3% go 24.1% ogo 50.6% ngo
	Neighbourhood Village	Primary Area	7 ha	R=149 m	24.96 units/ha	12% go 30.3% ogo 57.7% ngo
		Secondary Area	14 ha	R=259 m	18.50 units/ha	28.5% go 33.8% ogo 37.7% ngo

(1) go=ground-oriented (single-family detached and duplex), ogo=other ground-oriented, ngo=non-ground oriented

Creation of Urban Centre Polygons

CloverPoint created the centres in Arc/Info using buffers around the centres of the dimensions specified in Table 3-4 and using the GIS centroid locations for the centres. For Downtown Victoria, the Secondary Area was created as a polygon of equal area to the Primary Area. The centre polygons were then intersected with the UCI/UCB SLUPs that were created for the Base Strategy to create new SLUPs for each Alternative. For each of the newly created SLUPs, the area of the polygon in hectares was calculated.

Land Use Codes Assigned to Centres

Cloverpoint also required a new land use designation code id number for the SLUPs in each type of centre. These were assigned in sequence beginning with 21 (20 being the last ID assigned in

the UCIS). Each centre type has 2 codes: one for the primary area, one for the secondary area. Table 3-5 lists the land use designation codes that were used:

Table 3-5: Additional Land Use Type Codes for the Urban Centres for the Alternatives

Alternative 1: Metropolitan Core and Major Centres	Alternative 2: Transit-Linked Towns	Alternative 3: Hierarchy of Walkable Centres
21 Colwood Centre Primary Area	27 Corridor Centre Primary Area	33 Neighbourhood Village Primary Area
22 Colwood Centre Secondary Area	28 Corridor Centre Secondary Area	34 Neighbourhood Village Secondary Area
23 Metro Core Primary Area	29 Regional Centre Primary Area	35 Local Hub Primary Area
24 Metro Core Secondary Area	30 Regional Centre Secondary Area	36 Local Hub Secondary Area
25 Other Major Centre Primary Area	31 Non-Corridor Centre Primary Area	37 Colwood Centre Primary Area
26 Other Major Centre Secondary Area	32 Non-Corridor Centre Secondary Area	38 Colwood Centre Secondary Area
		39 Other Major Centre Primary Area
		40 Other Major Centres Secondary Area
		41 Regional Centre Primary Area
		42 Regional Centre Secondary Area

The SLUPs in the centres were all assigned a Density Class of Medium, were assigned the average residential density from Table 3-4, and the % Developable in centres was set to 90% across the board for residential uses.

As in the Base Strategy, the dwelling capacity was calculated by dwelling type at the SLUP level as:

Dwelling Unit Capacity = Area (ha) x percent developable (i.e. 90%) x average density in the centre type

3.6 Estimation of Regional Housing Demand, 2026

Objective: To obtain and estimate of housing demand for the VMA+ by dwelling type.

The regional-level future housing demand to 2026 was forecast using the Regional Housing Demand Spreadsheet (RHoDeS). RHoDeS provided the annual demand for housing by dwelling type. The same regional demand forecast was used for all alternatives, and was based on the PEOPLE 24 population forecast. The results of RHoDeS were expressed in terms of additional demand, i.e., the number of new dwellings required annually (in addition to those that exist already). The regional housing demand is summarized in Table 3-6.

**Table 3-6
Regional Housing Demand Projection for New Dwelling Units (From RHoDeS)**

Year	Demand for New Dwelling Units (in addition to existing units in 1996)			
	Single-family	Other Ground Oriented	Non-Ground Oriented	TOTAL
2001	4,743	1,170	2,469	8,382
2006	9,486	2,339	4,938	16,763
2011	14,228	3,509	7,408	25,145
2016	18,786	4,650	10,792	34,228
2021	23,343	5,791	14,176	43,310
2026	27,900	6,932	17,561	52,393

3.7 Adjustments to the Base Strategy Dwelling Capacities

Objective: To make adjustments to the dwelling capacities, including adjustments where the 1996 census of existing dwellings is higher than the estimated UCI capacity and to estimate remaining dwelling capacity.

Data Sources:

- 1996 Census of Dwellings by Traffic Zone
- Air Photo of Region
- Local Knowledge
- UCI/UCB/Urban Centre SLUP Data

Regional Planning Services conducted an extensive validation check on the dwelling unit capacities to ensure they were reasonable. Dwelling unit capacities were reduced in approximately 20 Traffic Zones. In these cases, the dwelling capacities were overestimated due to one or more of the following factors: an area may have become a park since the UCI data was compiled (dwelling capacities were set to 0), some areas were classified as ‘new neighbourhood’ yet fall outside the Proposed UCB (dwelling capacities were adjusted to lower potential densities), some areas in the Western Communities where there is Forest Land Reserve were not originally taken into account for determining dwelling capacities (% developable was reduced or potential densities were reduced). The capacity data was sent to Urban Systems Limited.

Urban Systems Limited pre-processed the UCI and 1996 census data in preparation for use within HAT as follows:

- The number of dwellings from the 1996 census population and average population per dwelling information by dwelling type and Traffic Zone was calculated.
- A factor for each Traffic Zone was calculated equal to the 1996 census number of dwellings (by type and Traffic Zone) divided by the number reported in the UCI – essentially the multiplier applied to the UCI data to make it equal to the census data.
- The factor was applied to the UCI data (1996 existing units) at the SLUP level. This allowed the census dwelling count numbers to be applied at the SLUP level – necessary for working with the “centre” data in the RGS alternatives.
- The census data then became the existing dwelling units at the SLUP level. The capacity was calculated at the SLUP level as the higher of the UCI capacity (density x area) or the existing dwelling units. The calculation of existing dwelling units and capacity within centres is described later in this section.
- The existing units and capacity were aggregated to the Traffic Zone level and converted to the HAT dwelling type categories. These values represent the base case and were used for the Base Strategy and for all Traffic Zones that did not include all or part of a centre for Alternatives 1, 2, and 3.
- The remaining capacity within each Traffic Zone, by dwelling type, was calculated.

Calculation of the existing dwelling units and capacities for Traffic Zones that included all or part of a Centre was more complicated. Since the RGS alternatives assumed that redevelopment would occur within the centres, it was not possible to subtract the 1996 existing units from the capacity to determine the remaining capacity. The existing units were adjusted to reflect the proportion of units after redevelopment. In essence, it was assumed for the purpose of allocation

of new dwelling units, that the redevelopment had taken place. The steps used to calculate the reallocated existing units and capacities for Traffic Zone that included Centres were as follows:

- The 1996 existing units (from the census dwelling numbers applied at the SLUP level) were assumed to remain the same, but the land use code was changed to reflect the land use code of the Centre.
- Some SLUPs were split to reflect portions inside and outside the Centre.
- The capacities inside the Centre (for each SLUP) were calculated by multiplying the area of the SLUP within the Centre by the density for the land use code.
- The existing units and capacity were summed by Traffic Zone and land use code. The total number of dwelling units by land use code was then converted to the HAT dwelling type categories based on the dwelling type distribution for the centre and specific land use code.
- The remaining capacity was calculated as the capacity less the revised 1996 existing units.

A final table was created that included the Traffic Zone number, municipality, existing units by type and remaining capacity by type. The existing and remaining units were summed by municipality and for the entire region, by type.

3.8 Dwelling Unit Supply/Demand Adjustments

Objective: To adjust the regional housing demand for new units where there is shortage of supply for a particular dwelling type.

The remaining supply at the regional level was defined as being the practical capacity less the 1996 existing units. The practical capacity is 90% of the total capacity.

The regional demand totals from RHoDeS, and the regional supply totals from the process described in section 3.6 were entered into HAT by Urban Systems Ltd. If there was sufficient supply (remaining supply as defined above) to meet the 2026 demand, the final (2026) regional housing demand numbers were used. If there was insufficient remaining supply, the year at which the demand could be satisfied was selected. For this comparison, the **total** of all dwelling types was used – initially, there was no consideration of the demand or remaining supply for individual dwelling types.

It was assumed that the demand for a particular dwelling type would shift to another dwelling type that had excess remaining capacity. In all cases, excess demand for Single-family dwelling was assumed to shift to Other Ground Oriented, and from Other Ground Oriented to non-ground oriented.

For the Base Strategy, the capacity is reached in the year 2025. Therefore, the regional population for the Base Strategy falls slightly short of the 2026 regional control total population forecast.

3.9 Allocation of Dwelling Units by Type to Municipalities, 2025/26

Objective: To allocate the regional housing demand to dwelling types by municipality for 2025/26

With the initiation of the RGS, the CRD proceeded with several projects to support the preparation of regional growth alternatives, including a review of the regional planning systems. Based on that review, the Housing Allocation Tool (HAT) was identified as a need. The review recommended development of a full relational database application that would be able to extract information as necessary from the Urban Capacity Inventory System (UCIS). However, given the time constraints of the Regional Growth Strategy project, this preliminary version of HAT has been developed by Urban Systems as a spreadsheet, will all data extraction and preparation completed manually outside the spreadsheet.

The Review of Regional Planning Systems report identified two types of methods that should be included in the final version of HAT: the Attraction Score Allocation Method; and the Land Use Polygon/Traffic Zone (LUP/TZ) method. The existing spreadsheet version uses the Attraction Score Allocation Method.

Factors

A workshop was held with planners and other professionals in related industries in 1999 to try to determine a set of factors and weightings that would be indicators of the relative attraction of one municipality over another for future residential development. Because the demand and supply are close to being equal, or demand exceeds supply, for all scenarios, this exercise was really more an indication of what areas will develop first. It was determined that the factors identified at the workshop would take a significant amount of effort and time to develop, therefore only affordability (existing housing price) and available capacity were used to allocate residential demand to municipalities. Weighting factors for affordability of 5, 7 and 3 for Single-family, Other Ground Oriented and non-ground oriented respectively were applied. The relatively low weighting for non-ground oriented is because the “measure” is selling prices, not rents. Non-ground oriented units for sale tend to be more upscale condominiums and therefore the demand for these units would be less price sensitive. The weighting factor for availability is 5 for all dwelling types, indicating that for Single-family dwelling, equal weighting has been assumed for affordability and availability.

The same ratings and weightings were used for all alternatives. A description of each of these factors is summarized below.

a) Affordability

An average of the April, May, June and September 1998 median selling prices as provided by the Victoria Real Estate Board Multiple Listing Service was used to establish existing prices. Single-family prices were for the Single-family category; the townhouse and strata duplex categories were used for Other Ground Oriented; and condominium was used for non-ground oriented. The average of these monthly median prices for each municipality are shown in Table 3-7.

Table 3-7: Median Selling Prices for Homes by Municipality (April, May, June, September 1998)

Municipality	Single-family	Townhouse	Condominium
Victoria	221,813	196,500	135,225
Oak Bay	293,938	302,500	175,188
Esquimalt	188,813	170,833	113,806
View Royal	230,000	227,381	

Saanich	243,366	254,851	142,168
Central Saanich	236,875	183,063	188,088
North Saanich	368,938	224,375	
Sidney	189,879	180,825	130,000
Highlands	252,125		
Langford	185,977	166,094	126,825
Colwood	197,750	136,750	59,000
Metchosin	226,625		

Within HAT, it was assumed that a lower price indicates greater attractiveness, thus this factor is an indicator of affordability. To be fully accurate, the housing price would have to be tied to the market demand, i.e., if the market demand is for more upscale accommodation among groups who are not highly price sensitive, a higher price may actually be an indicator of higher desirability. However, for the purpose of this analysis, higher prices are assumed to indicate lower relative attractiveness.

HAT assigns the class value based on the classification scheme as shown in Table 3-8.

Table 3-8: Home Affordability Classification Scheme

Class Score	Range of Selling Prices
1	> \$400,000
2	\$351,000 – 400,000
3	\$301,000 – 350,000
4	\$276,000 – 300,000
5	\$251,000 – 300,000
6	\$201,000 – 250,000
7	\$151,000 – 200,000
8	\$101,000 – 150,000
9	\$75,000 – 100,000
10	< 75,000

For those municipalities where there have been no sales for a given dwelling type, a class score of 1 was assigned. Since no information was available for Sooke, the values for Colwood were assumed.

b) Availability

The measure of availability is the remaining capacity expressed as a percent of the total capacity. The remaining capacity for each dwelling type was used.

The class values were assigned manually. The municipalities with a very high amount of remaining capacity are assumed to be that way because they are less desirable. However, those

with very little remaining capacity also received a low score because of the difficulty in developing areas that have little appropriate land left. The highest class scores were assigned to municipalities with 50 to 80 percent of their capacity remaining for a particular dwelling type. The classification scheme for class scores is shown in Table 3-4.

Table 3-9: Class Scores for Housing Availability

Class Score	Remaining Dwelling Capacity (Total Capacity)
0	0%
1	1 – 10%
3	11 – 20%
4	21 – 30%
5	31 – 40%
6	41 – 50%
7	51 – 60%
8	61 – 70%
9	71 – 80%
5	81 – 90%
2	> 90%

For those municipalities with no remaining capacity for a particular dwelling type, a class score of 0 was assigned.

Attraction Scores

HAT computes an initial allocation of new dwellings by type for each municipality. The remaining capacity (total remaining capacity, NOT practical remaining capacity) was entered by municipality and dwelling type from the data pre-processing as described in Section 3.7.

Some manual intervention was required to calculate the final percent share for each municipality as the initial allocation was higher than the total remaining capacity. The process to determine the final share was as follows:

- If the Initial Allocation was less than the Remaining Capacity for a municipality, the Initial Share was copied to a new table;
- If the Initial Allocation was greater than the Remaining Capacity for a municipality, the Maximum Share (remaining capacity divided by the number of units to be allocated) was copied into the new table and was set as the share to be allocated;
- The remaining unallocated units were then assigned to the municipalities with capacity remaining, in proportion to the initial shares (Initial Share 2);
- The new allocation (Initial Allocation 2) was then calculated using the Maximum Share or Initial Share 2 as appropriate;
- The Initial Allocation 2 was compared to the Remaining Capacity – if the Initial Allocation 2 was greater than the Remaining Capacity, the process was repeated,;
- Once the Initial Allocation was less than or equal to the Remaining Capacity for all municipalities, the final shares were copied into the Allocation Matrix.

HAT creates allocation matrices for each dwelling type, and for the periods from 1996 to 2010, and 2011 to the final projection year.

Limitations

The process requires a significant amount of pre-processing of data from the UCIS. The amount of pre-processing was compounded by the timing of the most recent census and the last UCI update. The most recent UCI update was completed in 1996, prior to the census. The results of the 1996 Census showed that the estimates of existing dwellings for some areas (within the UCI) were significantly different than the census counts. In particular, the census indicated an existing number of dwellings that was much higher than the total capacity reported in the UCI. In addition, all UCI data is recorded at the land use polygon (LUP) level – smaller geographic units than Traffic Zones, the smallest unit of reporting for the census.

The inconsistencies between the UCI and census also created challenges for the estimation of remaining capacity for the RGS alternatives since the “centres” did not necessarily coincide with Traffic Zone or even LUP boundaries.

3.10 Allocation of Dwellings by Type to Traffic Zones, 2025/26

Objective: To allocate the municipal dwellings allocated above to Traffic Zones by dwelling type
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Using HAT, Urban Systems inserted the number of units by type to be allocated in a spreadsheet for each municipality. The existing units and remaining capacity by Traffic Zone were entered from the pre-processing described in Section 3.7. No further manual intervention was required. HAT produced an overall summary with the Total Capacity and Allocated Units by Traffic Zone

and dwelling type. Using the pivot table function in Excel, a summary table was created that included the number of dwellings (allocated plus existing) for each dwelling type, by Traffic Zone.

The following is the regional control dwelling totals by dwelling type for each of the alternatives.

Table 3-10: Allocated Dwelling Units from the Housing Allocation Tool and Total Population for the VMA+ for the Alternatives, 2025/26 (unrounded totals)

	Base Strategy	Alternative 1	Alternative 2	Alternative 3
Projection Year (1)	2025	2026	2026	2026
Allocated single-family detached/duplex units (2)	99,460	91,767	88,415	91,924
Allocated other-ground-oriented units (3)	16,266	29,320	30,377	32,153
Allocated non-ground oriented units (4)	67,178	66,470	68,767	64,231
Total allocated units (5)	182,904	185,557	187,559	188,308
Total Population (6)	404,907	407,954	407,923	407,919
New Population, 1996 to 2025/26 (7)=(6) – 318,010	86,897	89,944	89,913	89,909

3.11 Conversion of Allocated Dwellings to Population, 2025/26

Objective: To convert the dwellings to a population by Traffic Zone for 2025/26

Data Sources:

- 1996 Census of Population by Dwelling Type by Municipality

The final step in the process was a conversion of allocated dwellings to population. The calculation of the average population per dwelling was completed outside HAT.

For each municipality, a multiplier that could be applied to the 1996 census regional average population per dwelling to determine the municipal average population per dwelling was calculated.

A preliminary estimate of the future regional average population per dwelling was made by first determining the overall average population per dwelling (regardless of dwelling type) by dividing the projected population by the total number of projected dwellings. Another factor was then calculated, equal to the 1996 census average population per dwelling for a given type, divided by the 1996 census average population per dwelling for all dwelling types. This factor was then multiplied by the future average population per dwelling for all types to obtain a preliminary future population per dwelling for a specific dwelling type. Using the preliminary future population per dwelling by type and the projected number dwellings by type, the total future regional population was calculated. A factor to convert the calculated future population to the actual population projection was applied to the future average population per dwelling to obtain the final future regional average population per dwelling, by dwelling type. An example of the process described above is summarized in Table 3-10 (note: the values in the table are for demonstration purposes only and do not represent actual projections).

Table 3-11
Sample Future Regional Average Population Per Dwelling Calculation

	A	B	C	D	E	F	
Dwelling Type	Projected Future Number of Dwellings	1996 Census Population per Dwelling	Factor – Population per Dwelling by type	Preliminary Future Population per Dwelling (C x Future Average Population per Dwelling)	Preliminary Future Population (A x D)	Future Average Population per Dwelling (D x Normalizing Factor)	Future Population (A x F)
Single-family	90,000	2.67	2.67/2.11 = 1.085	1.085 x 2.11 = 2.28	205,650	1.095 x 2.28 = 2.50	225,260
Other Ground Oriented	30,000	2.34	2.34/2.11 = 0.951	0.951 x 2.11 = 2.00	60,080	1.095 x 2.00 = 2.19	65,810
Non-Ground Oriented	70,000	1.66	1.66/2.11 = 0.675	0.675 x 2.11 = 1.42	99,440	1.095 x 1.42 = 1.56	108,930
Total	190,000	2.46			365,170		400,000
Projected Population		400,000	Normalizing Factor		400,000 / 365,170 = 1.095		
Future Average Population per Dwelling		2.11					

For each municipality, a multiplier that could be applied to the 1996 census regional average population per dwelling to determine the municipal average population per dwelling was calculated. For example, if the 1996 average population per dwelling for Single-family Dwellings in Municipality X was 2.0, and the 1996 regional average population per dwelling was 2.67 for Single-family Dwellings, the factor would be 0.749 (2.0/2.67). This factor was applied to the regional future average population per dwelling to establish a future average population per dwelling at the municipal level. All Traffic Zones within a municipality were assumed to have the same population per dwelling. The future total population by Traffic Zone was calculated and normalized to the population projection (400,000 in the example in Table 3-10). Table 3-11 lists the final regional control total populations for each of the Alternatives.

Table 3-12: Total Projected Population for the VMA+ for the Alternatives, 2025/26 (unrounded totals)

	Base Strategy	Alternative 1: Metro. Core & Major Centres	Alternative 2: Transit-Linked Towns	Alternative 3: Walkable Centres
Projection Year (1)	2025	2026	2026	2026
Total Population (2)	404,907	407,954	407,923	407,919
New Population, 1996 to 2025/26 (3)=(2) – 318,010	86,897	89,944	89,913	89,909

3.12 Distribution of Population by Age Cohort, 2025/26

Objective: To distribute the 2025/26 population by Traffic Zone to the seven age cohort categories used by the Emme/2 model.

Data Sources - BC Stats PEOPLE 24 Projection by Local Health Area

1) Total population at the Traffic Zone level was distributed by age cohort using the BC Stats PEOPLE 24 Projection for 2025/26 by age cohort for the three LHAs that comprise the VMA.

4.0 Employment Estimates, Projections, and Allocations

4.1 Purpose

The overall purpose of the exercise is to project and allocate future population and employment for each of the Alternatives, which in turn are used to estimate impacts on transportation, environment, and infrastructure systems in the VMA+.

In order to estimate these impacts, the following information on employment is required:

- 1) estimate of employment by Traffic Zone by Emme/2 Job Type Categories for 1996 for use in the Emme/2 transportation model
- 2) projection and allocation of employment to Traffic Zones by Emme/2 Job Type Categories for 2025/26 for each Alternative for use in the Emme/2 Transportation model

The data from the above can be used to derive municipal employment totals for reporting projections and allocations at the municipal level.

4.2 Emme/2 Job Type Categories

For the purpose of populating the Emme/2 model, employment distribution by Traffic Zone is required by Emme/2 job type categories. The eight general job type categories used in the CRD's Emme/2 transportation model are:

- Home-based business
- Elementary School
- High School
- Post Secondary School
- Hospital
- Office
- Retail, and
- Industrial.

Each job type category has unique characteristics for transportation, including how many trips are generated and attracted. It should be noted that these job type categories will differ from other employment classification systems as it is only intended for use in Emme/2's transportation model.

4.3 Employment Geographies Used

Customized employment geographies were defined by CRD Regional Planning Services staff using the ArcView GIS at the SLUP level. These geographies were thought to have unique employment growth characteristics than the surrounding area:

- Swartz Bay Ferry Terminal, District of North Saanich
- Victoria International Airport, District of North Saanich/Town of Sidney
- Keating Business Park, District of Central Saanich
- University of Victoria, District of Saanich/District of Oak Bay
- Camosun College: Glendale Campus, District of Saanich
- Royal Roads University, City of Colwood
- Royal Jubilee Hospital/War Memorial Hospital, City of Victoria/District of North Saanich
- Victoria General Hospital, Town of View Royal

- CFB Esquimalt (Naden and Dockyards), Township of Esquimalt
- Downtown Victoria, City of Victoria (different geographic definitions based on the Alternative)

For Alternatives 1, 2, and 3 which contain centres, the centres were also treated as special employment geographies.

The remaining area for each municipality was divided into that part of a municipality that is within the urban containment boundary and that which is outside. For example, the Town of View Royal was divided into that part of the municipality which is inside the Proposed UCB (but excluding the Victoria General Hospital), and that part of which is outside the Proposed UCB.

4.4 Method Overview

Estimation of 1996 Baseline Employment

First, employment data was required for the baseline year of 1996. Employment data by Traffic Zone by Emme/2 job type category was obtained for 1996 from Statistics Canada using a custom census run. This data was adjusted by CRD Regional Planning Services to account for the census undercount and those with no usual-place-of-work.

Forecast of Total Employment for the VMA+, 1996 to 2025/26

The VMA+ employed labour force to population ratio of 0.49 in 1996 was assumed to remain the same for 2025/26. This assumption was validated by comparing the jobs-to-population ratio with a study done by the Greater Vancouver Regional District (GVRD), which found that it had a consistent jobs-to-population ratio of about 0.49 between 1981 and 1996⁴. The GVRD assumes a higher jobs-to-population ratio in its projection of employment to 2021. However, it was thought that because of the higher median age of the population in the VMA compared to the GVRD, that the 0.49 ratio should continue to be used. Therefore, the total forecast employment in 2025/26 is equal to the total forecast population in 2025/26 multiplied by 0.49.

Allocation of 2025/26 Employment Growth to Employment Geographies

The total new employment growth between 1996 to 2025 in the VMA+ was allocated to the employment geographies using a number of different methods:

a) New Home-Based Businesses

First, new home-based businesses were estimated at 10% of the new population, which is slightly higher than the share of home-based businesses in 1996. The new home-based businesses were distributed according to the new population between 1996 and 2026 at the Traffic Zone level.

b) City of Victoria's Share of New Employment Growth

The City of Victoria currently has a 49% share of the region's total employment. Historical trends over the last 20 years show that Victoria's share of the Region's employment is declining.

It was assumed for the Base Strategy that 27% of new employment growth would occur in the City of Victoria in the absence of any new policies to attract employment growth to Downtown Victoria. This would mean that Victoria's overall share of total employment would decline to 45%. It was assumed that 40% of new employment growth would be located in the City of

⁴ Coriolis Consulting Corp. and Dr. T.A. Hutton. 1999. Lower Mainland Employment Study. Prepared for the Fraser Valley Regional District, Greater Vancouver Regional District, Squamish-Lilloet Regional District and Ministry of Transportation and Highways.

Victoria for Alternative 1 as it includes a Metropolitan Core that would be larger in size and more dense than under the Base Strategy or the other Alternatives. For Alternative 2 and 3, it was assumed that only office and retail employment would significantly differ under these alternatives. Therefore, it was estimated that 28% of new job growth for Alternative 2 would be located in the City of Victoria. For Alternative 3, it was estimated that 23% of new job growth would be located in the City of Victoria.

c) Special Employment Geographies

For the special employment geographies, the following employment growth assumptions were made for all the Alternatives between 1996 and 2026:

- Employment at the Royal Jubilee and Victoria General Hospitals would grow at the regional population growth rate of about 27.5%
- Employment at the University of Victoria would grow at the regional population growth rate of about 27.5%
- Employment at the Swartz Bay Ferry Terminal would grow at half the regional growth rate or about 14%, from 220 to 250 employees
- Employment at CFB Esquimalt was assumed to grow at a modest 6%
- Employment at Royal Roads University was assumed to increase to 200 people from about 75 in 1996
- Employment at Victoria International Airport and Keating Business Park was estimated to grow by 69% and 74% respectively, assuming that there would be greater demand than new supply for industrial lands, and by estimating the remaining available capacity in those areas.

d) Remaining Areas

For the remaining employment geographies, the percentage of population growth from 1996 to 2026 occurring in that area and the existing jobs-to-population ratio was used as a guide to project employment growth. For developing areas, such as Langford, the 1996 job-to-population ratio from the District of Saanich was used as a guide for selecting a reasonable job-to-population ratio to use.

The main differences between the Alternatives for the employment distribution was assumed to be the location of office, retail, elementary school, and high school jobs (in addition to new home-based businesses). Office, retail, elementary school and high school job distribution was assumed to follow the distribution of population growth, while taking into account the City of Victoria's estimated share of the Region's new employment growth. For Alternative 3, for instance, 20% of new office and retail jobs were assumed to be located in village centres, 15% in local hubs, 25% in Downtown Victoria, 25% in major centres, and 15% elsewhere in the region. This pattern largely reflects the distribution of population growth, with the exception of Downtown Victoria which was assumed to a higher share than its population growth would suggest.

Allocation of 2025/26 Employment Growth to Traffic Zones

The employment totals (other than home-based business which were previously calculated) at the employment geography level were then allocated to Traffic Zones. This was done using one or more of the following data sources:

- 1996 census of employment by Traffic Zone for the more developed municipalities normalized by calculating employment densities
- 1996 air photo mosaic of the region to determine remaining area that was undeveloped or underdeveloped in the City of Victoria, District of Langford, City of Colwood, Victoria International Airport, and Keating Business Park, including local knowledge of where

employment growth has occurred since 1996 or plans for future large office or retail developments; and,

- Urban Capacity Inventory Data on the percentage of the Traffic Zone that is industrial, commercial, or institutional.

Distribution of Employment Growth by Traffic Zone to Job Type Categories

Total employment by job type in the VMA+ was assumed to grow at the regional population growth rate. Therefore, elementary school, high school, hospital, home-based business and retail were assumed to grow by about 27.5%. Residual employment was allocated to industrial and office job types. The same growth rates were assumed to apply for all Alternatives.

The employment data for 2025/26 was then distributed by the eight job type categories used by the Emme/2 model. Home-based business employment was calculated as 5% of new population growth, the same ratio as in 1996, a slight rise over that in 1996. Hospital, post-secondary school, and industrial employment was assumed to occur in the same locations as in 1996. High school and elementary school locations were assumed to follow population growth at the municipal level and then was allocated to existing school locations, for municipalities other than Colwood and Langford. For Colwood and Langford, a proxy of elementary and high-school employment was used from an average of Gordon Head Traffic Zones in Saanich and then applied to Traffic Zones which were predominantly “new neighbourhood”. Office and retail jobs were distributed as described above.

Additional Work Conducted for Populating Emme/2 Model

The final step was to add employment for Traffic Zones on Vancouver Island that are outside the CRD and north of the Malahat, which are required to fully populate the Emme/2 model as travel between these region occurs via Highway 1. The 1996 census was used to estimate a jobs-to-population ratio and this was multiplied by the BC Stats Population Projection for 2025/26 to obtain 2025/26 employment up-Island. Work conducted in the early 1990s by a consultant to the CRD on the distribution of employment by job type categories and by Traffic Zones was used.

General Limitations

Employment projections and allocations are generally less reliable than population and housing projections and allocations. First, employment projections and allocations are based on population and housing projections and allocations, which in turn rely on many assumptions, such as average household size, and dwelling type preferences. Considerable effort was spent on validating the dwelling and population allocations and adjusting for errors, which should improve the employment allocations. Other complicating factors which are difficult to predict which can affect employment projections and allocations include market forces that dictate business location and expansion decisions, trends in interest rates, global economic conditions, technological changes, growth or decline in economic sectors, and public sector and corporate investments and expenditures. Therefore the emphasis in this exercise was the distribution of employment and comparability between alternatives.

The following provides more detail to each of the tasks to estimate, project and allocate employment for the Alternatives.

4.5 Estimation of 1996 Employment by Traffic Zone by Job Type Categories

Objective: To estimate the 1996 employment by Traffic Zone by Emme/2 job type, adjusting for the census undercount and those with no usual place of work
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Sources: Custom Statistics Canada 1996 Census Employment Data by Traffic Zone and by Emme/2 job type

Method and Assumptions:

1) A custom Statistics Canada file of Employment by Traffic Zone by Emme/2 Job Type Categories was ordered. For the Emme/2 model job types, CRD Regional Planning Services has a correspondence table between US Standard Industrial Classification (SIC) Codes and the eight Emme/2 job type categories. A correspondence table was used to relate the Canadian SIC Codes used by Statistics Canada to the US SIC Codes to determine the correspondence between Canadian SIC Codes and the eight Emme/2 job types.

2) Regional Planning Services adjusted the 1996 Census Employment data by Traffic Zone by Emme/2 job type categories to adjust for the census undercount of employment. The adjustment was first made at the VMA level then at the municipal level. The data at the Traffic Zone level was factored at the municipal level using the ratio of the adjusted employment municipal total to the unadjusted employment municipal total.

3) The Statistics Canada data does not include people with no usual-place-of-work in its Traffic Zone data. Regional Planning Services took the total number of people with no usual place of work in the VMA and distributed them according to the proportion of total employment in each Traffic Zone. The same distribution of job types was used for this allocation.

4) Regional Planning Services shifted employment for those Traffic Zones where there was a block face captured incorrectly in an adjacent Traffic Zone. This included moving employment from a Traffic Zone adjacent to the ferry terminal which contained BC Ferries employment and redistributing the University of Victoria employment which fell into one Traffic Zone instead of being distributed among the three Traffic Zones that comprise the University of Victoria campus.

5) Regional Planning Services added total employment for Port Renfrew and the surrounding area west of Jordan River as it falls outside the VMA.

1996 VMA+ Control Total Employment Adjusted for Census Undercount and those with no-usual-place-of-work (unrounded total): 155,847
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Validation and Limitations:

1) The 1996 Statistics Canada data was validated using CRD Regional Planning Services' Regional Employer Data. While there were some differences in employment totals by the Emme/2 job type categories, CRD Regional Planning Services staff were comfortable with the Statistics Canada data and believe their data is defensible.

4.6 Forecast of Total Employment for the VMA+, 1996-2026

Objective: To forecast a control total for total employment in 2025/26 for the VMA+.
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Sources: 1996 employed labour force to population ratio for VMA+, Statistics Canada Census Data

Method and Assumptions:

1) The employed labour force to population ratio for the VMA was 0.49 in 1996.

2) It was assumed that the 2025/26 employed labour force to population ratio would remain unchanged from 1996.

3) The total population for the VMA+ that Urban Systems Ltd. Calculated for 2025/26 for each of the Alternatives was multiplied by 0.49 to yield the total employment for the VMA+.

Table 4-1: Total Employment Projections for the VMA+ for the Alternatives, 2025/26 (unrounded totals)

	Base Strategy	Alternative 1	Alternative 2	Alternative 3
Projection Year (1)	2025	2026	2026	2026
Total Population (2)	404,907	407,954	407,923	407,919
Assumed regional jobs-to-population ratio (3)	0.49	0.49	0.49	0.49
Total Employment (4)=(2)*(3)	197,862	199,892	199,885	199,886
New Employment, 1996 to 2025/26, (5)=(4) - 155,847	42,015	44,045	44,038	44,039

Validation and Limitations:

1) The 0.49 regional jobs-to-population ratio is based on data for 1996 for the VMA. Supporting justification for using this ratio is a study by Coriolis Consulting Corp. for the GVRD (1999, p.44), which indicates that the jobs-to-population ratio in the Lower Mainland has been relatively constant from 1981 to 1996 at about 0.49. Their consultant thought that this would be at the low end of the range of employment projections to the year 2021 for the Lower Mainland. However, as the median age of persons is higher in the VMA than in the Lower Mainland, and will keep increasing over the next decades, the regional jobs-to-population ratio was thought to be the same or lower than that of the Lower Mainland. The actual jobs-to-population ratio in the future will be influenced by the unemployment rate and trends in the age that workers retire from the labour force. Future employment forecasts for the final Regional Growth Strategy may wish to include a participation rate in the employed labour force by age cohort to more accurately predict changes in the employed labour force.

4.7 Allocation of 2025/26 Employment Growth to Employment Geographies

Objective: To estimate total employment by employment geographies for 2025/26, which will be used as control totals later for allocating employment to Traffic Zones

Sources:

- 2025/26 total population by Traffic Zone from Urban Systems Limited.
- 1996 Regional Employer Database to calculate jobs-to-population ratios
- 1996 Regional Employer database and GIS captures to calculate employment densities
- 1996 Statistics Canada Custom Census Data Run of Employment by Traffic Zone

Method:

1) The 2025/26 total population data by Traffic Zone was split to the sub-land use polygon level and aggregated to the employment geography level. The population was split based on the potential units in the SLUPs contained within a Traffic Zone. The sub-land use population data was then aggregated to the employment geography level.

2) The points from the 1996 CRD regional employer database and the 1996 Statistics Canada population and dwelling blockface data were captured at the sub-land use polygon level, adjusted for the census undercount, and aggregated to the employment geography level. Jobs-to-population ratios and employment densities were calculated for 1996 for each of the employment geographies.

3) Calculation of New Home-Based Businesses

In 1996, 9.3% of the total employment in the VMA was home-based compared to 8.2% in the 1991 census. It was assumed that home-based business would increase in the future to 10% of new employment. Therefore, the new population at the Traffic Zone level was used to calculate the new home-based business distribution.

4) Calculation of New Employment Growth in the City of Victoria

As the City of Victoria contains the largest number of jobs in the region, its share of the 1996 to 2025/26 employment growth was then calculated. For the assumed share of new employment for the City of Victoria, the share was calculated relative to the total employment in the region. In 1996, the City of Victoria contained 49% of all jobs in the VMA. For the Base Strategy, it was assumed that the City of Victoria would continue to attract jobs, but that its overall total share of employment would decline. It was assumed that the total number of jobs in the City of Victoria would decline to about 45%, which is equivalent to 27% of job growth between 1996 and 2025 occurring in the City of Victoria.

For Alternative 1, which focuses growth in the Metropolitan Core and in Major Centres, it was interpreted that this alternative would have a higher share of the region's employment growth than the Base Strategy. It was therefore assumed that the City of Victoria's share of the VMA+'s total employment would decline to 47.5%, which is equivalent to about 40% of the new job growth occurring in the City of Victoria.

For Alternative 2, which has a Regional Centre for the City of Victoria that is smaller and less dense than the Metropolitan Core concept for Alternative 1, it was interpreted that the City of Victoria would receive employment within the range of the Base Strategy (27% of new employment growth) and Alternative 1 (40% of new employment growth). Redistributing the office and retail employment resulted in an estimate of new employment in the City of Victoria falling to about 28%. Using population as a guide for some of that employment growth indicates that Alternative 2 receives about 15% of the new population growth, compared to 21% for the Base Strategy and 20% for Alternative 1. Therefore, it was assumed that the City of Victoria's share of the region's total employment would fall to approximately 45%, about the same as for the Base Strategy.

For Alternative 3, where population growth is concentrated in centres of a range of sizes throughout the VMA, it was assumed that the City of Victoria would receive 25% of the office and retail jobs, the major centres would receive 25%, the villages 20%, the local hubs 15%, and elsewhere 15% of the office and retail jobs. This distribution is based on judgement by Regional Planning Services staff, using the population growth in the various centre types and geographies as a guide. This assumption results in the City of Victoria's share of employment growth declining to about 22% compared to 28% for Alternative 2. Therefore, the City of Victoria's share of the region's total employment would be about 43% compared to 45% for Alternative 2.

4) The residual new employment growth (after subtracting the City of Victoria's share and new home-based business) was then allocated to each of the special employment geographies, using one of four methods:

a) 2025/26 population * 1996 jobs-to-population ratio for that special employment geography (the method used for most employment geographies; some of the jobs-to-population ratios were adjusted if they seemed to high or low relative to similar areas)

b) 1996 jobs adjusted for census undercount * regional population growth rate (e.g. Royal Jubilee Hospital and War Memorial Hospital, Victoria General Hospital, University of Victoria)

c) manual calculation at the Traffic Zone level and aggregated to the employment geography level (using potential employment densities and air photos to determine remaining undeveloped or underdeveloped area) (e.g. Keating Business Area, Victoria International Airport, Glendale Lands), and

d) Special Cases (CFB Esquimalt, Swartz Bay Ferry Terminal, Royal Roads University).

Any residual employment was allocated to the District of Saanich or the District of Langford to add up to the VMA+ employment control total. Both the District of Saanich and District of Langford were thought to have capacity to accommodate additional employment growth beyond their new employment growth share.

Validation and Limitations:

1) The allocation of new employment, particularly retail and office jobs, is highly dependent on the distribution of dwellings and population and would be affected by any errors in the population projection and allocation. Regional Planning Services spent a considerable amount of time validating the dwelling and population allocations from Urban Systems Limited for the Alternatives. There were several corrections made to the UCIS database, particularly for Traffic Zones in the Western Communities, due to changes in land use designation since 1995 when the UCIS data was compiled. This includes reducing densities for 'new neighbourhood' land use classifications that are outside the UCB and not yet developed and reducing the densities to 0 for areas that have now become parks. Other changes included rectifying errors in the original UCIS database that resulted in an overestimation of densities and potentially developable areas in lands that are now designated as Forest Land Reserve or that have steep slopes (Malahat area and Sooke Hills). The population data was validated using thematic maps of population densities and population change by Traffic Zone in ArcView, supplemented with an air photo mosaic backdrop in ArcView.

4.8 Allocation of 2025/26 Employment Growth from Employment Geographies to Traffic Zones

Objective: To distribute the control totals for new employment growth by employment geography calculated above to Traffic Zones

Sources:

- 1996 Census, Statistics Canada Custom Run of employment by Traffic Zone
- Air Photo Mosaic of VMA
- Commercial, Industrial, and Institutional land area from the UCIS

- Local Knowledge

Method:

1) The control totals by employment geography were allocated to Traffic Zones in three ways:

a) For most employment geographies, the location of new jobs was assumed to follow the existing distribution of jobs within that employment geography. Therefore, if a Traffic Zone contains 10% of the 1996 employment within an employment geography, it is assumed to capture 10% of the new employment growth.

b) The above method can not be used for calculating employment in ‘new neighbourhoods’ created since 1996 and in areas that are close to capacity. Therefore, for the District of Langford, District of Colwood, City of Victoria, and parts of the District of Saanich, a manual estimate of the percentage of new growth occurring in each Traffic Zone was made. To assist in this process, an air photo mosaic of the region, GIS files containing land use information, and 1996 employment were used as guides for allocating the new employment growth. For the City of Colwood, the plan for the first phase of Royal Bay which shows village centre and school locations was also used. A manual distribution of employment to Traffic Zones was also used in Keating Business Park and at Victoria International Airport.

c) For new neighbourhoods, such as in Langford, the jobs-to-population ratios of Traffic Zones in the Gordon Head area were used as proxies for total employment in the Base Strategy.

Validation and Limitations:

The data was tested for reasonableness using thematic maps of employment densities and employment growth in Traffic Zones. However, because of the uncertainties regarding employment growth and location, there will likely be more errors than in the population and dwelling allocations to Traffic Zones. Where known retail or office developments had occurred since 1996, such as the Selkirk Waterfront Complex and the Thrifty’s Foods centre on Admirals Road, these were included in the 2025/26 Traffic Zone allocations of employment.

4.9 Distribution of Employment Growth by Traffic Zone to Emme/2 Job Type Categories, 1996-2025/26

Objectives: To distribute the total 2025/26 employment by Traffic Zone to Emme/2 Job Type Categories
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Sources: 1996 Custom Census Run of Employment by Traffic Zone by Emme/2 Job Type Categories.

Method:

1) Hospital and Post-secondary school employment growth was assumed to occur in the same Traffic Zones as in 1996. Both of these were assumed to grow by the VMA+ population growth rate for the period from 1996 to 2025/26.

2) New home-based businesses were calculated as a percentage of new population growth in a Traffic Zone. In 1996, 9.3% of jobs in the region were home-based business according to the 1996 Census. It was assumed that new home-based businesses would increase to 10% of the new employment growth from 1996 to 2025/26.

3) New high school and elementary school jobs were assumed to follow population growth at the municipal level. The high school and elementary school employment was allocated to Traffic Zones where schools are currently located for all municipalities other than Langford and Colwood. For Langford and Colwood, a proxy of the proportion of elementary and high school employment was used from an average of Gordon Head Traffic Zones in Saanich. This distribution of job type categories was then applied over the Traffic Zones which were predominantly new neighbourhood in Langford and Colwood.

4) Industrial job type growth was assumed to occur in the same Traffic Zones as in 1996. The distribution of new industrial-type jobs was assumed to be the same for all Alternatives.

5) Office and retail type jobs were the employment types that were assumed to change the most for the Alternatives. For Alternative 1, it was assumed that the City of Victoria contained 40% of the total new employment growth. Therefore, the office and retail jobs were back-calculated for the City of Victoria and the remaining employment geographies. For Alternative 2, 28% of the total new employment growth was assumed to occur in the City of Victoria. Therefore, the office and retail jobs were back-calculated for the City of Victoria and the remaining employment geographies. For Alternative 3 it was assumed that 20% of office and retail jobs would occur in villages, 15% in local hub centres, 25% in major centres, 25% in Downtown Victoria, and 15% elsewhere in the Region. These distributions were selected after reviewing population growth occurring in the centres of Alternative 3. Job-to-population ratios were then back-calculated for office and retail employment for each of the above geographies and then applied to population growth for Traffic Zones containing centres. For Traffic Zones not containing a centre, the office and retail job totals were distributed according to the distribution of office and retail jobs as in the Base Strategy.

6) The final result of all of these steps is employment by Traffic Zone by job type category for 2025/26, which was then converted into Emme/2 format.

Limitations:

1) The assumption of 10% of new employment working in home-based businesses does not take into account demographic differences of the new population by Traffic Zone or the location of the Traffic Zone. For example, the percentage of the new population working in home-based businesses would likely be higher in Metchosin or North Saanich compared to Victoria. In addition, the percentage of employment conducted in home-based businesses may increase in the future due to advances in communications technology and employment trends. However, to keep the method simple, a conservative 10% was used for the home-based business share of employment growth. This also does not require the existing home-based business share of employment in 1996 to be recalculated.

5.0 Additional Work Conducted for Populating Emme/2 Model

As the Transportation Model also requires information about areas outside the Region to estimate travel in the future, additional employment data by Traffic Zone by job type category was needed for areas north of the Malahat (i.e. The Cowichan Valley Regional District and further up-Island). This data is used to estimate trips over the Malahat on the Trans-Canada Highway. Only a portion of the total population and employment in these areas is used, so these totals will not match the total population and employment for these areas. The 2025/26 data for these Traffic Zones is assumed to be the same for all Alternatives.

Objective: To project and allocate employment by Traffic Zone and job type for the Traffic Zones on Vancouver Island north of the Malahat, for 1996 and for 2025/26.

Data Sources:

- 1996 OCP Option Study Data
- BC Stats PEOPLE 24 Population Projections to 2026 for the Cowichan Valley Regional District (CVRD), Nanaimo Regional District, Alberni-Clayoquot and Comox-Strathcona Regional District
- 1996 census for current jobs-to-population ratios
- Emme/2 Job-type distribution for CVRD based on work done in 1991 by CRD or its consultants

Method:

1) The CRD's Transportation Analyst estimated total employment growth for the up-Island Traffic Zones using the jobs-to-population ratio for the CVRD from 1996 and the PEOPLE 24 Population Projection for those Regional Districts.

2) The CVRD's 1996 Emme/2 job-type distribution was then applied to the new employment growth. As the population increased by 54.5% in this area, the total employment was assumed to increase by the same percentage.

Table 5-1: 1996 Population and Employment for part of CVRD and part of area to the north and 2025/26 Projected Population and Employment (unrounded total):

	1996	2025/26
Total Population	24,220	38,671
Total Employment	6,253	9,661

Limitations:

1) Less information was available to CRD Regional Planning Services on employment outside the region compared to data that was available for the VMA. Therefore the employment allocation for these areas is probably less accurate than for the VMA.

6.0 Terms, Assumptions and Limitations

Terms and Acronyms

The following terms are used throughout this report:

- **CRD** – Capital Regional District
- **GIS** – Geographic Information System
- **HAT** – Housing Allocation Tool (in the this report, it refers to the spreadsheet tool that has been developed specifically for the CRD’s Regional Growth Strategy project)
- **Practical Residential Capacity** – the total number of units that can be developed in an area based on an assigned land use designation and density. Practical capacity is reached at 90% of the total dwelling capacity for an area.
- **RHoDeS** – Regional Housing Demand Spreadsheet
- **RGS** – Regional Growth Strategy
- **SLUP** – Sub-Land Use Polygon (the lowest level of geography used in the UCI)
- **UCB** – Urban Containment Boundary – a boundary common to all the RGS Alternatives, which separates urban areas from rural, and within which future growth will be concentrated. Areas outside the UCB will retain their rural character and servicing standards.
- **UCI**– Urban Capacity Inventory
- **UCIS** – Urban Capacity Inventory System (the software used to manage the UCI)
- **VMA+ - Victoria Metropolitan Area plus** - a term used to describe the Regional Growth Strategy Study Area, based on the VMA (defined by Statistics Canada as the portion of the Capital Region extending from Otter Point, located west of Sooke, to Swartz Bay on the Saanich Peninsula) plus Port Renfrew. Note that Salt Spring Island and the Outer Gulf Islands are not included in the study area.
- **Forecast vs Projection** - A forecast represents a best estimate for the way in which future growth will be affected by current and future trends and developments, based on the professional judgement of the forecaster. The term forecast in this report refers to the regional population forecast prepared by BC Stats, the regional housing demand for new units (RhoDeS results) prepared by Urban Systems, as well as the regional employment forecast prepared by CRD Regional Planning Services.
The term projection refers to the way in which the regional population, dwellings, and employment forecast are allocated to the subregional level based on the characteristics and assumptions of each Alternative.
Neither should be considered as targets.
- **Employment and Jobs** – Employment and jobs in this report refers to employed labour force, full-time or part-time, and not positions available.
- **Subregions** – in 1996 the VMA+ consisted of 12 municipalities and 2 unincorporated electoral areas, generally categorized into three subregions:
 - ◆ Core: Township of Esquimalt, District of Oak Bay, District of Saanich, and City of Victoria
 - ◆ Peninsula: District of Central Saanich, District of North Saanich, and Town of Sidney
 - ◆ Western Communities: City of Colwood, District of Highlands, District of Langford, Langford Electoral Area, District of Metchosin, Sooke Electoral Area, and the Town of View Royal. Note that on December 6, 1999, the District of Sooke and Juan de Fuca Electoral Area were created, replacing the Sooke and Langford Electoral Areas.
- **Dwelling unit types** – the following categories of dwelling unit types were used in the models to determine housing supply and demand:

- ◆ **Single-family Detached/Duplex Units (Ground Oriented, or GO):** includes single-family detached houses, semi-detached houses and apartments in a detached duplex;
- ◆ **Other Ground Oriented Units (OGO):** includes row houses, other single-attached houses, and moveable dwellings/mobile homes;
- ◆ **Non-Ground Oriented Units (NGO):** includes apartments that are 5 or more stories and apartments that are less than 5 stories (these are the two census categories for apartments).

Note that secondary suites are not included in any of these categories; nor were they considered as part of the baseline data for housing units.

Assumptions

The baseline year for the Regional Growth Strategy is 1996. Census information used in the preparation of the data described in this report was taken from the 1996 Census of Canada. The ‘undercount’ of missed individuals/households of just over 4% has been taken into account.

The planning period for the RGS extends to 2026. However, for the Base Strategy, residential capacity to accommodate new population runs out in 2025, so the report refers to both 2025/2026.

The nine local First Nations are not formally participating in the Capital Region’s Growth Strategy project. However, the Reserves are included in the population and employment projections and allocations for the purpose of populating the Regional Transportation Model. There was no population reported for the Union Bay and South Saanich Indian Reserves in the 1996 Census.

A *practical capacity* of 90% of the total dwelling unit capacity is assumed to be both reachable and reached in residential areas. Dwelling unit supply has been calculated on the basis of reaching the practical capacity. There has been some disagreement about whether this is a realistic assumption; however, baseline data from the UCI indicates that some municipal planners consider a significant proportion of their areas to be developed to 100%, so 90% *as an average* could be considered reasonable.

The UCIS Base Strategy data continued to be used for the areas outside the centers in Alternatives 1 to 3.

Two factors were used in HAT to determine the ‘attractiveness’ of a municipality to those seeking housing: relative housing availability and affordability. Dwelling units allocated at the municipal level were then allocated to Traffic Zones based on each Traffic Zone’s share of the municipality’s remaining practical capacity. As demand exceeded supply for certain dwelling types, the housing supply/demand had to be adjusted by shifting unmet demand to other dwelling types or Traffic Zones. See Volume II – Methodology - for explanations of HAT, the process, and the adjustments.

It was assumed that in cases where demand exceeded supply of Single-family units, demand would shift to and consume first any remaining Other Ground Oriented supply, and then to Non-Ground Oriented units.

The 1996 jobs-to-population ratio for the Region of 0.49 was assumed to continue to 2026.

Home-based businesses were assumed to account for 10% of all new jobs from 1996 to 2026. Though some forecasters estimate higher proportions, it was decided that based on the mix of employment types typical here, this would be an appropriately-conservative estimate.

Geographic distribution of industrial employment and the special employment geographies remain constant between the 4 Alternatives.

Limitations

The following provides a list of some general limitations that should be kept in mind when reviewing the results of the population, dwelling, and employment projections and allocations. The limitations apply to all the Alternatives.

- *Length of Forecast Period* – given the rate of change in today’s world, it is considered by some to be risky to try to forecast behaviours, preferences and performance of various factors even five years in the future, let alone a quarter century.
- *Regional Population Forecast* - since all the regional population growth results from net migration, the forecast is particularly sensitive to changes in the local, provincial, federal and international economies and policies that affect migration. In addition, there is uncertainty over how the depletion of residential land supply will influence net migration through potential housing price increases.
- *Regional Housing Demand Forecast for New Dwelling Units* - the housing demand forecast is based on trends in and assumptions about several factors, including total population, family formation rates, household types, age distribution, and demand for rental versus owned dwellings, all of which are subject to change due to unforeseen circumstances that may arise during the planning period.
- *Dwelling and Population Projections and Allocations* - data for the Urban Capacity Inventory are for 1995/96 and were collected from municipal staff who identified on maps the land uses permitted in their Official Community Plans according to regionalized land use designations. There is subjectivity in the estimation of the percentage of the area which is currently developed. The data was verified using 1996 census data and by using local knowledge. The results of the Urban Capacity Inventory are estimated to be accurate to within +/-10%.
- Since the location of some of the centres, particularly the neighbourhood villages in Alternative 3, are conceptual, the distribution of population and employment within a municipality would change depending on the actual location chosen for those centres.
- *Regional Employment Forecast* - It is difficult to estimate the affect that trends such as people working beyond the typical 65 year retirement age may have on long-range jobs-to-population ratios. Future employment forecasts may wish to include a participation rate in the employed labour force by age cohort to more accurately project changes in the employed labour force.
- *Employment Projections and Allocations* - Employment projections and allocations are generally less reliable than projections and dwelling allocations of population for the following reasons:
 - ◆ CRD Regional Planning Services does not have a database of floor space and remaining commercial and industrial capacity
 - ◆ only new employment between 1996 and 2026 was allocated; the method does not account for changes in the total 1996 employment.
 - ◆ employment projections and allocations are based to some degree on population and housing projections and allocations, which in turn rely on many assumptions, such as average household size, and dwelling type preferences.
 - ◆ the distribution of new home-based businesses is particularly reliant on population forecasts
 - ◆ employment projections and allocations are complicated by factors which are difficult to predict such as market forces that dictate business location and expansion decisions;

interest rates; global economic conditions; technological change; growth or decline in economic sectors; and public sector and corporate investments, policy and expenditures.

APPENDIX A

HAT Output - Base Strategy

HAT Output for The Base Strategy

The primary assumptions for the Base Strategy are:

- Practical Capacity = 90%
- Traffic Zones including Indian Reserves have been included in the adjacent municipality

The remaining practical capacity is slightly insufficient to meet the 2026 regional demand of 52,393 new dwelling units. Therefore, the final horizon year has been set to 2025.

Urban Capacity Inventory

The total and remaining capacity information is summarized in Table A-1.

**Table A-1
UCI (Supply) Data for 1996, Base Strategy**

Dwelling Type	Number of Existing Units in 1996	Total Capacity (from UCI) for the Current Scenario	Practical Capacity (Total Capacity x Practical Capacity Assumption)	Remaining Units (Practical Capacity - Existing Units)
Single-family	85,128	107,244	101,739	16,611
Other Ground Oriented	9,715	17,701	16,378	6,663
Non-Ground Oriented	40,342	75,994	69,386	29,044
Total	135,185	200,939	187,503	52,318

For the Base Scenario, the practical capacity by SLUP was calculated from UCIS data and has been used as the regional practical capacity. Normally HAT would calculate the regional practical capacity (note: while the practical capacity by LUP is 90%, the result is a regional practical capacity of approximately 94% because some LUPs are currently more than 90% developed).

Supply/Demand Adjustments

The demand for all dwelling types can be met in 2010. However, by 2025, the demand for Single-family dwellings will exceed the remaining supply by 10,378 units, and for Other Ground Oriented by 41 units. It was assumed that all excess demand for Single-family and Other Ground Oriented would shift to Non-Ground Oriented. Table A-2 shows the assumed shift in demand.

**Table A-2
Adjustments to the RHoDeS Results, Base Strategy**

Dwelling Type	New Units Required		Total
	1996 to 2010	2011 to 2025	
Single-family	0	- 10378	- 10378
Other Ground Oriented	0	- 41	- 41
Non-Ground Oriented	0	10419	10419

Municipal Allocation

Tables A-3 and A-4 show the allocation of units by municipality and the remaining capacity for each for 1996 to 2010 and 2011 to 2025 respectively.

**Table A-3
Base Strategy, Allocation of Units and Remaining Total Capacity, 1996 to 2010**

Municipality	Allocated				Remaining Total Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	2,353	517	948	3,818	621	0	954	1,575
Highlands	380	0	0	380	0	0	0	0
Langford District	2,589	635	909	4,133	2,436	3,959	4,170	10,565
Langford EA	242	0	0	242	0	0	0	0
Metchosin	583	0	27	610	0	0	0	0
View Royal	475	428	575	1,478	0	0	0	0
Sooke	2,589	0	0	2,589	2,994	0	0	2,994
Esquimalt	210	288	788	1,286	0	0	1,617	1,617
Victoria	662	476	909	2,047	0	204	20,207	20,411
Saanich	1,040	357	788	2,185	2,142	548	1,733	4,423
Oak Bay	228	4	154	386	0	0	0	0
Central Saanich	1,110	116	1,026	2,252	0	0	0	0
North Saanich	638	142	0	780	642	0	0	642
Sidney	182	312	788	1,282	0	0	59	59
Total	13,280	3,275	6,914	23,469	8,836	4,711	28,738	42,285

Table A-4
Base Strategy, Allocation of Units and Remaining Total Capacity, 2011 to 2025

Municipality	Allocated				Remaining Total Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	210	0	954	1,165	411	0	0	411
Highlands	0	0	0	0	0	0	0	0
Langford District	1,078	2,636	4,170	7,884	1,358	1,323	0	2,681
Langford EA	0	0	0	0	0	0	0	0
Metchosin	0	0	0	0	0	0	0	0
View Royal	0	0	0	0	0	0	0	0
Sooke	731	0	0	731	2,263	0	0	2,263
Esquimalt	0	0	1,617	1,617	0	0	0	0
Victoria	0	204	11,858	12,062	0	0	8,349	8,349
Saanich	1,222	548	1,733	3,502	921	0	0	921
Oak Bay	0	0	0	0	0	0	0	0
Central Saanich	0	0	0	0	0	0	0	0
North Saanich	90	0	0	90	552	0	0	552
Sidney	0	0	59	59	0	0	0	0
Total	3,331	3,388	20,389	27,108	5,505	1,323	8,349	15,177

Dwelling units are allocated to all municipalities between 1996 and 2010. By 2010, only five municipalities have remaining capacity for Single-family Units. By 2025, Highland, Langford Electoral Area, Metchosin, Esquimalt, Oak Bay, Central Saanich and Sidney will be at or beyond their practical capacity. There will be just over 15,000 dwelling units remaining, representing 7.6% of the total capacity of the region.

Table A-5 shows the Allocated units and Remaining *Practical* Capacity by dwelling type by municipality for the Base Strategy for 1996 to 2025.

Table A-5
Base Strategy, Summary of Allocation of Units and Remaining Practical Capacity, 1996 to 2025

Municipality	Allocated				Remaining <i>Practical</i> Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	2,563	517	1,902	4,982	0	0	0	0
Highlands	380	0	0	380	0	0	0	0

Langford District	3,667	3,271	5,079	12,017	358	704	0	1,062
Langford EA	242	0	0	242	0	0	0	0
Metchosin	583	0	27	610	0	0	0	0
View Royal	475	428	575	1,478	0	0	0	0
Sooke	3,320	0	0	3,320	1,226	0	0	1,226
Esquimalt	210	288	2,405	2,903	0	0	0	0
Victoria	662	680	12,767	14,109	0	0	3,847	3,847
Saanich	2,261	905	2,521	5,687	0	0	0	0
Oak Bay	228	4	154	386	0	0	0	0
Central Saanich	1,110	116	1,026	2,252	0	0	0	0
North Saanich	728	142	0	870	12	0	0	12
Sidney	182	312	847	1,341	0	0	0	0
Total	16,611	6,663	27,303	50,577	1,596	704	3,847	6,147

Traffic Zone Allocation

The allocation to Traffic Zones are provided in the Excel Spreadsheets.

Conversion to Population

For the base case, the projected 2025 population is projected to be almost 405,000, with an average population per dwelling of 2.18. The population and total number of units in 2025 is summarized in Table A-6.

**Table A-6
Population and Dwelling Projection Summary, 2025 Base Strategy**

Dwelling Type	Average Population /Dwelling	2025 Population	2025 Dwelling Units
Single-family	2.56	260,473	101,737
Other Ground Oriented	2.24	36,747	16,377
Non-Ground Oriented	1.59	107,676	67,645
Total	2.18	404,896	185,759

APPENDIX B

HAT Output - RGS Alternative 1: Metropolitan Core & Major Centres

HAT Output for Alternative 1 - Metropolitan Core & Major Centres

The primary assumptions for Alternative 1 are:

- Practical Capacity = 90%
- Traffic Zones including Indian Reserves have been included in the adjacent municipality

The remaining practical capacity of 71,770 is more than sufficient to meet regional demand through to 2026.

Urban Capacity Inventory

The total and remaining capacity information is summarized in Table B-1.

Table B-1
UCI (Supply) Data for 1996, RGS Alternative 1

Dwelling Type	Number of Existing Units in 1996	Total Capacity (from UCI) for the Current Scenario	Practical Capacity (Total Capacity x Practical Capacity Assumption)	Remaining Units (Practical Capacity - Existing Units)
Single-family	79,746	101,958	91,762	12,016
Other Ground Oriented	13,066	30,386	27,347	14,281
Non-Ground Oriented	42,331	97,560	87,804	45,473
Total	135,143	229,904	206,914	71,771

Supply/Demand Adjustments

The supply of Single-family dwellings is predicted to be low by 1,264 units in 2010. Therefore it is assumed that the excess demand would be accommodated in Other Ground Oriented. From 2010 to 2026, the entire demand for Single-family dwellings of 14,260 must be accommodated in other dwelling types: 6,085 in Other Ground Oriented; 8,535 in Non-Ground Oriented. Table B-2 shows the assumed shift in demand.

**Table B-2
Adjustments to the RHoDeS Results, Alternative 1**

Dwelling Type	New Units Required		Total
	1996 to 2010	2011 to 2025	
Single-family	-1264	-14620	-15884
Other Ground Oriented	1264	6085	7349
Non-Ground Oriented	0	8535	8535

Municipal Allocation

Tables B-3 and B-4 show the allocation of units by municipality and the remaining capacity for each for 1996 to 2010 and 2011 to 2026 respectively.

**Table B-3
Alternative 1 Allocation of Units and Remaining Total Capacity, 1996 to 2010**

Municipality	Allocated				Remaining Total Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	2,300	913	991	4,204	723	468	2,531	3,722
Highlands	287	0	0	287	0	0	0	0
Langford District	2,531	860	951	4,342	2,175	3,351	4,034	9,560
Langford EA	20	0	0	20	0	0	0	0
Metchosin	398	0	27	425	0	0	0	0
View Royal	380	356	484	1,220	0	0	0	0
Sooke	2,531	429	319	3,278	1,075	160	1,435	2,671
Esquimalt	57	213	825	1,095	0	0	1,020	1,020
Victoria	1,016	644	951	2,612	4,072	5,542	29,415	39,028
Saanich	1,016	483	825	2,324	1,882	3,260	9,547	14,689
Oak Bay	153	3	93	249	0	0	0	0
Central Saanich	462	26	624	1,112	0	0	0	0
North Saanich	623	120	0	743	269	0	0	269
Sidney	242	492	825	1,559	0	0	332	332
Total	12,016	4,539	6,914	23,469	10,196	12,781	48,315	71,292

Table B-4
Alternative 1, Allocation of Units and Remaining Total Capacity, 2011 to 2026

Municipality	Allocated				Remaining Total Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	0	0	0	0	723	468	2,531	3,722
Highlands	0	0	0	0	0	0	0	0
Langford District	0	3,002	3,992	6,993	2,175	349	42	2,567
Langford EA	0	0	0	0	0	0	0	0
Metchosin	0	0	0	0	0	0	0	0
View Royal	0	0	0	0	0	0	0	0
Sooke	0	13	1,422	1,435	1,075	148	13	1,236
Esquimalt	0	0	961	961	0	0	59	59
Victoria	0	3,531	6,713	10,245	4,072	2,010	22,701	28,784
Saanich	0	3,196	5,827	9,023	1,882	64	3,720	5,666
Oak Bay	0	0	0	0	0	0	0	0
Central Saanich	0	0	0	0	0	0	0	0
North Saanich	0	0	0	0	269	0	0	269
Sidney	0	0	267	267	0	0	66	66
Total	0	9,742	19,182	28,924	10,196	3,039	29,133	42,368

Because of the reduction in the capacity for Single-family dwellings when compared with the Base Case, six municipalities will be fully developed by 2010. There will be a total of 42,368 units remaining in 2026, representing 18.3% of the total capacity of the region under Alternative 1. However, only 10% of the total capacity for Single-family and Other Ground Oriented will be remaining, while almost 30% of the total capacity of Non-Ground Oriented units will be remaining.

Table B-5 shows the Allocated units and Remaining *Practical* Capacity by dwelling type by municipality for the Base Strategy for 1996 to 2026.

Table B-5
Alternative 1, Summary of Allocation of Units and Remaining Practical Capacity, 1996 to 2026

Municipality	Allocated				Remaining <i>Practical</i> Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	2,300	913	991	4,204	30	303	2,103	2,436

Highlands	287	0	0	287	0	0	0	0
Langford District	2,531	3,862	4,943	11,335	1,214	0	0	1,214
Langford EA	20	0	0	20	0	0	0	0
Metchosin	398	0	27	425	0	0	0	0
View Royal	380	356	484	1,220	0	0	0	0
Sooke	2,531	441	1,741	4,713	267	81	0	348
Esquimalt	57	213	1,786	2,056	0	0	0	0
Victoria	1,016	4,176	7,665	12,856	2,452	918	17,250	20,621
Saanich	1,016	3,679	6,652	11,347	0	0	1,851	1,851
Oak Bay	153	3	93	249	0	0	0	0
Central Saanich	462	26	624	1,112	0	0	0	0
North Saanich	623	120	0	743	0	0	0	0
Sidney	242	492	1091	1,825	0	0	0	0
Total	12,016	14,281	26,096	52,392	3,964	1,302	21,205	26,470

Traffic Zone Allocation

The allocation to Traffic Zones is provided in the Excel Spreadsheets.

Conversion to Population

For the base case, the projected 2026 population is projected to be 407,930, with an average population per dwelling of 2.17. The population and total number of units in 2026 is summarized in Table B-6.

**Table B-6
Population and Dwelling Projection Summary, 2026 Alternative 1**

Dwelling Type	Average Population /Dwelling	2026 Population	2026 Dwelling Units
Single-family	2.57	235,750	91,767
Other Ground Oriented	2.25	66,014	29,320
Non-Ground Oriented	1.60	106,166	66,470
Total	2.17	407,930	187,557

APPENDIX C

HAT Output - RGS Alternative 2: Transit-Linked Towns

HAT Output for Alternative 2 - Transit Linked Towns

The primary assumptions for Alternative 2 are the same as Alternative 1:

- Practical Capacity = 90%
- Traffic Zones including Indian Reserves have been included in the adjacent municipality

The remaining practical capacity of 62,027 is more than sufficient to meet regional demand through to 2026.

Urban Capacity Inventory

- The total and remaining capacity information is summarized in Table C-1.

Table C-1
UCI (Supply) Data for 1996, RGS Alternative 2

Dwelling Type	Number of Existing Units in 1996	Total Capacity (from UCI) for the Current Scenario	Practical Capacity (Total Capacity x Practical Capacity Assumption)	Remaining Units (Practical Capacity - Existing Units)
Single-family	80,173	98,222	88,400	8,227
Other Ground Oriented	13,699	32,237	29,013	15,314
Non-Ground Oriented	41,282	88,631	79,768	38,486
Total	135,154	219,090	197,181	62,027

Supply/Demand Adjustments

The supply of Single-family dwellings is predicted to be low by 5,053 units in 2010. It is assumed that the excess demand would be accommodated in Other Ground Oriented. From 2010 to 2026, the entire demand for Single-family dwellings of 14,620 must be accommodated in other dwelling types: 3,329 in Other Ground Oriented; 11,291 in Non-Ground Oriented. Table C-2 shows the assumed shift in demand.

**Table C-2
Adjustments to the RHoDeS Results, Alternative 2**

Dwelling Type	New Units Required		Total
	1996 to 2010	2011 to 2025	
Single-family	-5,053	-14,620	-19,673
Other Ground Oriented	5,053	3,329	8,382
Non-Ground Oriented	0	11,291	11,291

Municipal Allocation

Tables C-3 and C-4 show the allocation of units by municipality and the remaining capacity for each for 1996 to 2010 and 2011 to 2026 respectively.

**Table C-3
Alternative 2 Allocation of Units and Remaining Total Capacity, 1996 to 2010**

Municipality	Allocated				Remaining Total Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	1,432	1,966	1,008	4,406	1,569	1,802	7,962	11,333
Highlands	287	0	0	287	0	0	0	0
Langford District	1,576	1,851	968	4,394	2,844	3,044	5,491	11,380
Langford EA	20	0	0	20	0	0	0	0
Metchosin	398	0	27	425	0	0	0	0
View Royal	379	356	485	1,220	0	0	0	0
Sooke	1,576	784	324	2,684	2,076	0	833	2,909
Esquimalt	57	213	839	1,109	0	0	1,006	1,006
Victoria	633	1,387	968	2,987	621	1,648	15,543	17,813
Saanich	633	1,040	839	2,511	2,208	3,715	9,599	15,523
Oak Bay	153	3	93	249	0	0	0	0
Central Saanich	462	26	624	1,112	0	0	0	0
North Saanich	388	120	0	508	504	0	0	504
Sidney	233	583	740	1,556	0	0	0	0
Total	8,227	8,328	6,914	23,469	9,822	10,210	40,435	60,467

Table C-4
Alternative 2, Allocation of Units and Remaining Total Capacity, 2011 to 2026

Municipality	Allocated				Remaining Total Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	0	1,789	5,356	7,144	1,569	14	2,606	4,189
Highlands	0	0	0	0	0	0	0	0
Langford District	0	2,340	5,137	7,477	2,844	705	354	3,903
Langford EA	0	0	0	0	0	0	0	0
Metchosin	0	0	0	0	0	0	0	0
View Royal	0	0	0	0	0	0	0	0
Sooke	0	0	837	837	2,076	0	0	2,072
Esquimalt	0	0	1,011	1,011	0	0	0	0
Victoria	0	1,500	5,137	6,637	621	148	10,406	11,175
Saanich	0	1,358	4,459	5,817	2,208	2,358	5,140	9,706
Oak Bay	0	0	0	0	0	0	0	0
Central Saanich	0	0	0	0	0	0	0	0
North Saanich	0	0	0	0	504	0	0	504
Sidney	0	0	0	0	0	0	0	0
Total	0	6,986	21,938	28,924	9,822	3,224	18,497	31,543

By 2026, Colwood, District of Langford, Sooke, Victoria, Saanich and North Saanich will have remaining capacity. The total remaining capacity by 2026 will be 31,543 units, representing 14.4% of the total units. Single-family and Other Ground Oriented will be fully allocated to the practical capacity of 90%. The remaining supply of Non-Ground Oriented units represents 21% of the total capacity of Non-Ground Oriented units.

Table C-5 shows the Allocated units and Remaining *Practical* Capacity by dwelling type by municipality for Alternative 2 for 1996 to 2026.

Table C-5
Alternative 2, Summary of Allocation of Units and Remaining Practical Capacity, 1996 to 2026

Municipality	Allocated				Remaining <i>Practical</i> Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	1,432	3,754	6,364	11,550	944	0	1,583	2,527
Highlands	287	0	0	287	0	0	0	0

Langford District	1,576	4,190	6,105	11,871	1,916	59	0	1,975
Langford EA	20	0	0	20	0	0	0	0
Metchosin	398	0	27	425	0	0	0	0
View Royal	379	356	485	1,220	0	0	0	0
Sooke	1,576	784	1,161	3,521	1,267	0	0	1,267
Esquimalt	57	213	1,850	2,120	0	0	0	0
Victoria	633	2,887	6,105	9,625	0	0	6,462	6,462
Saanich	633	2,397	5,298	8,328	0	1,370	3,259	4,629
Oak Bay	153	3	93	249	0	0	0	0
Central Saanich	462	26	624	1,112	0	0	0	0
North Saanich	388	120	0	508	3	0	0	3
Sidney	233	583	740	1,556	0	0	0	0
Total	8,227	15,314	28,852	52,392	4,130	1,428	11,305	16,863

Traffic Zone Allocation

The allocation to Traffic Zones is provided in the Excel Spreadsheets.

Conversion to Population

For the base case, the projected 2026 population is projected to be 407,930, with an average population per dwelling of 2.17. The population and total number of units in 2026 is summarized in Table C-6.

**Table C-6
Population and Dwelling Projection Summary, 2026 Alternative 2**

Dwelling Type	Average Population /Dwelling	2026 Population	2026 Dwelling Units
Single-family	2.59	228,575	88,415
Other Ground Oriented	2.27	68,826	30,377
Non-Ground Oriented	1.61	110,530	68,767
Total	2.17	407,930	187,559

APPENDIX D
HAT Output - RGS Alternative 3:
Hierarchy of Walkable Centres

HAT Output for Alternative 3 - Hierarchy of Walkable Centres

The primary assumptions for Alternative 3 are the same as Alternatives 1 and 2:

- Practical Capacity = 90%
- Traffic Zones including Indian Reserves have been included in the adjacent municipality

The remaining practical capacity of 66,986 is more than sufficient to meet regional demand through to 2026.

Urban Capacity Inventory

The total and remaining capacity information is summarized in Table D-1.

Table D-1
UCI (Supply) Data for 1996, RGS Alternative 3

Dwelling Type	Number of Existing Units in 1996	Total Capacity (from UCI) for the Current Scenario	Practical Capacity (Total Capacity x Practical Capacity Assumption)	Remaining Units (Practical Capacity - Existing Units)
Single-family	78,736	102,141	91,927	13,191
Other Ground Oriented	15,735	33,851	30,466	14,731
Non-Ground Oriented	41,448	89,458	80,512	39,064
Total	135,919	225,450	202,905	66,986

Supply/Demand Adjustments

The supply of Single-family dwellings is low by 5,053 units in 2010. It has been assumed that the excess demand has been accommodated in Other Ground Oriented. From 2010 to 2026, the entire demand for Single-family dwellings of 14,620 would be accommodated in other dwelling types: 3,329 in Other Ground Oriented; 11,291 in Non-Ground Oriented. Table D-2 shows the assumed shift in demand.

Table D-2
Adjustments to the RHoDeS Results, Alternative 3

Dwelling Type	New Units Required		Total
	1996 to 2010	2011 to 2025	
Single-family	-5,053	-14,620	-19,673
Other Ground Oriented	5,053	3,329	8,382
Non-Ground Oriented	0	11,291	11,291

Municipal Allocation

Tables D-3 and D-4 show the allocation of units by municipality and the remaining capacity for each for 1996 to 2010 and 2011 to 2026 respectively.

Table D-3
Alternative 3 Allocation of Units and Remaining Total Capacity, 1996 to 2010

Municipality	Allocated				Remaining Total Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	2,182	451	819	3,451	980	1,305	3,195	5,481
Highlands	287	0	0	287	0	0	0	0
Langford District	2,400	424	786	3,611	3,429	4,810	5,478	13,716
Langford EA	20	0	0	20	0	0	0	0
Metchosin	398	0	27	425	0	0	0	0
View Royal	709	371	962	2,042	0	435	2	437
Sooke	2,400	211	263	2,875	1,482	866	2,183	4,530
Esquimalt	360	318	682	1,359	0	238	1,343	1,582
Victoria	964	318	786	2,068	469	2,069	17,056	19,594
Saanich	964	238	682	1,884	3,214	3,986	9,367	16,567
Oak Bay	474	132	230	837	0	381	792	1,172
Central Saanich	1,101	265	962	2,328	0	355	645	1,000
North Saanich	591	318	33	942	641	45	322	1,008
Sidney	340	318	682	1,339	0	262	713	976
Total	13,191	3,364	6,914	23,469	10,214	14,752	41,096	66,062

Table D-4
Alternative 3, Allocation of Units and Remaining Total Capacity, 2011 to 2026

Municipality	Allocated				Remaining Total Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	0	1,305	3,195	4,500	980	0	0	980
Highlands	0	0	0	0	0	0	0	0
Langford District	0	3,424	3,343	6,767	3,429	1,386	2,135	6,949
Langford EA	0	0	0	0	0	0	0	0
Metchosin	0	0	0	0	0	0	0	0
View Royal	0	435	2	437	0	0	0	0
Sooke	0	866	1,137	2,002	1,482	0	1,046	2,528
Esquimalt	0	238	1,343	1,582	0	0	0	0
Victoria	0	2,069	3,343	5,412	469	0	13,713	14,182
Saanich	0	1,987	2,902	4,889	3,214	1,999	6,466	11,679
Oak Bay	0	381	792	1,172	0	0	0	0
Central Saanich	0	355	645	1,000	0	0	0	0
North Saanich	0	45	142	187	641	0	180	821
Sidney	0	262	713	976	0	0	0	0
Total	0	11,367	17,557	28,924	10,214	3,385	23,539	37,138

By 2026, Colwood, District of Langford, Sooke, Victoria, Saanich and North Saanich will have remaining capacity. The total remaining capacity by 2026 will be 37,138 units, representing 16.5% of the total units. Single-family and Other Ground Oriented will be fully allocated to the practical capacity of 90%. The remaining supply of Non-Ground Oriented units represents 26.3% of the total capacity of Non-Ground Oriented units.

Table D-5 shows the Allocated units and Remaining *Practical* Capacity by dwelling type by municipality for Alternative 3 for 1996 to 2026.

Table D-5
Alternative 3, Summary of Allocation of Units and Remaining Practical Capacity, 1996 to 2026

Municipality	Allocated				Remaining <i>Practical</i> Capacity			
	Single-family	Other Ground Oriented	Non-Ground Oriented	Total	Single-family	Other Ground Oriented	Non-Ground Oriented	Total
Colwood	2,182	1,756	4,014	7,952	288	0	0	288
Highlands	287	0	0	287	0	0	0	0
Langford District	2,400	3,848	4,129	10,378	2,370	720	1,436	4525

Langford EA	20	0	0	20	0	0	0	0
Metchosin	398	0	27	425	0	0	0	0
View Royal	709	806	964	2,479	0	0	0	0
Sooke	2,400	1,077	1,400	4,877	657	0	773	1,430
Esquimalt	360	566	2,025	2,941	0	0	0	0
Victoria	964	2,387	4,129	7,480	0	0	9,704	9,704
Saanich	964	2,225	3,583	6,772	0	1,095	4,629	5,723
Oak Bay	474	513	1,022	2,009	0	0	0	0
Central Saanich	1,101	620	1,607	3,328	0	0	0	0
North Saanich	591	363	175	1,129	115	0	139	254
Sidney	340	580	1,395	2,315	0	0	0	0
Total	13,191	14,731	24,471	52,392	3,429	1,815	16,680	21,924

Traffic Zone Allocation

The allocation to Traffic Zones is provided in the Excel Spreadsheets.

Conversion to Population

For the base case, the projected 2026 population is projected to be 407,930, with an average population per dwelling of 2.17. The population and total number of units in 2026 is summarized in Table D-6.

**Table D-6
Population and Dwelling Projection Summary, 2026 Alternative 3**

Dwelling Type	Average Population /Dwelling	2026 Population	2026 Dwelling Units
Single-family	2.55	234,312	91,924
Other Ground Oriented	2.23	71,828	32,153
Non-Ground Oriented	1.58	101,790	64,231
Total	2.17	407,930	188,308

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