City of Richmond

Report to Committee

To:	Planning Committee	**Date:**	July 12, 2010
From:	Joe Erceg, MCIP General Manager, Planning and Development	**File:**	
Re:	**2041 OCP Update: Demographic, Housing and Employment Projections Study**		

Staff Recommendation

That the Staff Report dated July 12, 2010 entitled "2041 OCP Update: Demographic, Housing and Employment Projections Study" be received for information.

Joe Erceg, MCIP
General Manager, Planning and Development

Att. 4

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Staff Report

Origin

Purpose of this Report

1) Provide Council with a copy and summary of the 2041 OCP Update study entitled: "Community-level Projections of Population, Housing & Employment", prepared by Urban Futures, dated May 19, 2010; and

2) Present options regarding the potential new forms and locations of ground oriented housing (GOH) outside the City Centre.

2041 OCP Update

Work commenced last year to update the 1999 Official Community Plan. In May 2009, staff held an OCP Update – Metro Vancouver (MV) Regional Growth Strategy (RGS) workshop with Council to discuss the City's priorities for the 2041 OCP Update. In October 2009, Council endorsed a preliminary OCP Update work program and terms of reference for the main OCP studies (e.g., ESA Management Strategy, Demographics Study, Employment Lands Strategy).

On June 14, 2010, Council considered a progress report on the 2041 OCP Update (various main OCP studies, the first round of public consultation findings and the next steps). It is anticipated that the OCP with an accompanying DCC Bylaw will be finalized in the Fall 2011.

Attachment 1 is the current Policy Planning – OCP Work Program. This Staff Report to Planning Committee is one of the items identified for July 2010.

Council Term Goal

This report is consistent with the following Council Term Coal:

#3 "Ensure the effective growth management for the City through updating of the OCP (and sub area plans) to reflect current realities and future needs."

The Study entitled: "Community-level Projections of Population, Housing & Employment", prepared by Urban Futures, dated May 19, 2010 (**Attachment 4**)

General

The purpose of the Study is to identify to 2041 the anticipated population growth, need for housing types and employment growth by occupational sectors for the City as a whole and for specific planning areas in the City. The housing projections take into account both market and affordable housing tenure. The percentage to be "affordable housing" will be driven primarily by the City's 2007 Affordable Housing Strategy and by senior levels of government assistance.

Urban Futures uses a trend-based model to determine 2009 baseline and future 2041 projections of population, employment and housing types at the community-level. One of the key reasons the City hired Urban Futures for the 2041 OCP Update is because of their expertise in doing this type of demographic work and because their model could be refined down to the City's specific planning areas. Urban Futures prepared a similar study to the year 2100 for the City Centre, which the City used as a basis for the City Centre Area Plan Update.

2939215

Attachment 2 is a summary of the modeling approach employed by Urban Futures. It should be noted that Urban Futures determined the population, housing and employment projections within Richmond, and City staff reviewed these based on the City's existing policies for accuracy.

2041 Study Projection Drivers (assumptions)

The 2041 "drivers" include:

- Share of the Metro Vancouver Region 2041:
  - The first step in the modeling process is to account for the annual demographic change of the existing population in each regional sub-area (e.g., Richmond) and their future housing requirements by structure type (ground oriented and apartment) as they age through the lifecycle of housing maintainership demonstrated in their area. As well, the degree to which current residents will move is considered, in order to measure turnover of existing dwellings within each sub-area's housing stock.
  - The next step is to allocate the annual growth in regional housing occupancy demand by structure type to each sub-area (i.e., Richmond), with increments of new housing being added to the existing housing stock. This allocation is based on historical patterns of housing development in the region (as reflected in the annual patterns of housing starts over the past four decades) and the patterns of regional growth implied by municipal Official Community Plans and policies and the regional growth management plan.
  - Once dwellings are located within the region, they are "filled up" with people by age and sex based on structure type specific occupancy patterns from the most recent Census. This accounts for the housing occupancy of each sub-area's base population as it grows and changes (including the turnover of the dwelling stock as this population ages) and new residential development (and hence residents) that will be added to each area annually over the projection period.
  - The last step is to distribute employment by occupational sector to each of the regional sub-areas (e.g., Richmond). Two components of employment were considered in this allocation:
    i. The Population Serving Component: - the portion of employment that would be serving the local population. The portion of annual growth in sectoral employment that was deemed to serve the local population was allocated to each regional sub-area on the basis of its share of annual population growth in the region over the projection period; and
    ii. The Region-wide or Economic Base Component: - the portion that serves non-local activities (the region-wide or economic base component). This component was allocated on the basis of each sub-area's share of regional sectoral employment in the prior year. This approach accounts for where employment growth may be realized due to population growth within the region, while recognizing existing nodes of sector specific employment that have formed in the region.

- Allocation of 2041 Projections to City Planning Areas:
  - A number of inputs were used in the development of spatial projections of ground oriented and apartment housing development over the coming years. These included:
    - Census data describing the number of ground oriented and apartment dwelling units that existed in each planning area in 2006.
    - Census data describing the number and share of net additional dwelling units by structure type that were added to each planning area between 2001 and 2006.
    - An assessment of the potential future shares of housing development within each planning area by structure type based on information provided by the City of Richmond Planning Department (e.g., OCP).
    - The total number of net additional ground oriented and apartment dwellings projected for the City as a whole.
  - The following steps were used to determine the population for Richmond's seven planning areas:
    - The population projections begin with the 2006 Census data describing population by age and sex in ground oriented and apartment accommodation in each area, with the ageing, natality and mortality of these residents being accounted for first. Age and sex specific natality and mortality rates were used to generate estimates of the number of annual births and deaths that would be seen in each planning area.
    - The next step considered the mobility of households and the potential number and composition of households moving out of each planning area. An age, sex and structure type specific profile was generated from the Census data and used in conjunction with community-specific rates of housing turnover (also from the most recent Census) to estimate the total number of housing units from which households would move. These vacated units were then "filled up" using five-year mobility data by age, sex, structure type and period of construction from the Census to develop an estimate of the number of people by age and sex to be residing in the existing dwelling stock in each planning area.
    - The final step was to add the increment of new ground oriented and apartment housing to each planning area, and then move households (described by age and sex) into these new units.
  - The spatial projections of employment within the City are based on a combination of functional and capacity modeling approaches:
    - A similar functional modeling approach to that which was used at the regional (Lower Mainland) and municipal (City of Richmond) levels was used for planning areas within Richmond, with population growth and the existing structure of employment used as a starting point in the allocation of additional local population serving and non-population serving jobs by occupation classification for each planning area.
    - Land supply and planning considerations were used to inform the initial distribution of additional population serving and non-population serving jobs among the planning areas.

The initial Study planning area projection drivers were tested for practicality, modified and are presented here.

2939215

The current Study updates the 2041 projection data for the City Centre and completes it for the other planning areas in Richmond (see **Attachment 3**).

Attachment 4 is the final demographics study prepared by Urban Futures for the 2041 OCP Update.

Metro Vancouver Demographic Data

As part of the November 2009 draft RGS, MV prepared population, housing and employment projections for the Metro Vancouver region and its member municipalities and electoral area. Although these projections are good to use for comparative and regional planning purposes, they can not be refined down to specific planning areas or types of housing forms as has been done by Urban Futures. This type of refinement is required for the 2041 OCP Update.

Findings Of Fact

Regional Context

Population

The following table summarizes Urban Futures' and Metro Vancouver's regional population projections to 2041. Please note that the Urban Futures' data for the Lower Mainland is based on 2009 data, while the Metro Vancouver data for Metro Vancouver is based on 2006 data.

REGIONAL POPULATION TO 2041					
Source	Area	Current Population	2041 Population	Change 2009 to 2041	
				Number	Percentage
Urban Futures	Lower Mainland*	2,640,000 (2009)	4,120,000	1,480,000	56%
Metro Vancouver	Metro Vancouver	2,195,000 (2006)	3,400,000	1,205,000	55%
* - Lower Mainland includes the Metro Vancouver, Fraser Valley and Squamish Lillooet Regional Districts					

Key points:

1. The region's population growth will largely be the result of people moving to the area from elsewhere in BC, Canada and beyond.

2. All the 55 plus age groups are projected to grow faster than average, while all of the under 55 age groups are projected to grow slower than average.

3. The Urban Futures projections for the Lower Mainland (which includes the Metro Vancouver, Fraser Valley and Squamish Lillooet Regional Districts) confirm that Metro Vancouver's projections for the MV region in the draft RGS are reasonable and can be used as a basis for planning Richmond.

Housing

The following table summarizes Urban Futures' and Metro Vancouver's regional housing projections to 2041. Urban Futures distinguishes between two forms of housing based on the census data:

"Ground Oriented" - which includes single detached houses, duplexes, town houses, row houses and other forms of housing that have their own private entrance and access to a private outdoor area at the ground level (not necessarily on the ground; can use stairs).

"Apartment"   - housing which does not have its own private entrance (i.e., is accessed from a common indoor corridor) or access to a private outdoor area at the ground level and includes buildings 4 or less storeys (low rise), 5 to 8 storeys (mid rise) and 9 or more storeys (high rise).

REGIONAL HOUSING TO 2041					
Source	Area	Current Housing	2041 Housing	Change 2009 to 2041	
				Number	Percentage
Urban Futures - Apartment - Ground Oriented	Lower Mainland*	1,023,016 Total (2009) 382,282 Apt 640,734 GO	1,715,364 Total (2009) 680,153 Apt 1,035,211 GO	692,348 297,871 394,477	68% 78% 62%
Metro Vancouver	Metro Vancouver	1,158,000 (2006)	1,753,000	595,000	51%
* - Lower Mainland includes the Metro Vancouver, Fraser Valley and Squamish Lillooet Regional Districts					

Key points:

1. The demand for apartments will continue to grow due to population pyramid dynamics.

2. The demand for ground oriented housing (e.g., secondary suites; coach houses; single detached homes; duplexes; townhouses) is projected to continue to grow, but less than apartments as the region densifies to meet the demand and based on the ability to pay.

3. Urban Futures' regional housing projections are similar to Metro Vancouver's when the same area (MV) is considered. However, Urban Futures provides a further needed breakdown both regionally and locally of the types of housing, which is required for specific planning purposes such as the 2041 OCP Update.

Employment

The following table summarizes the regional employment projections to 2041. Urban Futures distinguishes between the total labour force (supply of people available to work) and the total employment (demand for workers). Metro Vancouver's data is for the total employment (demand for workers) only.

REGIONAL EMPLOYMENT TO 2041					
Source	Area	Current Employment	2041 Employment	Change 2009 to 2041	
				Number	Percentage
Urban Futures - Labour Supply - Labour Demand	Lower Mainland*	1,520,000 (2009) 1,360,000 (2009)	2,230,000 2,140,000	710,000 780,000	47% 57%
Metro Vancouver	Metro Vancouver	1,158,000 (2006)	1,753,000	595,000	51%
* - Lower Mainland includes the Metro Vancouver, Fraser Valley and Squamish Lillooet Regional Districts					

Key points:

1. Age specific male and female labour force participation rates are projected to increase between 2009 and 2041, with the largest increases occurring in the 55 plus age groups.

2. For females, this represents a continuation of a long term upward trend in participation, while for males this would represent a deviation from the longer term trend of declining rates.

3. On a relative basis, jobs in the public service, arts and humanities are projected to grow the fastest (by 87%), while in an absolute basis occupations in sales and service would add the most jobs (219,160 additional jobs).

2939215

4. Urban Futures provides both labour supply and labour demand projections for the Lower Mainland (the latter which confirm that the employment projections in MV's draft RGS are reasonable when considering the same area and can be used as a basis for applying to Richmond).

City of Richmond

Population

The following table summarizes Urban Futures' and Metro Vancouver's population projections for the City of Richmond to 2041.

RICHMOND POPULATION TO 2041					
Source	Area	Current Population	2041 Population	Change 2009 to 2041	
				Number	Percentage
Urban Futures	Richmond	190,480 (2009)	278,692	88,212	46%
Metro Vancouver	Richmond	182,700 (2006)	275,000	92,300	51%

Key points:

1. The 65 plus age groups are all projected to grow faster than average, while all of the under 65 age groups are projected to grow slower than average in Richmond due to population pyramid dynamics.

2. Richmond will continue to account for approximately 7-8% of Metro Vancouver's population according to both Urban Futures and Metro Vancouver.

3. Urban Futures projects 3,692 more people in 2041 than Metro Vancouver, which is useful in managing the City's growth but does not pose any issues since these are long term estimates which could change between now and 2041.

Housing

The following table summarizes Urban Futures' and Metro Vancouver's housing projections for the City of Richmond to 2041 (again, recognizing that Urban Futures distinguishes between apartment and ground oriented housing).

RICHMOND HOUSING TO 2041					
Source	Area	Current Housing	2041 Housing	Change 2009 to 2041	
				Number	Percentage
Urban Futures - Apartment - Ground Oriented	Richmond	68,641 Total (2009) 22,028 Apt 46,613 GO	114,912 Total (2009) 48,522 Apt 66,390 GO	46,271 Total 26,494 Apt 19,777 GO	67% Total 120% Apt 42% GO
Metro Vancouver	Richmond	64,000 (2006)	115,500	51,500	80%

Key points:

1. Richmond's urban footprint is becoming mature and "built out" for new housing, as there are no more BC Packers, Trites Road and London Landing areas to convert from industrial to residential uses. Consequently, it is suggested that the anticipated 2041 housing growth is to be accommodated primarily by identifying a range of housing options which densify existing residential areas while trying to respect the single family residential character of these neighbourhoods.

2. From 2009 onward, more population and housing growth will occur in the City Centre than outside the City Centre.

3. Richmond's share of new apartments in the Lower Mainland will decline from 11% in 2009 to 6% in 2041 because of increased competition throughout the region for this housing form, due to the regional availability of land elsewhere and region-wide densification.

4. Similarly, as Richmond's land base for ground oriented housing is becoming increasingly constrained, the City's share of new ground oriented housing units in the Lower Mainland will decrease from 9% in 2009 to 6% in 2041.

5. Urban Futures' housing projections at 2041 are within 588 total dwelling units of Metro Vancouver's, which are acceptable due to rounding and the long term perspective.

Employment

The following table summarizes the two employment projections to 2041 for the City of Richmond.

RICHMOND EMPLOYMENT TO 2041					
Source	Area	Current Employment	2041 Employment	Change 2009 to 2041	
				Number	Percentage
Urban Futures	Richmond	135,061 (2009)	179,772	44,711	33%
Metro Vancouver	Richmond	130,000 (2006)	181,000	51,000	39%

Key points:

1. On a relative basis, the occupations in primary industry are projected to grow the fastest (by 144%, although this only equates to an additional 1,198 jobs), followed by 110% in government, education, arts and recreation (areas which Richmond is underserved relative to the region as a whole).

2. On an absolute basis, employment in sales and service would add the most jobs (10,027 additional jobs), being driven largely by population growth.

3. The difference (1,228 jobs) between Urban Futures' and Metro Vancouver's employment projections is insignificant and within the acceptable margin of error for trend-based forecasting along a long (2041) time frame.

Separate Report on Employment Lands Strategy:

The City has retained the services of AECOM to undertake an Employment Lands Strategy (ELS) for the 2041 OCP Update. This Strategy will further examine the employment projections by Urban Futures and their implications for the land and building area requirements for the industrial, commercial, office, institutional and agricultural sectors. A separate staff report will be presented to Planning Committee and Council in the fall of 2010 with regard to the ELS.

Preliminary Findings of Urban Futures:

1. Richmond's anticipated employment growth to 2041 (33% according to Urban Futures) is not as vigorous as its population growth (46% according to Urban Futures) or its housing growth (67% according to Urban Futures) because of an aging labour force and limited supply of land.
2. 2041 – Jobs to Working Age Population: City-wide, the jobs to working aged population ratio for Richmond is anticipated to remain relatively stable (1.12 in 2009 and 1.14 in 2041).
3. Generally, core municipalities such as Richmond (Vancouver, Burnaby and New Westminster) will see more rapid growth in their seniors population and hence have a smaller labour force.
4. The outlying municipalities like Surrey and Pitt Meadows will see more rapid growth in their working aged population and therefore will experience the greatest relative growth in employment between 2009 and 2041.

Richmond Planning Areas

City Centre

The following table summarizes Urban Futures' 2010 population, employment and housing projections for the City Centre to 2041.

CITY CENTRE TO 2041					
Source	Category	2009	2041	Change 2009 to 2041	
				Number	Percentage
Urban Futures (2010)	Population	46,250	100,203	53,953	117%
	Employment	40,472	59,506	19,034	47%
	Housing	20,881 Total	46,922 Total	26,041 Total	125% Total
	Apartment	14,637 Apt	35,000 Apt	20,363 Apt	139% Apt
	Ground Oriented	6,244 GO	11,922 GO	5,678 GO	91% GO

The 2041 OCP Update projections by Urban Futures are consistent with the projections in the City Centre Area Plan, which are summarized in the following table.

2009 CITY CENTRE AREA PLAN TO 2041 OR 2100					
Source	Category	Current	Projected	Change 2009 to 2041 or 2100	
				Number	Percentage
Urban Futures (2007)	Population	51,526 (2009)	96,665 (2041)	45,139	88%
Urban Futures (2007)	Housing Apartment Ground Oriented	20,828 Total (2009) 15,299 Apt (2009) 5,529 GO (2009)	41,589 Total (2041) 31,341 Apt (2041) 10,248 GO (2041)	20,761 Total 16,042 Apt 4,719 GO	100% Total 105% Apt 85% GO
City Staff (2009)	Employment	30,700 (2006)	80,000 (2100)	49,300	161%

The slight variance in the Urban Futures' projections for the 2041 OCP Update and the 2009 City Centre Area Plan (CCAP) can be explained as follows:

1. The CCAP did not have the 2006 Census (the 2041 OCP Update is using the 2006 data, thus the projections are now higher).

2. The 2041 OCP Update takes into account the economic slow down of the past two years (Urban Futures' work on the CCAP was completed before this slow down, hence the 2009 projections are higher than what occurred).

Key points:

1. The City Centre is going to more than double its population between 2009 and 2041, thereby increasing its share of the City's population from 24% in 2009 to 36% in 2041.

2. The City Centre is continuing to be projected to accommodate the greatest absolute and relative increase in employment between 2009 and 2041, reinforcing its status as the central employment hub in Richmond.

3. 77% of the City's new apartment development and 29% of the City's new ground oriented housing is projected to occur in the City Centre.

4. The higher population and housing projections for 2041 do not alter the ultimate projected City Centre build out of 120,000 people and 56,900 housing units; they mean that the City Centre will reach its ultimate potential slightly earlier than 2100.

2939215

North Richmond

The following summarizes Urban Futures' population, employment and housing projections to 2041 for North Richmond (e.g., West Cambie, East Cambie, Bridgeport Road and Mitchell Island areas).

NORTH RICHMOND TO 2041					
Source	Category	2009	2041	Change 2009 to 2041	
				Number	Percentage
Urban Futures	Population	21,841	30,564	8,723	40%
	Employment	34,481	40,921	6,440	19%
	Housing	6,542 Total	10,824 Total	4,282 Total	65% Total
	Apartment	473 Apt	3,165 Apt	2,692 Apt	570% Apt
	Ground Oriented	6,069 GO	7,659 GO	1,590 GO	26% GO

Key points:

1. The population and housing growth in North Richmond can largely be attributed to the development of the Alexandra Neighbourhood in the West Cambie Area and Oris Development's proposal on River Drive.

2. North Richmond's employment growth is understandable in light of the area's existing commercial land base (Bridgeport Road; Cambie Road; St. Edwards Drive; Richmond Auto Mall) and industrial/office areas (Knight Street corridor; Mitchell Island; River Road; Shellbridge Industrial Park).

East Richmond

The following table summarizes Urban Futures' population, employment and housing projections for East Richmond to 2041.

EAST RICHMOND TO 2041					
Source	Category	2009	2041	Change 2009 to 2041	
				Number	Percentage
Urban Futures	Population	8,465	11,561	3,096	37%
	Employment	14,025	17,183	3,158	23%
	Housing	2,733 Total	4,829 Total	2,096 Total	77% Total
	Apartment	51 Apt	235 Apt	184 Apt	361% Apt
	Ground Oriented	2,682 GO	4,594 GO	1,912 GO	71% GO

Key points:

1. The anticipated 2041 population and housing growth in East Richmond will nearly entirely be in the Hamilton area (in light of the proposed new Trans Link bus operations/ maintenance facility in this area, and anticipated population and housing increases in the yet unbuilt-out areas of Hamilton).

2. The new apartments assume the redevelopment of the neighbourhood service centre in Hamilton and the completion of the rental apartment at Riverport.

3. The majority of the employment growth will occur on Port Metro Vancouver's lands and in the Fraserwood Industrial Park.

Steveston

The following table summarizes Urban Futures' population, employment and housing projections for Steveston to 2041.

| | | STEVESTON TO 2041 | | Change 2009 to 2041 | |
Source	Category	2009	2041	Number	Percentage
Urban Futures	Population	25,458	28,023	2,565	10%
	Employment	4,235	5,381	1,146	27%
	Housing	9,413 Total	11,564 Total	2,151 Total	23% Total
	Apartment	2,316 Apt	3,758 Apt	1,442 Apt	62% Apt
	Ground Oriented	7,097 GO	7,807 GO	710 GO	10% GO

Key points:

1. Steveston is expected to grow relatively slowly (10% population growth) and its share of net additional housing units (both apartment and ground oriented) on a City-wide basis is projected to decline because of the constraints on available and developable land.

2. The modest increase in employment in Steveston will largely be in sales and service and in arts, culture, health and education.

Sea Island

The following table summarizes Urban Futures population, employment and housing projections for Sea Island to 2041.

| | | SEA ISLAND TO 2041 | | Change 2009 to 2041 | |
Source	Category	2009	2041	Number	Percentage
Urban Futures	Population	833	880	47	6%
	Employment	24,204	35,211	11,007	45%
	Housing	315 Total	315 Total	0 Total	0% Total
	Apartment	0 Apt	0 Apt	0 Apt	0% Apt
	Ground Oriented	315 GO	315 GO	315 GO	0% GO

Key points:

1. Insignificant population and no housing growth are projected for Sea Island because of the airport.

2. Employment growth on Sea Island equates to the second greatest in absolute and relative terms (behind the City Centre) in light of Vancouver Airport Authority's 20 Year Master Plan and projected increases in servicing the rising passenger volumes at YVR.

3. The employment growth will be in the retail, food and protective services and in professional and technical occupations in the natural and applied sciences.

2939215

South Richmond

The following table summarizes Urban Futures' population, employment and housing projections to 2041 for South Richmond (e.g., Riverside Industrial Park and the Agricultural Land Reserve south of Steveston Highway).

SOUTH RICHMOND TO 2041					
Source	Category	2009	2041	Change 2009 to 2041	
				Number	Percentage
Urban Futures	Population	573	724	151	26%
	Employment	6,736	8,249	1,513	22%
	Housing Apartment Ground Oriented	304 Total 0 Apt 304 GO	604 Total 300 Apt 304 GO	300 Total 300 Apt 0 GO	99% Total 0% Apt 0% GO

Key points:

1. The anticipated population and housing growth in South Richmond is contingent upon Council's approval of the potential densification of the Ironwood neighbourhood service centre (it is suggested that industrial or agricultural land not be used for this purpose).

2. The anticipated employment growth will primarily be in the Riverside Industrial Park.

Central Richmond

The following table summarizes Urban Futures' population, employment and housing projections to 2041 for Central Richmond (i.e., the Thompson, Seafair, Blundell, Broadmoor and Shellmont neighbourhoods).

CENTRAL RICHMOND TO 2041					
Source	Category	2009	2041	Change 2009 to 2041	
				Number	Percentage
Urban Futures	Population	87,059	106,738	19,679	23%
	Employment	10,908	13,321	2,413	22%
	Housing Apartment Ground Oriented	28,452 Total 4,550 Apt 23,902 GO	39,853 Total 6,064 Apt 33,790 GO	11,401 Total 1,514 Apt 9,888 GO	40% Total 33% Apt 41% GO

Key points:

1. It is anticipated that Central Richmond will add the second largest absolute number of residents between 2009 and 2041 (the City Centre will add the most) mainly because of its large area and existing demographics of being primarily a residential area.

2. Employment growth will largely be with arts, culture, health and education jobs.

3. Central Richmond's share of net additions of apartments in the City will be 6% between 2009 and 2041 (the City Centre will be 77% and North Richmond's will be 10%).

4. Apartments:
   - Approximately 45% of the additional 1,514 apartment housing units projected between 2009 and 2041 could be accommodated by the proposed Fantasy Gardens and Broadmoor/Richlea Shopping Centre developments.

2939215

- The remaining 55% would require new OCP policies such as permitting increased residential densities within the footprint of other neighbourhood service centres (e.g., Blundell; Garden City; Seafair; Terra Nova), the potential redevelopment of the City's Works Yard and/or densification on top of existing buildings (e.g., developing the air space above a building).

5. Ground Oriented Housing (GOH):
   - With about half of the City's ground oriented housing stock in 2009, Central Richmond is projected to account for the largest share of net additional ground oriented units to 2041 (i.e., 50% of all the new ground oriented housing units) and will continue to retain its single family residential character.
   - Accommodated By Existing OCP Policies: Approximately 50% of the additional 9,888 ground oriented housing units projected between 2009 and 2041 could be accommodated under existing OCP policies (e.g., OCP, Area or Sub Area Plans or single family lot size policies). This would include:
     a) Secondary suites (in new houses under the existing zoning);
     b) Coach houses (above the garage and off a lane according to the OCP Arterial Road policies);
     c) Single family residential development (e.g., subdivision along arterial roads with a lane according to the OCP Arterial Road policies; development consistent with the Ash Street and Laurelwood Sub Area Plans; single family lot size policy areas that support subdivision such as the Lockhart Road area; completion of houses in the Terra Nova subdivision; older duplexes possibly being demolished and replaced by two single family houses; subdivision of large lots under the existing zoning in cul de sacs or with large frontages);
     d) Two family residential development (e.g., construction of new duplexes along roads where this use has already started such as No. 2 Road or St. Albans Road; legalization of existing, non conforming duplexes; replacement of older legal duplexes); and
     e) Multiple family residential development (e.g., town houses along arterial roads according to the OCP Arterial Road policies; development consistent with the Laurelwood and Sunnymede North Sub Area Plans; infill development along non-arterial roads where town house development has already occurred such as Ryan Road).
   - Accommodated By New OCP Policies: The remaining 50% of the anticipated demand for 9,888 additional ground oriented housing units between 2009 and 2041 can not be located in Central Richmond according to existing City policies (e.g., OCP, Area or Sub Area Plan or single family lot size policies). The remainder of this Staff Report will focus on the options Council has to meet this potential deficiency.

Analysis

The whole point of the 2041 OCP population, housing and employment projection review is to accommodate growth not anticipated in the current 1999 OCP.

2939215

Based on Urban Futures' housing projections and from the above discussion, there is a demand for approximately 4,944 ground oriented housing units that City staff do not believe the current OCP, Area and Sub Area Plans, and single family lot size policies can accommodate. This represents around only 7% of the total housing stock (ground oriented and apartments) in Richmond in 2009.

Council has many options to accommodate this growth and in doing so can also, importantly, increase the range of housing choices which residents need to meet their varied lifestyles and financial situations across the City.

Council's direction is required on which of the following options in terms of the type, scale, location and implementation timing it wants staff to ask the public about as part of the next phase of the OCP consultation process.

Option 1: Explore New Ground Oriented Housing Forms In Central Richmond

The following are several options for new forms of ground oriented housing (GOH) that could be located in Central Richmond.

At Planning Committee, examples of each potential new form of GOH housing will be illustrated, and their potential locations identified for discussion.

1. Type: *Secondary Suites in Existing Houses.*

   Description: Self contained dwelling in a single family house used by one household.

   Possible Locations: Central Richmond has approximately 14,400 single family houses that are zoned to permit a secondary suite and that are not identified for other development potential. It is difficult to estimate how many of these houses have existing secondary suites or to identify where these existing secondary suites are located.

   Potential: It is estimated that approximately 910 secondary suites could be either:
   - legalized if the City introduced new incentives and/or pursued stricter enforcement of existing illegal secondary suites; and
   - constructed in existing houses if the City introduced incentives for new secondary suites.

2. Type: *Secondary Suites in Land Use Contract (LUC) Areas.*

   Description: Self contained dwelling in a single family house used by one household.

   Possible Locations: Central Richmond has 46 single family residential LUCs in different neighbourhoods.

   Potential: Under the current Provincial legislation, a whole LUC (e.g., affecting 30 properties) is very difficult to amend (i.e., 100% of the property owners must agree to consent to any LUC amendments). In response to public concerns regarding Westwind LUC 157, the City is asking the Province to change the legislation so that these LUCs can be amended if 50% of the property owners consent to their amendment.
   - Assuming that the Provincial legislation is changed, staff project that of the 1,700 lots governed by LUCs in Central Richmond, approximately 300 new secondary suites might be added to the ground oriented housing stock between 2009 and 2041.

2939215

— If the Provincial legislation is not changed, individual property owners could apply to discharge a Land Use Contract on their specific lot and replace it with zoning which would permit a secondary suite. This latter approach would be a much slower way to enable secondary suites.

3. **Type:** *Secondary Suites in New Town Houses.*

   Description: A self contained dwelling in a new town house used by one household (e.g., typically on the ground floor of a 3 storey town house).

   Possible Locations: Near neighbourhood service centres and transit routes which would negate the need for a vehicle for the secondary suite.

   Potential: Staff have identified the potential for around 110 secondary suites in new town houses in Central Richmond.

4. **Type:** *Laneway Housing.*

   Description: An additional 1 storey dwelling to the principal single family residence with a maximum floor area (e.g., say 800 ft²) detached and separate from the principal house on the lot which could not be subdivided.

   Possible Locations:
   a) Internal lots with access to a lane off an arterial road (e.g., lots behind Williams Road and No. 1 Road lane).
   b) Internal lots with access to a lane not off an arterial road (e.g., Shellmont; Central West Broadmoor; Sunnymede).

   Potential: Of the estimated 1,400 single family lots in Central Richmond that could accommodate this new housing form, it is projected that approximately 650 new laneway housing units could be built between 2009 and 2041.

5. **Type:** *Back Yard Cottages (with no lane).*

   Description: An additional 1 storey dwelling to the principal single family residence with a maximum floor area (e.g., say 1,000 ft²) detached and separate from the principal house on the lot which could not be subdivided.

   Possible Locations: Large single family lots with no lanes (e.g., Thompson area).

   Potential: City staff have tentatively identified 65 lots in Central Richmond that could potentially be used for a back yard cottage.

6. **Type:** *Duplexes.*

   Description: Two separate dwelling units located either above/below, beside or in front/behind of each other.

   Possible Locations: Dead end cul de sacs with larger single family residential lots (Central Richmond has a number of situations like this, which could be the location for new, well designed duplexes).

   Potential: There are approximately 1,455 lots in Central Richmond that are located on dead end cul de sacs. City staff project that around 600 new ground oriented housing units could be added to the housing inventory on these lots.

2939215

7. Type: *Triplexes.*

    Description: Three self contained dwellings in a single detached dwelling each used by one household.

    Possible Locations: a) A single family house with two secondary suites (e.g., within 400 m/1,312 ft or a 5 minute walk of a neighbourhood service centre but not on an Arterial Road, such as the Maple Lane area behind the Broadmoor Shopping Centre).

                            b) A 3 storey single family house with a dwelling unit on each floor (e.g., single family residential LUCs which currently permit 3 storeys and where more than 50% of the LUC property owners would support this new form of development).

    Potential: City staff have identified around 2,500 lots near the Broadmoor, Blundell, Garden City, Seafair and Terra Nova neighbourhood service centres in Central Richmond. It is estimated that approximately 900 new ground oriented housing units could be built in these locations between 2009 and 2041.

8. Type: *Fourplexes.*

    Description: Four self contained dwellings (2 strata units on the ground floor; 2 strata units on the second floor) in a 2 (or potentially 3) storey, duplex form.

    Possible Locations: a) The possible legalization of existing duplex sites that are already used as a fourplex provided that a new, well designed fourplex is built (e.g., Blundell Road west of No. 1 Road).

                            b) The redevelopment of larger single family residential lots backing onto a school or park site (e.g., Dixon Elementary School in the "Monds" neighbourhood).

    Potential: There are approximately 2,000 lots in Central Richmond that back onto a school or park site. It is assumed that around 535 new housing units could be added to the ground oriented housing stock on these lots over the next 31 years.

9. Type: *Town Housing in New Locations.*

    Description: Three or more dwelling units where the yards are either privately owned (e.g., row housing or fee simple town housing) or under common ownership (i.e., typical strata development).

    Possible Locations: a) Within 400 m/1,312 ft or a 5 minute walk of a neighbourhood service centre but not on an arterial road (e.g., single family area around the Blundell Shopping Centre).

                            b) Redevelopment or densification of existing town house sites that are currently not strata titled subject to the City's 1-1 rental replacement policy in the OCP (e.g., housing co-ops; BC Housing sites; privately owned rental properties).

c) Redevelopment or densification of existing apartment sites that are currently not strata titled subject to the City's 1-1 rental replacement policy in the OCP.

Potential: City staff have estimated that 875 new town houses could be built between 2009 and 2041 if this new form of housing was approved at a density of 1.2 floor area ratio.

10. Other Type: *To Be Determined (TBD).*

Together, these new forms of ground oriented housing add up to 4,944 units (approximately).

Option 2: Consider Other Policy Areas To Accommodate Existing And/Or New Ground Oriented Housing Forms

In addition to exploring the above housing options, it is possible that other policy areas could be reviewed to accommodate existing (e.g., coach houses off of a lane) and/or new (e.g., duplexes on cul de sacs; triplexes close to a neighbourhood service centre but not on an Arterial Road; etc.) ground oriented housing forms.

1. Steveston

    For example, staff estimate that Steveston could accommodate another 1,500 ground oriented housing units (or 30% of the 4,944 deficiency). There are approximately 900 single family lots in the Steveston Village area that have potential lane access. So, a coach house could be built on each of these lots if the lane was constructed and the City allowed coach houses on a non Arterial Road. The remaining 600 ground oriented housing units could be made up of duplexes on cul de sacs, fourplexes backing onto a school or park site, town houses on a housing co-op site, triplexes near the Steveston Village, laneway housing, and secondary suites in LUC areas or town houses.

2. East Cambie

    The East Cambie area of North Richmond could also accommodate another 1,500 ground oriented housing units (or another 30% of the 4,944 deficiency). These 1,500 units would involve the densification of existing residential areas with the new housing forms proposed for Central Richmond and not the conversion of any industrial or park space for residential purposes.

3. Tait

    The other area that could potentially accommodate some of the 4,944 deficiency between 2009 and 2041 is the Tait subdivision off Bridgeport Road in North Richmond. Staff estimate that around 125 duplexes could be located in the cul de sacs in this neighbourhood and roughly 500 town houses could be built in this area if it was permitted to redevelop for multiple family residential purposes. This represents a maximum of 10% of the 4,944 deficiency.

4. City Centre
   Staff do not believe that the City Centre has any additional capacity for ground oriented housing that hasn't already been planned for by the City Centre Area Plan.

5. West Cambie
   The West Cambie area in North Richmond has the recently adopted West Cambie Area Plan, and does not, it is suggested, need review.

6. Hamilton
   Hamilton has already taken its share of ground oriented housing unless the City wants to consider higher densities than a 0.7 floor area ratio – which is not recommended.

7. South Richmond
   South Richmond is either in the Agricultural Land Reserve or used for industrial/commercial purposes.

8. Sea Island
   Sea Island isn't suitable for additional new ground oriented housing at this time because of the airport.

Summary

Together Steveston, East Cambie and Tait might accommodate approximately 3,625 additional new ground oriented housing units or 73% of the 4,944 deficiency.

This means that for Central Richmond 1,319 additional new ground oriented housing units or 27% of the 4,944 deficiency needs to be accommodated for between 2009 and 2041.

If both of the above described OCP Options 1 and 2 were accepted, 8,569 ground oriented housing units would potentially be available in Central Richmond, Steveston and North Richmond (East Cambie; Bridgeport – Tait).

When added to the 4,944 ground oriented housing units permitted under existing OCP policies in Central Richmond, this would total 13,513 units - which would easily meet Urban Futures projection for 9,888 additional ground oriented housing units in Central Richmond between 2009 and 2041.

All options would be subject to public input, stakeholder (e.g., YVR) feedback, more detailed analysis and Council acceptance.

Option 3: Do Nothing At This Point In Time

Council could decide not to explore the new housing forms in Central Richmond or not to consider other policy areas to accommodate existing and/or new ground oriented housing forms as part of the 2041 OCP Update. This matter could be left to the next time to the OCP is reviewed (i.e., in 5 to 10 years) when more is known.

Option 4: Improved Transit Service (e.g., rapid transit, rapid bus) Routes and Supporting Densification Outside The City Centre

The following option is not proposed to be introduced at this time, but rather it is proposed to be explored, with the community, after the Metro Vancouver Regional Growth Strategy is approved (e.g., after 2011).

2939215

This option is predicated on the following notions:

- Richmond wishes to have better transit services outside the City Centre (e.g., provided by TransLink), to better:
    - encourage and enable residents to get out of their cars by providing more attractive, affordable and convenient transportation alternatives, and
    - minimize Greenhouse Gas (GHG) emissions.
- Over the long term, Metro Vancouver and TransLink are willing, subject to TransLink's budgets and enough additional Richmond transit ridership, to consider offering improved transit services outside of the City Centre. This improved service can only be achieved if there are enough extra transit riders (e.g., residential, employment, tourist) to pay for the improved transit service. If this is to be considered and achieved (and City staff suggest that it is desirable to do so), the City and TransLink can, after 2011 (e.g., after the upcoming Metro Vancouver Regional Growth Strategy is approved), jointly agree to establish a consultative, community land use and transit planning process to determine:
    - where, how and when extra densification which will result in improved ridership, can be achieved, and
    - where, how and which type of improved transit service can be provided.

In the future, this may be achieved by the City, with public consultation, agreeing to increase the residential, employment and tourist transit ridership densities enough to justify improving transit service. The consultative planning process will need to balance the Richmond public's acceptance of increased land use densities with general community preference to keep single family neighbourhoods. With this option, there may be additional apartment and GOH options and the areas to be considered for this additional density may be between 100 and 400 metres (e.g., the generally accepted walking distance to transit), from existing arterial roads (e.g., possibly No. 1, 2, 3, 4 Roads, Westminster Hwy, Garden City, Bundell, Williams, Francis, other). This opportunity can be explored in the long term, not now, and may result in additional apartment and GOH dwelling units.

Next Steps

Staff believe that all the possibilities in Option 1 and 2 are suitable for presentation to the public to determine their degree of acceptance. It is proposed that this will be done via the planned series of open houses scheduled in the Fall, unless direction to the contrary is received.

Once the public input is received, these ground oriented housing options will be reviewed further with Council, prior to consideration for inclusion in the OCP.

Financial Impact

None.

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Conclusion

As part of the 2041 OCP Update, Urban Futures has prepared a demographics study of the City (**Attachment 4**).

Based on their trend-based model (**Attachment 2**), Urban Futures baseline findings and future projections are generally consistent with the work done by Metro Vancouver (i.e., in 2041, Richmond will have a population of around 275,000 – 279,000 people, 180,000 – 181,000 jobs and approximately 115,000 housing units). However, Urban Futures further refines their work down to the City's specific planning areas and different housing types (e.g., apartments and ground oriented housing).

In accordance with the City Centre Area Plan, the majority of the anticipated 2041 population and housing growth will occur in the City Centre. Other areas of growth will include North Richmond based on the West Cambie Area Plan (e.g., Alexandra Neighbourhood) and the Hamilton area.

The implications of the employment projections will be reported to Planning Committee and Council in the fall of 2010 as part of the Employment Lands Strategy, which is a separate study being undertaken for the 2041 OCP Update.

One of the key findings of Urban Futures' study is that Central Richmond will require a total of 11,401 new housing units between 2009 and 2041 to accommodate an additional 19,678 people, as follows:

–   1,513 more apartments will be needed, and
–   9,888 more ground oriented housing units will be needed.

While accommodating the projected apartments can be done fairy easily, the options for accommodating ground oriented housing (e.g., secondary suites in LUC areas and townhouses; laneway housing; back yard cottages; duplexes, triplexes and fourplexes; town housing in new locations; row housing or fee simple town housing) need more analysis and discussion.

Terry Crowe
Manager, Policy Planning

HB:cas

Holger Burke, MCIP
Development Coordinator

Process

In October 2009, Council endorsed the:

– Theme for the OCP Update:
  - "Towards A Sustainable Community"

– Terms of reference for the main OCP studies

– Public consultation program

Timeline:

December 18th 2009 — Survey Deadline; Public Displays, Open Houses & Survey; Analysis

May 2010 — OCP Amendment GHG Targets Action and Policies

June 2010 / 2009

July 2010

October 2010 — Consultation; Studies

December 2010 — Concept

Mid 2011 — OCP Public Hearing & Final Adoption

Richmond

URBAN FUTURES
Strategic Research to Manage Change

Step 2: Growth and Change in Richmond

Housing

- Lower Mainland Net Additional Housing Demand by Structure Type
- Richmond Net Additional Housing by Structure Type
- Projected Housing Development by Sub-area
- Turnover of Existing Dwelling Stock
- Richmond Base Year Housing Occupancy

Population

- Richmond Population Projection
- Richmond Base Year Population
- Aging, Natural Increase
- In-movers
- Out-movers

Employment

- Richmond Employment Projection by Occupation
- Change in Population-serving Employment
- Change in Non-population-serving Employment
- Lower Mainland Net Additional Employment by Occupation (population/non-pop serving)
- Richmond Base Year Employment by Occupation

PLN - 144

URBAN FUTURES
Strategic Research to Manage Change

Step 3: Growth and Change in Richmond's Communities

Housing

- Richmond Net Additional Housing by Structure Type
- Community Net Additional Housing by Structure Type
- Turnover of Existing Dwelling Stock
- Spatial Projection of Housing Development in Richmond
- Community Base Year Housing Occupancy

Population

- Community Population Projection
- Community Base Year Population
- Aging, Natural Increase
- In-movers
- Out-movers

Employment

- Assessment of Community Employment Capacity Constraints
- Final Community Employment Projection by Occupation
- Unconstrained Community Employment Projection by Occupation
- Change in Population-serving Employment
- Change in Non-population-serving Employment
- Richmond Net Additional Employment by Occupation (population/non-pop serving)
- Community Base Year Employment by Occupation

East Richmond

North Richmond

City Centre

Sea Island

Central Richmond

Steveston

South Richmond

Final Report

Community-level Projections of Population, Housing, & Employment

City of Richmond

May 19, 2010

Prepared by

URBAN FUTURES
Strategic Research to Manage Change

Table of Contents

List of Figures and Tables

Introduction & Overview

The City of Richmond has commissioned Urban Futures to compile projections of population, employment, and housing for community planning areas within the City. As a first step towards completing this assignment, the following report documents the process used to prepare baseline projections of population, employment, and housing occupancy demand in the Lower Mainland region (comprising Metro Vancouver, the Fraser Valley Regional District and the Squamish-Lillooet Regional District) from 2009 to 2041.

The approach used to develop these baseline projections involved creating a foundation of empirically-observed, long-run historical trends in the factors underlying demographic and economic change, and extending these trends into the future in a manner that acknowledges both their long-run direction and more recent evidence that may result in future divergence from their longer-term historical paths. The result of the modification of long-run trends in light of more recent evidence is that these baseline projections represent *trend-based* scenarios rather than simply unmodified *trend* scenarios.

This region-wide analysis considered factors that shape and define the entire Lower Mainland, thereby including elements of change that were both internal and external to the region itself. At the heart of the regional population projection was a consideration of the broader provincial and national demographic contexts, as trends and policies in these larger spheres will have a direct impact on the Lower Mainland's demography (and economy) in the coming years. Thus, the research first considered the long-term population prospects of both Canada and British Columbia, and how these prospects could affect future levels of international, interprovincial, and intraprovincial migration to the region. Having established the external demographic context, the analysis then focused on trends in the region's age specific natality and mortality rates to project patterns of change in the region's vital rates. Combining future levels of natality, mortality and migration along with the aging of the region's base-year population resulted in a projection of both the size and composition of the Lower Mainland's population to the year 2041.

Next, this demographic projection provided the base for the regional labour force projection, which, in turn, provided a benchmark to which the regional employment projections could be considered. The labour force projection utilized trend-based projections of age and sex specific participation rates which were applied to the projected age and sex composition of the population to produce the size of the region's labour force in future years.

The employment projection was, in the first instance, independent of the demographic projection; it was a product of the trend-based extension of the historical relationship between provincial economic activity (as measured by real Gross Domestic Product, or GDP) and employment in the Lower Mainland. This provided a projection of both the level and occupational composition of employment in the region to 2041.

At this stage in the research an important juncture was reached: comparing and resolving the labour force projection – which represents a demographically-based projection of labour supply – with the economic-based projection of the demand for labour (i.e. employment). The mechanism through which a resolution between labour force and employment was achieved ensured that the resulting level of unemployment each year over the projection period fell within a range established by historical precedent; thereby ensuring that the projections of the region's demography and economy were consistent.

The demographic projection also provided the foundation for the projection regional housing occupancy demand. The link between the region's demography and resulting housing demand is the lifecycle pattern of household maintainer rates – defined by the household maintainer's age and the structure type of their dwelling. The trend-based projection of these rates acknowledged both the unique occupancy pattern of housing in the region and the reality that growth and change in the region's population and economy will bring about changes in the types of housing people desire. Applying the projections of age and structure type specific maintainer rates to the projected age composition of the region's population resulted in a trend-based projection of the number of dwellings of each structure type that would be required to accommodate the future population of the Lower Mainland over the course of the projection period.

This report therefore contains a set of integrated projections that include the Lower Mainland's demographic context, employment context, and housing context for the City of Richmond. As they are intended to provide a framework for projections within the City of Richmond, it is important to emphasize that long-term projections such as these are more concerned with time periods than with specific dates, with orders of magnitude than with specific values, and with strategic plans rather than with definitive ones. As region-wide changes in population and employment will determine the context for change in not only Richmond but in all other municipalities within the region, the following report emphasizes these macro projections before presenting the City-wide and City planning area projections that will be explored in subsequent additions to this report.

Part I: The Regional Context: Changes in the Lower Mainland

Components of Demographic Change

Future population change in the Lower Mainland, in terms of its size and composition, will essentially be determined by three broad factors: 1) the aging of current residents over the coming decades; 2) changes in patterns of age specific fertility and mortality; and 3) migration to and from the region. Of these, the most important (and often overlooked) will be the aging of today's population: given long and increasing life expectancies, 91 percent of the region's current residents will still be around in 2021 and 71 percent in 2041.

Figure 1

Population Age Profile
Lower Mainland

The importance of aging can be seen by examining historical changes in the region's age profile (Figure 1). In 2009, the typical Lower Mainland resident was between the ages of 44 and 63 – the cohort that was born between 1946 and 1965 (more commonly known as the Post World War II baby boom generation). This cohort comprised almost one-third of the region's population. In 1986 this cohort was between the ages of 21 and 40, with the most typical resident being 26 years of age. Throughout the years between their births and today, the aging of the baby boomers has shaped Canada's demography: from busy schools and pools, through the youth revolution and starter housing, to competition for mid-career positions, we now see the beginnings of tightening labour markets.

Their aging, combined with falling birth rates to below replacement levels, will continue to shift the bulk of the region's demography into the older age groups. At the same time, migration and fertility will round out the younger population.

Figure 2

Total Population *(millions)*
Lower Mainland, 1986 - 2009

Over the past two decades patterns of migration, natality, and mortality have combined to grow the region's total population from 1.62 million residents in 1986 to 2.64 million in 2009 (Figure 2). On average, the region grew by just over 44,000 residents per year, for an average annual growth rate of 2.1 percent.
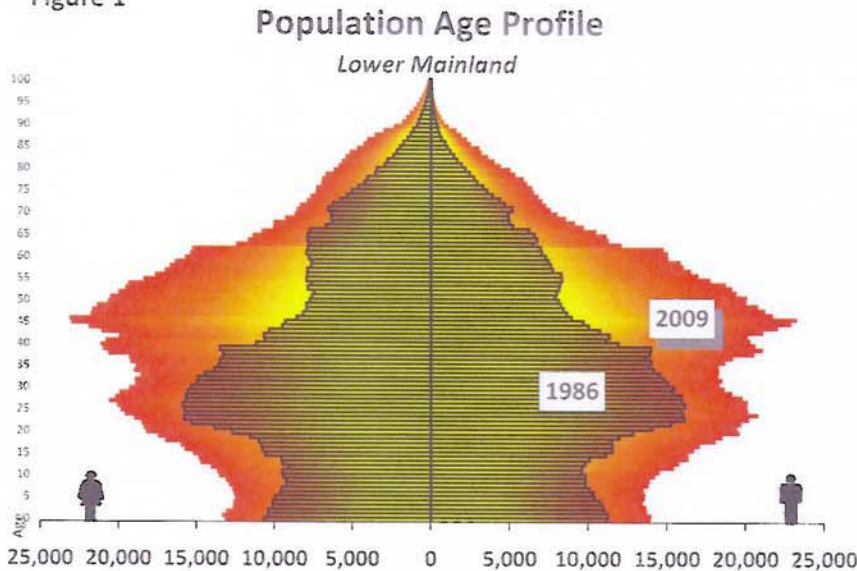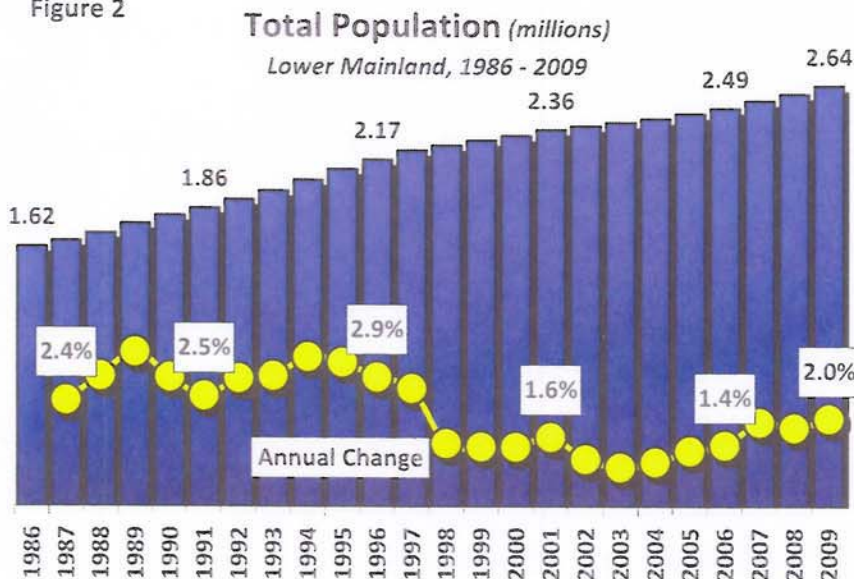
In order to understand the degree to which demographic processes will shape the region's future population, each of these factors must be considered individually before being brought together in a dynamic, formal projection. As a basis for understanding the directions of change which are implied by the projections, a brief review of current and projected trends for each component have been included before the projections are presented.
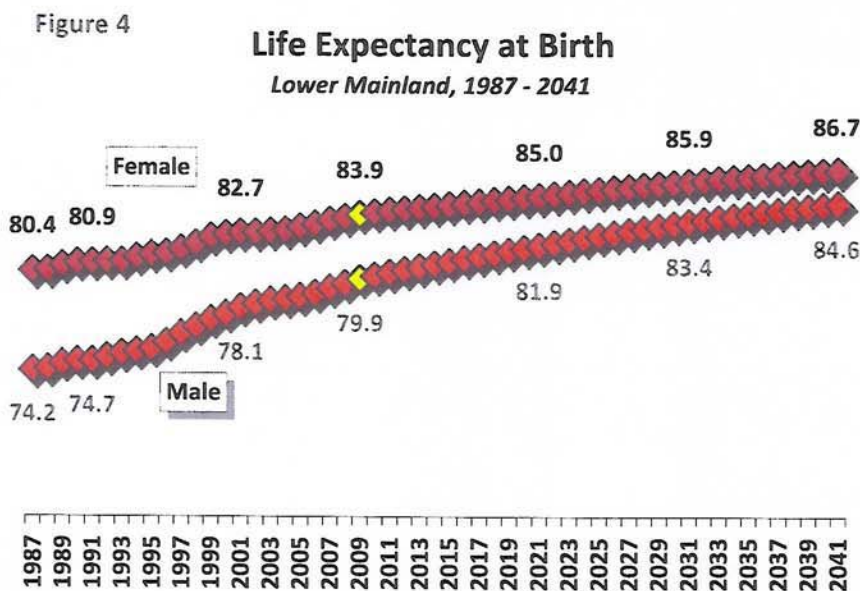
Natality A trend-based projection of age specific fertility rates indicates only slight changes in the region's future total fertility rate (TFR; the average number of children born per woman during her lifetime). Following two decades of a stable TFR – dropping only very slightly from 1.5 in 1987 to 1.4 in 2009 – it is projected that over the coming three decades the TFR will continue to remain in the neighbourhood of 1.4 (Figure 3).

Figure 3

Age Specific Fertility Rates
Lower Mainland
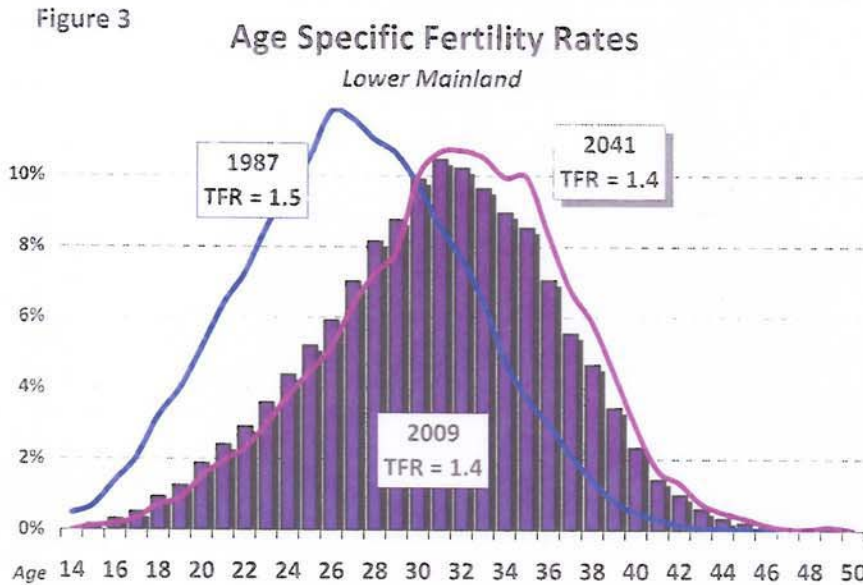
That said, while the average number of children a woman is projected to give birth to in her lifetime will remain relatively constant, the age specific pattern of childbearing is expected to change, with postponement resulting in a woman's peak child-bearing years increasing from her early-30s to her mid-30s by 2041. This trend will result in further declines in the propensity of females under the age of 30 to have children; declines which would just be offset by increases for those aged 30-plus.

Mortality While it is usually the trends in age and sex specific mortality rates that are of interest to a demographer, their historical changes are much more easily represented in the context of life expectancy (Figure 4). The historical increases in life expectancy for both males and females indicate that there will be further gains (equivalent to further declines in mortality rates); albeit these will be realized at a slower pace than that seen historically. Falling age specific mortality rates are expected to result in male life expectancy increasing into the range of 84.6 years at birth by 2041 (from 79.9 years today and 74.2 in 1987) and for females towards 86.7 years (versus 83.9 years today and 80.4 in 1987). While based on historical patterns of decline seen over the past three decades, it should be noted that the rate of decline in age specific mortality is expected to slow considerably in the future. The relative contributions of new medicine and medical

Figure 4

Life Expectancy at Birth
Lower Mainland, 1987 - 2041

technology to extending life expectancies will become increasingly more expensive and more difficult to achieve than those in the past.

Migration Two sources of migration are typically considered as part of population projections: domestic (comprising migrants from other provinces and other regions in BC) and international. As well as demonstrating differing age profiles, each stream contributes a different number of people annually to the Lower Mainland's population. As such, each source will be considered individually.

The past decade of interprovincial migration provides a reasonable baseline of future migration levels to the Lower Mainland; it encompasses both the period of low net in-migration that characterized the late-1990s (including years in which there was a net outflow, due to enhanced economic activity in Alberta and Ontario) and the higher levels seen over the past five years (Figure 5). To consider the pattern before 1998 may overestimate future levels of migration from other provinces as many jurisdictions attempt to retain workers in the face of slowly growing (or declining) working-aged populations. In this context, net interprovincial migration to the Lower Mainland is projected to decline slightly in the short-term due to the level of economic uncertainty that has prevailed since 2008, before leveling-off in the post-2010 period. On average, over the longer-term, the region is projected to add 4,500 residents annually through net interprovincial migration.
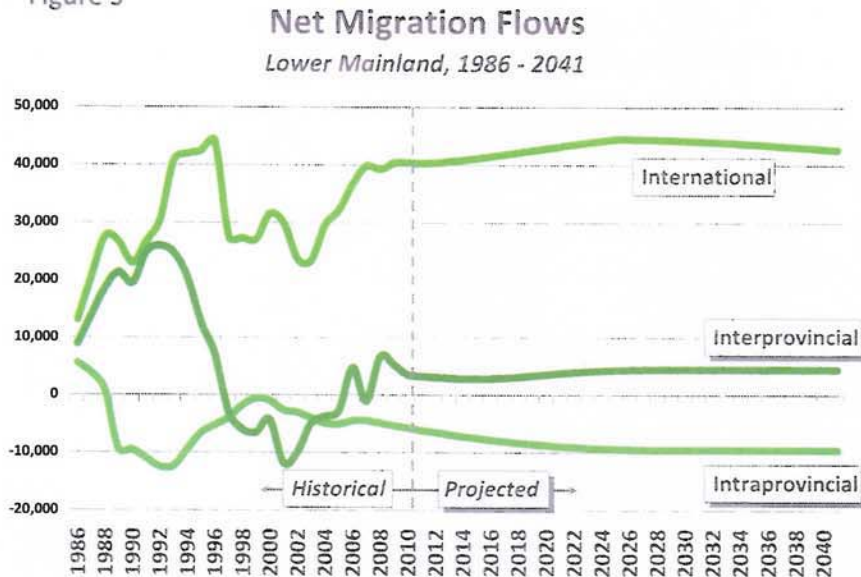
Figure 5

Net Migration Flows
Lower Mainland, 1986 - 2041

In contrast, net intraprovincial migration (people moving within the province) is projected to continue to be negative as the number of people moving from the Lower Mainland to other parts of the province continues to outpace those moving in the other direction. On average, it is expected that the region would lose upwards of 5,000 people to other parts on the province each year in the short-term. Over the longer-term this trend may be reinforced. Significant equity gains in residential real estate in the Lower Mainland could provide retirement incentives for boomers, resulting in their relocation to other amenity regions throughout the province. By 2041 net intraprovincial migration is projected to draw an average of 10,000 people out of the region each year.

The international flow of migrants is in large part shaped by federal immigration policy; as such, the national outlook establishes the context for international migration to BC and the Lower Mainland. For Canada as a whole, future immigration is projected to increase from current levels (250,000 immigrants per year, or 0.77 percent of the total Canadian population), towards 325,000 people and 0.79 percent of the population by 2031, and further to 330,000 immigrants annually by 2041 (0.75 percent of population).

The major factor influencing the projection of national immigration is the acknowledgement of a continuation of tightening labour supply throughout Canada. With a Canadian unemployment rate that only recently rose above a three-decade low, labour markets will continue to tighten over the longer-term, as employment begins to grow again in the face of the increasing prevalence of retirement in the baby boom cohort.

While this projection may represent a shift from other approaches to projecting immigration (many projections hold the future level constant at 250,000 immigrants, for example), it reflects the emergence of a new paradigm in the relationship between Canada's demography and economy, both on a local level and a national one.

Having established the future level of national immigration, historical trends in the provincial and regional shares of Canada's international migrant flow were used to determine the future number of immigrants who would settle in the province and in the Lower Mainland. When combined with the flow of emigrants out of the Lower Mainland (also projected on the basis of historical emigration as a share of regional population) and the change in the number of non-permanent residents (such as students and those on work visas), net international migration to the Lower Mainland is expected to increase. Moving from 40,400 people in 2009 to 44,150 in 2031, and then down slightly to 42,650 by 2041 – approximately the levels experienced in 1993 and 1996 (Figure 5). Just as it has over the past two decades, the next 32 years will see net immigration contribute the greatest number of new residents to the Lower Mainland.

It is interesting to note here that the contribution of natural increase (the number of births minus deaths, annually) is expected to contribute a relatively small number of new residents to the region. This trend is driven by a combination of low fertility rates and the large segment of the Lower Mainland's population that is aging outside of the high fertility stage of the lifecycle – not to mention an increasing number of people aging into the higher mortality stages of the lifecycle.

Projected Demographic Change

Combining the composition of the region's 2009 population with their aging and future migration, natality, and mortality provides the demographic framework for change in the Lower Mainland's population over the next 32 years. This projection shows a population that grows larger, albeit at a relatively slow (and slowing) rate when compared to the past.

The trend-based projection takes the Lower Mainland from its 2009 population of 2.64 million residents to 3.22 million by 2021, 3.71 million by 2031, and 4.12 million by 2041 (Figure 6). Over this period, the Lower Mainland would add an average of just over 46,000 new residents each year as it grows by 56 percent, or at an average rate of 1.4 percent per annum.

Figure 6

Total Population (millions)
Lower Mainland, 1986 - 2041

It is interesting to note that, in spite of the close-to-record levels of net migration, the declining contribution of natural increase will slow the pace of population growth in the region compared to its historical experience. By the end of the projection period annual growth in the region in expected to fall to under one percent. As a point of comparison, the past two decades have seen the Lower Mainland's population grow at an average annual rate of 2.2 percent, versus the 1.4 percent projected for the coming three.
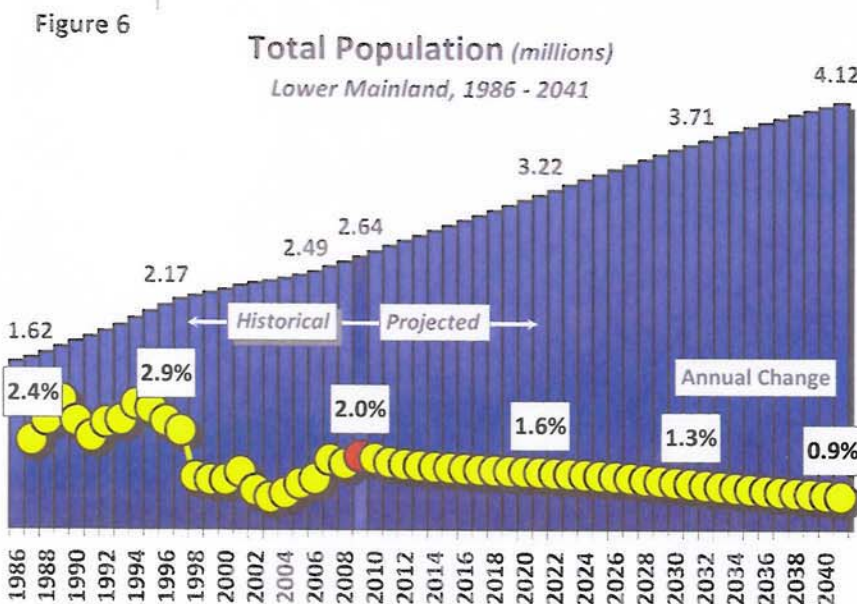
The implications of an aging population are illustrated through compositional changes; growth rates for the 65-plus population would be almost ten times greater than those for the working-aged population. Thus, while future <u>growth</u> in the region's population will be modest, the <u>change</u> in its composition will be more significant.

Figure 7

Population Age Profile
Lower Mainland
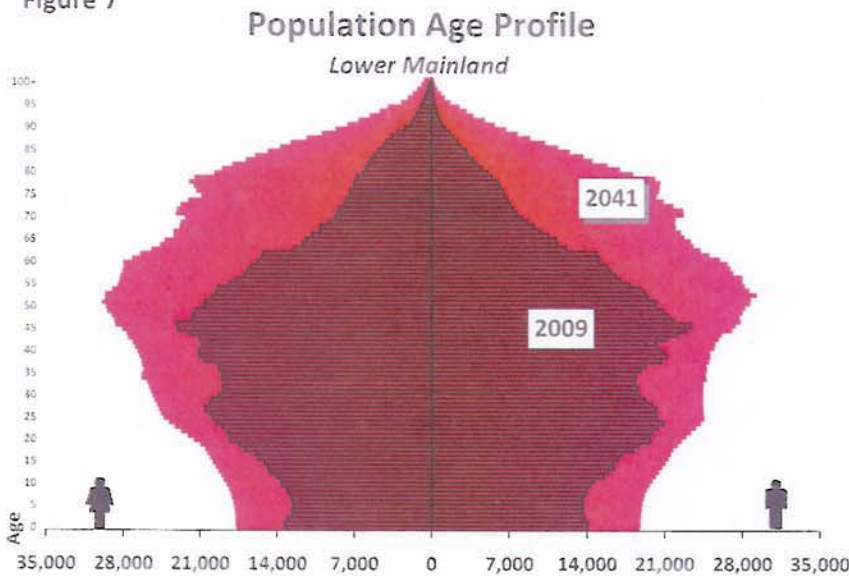
The aging of the region's population will shift the bulge in its current (2009) age profile from the mid-40s up into the retirement stage of the lifecycle over the next three decades (Figure 7). More importantly, rapid growth in the older segments of the population will be contrasted by a younger population that will grow much more modestly.

Figure 8 quantifies these changes with all of the 55-plus age groups growing much more rapidly than the population as a whole. The most rapidly-growing age group is expected to be those 85 and older (260 percent growth), while the group projected to add the greatest absolute number of people would be the 65 to 74 segment, growing by 267,000 people. Comparatively, each of the 25 to 54 and under-15 age groups are projected to grow by between 30 and 39 percent, while the 15 to 24 group would grow the slowest, at 24 percent.

The region's demographic future will therefore be one where the 65-plus population would almost double its share within the regional population, from 13 percent in 2009 to 24 percent in 2041. Conversely, the core working-aged population (25 to 64) would shrink from a 58 percent share to 52 percent over the same period. The population under the age of 25 would also decline in share, falling from 29 percent today to 25 percent by 2041.

Figure 8

Population Change by Age
Lower Mainland, 2009 - 2041
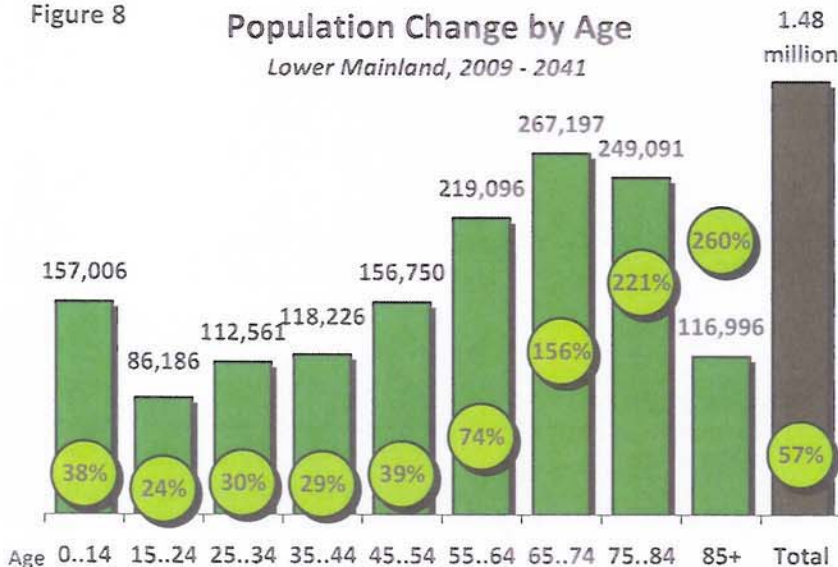
Thus, while all age groups are projected to increase in size, the aging of one-third of the region's current population into the 65-plus age group over the next 32 years will result in one of the most significant changes to the region's population experienced over the past half-century. The aging of the boom out of the working stage of the lifecycle will mean that even with almost record levels of migration, the working-age population is projected to grow relatively slowly. By extension, a relatively slowly growing labour force will have implications on the ability of the regional economy to grow and expand.

PLN - 156

Projected Labour Force Change

The 2008 lifecycle pattern of labour force participation in the Lower Mainland is characterized by the relatively low participation of the under-20 population, a relatively high percentage in the mid-career stage (25 to 54 years of age), and a significant decline in participation after the age of 55 (Figure 9 & 10). While the perception is that retirement is for those over the age of 65 – where labour force participation rates fall to between 30 and 40 percent – rates start to decline noticeably after the age of 55. It is important to note that this segment of the population is that which is projected to see the greatest growth in the Lower Mainland in the coming years.

Figure 9

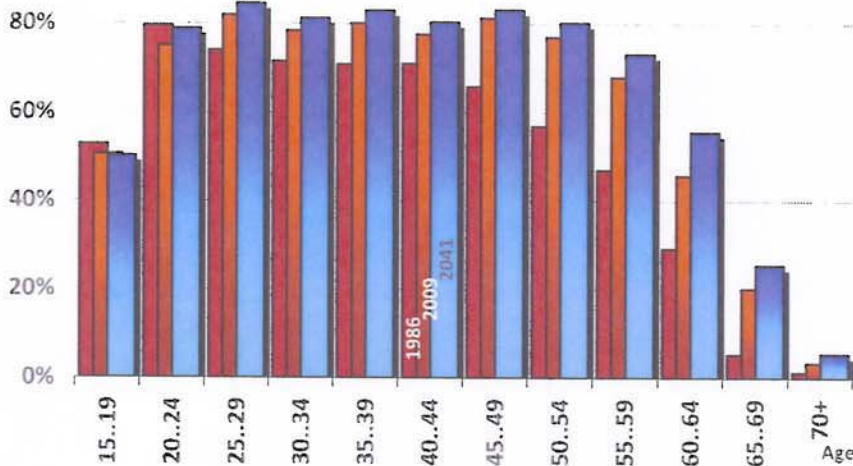### Female Labour Force Participation Rates
Lower Mainland

Figure 10

Male Labour Force Participation Rates
Lower Mainland
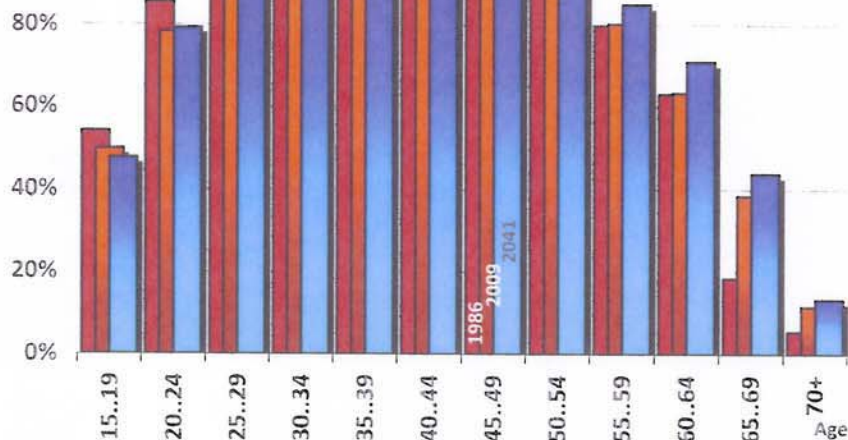
Figures 9 and 10 also show the age specific patterns of change in participation, projected to 2041. Considering historical patterns of change in female labour force participation, the coming 32 years are expected to see further increases, albeit relatively small ones when compared to history. The modest changes in participation for females aged 25 to 49 reflects the postponement of births as well as continued and increasing pursuit of post-secondary education.

These modest increases will be contrasted by significant increases in participation for the older female age groups. This will be driven by a combination of increasing opportunities to work provided by tight labour markets, freedom to work in post child-rearing years, and a next generation of female workers, who will carry their higher participation rates forward into later years as they age.

Participation rates for males have historically moved in the opposite direction to those for females, with declines characterizing all age groups during the four decades leading up to the year 2000. Between 2001 and 2006, however, the historical pattern of decline abated, with increases observed for each of the older age groups. Given the Lower Mainland's future economic reality of tightening labour markets, male labour force participation rates are projected to increase in spite of historical declines. Although growth in the high participation core working ages is expected to just return to historical highs experienced in the early-1970s, the rates in the latter stages of the working lifecycle are projected to see more substantial increases. For example, by 2041 participation for males in the 60 to 64 age group is projected to climb from 63 to 71 percent, from 38 to 44 percent in the 65 to 69 age group and from eleven to 13 percent for those aged 70-plus.

Combining these projected increases in age and sex specific labour force participation rates with projected changes in the Lower Mainland's demography between 2009 and 2041 results in a projection of the total size and composition (in terms of age and sex) of the region's stock of available workers (Figure 11).

The trend-based projection of regional population change, when combined with the projected increases in labour force participation, results in the number of people available to work within the Lower Mainland's economy. This is projected to grow from 1.52 million people in 2009 to 1.83 million in 2021, 2.04 in 2031, and 2.23 million by 2041. This 47 percent increase in the labour force is smaller than the 56 percent increase in total population; indicating that the projected increases in labour force participation for the older population will not be enough to offset the impact of the aging of the region's population over the coming 32 years.
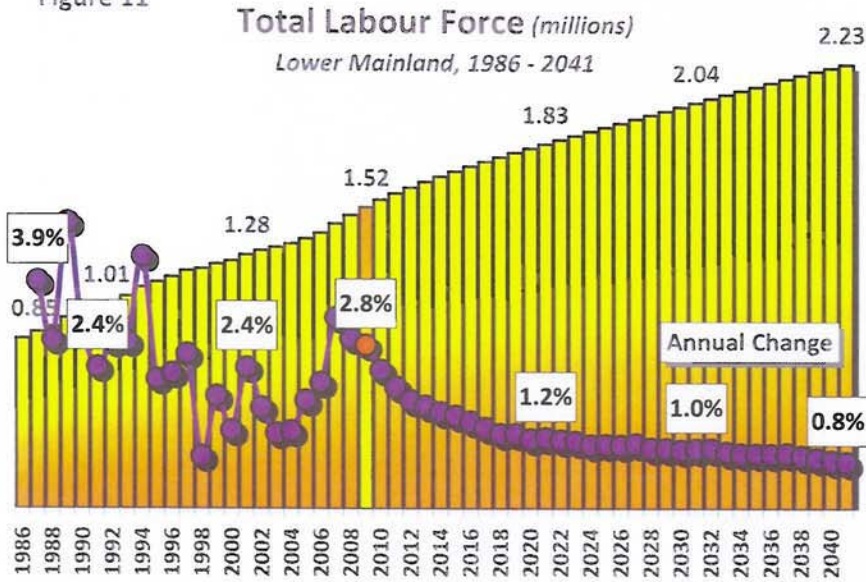
Figure 11

Total Labour Force (millions)
Lower Mainland, 1986 - 2041

Thus, despite attaining relatively high levels of both net migration and labour force participation, annual growth in the region's supply of workers would average less than 1.3 percent per annum over the next three-plus decades: falling below 1.5 percent by 2016 and further to below one percent by 2041. While a logical consequence of our demography, the economic implication is that the labour supply contribution to economic growth would be constrained within the 1.0 to 1.5 percent range over the course of the projection period. Any economic growth above this level would need to originate from increases in the contribution of productivity to economic growth.

Projected Employment Change

The labour force projection provides an estimate, rooted in demography, of the future supply of labour within the region. By virtue of its projected rate of growth, it also provides insights into some of the issues that will shape the future economic growth of the region. In order to place this growth in its proper context, it is necessary to move beyond a demographically-based assessment of the demand for workers in the region.

The economic framework used to generate the regional employment projection is an extension of the past three decades of historical changes in total employment (the demand for workers) in the Lower Mainland and BC's real Gross Domestic Product (GDP). While not revolutionary, the approach has several strengths, including a relatively long and easily-accessible historical database of economic and employment activity, as well as various short-term assessments of future provincial economic activity. Employment in the Lower Mainland has demonstrated a strong correlation with the level of BC's real GDP over the past three decades.

The economic history of the province has been characterized by significant but slowing growth in real GDP: in the 1960s GDP growth averaged 6.5 percent annually; in the 1970s, 5.7 percent; and in the

recessionary period of the 1980s, only 1.9 percent. The economy picked up thereafter, with GDP growing by an average of 2.8 percent per annum in the 1990s, and by 3.6 percent annually over the past five years. In spite of this recent strength compared to the 1980s, the long-term picture can be described by a general slowing in the rate of real GDP growth in BC.

Extending these changes in real GDP into the future, while acknowledging historical trends in economic activity and future potential constraints from a slowly-growing labour force, results in a baseline projection where economic growth would fall from 3.0 percent before the economic downturn of 2009 to 2.2 percent by 2021, 1.9 percent by 2031, and further to 1.7 percent by 2041. This would see the BC economy grow by 94 percent over the coming 32 years; as a point of comparison, the provincial economy grew by 137 percent over the past 32.[1]

Figure 12

Total Employment (millions)
Lower Mainland, 1987 - 2041
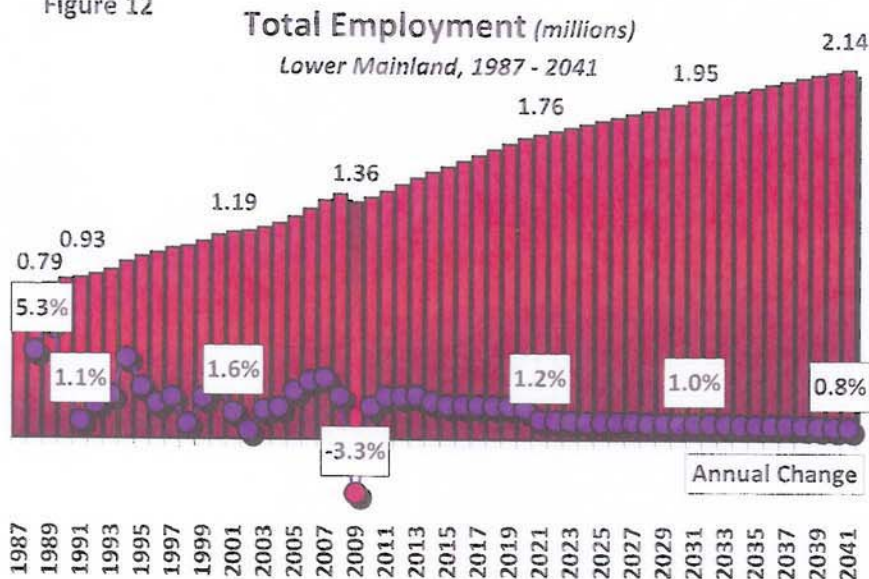
Next, a projection of total employment in the Lower Mainland can be developed using *a)* the observed historical relationship between total employment and BC's real GDP, and *b)* the trend-based projection of GDP (described above). Combining these two elements yields a projection of employment in the Lower Mainland growing from 1.36 million jobs today (2009) to 2.14 million by 2041 (Figure 12). The 57 percent growth in regional employment would relate to a 94 percent growth in GDP, implying future gains in output per worker (i.e. productivity).

With total employment projected to increase by 57 percent over the course of the projection period, and with the labour force projected to increase by 47 percent, the unemployment rate is projected to decline over the longer-term, falling to 4.0 percent midway through the projection period and remaining there to 2041 (Figure 13). This would be a significant drop from 2009 and 2010's ten percent unemployment rate – a consequence of the recent recession and its lingering effects – which represents the highest rate of unemployment experienced in the region in over two decades. Given this, beyond 2010, the unemployment rate is expected to decline once again, remaining above five percent through the rest of this decade, and then falling to its long-term rate of four percent thereafter as higher levels of migration and labour force participation exert their cumulative effect upon the economy.

While the overall levels of economic growth projected for the province and region could be called conservative, the result – when considered along with the labour force projection – is an unemployment rate that would remain at what economists call the *non-accelerating inflation rate of unemployment:* where cyclical employment is considered to be non-existent, and where the only remaining sources of

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[1] It is important to note that this measure of BC's future economic activity is referred to as a *baseline* projection, as the trend productivity inherent in the historical database may not sufficiently represent the substantial productivity gains that will be required to offset the implications of our aging population in the coming years. In this context, the future level of provincial economic activity may well be greater than projected here. If it is, growth above this baseline will need to be reflected in changes in the relative contribution of worker productivity to the provincial economy, as the declining contribution of the labour input to economic growth (even with increasing participation rates) has already been demonstrated in the labour force projection.

Figure 13

Demographic & Economic Resolution
Lower Mainland, 1987 - 2041
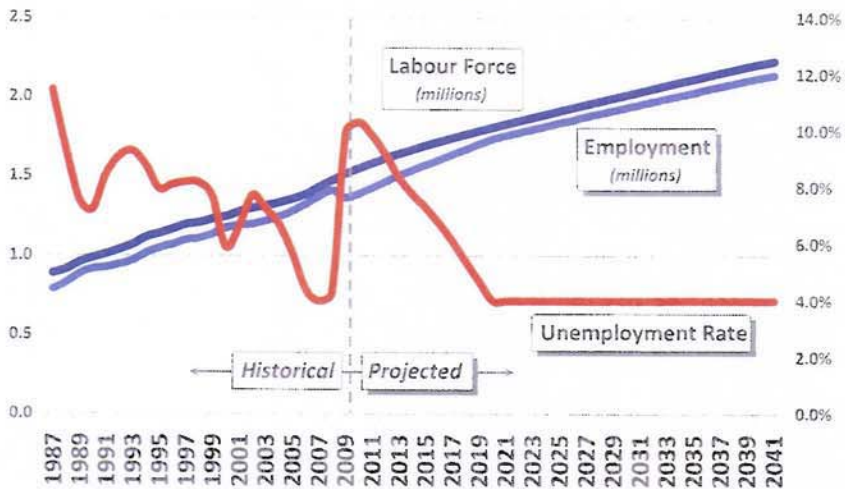
unemployment are the short-term mismatches between the demand and supply for specific types of labour (known as structural unemployment) as well as individuals moving between jobs (frictional unemployment).

This resolution between the demand and supply sides of the economy demonstrates the consistency between the independent projection of employment in the Lower Mainland and the region's demography and labour supply. It also underscores the changing economic and demographic paradigms that the region will face in the future: higher net migration and higher labour force participation rates alone will not be sufficient to attain levels of growth that have formed our recent economic experience, let alone to reach those that characterized the 1960s and 1970s when the baby boom cohort was entering the labour force. If economic growth above this level is to be attained, it will need to be realized through improvements in worker productivity that are well beyond what is represented in historical trends. With what is a comparatively high population and labour force projection for the region, the economic growth represented by historical trends alone will, nonetheless, continue to result in a relatively tight labour market within the region.

Regional Employment by Sector

The baseline projection of employment for the Lower Mainland involves adding 775,000 new jobs to the region by 2041. These jobs will be distributed across a wide range of economic activities, measured in terms of either *outputs* (the products and services that will be produced by the firms) or *processes* (the activities and services that are required to produce these outputs). Economic output is usually equated with employment in *industry* sectors, while the economic processes are generally equated with the *occupations* of the workers involved in the production of goods and services.

Traditionally, regional economic analysis has focused on a region's economy as defined by industry sector. Having noted this, structural changes in the nature of regional economic activities have led to occupation-based employment assessments becoming increasingly more relevant. For example, it is through a worker's occupation that the link is made between the task he or she is performing and the type and workplace required to carry out that task. The land use requirements of someone working in the marketing and sales department of a forestry firm differ considerably from someone working on the mill site itself. While these jobs would be categorized into two distinct occupations, both would be categorized within the same forest industry.

Another reason for considering occupation sectors rather than industry sectors is that the relationships between occupations *within* industries have changed dramatically over time. For example, over the past decade manufacturing industries in BC have largely seen employment growth concentrated in functions that require office and commercial types of workspaces (from human resources to the IT department), while jobs directly associated with the production of goods have typically grown much more slowly or, in some cases, declined.

PLN - 160

The projections of employment by occupational sector were developed in a similar manner to the projections of total employment, in that they considered the historical level of employment in a particular occupational sector in the Lower Mainland relative to the change in provincial real GDP. Employment/GDP correlations for each sector were then used as a basis to project where potential employment would be in each of ten occupational sectors in the Lower Mainland between 2009 and 2041 (please see the technical appendix for a comprehensive list of occupation sectors).

For example, relative to the 74 percent growth in total employment in the Lower Mainland between 1987 and 2009, the most rapidly-growing occupation group was Natural and Applied Sciences, which increased by 150 percent, adding more 61,000 jobs. Occupations in Public Service, Arts and Humanities (143 percent growth, 100,000 new jobs), Management (75 percent, 57,600 jobs), and Health (74 percent, 30,200) also grew more quickly than employment as a whole.

Sales and Service occupations grew more slowly than the average (at 73 percent) but added the largest number of jobs (147,400), representing one-quarter of all jobs added in the region over the past two decades. Similarly, Occupations in Business, Finance and Administration (55 percent growth, 92,000 new jobs); Transportation (36 percent, 11,600) and Construction (54 percent, 54,900) all grew more slowly than the average. Tracking these historical changes over time as a basis to the projections allows structural changes within the Lower Mainland's economy to be captured.

A note needs to be made about Occupations Unique to Primary Industry. While occupations specific to this sector experienced what may be considered relatively rapid growth (57 percent between 1987 and 2009) given the metropolitan focus of the region's economy and the nature of occupations that would fall within this sector (the extraction or processing of wood, minerals, oil or gas for example), this increase represented a relatively small share of total employment growth. Considering the growth between 1987 and 2009 also masks significant variability of employment within this sector from year to year. A similar situation exists with respect to Occupation Unique to Manufacturing, which is projected to expand by 68 percent between 2009 and 2041 (36,680 new jobs).

On the basis of these historical changes and their correlation to changes in provincial economic activity, future levels of occupation-based employment were projected. This approach indicates that Sales and Services occupations would grow by the largest absolute number, adding 219,160 jobs (63 percent growth), compared to total employment growth of 57 percent by 2041 (Figure 14). Other occupations that are projected to grow more rapidly than the average include jobs in Natural and Applied

Figure 14

Employment by Occupational Sector
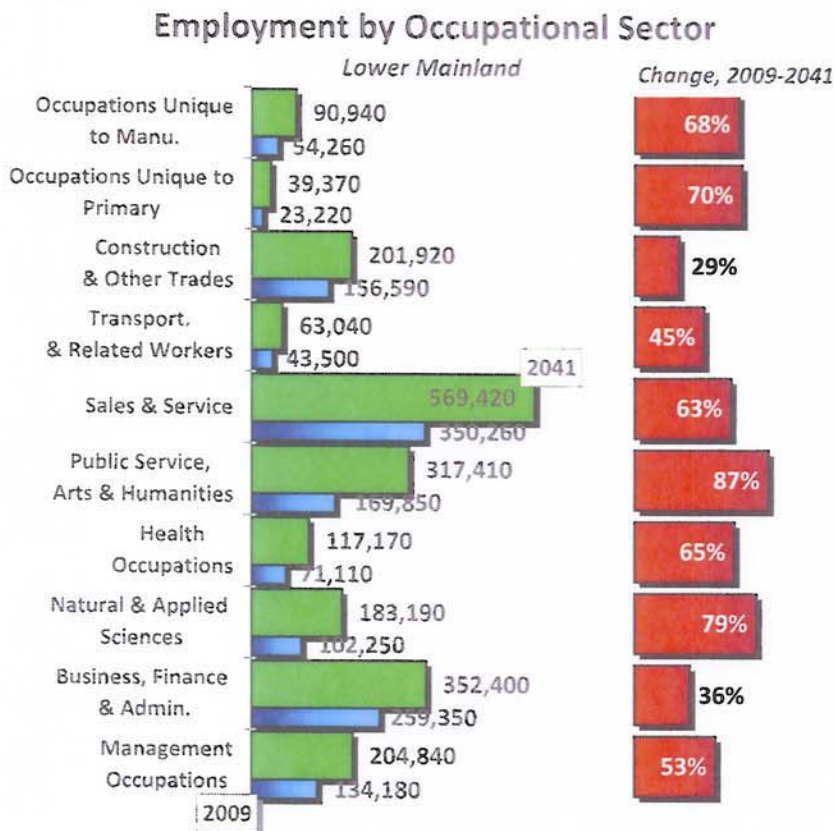
Sciences (79 percent, 80,940 additional jobs), occupations in Public Service, Arts and Humanities (87 percent, 147,560 jobs), and Health occupations (65 percent, 46,060 jobs).

A note again needs to be made about occupations in the 'Unique to Primary' category. While experiencing the third-greatest relative growth over the projection period (68 percent), this is driven by the relatively small base of jobs that are included within this sector and the significant variation in employment seen in the historical data; the absolute growth for this sector represents two percent of total job growth projected for the region as a whole (16,150 additional jobs).

Further to this, the current level of construction employment in the region also warrants comment. Given the number of construction projects that have been realized within the region over the past five years – the Vancouver Trade and Convention Centre, the continued boom in residential building development, and transportation infrastructure upgrades including the South Fraser Perimeter Road, Golden Ears bridge, and the Sea-to-Sky highway expansion – the actual count of construction and trades-related jobs is well in excess of where the historical trend line (based on economic activity) would have predicted employment in the sector. These workers will remain in the region in the coming years but will shift to other major projects. As a result, employment growth in this sector would be comparatively slow due to the large number of people working in the sector today (accounting for eleven percent of regional employment in 2009).

Housing Occupancy Demand

As housing provides the link between the regional and sub-area analysis, the final region-wide consideration is that of future housing occupancy demand. The approach followed in projecting the number of dwellings required to accommodate the Lower Mainland's future population is, as with the labour force projection, demographically-based: it applies the lifecycle pattern of maintaining a home to the projection of the change in the size and composition of the regional population. The lifecycle pattern of housing occupancy is described through the *age specific household maintainer rate*, or the percentage of people in an age group who are the primary providers of financial support for the household in which they reside.

In addition to being described by age, households can also be classified by the types of housing maintained. Two broad structure types have been included in this analysis: ground oriented (ranging from traditional single detached homes to row houses and duplexes) and apartments (including units in high-rise and low-rise buildings).

Figure 15

Age Specific Household Maintainer Rates
Apartment, Lower Mainland
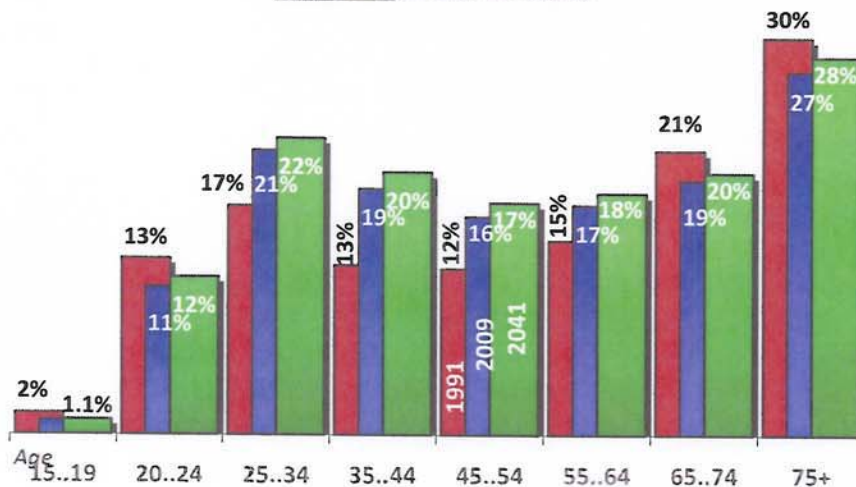
Figure 16

Age Specific Household Maintainer Rates
Ground Oriented, Lower Mainland
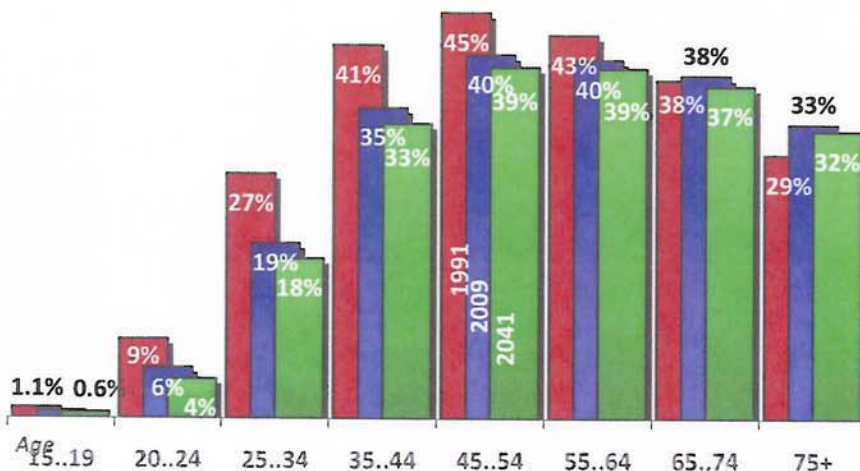
As with labour force participation rates, age and structure type specific household maintainer rates demonstrate both a lifecycle pattern and a distinct pattern of change over time. Figure 15 shows historical and projected changes in the lifecycle pattern of maintaining an apartment in the Lower Mainland. The pattern shows the highest propensities to maintain apartment units are for those between the ages of 25 to 34 (21 percent in 2009) and over the age of 75 (27 percent). Between these two age groups maintainer rates for apartments follow a U-shaped pattern, falling to 16 percent in the 45 to 54 age group, which is driven in large part by increasing maintainer rates in ground oriented units. This is generally seen as the prime child-rearing stage of the lifecycle when families typically occupy dwellings in ground oriented formats.

Household maintainer rates for ground oriented dwellings remain relatively low during the younger stages of the lifecycle (between six and 19 percent for people between the ages of 20 and 34), before increasing significantly during the peak period of labour force activity and family formation (Figure 16). The highest ground oriented maintainer rates are seen in the 45 to 64 age groups where 40 percent of people maintained households in ground oriented formats in 2009 (versus the 16 to 17 percent

of people in this age range maintaining households in apartments). Ground oriented rates begin to decline after the age of 65 (albeit only slightly) as maintainer rates in apartments begin to rise. Beyond the age of 75 ground oriented rates continue to decline, in part driven by people moving into apartments but also due to the movement towards non-private forms of housing (such as seniors' homes) through the oldest stages of the lifecycle.

There are four broad trends encompassed in the pattern of household maintainership in the Lower Mainland that will shape the trend-based projection of future maintainer rates for the region. The first is a continued increase – albeit at a diminishing rate – in the proportion of individuals in the young-adult age cohorts choosing to remain in their parents' homes. The pursuit of further post-secondary education will continue to push maintainer rates in the younger age groups down for both structure types.

The second is a continuation of increases in life expectancy – and specifically, *disability-free* life expectancy. This will result in further increases in independent living within the Lower Mainland's seniors' population. Healthier, longer lives will continue to broaden the range of housing options for the region's oldest population. An added factor will be a further narrowing of the gap between male and female life expectancy, which will result in more and more people growing older in couples, rather than growing older alone. Combined, relatively constant ground oriented and increasing apartment maintainer rates are expected for the 75 plus age group.

The third factor is the relative stability of maintainer rates for people in the 35 to 64 age groups, as lifestyle and family-formation patterns are expected to remain relatively constant for this group. Having said this, rates for the younger end of this age group may be influenced by the continued postponement of childbearing and the differing age specific fertility patterns of the recent-immigrant population.

Finally, while ground oriented accommodation is expected to continue to predominate throughout the region, land use constraints will continue to act as a push factor to shift some future demand towards higher-density housing formats such as apartments. This process will also certainly lead to increasing densification *within* various forms of ground oriented housing, as the growing predominance of row and town homes will be accompanied by traditional single detached homes being constructed on more compact lots.

Projected Housing Occupancy Demand

Figure 17

Total Housing Occupancy Demand
Lower Mainland, 1991 - 2041

Apartment

Ground Oriented

Apartment values: 226,17[?]; 279,383; 313,151; 354,812; 382,282; 448,725; 494,276; 540,652; 587,537; 634,580; 680,153

Ground Oriented values: 475,181; 543,794; 580,200; 600,217; 640,734; 738,803; 806,607; 871,387; 932,294; 986,992; 1,035,211
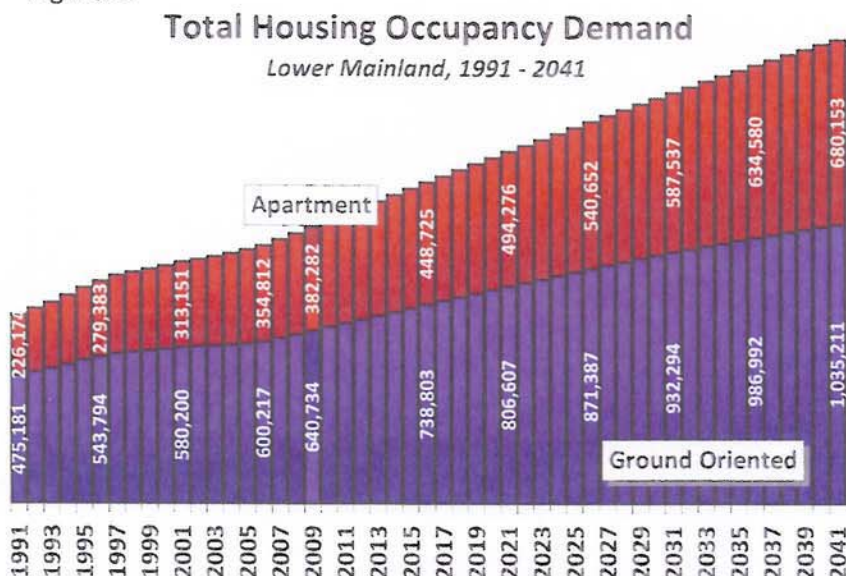
Combining the above trends in age and structure type specific maintainer rates with the projection of population growth and change in the region results in annual projections of occupancy demand which reflect changes in both the region's demography and in the lifecycle patterns of its residents. Figure 17 shows that the total housing occupancy demand in the Lower Mainland would grow to 1.72 million units by 2041, 700,000 more than the 1.02 million units demanded in 2009. The apartment stock is projected to grow from 382,282 units in 2009 to 494,276 in 2021, 587,537 in 2031, and to 680,153 by 2041; the number of

ground oriented dwellings would increase from 640,734 in 2009 to 806,607 in 2021, 932,294 in 2031, and to 1.035 million by 2041.

Overall, housing occupancy demand is projected to grow by 68 percent between 2008 and 2041 – faster than the growth in total population (which is projected to grow by 56 percent). The reason for housing occupancy demand increasing faster than population is that age groups for which household maintainer rates are the highest (i.e. in the 55 and older age groups) are also those which are projected to add the highest number of people in the coming years. On a structure type specific basis, demand for ground oriented units is projected to grow slightly faster than total population (62 percent versus 56 percent), while demand for apartment units would grow somewhat more rapidly (78 percent).

Figure 18

Change in Population and Housing Demand
Lower Mainland, 2009 - 2041

| Population 1,483,108 | Households 692,347 | Ground Oriented 394,477 | Apartment 297,870 |

Therefore, in order to accommodate growth and change in the region's future population, a net increase of just under 700,000 dwelling units would need to be realized by 2041 (Figure 18). While demand for ground oriented dwellings would demonstrate slower *relative* growth, almost 400,000 new ground oriented units would be required between 2009 and 2041 to accommodate demand, along with almost 300,000 net additional apartments.

This housing demand projection is the fourth in the suite of region-wide projections that establish the regional context and control totals for the projection of sub-area change within the Lower Mainland region. The next section describes the inputs, processes, and outputs associated with projections of change for the City of Richmond.

Part II: Spatial Projections of Population, Housing, and Employment

General Approach

The region-wide population projections in Part I described changes in the Lower Mainland's demography to 2041, given the composition of its current population and trends in natality, mortality and migration. Once resolved with the economic outlook for the region, a housing occupancy demand projection was generated by linking projected changes in the size and composition of the region's population to a projection of household maintainer rates by age and structure type of dwelling. Thus, at the regional level, population change is the given, with the regional housing market responding to accommodate growth and change in the regional population.

In contrast, *within* the region the availability of housing will in large part determine where population is accommodated. As a result, the current distribution of housing and its augmentation by future patterns of housing development provides the functional link between the regional and sub-area population projections. The methodology used to model this linkage starts with the current housing stock and current residents in eight sub-areas within the region: the City of Richmond, the City of Vancouver/UEL, Burnaby/New Westminster, the North Shore, the Tri-Cities, Surrey/Delta/White Rock, the Langleys, and Pitt Meadows/Maple Ridge. The first step in the modeling process is to account for the annual demographic change of each sub-area's existing population and their future housing requirements by structure type (ground oriented and apartment) as they age through the lifecycle of housing maintainership demonstrated in their area. As well, the degree to which current residents will move is considered, in order to measure turnover of existing dwellings within each sub-area's housing stock.

The next step in the modeling process is to allocate the annual growth in regional housing occupancy demand by structure type to each sub-area, with the increments of new housing being added to the existing housing stock. This allocation is based on historical patterns of housing development in the region (as reflected in the annual patterns of housing starts over the past four decades) and the patterns of regional growth implied by municipal Official Community Plans and policies and the regional growth management plan.

Once dwellings are located within the region, they are essentially "filled up" with people by age and sex based on structure type specific occupancy patterns from the most recent Census. This approach therefore accounts for the housing occupancy of each sub-area's base population as it grows and changes (including the turnover of the dwelling stock as this population ages) and new residential development (and hence residents) that will be added to each area annually over the projection period.

Once the future distribution of population is established, the next step is to distribute employment by occupational sector to each of the sub-areas. Two components of employment were considered in this allocation: the portion of employment that would go to serving the local population (the population serving component) and the portion that serves non-local activities (typically referred to as the region-wide or economic base component). The portion of annual growth in sectoral employment that was deemed to serve the local population was allocated to each sub-area on the basis of its share of annual population growth in the region over the projection period. The economic base component, on the other hand, was allocated on the basis of each sub-area's share of regional sectoral employment in the prior year. In this context, this approach accounts for where employment growth may be realized due to population growth within the region, while recognizing existing nodes of sector specific employment that

have formed in the region. The following pages present the background data and output from this approach for the City of Richmond and other broad geographies within the region.

Housing Existing Residents

As a sub-area's current resident population and their occupancy demand for housing will largely represent the majority of that sub-area's future housing demand, the natural starting point for modeling the spatial distribution of people within the region is the sub-area's existing resident population and its occupancy of the housing stock. The spatial allocation process, therefore, commences with consideration of the current stock of housing in each sub-area and the change in housing occupancy demand generated by the existing resident population as they age through the lifecycle of housing occupancy.

This first step is completed through an occupancy demand projection based on the aging and mortality patterns of each sub-area's resident population on an annual basis. The lifecycle pattern of housing occupancy that prevails in each sub-area is then applied to the "surviving" population to determine the size and nature of the housing stock that would be required to accommodate existing residents in the following year, if none of them moved. Age and structure type specific mobility rates are then applied to this population to determine how many people will move away during a year. The output from this process is: *a)* the remaining population, described by both its size and its composition; *b)* the number of dwelling units they will occupy; and *c)* the number of existing dwelling units that will be vacated and available for new residents to move into during the year (as a result of either the mortality or the mobility of existing residents).

It is important to note here that housing occupancy demand can grow solely from the aging of a population through the lifecycle of housing occupancy (i.e. without adding any new members to a community). Therefore, over the short-term, new capacity may actually be needed to accommodate the existing population as it ages. Over the longer-term, however, a certain portion of this stock will be "freed-up" as today's residents age into the oldest age cohorts where maintainer rates for private housing begin to decline as people move towards alternate forms of dwellings (such as collective or institutional accommodation), move away to other sub-areas or regions, or pass away.

Residential Development Patterns within the Region

The next step is to allocate net new dwelling units by structure type (ground oriented and apartment) to each sub-area. Three inputs were used to determine how much net new housing would be allocated to each sub-area. The first was the projected growth in annual housing occupancy demand by structure type for the region as a whole (presented in Part I). This recognizes that, while at the sub-area level land use and transportation policies will guide the pace and composition of new housing development, at the regional level, economics and demographics will determine both the population and the future demand for housing.

The second input was the extension of the historical pattern of each sub-area's share of total regional housing starts by structure type. The resultant future shares were then modified on the basis of the capacity thresholds, development constraints and planning policies reflected in the aggregate of regional Official Community Plans and policies, which represented the third component considered in the allocation. Having noted this, the sum of sub-area shares has to equal the regional total, and hence, allocations to a sub-area may differ from stated planning capacities for individual parts of the region.

Figure 19

Ground Oriented Housing Starts
Five-year Moving Average, 1965 - 2041

Figure 20

Apartment Housing Starts
Five-year Moving Average, 1965 - 2041
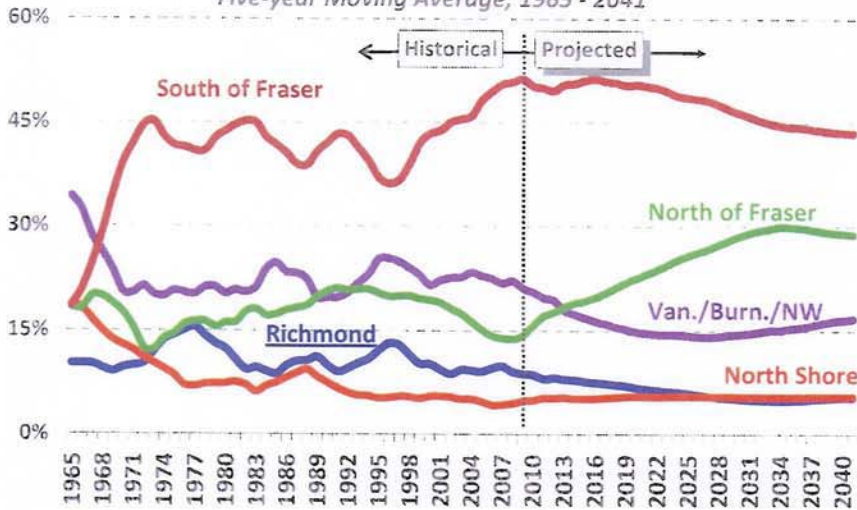
Figures 19 and 20 show the shares of housing starts by broad sub-area and structure type from 1965 to 2009, and the results of a trend-based projection of these shares to 2041.

While traditionally a ground oriented community, the pattern of housing starts in the City of Richmond in recent years has focused more towards higher-density development. From the mid-1960s to the late-1990s Richmond accounted for between nine and 16 percent of the region's ground oriented starts. This was accompanied by apartment starts in the City accounting for between five and 15 percent of the region's totals. Since the late-1990s however, the City's share of ground oriented development has declined (falling to under nine percent by 2009), while its share of apartment starts has increased from a low of four percent in 2001 to ten percent currently.

While not representing a historical high, the ten percent share of regional apartment starts in Richmond seen between 2006 and 2009 was the result of construction beginning on an average of 1,315 apartment units each year – this total is more than the 1,229 apartment starts seen in the City in 1981, which, until recently was the all-time high for Richmond.

Over the historical longer-term there has been a trend towards the development of apartments in Richmond – a trend that has fundamentally altered, and will continue to alter, the character of the City's housing stock. In the 1960s, apartment starts accounted for 12 percent of total development; in the 1970s and 1980s they accounted for 36 percent; in the 1990s, 39 percent; and in the most recent decade, 48 percent, with this trend projected to continue over the course of the projection period.

Other notable trends in the historical pattern of regional development are the South of the Fraser sub-area[2] accommodating the bulk of regional ground oriented development. From the early-1970s to the late-1990s the South of Fraser has accounted for between 35 and 45 percent of Metro Vancouver's ground oriented starts. Since the late-1990s its share has increased significantly, reaching 50 percent of all ground oriented starts by 2009. From the early-1970s to the late-1990s the South of Fraser sub-region

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[2] South of Fraser comprises Surrey, Delta, White Rock, City of Langley, and District of Langley.

PLN - 168

also accommodated a significant share of new apartment starts, ranging between ten and 20 percent. From 1997 onwards, however, its share of apartment starts declined as its share of ground oriented starts grew. By 2003, the South of Fraser's apartment share had declined into the range of five percent of regional starts, and by 2009 it had returned towards its historical average, reaching 20 percent.

Just as the South of Fraser part of the region has largely been the focus of ground oriented development in the region, the Vancouver/Burnaby/New Westminster sub-area has clearly been the focus for apartments. Between the early-1970s and mid-1990s this sub-area accommodated between 48 and 62 percent of the region's apartment starts. From 1996 onwards its share increased, reaching almost 75 percent by 2002 before declining back towards its historical range of 50 percent by 2009. While it has accounted for the bulk of region's apartment starts, its share of ground oriented accommodation has remained relatively constant since the 1970s, in the range 20 to 25 percent of ground oriented starts annually. Since 2004 this sub-area's share began to decline, falling towards an average of 20 percent by 2009.

With a relatively constrained land base the North Shore sub-area[3] has historically accounted for a greater proportion of the region's apartment starts than its ground oriented starts, with its share of apartment starts averaging 15 percent from the mid-1960s to early-1980s, before plateauing at just above five percent since then. Having accounted for 20 percent of the region's ground oriented starts in the mid-1960s, the North Shore's share declined rapidly and leveled off in the range of four to five percent over the past decade.

With additional land supply to accommodate future ground oriented development, it is expected that the South of the Fraser sub-area will maintain between 45 and 50 percent of ground oriented starts annually within the region. Similarly, capacity in the North of Fraser sub-area[4] is expected to see its share of ground oriented accommodation increase from current lows of under 15 percent towards 20 percent by 2018 and further to 30 percent by the mid-2030s. While continued declines are expected in the short-term for Vancouver/Burnaby/New Westminster's share of ground oriented starts as a result of capacity constraints, it is expected that by 2020 its share will fall into the range of 15 percent of ground oriented starts as policies in each of the three municipalities shift towards densification within existing ground oriented communities. The North Shore, with some additional capacity located in West Vancouver and redevelopment opportunities in North Vancouver, is projected to maintain its five percent share of future ground oriented development.

On the apartment side, development trends are expected to combine with local and regional policy to see communities outside of Vancouver/Burnaby/New Westminster accommodate a greater share of apartment units as both regional and municipal town centres grow and diversify. As Vancouver/Burnaby/New Westminster's share declines from its current 50 percent of apartment starts towards 44 percent by the end of the projection period, all other sub-areas will increase their shares of regional apartment starts over the longer-term (except for the City of Richmond, which will see growth in the short-term tempered by the longer-term outlook), the most notable being the North and South of Fraser, each increasing beyond their historical averages.

Richmond's share of regional apartment additions is expected to increase into the range of 19 percent range by 2015, as development policies remain focused on creating more densely-populated town

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[3] The North Shore comprises Bowen Island, Lion's Bay, West Vancouver, North Vancouver City, and North Vancouver District.
[4] North of Fraser comprises Pitt Meadows, Maple Ridge, Anmore, Belcarra, Coquitlam, Port Coquitlam, and Port Moody.

Figure 21

Net Additional Housing Units
City of Richmond, 1999-2009, projected to 2041
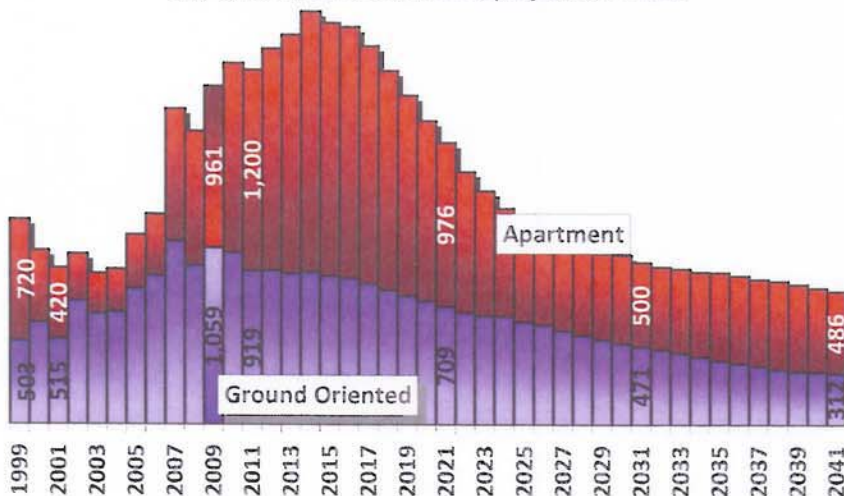
centres and major transportation corridors, taking advantage of substantial regional transportation infrastructure changes that will continue to improve accessibility to, and within, the City of Richmond. By 2041 it is projected that Richmond will account for seven percent of all apartment starts in the region as constraints on available land begin to impact the City's ability to add new units. This projections would see an average of 830 apartment units being added to the City annually out to 2041, 92 percent more than the 430 that were added on average in the preceding decade (Figure 21).

As the land base for residential development becomes increasingly constrained, it is expected that ground oriented forms of residential development will comprise an increasingly smaller share of new developments in the City. In recognition of this constrained land base (and the prominence of the North and South of Fraser parts of the region) Richmond's share of regional ground oriented starts is expected to decline – continuing the trends observed since 1997 – from ten percent in 2009 to just over five percent by 2025, remaining at this level to 2041.

This would result in the City adding an average of just over 630 new ground oriented dwelling units annually over the coming 32 years, versus the 650 that were added over the past decade (Figure 21). Apartment additions would therefore outweigh ground oriented starts in the coming years, with four apartment units being built for every three ground oriented ones.

Figure 22

Total Housing Occupancy Demand
City of Richmond, 2001 - 2041
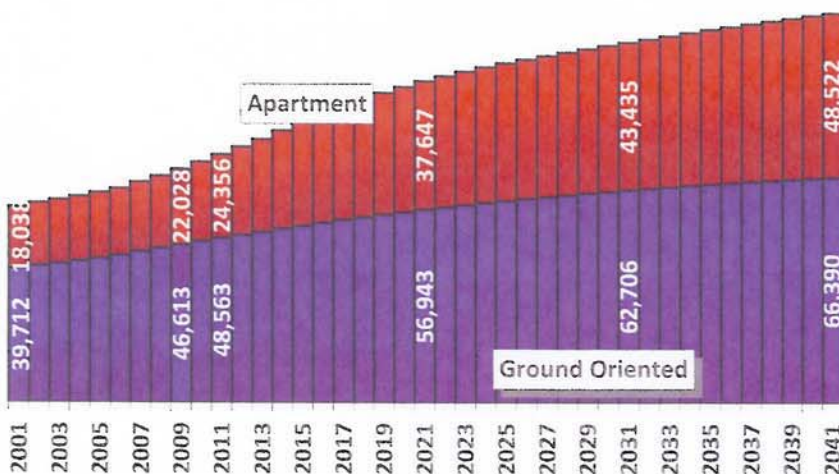
The coming three decades are therefore expected to bring significant changes to the City's housing stock. Overall, the number of occupied dwellings would increase by just over 46,000 units, with this 67 percent increase representing annual growth of 2.5 percent (Figure 22). While ground oriented dwellings would still comprise the majority of units in the City – accounting for 58 percent of all dwellings by 2041 – apartments would become increasingly prevalent. Adding 26,494 net new apartments to the City's stock would see it grow by 120 percent overall (an average of 1.6 percent per year).

In contrast, the stock of ground oriented units would grow by 42 percent by 2041 (growth of 1.1 percent per year), adding a total of 19,777 net new units. This trend towards more compact dwelling units is one observed throughout the region as a whole; the Lower Mainland's

apartment stock is projected to grow by 78 percent over the course of the projection period versus 62 percent growth for ground oriented units.

From Dwelling Units to Population

Having allocated additional housing from the regional level to the sub-area level annually, these dwelling units are then essentially "filled up" with residents using age and structure type specific occupancy factors to project the annual increments of new population by age and sex in each sub-area. The units vacated by existing residents due to turnover are also filled up using age and structure type specific turnover rates found in the Census data.[5] Combined with the aging, mortality and natural increase of each sub-area's existing residents, these net additions provide the estimates of total annual population by age and sex, by sub-area.

Figure 23 shows the specific in-mover household profiles used in the modeling process for the City of Richmond. The most recent mobility status data from the Census show that households moving into apartments are typically younger than those moving into ground oriented units, with the typical apartment in-mover being in their early- to mid-30s versus early- to mid-40s for ground oriented units. In addition to being slightly older, those moving into ground oriented accommodation have a greater likelihood of moving with children – people under the age of 15 made up 22 percent of the households moving into ground oriented units and only 14 percent of those moving into apartments.

Another important distinction between mobility into these two structure types is the overall size of household: households moving into apartments are significantly smaller than those moving into ground oriented dwellings. The average size of households moving into apartments is of 2.19 people versus 3.32 people for ground oriented homes.

In order to model households moving out of their existing dwellings in Richmond it was

Figure 23

Age Distribution of In-Movers & Resident Population
City of Richmond

Figure 24

Age Distribution of Out-Movers & Resident Population
City of Richmond

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[5] Annual structure type specific turnover rates were derived using 2006 Census data describing the number of households in Richmond who did not occupy their current dwelling five years earlier. For modeling purposes the annual turnover rate used for ground oriented dwellings was 6.0 percent and for apartments 9.5 percent.

necessary to develop proxy profiles and household sizes – the Census only concerns itself with the demographic characteristics of households as they occupy their current dwelling. Thus, mobility data from the 2006 Census for the whole of the Metro Vancouver region were used to develop age profiles and household sizes for modeling out-movers from the City of Richmond. From a statistical perspective, the region was chosen to develop the data inputs for the City due to the large sample size – and by extension, robustness – of the underlying data; from a practical perspective it was chosen because for every in-mover household there is an out-mover household, with the majority of out-moving households relocating elsewhere in the region.

Figure 24 shows that similar relationships hold between the age profile and size of *out-mover* households and the age profile and size of *in-mover* households used in the modeling process. For the model, the typical apartment out-mover is between the ages of 25 and 29 (versus 35 to 39 years old for ground oriented out-movers), while out-movers under the age of 15 account for an average of 11 percent of apartment households (compared to 24 percent), and the size of households moving out of apartments is 1.90 people per unit (versus 3.09 in ground oriented).

Considering the range of existing and new residents in old and new housing described by age, sex and the structure type of their dwelling, results in an annual projection of population in the City of Richmond for the next 32 years. In addition, it allows for an assessment of population *change* in terms of the changing age structure of the City's residents between 2009 and 2041. The output of the annual iterative modeling process is outlined below.

Demographic Projection

The demographic implications of adding new dwelling units, along with the aging of and change in the City's 2009 resident population, would result in Richmond's total population growing by 46 percent between 2009 and 2041, adding a total of 88,212 new residents. The City's population would grow from 190,480 in 2009 to 278,692 by 2041 (Figure 25).

Figure 25
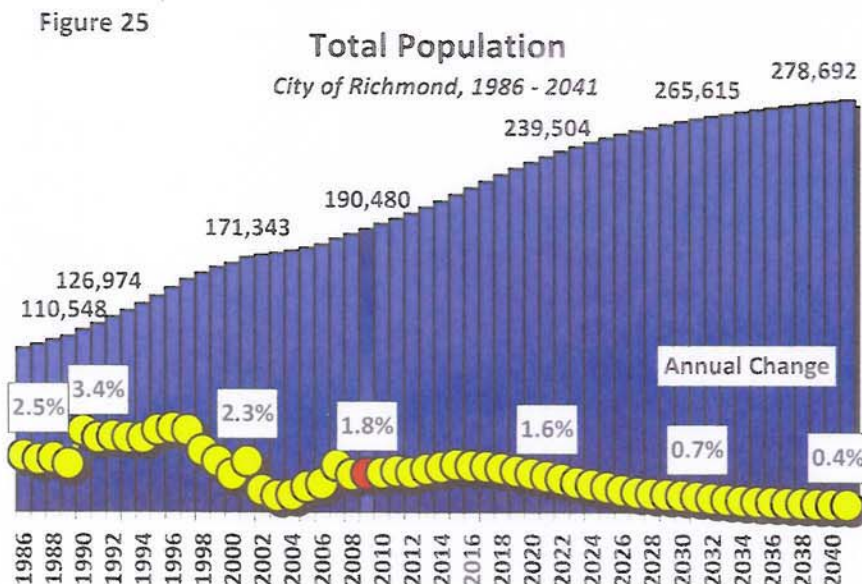
Historical population growth in the City has ranged between 3.5 percent (in the early- and mid-1990s) and one percent (in the early-2000s). The coming years are expected to see growth rates below what the City has experienced historically; falling gradually from 1.8 percent in 2009 to 1.6 percent by 2021, 0.7 percent by 2031, and to less than half a percentage point by 2041 – with this pattern being driven in large part by changing demography both locally and regionally (refer to Figure 6, which shows annual growth in the Lower Mainland falling from two percent today to 0.9 percent by 2041).

By 2041 the City would account for eight percent of Metro Vancouver's population, slightly more than the seven percent seen in 2009, but equal to the eight percent from a decade ago (1999).
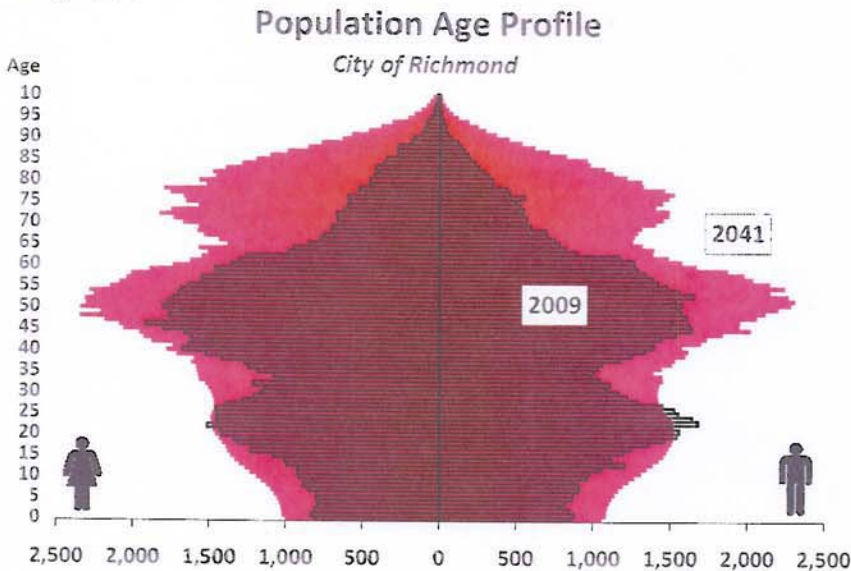
The City's population is also projected to change considerably over the coming 32 years (Figure 26). In 2009, two distinct bulges were evident in the City's population age profile: one centered on age 46 (representing the Post World War II baby boom cohort) and another on age 23 (the result of fertility patterns in the baby boom cohort as well as in-migration to the City). Compared to the Lower Mainland as a whole – where 59 percent of the population was under the age of 45 in 2009 – Richmond has a marginally younger population, with 56 percent of its residents under the age of 45.

Figure 26

Population Age Profile
City of Richmond

Over the coming 32 years, this age profile will grow outward and upward; in large part due to the aging of existing residents, but also as a result of the changing composition of new dwelling units being added to the community over the projection period. With apartments projected to comprise 42 percent of all housing in the City by 2041 (versus 32 percent in 2009), the inflow of new residents into these units will add to the younger segments of the City's population as they migrate in.

By 2041 the typical resident in Richmond is expected to be a 52 year old, only six years older than the City's typical resident in 2009. This will be the result of the aging of 2009's twenty-somethings into these age groups, and the impact of apartment additions (and hence younger households). That being said, the most dramatic changes to the City's age composition would be in its older age groups.

The size of the baby boom cohort and the inevitable process of their aging will see the top of the age profile grow much more significantly than the younger age groups: by 2041 the proportion of people aged 65-plus in the City would double, reaching 26 percent from 13 percent in 2009. Figure 27 provides further context for these compositional changes: above-average growth in each of the 65-plus age groups over the next three decades, with the 65 to 74 cohort growing by 125 percent, the 75 to 84 group by 240 percent, and the 85-plus group by 331 percent. The 75 to 84 age group would add the greatest absolute number of people, growing by 20,143 people. This age group alone would account for one-fifth of total population growth in the City by 2041.
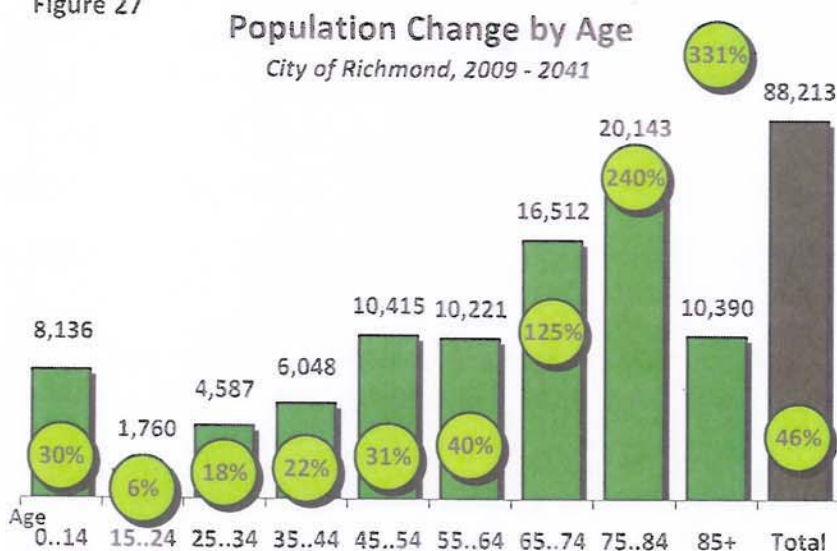
Figure 27

Population Change by Age
City of Richmond, 2009 - 2041

While every age group is projected to increase, each of the under-65 groups would grow more slowly than the average (46 percent), ranging between the six percent growth projected for the 15 to 24 cohort (adding only 1,760 people) and the 30 and 31 percent growth of the under-15 and 45 to 54 age groups respectively.

PLN - 173

With the base demographic and residential land use projections for the City of Richmond established, the focus of the modeling process moves to the employment implications for the City.

Employment: Spatial Allocation Methodology

Just as the sub-area demographic projections recognized the regional projections through the composition of future regional housing occupancy, the sub-area employment projections are tied to the regional projection of economic and employment change. In compiling employment projections within the GVRD to 2041, three major locational elements were considered.

The first was the future distribution of population growth within the region. All occupational types of employment have some degree of activity that goes directly to supporting the local population. This is typically referred to the _local population-serving_ component of employment activity and is based on the differential role that local population-based demand plays in economic activity.

As a quick example, a far greater proportion of employment in sales and service occupations would be expected to serve a local population than employment in manufacturing types of occupations. While a local drycleaner's business would largely focus on serving its surrounding population, automobiles from the manufacturing sectors could be manufactured for both local and non-local markets. Given its local population-serving nature, the allocation of population-serving employment in the region was based on each sub-area's share of future population growth in Metro Vancouver over the next 32 years.

The second element in allocating the non-population-serving component of employment growth in the region was the existing composition of employment within Richmond and surrounding sub-areas. Considering the current economic structure of a sub-area explicitly acknowledges the fact that specialized employment nodes have developed throughout the region (such as the international airport in Richmond).

The third element considered in allocating non-population-serving employment was the availability and suitability of land to accommodate future manufacturing and industrial employment.[6] Just as the availability of new housing will influence where population growth will be realized, the availability of land will, in part, determine where growth in non-population-serving employment will be seen in the coming years. Adding the annual increment of population- and non-population-serving components of employment to the existing (2009) employment base in each sub-area results in an annual projection of employment growth and change by occupational sector for each sub-area within the metropolitan region.

Employment: The Projections

From its estimated 2009 base of 135,061 jobs, total employment in the City is projected to reach 163,020 by 2021, 173,280 by 2031, and 179,772 by 2041 (Figure 28). Adding 44,711 jobs over the next 32 years would see the City of Richmond's employment base grow by 33 percent. On an annual basis, employment growth would be in the range of 1.5 to 2.0 percent to 2016 as the region and City recover from the impact of a provincial economy that contracted in both 2008 and 2009, with slow growth expected

Figure 28

Total Employment
City of Richmond, 2001-2006, Projected to 2041

131,793   135,061   152,809   163,020   168,709   173,280   176,856   179,772

3.2%   -2.5%   1.5%   0.8%   0.7%   0.6%   0.5%   0.3%

Annual Change

2001 2003 2005 2007 2009 2011 2013 2015 2017 2019 2021 2023 2025 2027 2029 2031 2033 2035 2037 2039 2041
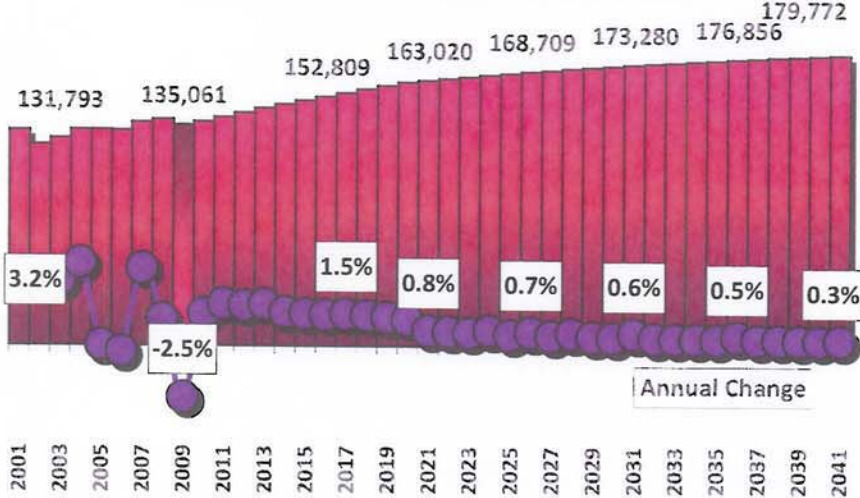
Figure 29

Employment by Occupational Sector
City of Richmond   Change, 2009-2041

Sector	2041	2009	Change
Unique to Manu	10,304	7,432	39%
Unique to Primary	2,027	829	144%
Const. & Other Trades	18,991	16,652	14%
Transport	7,465	6,334	18%
Sales & Services	49,168	39,141	26%
Govt / Arts / Recreation	21,171	10,077	110%
Health	7,016	3,565	97%
Nat & App Sci	17,687	12,866	37%
Bus / Fin / Admin	28,191	23,735	19%
Mngmt Occs	17,753	14,429	23%
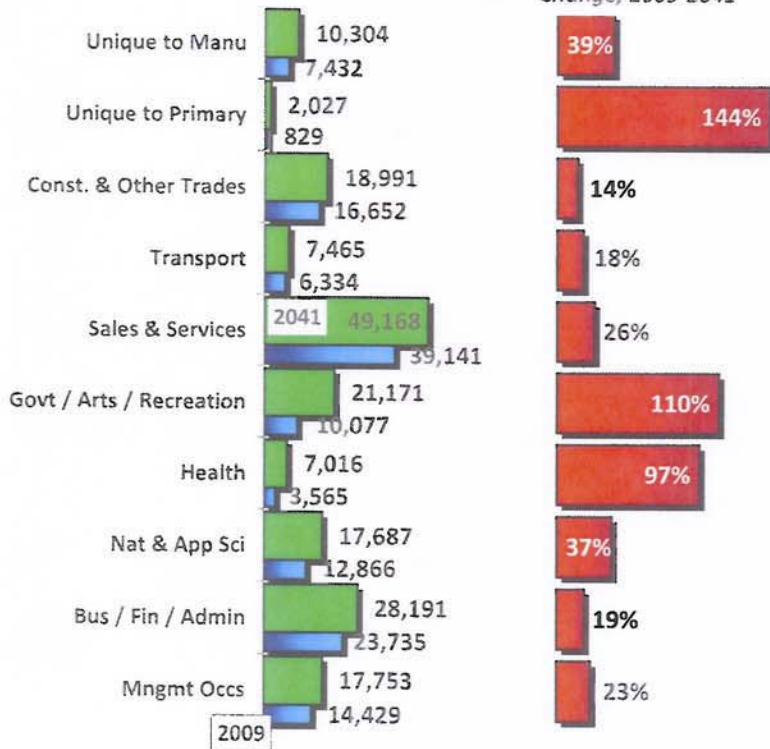
through 2010 and beyond. With the provincial economy expected to slowly move back towards historical averages, employment growth would fall in the range of 0.3 to 0.5 percent per year to 2041.

Figure 29 shows the changing occupational composition of employment within the City between 2009 and 2041. Just as at the regional level, Public Service, Arts, and Humanities and Sales and Service occupations would grow by the greatest absolute amount over the course of the projection period, adding 10,394 jobs (110 percent growth) and 10,027 jobs (26 percent growth), respectively. Combined, these two sectors would account for 46 percent of the total increase in employment projected for Richmond over the next three decades.

In addition to Public Service, Arts, and Humanities, other occupational sectors that are projected to grow more rapidly than the City average include jobs in Health (97 percent growth, 3,451 additional jobs), occupations Unique to Primary (144 percent, 1,198 jobs), occupations Unique to Manufacturing (39 percent, 2,872 jobs), and occupations in Natural and Applied Sciences (37 percent, 4,820 jobs).

Along with the Sales and Service sector, Management (23 percent growth, 3,324 additional jobs), Business, Finance, and Administration (19 percent, 4,456 jobs), Transportation and Related Workers (18 percent, 1,131 jobs), and Construction and Other Trades (14 percent, 2,339 jobs) would all grow more slowly than the City-wide average.

PLN - 175

Part III: Projections for Richmond's Communities

As part of its municipal planning efforts, the City of Richmond is has been divided into 14 planning areas, each exhibiting their own unique housing mix, natural environment, employment structure, and long-term development vision as described in the City's Official Community Plan. In looking toward the future, the primary determinants of the long-term character of communities within the City will be how the mix of housing, the size and composition of population, and the occupational structure of employment changes over time. This section of the report considers these elements of change for communities within the City of Richmond.

In compiling the projections for Richmond's communities, it was necessary to combine the 14 planning areas into larger aggregations for two main reasons, one functional and one practical. The functional reason was necessitated by the relatively small size of some of the planning areas and the level of detail available in the data used to make the projections. The practical reason stemmed from many planning areas sharing common land use, economic, or demographic characteristics.

From a demographic perspective a good example is the group of residential communities of Broadmoor, Blundell, Seafair, and Thompson. Each of these predominantly residential communities has a high proportion of their housing stock in ground oriented dwellings (between 77 and 91 percent), and thus each show a similar demographic composition (between 20 and 23 percent of residents are in the family-rearing stage of the lifecycle and between 15 and 17 percent in the youth stage). Additionally, as these communities are not highly-concentrated employment centres – unlike the City Centre or Sea Island – it is reasonable to compile long-term projections for the group as a whole, thus preserving a degree of statistical robustness that would be lost in considering each community individually.

Figure 30
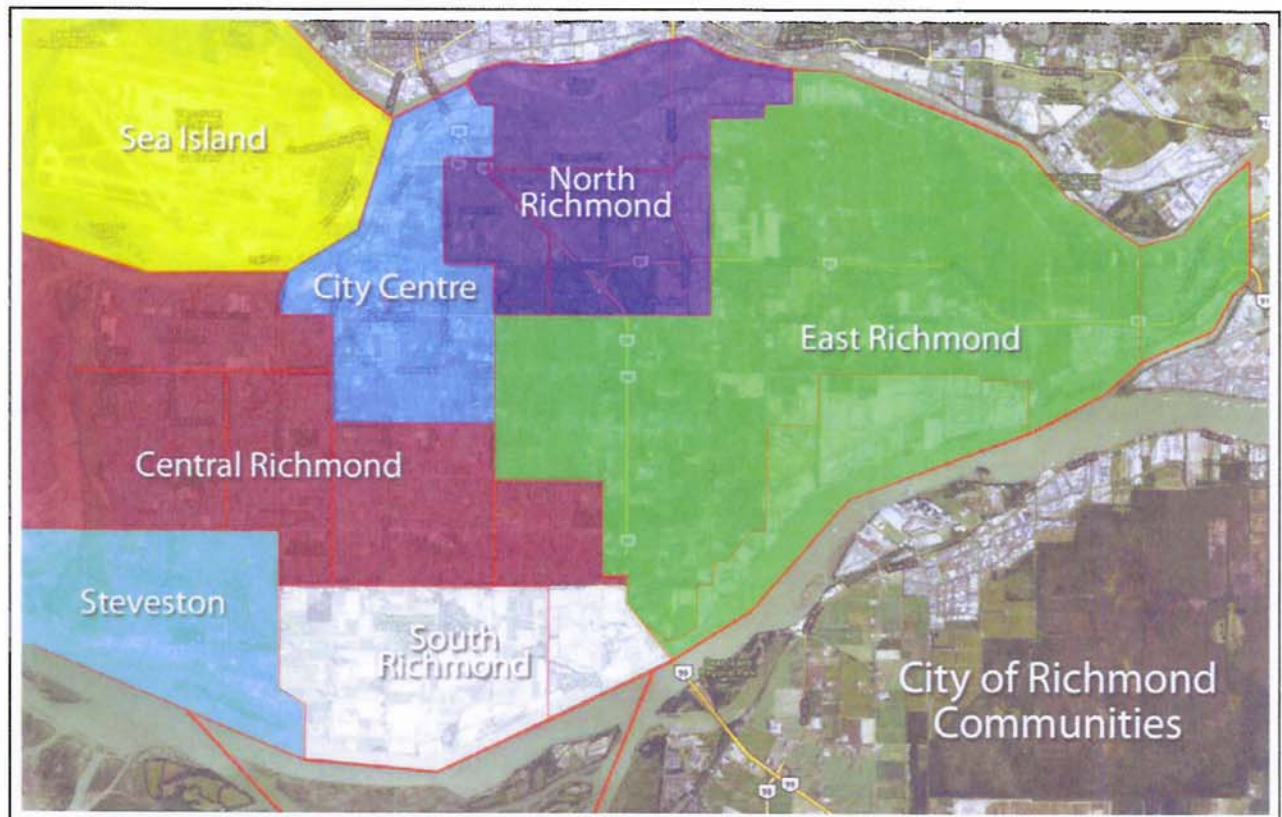
Figure 30 shows the seven community aggregations that are considered in the current projection series: Sea Island, City Centre, Central Richmond (comprising Thompson, Seafair, Blundell, Broadmoor, and the northern half of Shellmont[7]), Steveston, South Richmond (Gilmore and the southern half of Shellmont), East Richmond (East Fraserlands and Hamilton), and North Richmond (Bridgeport, East Cambie, and West Cambie). These will be referred to as Richmond's *communities* throughout the remainder of this report. The following section briefly outlines the data, projection methodology, and general findings for each community, with this overview being followed by more detailed tabulations of the projections for each area. It is important to note that as in previous sections of this report, the housing, population, and employment numbers have not been rounded; this is not meant to impart a superior degree of precision to the projections, but rather to allow readers to more easily interpret and compare the data.

Housing Allocation

As described in the preamble to the City-wide projections in Part II, the availability of housing will in large part determine where residents are accommodated within the region; it will also largely determine where population growth will be seen *within* the City of Richmond. Given this, an appropriate starting point for the projections of population is the pattern of residential development expected within the City of Richmond.

A number of inputs were used in the development of spatial projections of ground oriented and apartment housing development over the coming years. These included:

1) Census data describing the number of ground oriented and apartment dwelling units that existed in each community in 2006;
2) Census data describing the number and share of net additional dwelling units by structure type that were added to each community between 2001 and 2006;
3) An assessment of the potential future shares of housing development within each community by structure type provided by the City of Richmond Planning Department; and
4) The total number of net additional ground oriented and apartment dwellings projected for the City as a whole (as presented in Part II of this report).

With the 2006 Census representing the most recent comprehensive count of housing and the attributes of its residents, changes over the past Census period (2001 to 2006) were used to develop intercensal estimates of housing and population to 2009 for each community, with 2009 representing the base year for the long-range projections of community change.

With respect to housing, combining the City-wide projected additional number of dwelling units by structure type with an assessment of the longer-term potential distribution of future residential development provided by the City's Planning Department results in a projection of growth and change in each community's housing stock over the projection period. Table 1 presents the results of combining the Planning Department's assessments of the spatial distribution of future development and the City-wide projections of additional dwelling units by structure type.

With 51 percent of the City's estimated stock of ground oriented dwellings in 2009, Central Richmond is projected to account for the largest share of net additional ground oriented units through to 2041. While

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[7] For the purposes of this research the community of Shellmont has been divided into an upper half (included in Central Richmond) and a lower half (included in South Richmond) along the Steveston Highway.

this community accounted for just over 20 percent of the ground oriented additions seen in Richmond over the last Census period (2001 and 2006), the City's longer-term planning directions would see up to 50 percent of future ground oriented development being added in Central Richmond. This would add in the range of 9,888 units to Central Richmond between 2009 and 2041. An important note should be made here with respect to the broad range of housing types that fall within the ground oriented category: while the traditional single detached home comes to mind, this category also includes semi-detached homes, apartments or flats in detached duplexes, row homes, and mobile and moveable dwellings.

Table 1

Allocation of Net Additional Housing				
City of Richmond Communities, 2010-2041				
	Stock	**Net Additional Units**		
Ground Oriented	**2009**	**2010-2021**	**2022-2031**	**2032-2041**	**2010-41 Total**
Central Richmond	23,902	3,922	3,132	2,833	9,888
Steveston	7,097	468	163	78	710
City Centre	6,244	3,975	1,314	389	5,678
North Richmond	6,069	1,020	389	180	1,590
East Richmond	2,682	945	764	203	1,912
Sea Island	315	0	0	0	0
South Richmond	304	0	0	0	0
Total	46,613	10,330	5,763	3,684	19,777
	Stock	**Net Additional Units**		
Apartment	**2009**	**2010-2021**	**2022-2031**	**2032-2041**	**2010-41 Total**
Central Richmond	4,550	732	415	366	1,513
Steveston	2,316	898	289	254	1,442
City Centre	14,637	12,207	4,341	3,815	20,363
North Richmond	473	1,744	649	300	2,692
East Richmond	51	39	15	130	184
Sea Island	0	0	0	0	0
South Richmond	0	0	79	221	300
Total	22,028	15,620	5,787	5,087	26,494

While accounting for an estimated 13 percent of the City's ground oriented stock in 2009, the most recent Census period saw the City Centre accounting for a more significant 46 percent share of the City's ground oriented housing additions. The coming decades are expected to see the City Centre continue to increase its share of ground oriented accommodation in the City: over the projection period the City Centre is projected to accommodate just under 30 percent of future ground oriented additions to the Richmond (5,678 units).

With an estimated six percent of the City's ground oriented housing stock in 2009, over the next three decades East Richmond is expected to account for ten percent of new ground oriented development (1,912 units), while North Richmond would account for eight percent (1,590 units), slightly below its 2009 13 percent share of the City's ground oriented stock. Steveston, with 16 percent of the City's ground oriented dwellings in 2009, is also expected to see its share of net additional ground oriented units fall in the coming years as it reaches capacity due to constraints on available and developable land. Over the longer-term Steveston's share of ground oriented additions is expected to be four percent (710 units). Finally, Richmond's Planning Department does not expect growth in the ground oriented side of the

PLN - 178

market over the coming decades in either South Richmond or Sea Island (with respect to Sea Island, proximity to the airport and orientation to the flight path are the primary reasons).

On the apartment side, in 2009 the City Centre comprised almost two-thirds of the City's apartment stock (66 percent), and accommodated slightly more than two-thirds of the City's apartment additions over the last Census period. Longer-term policy expects up to 77 percent of the City's future apartment development to occur in the City Centre. This would see upwards of 20,363 new apartment units added to the City Centre by 2041.

Accommodating a relatively small proportion of the City's estimated apartment stock in 2009 (two percent), North Richmond is projected to account for ten percent of City-wide apartment additions by 2041 (2,692 units). Central Richmond, which accounted for 21 percent of the City's apartments in 2009, is projected to see its share of net additions over the longer-fall term below this level, at six percent (1,513 units). Steveston is also expected to see its share of the City's new apartment stock decline over time, accounting for five percent of net growth between 2009 and 2041 (or 1,442 units) relative to its current share of eleven percent. Plans indicate that the development of the Ironwood Neighbourhood Service Centre in South Richmond could include up to 300 apartment units, equivalent to one percent of net apartment additions in the City as a whole. East Richmond, with less than one percent of the City's apartment stock in 2009, would accommodate just under one percent of City-wide additions (184 units) by 2041. As with the ground oriented side of the market, Sea Island's proximity to the airport would see no new apartment development in this community over the projection period.

Population Implications

Using the same approach used to model population change within the Lower Mainland, the demographic projections for Richmond's seven communities begin with 2006 Census data describing population by age and sex in ground oriented and apartment accommodation in each community, with the aging, natality, and mortality of these residents being accounted for first. As at the regional level, age and sex specific natality and mortality rates were used to generate estimates of the annual number of births and deaths that would be seen within each community.[8]

Once these elements of natural increase of the existing residents were accounted for, the next step considered the mobility of households and the potential number and composition of households moving out of each community. An age, sex and structure type specific profile was generated from the Census data and used in conjunction with community-specific rates of housing turnover (also from the most recent Census) to estimate the total number of housing units from which households (and hence people, described by age and sex) would move. These vacated units were then "filled-up" using five-year mobility data by age, sex, structure type, and period of construction from the Census to develop an estimate of the number of people by age and sex expected to be residing in the existing dwelling stock in each community.

The final step in the modeling process was to add the increment of new ground oriented and apartment housing to each community, and then move households (described by age and sex) into these new units. Similar to the process undertaken to step down from the regional population and housing projections to

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[8] Note that municipal-level age specific fertility rates were used to determine the projected number of births for each community. Similarly, age and sex specific patterns of mortality in each community were assumed to be the same as the City-wide level.

the municipal level, five-year mobility data by age, sex, structure type, and period of construction from the Census were used to develop community-specific age profiles and household sizes for new households moving into each community. This approach explicitly acknowledges the local differences – and similarities – that exist across the seven communities within the City. These profiles ranged from the older in-mover ground oriented households in East Richmond to their younger counterparts in Steveston, to the relatively small households moving into apartments in North Richmond and the comparatively larger households moving into apartments in Central Richmond.

Considering all of these components of community change together on an annual basis resulted in projections of population by age and sex for each of the City's seven communities; the results of this component-based approach are shown in Table 2. As presented in Part II of this report, the City of Richmond is projected to add 88,213 people between 2009 and 2041 for total growth of 46 percent. In comparison, the City Centre is projected to more than double in size by 2041 (growing by 117 percent) as it adds 53,953 people – thereby increasing its share of the City's population from one-quarter to 36 percent by 2041.

Table 2

Total Population				
City of Richmond Communities, 2009 & 2041				
Planning Area	2009	2041	2009-2041 Change	
			#	%
Central Richmond	87,059	106,738	19,678	23%
North Richmond	21,841	30,564	8,723	40%
East Richmond	8,465	11,561	3,096	37%
City Centre	46,250	100,203	53,953	117%
Steveston	25,458	28,023	2,566	10%
Sea Island	833	880	47	6%
South Richmond	573	724	150	26%
Total	190,480	278,692	88,213	46%

In adding just under 4,300 new dwelling units over the projection period, North Richmond's population is projected to grow by 40 percent by 2041, adding 8,723 additional people. East Richmond (which includes the community of Hamilton) would grow by 37 percent and add 3,096 new residents between 2009 and 2041. Meanwhile, South Richmond, with the development of the Ironwood Neighbourhood Service Centre that is expected to be completed by 2041, is projected to grow by 26 percent, adding 150 new residents over the projection period.

Central Richmond is projected to see moderate relative growth over the coming three decades: a projected 23 percent increase in its population would see 19,678 new residents added to this community in the coming years. It is important to note that although relative growth would be considered moderate (23 percent versus the 46 percent City-wide), Central Richmond would add the second largest absolute number of residents.

Steveston on the other hand is expected to grow relatively slowly (by ten percent) and grow by a relatively small number of new residents (2,566 additional people). This relatively slow growth will result from a relatively constrained land base and thus capacity to add net new dwelling units. Finally, Sea Island, with only 833 people living within its boundaries in 2009, would see its population grow by only six percent by 2041 (47 new people), recognizing that this growth would be seen within the existing dwelling stock as no units are expected to be added in the coming years.

With the housing and population projections established for each of the City's seven communities, consideration was next given to current and future employment levels in each community.

Employment Implications

The spatial projections of employment within the City are based on a combination of functional and capacity modeling approaches. A similar functional modeling approach to that which was used at the regional (Lower Mainland) and municipal (the City of Richmond) levels was used for communities within the City, with population growth and the existing structure of employment used as a starting point in the allocation of additional local population serving and non-population serving jobs by occupation classification for each community. However, much like the allocation of housing, as one moves to these smaller geographic scales the availability of employment lands that prevail within the municipality and planning policies play a much larger role in where future employment will ultimately situate. As such, land supply and planning criteria were used to inform the initial distribution of additional population serving and non-population serving jobs among the communities.

The resulting projections of total employment are presented in Table 3.[9] Of all the communities in Richmond, the City Centre is projected to accommodate the greatest absolute and relative increase in employment between 2009 and 2041, reinforcing its status as the central employment hub in the City.

Table 3

Total Employment				
City of Richmond Communities, 2009 & 2041				
Planning Area	2009	2041	2009-2041 Change	
			#	%
Central Richmond	10,908	13,321	2,412	22%
North Richmond	34,481	40,921	6,440	19%
East Richmond	14,025	17,183	3,159	23%
City Centre	40,472	59,506	19,034	47%
Steveston	4,235	5,381	1,147	27%
Sea Island	24,204	35,211	11,006	45%
South Richmond	6,736	8,249	1,512	22%
Total	135,061	179,772	44,710	33%

Accounting for 30 percent of the City's employment in 2009, by 2041 it is expected that the City Centre will increase its share to 33 percent. Employment is projected to grow by 19,034 jobs by 2041, a 47 percent increase over 2009. This would be driven in part by a growing residential population in the City Centre (local population serving jobs) and in part due to the increasing diversity of goods and services demanded by residents throughout the rest of Richmond, the region, and beyond. Sectors expected to see significant growth in the City Centre would be health, education, and government services as well as sales and services occupations such a retail and food and accommodation (please see the Technical Appendix for a more detailed sectoral breakdown of employment categories).

In developing employment projections for Sea Island, specific consideration was given to the Vancouver Airport Authority's 20-year Master Plan and the medium-term plans for airport expansion. Over the coming two decades, passenger volumes at YVR are projected to increase by 84 percent.[10] With the airport expected to realize further efficiencies and economies of scale as it expands operations of both passenger and goods handling, Sea Island's employment is projected to grow by 45 percent as it adds 11,006 new jobs by 2041. Employment growth on Sea Island would equate to the second-greatest absolute and relative growth in employment amongst the City's seven communities. On a sectoral basis it is expected that employment growth would be lead by job increases in retail, food services, and protective services in large part to service growing passenger volumes, and in professional and technical types of occupations in natural and applied sciences related to both the logistics of goods movement and handling and engineering aspects related to the avionics industries.

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[9] Note that, as with the City-wide projections of employment, the projections include people with a usual place of work, those who work at home, and an allocation for those with no fixed workplace.

[10] Projected passenger volumes provided to the City of Richmond by the Vancouver Airport Authority.

North Richmond, with the second-most jobs in the City in 2009, would add the third-most jobs of any community in the City by 2041. Adding 6,440 new jobs (19 percent growth) North Richmond would diversify its land uses and employment structure. With a large base of employment in management, business, and finance occupations in 2009, this area of the City is expected to see significant growth in this sector as well as in health, education, and government services.

The coming three decades is expected to see employment in East Richmond grow by 23 percent, or by 3,159 new jobs. With a large segment of its land base in agricultural uses much of this growth would be realized in occupations unique to primary industry. Similarly, continued port operations and vacant industrial land situated along the South Arm of the Fraser River in East Richmond would see growth in manufacturing types of occupations; combined, almost two-thirds of employment growth in East Richmond is expected to be seen in primary industry and manufacturing, further reinforcing East Richmond's employment base in these sectors.

Over the coming three decades employment growth in Central Richmond will largely be constrained by the availability of suitable employment lands. An increase of 2,412 jobs in Central Richmond would equate to 22 percent growth in employment over the projection period, largely driven by growth in arts, culture, health, and education.

With a significant proportion of its land base in the Agricultural Land Reserve, South Richmond is projected to see relatively small employment growth to 2041. Total employment in South Richmond is expected to grow by 1,512 jobs (22 percent) between 2009 and 2041. Given its strong agricultural base, two-thirds of this growth would be in occupations unique to primary industry and manufacturing. In addition, this growth recognizes a 60-acre parcel of agriculturally-zoned land that is expected to be converted to industrial use (in the Riverside Industrial Park) by 2041. Finally, another community with a relatively constrained employment land base is Steveston. Employment here is projected grow by 1,147 jobs by 2041, representing a 27 percent increase over 2009. This would largely be the result of increases in occupations in art, culture, health, and education, as well as in occupations in sales and service.

Community Profiles

Building on this community overview, the following section provides further details of the housing by structure type, population by age, and employment by occupation projections for each community, in both tabular and graphical form. It includes an age breakdown for the population and an occupational sector breakdown for the employment projections. Note that the occupational categories are more aggregated than at the regional and City-wide level: this was necessary due to the small employment numbers in specific occupational sectors in some communities and Statistics Canada's data thresholds for maintaining confidentiality.

Profile of Central Richmond

Total Housing Stock by Structure Type, 2009 - 2041										
Central Richmond	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	28,452	29,083	31,023	33,106	34,951	36,654	38,318	39,853	11,401	40%
Ground Oriented	23,902	24,452	26,082	27,824	29,440	30,957	32,432	33,790	9,888	41%
Apartment	4,550	4,631	4,940	5,282	5,510	5,697	5,887	6,064	1,513	33%

Population by Age, 2009 - 2041											
Central Richmond		2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
	Total	87,059	88,456	92,619	97,307	100,987	103,551	105,372	106,738	19,678	23%
Age Groups	<15	12,241	11,638	11,278	12,216	13,549	14,292	13,945	13,022	781	6%
	15-24	13,374	13,154	11,226	9,582	8,793	8,999	10,103	11,335	-2,039	-15%
	25-34	10,406	11,394	14,494	14,921	12,654	10,571	9,755	10,135	-271	-3%
	35-44	11,511	10,430	9,062	12,126	15,761	15,709	13,320	11,361	-150	-1%
	45-54	15,359	15,242	14,220	11,536	10,268	13,153	16,635	16,775	1,416	9%
	55-64	12,381	13,756	15,455	15,627	14,338	11,821	10,760	13,633	1,251	10%
	65-74	6,415	6,953	9,912	13,107	14,697	14,951	13,879	11,649	5,234	82%
	75+	5,371	5,889	6,973	8,192	10,927	14,055	16,975	18,827	13,456	251%

Total Population, Central Richmond 2009 - 2041

Population Age Profile, Central Richmond 2009 & 2041
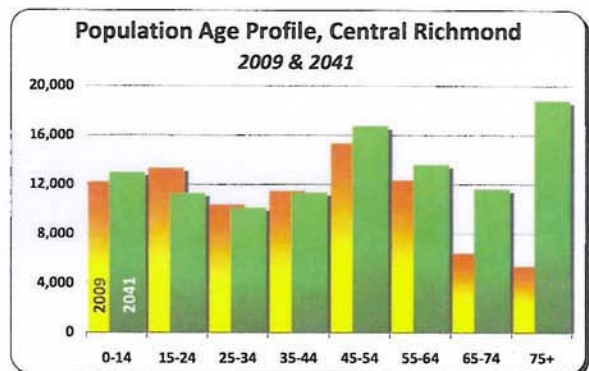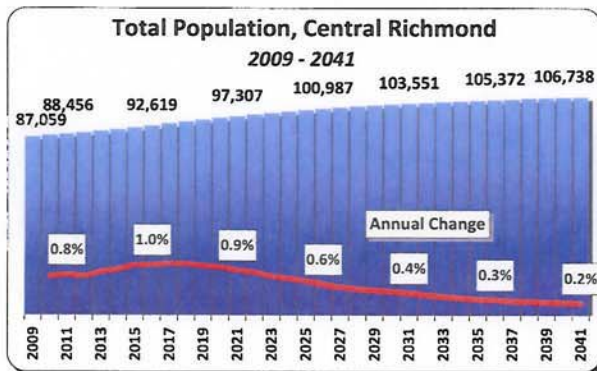
Employment by Occupation, 2009 - 2041										
Central Richmond	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	10,908	11,161	11,812	12,390	12,704	12,949	13,150	13,321	2,412	22%
Mgmt, Bus, Fin, Admin, Cler	3,138	3,163	3,266	3,355	3,391	3,414	3,433	3,448	310	10%
Natural & Applied Sci	526	531	543	556	565	573	580	586	60	11%
Health, Edu, Govt, Art, Culture	2,874	3,045	3,438	3,789	3,999	4,171	4,314	4,436	1,562	54%
Sales & Service	3,013	3,045	3,139	3,223	3,266	3,299	3,324	3,344	331	11%
Trades & Transport Occs	1,126	1,128	1,153	1,182	1,192	1,198	1,204	1,208	82	7%
Occs Unique to Prim & Manu	230	250	273	285	291	294	296	298	68	30%

Total Employment, Central Richmond 2009 - 2041

Employment Occupation, Central Richmond 2009 & 2041
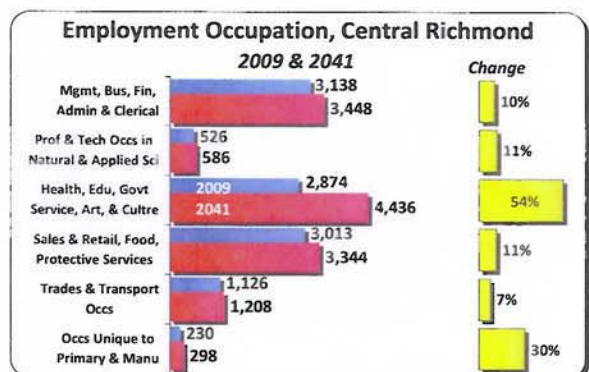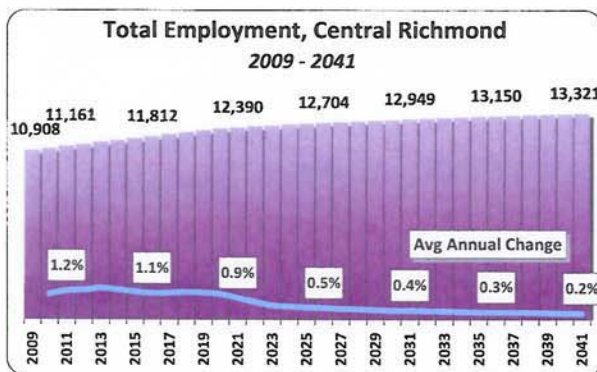
Profile of North Richmond

Total Housing Stock by Structure Type, 2009 - 2041

North Richmond	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	6,542	6,880	8,094	9,306	9,944	10,344	10,621	10,824	4,282	65%
Ground Oriented	6,069	6,272	6,729	7,089	7,327	7,479	7,583	7,659	1,590	26%
Apartment	473	607	1,365	2,217	2,617	2,865	3,038	3,165	2,692	570%

Population by Age, 2009 - 2041

North Richmond		2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
	Total	21,841	22,441	24,399	26,737	28,368	29,401	30,083	30,564	8,723	40%
Age Groups	<15	3,348	3,226	3,318	3,871	4,370	4,590	4,465	4,148	800	24%
	15-24	3,512	3,548	3,307	2,944	2,806	2,954	3,280	3,599	87	2%
	25-34	3,139	3,432	4,203	4,553	4,105	3,478	3,225	3,342	203	6%
	35-44	2,960	2,776	2,928	3,932	4,777	4,812	4,213	3,568	608	21%
	45-54	3,687	3,665	3,444	3,069	3,161	3,954	4,723	4,759	1,072	29%
	55-64	2,790	3,146	3,625	3,746	3,538	3,129	3,152	3,908	1,119	40%
	65-74	1,346	1,483	2,175	2,926	3,335	3,492	3,368	3,046	1,701	126%
	75+	1,059	1,166	1,400	1,696	2,277	2,991	3,658	4,193	3,134	296%

Total Population, North Richmond 2009 - 2041

Population Age Profile, North Richmond 2009 & 2041
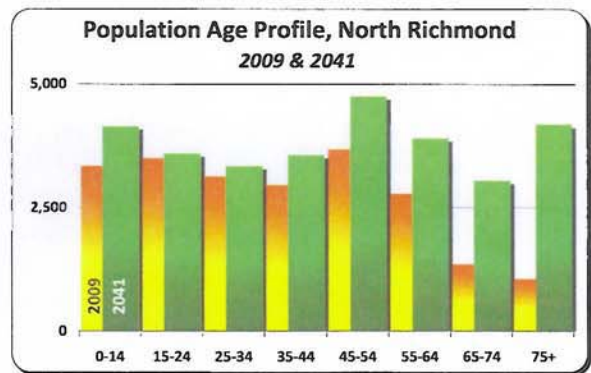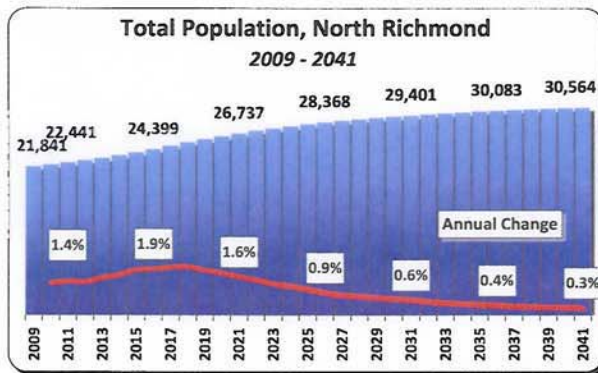
Employment by Occupation, 2009 - 2041

North Richmond	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	34,481	35,195	36,980	38,442	39,316	40,011	40,523	40,921	6,440	19%
Mgmt, Bus, Fin, Admin, Cler	11,892	12,014	12,444	12,770	12,954	13,098	13,196	13,266	1,374	12%
Natural & Applied Sci	6,063	6,174	6,429	6,651	6,817	6,962	7,081	7,179	1,117	18%
Health, Edu, Govt, Art, Culture	2,262	2,443	2,894	3,332	3,590	3,785	3,939	4,067	1,805	80%
Sales & Service	5,841	5,945	6,253	6,523	6,669	6,780	6,856	6,913	1,072	18%
Trades & Transport Occs	6,835	6,858	7,010	7,147	7,234	7,308	7,355	7,384	550	8%
Occs Unique to Prim & Manu	1,589	1,761	1,950	2,018	2,052	2,078	2,096	2,111	522	33%

Total Employment, North Richmond 2009 - 2041

Employment Occupation, North Richmond 2009 & 2041

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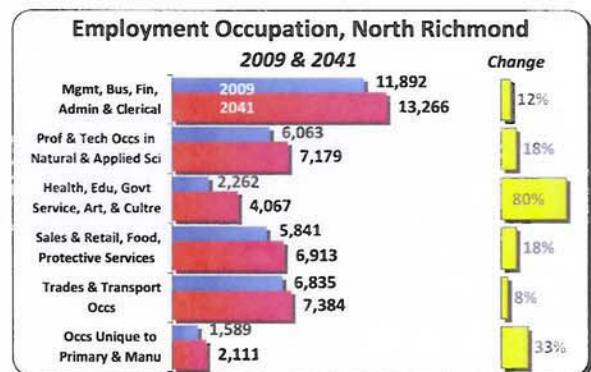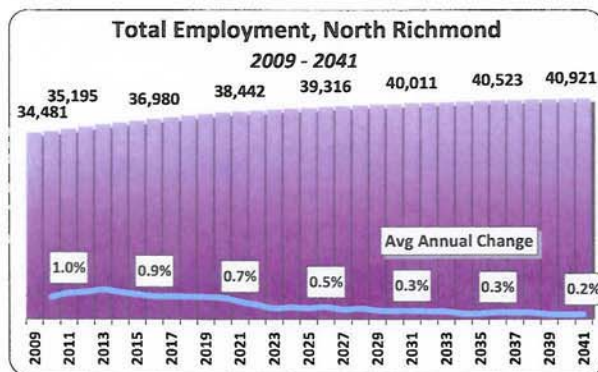
Profile of East Richmond

Total Housing Stock by Structure Type, 2009 - 2041										
East Richmond	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	2,733	2,886	3,297	3,717	4,144	4,496	4,699	4,829	2,096	77%
Ground Oriented	2,682	2,820	3,207	3,626	4,054	4,391	4,540	4,594	1,912	71%
Apartment	51	66	90	90	90	105	159	235	184	358%

Population by Age, 2009 - 2041											
East Richmond		2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
	Total	8,465	8,669	9,288	9,989	10,610	11,080	11,369	11,561	3,096	37%
Age Groups	<15	1,431	1,396	1,464	1,610	1,744	1,814	1,762	1,652	221	15%
	15-24	1,149	1,144	1,037	900	944	1,044	1,133	1,207	58	5%
	25-34	1,154	1,242	1,398	1,496	1,376	1,209	1,208	1,270	116	10%
	35-44	1,315	1,226	1,217	1,525	1,770	1,807	1,618	1,408	92	7%
	45-54	1,430	1,469	1,508	1,289	1,288	1,585	1,814	1,819	389	27%
	55-64	1,056	1,185	1,337	1,480	1,477	1,280	1,270	1,543	487	46%
	65-74	509	551	807	1,081	1,203	1,308	1,321	1,182	673	132%
	75+	421	456	520	609	809	1,032	1,244	1,480	1,059	251%

Total Population, East Richmond 2009 - 2041

Population Age Profile, East Richmond 2009 & 2041
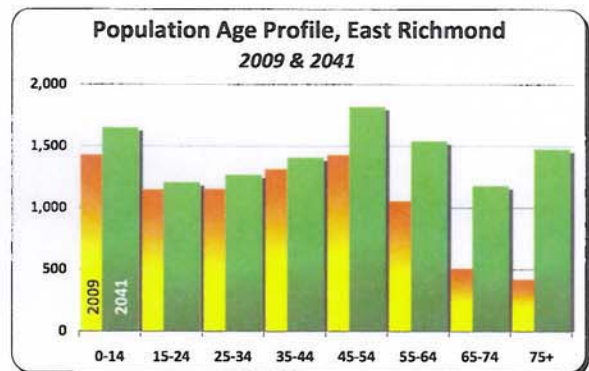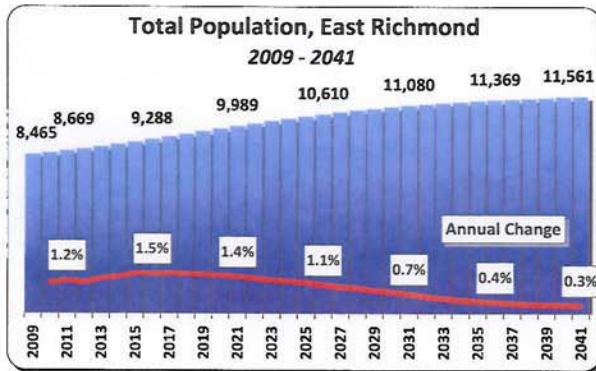
Employment by Occupation, 2009 - 2041										
East Richmond	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	14,025	14,757	15,778	16,316	16,626	16,870	17,046	17,183	3,159	23%
Mgmt, Bus, Fin, Admin, Cler	3,066	3,087	3,163	3,220	3,254	3,282	3,301	3,315	248	8%
Natural & Applied Sci	1,147	1,160	1,188	1,212	1,231	1,247	1,261	1,272	125	11%
Health, Edu, Govt, Art, Culture	505	551	658	761	825	879	921	955	450	89%
Sales & Service	2,250	2,265	2,305	2,338	2,359	2,377	2,390	2,398	148	7%
Trades & Transport Occs	2,834	2,847	2,911	2,957	2,993	3,027	3,049	3,062	229	8%
Occs Unique to Prim & Manu	4,222	4,847	5,553	5,828	5,964	6,056	6,125	6,181	1,960	46%

Total Employment, East Richmond 2009 - 2041

Employment Occupation, East Richmond 2009 & 2041

PLN - 185
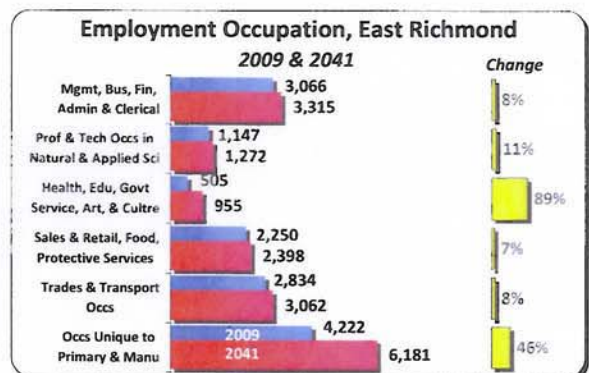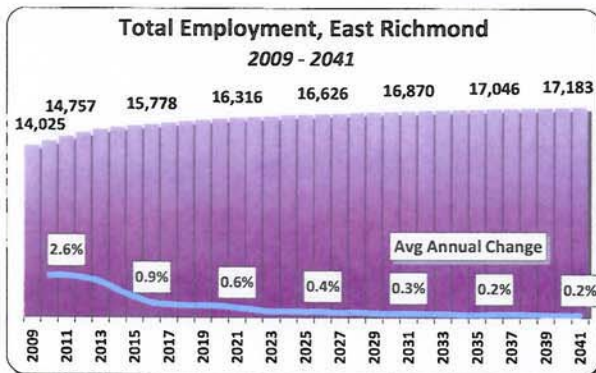
Profile of City Centre

Total Housing Stock by Structure Type, 2009 - 2041										
City Centre	**2009**	**2011**	**2016**	**2021**	**2026**	**2031**	**2036**	**2041**	**2009-41 Change**	
Total	20,881	23,749	31,352	37,063	40,313	42,717	44,896	46,922	*26,040*	125%
Ground Oriented	6,244	7,169	8,992	10,219	11,033	11,532	11,805	11,922	*5,678*	91%
Apartment	14,637	16,580	22,360	26,844	29,280	31,185	33,091	35,000	*20,363*	139%

Population by Age, 2009 - 2041											
City Centre		**2009**	**2011**	**2016**	**2021**	**2026**	**2031**	**2036**	**2041**	**2009-41 Change**	
	Total	46,250	50,770	63,996	76,782	85,905	92,156	96,704	100,203	*53,953*	117%
Age Groups	<15	5,972	6,641	8,443	10,406	12,003	13,047	13,283	13,047	*7,075*	118%
	15-24	5,830	6,148	7,323	7,990	8,393	8,925	9,663	10,420	*4,590*	79%
	25-34	7,094	8,109	10,603	12,504	12,748	12,172	12,050	12,496	*5,403*	76%
	35-44	7,800	8,297	10,265	13,168	15,372	15,918	15,336	14,525	*6,725*	86%
	45-54	7,985	8,752	10,562	11,385	12,156	14,079	15,808	16,109	*8,124*	102%
	55-64	5,410	6,321	8,476	10,415	11,452	11,426	11,737	13,400	*7,991*	148%
	65-74	3,090	3,370	4,768	6,662	8,329	9,683	10,394	10,357	*7,267*	235%
	75+	3,071	3,133	3,557	4,251	5,451	6,907	8,432	9,849	*6,778*	221%

Total Population, City Centre
2009 - 2041

Population Age Profile, City Centre
2009 & 2041
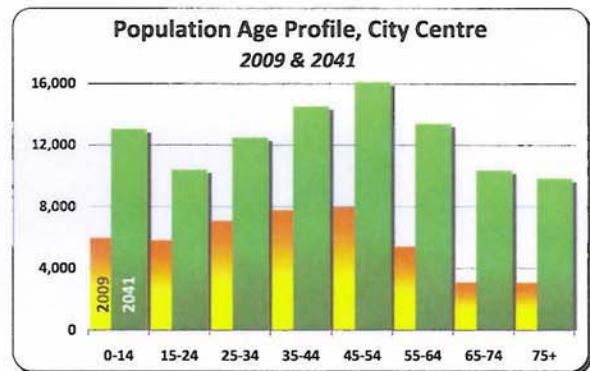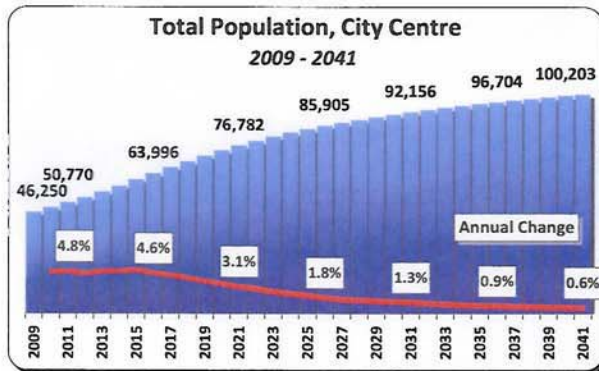
Employment by Occupation, 2009 - 2041										
City Centre	**2009**	**2011**	**2016**	**2021**	**2026**	**2031**	**2036**	**2041**	**2009-41 Change**	
Total	40,472	42,208	47,562	52,102	54,567	56,565	58,171	59,506	*19,034*	47%
Mgmt, Bus, Fin, Admin, Cler	11,934	12,191	13,240	14,017	14,437	14,825	15,133	15,386	*3,453*	29%
Natural & Applied Sci	1,915	2,012	2,270	2,536	2,721	2,883	3,028	3,157	*1,243*	65%
Health, Edu, Govt, Art, Culture	6,223	7,090	9,431	11,593	12,840	13,829	14,635	15,313	*9,091*	146%
Sales & Service	16,131	16,566	17,828	18,784	19,262	19,623	19,894	20,110	*3,979*	25%
Trades & Transport Occs	3,201	3,203	3,499	3,795	3,896	3,969	4,027	4,072	*870*	27%
Occs Unique to Prim & Manu	1,068	1,146	1,294	1,376	1,411	1,436	1,453	1,467	*399*	37%

Total Employment, City Centre
2009 - 2041

Employment Occupation, City Centre
2009 & 2041

Profile of Steveston

Total Housing Stock by Structure Type, 2009 - 2041										
Steveston	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	9,413	9,701	10,363	10,779	11,036	11,232	11,405	11,564	2,152	23%
Ground Oriented	7,097	7,229	7,440	7,565	7,660	7,728	7,774	7,807	710	10%
Apartment	2,316	2,471	2,923	3,214	3,377	3,503	3,631	3,758	1,442	62%

Population by Age, 2009 - 2041											
Steveston		2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
	Total	25,458	25,775	26,576	27,242	27,690	27,919	28,006	28,023	2,566	10%
Age Groups	<15	3,675	3,505	3,370	3,492	3,696	3,718	3,383	2,910	-765	-21%
	15-24	3,636	3,555	2,881	2,299	2,077	2,113	2,396	2,718	-918	-25%
	25-34	2,912	3,089	3,762	3,677	2,841	2,133	1,916	2,015	-897	-31%
	35-44	3,502	3,221	2,771	3,375	4,157	3,922	2,988	2,280	-1,222	-35%
	45-54	4,554	4,369	3,918	3,020	2,541	3,235	4,135	4,022	-532	-12%
	55-64	3,928	4,358	4,552	4,276	3,764	2,922	2,530	3,364	-564	-14%
	65-74	1,746	2,038	3,355	4,483	4,728	4,540	4,133	3,351	1,605	92%
	75+	1,505	1,639	1,966	2,619	3,886	5,335	6,526	7,364	5,859	389%

Total Population, Steveston
2009 - 2041

Population Age Profile, Steveston
2009 & 2041
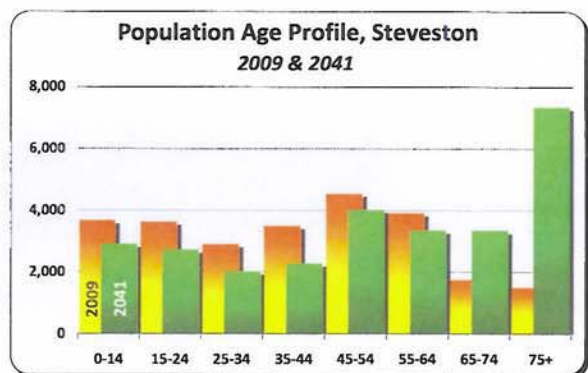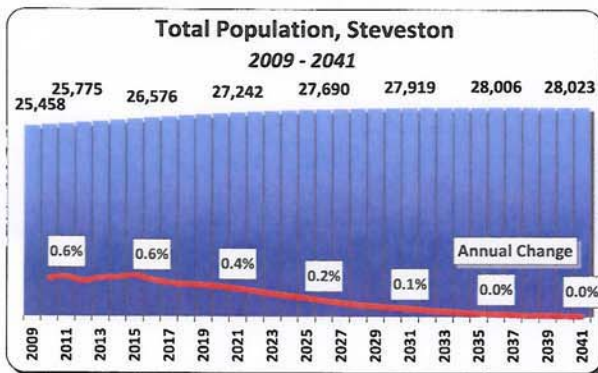
Employment by Occupation, 2009 - 2041										
Steveston	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	4,235	4,359	4,688	4,954	5,103	5,219	5,309	5,381	1,147	27%
Mgmt, Bus, Fin, Admin, Cler	1,190	1,203	1,250	1,282	1,294	1,302	1,307	1,310	121	10%
Natural & Applied Sci	271	275	285	295	302	309	314	319	48	18%
Health, Edu, Govt, Art, Culture	921	1,001	1,189	1,355	1,459	1,545	1,615	1,673	752	82%
Sales & Service	1,400	1,421	1,472	1,506	1,523	1,534	1,541	1,546	145	10%
Trades & Transport Occs	305	309	334	351	357	360	362	363	57	19%
Occs Unique to Prim & Manu	147	149	158	164	167	169	170	171	24	16%

Total Employment, Steveston
2009 - 2041

Employment Occupation, Steveston
2009 & 2041
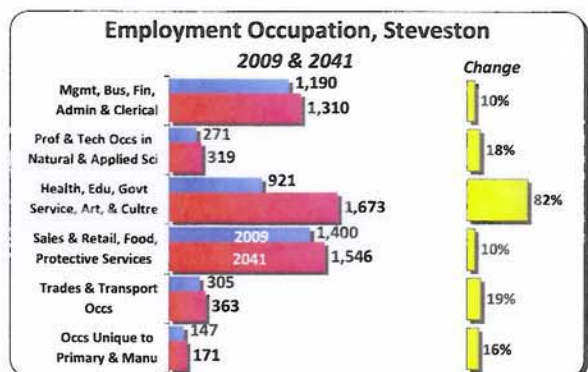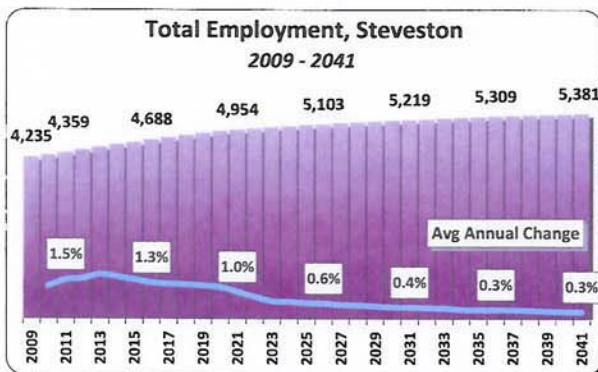
Profile of Sea Island

Total Housing Stock by Structure Type, 2009 - 2041										
Sea Island	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	315	315	315	315	315	315	315	315	0	0%
Ground Oriented	315	315	315	315	315	315	315	315	0	0%
Apartment	0	0	0	0	0	0	0	0	0	0%

Population by Age, 2009 - 2041											
Sea Island		2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
	Total	833	839	849	861	873	881	882	880	47	6%
Age Groups	<15	145	125	93	77	89	107	113	101	-44	-30%
	15-24	115	132	127	94	63	43	46	63	-51	-45%
	25-34	61	54	96	142	132	91	58	39	-21	-35%
	35-44	133	113	59	47	93	133	119	79	-54	-41%
	45-54	194	201	165	109	59	52	95	135	-59	-30%
	55-64	101	118	173	205	164	108	66	64	-37	-36%
	65-74	46	55	87	121	176	208	170	118	72	157%
	75+	39	41	48	66	97	139	214	281	242	620%

Total Population, Sea Island 2009 - 2041

Population Age Profile, Sea Island 2009 & 2041
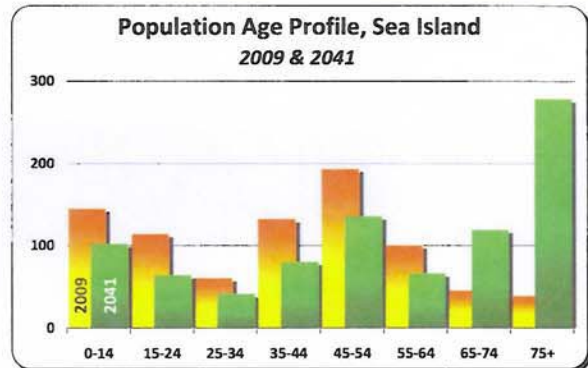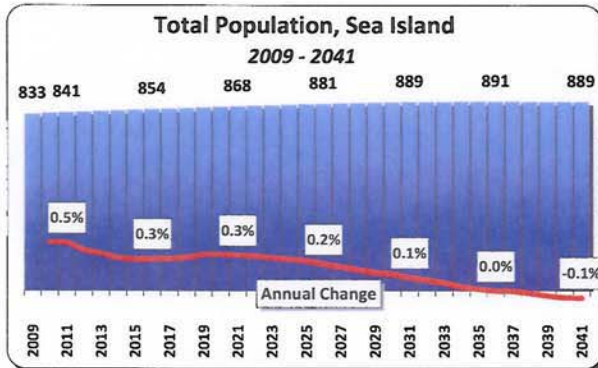
Employment by Occupation, 2009 - 2041										
Sea Island	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	24,204	25,215	28,361	31,021	32,456	33,598	34,489	35,211	11,006	45%
Mgmt, Bus, Fin, Admin, Cler	4,829	5,021	5,751	6,336	6,596	6,779	6,917	7,025	2,196	45%
Natural & Applied Sci	2,346	2,528	2,986	3,438	3,762	4,046	4,293	4,511	2,164	92%
Health, Edu, Govt, Art, Culture	580	655	829	998	1,110	1,211	1,289	1,353	773	133%
Sales & Service	8,946	9,392	10,627	11,624	12,170	12,596	12,912	13,160	4,214	47%
Trades & Transport Occs	7,257	7,340	7,857	8,303	8,490	8,636	8,745	8,827	1,570	22%
Occs Unique to Prim & Manu	245	279	311	322	327	330	332	334	89	36%

Total Employment, Sea Island 2009 - 2041

Employment Occupation, Sea Island 2009 & 2041

PLN - 188
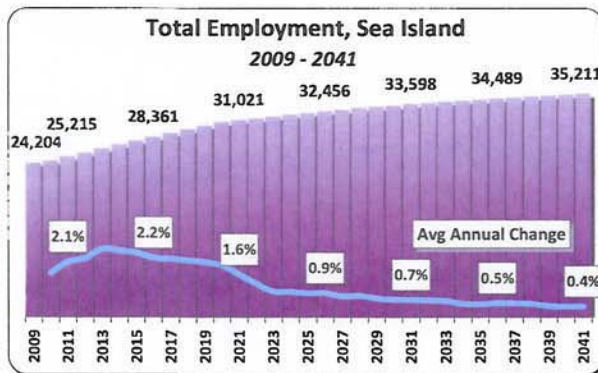
Profile of South Richmond

Total Housing Stock by Structure Type, 2009 - 2041										
South Richmond	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	304	304	304	304	326	383	476	604	300	99%
Ground Oriented	304	304	304	304	304	304	304	304	0	0%
Apartment	0	0	0	0	21	79	171	300	300	0%

Population by Age, 2009 - 2041											
South Richmond		2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
	Total	573	576	581	586	598	627	670	724	150	26%
Age Groups	<15	39	34	33	40	52	71	90	108	70	180%
	15-24	48	51	41	28	28	40	61	82	34	70%
	25-34	38	43	60	69	59	57	71	92	54	144%
	35-44	62	46	30	43	68	88	96	110	48	78%
	45-54	112	109	89	53	41	65	98	116	5	4%
	55-64	105	113	117	118	95	65	61	79	-26	-25%
	65-74	94	88	100	116	119	109	77	54	-40	-43%
	75+	77	91	112	119	137	131	114	83	6	8%

Total Population, South Richmond 2009 - 2041

Population Age Profile, South Richmond 2009 & 2041
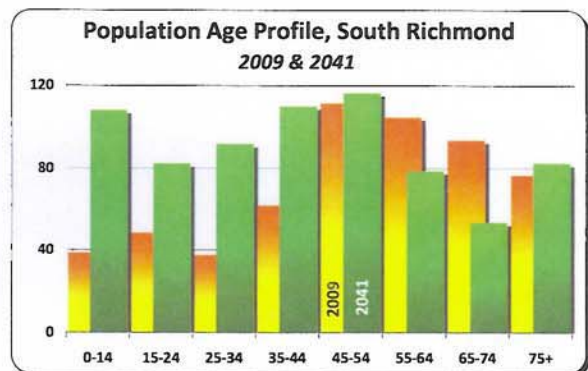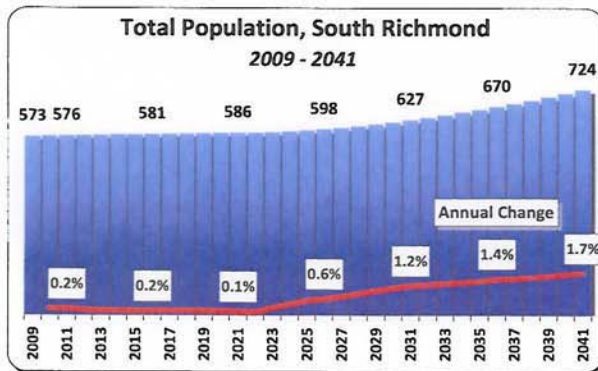
Employment by Occupation, 2009 - 2041										
South Richmond	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	6,736	7,164	7,628	7,795	7,938	8,069	8,167	8,249	1,512	22%
Mgmt, Bus, Fin, Admin, Cler	2,115	2,122	2,143	2,154	2,166	2,177	2,186	2,192	78	4%
Natural & Applied Sci	598	604	619	631	641	649	656	662	65	11%
Health, Edu, Govt, Art, Culture	277	289	315	335	349	363	376	390	113	41%
Sales & Service	1,560	1,575	1,605	1,620	1,641	1,664	1,681	1,697	137	9%
Trades & Transport Occs	1,428	1,440	1,467	1,474	1,493	1,515	1,529	1,539	112	8%
Occs Unique to Prim & Manu	759	1,133	1,480	1,581	1,648	1,701	1,738	1,768	1,009	133%

Total Employment, South Richmond 2009 - 2041

Employment Occupation, South Richmond 2009 & 2041
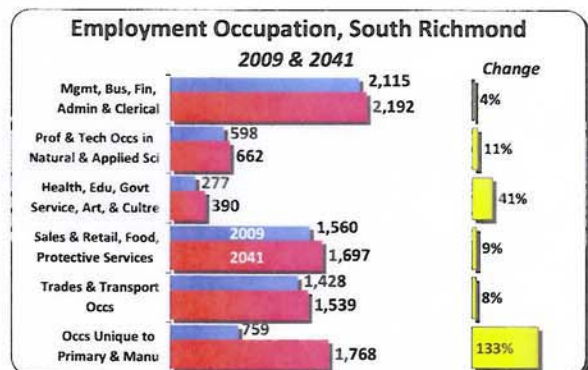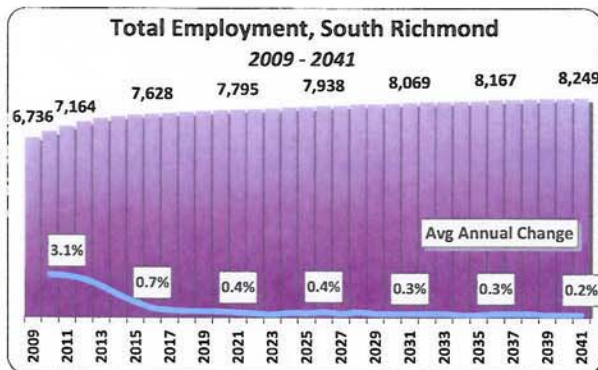
Profile of the City of Richmond

Total Housing Stock by Structure Type, 2009 - 2041										
Richmond	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	68,641	72,918	84,748	91,093	101,029	106,141	110,729	114,912	46,272	67%
Ground Oriented	46,613	48,563	53,070	55,492	60,134	62,706	64,753	66,390	19,777	42%
Apartment	22,028	24,356	31,678	35,601	40,896	43,435	45,976	48,522	26,494	120%

Population by Age, 2009 - 2041											
Richmond		2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
	Total	190,480	197,527	218,307	239,504	255,033	265,615	273,085	278,692	88,213	46%
Age Groups	<15	26,852	26,566	27,998	31,713	35,502	37,639	37,041	34,988	8,136	30%
	15-24	27,665	27,732	25,941	23,837	23,103	24,118	26,682	29,425	1,760	6%
	25-34	24,802	27,363	34,617	37,361	33,916	29,712	28,284	29,389	4,587	18%
	35-44	27,283	26,111	26,332	34,216	41,998	42,390	37,689	33,331	6,048	22%
	45-54	33,320	33,807	33,905	30,462	29,515	36,125	43,309	43,736	10,415	31%
	55-64	25,770	28,997	33,735	35,867	34,828	30,750	29,575	35,991	10,221	40%
	65-74	13,246	14,539	21,203	28,496	32,586	34,291	33,343	29,757	16,512	125%
	75+	11,542	12,414	14,576	17,553	23,584	30,590	37,162	42,075	30,533	265%

Total Population, City of Richmond
2009 - 2041

Population Age Profile, City of Richmond
2009 & 2041
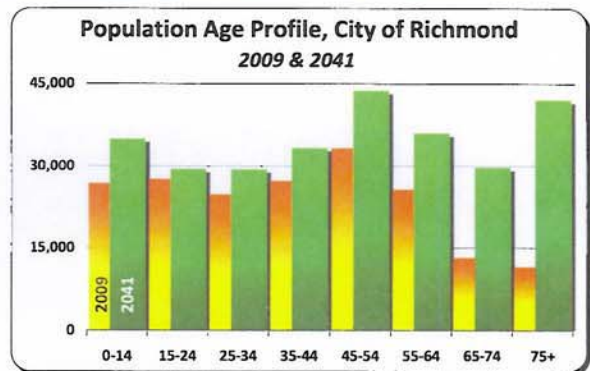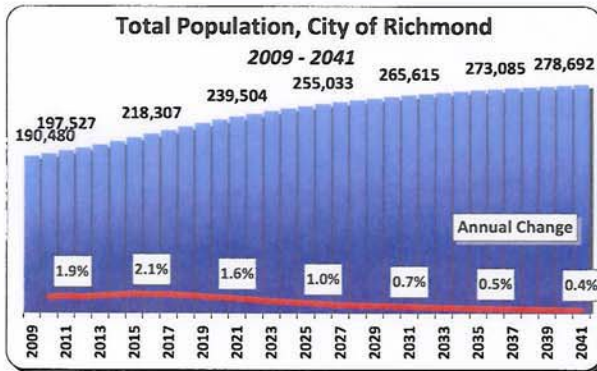
Employment by Occupation, 2009 - 2041										
Richmond	2009	2011	2016	2021	2026	2031	2036	2041	2009-41 Change	
Total	135,061	140,059	152,809	163,020	168,709	173,280	176,856	179,772	44,710	33%
Mgmt, Bus, Fin, Admin, Cler	38,164	38,801	41,257	43,134	44,092	44,877	45,473	45,943	7,779	20%
Natural & Applied Sci	12,866	13,285	14,320	15,320	16,038	16,671	17,212	17,687	4,821	37%
Health, Edu, Govt, Art, Culture	13,642	15,074	18,754	22,163	24,173	25,782	27,089	28,187	14,545	107%
Sales & Service	39,141	40,209	43,229	45,619	46,891	47,874	48,599	49,168	10,027	26%
Trades & Transport Occs	22,986	23,125	24,231	25,210	25,655	26,014	26,271	26,455	3,469	15%
Occs Unique to Prim & Manu	8,261	9,565	11,019	11,574	11,860	12,063	12,211	12,331	4,070	49%

Total Employment, City of Richmond
2009 - 2041

Employment Occupation, City of Richmond
2009 & 2041
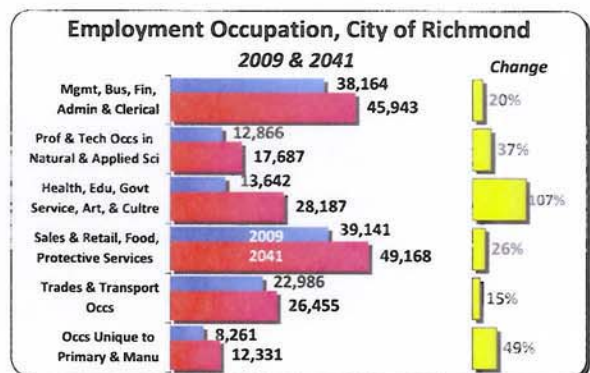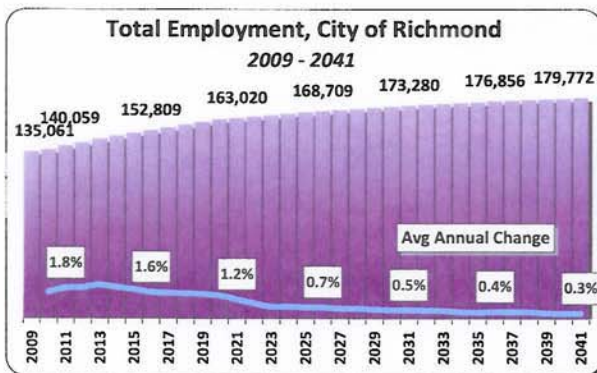
Part IV: Technical Appendix

Comparison to Other Projections

Three organizations currently maintain population projections for the Greater Vancouver Regional District (GVRD). BC Stats and Urban Futures maintain demographically-based forecasting models to project the future size and composition of population in the province and its communities, while Metro Vancouver maintains population and employment estimates for the GVRD and its communities as part of its regional Growth Management Strategy.

The projections developed by Urban Futures and BC Stats are based on a cohort survival methodology which accounts for specific components of demographic change by age and sex on an annual basis. Being trend-based in nature, these projections are based on the extension of long-run trends in population dynamics, both in terms of vital rates (natality and mortality) and net migration levels, including intra-provincial, inter-provincial and international movement. Metro Vancouver maintains population estimates as part of its Liveable Region and Growth Management Strategies which recognize the functional modeling approaches of BC Stats and Urban Futures within the context of policy objectives outlined in the Liveable Regional Strategic Plan and Growth Management Strategy.

Figure 31

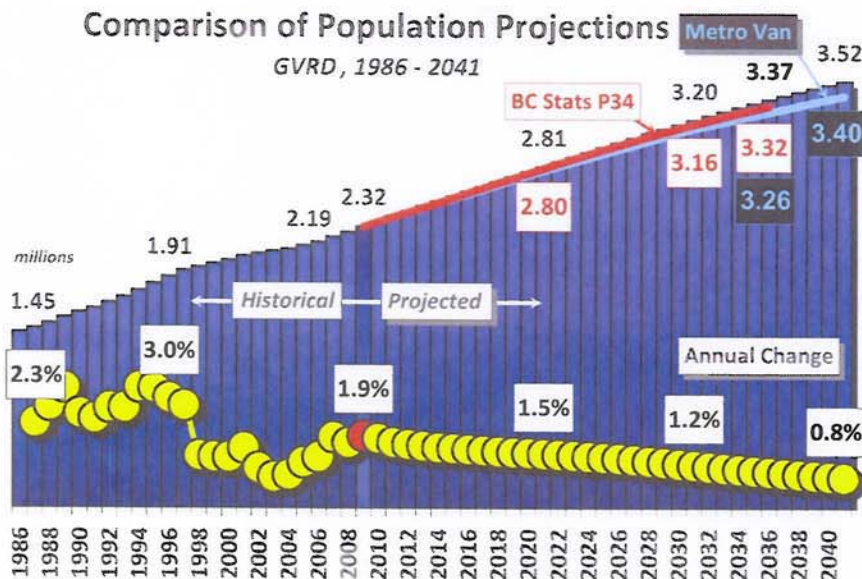Comparison of Population Projections
GVRD, 1986 - 2041

Figure 31 shows each organization's most recent series of projections for the GVRD for the various time horizons provided in each projection.

BC Stats' most recent projection (included as part of its P.E.O.P.L.E. 34, or P34, publication) shows the GVRD's population increasing by one million residents between 2009 and 2036 as it grows from 2.31 to 3.32 million people. Overall, BC Stats expects the Region to grow by 43 percent over the coming 27 years.

The Urban Futures projection for the GVRD indicates that over the same period (2009 to 2036) the regional population would increase by 1.1 million residents, growing by 45 percent. While Metro Vancouver's projections are provided for 2031 and 2041, interpolating between these two dates to derive a comparable 2036 estimate would see the GVRD add 950,000 new residents, resulting in overall growth of 41 percent and reaching 3.26 million people in 2036.

This range of projections – from a low of 3.26 million residents to a high of 3.37 million – represents a difference of 101,500 people (three percent) by 2036. Among a number of differences between the projection methodologies, the major difference between the Urban Futures and BC Stats projections lies in the projected level of immigration to Canada, and hence to the GVRD. BC Stats' projections recognize Statistics Canada's baseline assumption that immigration flows will attain 0.75 percent of the

existing Canadian population each year in the future; this is then allocated, on a constant-share basis, to British Columbia, and then using a net migration calculation, to the GVRD over the coming decades.

Urban Futures' models adopt a different approach, one which explicitly recognizes the demographic consequences of an aging Canadian population on the demand for, and supply of, workers in the country. Thus, Urban Futures projects annual immigration to Canada to increase from its recent 0.76 percent of the existing population to 0.82 percent by 2020. This would see immigration to Canada reach 306,000 by 2020 and 329,000 by 2036. This is then allocated to BC and the GVRD on an increasing-share basis in the short-term, and on a constant-share basis over the longer-term, informed by observed historical levels of immigration.

In spite of these different approaches to determining immigration levels over the coming decades, the two projections are essentially indistinguishable in the short-term, with Urban Futures' immigration assumptions becoming more prominent over the medium' and longer-terms. This is largely due to a reduction in the contribution of natural increase (the annual number of births minus deaths) to population growth as the bulk of our population ages out of the high fertility stages of the lifecycle and into the higher mortality ones.

As all population thresholds will ultimately be achieved at some point in the future (within reason), from a growth management and planning perspective there is a strategic advantage to considering the *timing* associated with achieving these population thresholds, rather than simply considering the difference between the projections in some future year. This can be done through an evaluation of current and historical projections for the GVRD from BC Stats, Urban Futures, and Metro Vancouver.

As previous projection series were only compiled to 2031, the baseline reference used here will be the 3.1 million people achieved by the GVRD in BC Stats' P34 projection for 2031. Table 1 indicates the date at which a 3.1 million population is attained in each projection series for the region. Compared to pervious BC Stats projection series, it shows that this population number is now projected to be attained four years earlier (2031 versus 2035) than in their projection series from 2003. Similarly, Metro Vancouver's most recent projection has the Region achieving a population of 3.1 million in 2031, also four years earlier than previous assessments (the GMS 4.0).

The most recent Urban Futures projection has the GVRD achieving 3.1 million residents in 2029, two years earlier than both BC Stats and Metro Vancouver, and seven years earlier than a projection run made in 2003. As previously indicated, the source of the difference is largely being driven by the higher level of immigration assumed under the current projections by Urban Futures.

If these most recent projections are considered collectively a mean date for achieving 3.1 million residents in the GVRD would be 2033, with a variance around this mean of approximately three years (as shown in Table 1).

Table 4

Timing of Regional Population Projections

BC Statistics Baseline		*3.1 Million*
	year projection achieves 3.1 million	
BC STATS P34 (2009)		2031
BC STATS P28 (2003)		2035
Metro Vancouver GMS 6.0		2031
Metro Vancouver GMS 4.0		2035
URBAN FUTURES (2009)		2029
URBAN FUTURES (2003)		2036
Mean		2033
Variance (years)		3

Note: Where future dates were not available as part of the projection series, the most recent projections were used to generate intermediate dates

In considering the range of projections for the City of Richmond, a slightly different situation emerges. Again, using as a baseline the current BC Stats projection (P34) of 262,574 residents for the City by

2036, the Metro Vancouver projection achieves this number one year earlier (in 2035), while the Urban Futures projection achieves it five years earlier (in 2031). By 2036 the projection range for the City is roughly six percent (Urban Futures' 278,000 residents on the high side and BC Stats' 262,000 residents on the low side). Much of this difference is explained by the longer-term implications of the higher immigration level under the Urban Futures projection, with the magnitude of the differences being much smaller over the short- and medium-terms (differences of between one and three percent). The variance between the projections increases over the longer-term due to the declining contribution that natural increase makes to future population growth. Furthermore, it is over the longer-term that the impacts of immigration will be most clearly seen, as natural increase will actually become natural *decrease* (where the annual number of deaths outweighs the number of births).

While projected migration – and specifically, immigration – is a contributing factor to the differences in both the Regional and the City-wide projections, it should also be noted that the more conservative projections from both BC Stats' and Metro Vancouver are contrasted by their previous projection series that were notably lower than their current runs. For example, BC Stats' P34 projection of 253,695 residents in the City of Richmond by 2031 is 15 percent higher than its P28 projection of 216,887 residents by 2031. Similarly, the most recent Metro Vancouver projection of 225,000 people in the City by 2021 is nine percent higher than the 207,000 projected for 2021 under the GMS 4.0.[11]

What do these projections tell us? The most fundamental and unquestionably important point is that they agree that sometime between 2026 and 2031 the GVRD will reach a population of 3.1 million. Based on the range of projections, the City of Richmond might anticipate growing to 260,000 residents sometime around 2033 (give or take three years) and somewhere between 275,000 and 290,000 by 2041.[12]

Within the context of strategic planning and anticipating infrastructure, land use, and financing requirements, there are few strategic planning considerations where the difference in timing among the organizations' projections is significant. While a particular plan may choose to adopt a low, medium, or high population scenario, it must be anticipated that within a three- to five-year window each projection series will be achieved. In certain contexts, it may be most appropriate to plan for the realization of the higher level of growth, as the consequences of having capacity a couple of years early are generally easier to mitigate than not having capacity when it is needed.

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[11] The year 2021 was used as a comparator here as the GMS 4.0's projection horizon was to 2021.
[12] Based on current Metro Vancouver and Urban Futures projections, respectively.
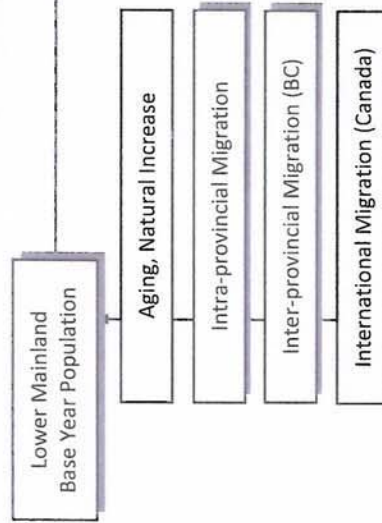
Occupation Classifications

Table 5

A Management occupations
A0 Senior management occupations
A1 Specialist managers
A2 Managers in retail trade, food and accommodation services
A3 Other managers, n.e.c.
A30 Managers in financial and business services
A31 Managers in communication (except broadcasting)
A32 Managers in health, education, social and community services
A33 Managers in public administration
A34 Managers in art, culture, recreation and sport
A35 Managers in protective service
A36 Managers in other services
A37 Managers in construction and transportation
A38 Managers in primary production (except agriculture)
A39 Managers in manufacturing and utilities

B Business, finance and administrative occupations
B0 Professional occupations in business and finance
B1 Finance and insurance administration occupations
B2 Secretaries
B3 Administrative and regulatory occupations
B4 Clerical supervisors
B5 Clerical occupations

C Natural and applied sciences and related occupations
C0 Professional occupations in natural and applied sciences
C01 Physical science professionals
C02 Life science professionals
C03 Civil, mechanical, electrical and chemical engineers
C04 Other engineers
C05 Architects, urban planners and land surveyors
C06 Mathematicians, statisticians and actuaries
C07 Computer and information systems professionals
C1 Technical occupations related to natural and applied sciences
C11 Technical occupations in physical sciences
C12 Technical occupations in life sciences
C13 Technical occupations in civil, mechanical and industrial engineering
C14 Technical occupations in electronics and electrical engineering
C15 Technical occupations in architecture, drafting, surveying and mapping
C16 Other technical inspectors and regulatory officers
C17 Transportation officers and controllers
C18 Technical occupations in computer and information systems

D Health occupations
D0 Professional occupations in health
D01 Physicians, dentists and veterinarians
D02 Optometrists, chiropractors & other health diagnosing/treating profs
D03 Pharmacists, dietitians and nutritionists
D04 Therapy and assessment professionals
D1 Nurse supervisors and registered nurses
D2 Technical and related occupations in health
D21 Medical technologists and technicians (except dental health)
D22 Technical occupations in dental health care
D23 Other technical occupations in health care (except dental)
D3 Assisting occupations in support of health services

E Occupations in social science, education, government service and religion
E0 Judges, lawyers, psychologists, social workers, min of religion, & policy & program officers
E01 Judges, lawyers and Quebec notaries
E02 Psychologists, social workers, counsellors, clergy and probation officers
E03 Policy and program officers, researchers and consultants
E1 Teachers and professors
E2 Paralegals, social services workers and occupations in education and religion, n.e.c.

F Occupations in art, culture, recreation and sport
F0 Professional occupations in art and culture
F01 Librarians, archivists, conservators and curators
F02 Writing, translating and public relations professionals
F03 Creative and performing artists
F1 Technical occupations in art, culture, recreation and sport
F11 Technical occupations in libraries, archives, museums and art galleries
F12 Photographers, graphic arts technicians and technical and co-ordinating occs
F13 Announcers and other performers
F14 Creative designers and craftspersons
F15 Athletes, coaches, referees and related occupations

G Sales and service occupations
G0 Sales and service supervisors
G1 Wholesale, technical, insurance, RE sales specialists, and retail, wholesale & grain buyers
G2 Retail salespersons and sales clerks
G3 Cashiers
G4 Chefs and cooks
G5 Occupations in food and beverage service
G6 Occupations in protective services
G7 Occupations in travel and accommodation, including attendants in recreation and sport
G8 Child care and home support workers
G9 Sales and service occupations, n.e.c.

H Trades, transport and equipment operators and related occupations
H0 Contractors and supervisors in trades and transportation
H1 Construction trades
H2 Stationary engineers, power station operators and electrical trades & telecomm occs
H3 Machinists, metal forming, shaping and erecting occupations
H4 Mechanics
H5 Other trades, n.e.c.
H6 Heavy equipment and crane operators, including drillers
H7 Transportation equipment operators and related workers, excluding labourers

I Occupations unique to primary industry
I0 Occupations unique to agriculture, excluding labourers
I01 Contractors, operators and supervisors in agriculture, horticulture and aquaculture
I02 Agriculture and horticulture workers
I1 Occs unique to forestry ops, mining, oil & gas extraction & fishing, excl labourers
I11 Supervisors, logging and forestry
I12 Supervisors, mining, oil and gas
I13 Underground miners, oil and gas drillers and related workers
I14 Mine service workers and operators in oil and gas drilling
I15 Logging machinery operators
I16 Logging and forestry workers
I17 Fishing vessel masters and skippers and fishermen/women
I18 Other fishing and trapping occupations
I2 Primary production labourers

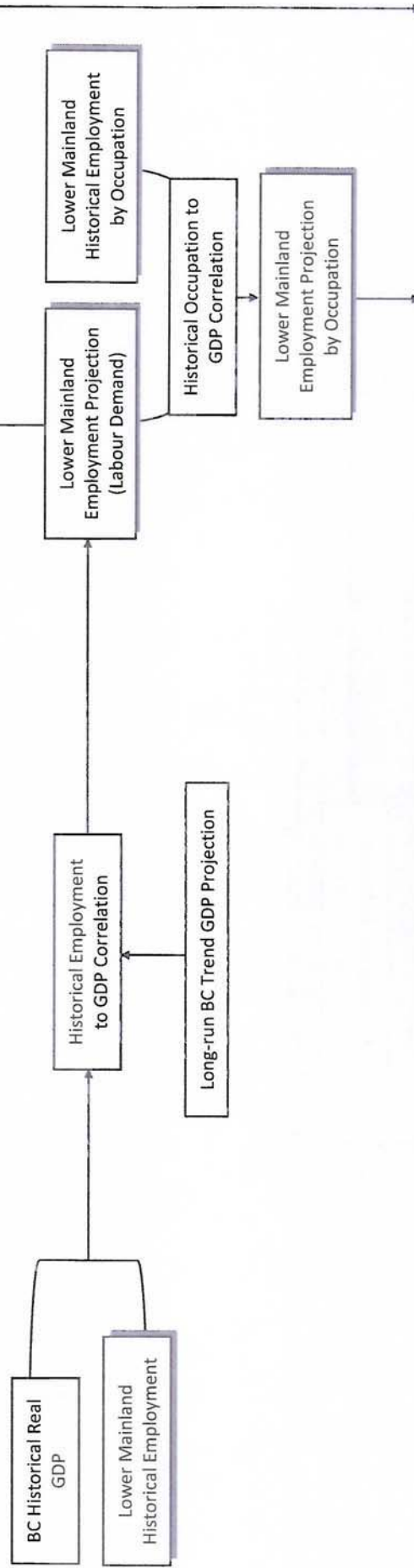| J Occupations unique to processing, manufacturing and utilities |
| --- |
| J0 Supervisors in manufacturing |
| J1 Machine operators in manufacturing |
| J2 Assemblers in manufacturing |
| J3 Labourers in processing, manufacturing and utilities |

PLN - 194

Modeling Approach

Step 1: The Regional Context

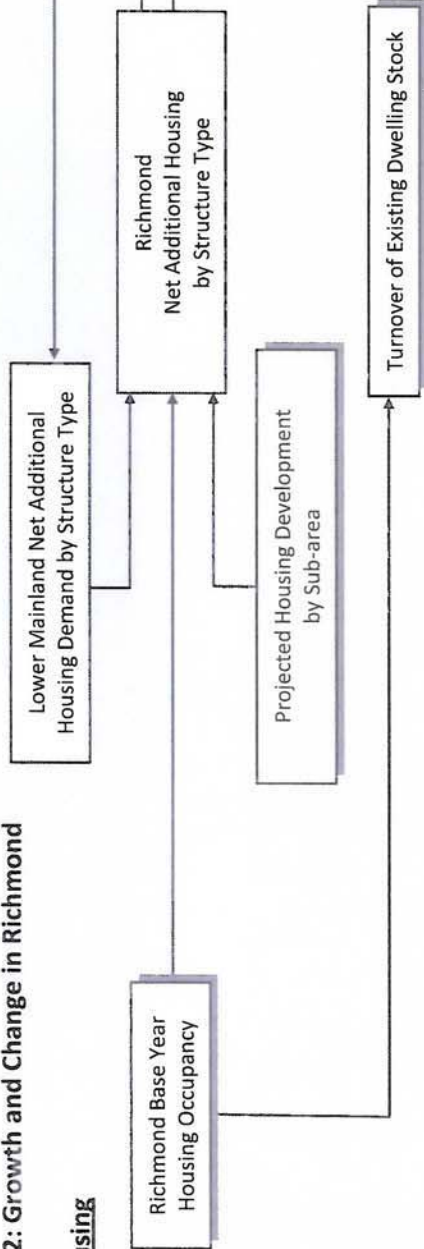Independent Demographic & Housing Projection

Independent Employment Projection

URBAN FUTURES
Strategic Research to Manage Change

Step 2: Growth and Change in Richmond

Housing

- Lower Mainland Net Additional Housing Demand by Structure Type
- Richmond Net Additional Housing by Structure Type
- Projected Housing Development by Sub-area
- Turnover of Existing Dwelling Stock
- Richmond Base Year Housing Occupancy

Population

- Richmond Population Projection
- Richmond Base Year Population
- Aging, Natural Increase
- In-movers
- Out-movers

Employment

- Lower Mainland Net Additional Employment by Occupation (population/non-pop serving)
- Change in Population-serving Employment
- Change in Non-population-serving Employment
- Richmond Employment Projection by Occupation
- Richmond Base Year Employment by Occupation

URBAN FUTURES
Strategic Research to Manage Change

Step 3: Growth and Change in Richmond's Communities

Housing

Richmond Net Additional Housing by Structure Type

Community Net Additional Housing by Structure Type

Turnover of Existing Dwelling Stock

Spatial Projection of Housing Development in Richmond

Community Base Year Housing Occupancy

Population

Community Population Projection

Community Base Year Population

Aging, Natural Increase

In-movers

Out-movers

Employment

Assessment of Community Employment Capacity Constraints

Final Community Employment Projection by Occupation

Unconstrained Community Employment Projection by Occupation

Change in Population-serving Employment

Change in Non-population-serving Employment

Richmond Net Additional Employment by Occupation *(population/non-pop serving)*

Community Base Year Employment by Occupation