



City of Richmond State of the Environment

2005 Update Report



December, 2005



# City of Richmond State of the Environment 2005 Update Report December 2005

This report was prepared under the direction of  
Richmond's Advisory Committee on the Environment

by:

**The City of Richmond**  
**Planning and Development Department**  
**Policy Planning Section**  
6911 No. 3 Road  
Richmond, BC

and

**The Sheltair Group**  
205 – 1525 West 8th Avenue  
Vancouver, BC  
V6J 1T5  
Tel: 604-732-9106

Copies of this report can also be obtained on the City's website:  
**[www.city.richmond.bc.ca](http://www.city.richmond.bc.ca)**



# Table of Contents

<b>Indicator Highlights</b> .....	v
<b>Introduction</b> .....	1
<b>List of Indicators</b> .....	5
<b>Context Indicators</b> .....	7
CTX-1: Population Size and Growth .....	8
<b>Preserve a Sustainable Agricultural Land Base</b> .....	11
PSA-1: Land in the Agricultural Land Reserve.....	12
<b>Protect Natural Areas &amp; Provide Park Space and Trails</b> .....	17
PNA-1: Parks and Protected Areas .....	18
PNA-2: Designated Terrestrial Environmentally Sensitive Areas .....	23
PNA-3: Trail Network.....	28
<b>Reduce Resource Consumption and Emissions</b> .....	31
RRC-1: Water Consumption .....	32
RRC-2: Wastewater Generation .....	36
RRC-3: Residential Solid Waste Disposal .....	38
RRC-4: Residential Building Energy Use.....	41
RRC-5: Greenhouse Gas Emissions .....	44
<b>Build Compact and Complete Communities</b> .....	47
BCC-1: Population and Housing Unit Density .....	48
BCC-2: Residential Housing Mix .....	54
BCC-3: Amenity Access .....	57
BCC-4: Labour Force Living and Working within Richmond .....	60
BCC-5: Commuter Trip Distance .....	62
<b>Increase Transportation Choice</b> .....	65
ITC-1: Choice of Transportation Mode .....	66
ITC-2: Registered Passenger Vehicles.....	70
ITC-3: Cycling Facilities .....	73
ITC-4: Transit Access .....	77
<b>Maintain Clean Water, Land and Air and Minimize Noise</b> .....	79
WLA-1: Fraser River Water Quality .....	80
WLA-2: Ambient Air Quality .....	83
WLA-3: Short Term Air Quality Exceedances.....	87
WLA-4: Soil Quality .....	89
WLA-5: Noise .....	90

**Provide Environmental Leadership** ..... 93

PEL-1: City Building Energy Consumption ..... 94

PEL-2: Green City Buildings ..... 96

PEL-3: Vehicle Fleet Management ..... 97

**Conclusions and Next Steps**..... 99

**Acronyms and Abbreviations** ..... 103

**For Further Information** ..... 104

**Acknowledgements**..... 107

**Key Facts for Richmond** ..... 108

## Indicator Highlights

The City of Richmond, BC, has a State of the Environment (SOE) program to help monitor and report on the city's environmental health and the pressures placed on the environment by urban activity. State of the Environment reports have been published in 1998 and 2001 and this third edition for 2005 includes a refined set of indicators and reports on the current state of urban activity, human pressures on the environment, and the state of the environment within and surrounding the municipality.

### This report aims to:

- monitor the status and trends in urban pressures on the environment and the general environmental quality over time; and,
- assess whether the city is moving towards, or away from, desired environmental and sustainability objectives.

The 2005 SOE report update contains 27 indicators that are organized into the following eight categories, representing contextual, environmental and growth management objectives:

- Context Indicators - Population Size and Growth
- Preserve a Sustainable Agricultural Land Base
- Protect Natural Areas and Provide Parks and Trails
- Reduce Resource Consumption and Emissions
- Build Compact and Complete Communities
- Increase Transportation Choice
- Maintain Clean Water, Land, and Air and Minimize Noise; and,
- Provide Environmental Leadership by the City.

### Context: Population Size and Growth

Population growth is one of the major drivers impacting the environment in urban regions. Population drives demand for housing, public services, land, water, energy, and other resources and places pressure on green space and transportation systems. The actual impact of human activity on the environment is a function of the population size and each person's use/impact on the environment (per capita consumption and impact). To move towards a sustainable municipality with a growing population requires that individuals reduce their current per capita impact on the environment.

### How are we doing?

#### Population Size and Growth

- Richmond is the fourth most populous municipality in Greater Vancouver with 181,900 residents at the end of 2005. The population has increased by 6.7% over the five years from 2000 to 2005 - a slower rate than was experienced in the 1990s but still a substantial rate of growth.

*Richmond's challenge will be to reduce per capita environmental impact as the population increases.*





## Preserve a Sustainable Agricultural Base

Preservation of land for agriculture is the first and most important step in ensuring the viability of agriculture in Richmond. The provincial government recognizes the importance of agricultural land for food and economic security, and in 1973 established the BC Agricultural Land Reserve (ALR) to protect and maintain the province's agricultural land base.

### How are we doing?

#### Lands in the Agricultural Land Reserve

- Approximately 40% of the land base in Richmond, or 5,179 ha (12,797 acres), was located in the ALR in 2005. Approximately 90% of Richmond's original Agricultural Land Reserve remains intact.
- Since the 2001 SOE, approximately 2 ha (4.95 acres) have been excluded from the ALR.
- In 2005, the Canada Lands Corporation applied to exclude 55 ha (136 acres) of land from the Agricultural Land Reserve; the Agricultural Land Commission will consider this application in 2006.
- A significant number of non-agricultural uses are occurring in the ALR, which reduces the agricultural potential of the area.

*Richmond has been largely successful in protecting the Agricultural Land Reserve but population growth and development will increase pressure to exclude land from the ALR.*

## Protect Natural Areas and Provide Parks and Trails

Greenspace contributes both aesthetic value and environmental benefits to a community and it is critical for providing wildlife habitat. Parks retained in a natural state and protected areas provide the highest level of protection for wildlife. The City also has a long-established Environmentally Sensitive Areas program and policy to foster protection of wildlife habitat.

### How are we doing?

#### Parks and Protected Areas

- Approximately 9.7% of Richmond's land base, or 1,248 ha (3,085 acres), was located in a park or protected area in 2005. Since 2001 two parks, totalling 10.9 ha (26.93 acres), have been added to the City's inventory. This update to the Parks and Protected Areas indicator incorporates a number of adjustments to the totals as a result of technical refinements over the 2001 SOE.





### Terrestrial Environmentally Sensitive Areas

- The City has an estimated 1,578 ha (3,899 acres) of terrestrial Environmentally Sensitive Areas, representing approximately 12% of Richmond's land base.
- Approximately 49% of the City's designated terrestrial Environmentally Sensitive Areas were protected as parks or other protected areas as of 2005.

### Trail Network

- The City has established a 49-kilometre trail network and added 9.75 kilometres of trail between 2001 and 2005.

*The total land area of designated or protected green space in the city, including the Agricultural Land Reserve and parks and protected areas, is 6,422 hectares (15,870 acres), representing 50% of Richmond's land base.*

The City of Richmond, other government agencies and land trusts have successfully established a significant portion of the municipality as parks and protected areas and continue to add new parks.



## Reduce Resource Consumption and Emissions

To achieve long-term sustainability, cities will have to reduce resource consumption and the creation of wastes. Expected population growth will make this task very challenging. Consuming resources like energy and water, generating liquid and solid wastes that require treatment or disposal, and creating emissions of air pollutants are a burden we place on the environment - both globally and locally.

### How are we doing?

#### Water Consumption

- In 2004, total residential water consumption was 45% greater than 1990 levels - more or less in line with population growth. There has been no reduction in per capita residential water consumption over the past 15 years.

#### Wastewater Generation

- Wastewater generation is increasing - per capita wastewater flows are up 13% from 1990 to 2004. Increased per capita flows combined with increased population means that wastewater flows are growing faster than the population growth rate.

#### Residential Solid Waste Disposal

- From 1990 to 1999, Richmond reduced its annual solid waste disposal from single-family homes from 323 kg to 179 kg per capita (the lowest in the past 15 years). Since then, per capita amounts have been increasing and in 2004 single-family homes generated 194 kg of solid waste per capita per year.



### Residential Building Energy Use

- In 2004, Richmond residents used about 3,000 kWh of electricity per capita per year and about 20 GJ of natural gas per capita per year. Per capita energy usage has remained unchanged over the last few years, but total energy consumption has increased with population growth.

### Greenhouse Gas Emissions

- In 2001, Richmond joined the Partners for Climate Protection Program developed by the Federation of Canadian Municipalities. Through this program the City will be defining greenhouse gas reduction targets and developing plans to meet these targets.

*Total resource consumption and emissions are currently growing as a result of population growth. In order to reduce total consumption, per capita reductions will need to be achieved. Per capita garbage disposal has decreased but not water or energy consumption.*

## Build Compact and Complete Communities

The City of Richmond's Official Community Plan identifies policies for developing a compact urban form and building complete communities, including concentrating growth in the City Centre. By building complete communities – places where we can live, work, shop, and play – we can better meet our daily needs closer to home thereby reducing trip distances and reducing overall reliance on the automobile.

### How are we doing?

#### Population and Housing Unit Density

- Housing density in the City Centre increased from 11.3 units/ha (4.6 units/acre) in 1990 to 20.9 units/ha (8.5 units/acre) in 2005 – almost doubling the number of housing units in the City Centre.
- The proportion of the city's dwellings located within the City Centre has increased from 21% in 1990 to 28% in 2005.
- The West Richmond Urban Area is now at or approaching levels of density that are supportive of reduced automobile dependence.

#### Residential Housing Mix

- Between 1990 and 2005, the share of single detached housing in the city declined from 57% to 46%. The majority of housing units are now multi-family units, which are more land and resource efficient.

#### Amenity Accessibility

- Over 90% of dwelling units are located within 400 metres of a park/school yard and within 400 metres of a shopping area / convenience store as of 2004.
- Approximately 93% of dwelling units are located within 2 kilometres of a community centre as of 2004.



### Labour Force Living and Working within Richmond

### Commuter Trip Distance

- Approximately 54% of Richmond's labour force worked within Richmond in 2001, up from 53% in 1991 – one of the highest shares for any municipality in Greater Vancouver.
- The median commute distance fell from 7.5 km in 1996 to 6.7 km in 2001 – a distance that is shorter than both regional and national averages. A shorter median trip distance is supportive of walking and cycling for journey-to-work trips and results in reduced transportation fuel consumption for commuting.

*Overall, the City of Richmond has been successful in developing the Richmond City Centre into a higher density, mixed-use area and in retaining a compact urban form and attracting a high number of jobs to locate in the city.*

## Increase Transportation Choice

Our travel choices have a tremendous impact on the environment. The vast majority of motor vehicles burn non-renewable fossil fuels, producing air emissions and greenhouse gases. A shift towards more sustainable modes of transportation – notably walking, cycling, and public transit – is one of the primary ways we can help protect our environment.

### How are we doing?

### Choice of Transportation Mode for Journey-to-Work Trips

- The City of Richmond remains automobile dependent as approximately 85% of journey-to-work trips were made by drivers or passengers of private vehicles in 1996 according to the Census of Canada (more recent data from the 2001 Census were invalid due to the transit strike).
- Transit ridership in general is increasing. The 98 B-Line, which was introduced in 2001, has resulted in a 20% reduction in travel time between Richmond City Centre and downtown Vancouver. Ridership increased from 18,000 per day in 2002 to 20,000 per day in 2004.

### Passenger Vehicles

- The registered and insured vehicle rate for both passenger and commercial vehicles has remained relatively flat at 0.66 to 0.68 vehicles per capita from 2000 to 2005. The registered and insured passenger vehicle rate in 2005 was 0.57 vehicles per capita. The vehicle ownership rate is relatively high and the total number of registered motor vehicles continues to climb because of the increased population.

### Cycling Facilities

- The 57 kilometre cycling network, which includes on-street facilities as well as multi-user pathways and dyke trails, increased by 11 kilometres between 2000 and 2005.





## Transit Access

- Approximately 63% of Richmond residents lived within 400 metres of transit routes with a 10-minute or better rush-hour service in 2003.

*Richmond is an automobile dependent city with a high vehicle ownership rate and a high proportion of trips being made by automobiles. However, much progress has been made in creating a land use pattern supportive of walking, cycling and transit as well as improving public transit service and expanding the cycling network in the city.*

## Maintain Clean Water, Land, and Air and Minimize Noise

All human activity results in emissions of waste to water, land and air. In many cases, the environment can assimilate these emissions. However, as our population grows we put more stress on our environment and can disrupt those 'ecological services' that the environment performs for us. The objective is to maintain air, water and land at sufficient quality to ensure that these environmental services can still be provided.

### How are we doing?

#### Fraser River Water Quality

- Generally Fraser River water quality in the area around Richmond meets provincial water quality objectives.

#### Ambient Air Quality

- Air quality - as measured by average annual concentrations of ozone and particulate matter - has remained the same for the past decade.

#### Short Term Air Quality Exceedances

- Short term exceedances of particulate matter standards are rare in Richmond (one or two days per year) indicating that they are likely due to intermittent events and are not a sign of deteriorating air quality.

#### Soil Quality

- No indicator is in use in Richmond to track changes in agricultural soil quality or contamination of lands.

#### Noise

- Current noise levels in Richmond are below the level thought to impact human health. In recent years, improvements in aircraft technology have reduced noise levels at most monitoring stations.
- General urban noise sources are addressed through a complaint investigation process. In 2004/2005, 120 complaints were investigated.

*Environmental quality in Richmond is generally within established guidelines and standards to protect human health.*

## Provide Environmental Leadership

The City has completed a number of significant environmental initiatives for its corporate operations that demonstrate its environmental leadership in the community. These include:



- building an environmentally award winning City Hall;
- implementing a City Environmental Purchasing Policy and Guidebook in 1999;
- completing a wide array of energy efficiency programs in City buildings through the BC Hydro Power Smart program; and,
- conducting fleet management activities to reduce energy consumption in its vehicles.
- maintaining and supporting an Advisory Committee on the Environment,
- maintaining an Environmentally Sensitive Area program,
- supporting external programs such as FREMP and the Vancouver Airport Authority's Noise and Environment Committee

## How are we doing?

### City Building Energy Consumption

- From 1997 to 2002, the City of Richmond reduced its electricity consumption per square foot by 33% for City buildings. This reduction translates into a savings of \$500,000 in annual electricity costs, as well as savings in natural gas expenditures.

### Green City Buildings

### Vehicle Fleet Management

- The Richmond Oval building is being designed to achieve a minimum of a LEED<sup>1</sup> Silver Designation.
- From September 2004 to September 2005, the City used over 100,000 litres less fuel than in the previous 12-month period for a savings of approximately 10%.

*The City has shown environmental leadership through numerous initiatives related to reducing resource consumption and emissions in buildings, purchasing policies, and operations. Its environmental leadership has resulted in the City winning several awards, including being the first and only BC Hydro Power Smart Certified municipality in BC in 2003 as well as receiving awards for its environmental purchasing policy and guidebook.*

## Looking Forward

The City of Richmond's population is expected to continue to grow, and is projected to reach 212,000 by 2021. How this population growth is managed will determine to a large degree how the City will perform on the indicators in future State of the Environment reports.

A number of major initiatives will be occurring over the next 5 years, which will impact a number of indicators, including:

- the completion of the Canada Line rapid transit system in 2009 connecting the Vancouver International Airport and Richmond City



<sup>1</sup>The LEED (Leadership in Energy and Environmental Design) Green Building Rating System® is a voluntary rating system developed by the U.S. Green Building Council that identifies the overall environmental and resource consumption performance of high-performance buildings and sites.

Centre with downtown Vancouver, which is expected to significantly increase the use of public transit in Richmond and focus development along this corridor;

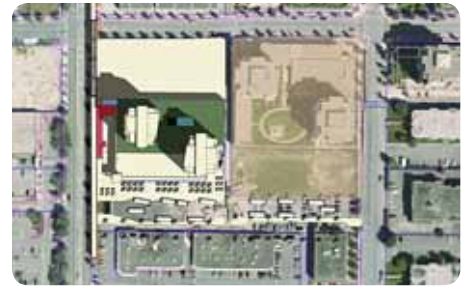
- the updates of the City Centre Area Plan, City Centre Transportation Plan, and the On-Street Cycling Network Plan starting in 2006;
- In April 2005, Council endorsed a No. 3 Road streetscape vision which includes Principles of Great Streets and Transit Oriented Development (TOD) principles;
- the No. 3 Road Corridor Streetscape Study, to be completed in 2006, to identify strategies and policies to encourage transit-oriented development along the corridor and make No. 3 Road more pedestrian and cycling friendly;
- No. 3 Road Canada Line station precinct planning to be completed in 2007 to encourage high density Transit oriented development friendly villages;
- a Parks and Open Space Strategy to be initiated in 2006;
- a voluntary water metering program being implemented for single-family homes; and,
- the implementation of a fuel conservation and anti-idling program for the city's vehicle fleet.

It is expected that some indicators will show significant progress as a result of these initiatives.

## Future Updates

It is recommended that:

1. the next State of the Environment report be prepared and released in 2008, 10 years after the first report;
2. the 2008 report will also incorporate data from the 2006 Census of Canada, and;
3. subsequent State of the Environment reports be prepared every 5 years to coincide with the release of data from future Censuses.



Draft for discussion purposes only.



Draft for discussion purposes only.



# Introduction

## Background

The community vision for Richmond is to be “the most appealing, livable, and well-managed community in Canada.” Essential to the appeal and livability of a community are the quality of its natural environment and its natural public amenities. The City of Richmond has a State of the Environment (SOE) program to help monitor and report on the city’s environmental health and the pressures on the environment. In addition, City Council established an Advisory Committee on the Environment (ACE) in 1992 to advise them on environmental issues and indicators, and to help enhance public awareness on environmental issues facing the City.

This is the third edition of Richmond’s State of the Environment Report. The first SOE report was published in 1998 and provided important baseline information for monitoring. A second edition was released in 2001, which updated and expanded the set of indicators. This 2005 edition refines the set of indicators and reports to the community on the current State of the Environment, including human pressures and activities that may impact the environment – locally, regionally, and globally.

## Purpose

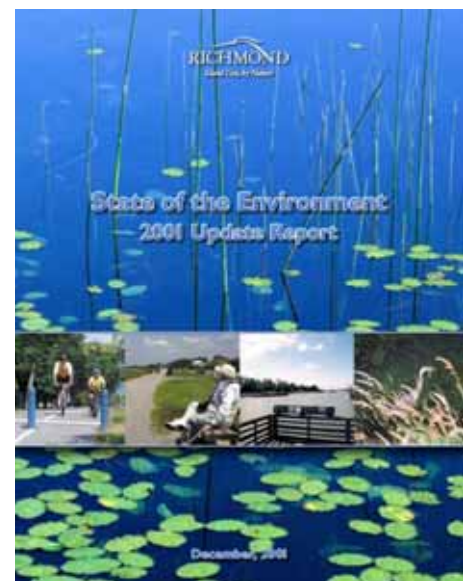
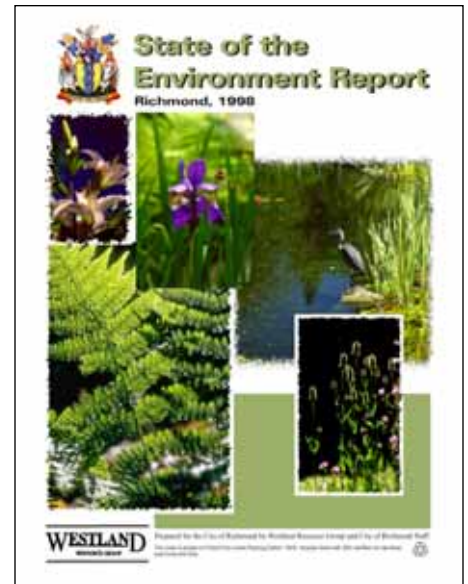
The report aims to:

- monitor changes and trends in environmental quality and pressures on the environment over time;
- assess whether the city is moving towards or away from environmental and sustainability objectives; and
- provide recommendations for future SOE updates.

A key objective of this report is to encourage the City, all Richmond residents and businesses to work together to take actions that protect our environment. In addition to commenting on the status of each indicator, this report presents ideas and potential actions that citizens can take to work towards a more sustainable environment. It also identifies what the City and its partners are doing to protect the environment and manage growth. Together, we all need to do our part.

## Richmond – An Island City that is Part of a Larger Region

Richmond is a growing, dynamic, urban centre with a unique mix of residential areas, commercial development, agricultural lands, industrial and business parks, and natural areas. Richmond has undergone enormous change over the last several decades, with significant growth in the early 1990s.





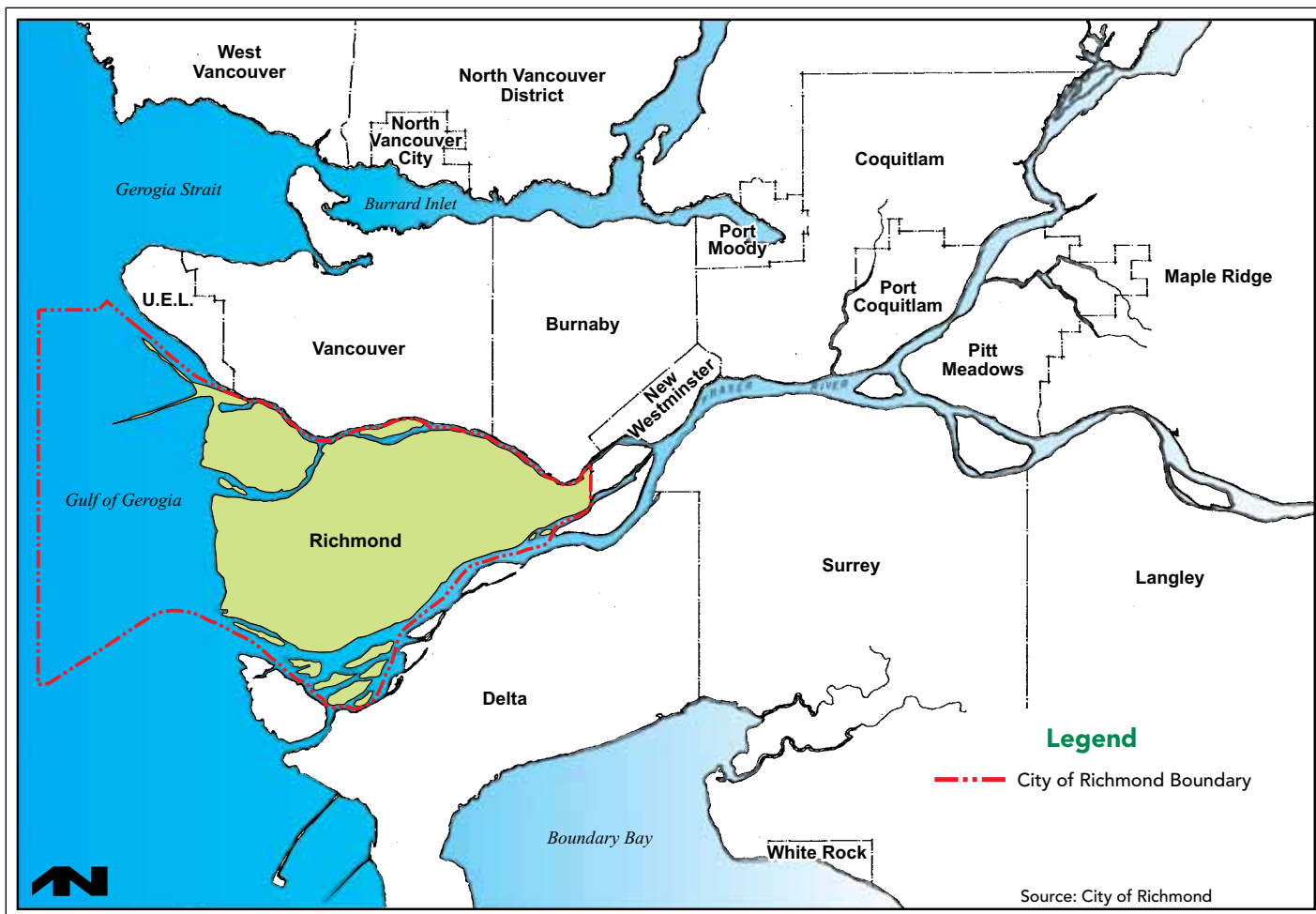


Fig. 1: Location Map of City of Richmond in Greater Vancouver

In terms of its physical setting, Richmond is a group of islands, consisting of two main islands – Lulu and Sea Island – as well as other smaller islands - that lie at the mouth of the Fraser River. The shores surrounding Richmond create an estuary environment that provides habitat for fish and for millions of migrating birds on the Pacific Flyway.

The Fraser River provides a natural barrier that defines Richmond as an island community and gives the city a unique identity. The environmental quality of Richmond is interconnected with other areas in the Lower Mainland and the province. Because it is located at the mouth of the Fraser River – the most downstream point – contaminants and effluent from upstream can impact the river water quality in the vicinity of the city. Conversely, human activities in Richmond impact other parts of the region; for example, air quality emissions from vehicles and industry in Richmond affect air quality in the Fraser Valley due to the western prevailing winds and the constraints of the mountains.



## Indicators

An indicator is a measure that reveals a condition, a trend, or an emerging issue. Indicators are often normalized to facilitate comparison with other communities such as on a per capita basis. Indicators can show whether the community is moving towards or away from its objectives. An indicator does not, however, reveal the cause or effect of a change.

The indicators from the 1998 and 2001 SOE reports were reviewed and a refined set of indicators was identified in conjunction with City staff and Richmond's Advisory Committee on the Environment. Potential indicators were prioritized and limited to a manageable set for which data was available. This report does not include every possible indicator. It focuses on community indicators and does not include indicators related to industry and businesses. In addition, some environmental issues are recognised as important, but do not have a quantifiable data set. These issues are discussed in the report qualitatively.

The 2005 SOE report update contains 27 indicators that are organized into the following eight categories, which represent contextual, environmental and growth management objectives:

1. Context Indicators
2. Preserve a Sustainable Agricultural Land Base
3. Protect Natural Areas and Provide Parks and Trails
4. Reduce Resource Consumption and Emissions
5. Build Compact and Complete Communities
6. Increase Transportation Choice
7. Maintain Clean Water, Land, and Air and Minimize Noise; and,
8. Provide Environmental Leadership

The set of indicators selected is believed to provide a reasonable indication of key human activities impacting the environment, activities to protect the environment and natural resources, and the overall state of the environment in Richmond.

For each indicator, information is provided on:

- Why is this indicator important?
- What is being measured?
- What is happening?
- How do we compare to other similar communities?
- What is being done?
- Looking forward
- What can citizens do?
- An overall summary

This version of the SOE Update incorporates a number of adjustments to overall totals which make direct comparisons with the 2001 SOE difficult.

1. Notably, within its Geographic Information System (GIS) database, the City has defined a new shoreline which differentiates mud flats/marsh areas from upland areas.
2. Spatial adjustments were also made to the property database for most of East Richmond to correct for translation inaccuracies from the original surveys of these lands.
3. A number of corrections were made to upland designations to more accurately identify features and properties being referenced.

Collectively, this has resulted in adjustments being made to the total land area, the area of terrestrial Environmentally Sensitive Areas (ESAs), parks and protected areas, upland Agricultural Land Reserve (ALR) and overall greenspace. Notations have been made in the appropriate sections of the report where adjustments have been made to these totals.



# List of Indicators

The 2005 State of the Environment indicators are organized by overarching community objectives:

## Context Indicators

CTX-1: Population Size and Growth (NEW)

## Preserve a Sustainable Agricultural Land Base

PSA-1: Land in the Agricultural Land Reserve

## Protect Natural Areas & Provide Park Space and Trails

PNA-1: Parks and Protected Areas

PNA-2: Designated Terrestrial Environmentally Sensitive Areas

PNA-3: Trail Network (NEW)

## Reduce Resource Consumption and Emissions

RRC-1: Water Consumption

RRC-2: Wastewater Generation

RRC-3: Residential Solid Waste Disposal

RRC-4: Residential Building Energy Use

RRC-5: Greenhouse Gas Emissions (NEW)

## Build Compact and Complete Communities

BCC-1: Population and Housing Unit Density

BCC-2: Residential Housing Mix

BCC-3: Amenity Access

BCC-4: Labour Force Living and Working within Richmond (NEW)

BCC-5: Commuter Trip Distance (NEW)

## Increase Transportation Choice

ITC-1: Choice of Transportation Mode for Journey-to-Work Trips

ITC-2: Registered Passenger Vehicles

ITC-3: Cycling Facilities

ITC-4: Transit Access

## Maintain Clean Water, Land and Air and Minimize Noise

WLA-1: Fraser River Water Quality

WLA-2: Ambient Air Quality

WLA-3: Short Term Air Quality Exceedances (NEW)

WLA-4: Soil Quality

WLA-5: Noise

## Provide Environmental Leadership

PEL-1: City Building Energy Consumption

PEL-2: Green City Buildings (NEW)

PEL-3: Vehicle Fleet Management



# Context Indicators – Population Growth

## Population Growth and Pressures on the Environment

Population growth is one of the major drivers impacting the environment. The impact of human activity on the environment is a function of the size of the population and the per capita impact on the environment. Population drives demand for housing, public services, land, energy, potable water and other resources and places pressures on greenspace, transportation, and public services. The City of Richmond's population is growing significantly and this trend is expected to continue. In 2005, 181,900 people lived in Richmond according to City of Richmond's population estimates. By 2021, Richmond is expected to have a population of 212,000, an increase of approximately 31,500 people over current levels. In comparison, BC Stats projects that the population of the GVRD will increase from 2.2 million in 2005 to about 2.6 million by 2021.



This section focuses on one of the key indicators  
for population growth:

- CTX-1: Population Size and Growth

### Growth Management

A challenge facing all municipalities in the Lower Mainland is how and where to accommodate additional population and development. In 1996, the GVRD, together with its member municipalities, created the Livable Region Strategic Plan (LRSP) to manage growth in the region. The LRSP advocates development of the region according to four fundamental strategies:

- protect the Green Zone, including parks, drinking water supply catchment areas, and the agricultural land base;
- build complete communities;
- achieve a compact metropolitan region; and,
- increase transportation choice.

The LRSP includes a network of eight compact regional town centres, including Richmond City Centre, and a number of smaller municipal town centres in addition to the Vancouver metropolitan core. Regional town centres are planned to provide a balanced mix of housing, employment, shopping, and services in close proximity, and to be interconnected by frequent public transit service. With the completion of the rapid transit Canada Line in 2009, Richmond's City Centre and the Vancouver International Airport will have high quality rapid transit service to downtown Vancouver and the Cambie Street corridor. These strategies form the basis for a livable and transit-oriented city and region.

Within this context, Richmond's Official Community Plan (1999) contains a growth management strategy and a regional context statement with a vision to protect agricultural lands, concentrate growth in the City Centre, and retain the single-family character of neighbourhoods. By managing population growth, the pressures on natural areas and agricultural land in the City can be reduced, public services can be provided more efficiently, new infrastructure for servicing development can be minimized, and reduced automobile dependence can be fostered. Just as importantly, people can enjoy a more livable community.

## CTX-1: Population Size and Growth

### Why is this Indicator Important?

Population size and growth are important drivers that impact the local, regional and global environment. Understanding population trends and growth rates is critical to managing development. This indicator provides context for the rest of the State of the Environment report.

### What is Being Measured?

This indicator measures both population size and population growth city-wide.

### What is Happening?

According to the City of Richmond's population estimates, Richmond's population increased to 181,900 in 2005 from 126,800 in 1990 or an increase in total population size of about 43%. Since 2000, Richmond's population has increased in total by 6.7% (1.3% average annual growth rate), a much slower rate than that experienced in the 1990s (3.4% average annual growth rate).

In 2006 - 2008, the City will update it's Official Community Plan and set population growth targets to 2031.

Similarly, in 2006-2008 the GVRD in cooperation with the member municipalities will be updating the Livable Region Strategic Plan to 2031.

### Summary

#### Status:

The population of the City of Richmond was 181,900 at the end of 2005.

#### Trend:

The population increased in total by 6.7% from 2000 to 2005, for an annual growth rate of 1.3% - a slower rate than that experienced in the 1990s.

#### Outlook:

The population is anticipated to keep growing in Richmond particularly due to net migration to the area.





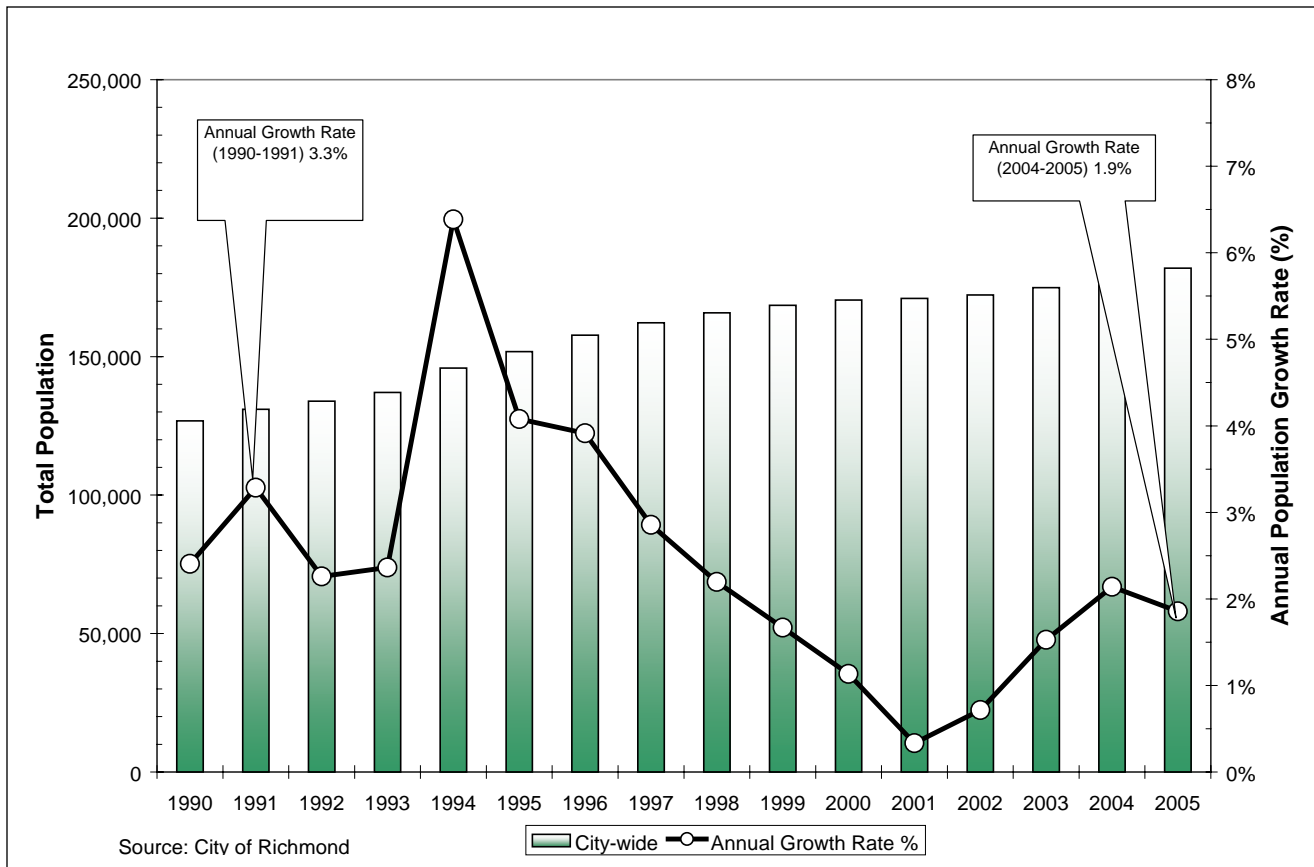


Fig. 2: Total Population and Annual Population Growth Rate, 1990-2005

## How Do We Compare?

Richmond is the fourth most populous municipality in Greater Vancouver after the cities of Vancouver, Surrey and Burnaby. Richmond's total percentage population increase from 2000 to 2005 (6.7%) was higher than the GVRD average (5.6%). Of comparable municipalities in the Lower Mainland, the Corporation of Delta experienced the lowest increase in total population (1.6%) and the City of Surrey had the highest increase (11.3%) over the same time period.

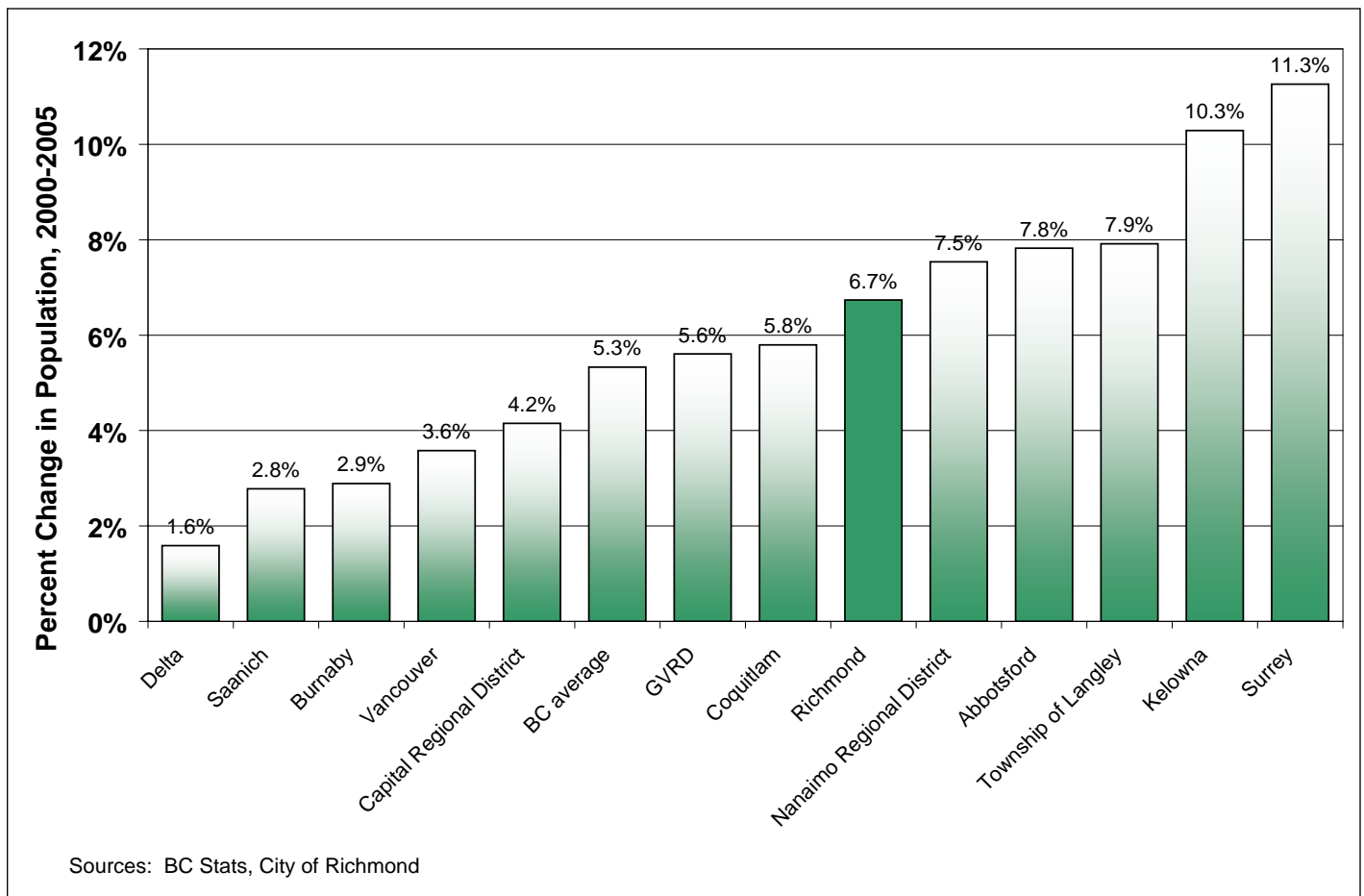


Fig. 3: Change in Population Size for Selected Jurisdictions, 2000-2005

## What is Being Done?

The rate and dynamics of population growth are largely outside the sphere of influence of the City. However, the City manages its population growth through various policies and mechanisms (see text box at beginning of section).

## Looking Forward

Richmond's population will continue to increase. The City's Official Community Plan indicates that its population is projected to reach 212,000 by 2021.

## Goal 1: Preserve a Sustainable Agricultural Land Base

Located in the Fraser River delta, Richmond possesses fertile soils and a climate well-suited to agriculture. Since World War II, Richmond has undergone significant urbanization, resulting in the conversion of former agricultural lands into urban uses. However, agriculture continues to play an important role in Richmond's economy today; in 2000, gross farm receipts contributed \$37.6 million to the economy.

The provincial government recognized the importance of agricultural land for both food and economic security, and in 1973 established the BC Agricultural Land Reserve (ALR) to protect and maintain the province's agricultural land base. ALR-designated lands cannot be subdivided or utilized for non-farm use without the approval of the Agricultural Land Commission.

Agricultural land is a critical natural resource for growing crops and supporting livestock for local food production and for export. Agricultural lands also provide wildlife habitat that includes habitat for migrating birds along the Pacific Flyway. In addition, the ALR acts as an urban containment boundary for Richmond and agricultural lands provide scenic landscapes that enhance the natural beauty of the area.

### This section focuses on one indicator of agriculture:

- [PSA-1](#) Land in the Agricultural Land Reserve

Preserving agricultural land and farming activity does not ensure the environment is protected. Many agricultural practices can be harmful to the environment if not managed in a responsible manner. Potential environmental impacts can include soil erosion or deterioration of soil quality, and impacts to surface water quality from manure, pesticide and herbicide application. Coordinating environmental protection with agricultural viability is an important objective in addition to protecting the land base.

### ❓ Did you know...

The total area of designated or protected greenspace in the City includes lands in the Agricultural Land Reserve (5,179 ha) as well as parks and protected areas (1,248 ha). In total, these areas comprise 6,423 hectares (15,870 acres), representing roughly one-half of Richmond's land base.



## PSA-1: Land in the Agricultural Land Reserve

### Why is this Indicator Important?

Preservation of land for agriculture is the first and most important step in ensuring agricultural viability in Richmond. The establishment of the Agricultural Land Reserve by the provincial government has afforded a level of protection to agricultural lands from urban development. Richmond's Official Community Plan recognizes the ALR and the importance of agriculture as a contributor to the economy, a source of food, an environmental resource, and a heritage asset.

### What is Being Measured?

This indicator tracks the success of the protection of agricultural land by measuring the amount of land that has been added or removed annually from the Agricultural Land Reserve within the city.

This measure generally provides a good indication of the potential for agriculture in a community; however, farming activities also occur on agricultural land that is not currently in the ALR. Conversely, land that is located in the ALR may not be farmed. In addition, non-agricultural uses of the ALR (e.g. golf courses, recreation facilities, rights-of-ways, military uses, and residential properties) currently represent about 10% of ALR lands in Richmond according to tax and business licence data from the City.

### What is Happening?

Including road and rail rights of way, Richmond's ALR occupies 5,179 ha (12,797 acres) of land as of 2005<sup>2</sup>. The ALR represents approximately 40% of the land base in Richmond, making it one of the largest designated land areas in Richmond.



<sup>2</sup> The land area from the ALR located on Sea Island (205 ha) which is federally owned was not included in the 2001 SOE Update and is included in the above totals.

## Summary

### Status:

Excluding road and rail rights-of-way, approximately 4,717 ha (11,655 acres) of land in Richmond is located in the Agricultural Land Reserve as of 2005. On the order of 90% of Richmond's original ALR remains intact.

### Trend:

Since the 2001 SOE, approximately 2 ha (4.95 acres) have been excluded from the ALR.

### Outlook:

In 2005, the Canada Lands Corporation applied to exclude 55 ha (136 acres) of land from the Agricultural Land Reserve, which will be considered by the Agricultural Land Commission in 2006. Pressures for development are expected to increase and result in additional pressure to exclude land from the ALR.

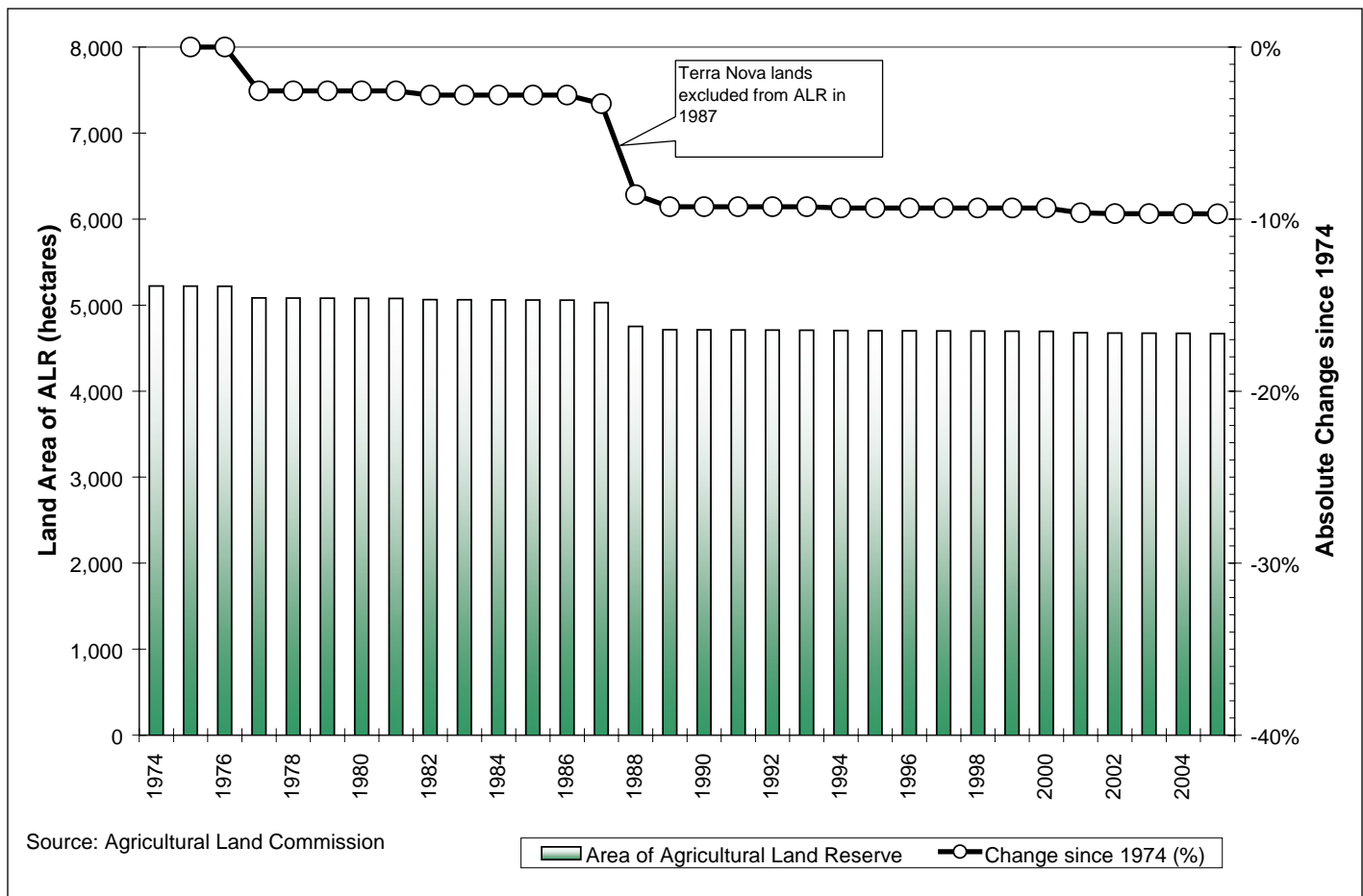


Fig 4: Net Change in Land Area of Agricultural Land Reserve, 1974-2005

Since 1974, Richmond's ALR has been reduced in size by approximately 10%. Since 2001, approximately 2 ha (4.95 acres) or 0.02% of Richmond's ALR has been excluded based on applications received and approved by the Agricultural Land Commission. In 2005, there were no exclusion applications approved by the Commission in Richmond.

In late 2005, the Canada Lands Company applied to the Agricultural Land Commission to exclude a 55 ha (136 acres) parcel of land along Garden City Road from the Agricultural Land Reserve. The lands are bounded by Garden City Road, Westminster Highway, No. 4 Road and Alderbridge Way. The lands are federal property and are not subject to the Agricultural Land Commission Act; however, the federal government is proceeding through the local and provincial government approvals process. The Agricultural Land Commission will consider the application for exclusion in 2006.





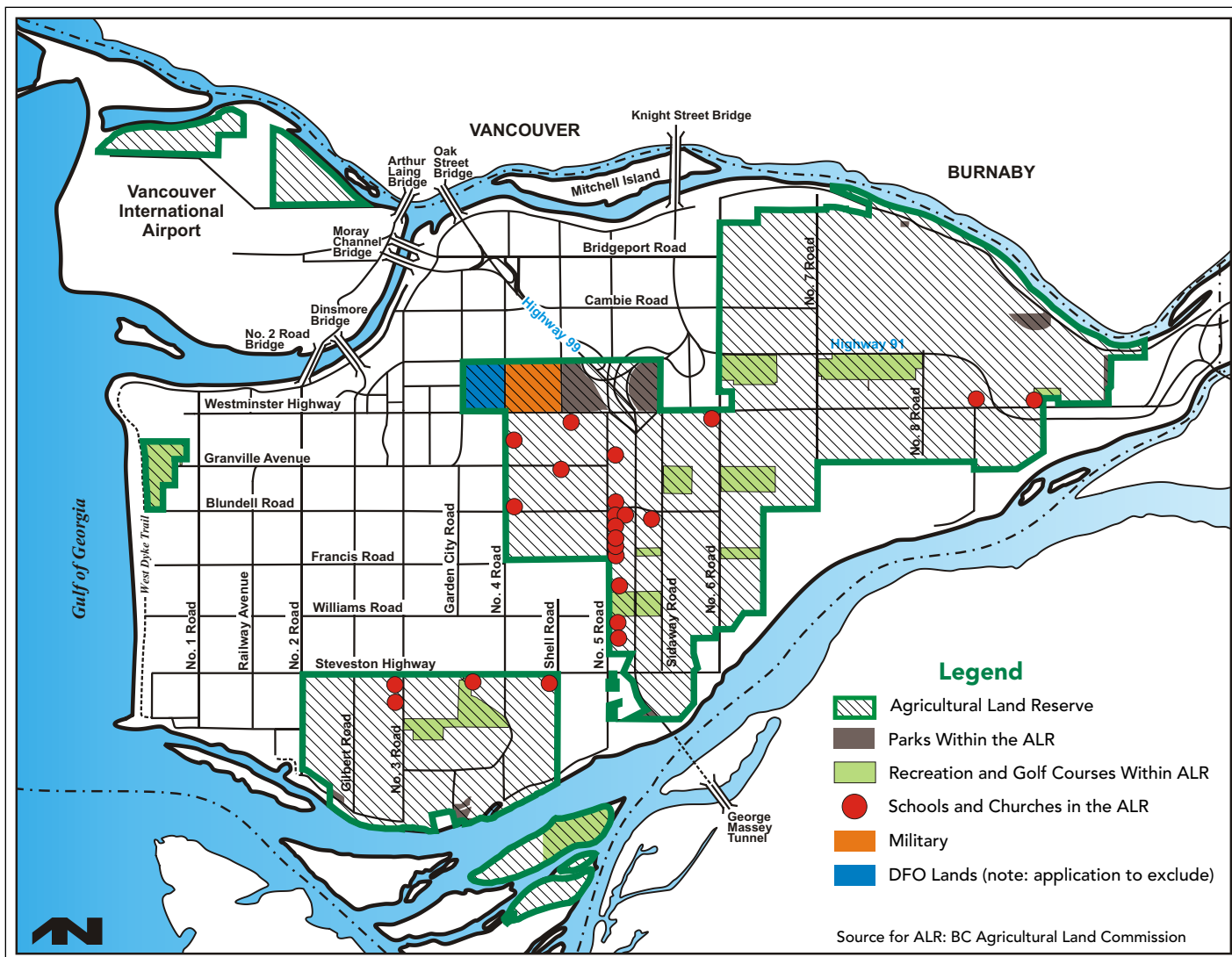


Fig. 5: Map of Agricultural Land Reserve and Non-Agricultural Uses in ALR in Richmond, 2005

## How Do We Compare?

Approximately 9% of the ALR in the GVRD is located in the City of Richmond. Approximately 0.4% (17 hectares) of land has been removed from the ALR in Richmond from 2000 to 2005, compared with 0.3% (182 hectares) for the GVRD as a whole.

## What is Being Done?

Richmond's Official Community Plan protects farmlands in the ALR. The OCP contains policies to establish effective buffers along the urban/rural boundary that define the urban/rural edge and protect farm viability. Lands in the ALR are also protected from development as they are part of the Green Zone in the GVRD's Livable Region Strategic Plan.



Richmond adopted an Agricultural Viability Strategy in 2003 that makes recommendations for fostering and maintaining agricultural viability and addressing agricultural issues. In 2003, the City formed an Agricultural Advisory Committee with a mandate to provide input and advice from an agricultural perspective on a range of policy issues and development proposals that affect agriculture. The Agricultural Advisory Committee is also responsible for monitoring and guiding the implementation of the Agricultural Viability Strategy, and works with the Richmond Farmers Institute.

In addition, the Province has enacted the Farm Practices Protection (Right to Farm) Act and is implementing other programs intended to strengthen the working relationships between local and provincial governments and the farming community.

## Looking Forward

As Richmond's population continues to grow, there will be increased pressure to convert ALR lands to urban uses, especially lands that are adjacent to already developed areas. There have been a growing number of ALR exclusions in other parts of the Lower Mainland. For example, in Abbotsford, the Agricultural Land Commission recently excluded 118 hectares of land from the ALR. While the Agricultural Land Commission reviews each application based on merit, this action does raise concerns about block removals of land from the ALR.

The Province of B.C. has authorized the preparation of a B.C. Agricultural Strategy scheduled for completion in June, 2007.

## What Can Citizens Do?

- Buy local agricultural products to support the local agricultural sector.
- Visit or volunteer at the Community Garden at Terra Nova Rural Park (2431 Westminster Highway) and contact City Farmer for further ideas and information ([www.cityfarmer.org](http://www.cityfarmer.org)).
- Buy locally grown agricultural produce
- Learn more about the issues in Smart Growth BC's "Protecting Agricultural Land in British Columbia: A Citizen's Guide" ([www.smartgrowth.bc.ca](http://www.smartgrowth.bc.ca)).
- Respect farming activities and needs.
- Support the Richmond Agricultural Viability Strategy.
- Support and encourage farming in the backlands, east of No. 5 Road between Steveston Hwy. and Blundell Road, as shown in the Official Community Plan.

### ? Did you know...

Approximately 94% of the land contained in the Agricultural Land Reserve in Greater Vancouver is located in four municipalities all located south of the Fraser River – the Township of Langley, Corporation of Delta, City of Surrey, and City of Richmond.







## Goal 2: Protect Natural Areas & Provide Park Space & Trails

As used in this report “greenspace” includes the Agricultural Land Reserve, Environmentally Sensitive Areas, parks, protected areas and trails.

Greenspace contributes both environmental services and aesthetic value to a community and is critical to the survival of wildlife in the urban setting. Environmental services provided by natural areas include absorbing and filtering pollutants in water and the air. Greenspace and trails can also enhance urban areas by providing opportunities for recreation, tourism and agriculture.

The City of Richmond’s Official Community Plan describes a “Garden City Vision” for Richmond where the city evolves to become a “park-like city”. Parks and protected areas today in the City of Richmond include remnant natural habitats (e.g., marshes, sloughs, bogs, grasslands, shrublands and forest) and parkland. The previous section described and discussed one important component of the greenspace system – the Agricultural Land Reserve.

**This section of the report examines several other components of greenspace as well as trails:**

- **PNA-1:** Parks & Protected Areas
- **PNA-2:** Designated Environmentally Sensitive Areas
- **PNA-3:** Trails

### ? Did you know...

Established in 1976, the Richmond Nature Park is operated by the City of Richmond and the Richmond Nature Park Society. This 86 ha (212 acres) park is located in two parts on both sides of No. 5 Road north of Westminster Highway. The park provides environmental education about the natural features of the Lulu Island Bog – a remnant ecosystem of the raised peat bogs that once covered 25% of Richmond. Visit the Richmond Nature Park Visitor Centre or walk along the 5 kilometres of trails in the park to find out more about Richmond’s bogs and the wildlife that the bog supports.



## PNA-1: Parks & Protected Areas

### Why is this Indicator Important?

Residents, visitors and wildlife make extensive use of Richmond's parks and open space system. The types of parks available in Richmond range from nature parks and regional parks that emphasize the protection of the environment, to community and neighbourhood parks that are developed for active recreational use. Richmond also contains protected areas including land held by trust lands, Wildlife Management Areas and Conservation Areas. These latter categories of protected areas are managed primarily for the benefit of fish and wildlife and protection of ecological services.

From an environmental perspective, parks and protected areas provide habitat and support biological diversity. From a social perspective, they provide focal points for community recreation, enhance aesthetic values, foster civic pride, and encourage outdoor activities that contribute to personal health and vitality. Finally, from an economic perspective, parks can increase the value of properties adjacent to them.

As land in the city becomes more developed, the importance of publicly owned parks and protected areas increases. Private lands can also be protected through conservation covenants that restrict development on portions of a property.

### What is Being Measured?

This indicator measures the amount of parkland and protected areas by type of protection. Parks may be managed for conservation or primarily be intended for active recreation, such as neighbourhood or school parks. Protected areas, as defined by the World Conservation Union (IUCN) are "areas of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means." For this indicator, only terrestrial, or land-based, protected areas are included and marine protected areas, such as Sturgeon Banks, are excluded - in part because the physical extent of these areas vary from year to year and are difficult to measure.

### Summary

#### Status:

In 2005, approximately 9.7%, or 1,248 ha (3,085 acres), of Richmond's land base was located in a park or protected area.

#### Trend:

Excluding technical adjustments, Richmond has added approximately 10.9 ha (26.93 acres) of parks and protected areas since 2001.

#### Outlook:

Increased demand for recreational opportunities will increase the demand for park space. The updates of the Parks, Recreation and Cultural Services Master Plan and the Open Space Strategy, anticipated to occur in 2006, will continue to put focus and resources on acquiring additional parkland in the future.

### ❓ Did you know...

"The Terra Nova Northwest Quadrant in Richmond plays a significant role in the ecology of the Greater Vancouver Region, as well as the Fraser River estuary ecosystem. The Terra Nova area is particularly important because it provides habitat diversity and serves as a backshore habitat to Sturgeon Bank. The combination of open fields, ditches, treed areas, landscaped gardens and hedgerows is rare in the City of Richmond and it provides a productive habitat for a variety of wildlife." Source: Terra Nova North West Quadrant: Biophysical Inventory Assessment. 2003.

A limitation of this indicator is that it does not measure connectivity between areas of parks and greenspace. Connectivity is important to facilitate wildlife movement and migration, but such an indicator has not been included due to the complexity of calculating this information.

The 2005 version of this indicator incorporates a number of technical adjustments, primarily the result of the City having redefined its shoreline boundary.

What is Happening?

In 2005, parks and protected areas in Richmond comprised a total of 1,248 ha (3,085 acres), or about 9.7% of the city’s total land base. Of this area, 702 ha (1,736 acres) are parks and 546 ha (1,352 acres) are protected areas.

In 2002 both the Imperial Landing waterfront park and Woodward’s Slough park lands were added to the City’s parks inventory. Together these additions totalled 10.9 ha (26.93 acres).

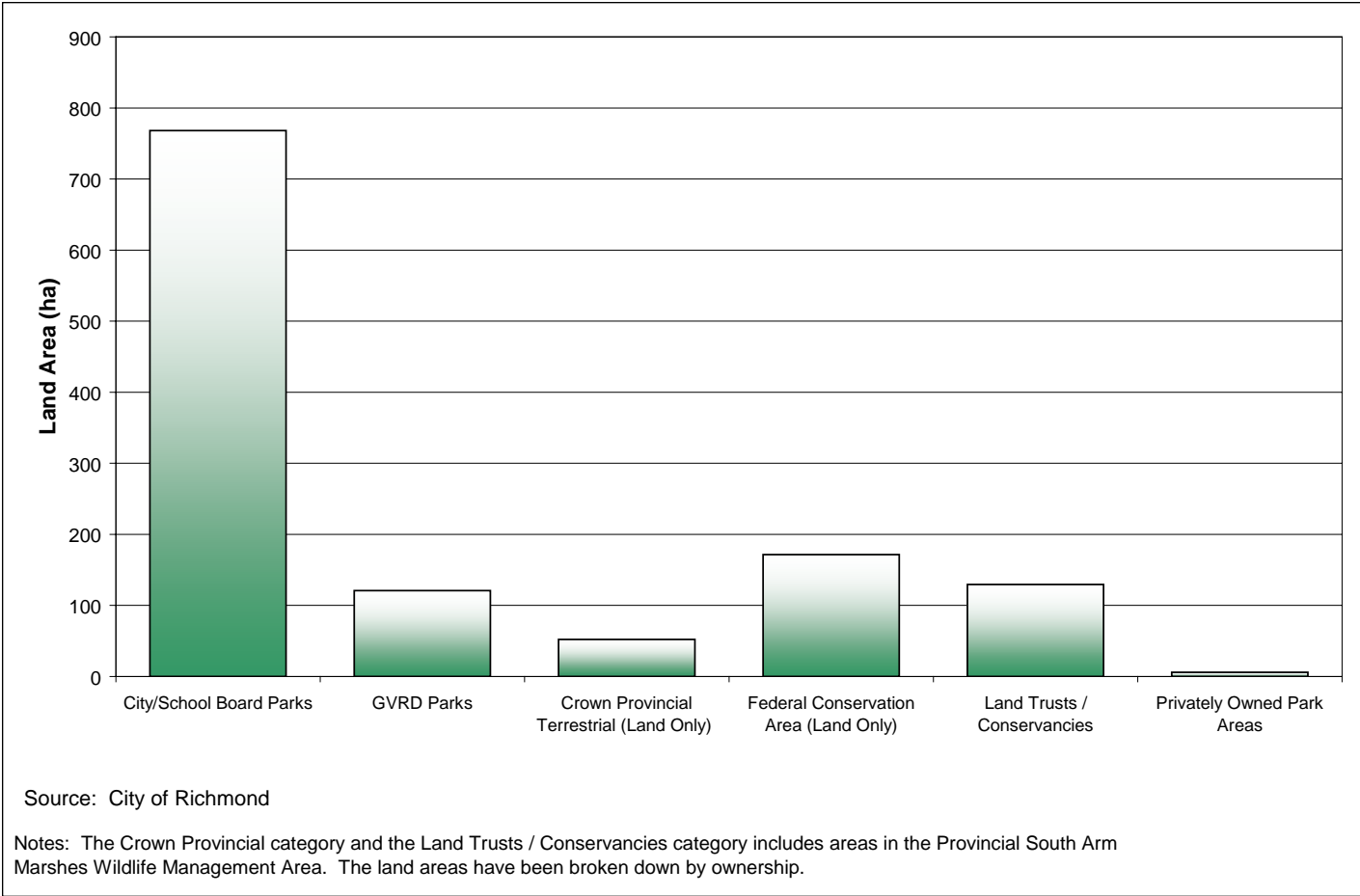


Fig. 6: Parks and Protected Areas in Richmond by Type, 2005

In 2005 the status of the former DFO lands along Garden City Road came under discussion between the Federal Government, the City and the Musqueam First Nations. For this SOE update, these lands were removed from the Parks and Protected Areas inventory. They total 55.18 ha (136.35 acres).

The significant protected areas in Richmond that are located outside parks include the provincially designated South Arm Marshes Wildlife Management Area, the federal Sea Island Conservation Area, and various islands in the Fraser River held by land trusts and the GVRD.

The provincial government established Sturgeon Banks Wildlife Management Area in 1998 (5,200 ha). As this area exists in the estuary and ocean, it is not included in the statistics for this indicator.

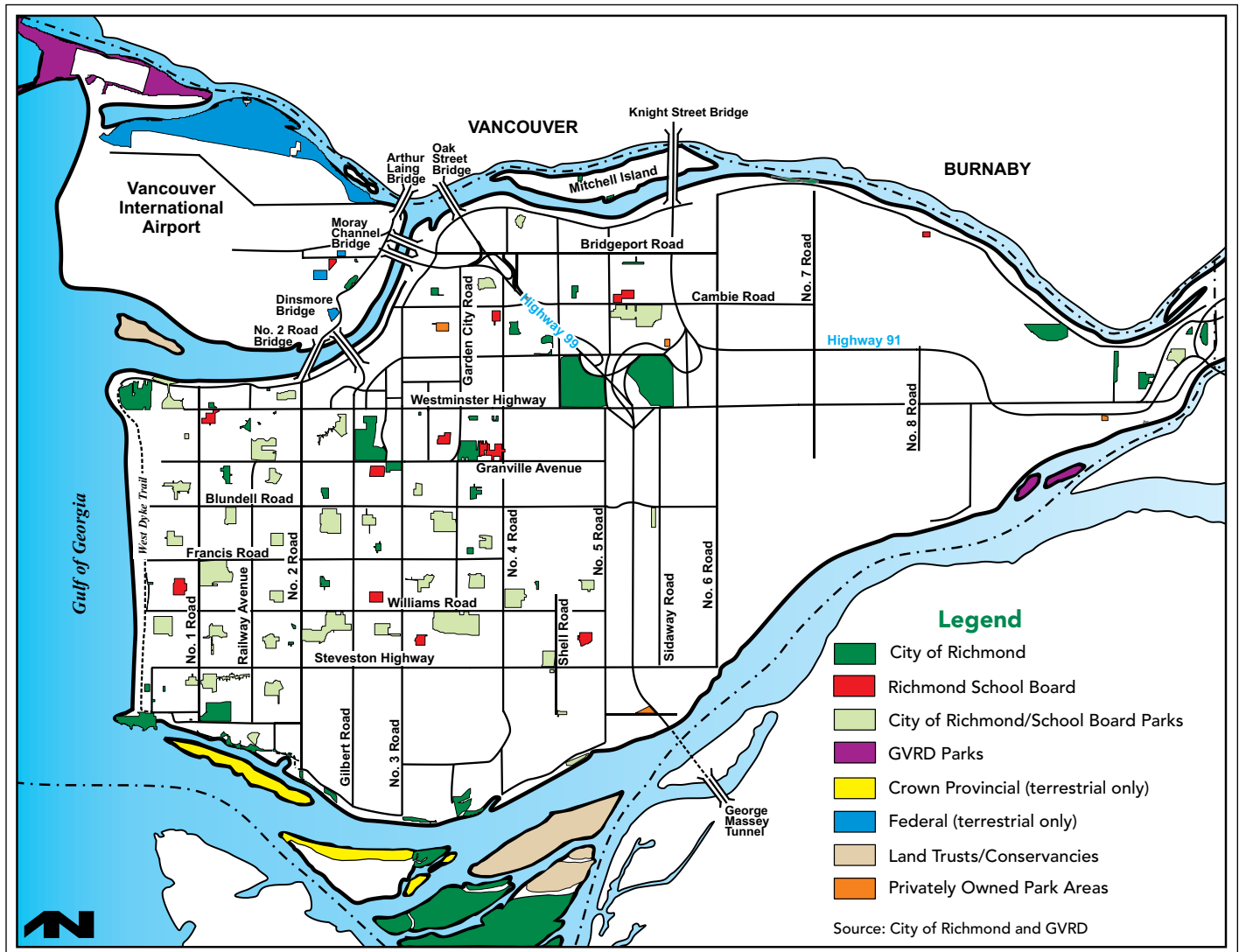


Fig. 7: Map of Parks and Protected Areas by Type, 2005

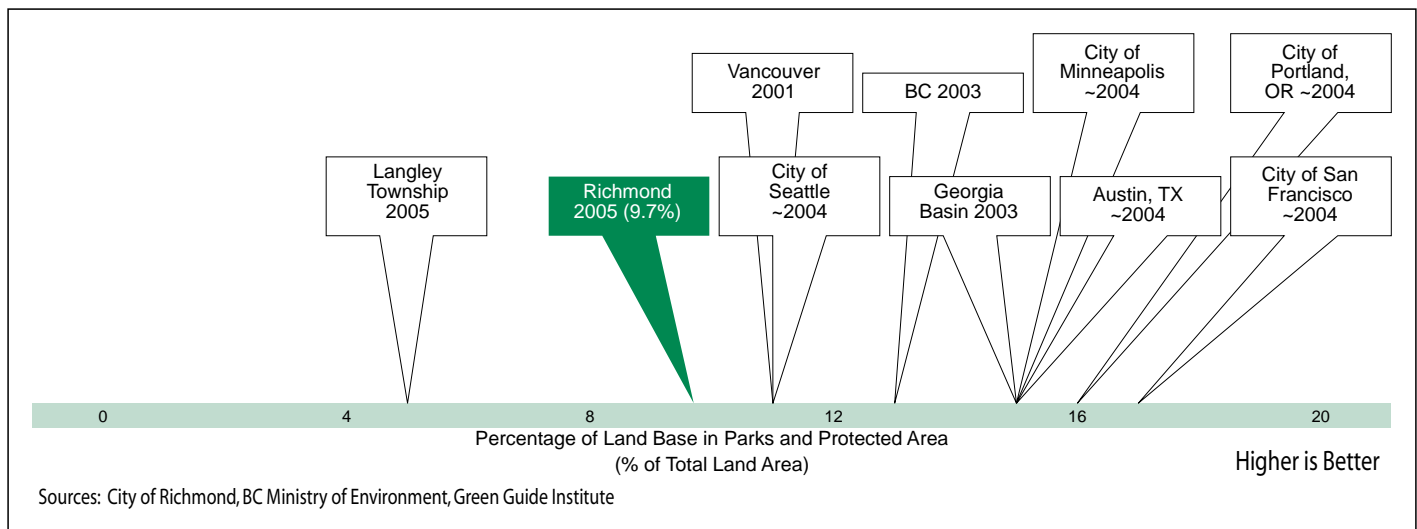


Fig. 8: Percentage of Land Base in Parks and Protected Areas, Selected Jurisdictions

## How Do We Compare?

Richmond, with approximately 10% of its land base in parks and protected areas, compares favourably with other municipalities in the GVRD and with some of the “greenest” cities in the U.S. In terms of park standards, the City of Richmond has a city-wide standard of 3.1 ha (7.66 acres) per 1,000 people. Currently, the City has 3.08 ha (7.62 acres) of parks per 1,000 people, including all City and School Board parks.

## What is Being Done?

The City’s OCP focuses on building and managing open space resources. In early 2003, the City began a master planning process that has led to a draft Parks, Recreation and Cultural Services Master Plan for 2005 to 2015. The Plan will provide a comprehensive framework that can be used to set the 10-year direction for Richmond’s parks and other recreational services.

A Parks and Open Space Strategy is also planned for 2006, which will provide the blueprint for purposefully acquiring, planning, developing and maintaining publicly accessible open space.

The City has the following programs and policies to support the further acquisition of parks:

- maintain the Parkland Development and Acquisition Cost Charge Program to provide and enhance neighbourhood, community, and citywide parks; and,
- pursue 5% land dedication in new developments as per the Community Charter of BC and the implementation of policies in the Official Community Plan.

Parks are both expensive to acquire and costly to maintain. One way the City is able to continue to offer high quality parks programs is through developing partnerships with public, private and non-profit organizations.





For example, the Partners for Beautification Program has been successful in not only raising funds and capitalizing on volunteer efforts, but also raising the level of public awareness about the importance of parks and natural areas. In addition, volunteers at the Richmond Nature Park help ensure a diverse range of activities and environmental education are offered year-round at this park.

## Looking Forward

As the City becomes more developed and densely populated, it will be faced with the challenge of providing recreational park space and preserving contiguous natural areas and greenspace. A key focus is to increase park space in the City Centre in conjunction with the population growth occurring there by requiring park space as an integrated part of providing development amenities.

Another key challenge is to increase the protection of natural areas that are located on private lands. New tools and incentives such as conservation covenants, tax incentives, and stewardship programs on private lands can help foster conservation in these areas.

## What Can Citizens Do?

Help protect lands and maintain existing parks and protected areas through the following actions:

- Adopt a park through the Partners for Beautification Program;
- Volunteer for stewardship events or programs sponsored by the City or non-profit groups.
- For large land-owners or businesses, consider making portions of your land available as Privately Owned Publicly Accessible Open Space (POPAS).



## PNA-2: Designated Environmentally Sensitive Areas

### Why is this Indicator Important?

Richmond is home to a diversity of natural habitats and wildlife. The Fraser River estuary and its adjacent lands have international significance for both aquatic and terrestrial wildlife. Today, much of the original natural habitat has disappeared or been modified and what is left is typically fragmented and surrounded by developed areas. Despite these changes, the Fraser River estuary remains vital to the survival of many species, in particular, waterfowl and juvenile salmonids. In addition, Richmond is located on the Pacific Flyway, an internationally recognized stopover for migratory birds. Richmond also contains wetlands, bogs, inland waterways, urban forest, fallow fields, and grasslands that provide additional wildlife habitat.

In 1984, the City of Richmond identified the location of its Environmentally Sensitive Areas (ESAs) as development permit areas. In 1991, the identified ESAs were subsequently mapped and designated in the City's OCP, which was later amended to afford ESAs greater protection during the development process.

Today, designated ESAs are located in places that are protected, such as parks and wildlife management areas, and in unprotected areas, including those on public and private lands. ESAs are also located on lands in the Agricultural Land Reserve.

### What is Being Measured?

This indicator measures the land area of terrestrial, or upland, ESAs in Richmond and the percentage of this land that has been protected from development either as a park or other protected area (see previous indicator for definition).

Since 1994, changes have occurred to the ESA database and mapping to improve the accuracy of the information. The City continues to commission further work to update and improve the inventory.

#### ? Did you know...

The Fraser River is home to one of the world's largest salmon runs and is a major staging area for birds on the Pacific Flyway. The Fraser River estuary supports some 500,000 birds, with more than one million birds using the estuary during migration periods. The river, estuary, and shoreline areas provide habitat for many species listed as threatened or endangered. Key areas in the estuary are identified as Environmentally Sensitive Areas and indicate that this habitat is sensitive to disturbance from human activities.

## Summary

### Status:

The City of Richmond has had an Environmentally Sensitive Areas (ESA) program and policy since 1984. The City also has a good quality mapping inventory of the location of terrestrial ESAs, which is a precursor to protecting these lands. In 2005, the area of land and water designated as ESA totalled 2,909 hectares. Of this, 1,578 ha were upland ESAs.

### Trend:

Approximately 49% of the identified ESAs were protected in 2005 and continued efforts are being made to acquire and link ESAs as part of the city's network of parks and protected areas, and the foreshore.

### Outlook:

Increased pressure on ESAs is expected with increasing population and development. The future status of ESAs on private land remains uncertain. Fostering stewardship and environmental protection on private lands and additional parkland acquisition are some of the ways that these areas can be protected. Between the 2005 SOE and the next SOE update it is expected that the overall ESA figures will change as mapping and inventory refinements continue to be made.

## What is Happening?

After adjusting for changes to the definitions of the shoreline boundary, Richmond's 2005 upland ESA total of 1,578 ha (3,899 acres) compares favourably with the 2001 SOE and indicates that there has been an overall net gain of 64 ha 158 (acres) to the upland ESA. (Note that the figure of 2,243 ha of terrestrial ESAs reported in the 2001 SOE included foreshore marsh areas which have been removed from the 2005 totals to allow for more consistent comparisons between reporting periods).

The best protection for ESAs is public or land trust ownership as a park or protected area. As of 2005, approximately 49% of the City's designated terrestrial ESAs are protected as parks or protected areas.

Approximately 815 ha (2,014 acres) of the designated ESAs are located in the Agricultural Land Reserve. This represents about 52% of the total upland ESAs. A development permit is not required for conducting normal farming activities, such as land cultivation or field clearing but may be required for ancillary non-farm related structures. Land and environmental stewardship practices by farmers are important to retain the environmental values of these areas.

Areas outside the crest of the dykes are managed through a partnership between the federal, provincial, and regional governments and the Port Authorities. This partnership is administered through the Fraser River Estuary Management Program (FREMP). Through its Estuary Management Plan, FREMP uses a colour coding system for identifying shoreline habitat according to the current level of productivity.

- Red coded (high productivity) habitat - are "productive and diverse habitat features that support critical fish and wildlife functions onsite or as part of a more regional context..."
- Yellow coded (moderate productivity) habitat – include "habitat features that are of moderate value in structure or diversity due to existing conditions (e.g., surrounding land uses or productivity) and support moderate fish and wildlife functions."
- Green coded (low productivity) habitat – include "areas where habitat features and functions are limited due to existing conditions (e.g., developed for port or other urbanized uses)."

Based upon FREMP's 2005 Habitat Coding Inventory, Richmond had approximately 24 km of green coded shoreline, 23 km of yellow coded shoreline, and 113 km of red coded shoreline. Virtually all of Richmond's shoreline has also been designated as an ESA.



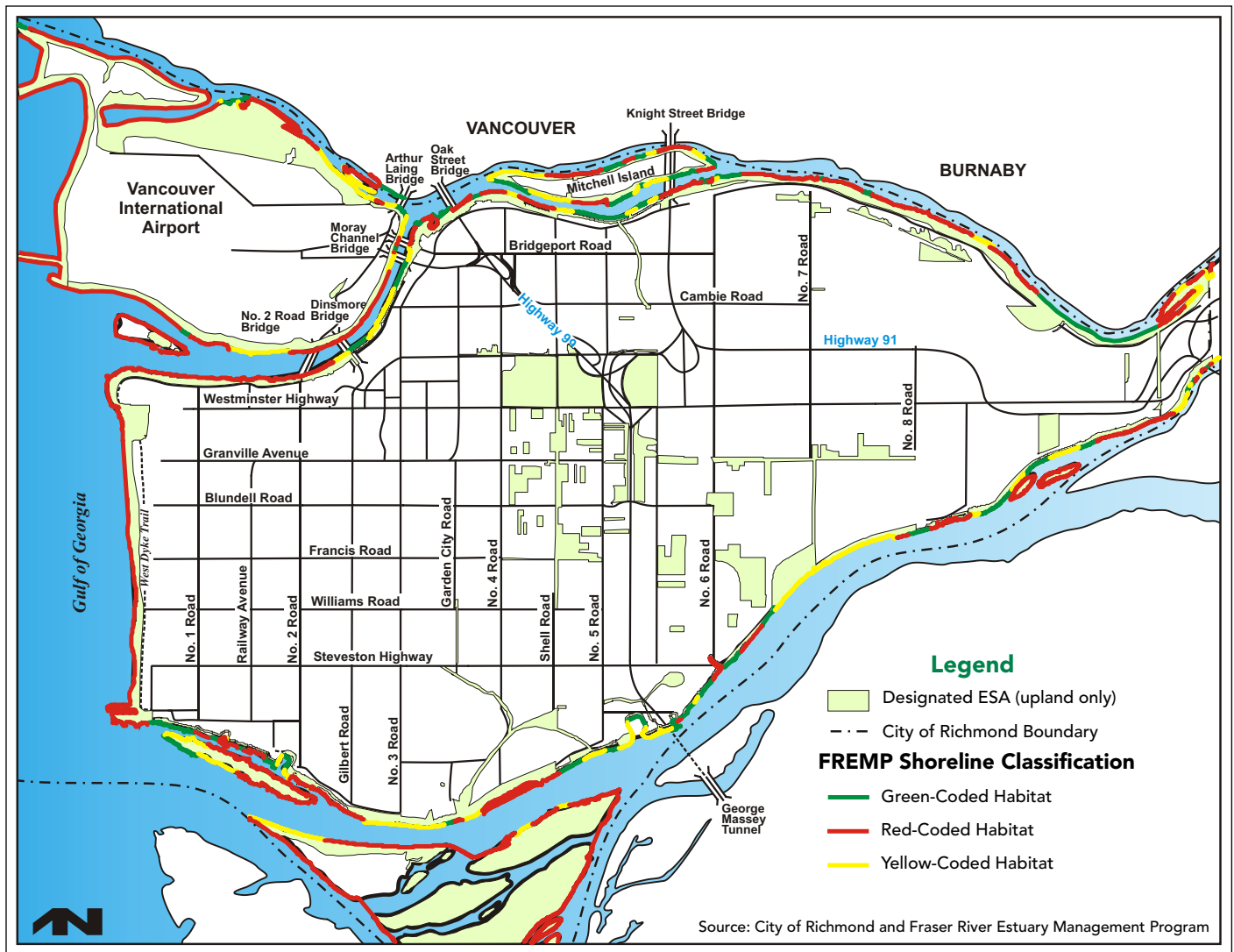


Fig. 9: Map of Terrestrial Environmentally Sensitive Areas (2005) and FREMP Shoreline Classification Areas (2005)

## How Do We Compare?

The definition of what constitutes an ESA varies among municipalities. Thus, it is difficult to make meaningful comparisons between Richmond's progress with respect to this indicator and what other municipalities in the GVRD have achieved. What is apparent, however, is that the identification, preservation, and connectivity of ESAs are receiving increased attention throughout Greater Vancouver.

## What is Being Done?

The Official Community Plan designates ESAs as a Development Permit Area and establishes guidelines for any development occurring in those areas. Provisions in the OCP require a development permit if the property is defined as an ESA and there are plans to subdivide the land or build on it.



Many of the city's ESAs are designated as Public and Open Space Use or Conservation Area in the Official Community Plan. Conservation Areas have been secured by legal means or by a long-term policy commitment by a senior level of government or are being secured through the land development process. The City also engages in parkland acquisition activities and encourages community groups, land trusts and other government bodies to acquire ESAs.

The City has also developed a design manual for developers, conservationists and designers who are working in or near Richmond's ESAs to provide guidance during the development process (Criteria for the Protection of Environmentally Sensitive Areas, 2001).

Finally, the GVRD, Environment Canada, Province of BC, and Fraser River Estuary Management Program initiated a Biodiversity Conservation Strategy for the Greater Vancouver Region in 2000. A key component of the strategy is mapping of biodiversity "hotspots", core areas called reservoirs, corridors and sensitive areas. The information developed through the strategy can assist Richmond in its efforts to protect ESAs.

## Looking Forward

The rate of current and projected growth in Richmond will place stress on the designated ESAs in Richmond. Approximately half of the ESAs currently identified have park or protected area status. Going forward, it will be important to continue to secure park and protection status for priority ESAs. Land stewardship activities by private landowners are especially important to foster protection on private lands. Finally, the next evolution of the ESA inventory will be to update the spatial extent of ESAs with improved habitat mapping.

As described in the Parks and Protected Areas indicator, a Parks and Open Space Strategy is planned for 2006, which can be used as a strategy for acquiring or protecting ESAs.

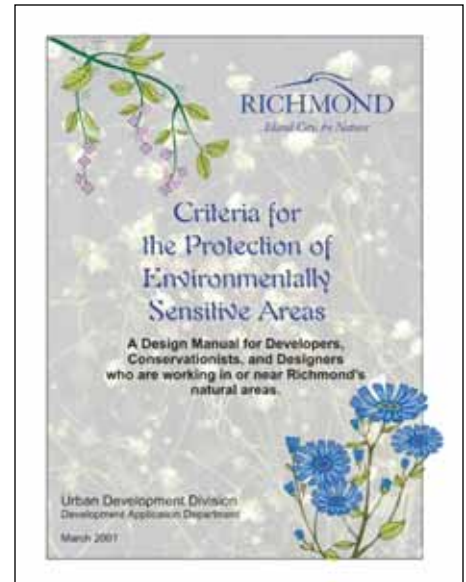
Finally, new legislation designed to protect wildlife species and habitat has been enacted, such as the provincial Riparian Area Regulation for protecting fish habitat and the Species at Risk Act for preventing wildlife species from becoming extinct and fostering their recovery. These may provide new tools for protecting ESAs.



## What Can Citizens Do?

There are a number of ways you can help maintain natural areas in your community:

- Plant native vegetation in your garden to provide habitat for wildlife. For more information contact Naturescape BC ([www.hctf.ca/](http://www.hctf.ca/)).
- If there are ESAs on your land, consider placing conservation covenants on that portion or donate that land to a land trust organization. There may be tax incentives at different levels of government for doing so.
- Volunteer with conservation organizations that are involved in the identification and monitoring of ESAs. A good place to start is the Federation of BC Naturalists where you can get information about joining local natural history societies ([www.naturalists.bc.ca](http://www.naturalists.bc.ca)), or the Evergreen Foundation ([www.evergreen.ca](http://www.evergreen.ca)).
- Respect natural areas.
- Report illegal dumping or other activities, which damage natural areas.
- Consult the 2001 Richmond Environmental Project Guidebook for more ideas ([www.richmond.ca/services/environment/action/guidebook.htm](http://www.richmond.ca/services/environment/action/guidebook.htm)).





## PNA-3: Trail Network

### Why is this Indicator Important?

A well planned city-wide trails and greenways system contributes to a livable community by connecting people to nature and providing connections between neighbourhoods and to key destinations. Connected trails provide a diversity of experiences from wooded areas to the foreshore and contribute to the community's recreation amenities by allowing places for people to walk, jog, and cycle. Trails promote a healthy lifestyle and encourage alternative transportation choices that decrease reliance on automobiles. From a wildlife perspective, trails and greenway corridors can provide habitat value and facilitate movement by wildlife and connect core habitat areas. Trails can also provide an economic benefit by attracting visitors to the area and can strengthen awareness of Richmond's heritage and natural history by providing access and interpretive information.

### What is Being Measured?

This indicator measures the length of trails that have been completed in the city. The City now classifies its trails into three categories: "Trails" are the name given to rustic trails; "Greenways" are used for significant city-wide trails; and "Green Links" are used for neighbourhood trails. From an environmental perspective, greenways provide the most value as wildlife habitat.

There is some overlap between the trails indicator and the cycling facilities indicator (Indicator ITC-3). Multi-user pathways, such as portions of the dyke trail system, are included in both indicators. Bike routes on city streets, however, are not included in this indicator.

### What is Happening?

In 2005, there were 49 kilometres of trails. Of this, 17 kilometres were on dykes, primarily consisting of the West Dyke, Middle Arm Dyke and South Dyke Trails, and Iona Spit Trail. Part of the trail network consists of sidewalks, car parks, and footbridges that provide important linkages for trail continuity. Since 2001, the City has built or has committed to build 9.75 kilometres of trails. This includes the completion of multi-user pathways on Westminster Highway between No. 6 Road and No. 8 Road and on No. 5 Road from Rice Mill Road to Dyke Road. In addition, some significant city-wide greenway connections such as Imperial Landing along the Steveston waterfront and the Shell Road greenway have been developed or are in the process of being developed.

## Summary

### Status:

The City had a network of 49 km of trails in 2005.

### Trend:

Significant progress has been made by adding 9.75 kilometres of trails from 2001 to 2005 including planned trail construction in 2006), increasing the trail system by over 20%.

### Outlook:

The City has updated its Trails Strategy, which provides increased focus and resources for expanding the trail network.

## ? Did you know...

A survey from the 2001 Richmond Community Needs Assessment indicated that 88% of Richmond residents walk, jog, or cycle in Richmond. Linking the various trails, establishing more natural areas and waterfront access were identified as the top three community priorities for capital investment.

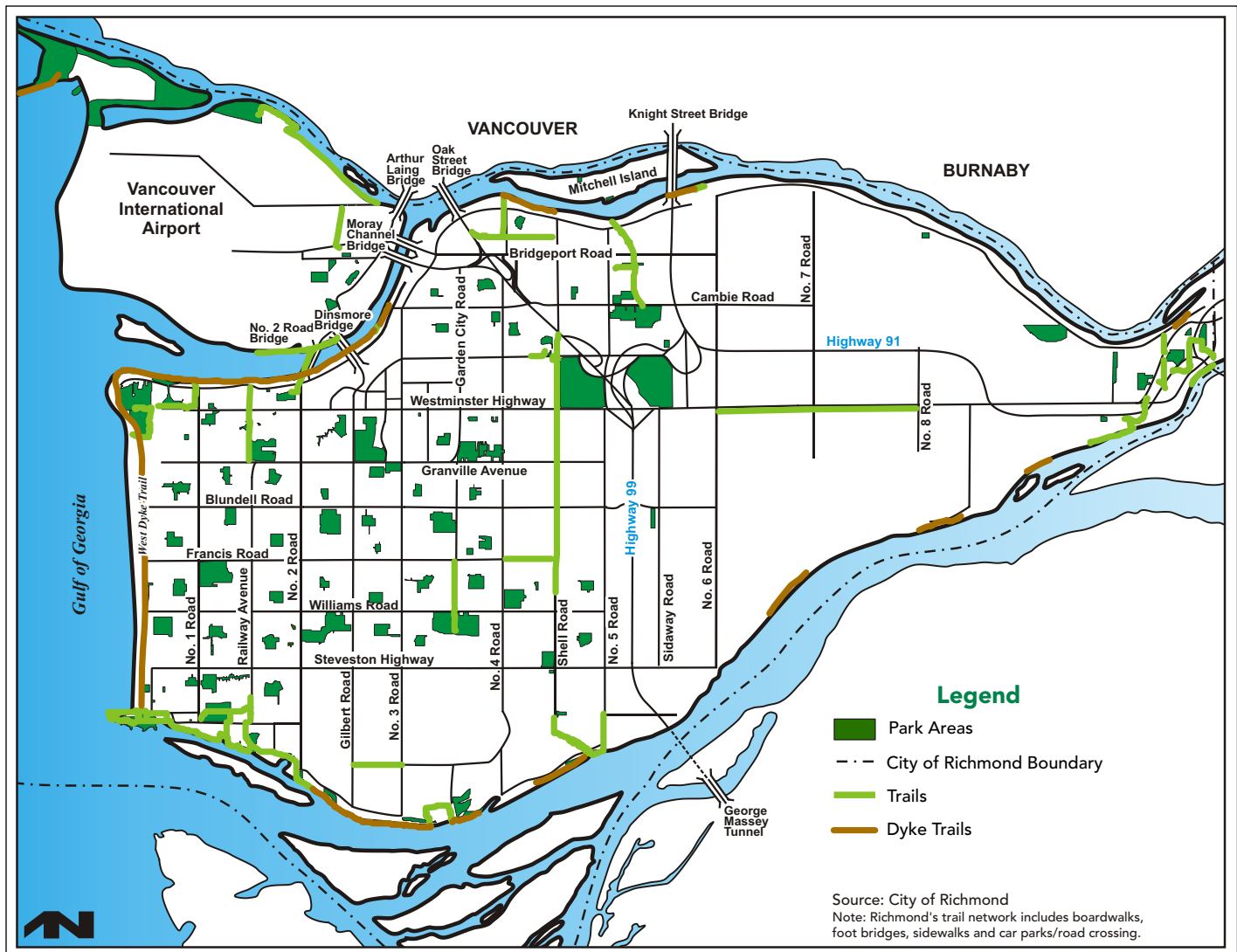


Fig. 10: Map of Trail Network by Type, 2005

## How Do We Compare?

The City has made good progress in terms of implementing its trail strategy and compares well to other similar size municipalities. There are examples of other jurisdictions that have developed extensive trail systems. Coquitlam's trail system is over 90 km in length and includes a portion of the Trans Canada Trail. Outside the GVRD, there are metropolitan areas that have attracted tourism because of their highly successful trail networks. The Capital Regional District (Greater Victoria) has approximately 185 km of regional trails that were completed as of 2000. Montreal was rated the number one cycling city in North America in 1999 by Bicycling magazine – it has over 300 km of bike routes and paths, including a path system for cyclists and in-line skaters that circumnavigates the island. Other Canadian cities with extensive systems include Calgary (220 km of paved recreation paths), Edmonton (150 km of trails), and Ottawa (170 km of multi-user pathways).

## What is Being Done?

Richmond recognized the value of a trail network early on and in 1979 City Council adopted a Richmond Trails Plan. The Trails Plan was last updated in 2003 and renamed the 2010 Richmond Trail Strategy. The City is working to implement the Trail Strategy with a focus on creating an interconnected trail system, including waterfront and neighbourhood connections.

The Official Community Plan also sets out principles, objectives and policies for addressing trails in the community. These objectives call for:

- strengthening the network of trails and greenways, using innovative approaches to provide improved linkages to key destinations and between components of the network itself; and,
- designing and developing trails and greenways to accommodate multiple users and enhance the appearance of adjacent areas.

In response to the significant residential growth in the City Centre, the City developed the Middle Arm Open Space Amenity Plan in 2004. The plan focuses on a City Centre waterfront greenway between Dinsmore Bridge and Cambie Road. The City is exploring funding for the implementation of this greenway. Finally, the City is also working with non-governmental organizations to encourage trail etiquette and safety to reduce trail user conflict, such as through the Share the Dykes Campaign.

## Looking Forward

Implementing the 2010 Richmond Trails Strategy will move the City towards expansion and better continuity of the trail system.

## What Can Citizens Do?

- Organize social walks or runs and enjoy the trail network that the city has to offer.
- Obey trail etiquette and be considerate to other trail users.
- Keep nature greenway links as places for wildlife. Respect their priority in these areas and enjoy one of the city's trails that are established for public use.
- Volunteer to help construct or maintain trails.
- Consider providing pedestrian short cuts where acceptable and appropriate through your property before fencing in a large parcel of land.



## Goal 3: Reduce Resource Consumption and Emissions

Consuming resources like energy and water, generating liquid and solid wastes that require treatment or disposal, and creating emissions of air pollutants are a burden we place on the environment - both globally and locally. To achieve long-term sustainability, cities need to reduce resource consumption and the creation of wastes.

Reducing our resource consumption can have multiple benefits to the community. Many resource services (e.g., water, sewage treatment) require large investments in facilities, such as water treatment plants, landfills and incinerators, and wastewater treatment plants. By using these resources more carefully, we can avoid expensive capital investments - or at least defer them further into the future. Conservation measures also reduce emissions of pollutants to the air and water and reduce infrastructure operating costs.

To measure the environmental burdens of our resource consumption, we use indicators that measure:

- RRC-1: Water Consumption
- RRC-2: Wastewater Generation
- RRC-3: Residential Solid Waste Disposal
- RRC-4: Residential Building Energy Use
- RRC-5: Greenhouse Gas Emissions





## RRC-1: Water Consumption

### Why is this Indicator Important?

Water may seem abundant in the Lower Mainland and we often take our high quality, plentiful water supply for granted. However, there are limits on the amounts we can consume that are imposed by our water storage and distribution infrastructure. For example:

- the amount of water that can be stored from the winter snow pack behind storage dams to be used later in the summer is limited. Meeting future demand will require either new storage dams, raising the current dams or substantial conservation measures.
- all the water in our system is treated to meet health guidelines. Municipalities pay for every litre of water that is treated, pumped and delivered - and these costs are passed on to residents and other users.
- the capacity of the water system to transport water around the region can be exceeded during summer peak hours.

Tracking water consumption helps us to understand whether efforts to conserve this resource are successful.

### What is Being Measured?

Per capita residential consumption is a measure of our individual behaviour towards water consumption. Total residential water consumption includes the effect of both our individual consumption rates and the effect of our growing population. Comparing residential consumption allows residents to compare themselves to other municipalities.

### What is Happening?

Residents of Richmond used about the same amount of water per capita in 2004 as they did in 1990. Combined with a population increase of over 40% during this period, our total residential water consumption has increased 45% since 1990 – totalling over 55,000,000 litres per day. This trend indicates that total water consumption will continue to increase as population grows.



## Summary

### Status:

In 2004, total residential water consumption was 45% greater than in 1990 - more or less in line with population growth.

### Trend:

There has been no reduction in per capita residential water consumption over the past 15 years. Coupled with population growth, total residential water consumption continues to climb.

### Outlook:

The City has begun a program of water conservation including voluntary single-family residential water meter installation and in 2004 began billing metered customers on a usage basis.



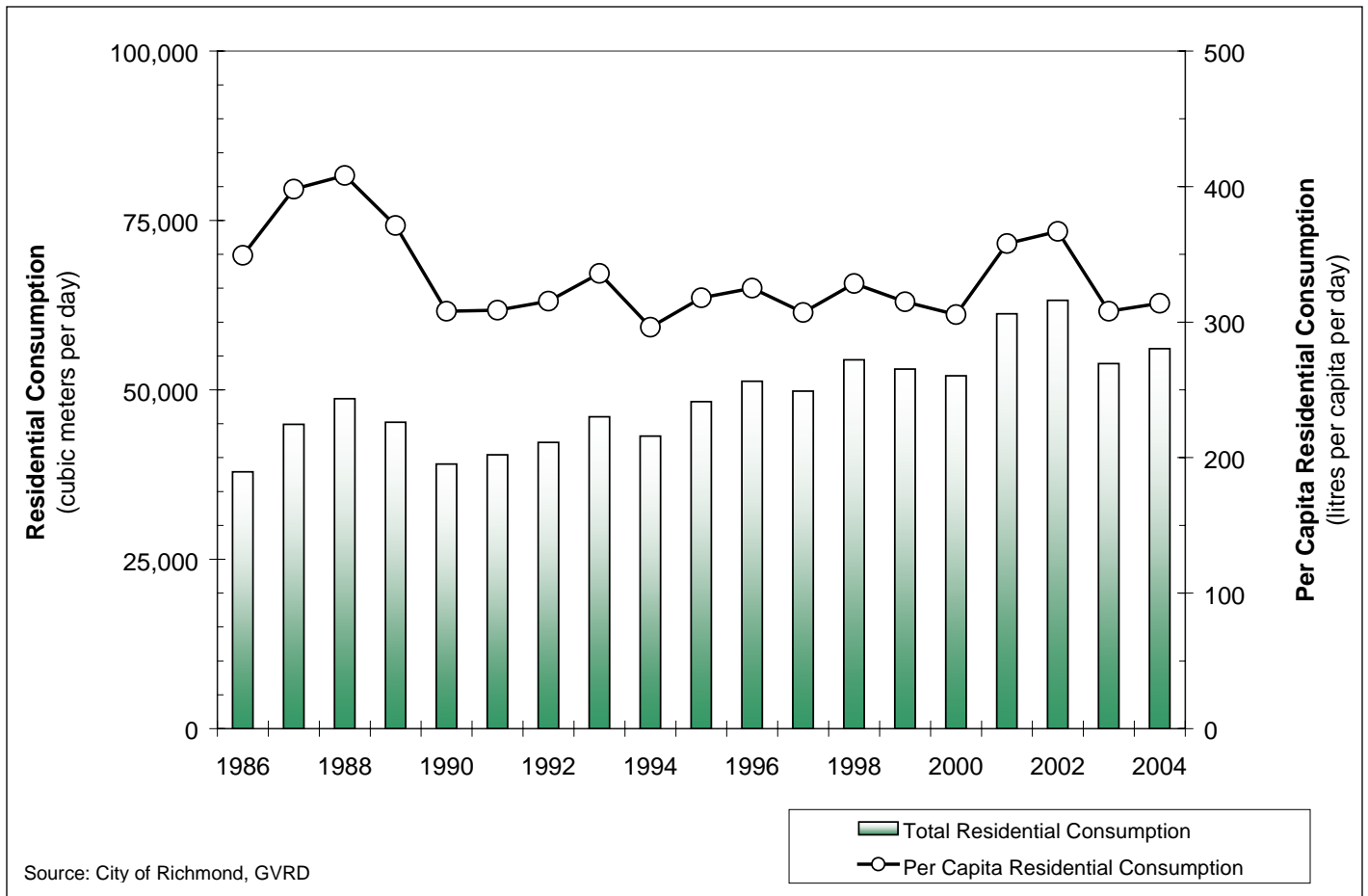


Fig. 11: Residential Water Consumption, 1986-2004

## How Do We Compare?

Richmond's residential water consumption is about mid-range amongst the municipalities of the Lower Mainland and well above comparable consumption data from Europe (see Figure 12).

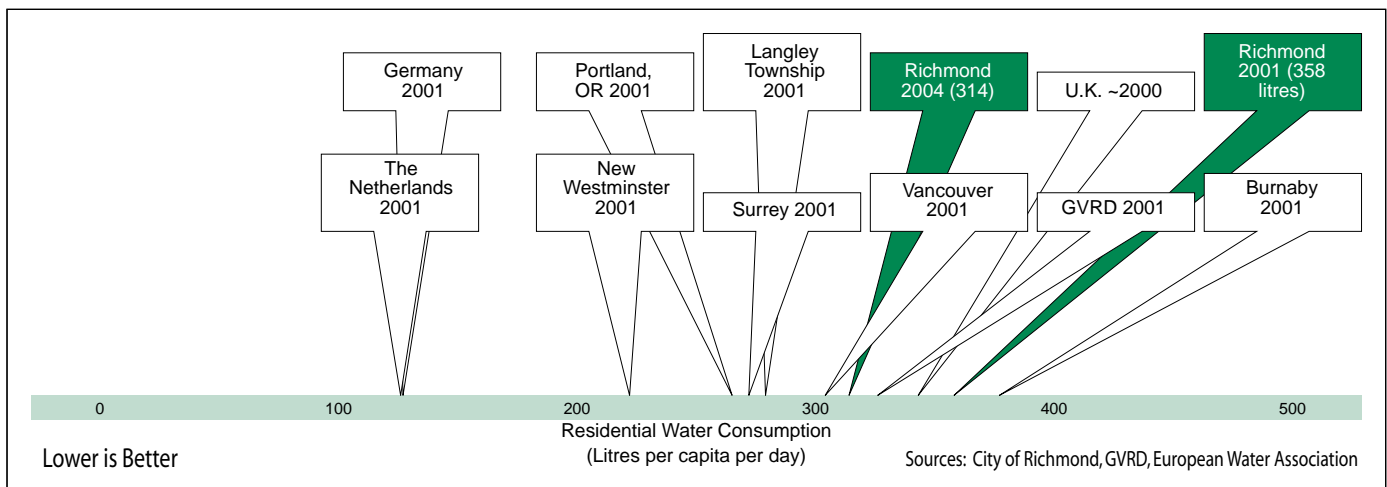


Fig. 12: Comparison of Residential Water Consumption for Selected Jurisdictions

## What is Being Done?

In 2004, the City implemented a voluntary residential watering metering program that provides residents with an alternative to flat rate billing. Participants receive a water meter and then pay for only the actual amount of water they use. The program includes incentives such as a first year guarantee that the customer will not pay more than in the flat fee system and free water conservation devices. Currently this program is available only to single-family homes.

The City also enforces lawn water sprinkling regulations in the summer and promotes water conservation awareness and education.



## Water Consumption by Sector

Water has historically been delivered in Richmond on a “flat rate” basis whereby consumers pay a fixed yearly fee. Metered consumption - where users pay quarterly based on the amount they consume - was typically applied only to non-residential users.

Figure 13 shows a breakdown of water consumption by sector. Two-thirds of the water purchased by the City is unmetered, which includes most residential users, some institutional and agricultural connections, schools and municipal properties, as well as overall system losses.

For the remaining consumption (one-third of total), Figure 13 shows the estimated consumption based on use by sector. Note that these uses represent only the known metered consumption - for example, many institutional connections are unmetered.

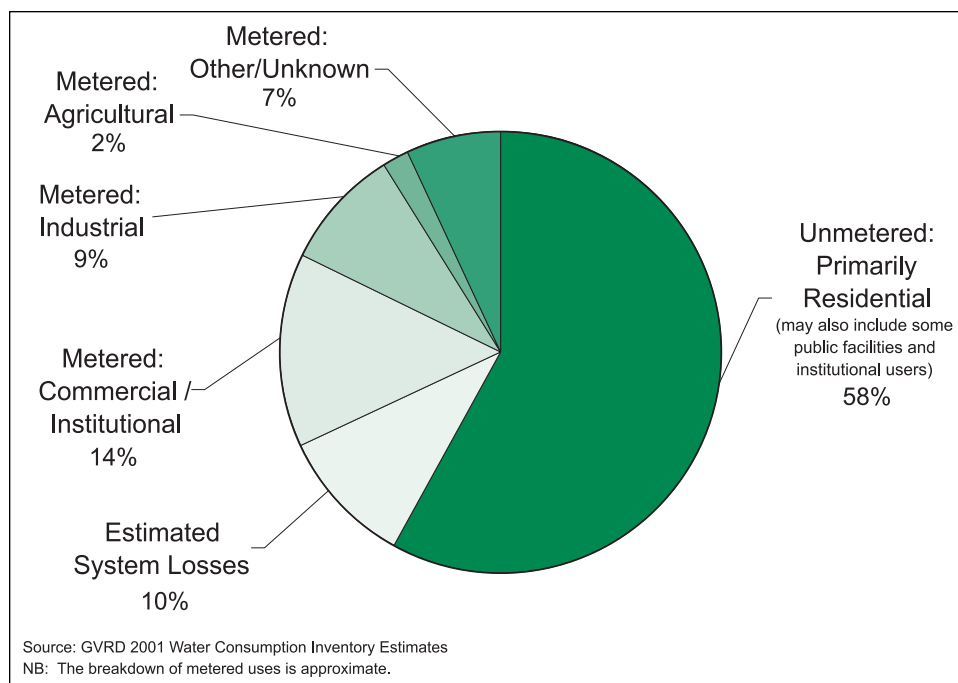


Fig. 13: Water Consumption in Richmond by Sector, 2001

## Looking Forward

In the future, wholesale water costs (charged by the GVRD to municipalities) are expected to rise from about \$0.20 per cubic meter in 2004 to \$0.37 in 2008 and \$0.45 by 2015. These increases are required to pay for new treatment facilities and infrastructure. As these costs will be passed on through the municipalities to consumers, the financial incentive for water conservation will increase.

## What Can Citizens Do?

- Install water conserving fixtures and appliances.
- Obey summertime lawn watering regulations.
- Get in the habit of turning off running faucets when brushing teeth or washing dishes.
- Do full, rather than partial, loads of laundry or dishes.
- Check toilets regularly for leaks.
- Sign up for voluntary residential watering metering and keep track of your usage levels.

### A Closer Look: Residential Water Meters

Residential water metering is only one part of a program to reduce water consumption that includes education and outreach campaigns, provision of water efficiency kits, and home and business audits. Metering, with its pricing based on the amount consumed, has been shown to be a highly effective measure at both raising awareness and providing citizens with direct feedback on their water consumption.

Currently water service is provided on a flat fee basis where the customer pays a fixed yearly amount, regardless of how much water they use. With a water meter installed, consumers can pay based on their actual use. A nationwide water survey in 2001 showed that in municipalities that charged according to the volume of water used (metered), the average daily consumption rate was 272 litres per capita, while in communities that charged a flat or fixed rate, used 474 litres per capita - 74% higher! Metering and consumption-based pricing are clearly valuable demand management tools for promoting the responsible use of water resources.

In 2004, the City began allowing residents in single-family houses to pay on a metered basis for the water they use. As of November 2005, there are 7,214 metered residential connections or about 15% of the total. (see [www.watermeter.ca](http://www.watermeter.ca)).



## RRC-2: Wastewater Generation

### Why is this Indicator Important?

Wastewater generated by residential, commercial, and industrial activity must be treated before being discharged into the Fraser River. Increases in flows will eventually result in a requirement for expansions to the infrastructure - usually the wastewater treatment plant.

The volume of wastewater created depends upon several factors including: the amount of water we use; the amount of industrial and commercial discharges; the amount of storm water that enters the sewer system due to improper connections of storm lines; and the condition of the sewer system, which if not maintained will allow groundwater to leak into the network.

### What is Being Measured?

Total wastewater flow (averaged on a daily basis in millions of litres per day) is measured at the Lulu Island wastewater treatment plant, which serves the majority of Richmond (i.e., the western half of Lulu Island). The average per capita flow (in litres per capita per day) is calculated based on the total flow.

### What is Happening?

Total flow volumes have increased 50% from 1990 to 2004, growing at a rate slightly faster than the population. As a result, per capita wastewater generation is also increasing - from around 350 L per capita per day (L/c/d) in the early 1980s, to 400 L/c/d in 1990, to 450 L/c/d in 2004 (Figure 14). These increases are likely the result of increased industrial discharges to the sewer system, increased storm flow and groundwater entering the sewer collection network, and more discharges to the sewer network from residents.

### What is Being Done?

The GVRD has a Liquid Waste Management Plan in place, which outlines measures to manage liquid waste in the region, and includes a process for expanding the Lulu Island plant to accommodate increased volumes. The GVRD also maintains a source control program that regulates all industrial discharges into the sewer system to prevent harmful compounds being released that might otherwise harm the environment, upset the sewage treatment plant processes, or damage the sewer collection network.

## Summary

### Status:

Wastewater generation is increasing - per capita wastewater flows are up 13% from 1990 to 2004.

### Trend:

Increased per capita flows combined with increased population has resulted in wastewater flow volumes increasing faster than the population growth rate.

### Outlook:

The trend is likely to continue. To accommodate this, an expansion of the Lulu Island wastewater treatment plant has already been defined and will be completed by 2008. This expanded capacity is projected to handle growth for a decade.



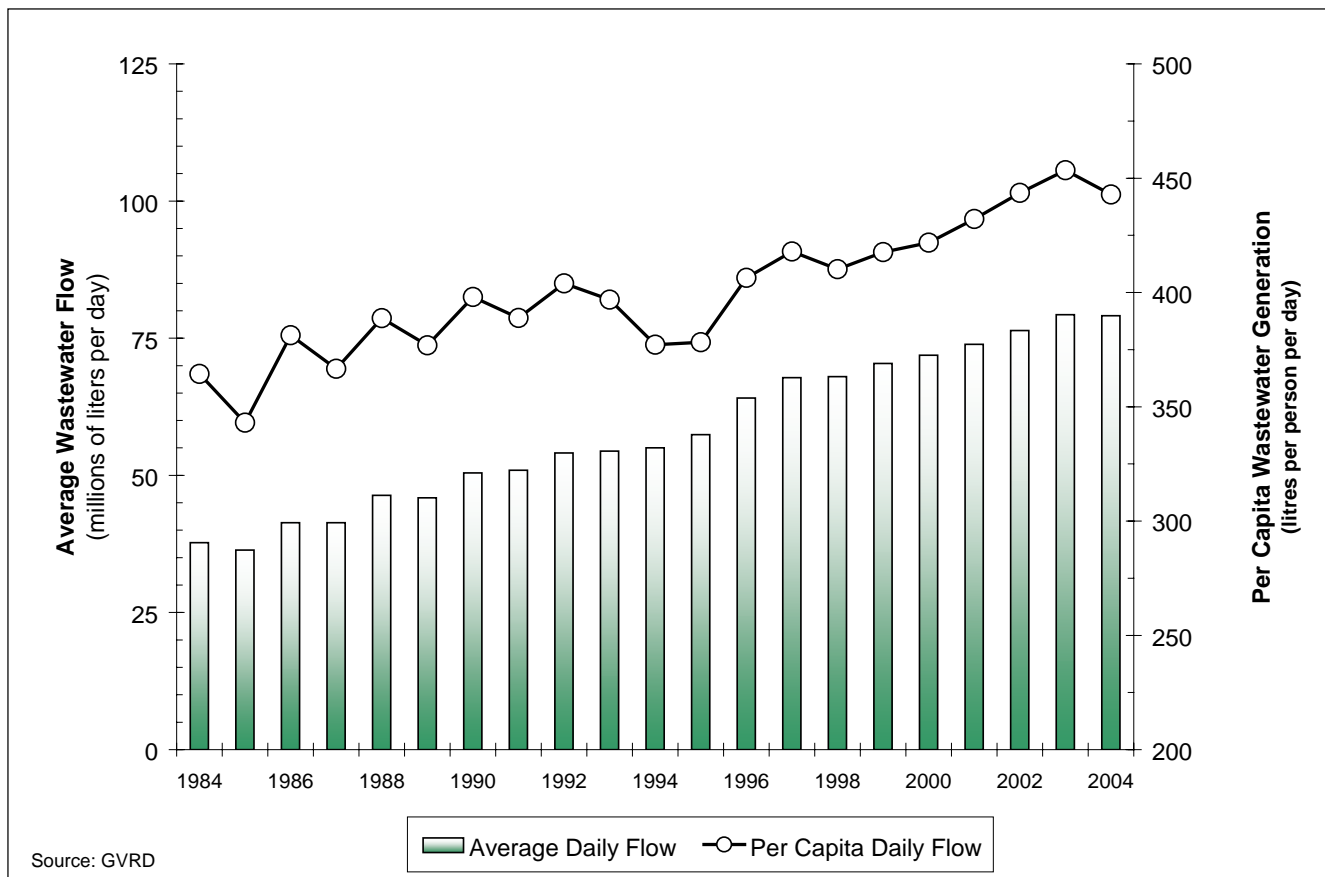


Fig. 14: Wastewater Flows to the Lulu Island Plant, 1984-2004

## Looking Forward

A partial expansion of the Lulu Island wastewater treatment plant is undergoing design and should be in service by 2008. This upgrade will ensure that full treatment can be provided to all expected flows for the next decade, after which it is expected that there will be a requirement for further expansion of the plant.

## What Can Citizens Do?

- Actively pursue water conservation for activities that discharge into sewers. This could include using low flow toilets, water efficient fixtures and appliances, and reducing unnecessary running of taps and faucets.
- Do not put chemicals or petroleum products into sewer systems or surface drains. These can harm the sewer network of the wastewater treatment plant processes.
- Do not put greases or cooking oils down drains.
- Businesses can investigate opportunities to conserve water and reduce discharges to the sewer system.
- Lobby for the development of grey water recycling systems.
- Encourage the development of efficient recycling systems in residential towers.



## RRC-3: Residential Solid Waste Disposal

### Why is this Indicator Important?

Each year, residents and businesses in the region send thousands of tonnes of solid waste to landfills or incinerators. The GVRD maintains three disposal facilities – the Vancouver Landfill in Delta, the waste-to-energy incineration facility in Burnaby, and the Cache Creek Landfill. In 2007, the Cache Creek Landfill is scheduled to close. This facility takes almost 30% of the waste generated in the Lower Mainland - about 400,000 tonnes of waste per year. A new landfill site is currently being considered but has not yet been finalized. Regardless, landfills consume valuable land and burying wastes can have environmental impacts. For example, decomposing wastes produce methane gas that contributes to global warming. Additional air emissions are generated from transporting wastes to the landfills or incinerators.

### What is Being Measured?

Solid waste is measured by the weight of the material, typically reported as tonnes or kilograms (kg). This indicator provides data on the annual amount of solid waste disposed in landfills or incinerated by residents of single-family dwellings – both the total amount and the amount produced per capita.

The indicator shows the waste produced by single-family dwellings, which today house about 55% of Richmond residents. For these dwellings, waste pickup is performed by the City. The indicator does not include waste from residents of multi-family dwellings such as apartments and town homes, or from commercial or industrial sources. The waste from these sources is handled by numerous private sector waste collectors and data is not available.

### What is Happening?

In the early 1990s, the BC Ministry of Environment set a goal that all municipalities should reduce per capita solid waste disposal to 50% of 1990 levels by 2000. Under this mandate the City and the Regional District developed many recycling and waste reduction programs during the mid 1990s. Total single-family waste disposal in Richmond was over 25,000 tonnes per year in the early 1990s and had dropped to less than 20,000 tonnes per year in 1999.

On a per capita basis, from 1990 to 1999, Richmond residents reduced their waste sent to disposal from 323 kg to 179 kg per capita per year (the lowest in the past 15 years). Since then, per capita amounts have been increasing and in 2004 disposal had increased to 194 kg per capita per year. The 50% target was never achieved in Richmond.

## Summary

### Status:

Residents living in single-detached homes in Richmond generated 194 kg of solid waste per capita per year in 2004.

### Trend:

From 1990 to 1999 Richmond reduced its annual waste disposal from 323 kg to 179 kg per capita (the lowest in the past 15 years). Since then, per capita amounts have been increasing and in 2004 disposal had increased to 194 kg per capita per year.

### Outlook:

Increasing proliferation of single use disposable products and increasing population in Richmond will lead to increases in the amount of total and per capita waste generated.



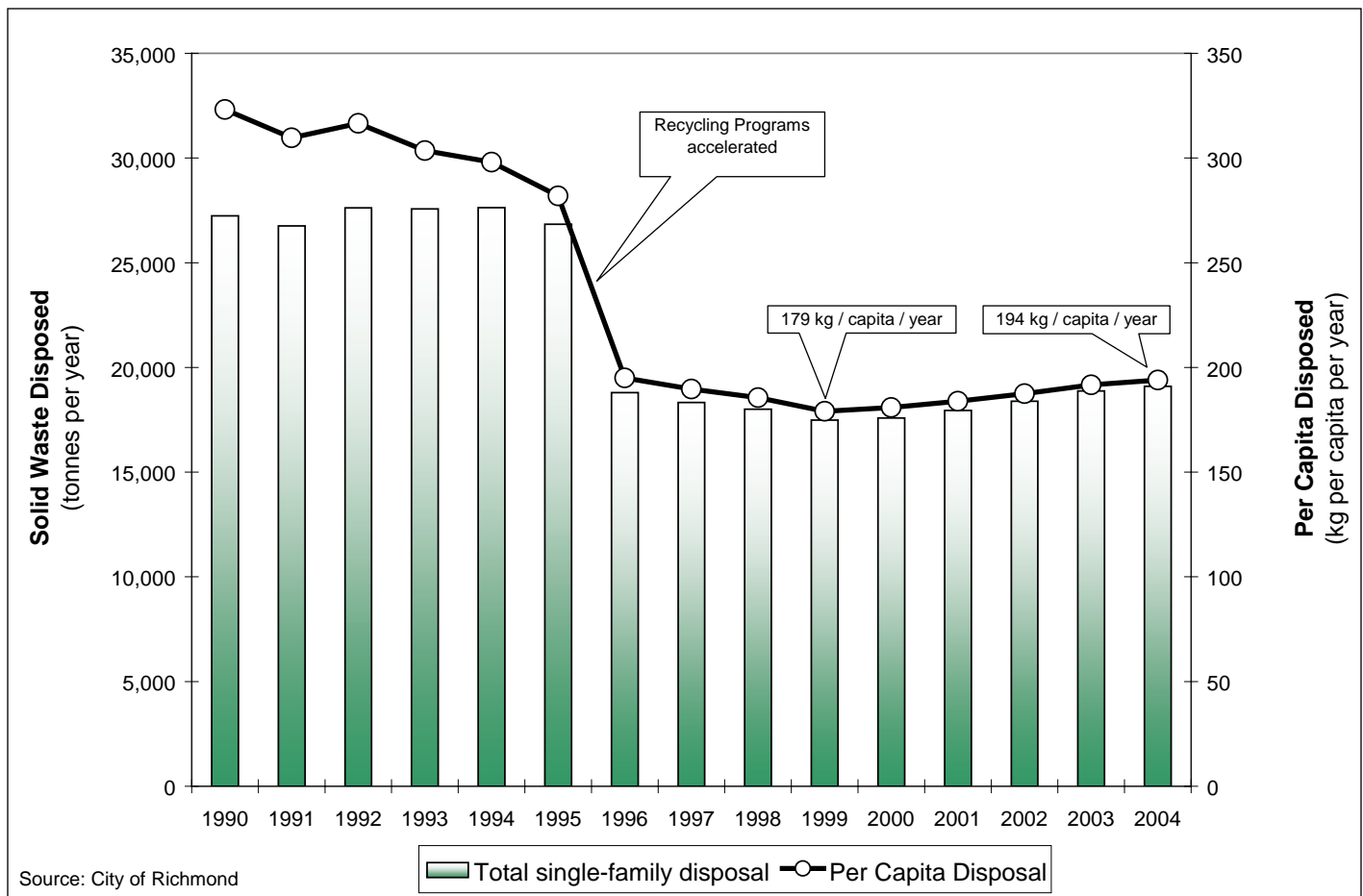


Fig. 15: Total and Per Capita Solid Waste Disposed by Single-family Dwellings, 1990-2004

## What is Being Done?

Recycling programs in Richmond date back to the early 1990s. These programs, along with a yard trimmings collection program started in 1996, resulted in a reduction of approximately 8,000 tonnes of waste going to the landfill by 2005. Residents of single-family dwellings in Richmond have a number of waste reduction programs available to them, including curbside pick up of recyclable materials and yard waste, and the Product Care program for paint and other toxic consumer products. The City Recycling Depot takes appliances, large metal items, yard waste, and all other blue box recyclable material. Household hazardous wastes can be recycled at a number of privately operated facilities around Richmond.

A large portion of the waste generated could be eliminated through careful purchasing, reduction of consumption, re-use, or recycling. As well, much more organic material could be composted. Several provinces have achieved organics diversion rates in excess of 50% through composting programs (e.g., Nova Scotia and Prince Edward Island).



## Looking Forward

The current trend is one of slowly increasing per capita waste generation for single-family residents. Combined with population growth, the total waste generated by Richmond residents will also continue to increase.

## What Can Citizens Do?

- Continue efforts to recycle and implement composting wherever possible. Compost boxes and other helpful information are available from the City. (see [www.richmond.ca](http://www.richmond.ca))
- Make conscious choices to reduce the purchase of excess packaging, disposable products and single use items.

### ? Did You Know...

The BC Ministry of Environment has established programs to return and recycle many existing products including beverage containers, lead-acid batteries, lubricating oil and used oil filters, medications, paints, solvents/flammable liquids, gasoline, pesticides, and tires. These "Extended Producer Responsibility Programs" place the costs of collection and recycling on the seller and buyer and not on taxpayers. In 2005, the province announced its intentions to establish a system for the recycling of "e-waste" (computers, televisions, cell phones, etc.) by 2007.

## RRC-4: Residential Building Energy Use

### Why is this Indicator Important?

We use energy - primarily electricity and natural gas - for space heating, cooking, appliances and lighting, and to power our economy. We have historically enjoyed cheap, affordable energy but our energy infrastructure has limits. Electricity in BC is primarily produced from hydroelectric facilities (although a portion is generated from fossil fuels). Growth in BC over the past decades has created requirements for new electricity generation capability and all forms of electricity generation have some environmental impacts.

The natural gas that we consume in the Lower Mainland typically originates from the Peace River area in the province's northeast and Alberta. Shortages of supply in North America have driven prices to near record highs all over North America and they are not expected to decline any time soon.

### What is Being Measured?

Energy consumption is typically measured in kilowatt-hours (kWh) of electricity and gigajoules (GJ) of natural gas. This indicator shows how much energy is used by residential consumers in Richmond. At present, only data for electricity is available. For future updates, natural gas data will become available each year.

### What is Happening?

An average single-family dwelling uses approximately 10,000 kWh of electricity each year and 100 GJ of natural gas.

Per capita energy consumption in single-family residences in Richmond has increased slightly from 1996 to 2004 and averages around 3,000 kWh per capita. However, the population in Richmond has increased by 13% over the same period - resulting in an increase in total consumption.

Natural gas consumption for single-family houses is about 20 GJ per capita per year. A long-term trend for natural gas consumption cannot be determined due to limited data availability.

Condominiums and multi-family dwellings use much less energy per unit, and many do not use natural gas at all for water or space heating. Currently, this natural gas use cannot be tracked separately through gas records but will be in the future through Terasen Gas.

### Summary

#### Status:

Richmond residents use about 3,000 kWh per capita per year of electricity per capita per year.

#### Trend:

Per capita energy (electricity) usage has remained unchanged over the last few years, but total energy use has increased with population growth.

#### Outlook:

Multi-family dwellings use less energy (per capita) than single-family dwellings. As more multi-family dwellings are built, total consumption will increase, though per capita energy consumption is expected to decline.



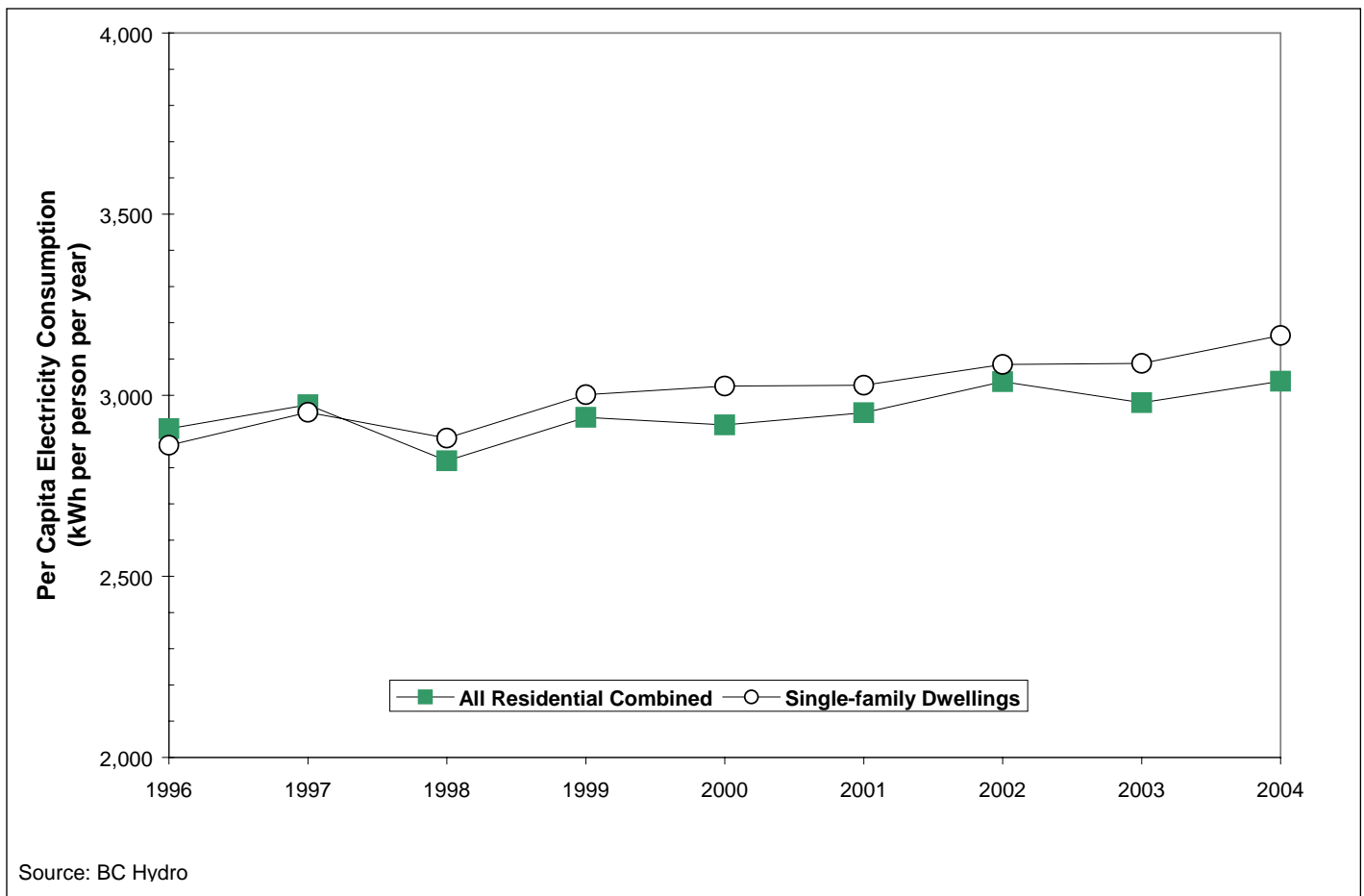


Fig. 16: Per Capita Residential Electricity Consumption, 1996-2004

## What is Being Done?

BC Hydro has developed energy efficiency programs for residents that include compact fluorescent light bulb promotions and exchanges of old, high energy consuming appliances and light fixtures. These programs are part of a broad conservation strategy called PowerSmart that aims to reduce consumption by all electricity users.

Terasen does not have energy conservation programs targeted at the residential level but works with large users through its “Gas Efficient Boiler Program” to encourage the use of high- efficiency, natural gas hydronic (i.e., circulating water) space-heating systems in new construction and retrofit applications.

In general, energy conservation is the responsibility of the individual and residents need to take the initiative to reduce their electricity and gas consumption.



## Looking Forward

We expect that per capita residential electricity consumption will continue at the same level, and that population increases will result in increases in total demand. The trend of development in Richmond is towards multi-family dwellings and these are much more efficient than detached dwellings for heating and cooling requirements. Over many years, this transition may result in a decline of per capita energy (combined electricity and natural gas).

## What Can Citizens Do?

- Buy energy efficient appliances and computer systems (e.g., EnergyStar rated).
- Replace your incandescent light bulbs with compact fluorescents.
- PowerSmart your home with good insulation and use energy saving devices to reduce electrical and furnace use.
- Have an EnerGuide for Houses evaluation conducted for your home to assess how your current home performs and identify how you can reduce energy consumption and save money at the same time.
- Take the One-Tonne Challenge to reduce greenhouse gas emissions ([www.climatechange.gc.ca/onetonne](http://www.climatechange.gc.ca/onetonne)).
- Undertake the energy conservation projects listed in the 2001 Richmond Environmental Project Guidebook (see [www.richmond.ca](http://www.richmond.ca))



## RRC-5: Greenhouse Gas Emissions

### Why is this Indicator Important?

Greenhouse gas (GHG) emissions can accelerate the natural ‘greenhouse effect’ (which keeps heat in the earth’s atmosphere) and result in global climate change. Global climate change is expected to have serious impacts on our weather, meteorological and ecological support systems. Potential impacts of climate change include:

- sea level rise and increased flooding risk;
- more extreme weather events like storms, floods, and droughts;
- diminished water supplies;
- diminished fishery resources as a result of warmer oceans and rivers; and,
- diminished forestry resources as a result of increased incident of fire, insect outbreaks and disease.

The major sources of greenhouse gases are from combustion of fossil fuels such as oil, natural gas or coal, and from the decomposition of organic wastes in landfills. Within Richmond, the primary GHG sources are the burning of natural gas and petroleum.

### What is Being Measured?

No indicator was measured for this report as there is currently no reportable data available for Richmond. As Richmond develops its emissions baseline and forecast, there will be information with which to track GHG emissions in future years.

### What is Being Done?

- Canada has committed in the Kyoto Protocol (which came into effect in 2004) to reduce total greenhouse gas emissions to 6% less than 1990 levels by 2012. The federal government has been developing actions and program funding to help industries, communities and individuals reduce their emissions.
- Municipalities have an important role to play as much of the GHG emissions are related to vehicles and housing - which can be influenced by municipal actions. In 2001, the City of Richmond joined the Federation of Canadian Municipalities’ Partners for Climate Protection Program. This program is a five milestone framework to define an emissions baseline, establish a forecast of future emissions, define a reduction target, and develop community plans to manage these emissions. Richmond is working to define a baseline emissions inventory and the information from this will be used to help create a forecast and reduction targets.

## Summary

### Status:

There is currently no complete indicator data of greenhouse gas (GHG) emissions for Richmond. The City is working to develop its GHG emissions baseline as part of the Partners for Climate Protection program.

### Trend:

No trend data on GHG emissions in Richmond is currently available, but the growth in the population and associated increases in vehicle traffic, housing and commercial activities have likely resulted in increased total GHG emissions over the past several decades.

### Outlook:

Unknown.

- Richmond is one of 40 Canadian communities chosen to implement the One-Tonne Challenge, a two year initiative running from 2004-2006 that encouraged all Canadians to reduce their GHG contributions by 20% or one tonne. The Richmond Community Challenge (RCC) is a partnership between Richmond School District #38, the Vancouver International Airport Authority, Passion for Action (an environmental education company) and the City. During the first year, the RCC implemented a community outreach program by identifying student and youth ambassadors to engage the community of Richmond to take the challenge. Year Two of the challenge will focus on developing an idle free program in Richmond.
- The GVRD's new air quality management plan completed in 2005 includes a commitment to help reduce greenhouse gas emissions in the region. This is a substantial development as it allows greenhouse gases to be managed at a regional level.

## Looking Forward

Experiences in other growing communities suggest that total GHG emissions will continue to increase, unless we learn to change our behaviours in order to reduce emissions.

## What Can Citizens Do?

- Reduce your use of fossil fuels, drive less, and use energy efficient appliances.
- Plant trees, keep and support green spaces.
- Walk - don't drive.
- Ride a bike or take transit to work just one day per week.
- Take the One-Tonne Challenge and find more ways to reduce your GHG profile ([www.climatechange.gc.ca/onetonne](http://www.climatechange.gc.ca/onetonne)).





## Goal 4: Build Compact & Complete Communities

Land use patterns have a significant impact on the environment. For example, the density of development and land use patterns affect the amount of land consumed, the amount of separation between land uses, the length of travel distances, and transportation choices. These factors have an impact on energy consumption, particularly for buildings, infrastructure and transportation, as well as emissions of air contaminants and greenhouse gases. Urban sprawl and low densities with predominantly single-family detached residential land use development consumes land and generally results in a high level of automobile dependence.

The environmental benefits of a compact urban form include using land resources more efficiently and reducing pressures on agricultural land and greenspaces. Compact urban form also supports more efficient provision of municipal infrastructure services and reduced levels of automobile dependence.

By building complete communities – places where we can live, work, shop, and play – we can meet our daily needs closer to home, thereby reducing trip distances and reducing our overall reliance on the automobile. Shorter trip distances make walking, cycling, and transit viable transportation options. In addition, increasing the share of multi-unit housing results in more shared wall and floor space, which reduces the heating requirements of buildings. Some of the other benefits of complete communities include better access to key services such as schools, parks, shopping, and transit; more pedestrian-friendly neighbourhoods; and a stronger sense of community as residents have more opportunities to interact.

This section uses several indicators to monitor land use and community development patterns:

- BCC-1: Population and Housing Unit Density
- BCC-2: Residential Housing Mix
- BCC-3: Access to Parks, Shopping and Amenities
- BCC-4: Labour Force Working and Living within Richmond
- BCC-5: Commuter Trip Distance





## BCC-1: Population and Housing Unit Density

### Why is this Indicator Important?

Promoting higher density living is one of the main ways we can manage population growth and maintain a compact urban form. Richmond can meet growth management objectives to develop transit-friendly and pedestrian-friendly urban centres and preserve agricultural land and greenspace by concentrating new development in its City Centre.

### What is Being Measured?

This indicator looks at changes in residential population and housing density for Richmond City Centre, City of Richmond Planning Areas, the West Richmond Urban Area, and the city as a whole. The measure is gross density, which includes streets, parks, rights-of-way and non-residential land uses in the area.

For the purpose of this indicator, the West Richmond Urban Area is defined geographically to comprise the following Planning Areas: Steveston, Seafair, Thompson, Blundell, Broadmoor, Shellmont, and West Cambie. It excludes the City Centre, Sea Island and Gilmore.



### Summary

#### Status:

Richmond City Centre is becoming a high density, multi-use area. The City Centre and West Richmond Urban Area is now at or approaching levels of density that are supportive of reduced automobile dependence.

#### Trend:

Population and dwelling unit densities have significantly increased in the City Centre and West Richmond Urban Area over the last 15 years. The City Centre has more than doubled in population between 1990 and 2005.

#### Outlook:

Density in the City Centre is expected to continue to increase as the City implements its housing-related Official Community Plan policies. Development along the Canada Line will support population and dwelling unit density increases in the City Centre and West Richmond Urban Area. Development constraints in other parts of Richmond will minimize population growth and development in the East Richmond and Gilmore areas.

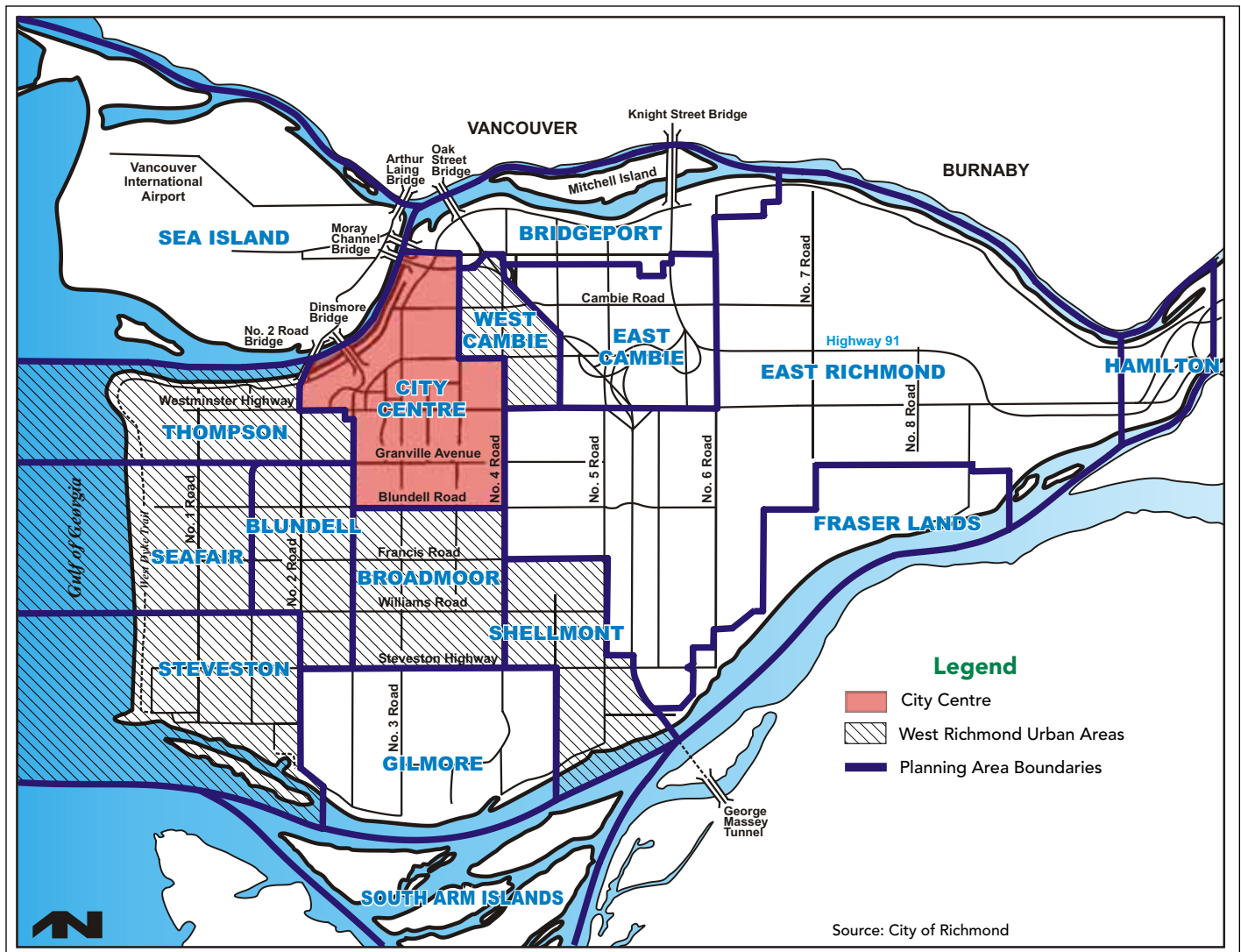


Fig. 17: Map of Richmond City Centre and Richmond Planning Areas

## What is Happening?

In 2005, the City Centre was home to 40,300 people or 22% of Richmond's residents. These residents occupied 17,065 dwelling units or about 28% of the city's dwelling stock in 2005. Between 1990 and 2005, the City Centre's population more than doubled (110% increase), compared to a 32% increase in the rest of the city. Population density within the City Centre climbed from 23.5 persons per hectare in 1990 (11.3 units/ha) to 49.3 persons per hectare (20.9 units/ha) in 2005. Over the same time period, the population density in West Richmond, outside the City Centre, rose from 21.2 persons/ha (6.8 units/ha) in 1990 to 26.6 persons/ha in 2005 (8.5 units/ha). City-wide, the gross population density rose from 9.8 persons/ha in 1990 (3.4 units/ha) to 14.0 persons/ha in 2005 (4.8 units/ha).



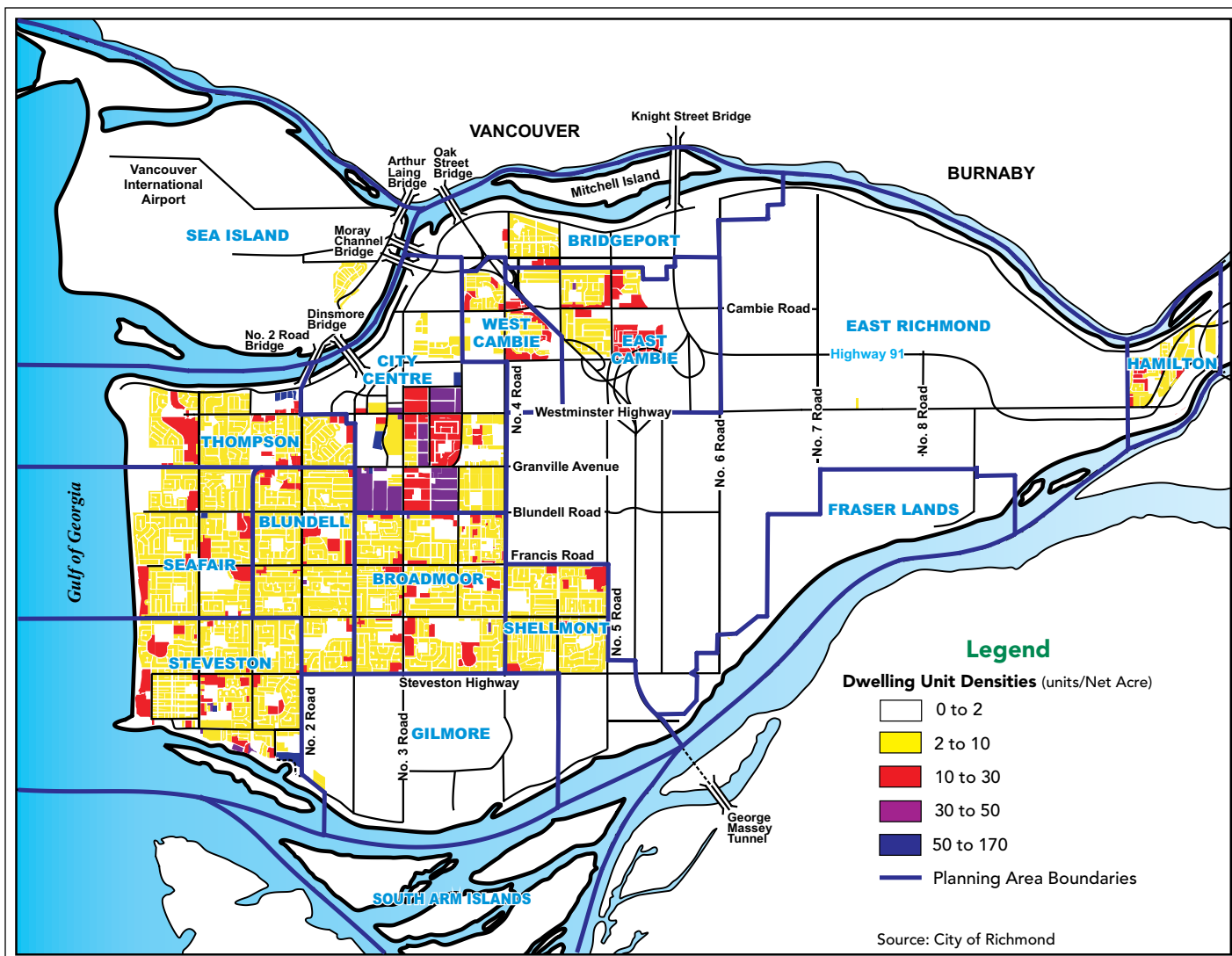


Fig. 18: Map of Net Dwelling Unit Densities in Richmond, 2005

Figure 19 shows the comparison of gross dwelling unit density in each Planning Area, the West Richmond Urban Area, and city-wide for 1990 and 2005. The largest increases in dwelling unit density have occurred in the City Centre, West Cambie Planning Area, Thompson Planning Area and Hamilton Planning Area.

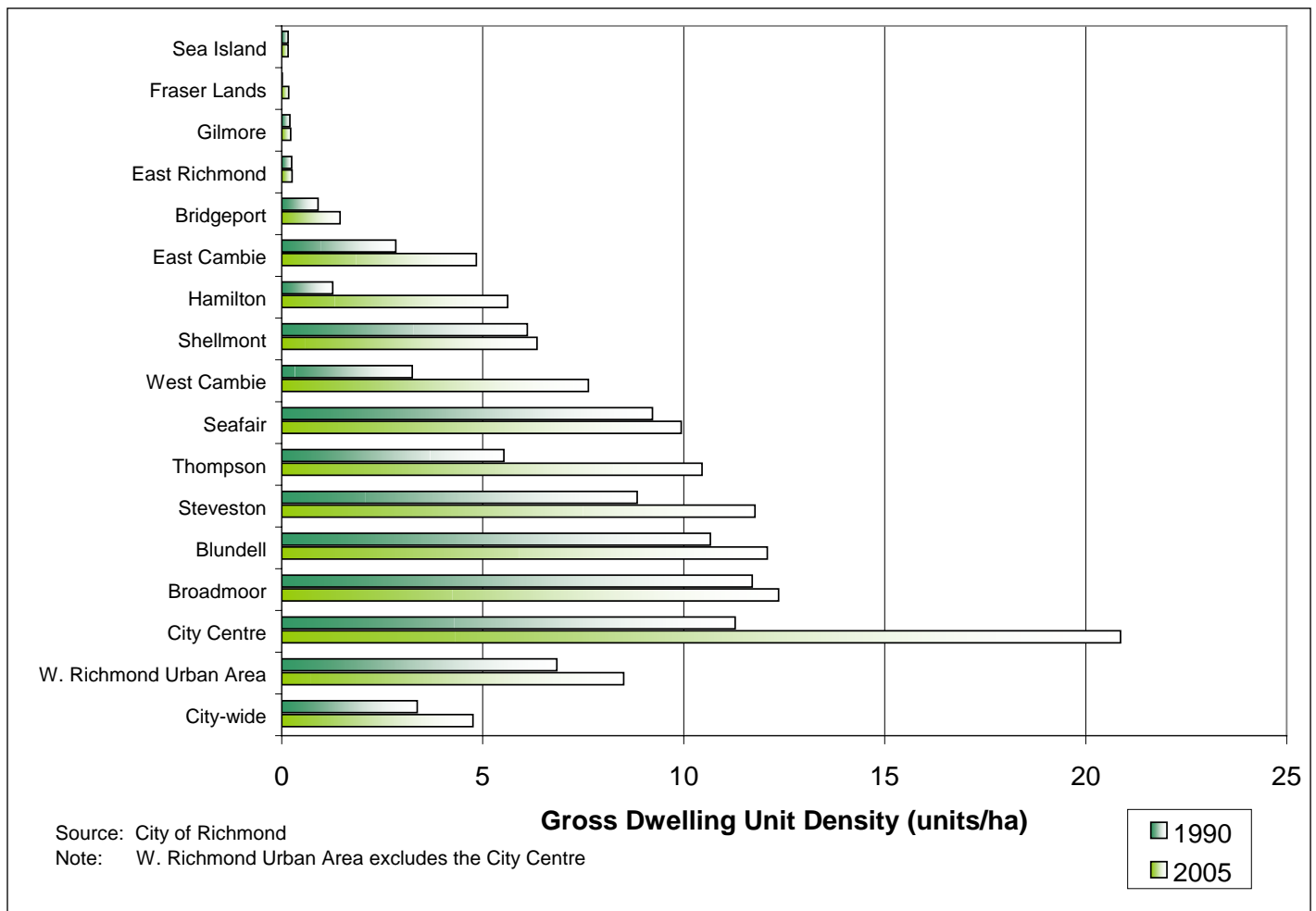


Fig. 19: Density of Dwelling Units by Richmond Planning Area and Selected Areas, 1990 and 2005

The City Centre and the West Richmond Urban Area population density of almost 50 persons/ha and 27 persons/ha respectively is above that or is approaching the threshold that is generally considered the benchmark for supporting alternatives to the automobile and fostering a reduced level of automobile dependence (about 35 persons/ha ). More development in the City Centre and in existing urban areas also translates into less greenfield development (i.e., less newly developed land). As a result, municipal infrastructure costs are lower, and less pressure is placed on the city's agricultural land.

## How Do We Compare?

Figure 20 compares Richmond's population density to that of other municipalities in the GVRD in 2001. The density comparisons exclude land in the Green Zone (i.e., major parks, lands in the Agricultural Land Reserve, and water supply catchment areas). With a population density of 22 persons/ha, Richmond falls in between the more dense Burrard Peninsula cities (Vancouver, Burnaby and New Westminster) and Northeast Sector cities (Coquitlam, Port Moody and Port Coquitlam) and the lower density outer suburban areas (Delta, Surrey and the Township of Langley).

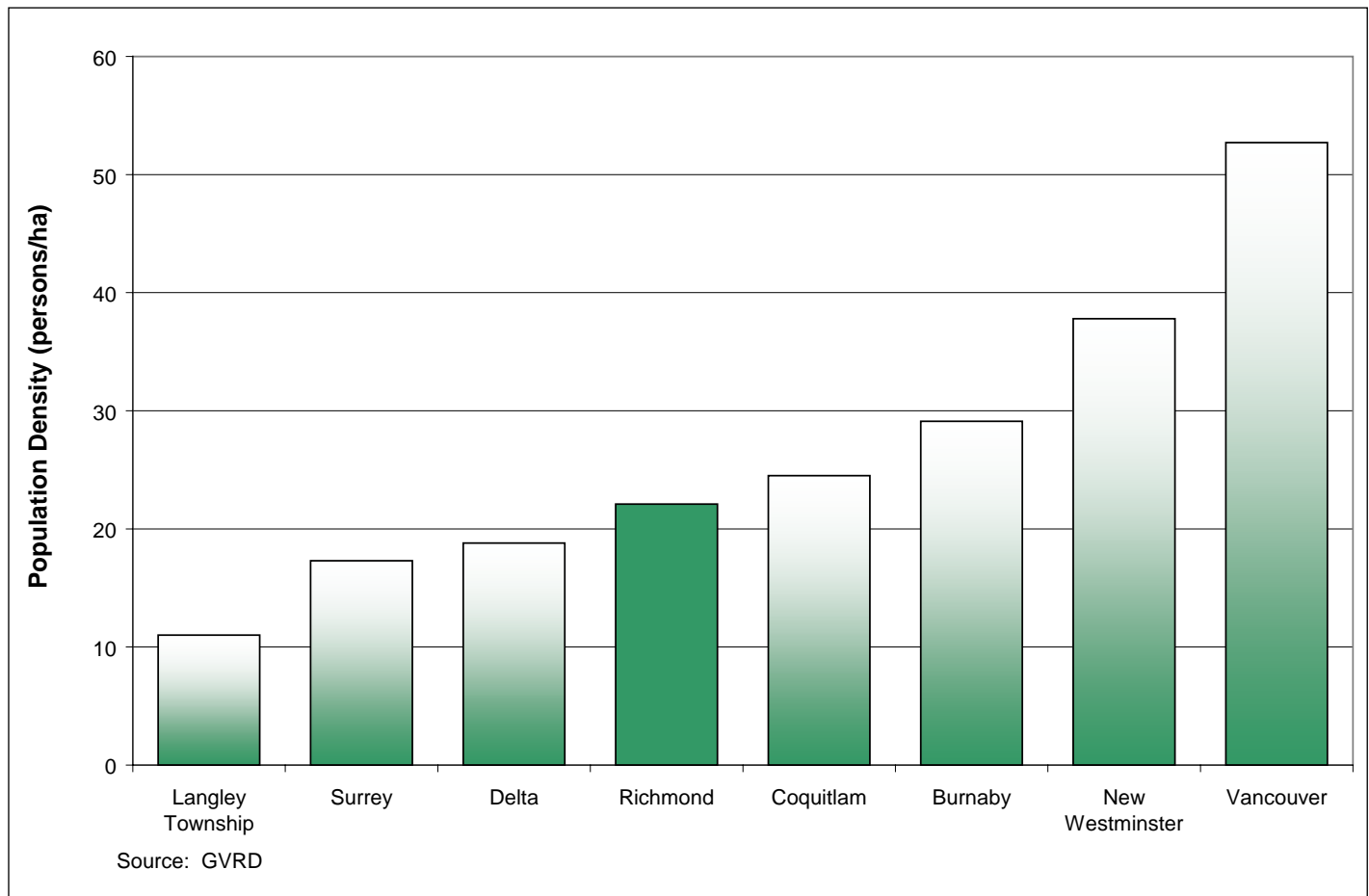


Fig. 20: Population Density in Selected Municipalities in the GVRD, excluding the Green Zone, 2001

## What is Being Done?

The City Centre is evolving in accordance with the objectives of the Official Community Plan and City Centre Area Plan, both of which promote a vibrant commercial core with high- and medium-density development suitable for a range of residents and businesses. Residential development outside the City Centre is guided by the Official Community Plan and Area Plans. These policies parallel the objectives of the GVRD's Livable Region Strategic Plan to build complete communities and achieve a compact metropolitan region.



The City has adopted Transit Oriented Development (TOD) principles to promote transportation create compact communities which will take advantage of the Canada Line.

## Looking Forward

Given the City's OCP policies to promote development in the City Centre while preserving agricultural land and retaining the single-family character of neighbourhoods outside the centre, it is likely that the City Centre will continue to densify relative to other parts of the city.

The Canada Line rapid transit system will shape future development in Richmond by encouraging continued growth and densification in the City Centre and around the transit stations. Developing these areas will result in higher densities.

## What Can Citizens Do?

- Attend public meetings on planning initiatives including applications for rezoning, subdivisions and land development activities.
- View the area plan for where you live by visiting City Hall or by visiting the City's website ([www.richmond.ca](http://www.richmond.ca)) and provide comments to the City's Urban Development Division.



Draft for discussion purposes only.



Draft for discussion purposes only.

## BCC-2: Residential Housing Mix

### Why is this Indicator Important?

Housing choice is an important element of complete communities. Neighbourhoods that demonstrate a mix of housing types (i.e., ranging from single-family homes to apartment complexes) are often more stable and attract longer-term residents as people can move to different types of accommodation throughout their lifecycle. While some parts of the city are better suited to higher density living due to shortage of space and the high cost of land, other areas are amenable to lower density housing choices such as single-family homes. Maintaining a mix of housing choices serves all members of the community while adding diversity to the urban landscape – both architecturally and socially.

An increasing share of multi-unit dwellings is positive from an environmental perspective. It means land is being used more efficiently and energy, material and water consumption tend to be less on a per capita basis due to shared walls and floors as well as less yard space.

### What is Being Measured?

This indicator breaks down the percentage of total and new housing units in Richmond by dwelling type.

### What is Happening?

Richmond's housing stock is steadily diversifying. While much of the city remains single-family in character, fewer and fewer single-family homes are being constructed. From 1990 to 2005, the share of the city's total dwelling stock that was single-family declined from 57% to 46% according to the City's dwelling unit estimates. In that same time span, the townhouse share rose from 18% to 22% and the apartment share increased from 23% to 31%.

These trends are caused by increasing prices for land in the Lower Mainland as well as the limited space for expansion due to the Agricultural Land Reserve and protected areas in Richmond.

### How Do We Compare?

The percentage of single-family homes in Richmond (46% in 2005 and 47% in 2001 from the Census of Canada) is significantly lower than the national average (57%), but slightly higher than the GVRD average (43%). Within the GVRD, Richmond has a higher share of single-family homes than Vancouver (28%) and Burnaby (36%), but less than Coquitlam (51%), Surrey (55%), and Langley Township (71%).

Looking at recent housing completions, Richmond has a lower share of single-family completions than the region as a whole. Between 1997 and 2004, only 26.4% of the city's completions were single-family, compared with 34.4% for the GVRD.

## Summary

### Status:

Richmond's 2005 housing mix was 46% single-family dwellings, 2% two-family, 22% townhouses, and 31% apartments, representing a diversity of housing types.

### Trend:

The share of townhouses and apartments in the city has been increasing steadily, while the single-family housing share is falling. Between 1990 and 2005, the single-family housing share of the city's total dwelling stock declined from 57% to 46%.

### Outlook:

The share of multi-unit homes will continue to increase in the city due to land development constraints and policies supportive of increased development in the City Centre.



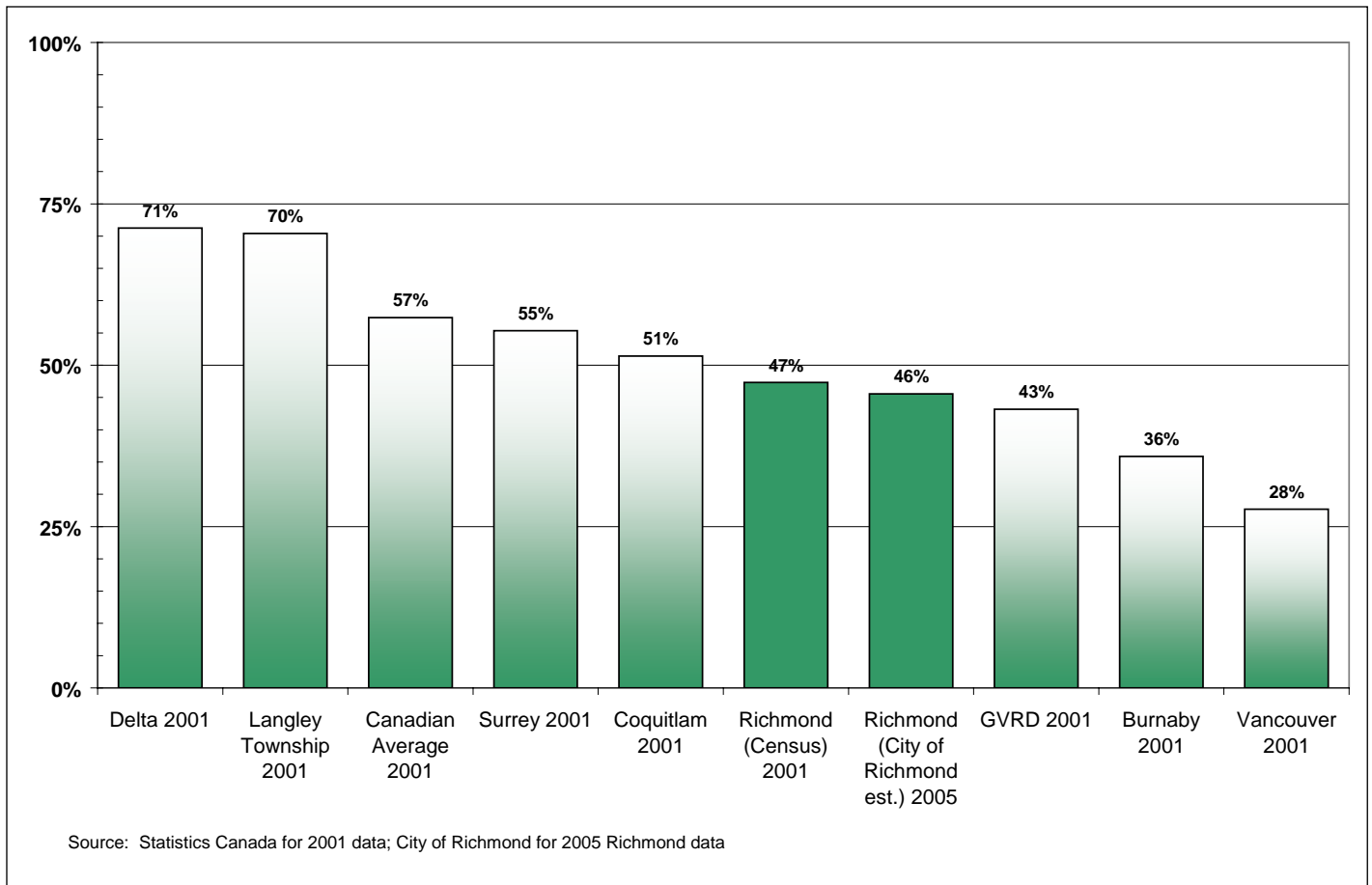


Fig. 21: Share of Housing as Single-family Dwellings for Selected Urban Areas, 2001 and 2005

## What is Being Done?

Richmond's Official Community Plan includes objectives to concentrate growth in the City Centre, which supports a move towards higher density forms of housing, such as apartments and townhouses.

Richmond's OCP also encourages a variety of housing types, universally designed dwelling units, and a diversity of housing of different tenures and price ranges suitable to meet the needs of a wide range of individuals and families in the community.

In working towards its objectives to create a strong City Centre and provide more housing choices in specific areas of the city, the City has developed or is in the process of updating plans for each of its 14 planning areas. In addition to the OCP and Area Plans, zoning by-laws and development permitting are the primary tools the City uses to control the type of housing that is developed.

In 2006, the City will be updating its affordable housing strategy.



## Looking Forward

Developing the City Centre at a higher density combined with the development constraints in other parts of the city will continue to result in a higher share of multi-unit development. In addition, development around the Canada Line rapid transit stations will also support the continued trend towards the majority of housing being townhouse or apartment units.

## What Can Citizens Do?

- Attend public meetings on planning issues such as zoning applications or land development activities.
- Consider moving into a townhouse or condominium if your living situation has changed (e.g., fewer people living in your household) and you no longer need all the space provided by a single-family home.
- View the Area Plan for where you live and participate in planning processes when the plan for your area is being updated.
- Consider buying or building a smaller house rather than one that is too large.



## BCC-3: Access to Parks, Shopping and Amenities

### Success Story

Steveston is an example of a neighbourhood outside the City Centre in Richmond that epitomizes a complete community. Steveston contains shopping, services, local jobs, significant park space, and a community centre all within close proximity of dwellings. Its success attracts visitors from Richmond and around the region.

### Why is this Indicator Important?

Complete communities provide convenient access to shopping, work, schools, and recreation, allowing residents to meet many of their daily needs closer to home. Residents who live within walking distance of everyday destinations are much less car-dependent. This in turn results in less fuel consumption and fewer greenhouse gases and air emissions being generated by vehicles.

### What is Being Measured?

This indicator measures the proximity of residential units to three commonly used amenities: shopping, parks or schoolyards, and recreational centres. A 400 m distance threshold (as the “crow flies”) is used for proximity to shopping and schools or parks, which roughly corresponds to a 10-minute walk.

For proximity to community centres, 1 km and 2 km distance thresholds are used.

This indicator also measures the percentage of the city’s residential dwellings located within Richmond’s City Centre, which has the highest diversity of shopping, services, and amenities in the city and is the location of a large share of the city’s jobs.

### What is Happening?

The vast majority of Richmond residents have convenient neighbourhood access to parks or schoolyards, shopping, and community facilities. In 2005, over 92% of dwelling units were located within 400 m of a park or schoolyard, and 91% were within 400 m of shopping or convenience stores. Almost one-half (46%) of all dwellings were located within 1 km of a community centre, and over 93% were within 2 km in 2005.

Approximately 28% of all the dwellings in the city were located within the City Centre in 2005, up from about 21% in 1990 according to the City’s dwelling unit estimates.

### Summary

#### Status:

In 2005, over 90% of Richmond residents lived within 400 m of basic shopping and schools or parks and over 90% lived within 2 km of a community centre. However, access to the amenities can be hampered by road design and layout.

#### Trend:

Data for the City Centre, which has the widest array of shops, services, amenities, and jobs, indicates an improving trend with the percentage of the city’s dwelling stock located in the City Centre increasing from 21% in 1990 to 28% in 2005. In addition, housing density increases discussed in BCC-1 (population and housing unit density) suggest that the trend to increased access is in fact occurring.

#### Outlook:

Continued growth in the City Centre suggests that this indicator will improve in the coming years.





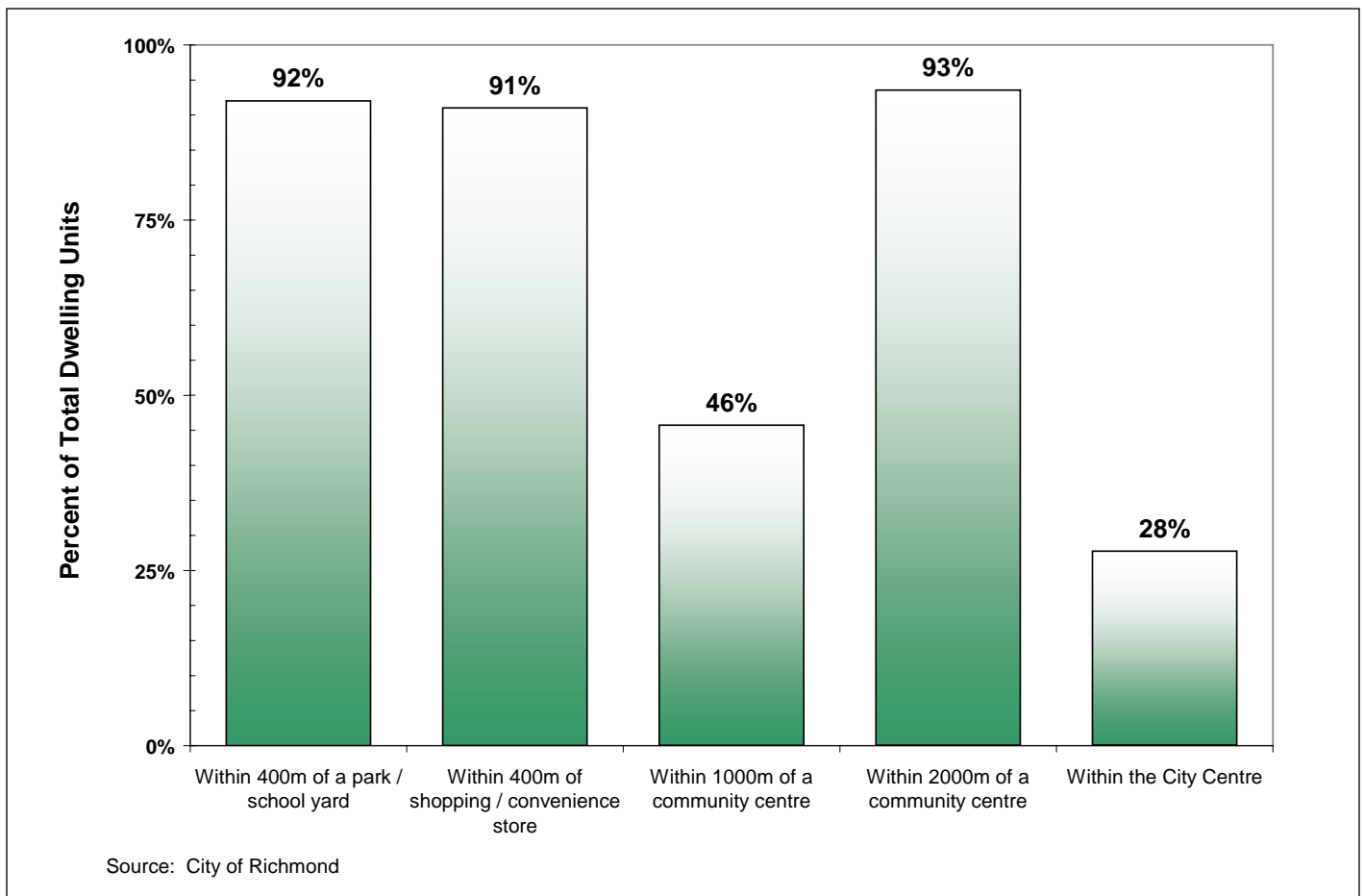


Fig. 22: Proximity of Dwelling Units to Selected Urban Features in Richmond, 2005

## How Do We Compare?

Comparison with other communities is difficult due to lack of data and differences in how these numbers are calculated.

## What is Being Done?

The OCP contains policies to locate a range of community services and facilities close to neighbourhoods. The City is also encouraging higher-density, mixed-use developments in the City Centre. As a result, neighbourhood accessibility to transit, services, and amenities should continue to improve.

The City also has policies to provide parks within each neighbourhood and has established park standards.

Street design plays an important role in accessibility. Busy arterial streets are often difficult for pedestrians to cross, and cul-de-sacs can significantly increase the length of a journey. In 2005, the City initiated the No. 3 Road Corridor Streetscape Study, which is a detailed design analysis of No. 3 Road that will address issues such as integration of the elevated Canada Line guideway and the development of strategies to make the area more



pedestrian-friendly. Concepts being considered include transforming No. 3 Road into a “Great Street” and encouraging Transit-Oriented Development (TOD) around the transit stations whereby a range of housing types, jobs, shops, services, and amenities are located within a 5 to 10 minute walk from a transit station.

## Looking Forward

Rising energy prices and an aging population may result in more citizens locating in pedestrian- and transit-friendly neighbourhoods that offer services closer to home. The Canada Line and continued attraction of development in the City Centre should result in improved performance on this indicator going forward.

## What Can Citizens Do?

- Choose to live in communities that offer a variety of services and amenities close to home, pedestrian-friendly design and good access to transit so that personal auto use can be reduced.
- Support neighbourhood businesses by shopping locally.



## BCC-4: Labour Force Living and Working within Richmond

### Why is this Indicator Important?

The concept of housing and jobs balance is a central theme in building complete communities. The degree to which workers live in proximity to their jobs directly influences the length of trips, transportation mode choice, and transportation demand patterns. These in turn impact fuel consumption for transportation and associated emissions.

### What is Being Measured?

This indicator measures the percentage of the employed labour force that both live and work within Richmond.

### What is Happening?

In 2001, 54% of Richmond's employed labour force of 79,510 worked within the city. This is a slight increase from 1991 when 53% of the city's employed labour force worked within Richmond.

Richmond has the highest number of jobs relative to the resident labour force in the suburban communities in the region. The city's close proximity to the international airport, major ports, industrial areas, the City of Vancouver, and the U.S. border has helped attract jobs. From 1991 to 2001, the rate of job growth has increased at almost 2.5 times the growth rate in the resident labour force in Richmond meaning that more people are commuting into Richmond to work. The percentage of jobs in Richmond being held by residents has fallen from 41% in 1991 to 37% in 2001. High housing costs in Richmond may have contributed to this trend.

The proportion of the employed labour force working from home has increased from 6.6% in 1991 to 8.1% in 2001, equal to the level across the GVRD. These trends likely reflect changes in technology, which have made it possible for a larger portion of the labour force to work from home.

### How Do We Compare?

Of all the suburban areas in the GVRD, Richmond has by far the highest percentage of people living and working within their home subregion – all the other subregions are well below 50%. Only the Vancouver / University Endowment Lands has a higher proportion of people working and living in the same subregion at 66%. The high performance on this indicator reflects the presence of the Vancouver International Airport and a successful City Centre with approximately 26,615 jobs in 2001.

## Summary

### Status:

Richmond had 54% of its resident labour force working within Richmond in 2001 – a very high proportion relative to other Lower Mainland municipalities. The high performance on this indicator supports both shorter trips for commuting and greater use of walking, cycling and transit.

### Trend:

The proportion of Richmond's employed labour force working within the city increased slightly from 53% in 1991 to 54% in 2001.

### Outlook:

The outlook is positive due to the surplus of jobs in Richmond relative to the size of the resident employed labour force.

### ? Did You Know...

Richmond has a higher ratio of jobs to workers than most other municipalities in the Lower Mainland. For every worker who lives in Richmond, there were 1.46 local jobs in 2001. Source: Statistics Canada.



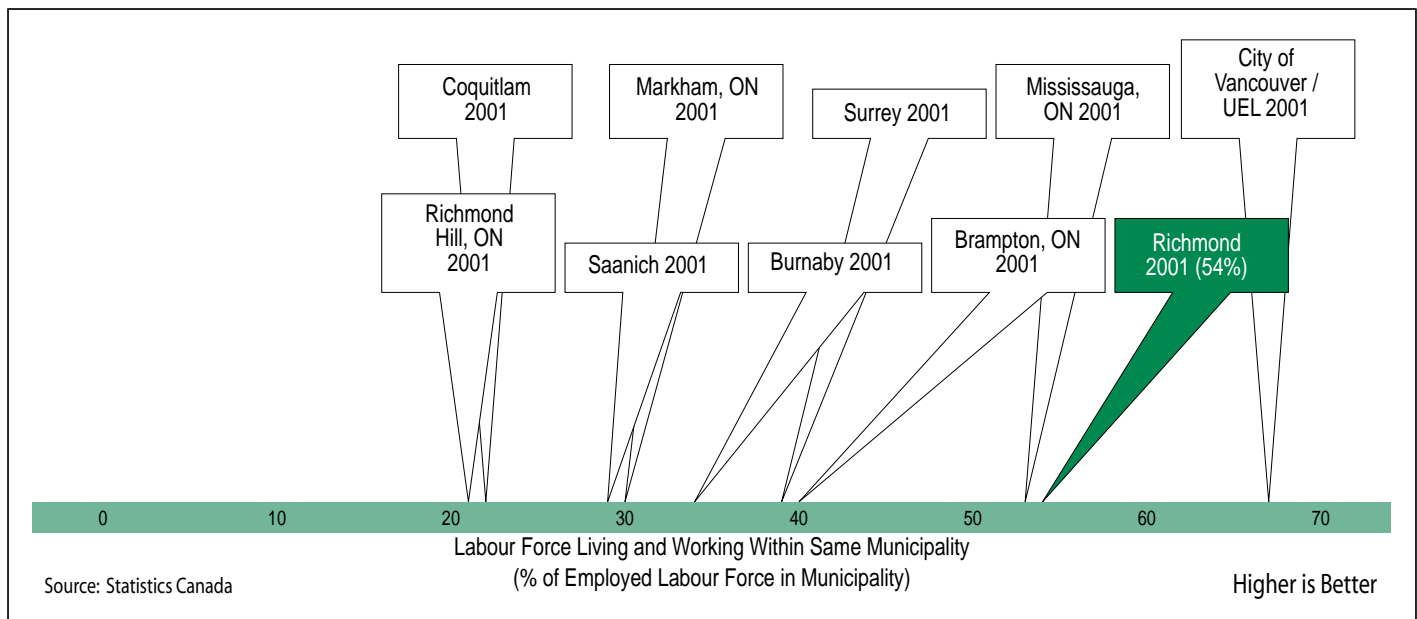


Fig. 23: Labour Force Living and Working within Same Municipality, 2001

## What is Being Done?

The GVRD's Livable Region Strategic Plan identifies the City Centre in Richmond as a Regional Town Centre and the City has reinforced this status in its OCP land use designations and policies that concentrate job growth there.

Richmond's OCP also identifies that Richmond should strive to offer entry-level home ownership options and rental housing choices. The OCP contains policies such as fostering housing choice in the City Centre as well as in neighbourhoods outside the City Centre. In addition, the OCP contains policies to encourage market rental housing choices, non-market rental housing choices, and support for co-op housing choices. These policies will allow people of a wider range of incomes to live in Richmond and be closer to jobs of a range of salaries.

## Looking Forward

We expect that there will continue to be a high percentage of people living and working within Richmond. In addition, high energy prices, particularly for gasoline, may increase the cost for commuting and result in some workers looking for new jobs closer to where they live.

## What Can Citizens Do?

- Live closer to where you work to minimize your commuting distance and travel time to work.
- Work from home for one or more days per week if your employer allows that flexibility.



## BCC-5: Commuter Trip Distance

### Why is this Indicator Important?

Commuter trip distance is related to the choice of transportation mode. Shorter trips tend to be well served by walking and cycling, and to some degree by public transit. These modes are more energy efficient than the private automobile, which results in less fuel consumption, and hence fewer air and greenhouse gas emissions.

### What is Being Measured?

This indicator measures the median daily commuter distance traveled in kilometres of the employed labour force in Richmond that does not work at home. Commuting distance is calculated as the straight-line distance between the resident's home and his or her usual workplace location based on estimates by Statistics Canada.

### What is Happening?

The median commuter trip distance for Richmond's employed labour force fell from 7.5 km in 1996 to 6.7 km in 2001. More residents work within 5 km of home – 38% in 2001 versus 35% in 1996. Commute distances are even shorter for people working in the City Centre, where almost one-half of all commutes were less than 5 km in 2001 according to Statistics Canada.

The labour force that works in business parks travels significantly further than the municipal average. Those working in the Crestwood area (along No. 6 Road and Viking Way), for example, commute an average of 10.1 km, 87% further than people who work in the City Centre. In addition, transit and non-motorized access to business parks can be poor, resulting in more employees driving.

Relatively short commute trip distances in Richmond may be attributed to several factors. As noted in BCC-4 (labour force living and working within Richmond), Richmond has experienced an increase in the number of jobs relative to the number of residents and residential growth has been concentrated in the City Centre, which increases proximity to jobs located in the City Centre and the Vancouver International Airport. In addition, the proportion of Richmond's employed labour force working from home has increased from 6.6% in 1991 to 8.1% in 2001. As there is no commute involved, this reduces energy consumption and emissions associated with transportation.

## Summary

### Status:

Richmond residents have shorter commuting trips than most residents in the region, reflecting the high proportion of people living and working in Richmond.

### Trend:

Median commuter trip distances decreased from 7.5 km in 1996 to 6.7 km in 2001.

### Outlook:

The policy to concentrate development in the City Centre should continue the trend to shorter commuter trip distances. However, a continued increase in Richmond's labour force working in business parks may halt or reverse this trend.

## ? Did you know...

Approximately 27% of Richmond's labour force worked in Vancouver in 2001, followed by Burnaby (6%), Delta (3%) and Surrey (2%).  
Source: Statistics Canada.



### How Do We Compare?

The median Richmond commute trip distance of 6.7 km is shorter than both regional and national averages (7.6 and 7.2 km respectively). Within the GVRD, Richmond residents commute further than Vancouver citizens (5 km), but less than residents in Burnaby (8.1 km), Surrey (11.5 km), Coquitlam (11.7 km), and Delta (13.3 km). The significantly longer commute trips in municipalities south of the Fraser River likely result from several factors. A low job-to-resident ratio, such as in Delta, results in more residents traveling outside their municipality for work. Secondly, new employment opportunities have disproportionately gone into dispersed office parks in suburban areas rather than into Regional Town Centres. The result is longer commuter trip distances and increased reliance on the automobile.

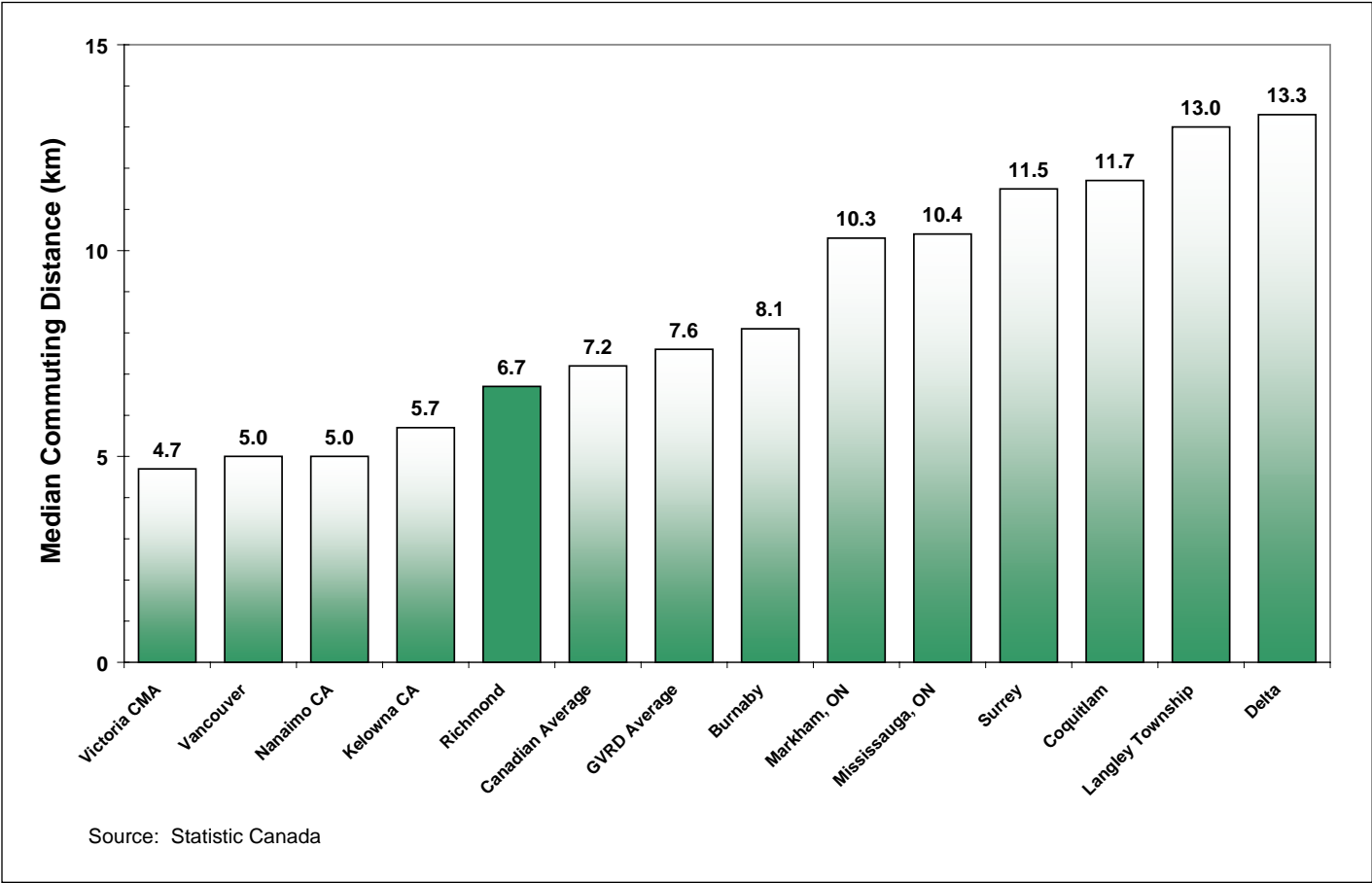


Fig. 24: Median Commuting Distance for Selected Municipalities, 2001

### What is Being Done?

The OCP focuses residential and employment growth in the City Centre, which should have the effect of reducing median commuter trip distances. However, business parks are allowed in many industrial areas of Richmond, which tend to be located separately from housing and thus may increase the median commuter trip distance.

## Looking Forward

It is anticipated that the median commuter trip distance will remain stable. Technological innovations may result in greater opportunities to work from home, which results in no travel (although this is not measured by the indicator); on the other hand, an increase in short-term contracts and multi-income households could make it more difficult for residents to choose a work location close to home.

If Richmond continues to attract housing and jobs to its City Centre and along the Canada Line, a higher percentage of new jobs and residences should be in closer proximity to each other, which would also contribute to reducing or stabilizing the median commuter trip distance at current levels.

These trends may be offset by regional factors, particularly the trend towards suburban office parks. In 2003, Royal LePage forecast that office space in business parks will more than double by 2012 (growth of 112% versus only 36% for Regional Town Centres), which may have the impact of increasing median commuting distances.

## What Can Citizens Do?

- Work from home one or more days per week if your employer allows that flexibility.
- Live closer to your location of work to minimize your commuting time and enable a greater range of transportation choice.



## Goal 5: Increase Transportation Choice

Transportation is frequently cited as a major concern throughout the Vancouver region and with good reason. We all deserve access to goods and services and to places where we can work, live, and play. Our quality of life and our economy depend on good transportation infrastructure.

However, over reliance on personal vehicles has resulted in congestion and air pollution problems and affected how our communities develop. In the GVRD, cars and light trucks are the largest source of greenhouse gas emissions and account for 63% of carbon monoxide emissions. Increased reliance on the automobile also encourages sprawling development, erosion of vital natural habitat and agricultural land, and can affect our health indirectly through reduced physical activity. In an age of escalating gas prices, increasing transportation choice is more important than ever.

This report uses several indicators to evaluate automobile dependency and transportation choice:

- ITC-1: Choice of Transportation Mode for Journey-to-Work Trips
- ITC-2: Registered Passenger Vehicles
- ITC-3: Cycling Facilities
- ITC-4: Transit Access



## ITC-1: Transportation Mode for Journey-to-Work Trips

### Why is this Indicator Important?

Commuting trips are one of the most common types of trips people take and characterizing journey-to-work trips provides an indication of the diversity of transportation choices used. A high share of trips taken by walking, cycling, and transit is desirable as these modes are energy and resource efficient and have low or no cost associated with them.

### What is Being Measured?

This indicator measures mode share, which means the percentage of journey-to-work trips taken by car, truck or van as a driver or passenger, walking, cycling, public transit, and other modes.

This indicator uses Census data. Unfortunately, the latest information available is from 1996 for the following reasons: (1) the most recent Census (2001) took place during a regional transit strike, skewing results; and (2) the most recent regional travel diary (2004) was only a partial survey with an insufficient sample size to provide useful data for Richmond as a whole. The most recent reliable data then, dates back to 1996 (Census information) and 1999 (travel diary).

It is believed that the 1996 data underestimates the current share of journey-to-work trips taken by public transit because the City Centre has densified considerably and significantly improved public transit service, including the 98 B-Line, has been introduced.

### What is Happening?

In 1996, trips by automobile comprised 85% of all journey-to-work trips. Another 9.4% of trips were by transit, 3.1% by walking, 1.7% by cycling, and 0.8% by other modes (e.g., taxi or motorcycle). These results represent a high level of automobile dependence.

Generally, public transit usage is increasing. In August 2001, the 98 B-line bus service was introduced and has resulted in increased ridership to and from Vancouver due to improved travel times and reliability. In 2002, its first full year of operation, ridership was estimated at 18,000 per day, a 28% increase over the equivalent services it replaced. Since then ridership has continued to increase and the route now carries over 20,000 passengers per day. A 2003 marketing study indicated that 31% of riders were new trips to transit, and 23% of riders had switched from auto travel.

## Summary

### Status:

Richmond had a relatively high automobile share with 85% of all journey-to-work trips being as a driver or passenger of a car in 1996 (the most recent reliable data year due to the transit strike in 2001). Approximately 9.4% of journey-to-work trips were by transit, 3.1% by walking, 1.7% by cycling, and 0.8% by other modes.

### Trend:

Due to lack of reliable data in recent years, no quantitative trends in mode share can be determined. However, transit usage has increased considerably due to the introduction of the 98 B-Line bus service and other transit improvements.

### Outlook:

The introduction of the rapid transit Canada Line in 2009 and improved local bus service will provide much better transit service to residents and, correspondingly, the mode share of transit is expected to increase significantly. It is also expected that the share of journey-to-work trips by walking and cycling will increase but to a lesser extent than transit.

## Success Stories

Market studies indicated that 23% of 98 B-Line bus riders using the service in its first year had switched from auto travel.

## How Do We Compare?

Figure 25 compares Richmond to other jurisdictions in the GVRD for 1996 and to jurisdictions in selected areas in the rest of Canada using 2001 data. The share of journey-to-work trips by transit in Richmond (9.4%) is similar to the transit mode shares of Coquitlam (9.3%) and Surrey (10.2%) in 1996. However, the share is much lower than the GVRD regional average of 14.3% and that achieved in Burnaby (16.8%) in 1996. Much higher transit mode shares have also been achieved in comparable jurisdictions such as Mississauga (14.7%).

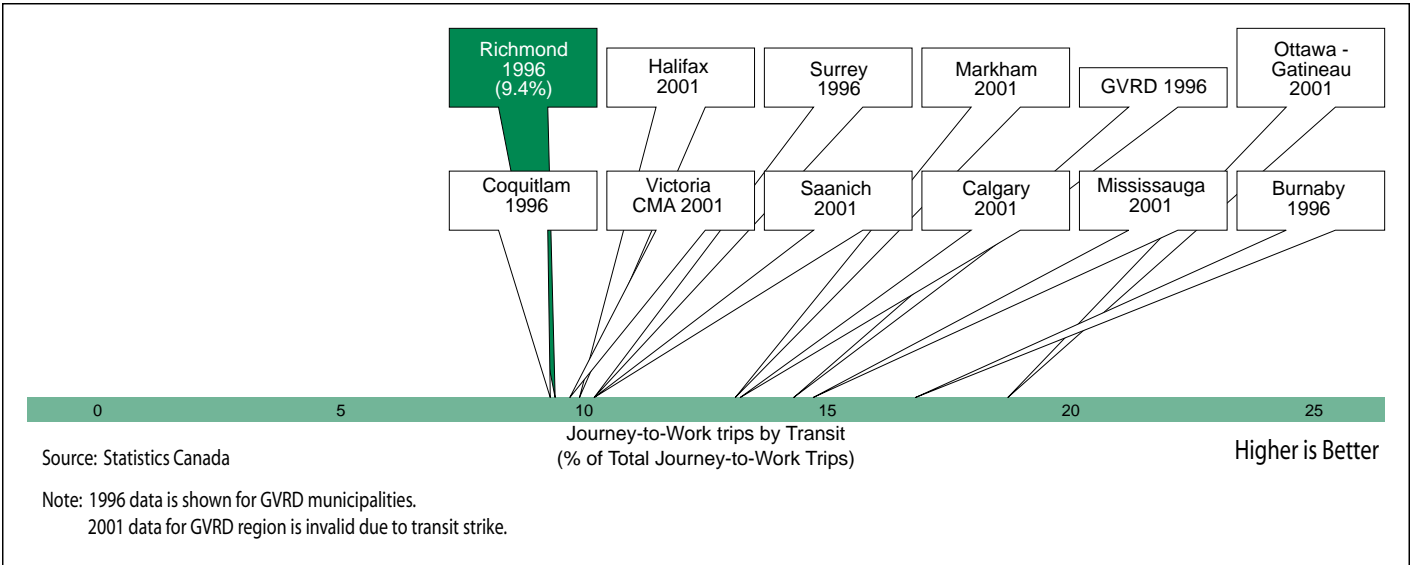


Fig. 25: Mode Share for Journey-to-Work Trips by Transit

For cycling, the mode share for Richmond (1.7%) is approximately the same as the GVRD average of 1.7% in 1996. Richmond performs reasonably well against other jurisdictions in Canada. However, it falls considerably below the Victoria Census Metropolitan Area where 4.8% of journey-to-work trips were made by cycling – the highest of any region in Canada.



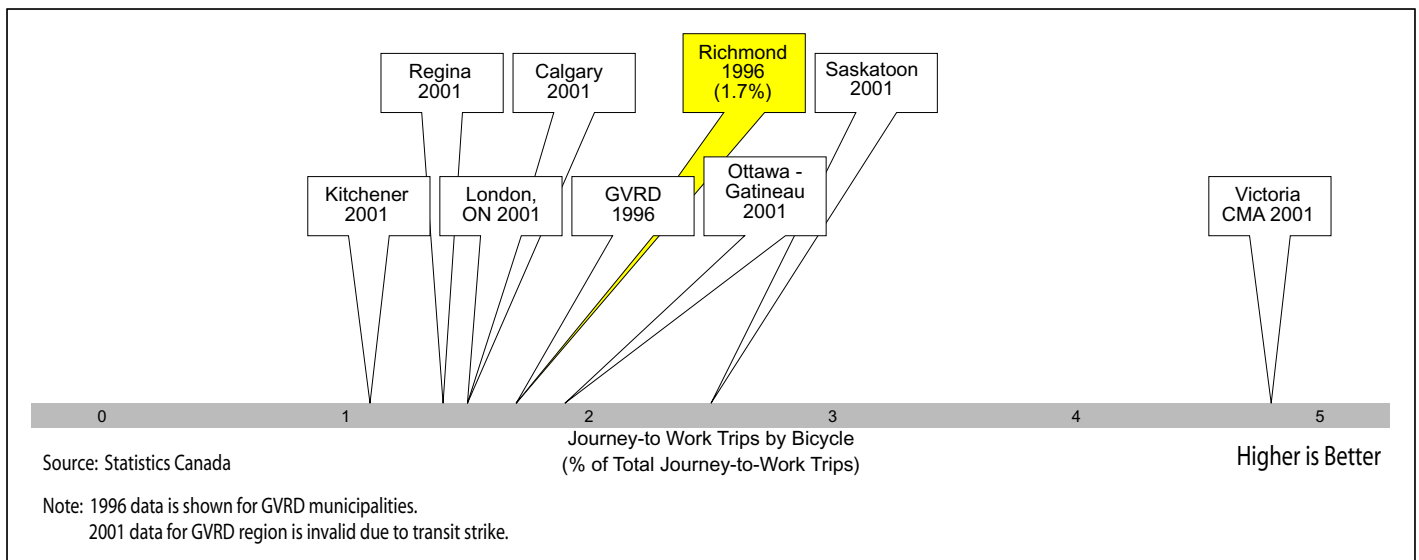


Fig. 26: Mode Share for Journey-to-Work Trips by Bicycle

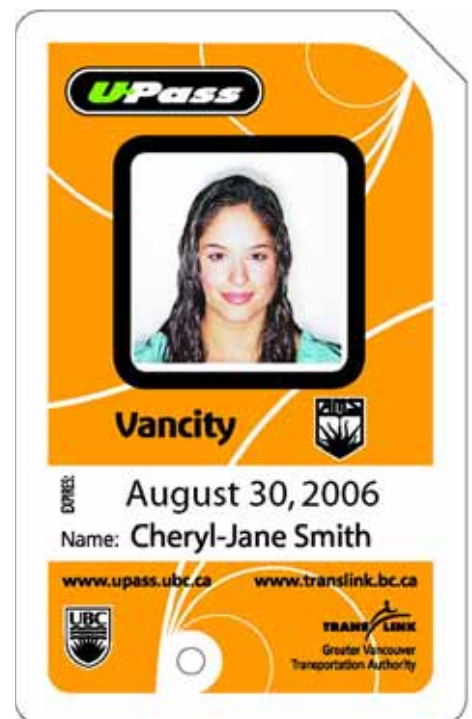
In Richmond, 3.1% of the population walked for journey-to-work trips in 1996, which is much lower than the 5.8% average for the GVRD in 1996.

## What is Being Done?

TravelSmart, funded by TransLink and Transport Canada, is part of the regional Urban Transportation Showcase Project and aims to promote the use of transit, cycling, walking and ridesharing by providing information and incentives to residents. Richmond City Centre is one of six neighbourhoods selected for the pilot project.

TransLink's Richmond Area Transit Plan (2000) identifies specific transit service improvements to be implemented over a five-year period. Components of the plan include launching the 98 B Line service between Richmond City Centre and downtown Vancouver which occurred in 2001, providing improved local cross-town routes and new regional connector routes linking Richmond with other Regional Town Centres, and introducing two new community shuttle services.

The U-Pass program was launched by TransLink in 2003 at UBC and SFU and has resulted in increased transit use by students. Although these are not journey-to-work trips, the same students who work part-time have an increased propensity to use transit since they already have a bus pass. The U-Pass is a mandatory program for students approved via referendum that provides unlimited, all zone access to public transit in the GVRD at approximately 20% of the cost of a regular monthly transit pass.



Upcoming local initiatives include updates of the City Centre Area Plan, the City Centre Transportation Plan and the On-Street Cycling Network Plan beginning in 2006. Indicator ITC-3 (Cycling Facilities) provides more detailed information regarding cycling initiatives. In addition, the City has commissioned the No. 3 Road Corridor Streetscape Study to promote transit-oriented development around the Canada Line stations and make No. 3 Road more pedestrian- and cycling-friendly.

## Looking Forward

There is great potential for increasing the share of walking, cycling, and transit in Richmond:

- the median commuter distance of 6.7 km in 2001 is quite low and amenable to alternative transportation options;
- 54% of the labour force that lived in Richmond in 2001 also worked in Richmond;
- the new 19.5 km Canada Line rapid transit system, scheduled for completion in 2009, will have an expected one-way travel time from downtown Vancouver to Richmond City Centre of about 25 minutes with service approximately every 5 minutes;
- the 2000 Richmond Area Transit Plan will be updated in 2007 and will include the integration of bus routes with the Canada Line stations and improved east-west connectivity of the routes;
- Richmond is flat and compact and there is an extensive and expanding cycling network (see Indicator ITC-3); and,
- growth is concentrated in the City Centre, which will further support increased walking and use of public transit.

The main challenge going forward will be to encourage commuting by walking, cycling and transit to and from business parks and industrial areas.

## What Can Citizens Do?

- Take transit, walk or cycle to work (see [www.translink.bc.ca](http://www.translink.bc.ca) for information on transit routes and schedules).
- If possible, try cycling or walking to work at least once per week.
- Try ridesharing (Jack Bell Rideshare [www.ride-share.com](http://www.ride-share.com)) or join a carpool.
- Ask your employer about incentives for using alternative transportation (e.g., parking cash-out, employee transit passes, cycling facilities such as secure racks, lockers and showers).
- If you are an employer, consider promoting alternative transportation modes.
- Provide input to TransLink on the update of the Richmond Area Transit Plan, and to the City on the updates of City Centre Transportation Plan and City Centre Area Plan when the processes are initiated.



## ITC-2: Passenger Vehicles

### Why is this Indicator Important?

Vehicle ownership is a strong measure of our reliance on the automobile. Once the fixed or 'sunk' costs of purchase price, insurance and registration fees are paid, the cost of the next trip is relatively cheap and car owners are less likely to use transit or other more sustainable forms of transportation. Internal combustion engines create air pollutants and the burning of fossil fuels results in greenhouse gas emissions.

### What is Being Measured?

This indicator measures the per capita registered and insured vehicle rate of passenger and total vehicles registered in Richmond.

### What is Happening?

From 1995 to 2005, total vehicle growth outpaced population growth in Richmond. The number of registered vehicles rose from 0.62 to 0.68 vehicles per person from 1995 to 2000, or from 94,600 to 116,300 vehicles. Since 2000, per capita rates have remained relatively stable at between 0.66 and 0.68 total vehicles per capita. Overall, the total number of registered motor vehicles continues to climb because of increased population.

In 2005, there were 103,300 passenger vehicles or 0.57 passenger vehicles per capita.



## Summary

### Status:

Richmond had a high registered and insured vehicle rate at 0.57 passenger vehicles per capita and 0.68 total vehicles (including commercial vehicles) per capita in 2005.

### Trend:

The total passenger and commercial registered and insured vehicle rate has remained relatively stable at approximately 0.66 to 0.68 vehicles per capita from 2000 to 2005.

### Outlook:

Per capita vehicle ownership may decrease due to the introduction of the Canada Line rapid transit system in 2009, the higher share of multi-unit buildings in the city, which tend to have a lower vehicle ownership rate, and the concentration of growth in the City Centre.

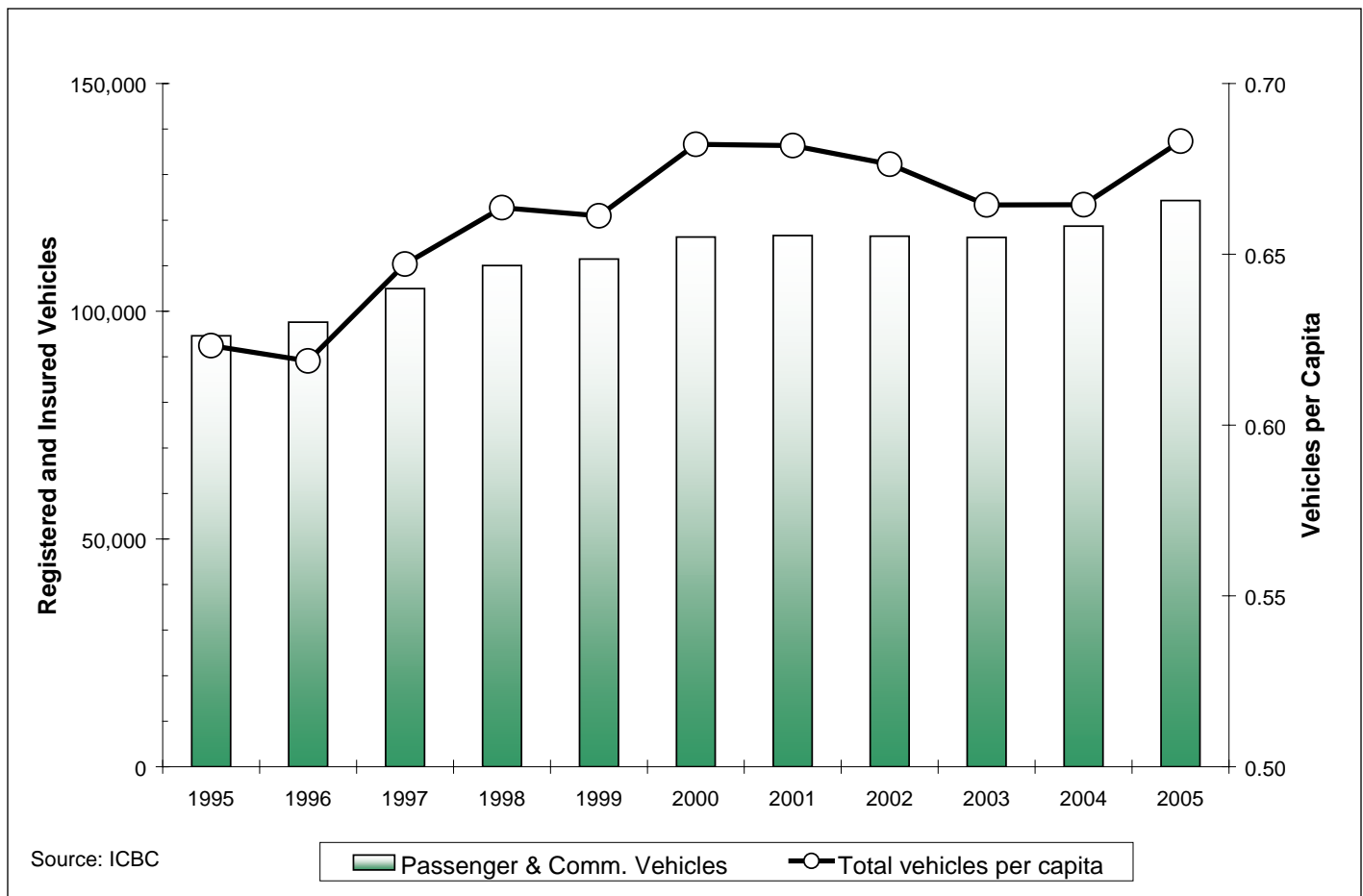


Fig. 27: Number of Registered and Insured Vehicles in Richmond, 1995-2005

## How Do We Compare?

While Richmond's per capita total registered vehicle rate has levelled off, it remains significantly higher than regional, provincial and national levels. From 1995 to 2000, registered per capita motor vehicles in the GVRD held steady at 0.57. Within the GVRD, Richmond's passenger and commercial vehicle per capita rate compares poorly to other major municipalities located in suburban locations, including Burnaby (0.60), Surrey (0.60) and Coquitlam (0.62). Ottawa-Gatineau has one of the lowest registered vehicle rates of 0.48 vehicles per capita. The European average for car ownership is even lower at 0.39.

## What is Being Done?

Whether a household owns a vehicle or not is outside the sphere of influence of the City of Richmond. However, the City's land use and transportation policies in its OCP and transportation plans are supportive of reduced reliance on automobiles, and hence the need to own a vehicle.

Programs for encouraging more sustainable transportation are described under other indicators in this section.

## Looking Forward

There are a number of factors that could contribute to reduced vehicle ownership in the future. Increased energy prices, continued development of a mixed-use City Centre, and public transit improvements will reduce reliance on the automobile and allow more households to reduce the number of vehicles they own.

Vehicle ownership could be further reduced by progressive policy initiatives, such as car share co-ops where members jointly own and use vehicles with other members, location-efficient mortgages that reward home buyers for moving to transit-oriented neighbourhoods and 'unbundled' parking whereby parking is leased or rented separately from housing, allowing residents to reduce housing expenses by not having a car.

## What Can Citizens Do?

- Consider joining or starting a car share co-operative.
- Choose not to own a car or reduce the number of cars in your household by one.
- Choose more energy efficient vehicles when replacing them.





## ITC-3: Cycling Facilities

### Why is this Indicator Important?

Cycling is a healthy and inexpensive transportation choice. For shorter trips and in congested areas, it is often faster than driving or taking public transit. Environmentally, cycling is energy and resource efficient, non-polluting and quiet. By improving and expanding cycling facilities, the City of Richmond can encourage a healthier lifestyle while reducing air pollution, greenhouse gas emissions and traffic congestion.

### What is Being Measured?

This indicator measures the length of Richmond's cycling facilities, including multi-user off-street pathways, bike lanes and other designated routes. The City's dyke trails are included in the totals and tabulated separately. This indicator therefore measures cycling infrastructure for both commuter and recreational cycling trips.

### What is Happening?

Since 2000, Richmond's cycling network has increased by 11 km, or 24%, to almost 57 km of cycling facilities in 2005. The existing network consists of 8.5 km of multi-user off-street pathways, 17 km of dyke trails, 26 km of bike lanes, 3 km of signed routes, and 2.5 km of other facilities such as wide curb lanes.



## Summary

### Status:

Richmond compares favourably with other leading BC municipalities in terms of cycling facilities, particularly for bike lanes and multi-user off-street pathways including the dyke trail system.

### Trend:

Since 2000, the cycling network has increased by 24% to 57 km in 2005.

### Outlook:

With plans to add 14 kilometres of cycling infrastructure by 2010, many of the key routes and gaps will be filled to further improve the cycling network in Richmond.

### ? Did you know...

More than 50% of the population of Copenhagen cycles on a daily basis, and 33% of Copenhagen commuters bike to work.

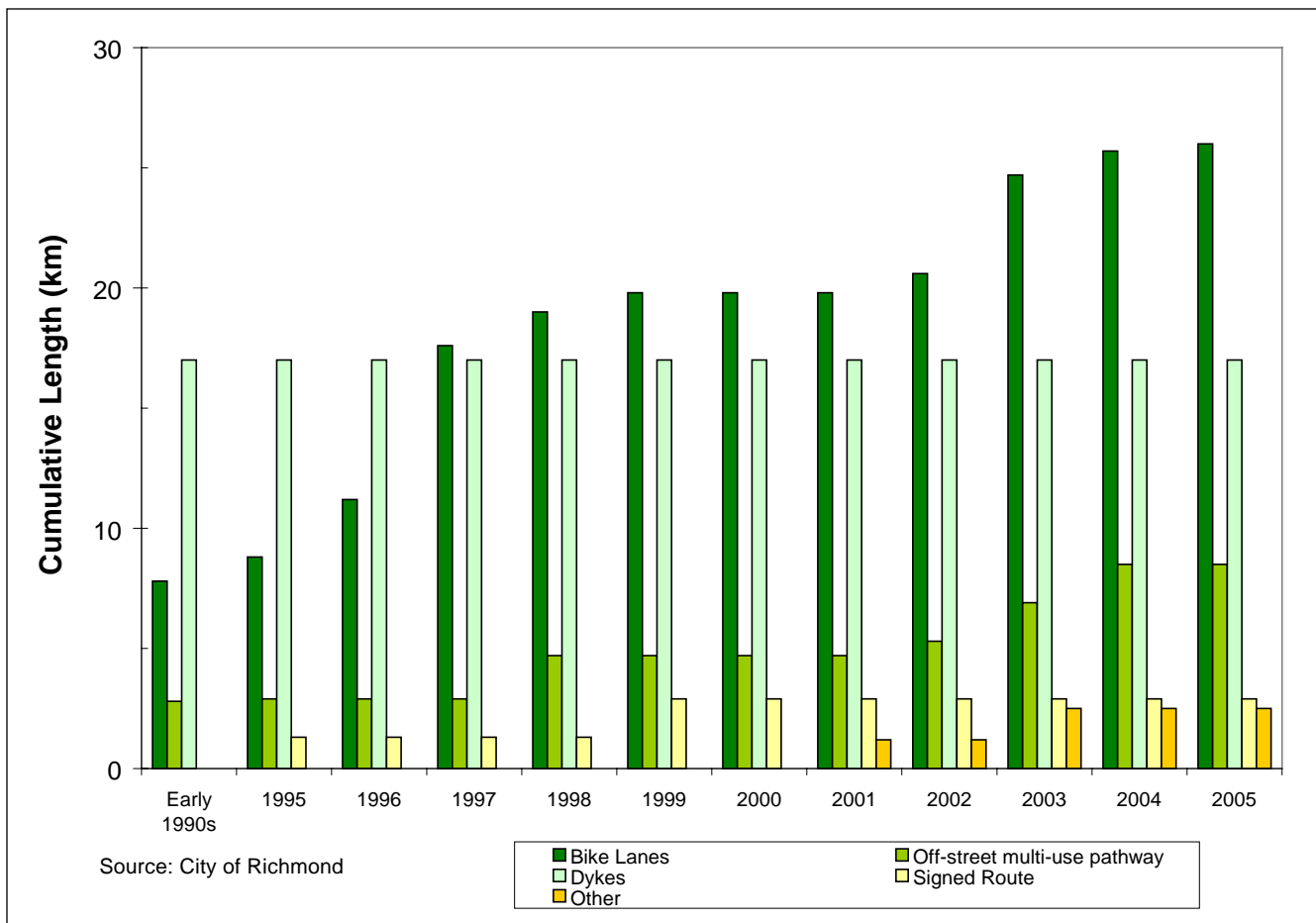


Fig. 28: Length of Cycling Infrastructure by Facility Type, Early 1990s-2005

## How Do We Compare?

Richmond compares well within the region, especially for bike lanes and off-street multi-user pathways. Richmond also compares favourably with other top municipal performers in BC such as the District of Saanich, which had 30 kilometres of bike lanes and 11 kilometres of multi-user pathways in 2003. One way to compare cycling infrastructure is by the length of bicycle infrastructure per 1,000 people. Richmond had approximately 0.32 lane-km of bike lanes per 1,000 people in 2005. Other municipalities such as Greater Victoria, Greater Vancouver, and Ottawa-Gatineau have as much as 0.60 lane-km per 1,000 people. The highest value in Canada is Calgary with 0.92 lane-km per 1,000 people.



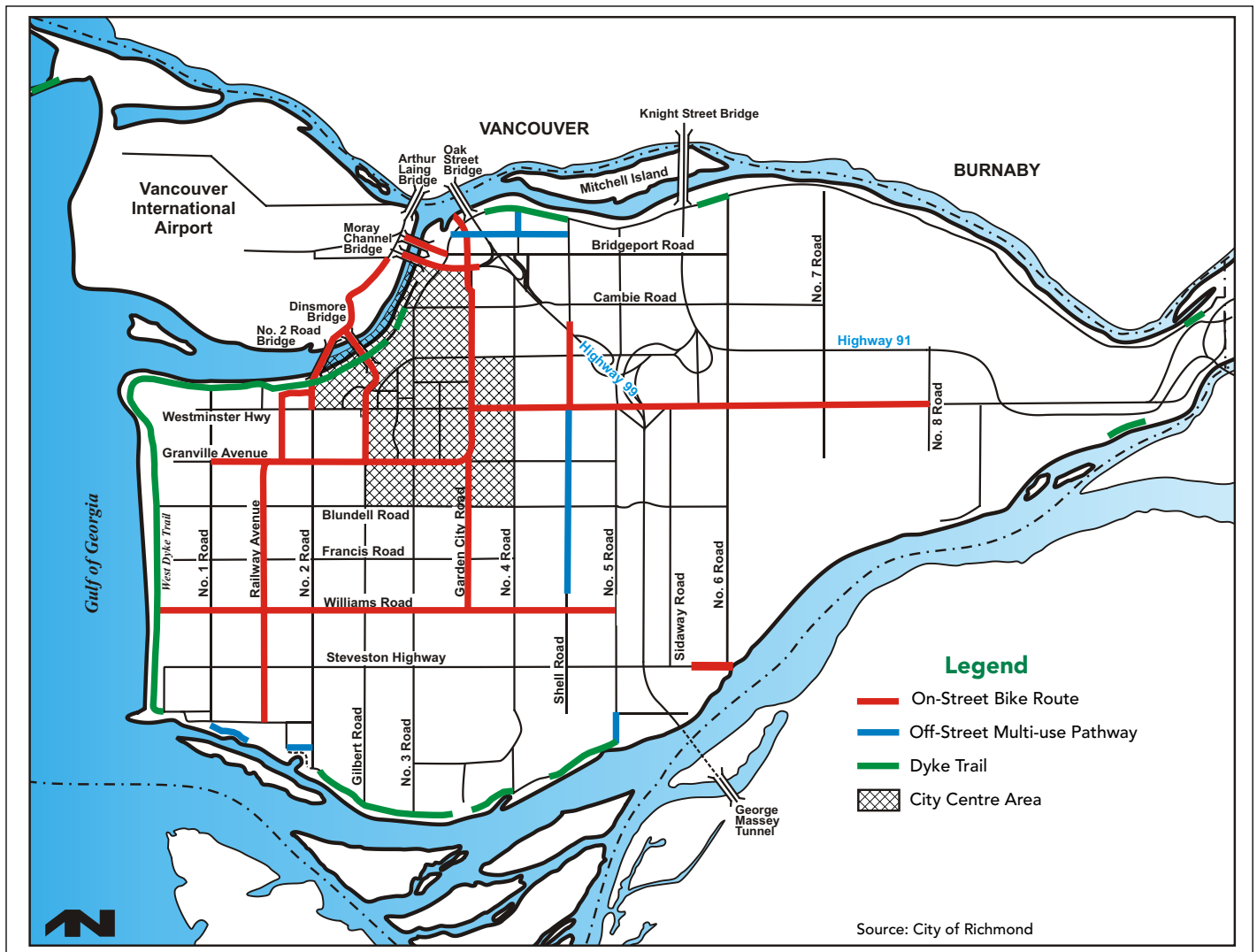


Fig. 29: Map of Cycling Infrastructure by Facility Type, 2005

## What is Being Done?

The City's OCP has an objective to foster cycling as an appealing and environmentally friendly travel choice. The OCP also contains development permit guidelines that specify minimum standards for long-term and short term bicycle parking facilities and encourage non-residential projects to provide end-of-trip facilities such as showers and lockers.

Richmond's 1996 On-Street Cycling Network Plan identifies cycling improvement projects and the current City Centre Transportation Plan advocates for the provision of on-street and off-street separated pathways and end-of-trip facilities in the City Centre.



The Richmond Community Cycling Committee provides input to the City on cycling infrastructure projects and suggestions for enhancements to the cycling environment and educational initiatives. Richmond strives to complete at least one major cycling infrastructure project each year and actively pursues cost-share grants from TransLink and the Province.

The City is also undertaking a number of integration activities associated with the Canada Line rapid transit system including:

- providing cycling and pedestrian connections to the pedestrian-bike lane on the Canada Line bridge over the north arm of the Fraser River;
- improving local cycling access to Canada Line stations; and,
- ensuring the provision of end-of-trip facilities at rapid transit stations, such as bike lockers.

Other cycling-related initiatives include:

- applying a bicycle stencil on traffic signal loop detectors to indicate where cyclists should position their bikes to trigger a signal change;
- providing bike racks at City-owned facilities such as libraries, community centres, and parks; and,
- staging an annual bike tour to encourage greater levels of cycling by the community.

## Looking Forward

Between 2006 and 2010, the City has over 14 km of cycling infrastructure projects planned including improvements along Shell Road, Westminster Highway and Garden City Road, as well as improved cycling connections to the Canada Line.

Increased cycling infrastructure will be necessary to increase cycling as a transportation choice in the city, as it can increase the level of comfort and safety for cyclists. Additional issues that the City faces includes working with TransLink and the provincial Ministry of Transportation to improve regional connections. The bridges that connect Richmond with other municipalities are generally not designed to accommodate cyclists and cyclists are prohibited from using the George Massey Tunnel. While a seasonal shuttle service through the tunnel is provided, service is relatively infrequent and currently does not connect with public transit stops.

It is anticipated that the City will commence updating its 1996 On-Street Cycling Network Plan in 2006, which will afford the opportunity to re-evaluate cycling in Richmond and refocus efforts on developing a more fully integrated cycling network

## What Can Citizens Do?

- Get out and cycle on the cycling network!
- Use your bike to get around when making trips to work or for errands instead of driving.
- Participate in the City's annual "Island City, by Bike" tour each June during Bike Month.





## ITC-4: Access to Transit

### Why is this Indicator Important?

Access to public transit is essential for providing transportation choice to residents, workers and visitors to Richmond and is particularly important for those individuals who do not have a driver's licence or access to a vehicle. Access to a bus stop alone does not tell the whole story. For transit to compete with the private automobile, service quality and frequency of service are also important. Residents who are located in close proximity to good transit service and are traveling to a destination that is also well served by transit are more likely to use transit.

### What is Being Measured?

This indicator measures the percentage of dwellings units that are within 400 m of a bus stop (approximately a 10 minute walk) with a minimum frequency of transit service of every 10 minutes during rush hour. This indicator is measured as the 'crow flies' or straight-line distance rather than actual distance using the street network.

### What is Happening?

Most Richmond residents have transit access within walking distance of their homes. Almost 92% of the city's residential units are within 400 m of a transit stop, a 15% increase from 2001. This change is significant and likely due to a number of factors, including new and improved transit service and continued concentration of new development in the City Centre, which is well served by transit. According to a 2003 TransLink report, 63% of Richmond residents live within 400 m of a transit service with 10 minutes or better rush hour frequency. The 98 B-Line in particular, which provides transit service between Richmond City Centre and downtown Vancouver, has significantly improved public transit service since it was launched in 2001.

In addition, data from Statistics Canada indicates that 89.6% of all jobs in Richmond in 2001 were located within 400 metres of a transit stop; thus most jobs in the city are transit-accessible.

### How Do We Compare?

Richmond residents have good access to public transit relative to most other suburban GVRD municipalities. As of 2003, 63% of Richmond residents lived within 400 m of transit routes with 10 minute or better rush-hour frequency. This is much lower than the Vancouver/Burnaby/New Westminster area (83%), but significantly higher than the North Shore (53%), Delta/Surrey/White Rock (24%) and the Northeast Sector (Coquitlam/Port Coquitlam/Port Moody) / Maple Ridge and Pitt Meadows (22%).

## Summary

### Status:

In 2003, approximately 63% of residents were located within 400 m of a bus stop that had a 10-minute frequency of service in the morning rush hour.

### Trend:

Since 2000, the proportion of the population within 400 m of a bus stop has increased.

### Outlook:

It is anticipated that Richmond will continue to improve on this indicator due to the introduction of the Canada Line and with new initiatives arising from the update of the Richmond Area Transit Plan in 2007.

## Success Story

The 98 B-Line has resulted in a 20% reduction in one-way travel time between Richmond City Centre and downtown Vancouver from 50 minutes to 44 minutes. In addition, the B-Line bus stops have real-time monitoring of bus locations to let passengers know when the next two buses will be arriving.



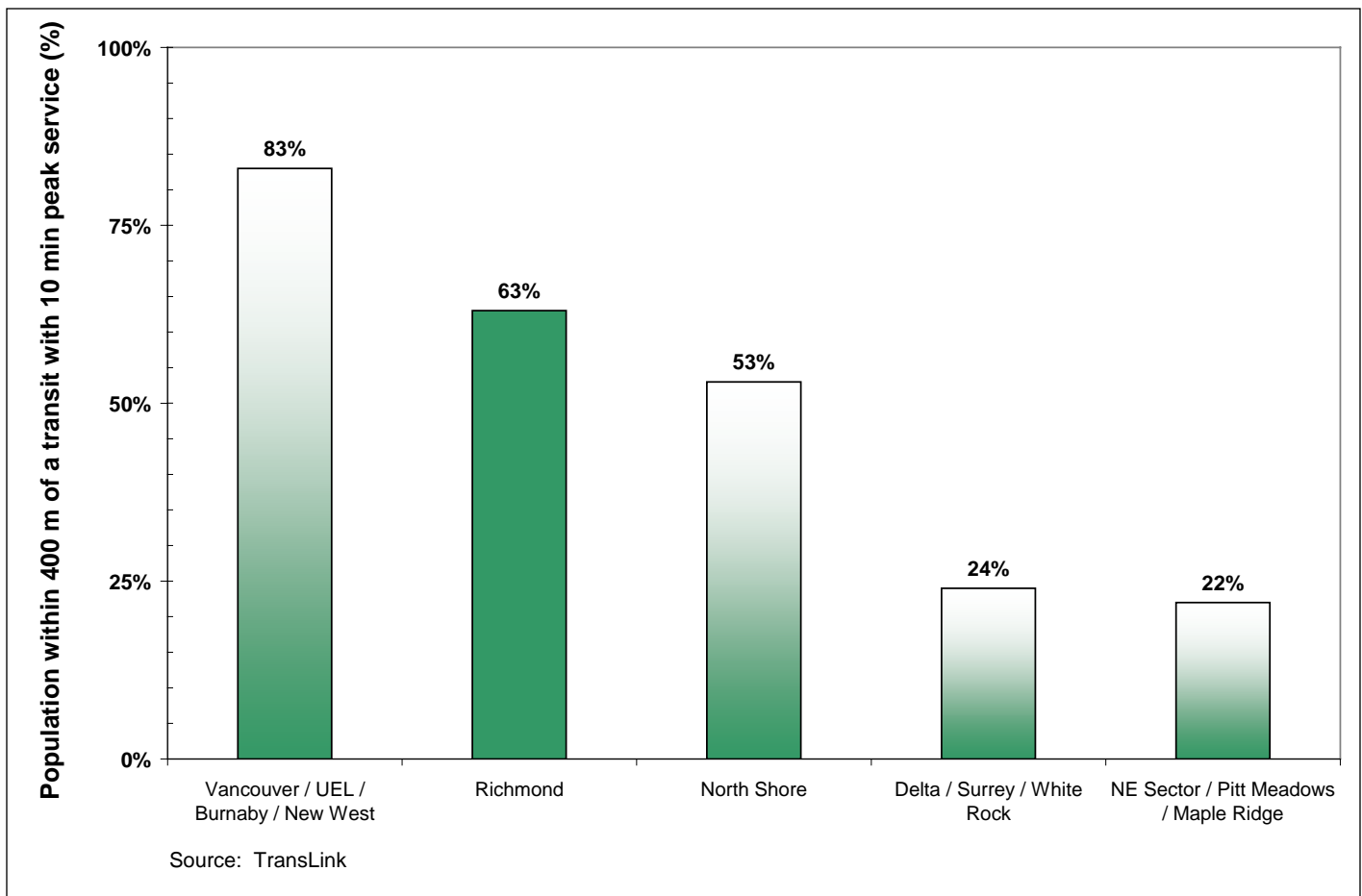


Fig. 30: Comparison of Richmond Transit Access to Selected Lower Mainland Areas, 2003

## What is Being Done?

See ITC-1 (Transportation Mode), which discusses key transit improvements in the City, including the 98 B-Line service, the rapid transit Canada Line, and the Richmond Area Transit Plan (2000).

## Looking Forward

After the Canada Line is operational in 2009, it is recommended that the indicator be slightly revised to include all dwellings within 400 m of a bus stop OR 1,000 m of a rapid transit station, which recognizes the improved level of rail-based transit service, which attracts people over a greater distance.

## What Can Citizens Do?

- When relocating within Richmond, ensure that you choose a residence near transit.

## Future Indicator on Transit Boardings

In 2006, TransLink anticipates completing the installation of automated passenger counter systems in all buses, which will allow data to be generated for all boardings within Richmond. The data generated can be used to provide an additional indicator on transit usage in future SOE reports.

## Goal 6: Maintain Clean Water, Land and Air & Minimize Noise

Human activity results in emissions of waste to water, land and air. In many cases, the environment can assimilate these emissions. However, as we grow we put more stress on our environment and can disrupt the ecological services that the environment performs for us. The objective is to maintain air, water and land at sufficient quality to ensure that these environmental services can still be provided.

Our ambient waters provide support for aquatic ecosystems. Several federal government and partnered programs address water quality in the Fraser River including the Fraser River Action Plan, the Fraser River Estuary Management Plan and the current Georgia Basin Action Plan. The GVRD has regional plans related to air quality and drinking water management which link into the Sustainable Region Initiative.

Air quality in the region is addressed through the regional Air Quality Management Plan (AQMP) adopted in 1994. A principal target of the AQMP was to reduce the overall emissions of the most common air contaminants - carbon monoxide, sulphur and nitrogen oxides, particulate matter and volatile organic matter - by 38% from 1985 levels by 2000. The Plan was successful in meeting this target and further reductions are planned in the updated AQMP (2005).

Soils serve many functions - they are a source of habitat and biodiversity, provide a growing medium for both natural vegetation and agricultural crops, retain and filter water and can sequester carbon from the atmosphere. Soils that have eroded require decades or more to replace and remediation of contaminated soils can be difficult and costly.

Noise is another “waste” associated with modern human activity that can impact wildlife, and our own quality of life. Noise pollution is a particular issue in Richmond due to the nearby location of the airport, but noise is also created by traffic, construction, development activity, and public and private events.

### This objective is evaluated by the following indicators:

- WLA-1: Fraser River Water Quality
- WLA-2: Ambient Air Quality
- WLA-3: Short Term Air Quality Exceedances
- WLA-4: Soil Quality
- WLA-5: Noise



## WLA –1: Fraser River Water Quality

### Why is this Important?

The Fraser River and the estuary at its mouth are a defining part of our natural environment. In Richmond, the Fraser River and the sea meet resulting in a diverse and productive ecological environment for aquatic species, land animals and birds. The estuary is also a place of active trade, transport and land development, which can put stresses on the environment.

There are countless discharges of all types into the Fraser River. These include point sources like factories, industries and wastewater treatment plants. Other sources are more dispersed such as stormwater discharges, which occur at countless locations, and combined sewer overflows (CSOs) from some areas in Vancouver adjacent to the North Arm.

The drainage network in Richmond collects runoff and groundwater from the ditch system within the city, which is then pumped over the dykes and into the Fraser River at numerous locations around the island. The water in the ditches can be contaminated by urban and agricultural runoff that includes a wide range of animal waste, litter and other contaminants.

### What is Being Measured?

In 2003, a new water sampling program was initiated by the GVRD in cooperation with the provincial Ministry of Environment. This program monitors water quality in the Fraser River at seven locations from Langley to the mouth of the North and Main Arms (Figure 31). The program collects samples for analysis for five weeks in February when the river is at low flow and would least dilute any pollutants. The sample analysis results, which identify contaminant levels in the water, are compared to provincial water quality objectives (WQOs) to provide an understanding of the general health of the water.

### Summary

#### Status:

Generally, Fraser River water quality in the area around Richmond meets provincial water quality objectives.

#### Trend:

No trend is reported due to limited data.

#### Outlook:

A program of annual monitoring was initiated in 2003 and in future SOE reports will be used to determine trends in water quality in the river.



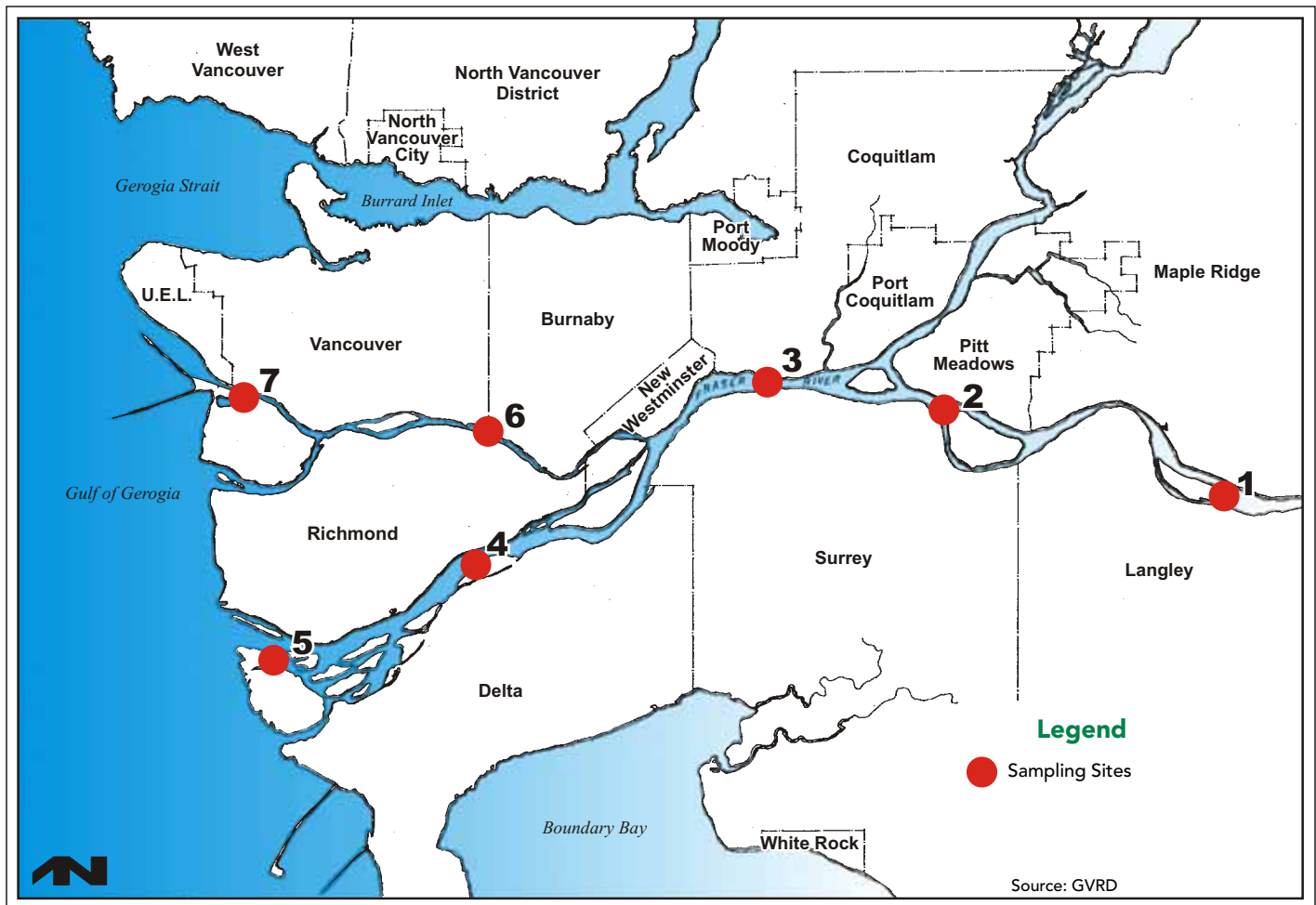


Fig. 31: Locations of GVRD Ambient Water Monitoring Sites (since 2003)

## What is Happening?

To properly understand water quality trends occurring in this system, a longer data record is required. However, the GVRD and the MOE are committed to continuing this program and the next SOE report update will have a substantial database of water quality data from which to determine status and trends.

## What is Being Done?

The Fraser River Estuary Management Program (FREMP) has been in place for 20 years. FREMP provides a multi-agency forum where federal and provincial government agencies, the port authorities, and others can coordinate activities in the Fraser River estuary and have a consistent management approach.



## Looking forward

The growth in the Lower Mainland over the past decades is expected to continue, which could place greater pressures on the Fraser River (e.g., consume lands within the watershed for human activities). However, at the same time, municipalities are planning better for stormwater management, resource industries are now required to better manage their activities, agricultural practices are evolving, and point source discharges from industries are being reduced. The future is uncertain at present, but it is possible that a growing population and economic region could co-exist with a healthy Fraser River environment.

## What Can Citizens Do?

- Prevent pollution from reaching our natural waters. Don't dispose of hazardous or toxic materials through sewers or storm drains. Properly maintain your vehicle to reduce discharges of oil and fuel.
- Become involved with a local conservation group.
- Reduce the amount of paved or impervious surface on your property. These result in faster runoff from storms, which can increase erosion and contaminant discharges from stormwater.
- Reduce or eliminate uses of pesticides and herbicides on your lawn and garden. These chemicals ultimately find their way into the river systems.
- Lobby for long term commitments to well developed and consistent monitoring programs.

## Success Story: Wastewater Treatment Plant Upgrades

In the 1990s, the GVRD upgraded the regional wastewater treatment plants at Annacis and Lulu Islands from primary treatment to state-of-the-art secondary treatment. Prior to these upgrades the effluent from these plants frequently did not meet the minimum standards expected by Environment Canada under the Fisheries Act. Since the upgrade, the effluent quality has improved dramatically and discharges of contaminants into the Fraser River for many contaminants has decreased to 10% or less of the pre-upgrade levels. In addition, fecal coliform levels during winter in the Fraser River (when the effluent is not disinfected) have been reduced dramatically due to the secondary treatment upgrades.



## WLA-2: Ambient Air Quality

### Why is this Important?

Air pollution has been shown to have detrimental effects on human health - particularly to persons with respiratory ailments.

In the Lower Mainland, the primary pollutants of concern are:

- Ozone which can cause decreased lung function and inflammation in the lungs. People affected with asthma may experience difficulty breathing. 'Ground level' ozone (i.e., smog) is formed when NO<sub>x</sub> and VOCs react in the atmosphere. Ozone concentrations are typically higher during the summer months.
- Particulate matter which can impair respiratory function. Natural processes contribute to increases in particulate matter (e.g., forest fires, volcanic ash and dust storms), but a particular concern arises from combustion-based particulate which is composed of extremely small particles that can travel deep into the lungs.

Measuring long-term ambient air quality especially ozone and particulate matter helps evaluate the overall exposure of the population to contaminants. Other pollutants that are often measured include:

- nitrogen oxides (NO<sub>x</sub>) resulting from combustion - especially from vehicle engines;
- sulphur oxides (SO<sub>x</sub>), from burning fuels with sulphur content;
- carbon monoxide (CO), from incomplete combustion; and
- volatile organic compounds (VOCs), from unburned fuel and organic compounds.

Residential wood fireplaces or stoves and backyard burning can also have a significant impact on local air quality, particularly if the wood is burned in inefficient appliances such as outdoor fireplaces.

Sources of air pollutants fall into three main categories:

- point sources (e.g., a stationary source of pollution such as industry);
- mobile sources (e.g., vehicles); and,
- area sources (e.g., wood stoves or outdoor burning).

Air pollution is a regional and global issue. Air pollutants do not observe municipal boundaries. Winds transport emissions from Richmond around the Lower Mainland and up the lower Fraser Valley towards Hope, adversely impacting the region's eastern residents.

### Summary

#### Status:

Air quality in Richmond is within Canada-wide standards for the contaminants of ozone and particulates.

#### Trend:

There have been slight increases in the level of ground level ozone at the south Richmond monitoring station. Levels of fine particulates have remained unchanged since 1998.

#### Outlook:

It is likely that our air quality will remain good, but our emissions could impact other communities.



## What is Being Measured?

Particulate matter with a diameter of 10 micrometres or smaller (called PM10) and ground-level ozone (smog) are measured at various monitoring locations in the GVRD. In Richmond, there are two stations that measure PM10 and ozone - one at the airport and another in south Richmond. The station at the airport has been monitoring PM10 and ozone since 1998 while that in south Richmond has measured ozone since 1987 and PM10 since 1994.

For this indicator, the annual average of the ambient concentrations of PM10 and ozone were calculated from hourly monitoring data.



## What is Happening?

Annual ozone concentrations (Figure 32) at the south Richmond station have increased slightly over the past 16 years from around 13 parts per billion (ppb) in the early 1990s to 15 ppb in 2003 and 2004. There is no significant trend detectable in the data.

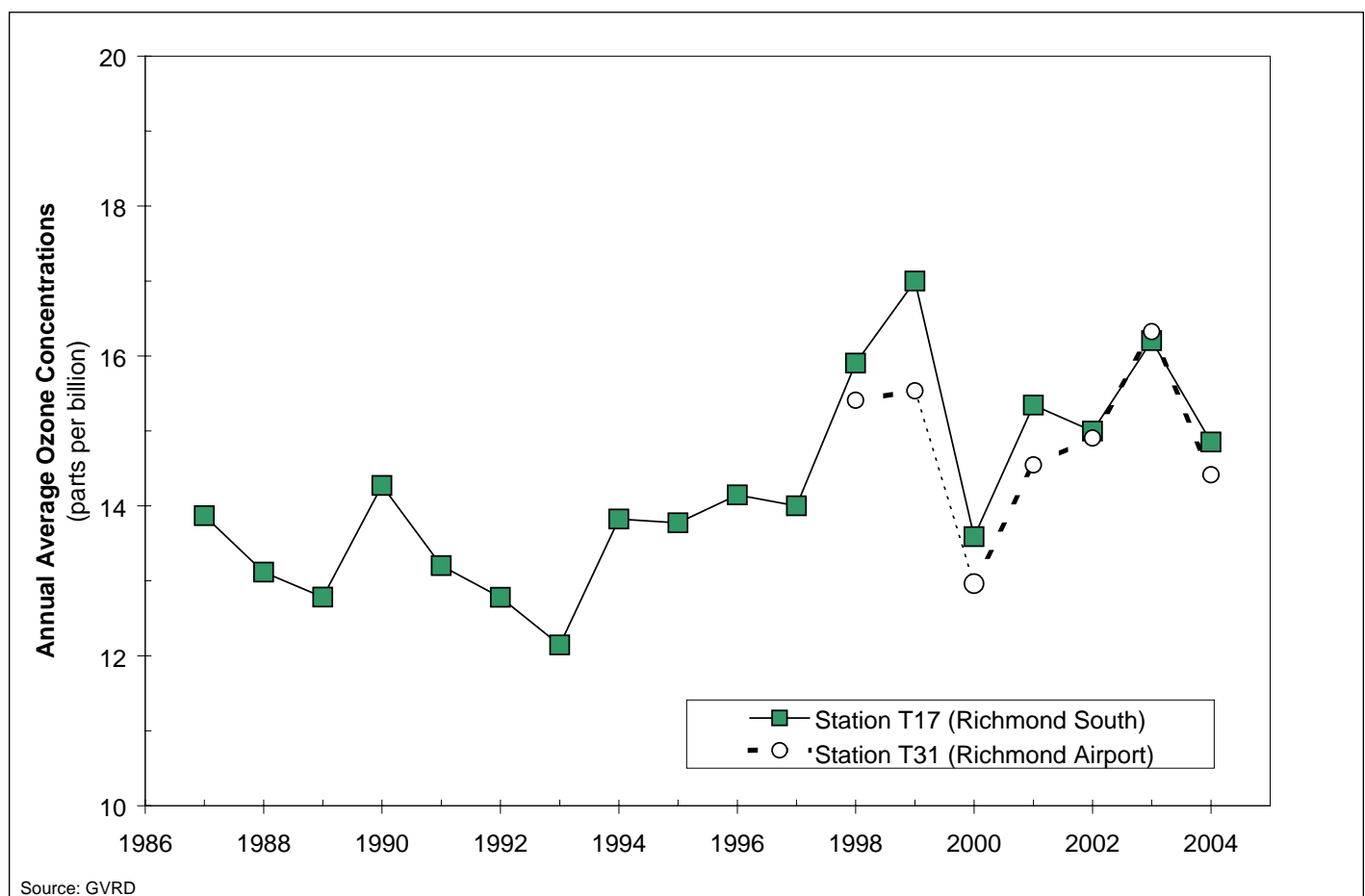


Fig. 32: Annual Average Ozone Concentrations, 1987-2004

Annual average concentrations of PM<sub>10</sub> (Figure 33) have generally remained constant in the range of 12 to 16 mg/m<sup>3</sup> since monitoring was initiated. The particulate levels are well below the desired objective values established by the Ministry of Environment and the GVRD of less than 50mg/m<sup>3</sup>.

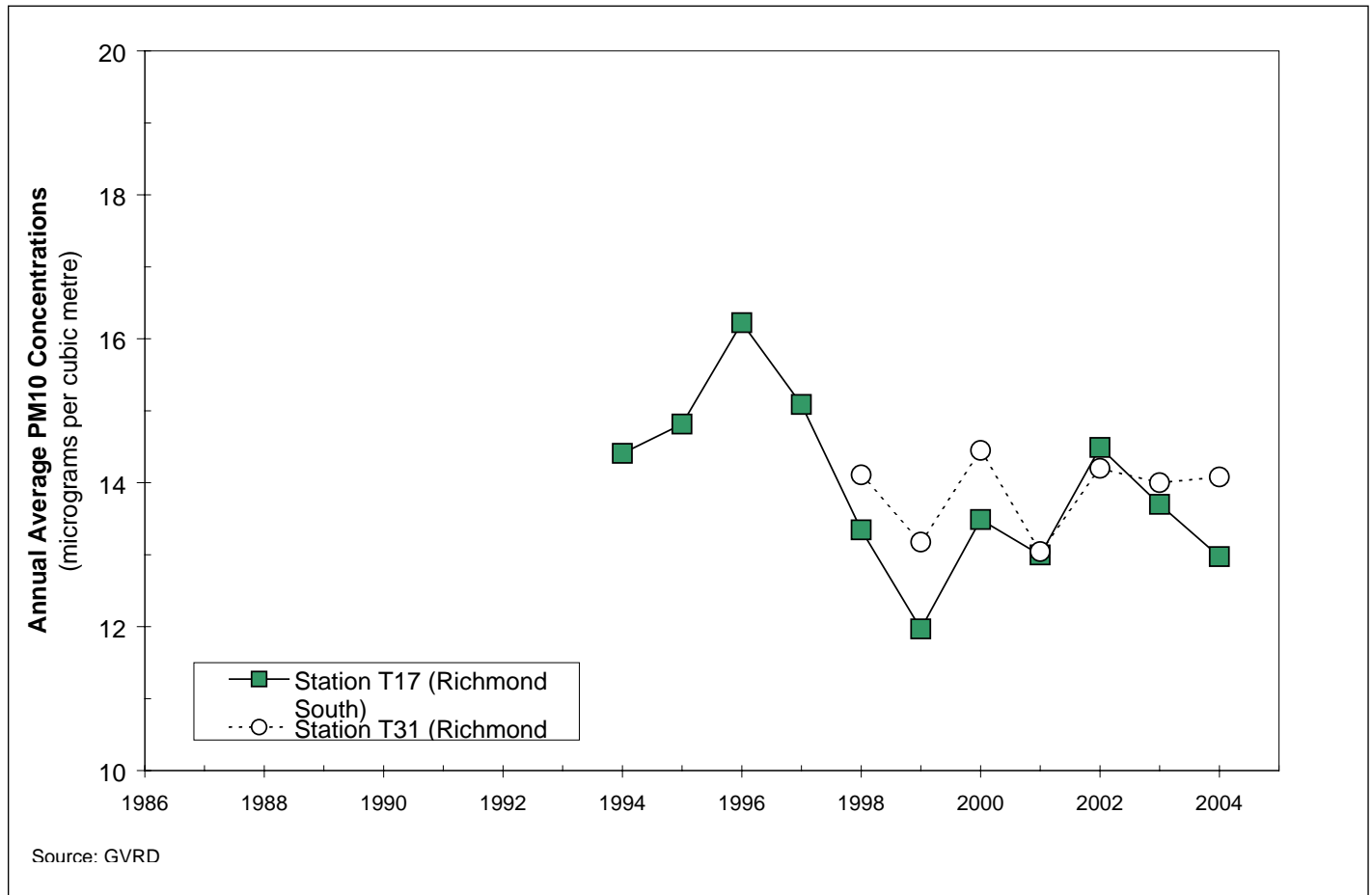


Fig. 33: Annual Average PM<sub>10</sub> Concentrations, 1994-2004

## What is Being Done?

- In 1994, the GVRD became the first regional government in Canada to develop an Air Quality Management Plan. Since then, it has achieved its goal of reducing vehicle, industrial and commercial sources of emissions. In 2005, the GVRD Board approved a new management plan.
- AirCare, a program developed in partnership with the GVRD and Ministry of Environment, helps to improve air quality through the identification and repair of high polluting vehicles.
- In Richmond, yard waste collection is an alternative to backyard burning, which helps to reduce smoke and particulate matter.

## Looking Forward

Future development will create new sources of emissions and these could impact the quality of air in the lower Fraser Valley. Richmond's location at the upstream end of the lower Fraser Valley wind patterns means that we will likely continue to enjoy good air quality, but that our emissions will blow downwind and be felt by another community.

## What Can Citizens Do?

- Use non-vehicular modes of travel (walk, bicycle) for short trips.
- Use transit or carpool to work.
- Maintain your vehicle in good condition.
- Avoid the use of backyard wood burners or inefficient fireplaces. Use the City's yard waste collection service.

### ? Did you know...

Cars and light-duty trucks account for two-thirds of vehicle-related air pollution in the lower Fraser Valley airshed (GVRD).

## WLA-3: Short Term Air Quality Exceedances

### Why is this Important?

Short periods of poor air quality might not be detected in an annual average measure (like WLA 2) but could still result in increased hospitalizations or visits to doctors, or reduced activity by persons with respiratory ailments. Monitoring of short term exceedances of air quality objectives can be a first indicator that air quality is deteriorating - which might not be detected using a long-term average measure.

### What is Being Measured?

Particulate concentrations (PM10) are measured at each of the two Richmond monitoring stations. This indicator shows us how many days of the year the particulate measurement at either of the Richmond monitoring stations exceeded the provincial and GVRD objective of 24-hour exposure to PM10 of 50 mg/m<sup>3</sup>.

### What is Happening?

Fortunately, short term exposure to PM10 in excess of the guideline only happens on a few days in a year and in many years it does not happen at all. This is a good sign and indicates that our air quality is generally good. The intermittent nature of these exceedances indicates that they are caused by specific events (e.g., a forest fire, the Burns Bog fire in 2005) and are not tracking a trend of deteriorating air quality.

### What is Being Done?

The GVRD established a new air quality management plan in 2005 that provides direction and a work plan for managing air quality within the region.

Environment Canada is working to address issues related to particulate emissions from ocean-going vessels, which generally are not within the jurisdiction of the GVRD or Richmond. However, this is one area where emissions are expected to grow in the future as ocean traffic expands.

## Summary

### Status:

Air quality in Richmond is generally within Canada-wide standards for contaminants on a short term basis; however, there are periodic brief exceedances.

### Trend:

Exceedances remain intermittent and few in number each year.

### Outlook:

Short term air quality will likely not exceed objectives, though specific events could result in short term exceedances.



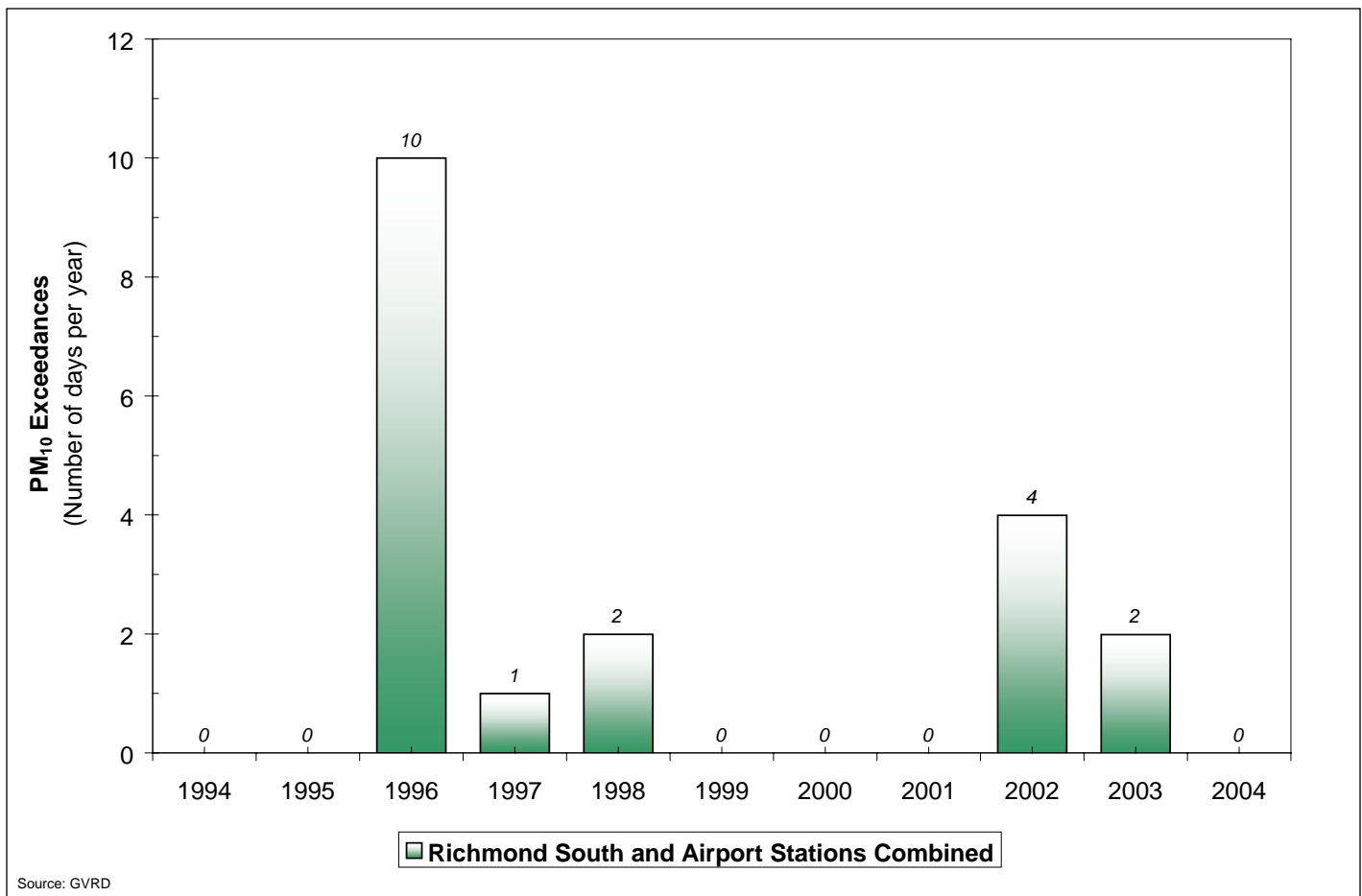


Fig. 34: Number of Days PM<sub>10</sub> Exceeds the Provincial Objective, 1994-2004

## Looking Forward

Increasing population will be associated with increased vehicle usage and possibly increased industrial activity - both of which could result in increased emissions.

## What Can Citizens Do?

- If you have a lung ailment, track air pollution levels by noting the air quality index ([www.gvrd.bc.ca](http://www.gvrd.bc.ca)). Avoid excessive activity on days of poor air quality.
- Use non-vehicular modes of travel (walk, bicycle) for short trips.
- Use transit or carpool to work.
- Maintain your vehicle in good condition.
- Do not burn material in a backyard burner or an inefficient fireplace.

## WLA-4: Soil Quality

### Why is this Subject Important?

The land within the community, and specifically agricultural soils, natural areas and ecological reserves are a source of ecological habitat and biodiversity, provide the growing medium for both natural vegetation and most of our agricultural crops, and retain and filter rainfall and groundwater.

Concerns about soil quality are usually focussed on two areas - the protection of agricultural soil quality and quantity to maintain food productivity, and the protection of lands from pollution and contamination. Agricultural soils that have deteriorated through poor management or have been lost due to erosion could require years to recover. Contaminated lands could result in ecological or human health impacts.

To reflect the importance of land to the community, and to acknowledge these potential concerns, soil quality was included in the SOE reporting beginning in 2001.

### What is Being Measured?

Potential issues that an agricultural soil quality indicator would address include: physical and chemical properties; nutrient content; erosion by wind, water or tillage; organic matter content; soil compaction; salinization; and contamination by chemicals, wastes, or runoff. At present there is no indicator applicable to Richmond that captures the concerns of agricultural soil quality.

### What is Happening?

Soils that have been contaminated are a concern for human and ecological health and often require extensive and costly remediation. Typically, chemical contamination is caused by a historical activity on an industrial or commercial site - sometimes due to mismanagement, but often due simply to practices that were considered acceptable in their time. In the past 20 years, the Province of BC has developed and updated an extensive set of regulations for identifying, managing and remediating sites during re-development.

## Summary

### Status:

As yet there is no numerical indicator of soil quality to evaluate Richmond soils and there is no coordinated data collection program. Some jurisdictions in North America are developing agricultural soil indicators and soil contamination index measures that may be applicable in the future.

### Trend:

Unknown.

### Outlook:

Unknown.



## WLA-5: Noise

### Why is this Important?

Noise is a common feature of our urban environments. However, noise can be an aesthetic irritant and excessive noise can detrimentally affect human well-being and the livability of our city. It also can impact and disturb wildlife. Common sources of noise include construction activity and ambient noise (such as traffic and landscaping equipment). Richmond has special noise considerations because the Vancouver International Airport is located within the municipality and flight paths pass directly over the city.

### What is Being Measured?

Noise is a complicated issue and for this SOE report, no single indicator is proposed. However, several major noise-related issues are discussed including aircraft-related noise and general urban noise issues reported to City and health authorities.

### What is Happening?

**Aircraft Noise:** Figure 35 shows the trend of annual average noise levels at selected noise monitoring stations within Richmond. In general, noise levels over 85 dBA are thought to negatively impact human health. The Vancouver International Airport Authority (VIAA) operates these stations which, as part of the noise management activities of the VIAA, are located along flight paths and elsewhere in order to understand the effects of airport operations on the city. Over the past 15 years, average noise levels have declined at most stations, which is primarily the result of the phasing-in of newer, quieter aircraft.



## Summary

### Status:

Current noise levels in Richmond are generally below the threshold thought to impact human health. Primary sources of noise are aircraft-related due to the proximity of the Vancouver International Airport and general urban sources such as traffic, construction, animals, and alarm systems.

### Trend:

Management activities by the City and the Vancouver International Airport Authority, in conjunction with aircraft technology changes, have reduced the amount of noise pollution in Richmond generated by airport activities.

### Outlook:

Further technology improvements particularly in airplanes may further reduce airplane-associated noise. Increases in population will likely result in increased urban noise.

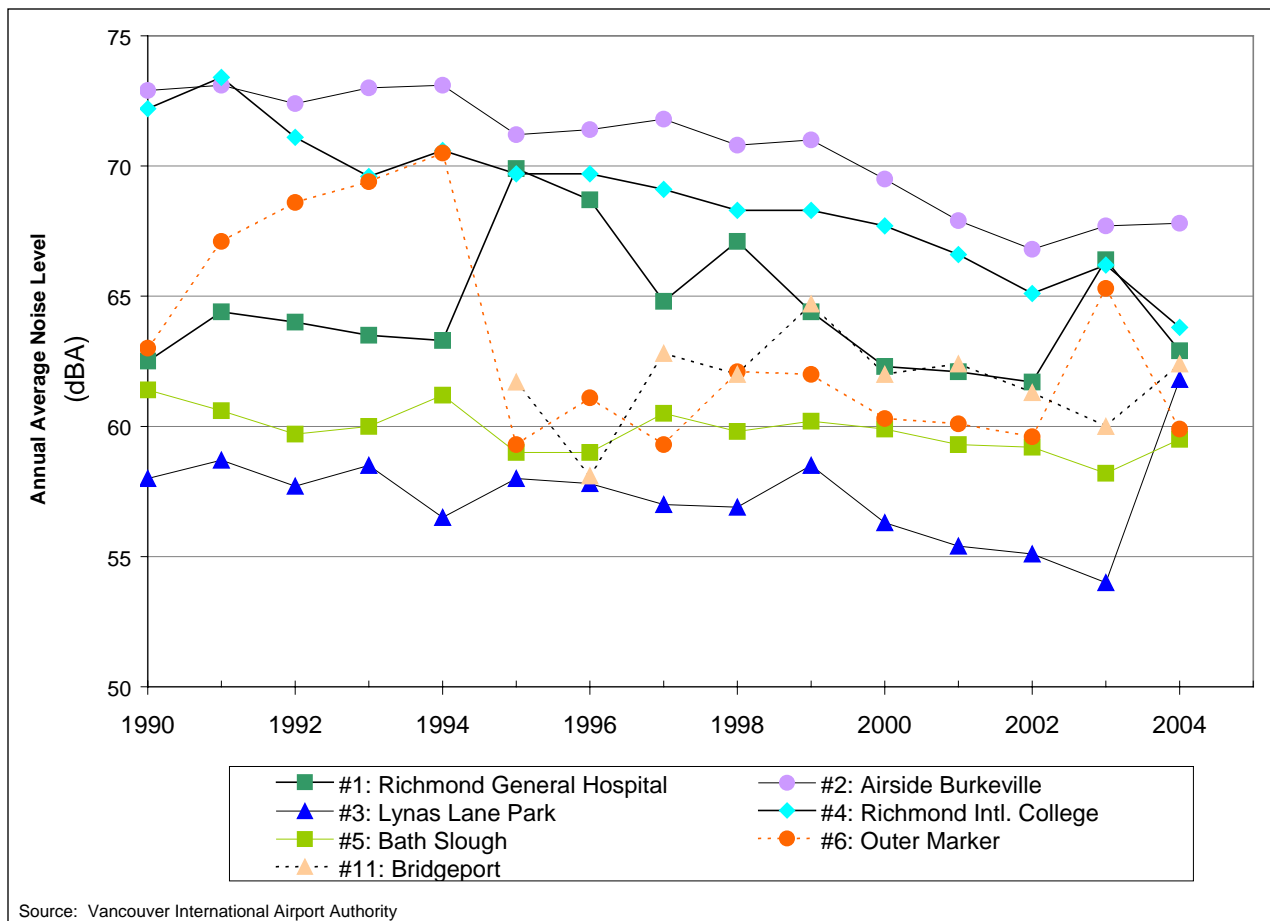


Fig. 35: Average annual Noise Levels at VIAA Noise Monitoring Stations, 1990-2004

Urban Noise: Richmond Health Services, part of the Vancouver Coastal Health Authority, administers the Richmond noise by-law on behalf of the City. The agency responds to complaints about noise and reviews development plans for potential noise impacts. In 2004/2005, it responded to 120 complaints about noise and reviewed 280 development applications and plans. Complaints include concerns about construction, parties or music, traffic, animals, alarm systems, and equipment and industrial sources. Health Services officials investigate and track these activities and report to the City twice per year.

### What is Being Done?

To address issues of aircraft noise, the City worked with the Vancouver International Airport Authority to develop an Aircraft Noise Sensitive Development (ANSI) policy. Incorporated into the OCP in 2004, this policy provides guidance to development within subject areas (see Figure 36). City aircraft noise mitigation efforts continue.

Noise is also addressed through City regulations. City by-laws regulate the hours of construction activity to minimize night-time and early morning disturbances to residents.



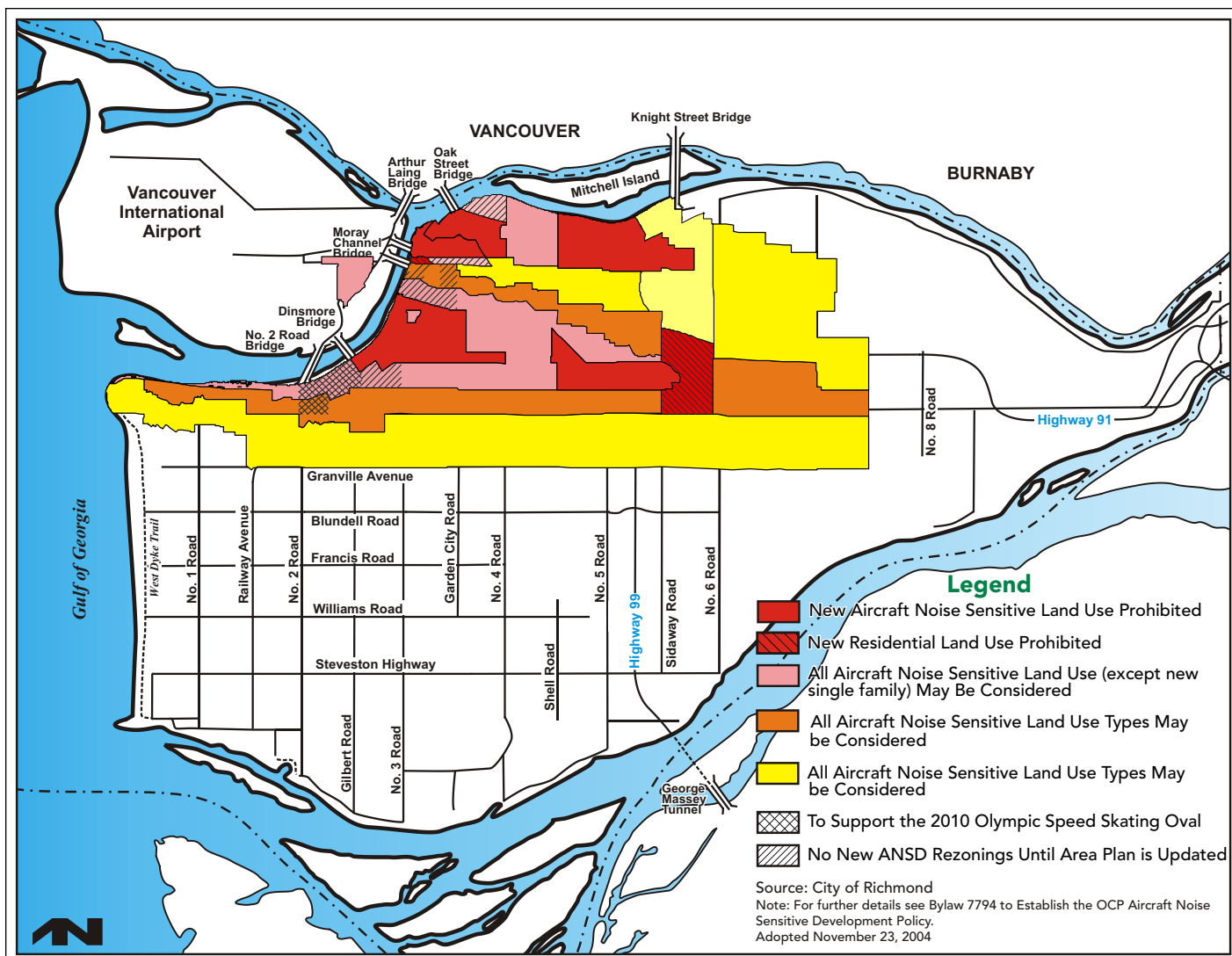


Fig. 36: City OCP areas designated under the Aircraft Sensitive Noise Development Policy

## Looking Forward

Our urban areas will increase in population density, airport traffic will expand, and noise issues will become ever more part of our daily lives. Managing noise within our urban areas will remain an on-going activity and challenge.

## What Can Citizens Do?

- When planning new developments ensure that the project will be designed to conform to the City's Aircraft Sensitive Noise Development Policy.
- Conduct all construction and landscaping activities in accordance with the City noise by-law.
- Use non-motorized outdoor equipment such as manual lawnmowers and rakes instead of leaf blowers.



## Goal 7: Provide Environmental Leadership

Richmond has earned a reputation as a ‘green’ municipality by demonstrating leadership in environmental practices manifested through a variety of policies, plans and actions. These initiatives include the building of an environmentally award-winning City Hall and the implementation of a City Environmental Purchasing Policy and Guide in 1999.

Municipalities are in an ideal position to provide environmental leadership. For example, when making purchasing decisions, City staff can choose products that limit the use of natural resources and maximize the use of recycled materials. The City’s actions can directly demonstrate the feasibility of efficient, responsible behaviour. This in turn can spur private developers and the community at large to undertake more sustainable methods of doing business. This section highlights some of the areas where the City’s own practices are setting an example, by reducing impact on the environment and proving to the community that innovative solutions can be cost-effective.

This section describes the City of Richmond’s environmental leadership through the following indicators:

- PEL-1: City Building Energy Consumption
- PEL-2: Green City Buildings
- PEL-3: Vehicle Fleet Management

### ? Did you know...

In 2001, the City of Richmond received two prestigious national honours for its Environmental Purchasing Policy and Guide – one from the Canadian Association of Municipal Administrators, and one from the Federation of Canadian Municipalities - CH2M HILL Sustainable Community Awards for excellence in service delivery.



## PEL-1: City Building Energy Consumption

### Why is this Indicator Important?

Energy is a significant resource consumed by the City to operate its buildings and facilities and a significant expenditure by the City. The overall importance of energy consumption in buildings from an environmental perspective is discussed in indicator RCC-4. By implementing energy conservation measures in existing buildings, the City can set an example for others and, at the same time, reduce costs.

### What is Being Measured?

This indicator measures total energy consumption at ten City-operated facilities that were selected to represent a range of facilities. The data is for total electricity consumption and natural gas consumption, measured in gigajoules.

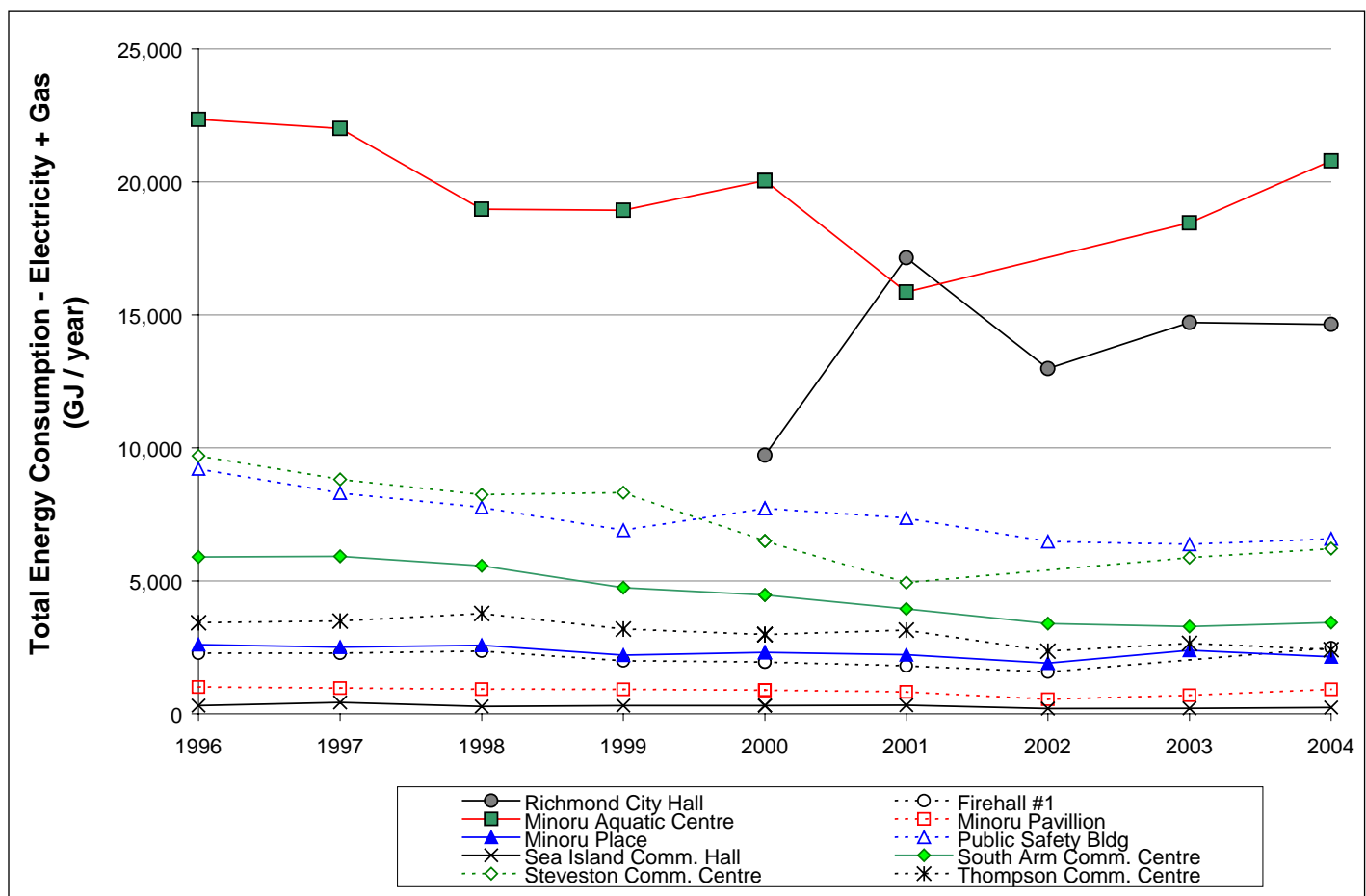


Figure 37: Energy Consumption at Selected City Facilities, 1996-2004

## What is Happening?

Since 1997, there has been a substantial decline in energy consumption at some facilities. The data does not differentiate between changes in energy consumption that may be related to changes in programs and usage and those attributable to energy efficiency measures. However, changes in use and programs would not be expected to result in a downward trend over several years.

## What is Being Done?

The City has taken major steps to reduce energy consumption at its facilities. In the early 1990s, the City undertook an extensive program of retrofitting buildings to be more energy efficient. Since 1997, the City has undertaken a wide array of activities including:

- Building the new City Hall to high standards of energy efficiency and with environmental considerations.
- Purchasing and installing a solar heating panel system at the Minoru Aquatic Centre. This system will be used to heat the pool and shower water and will reduce energy consumption, operating costs and greenhouse gas production.
- Completing the Richmond Ice Centre Power Smart project, which includes a low emissivity (“low e”) ceiling, lighting controls, new efficient pump motors, and low flow showerheads. These measures are expected to save 727,000 kWh of electricity, 243 GJ of natural gas, and almost \$25,000 annually.
- Upgrading equipment and lighting with BC Hydro Power Smart technologies.
- Installing light-emitting diode (LED) traffic lights (Richmond was the first municipality in BC to do so). This measure has resulted in annual electricity savings of \$85,000.
- Installation of building automation systems at the Steveston, Sea Island and Thompson Community Centres and at the Steveston Martial Arts Centre.
- An upgrade to the gym lighting system at the Thompson Community Centre.

From 1997 to 2002, the City of Richmond reduced its electricity consumption per square foot by 33% according to data from BC Hydro Power Smart. This translates into a savings of \$500,000 in annual electricity costs, as well as savings in natural gas expenditures. Due to its efforts, the City of Richmond was named the first Power Smart Certified municipality in BC in 2003.



## PEL-2: City Green Buildings

### Why is this Indicator Important?

Green buildings are designed to minimize the consumption of resources in the construction phase and minimize impacts of operations throughout the lifecycle of the building. 'Green' building design includes consideration of the indoor air quality, the materials of construction, and the paints and finishes used - all with the intent of minimizing impacts while maximizing personal comfort.

Green building design reduces the consumption of energy and potable water and may reduce discharges to the sanitary and storm water systems. In the long-term, these buildings will save money for the municipality, while reducing environmental impacts.

### What is Being Measured?

This indicator is currently under development and is intended to measure the total floor space in civic buildings built since 2000 that are built to LEED standards or equivalent. LEED stands for Leadership in Energy & Environmental Design (LEED®) Green Building Rating System and is a voluntary, consensus-based standard developed by the US Green Building Council. The LEED standard has been adopted in many municipalities in Canada for developing high-performance, sustainable buildings.

### What is Being Done?

- Richmond's Olympic Speed Skating Oval building, initiated in 2004, is being designed to achieve a minimum of a LEED® Silver Certification. This project at 33,750 m<sup>2</sup> (over 360,000 square feet) could well become the largest LEED® Silver certified building in the world when completed. This state-of-the-art building will be a world-class facility and leave a vibrant and sustainable legacy to the community after the Olympic and Paralympic Games in 2010. With the sale of residual Oval lands, the City will be asking developers of these lands to strive for LEED Silver Certification in their projects.
- In 2005, Council adopted a Sustainable "High Performance" Building Policy for City-owned facilities. The policy includes incorporating high performance attributes into building design and construction to the maximum extent possible and identifies that LEED® BC will be used as the standard by which to assess building performance. LEED Gold Certification was set as the desired standard for new City buildings greater than 2,000 m<sup>2</sup> (approximately 20,000 sq. ft.) and the City will seek to meet the performance standards of LEED Silver Certification for major renovations to existing facilities and new City buildings smaller than 2,000 m<sup>2</sup>. The City's prior commitments and budgetary process for the Richmond Olympic Oval mean that Gold Certification will not be sought for this project.



## PEL-3: City Vehicle Fleet Management

### Why is this Indicator Important?

For many municipalities, vehicle and equipment operation represents a substantial portion of their energy needs as well as corporate greenhouse gas emissions. The City operates over 375 vehicles to provide its services and the fuel consumed is a substantial budget item. Fuel costs are expected to remain high and potentially will go higher. These increases will make smaller, more efficient vehicles more cost-competitive than ever before.

City fleet management practices demonstrate to the community that there are simple and cost-effective measures that can achieve real savings in fuel consumption and air emissions.

### What is Being Measured?

This indicator will measure City fleet vehicle fuel consumption. At present fuel consumption is not tracked over time.

### What is Happening?

In the period from September 2004 to September 2005, the City used over 100,000 litres less fuel than in the previous 12-month period. This represents a savings of about 10% based on the easily implemented measures identified below.

### What is Being Done?

The City's fleet management group has implemented a series of measures aimed at reducing the consumption of fossil fuels, reducing toxic and smog-forming exhaust emissions and reducing emissions of greenhouse gases. Specific activities include:

- an Idle-Free program to reduce vehicle idling in works yards and on sites;
- a Fuel Sense Training program to encourage energy saving vehicle operations based on the NRCan Fleet Smart program;
- use of a 5% biodiesel blend (i.e., renewable fuels derived from natural oils like soybean oil) in the City's diesel vehicles;
- provision of City vehicles for staff carpooling to/from work;
- pilot testing of LED lighting systems on traffic control signs to reduce energy consumption;
- incorporation of 6 gas-electric hybrid vehicles into the light vehicle fleet to evaluate their cost-effectiveness; and,
- right-sizing of vehicles by matching new vehicle assignments to the appropriate task.







# Conclusions and Next Steps

## How Are We Doing Overall?

The 27 indicators included in the 2005 SOE Report paint a story of the overall state of human activity and quality of Richmond’s environment. These indicators highlight the current status of human activities and the state of the environment at one point in time and the past trend.

Richmond has changed considerably over the last decade with significant amounts of population growth and development. This SOE Report shows that certain indicators are improving, some are stable, and a few are worsening. Overall then, what does the SOE report tell us? Key findings from this edition of the State of the Environment report include:

Context Indicators	<ul style="list-style-type: none"><li>Richmond’s current population growth rate is slower than in the 1990s, but Richmond’s challenge will be to reduce per capita environmental impact as the population increases.</li></ul>
Preserve a Sustainable Agricultural Land Base	<ul style="list-style-type: none"><li>Richmond has been largely successful in protecting the Agricultural Land Reserve but population growth and development may increase pressure to exclude land from the ALR in the future.</li></ul>
Protect Natural Areas and Provide Parks and Trails	<ul style="list-style-type: none"><li>Richmond, other government agencies and land trusts have successfully established a significant portion of the municipality as parks and protected areas and new parks are being added.</li></ul>
Reduce Resource Consumption and Emissions	<ul style="list-style-type: none"><li>Total resource consumption and emissions are currently growing as a result of population growth. In order to reduce total consumption, per capita reductions will have to be achieved. Per capita garbage disposal has decreased but not water or energy consumption.</li></ul>
Build Compact and Complete Communities	<ul style="list-style-type: none"><li>Overall, the City of Richmond has been successful in developing the Richmond City Centre into a higher density, multi-use area and in retaining a compact urban form and attracting a high number of jobs to locate in the city.</li></ul>
Increase Transportation Choice	<ul style="list-style-type: none"><li>Richmond is an automobile dependent city with a high vehicle ownership rate and a high proportion of trips being made by automobiles. However, much progress has been made in creating a land use pattern supportive of walking, cycling and transit as well as improving public transit service and expanding the cycling network in the city.</li></ul>
Maintain Clean Water, Land, and Air and Minimize Noise	<ul style="list-style-type: none"><li>Environmental quality in Richmond is generally within established guidelines and standards to protect human health and the environment.</li></ul>
Provide Environmental Leadership by the City	<ul style="list-style-type: none"><li>The City has shown environmental leadership by reducing energy consumption in City buildings, its purchasing policies, and its vehicle operations. In 2003, the City became the first, and is still the only, BC Hydro Power Smart Certified municipality in BC. The City has also received awards for its environmental purchasing policy and guidebook.</li></ul>

Table 1 presents the overall rating and the general trend for each of the indicators. The overall rating is a subjective evaluation based on the current snapshot at one point in time (2005) for that indicator. The trend is also subjective and shows the general direction of how the indicator has been changing based on historical data. Both of these ratings were made by the consultant team, and are qualitative and subjective. It is one possible interpretation of the data.

**Table 1: Summary of the General Trends and Overall Ratings of the 2005 SOE Indicators**

	General Trend Rating (subjective)	2005 Overall Rating (subjective)
PSA-1: Land in the Agricultural Land Reserve	Positive (Stable)	Good
PNA-1: Parks and Protected Areas	Positive	Good
PNA-2: Terrestrial Environmentally Sensitive Areas	Neutral	Good
PNA-3: Trail Network	Positive	Good
RRC-1: Water Consumption	Neutral	Poor
RRC-2: Wastewater Generation	Negative	Poor
RRC-3: Residential Solid Waste Disposal	Negative	Fair
RRC-4: Residential Building Energy Use	Neutral	Fair
RRC-5: Greenhouse Gas Emissions	No Data	No Data
BCC-1: Population and Housing Unit Density	Positive	Good
BCC-2: Residential Housing Mix	Positive	Good
BCC-3: Amenity Access	Positive	Good
BCC-4: Labour Force Living & Working in Richmond	Positive	Very Good
BCC-5: Commuter Trip Distance	Positive	Very Good
ITC-1: Transportation Mode for Journey-to-Work Trips	No Recent Data	No Recent Data
ITC-2: Registered Passenger Vehicles	Neutral	Poor
ITC-3: Cycling Facilities	Positive	Good
ITC-4: Transit Access	Positive	Good
WLA-1: Fraser River Water Quality	No Data	No Data
WLA-2: Ambient Air Quality	Neutral	Good
WLA-3: Short Term Air Quality Exceedances	Neutral	Good
WLA-4: Soil Quality	No Data	No Data
WLA-5: Noise	Positive	Good
PEL-1: City Building Energy Consumption	Positive	Good
PEL-2: Green City Buildings	No Data	Good
PEL-3: Vehicle Fleet Management	Positive	Good

**General Trend Codes:** Positive – Improving trend; Neutral – Unchanged or no significant change in trend; Negative – Worsening trend; No Data – Insufficient data to establish trend; Unclear – Undetermined trend.

**Overall Rating Codes:** Ratings are from a sustainability and environmental perspective and are interpreted by the consultant team. The ratings also include a consideration of new or recent initiatives that show promise for the future but many not have yet affected the indicator results.

## Indicator Comparisons with Previous SOE Reports

Table 2 presents the overall ratings of the indicators from the 1998, 2001, and 2005 editions of the SOE report. These ratings are subjective and were made by the consultants retained to work on the SOE reports. The indicators have changed or evolved over time so the comparisons should be considered very generalized. Only indicators from the 2005 report are compared to earlier indicators. In addition, a different rating system is used in 2005 compared to 1998 and 2001. The original rating systems by each consultant has been retained.

**Table 2: Summary Comparison of Overall Ratings of Indicators with Previous SOE Report Editions**

	1998 Overall Rating	2001 Overall Rating	2005 Overall Rating
PSA-1: Land in the Agricultural Land Reserve	Good News	Good News	Good
PNA-1: Parks and Protected Areas	Good News	Good News	Good
PNA-2: Terrestrial Environmentally Sensitive Areas	Mixed Results	Good News	Good
PNA-3: Trail Network	---	Good News	Good
RRC-1: Water Consumption	Bad News	Mixed Results	Poor
RRC-2: Wastewater Generation	---	Mixed Results	Poor
RRC-3: Residential Solid Waste Disposal	Mixed Results	Good News	Fair
RRC-4: Residential Building Energy Use	---	Bad News	Fair
RRC-5: Greenhouse Gas Emissions	---	---	No Data
BCC-1: Population and Housing Unit Density	No indicators	Good News	Good
BCC-2: Residential Housing Mix	---	Good News	Good
BCC-3: Amenity Access	---	Good News	Good
BCC-4: Labour Force Living & Working in Richmond	---	---	Very Good
BCC-5: Commuter Trip Distance	---	---	Very Good
ITC-1: Transportation Mode for Journey-to-Work Trips	Bad News	Bad News	No Recent Data
ITC-2: Registered Passenger Vehicles	Bad News	Bad News	Poor
ITC-3: Cycling Facilities	Good News	Good News	Good
ITC-4: Transit Access	---	Good News	Good
WLA-1: Fraser River Water Quality	Mixed Results	Mixed Results	No Data
WLA-2: Ambient Air Quality	---	---	Good
WLA-3: Short Term Air Quality Exceedances	---	---	Good
WLA-4: Soil Quality	---	No Data	No Data
WLA-5: Noise	No indicators	Mixed Results	Good
PEL-1: City Building Energy Consumption	No indicators	Good News	Good
PEL-2: Green City Buildings	---	---	Good
PEL-3: Vehicle Fleet Management	No indicators	Good News	Good

**Codes:** No indicators – Indicator was included in version of SOE report, but no measures were identified; --- indicator was not included in a previous version of the SOE report; No data – there is insufficient data to assess the indicator

**Sources:** Westland Resource Group. 1998. State of the Environment Report: Richmond, 1998. Prepared for City of Richmond.

AXYS Environmental Consulting Ltd. December 2001. City of Richmond State of the Environment: 2001 Update Report. Prepared for City of Richmond.

## Looking Forward

The City of Richmond's population is expected to continue to grow, and is projected to reach 212,000 by 2021, for an increase of 30,000 people, or 17%, over the current population. How this population growth is managed will determine to a large degree how the City will perform on the indicators in future State of the Environment reports.

A number of major initiatives will be occurring over the next 5 years, which will impact a number of indicators, including:

- completion of the Canada Line rapid transit system in 2009 connecting the Vancouver International Airport and Richmond City Centre with downtown Vancouver, which is expected to significantly increase the use of public transit in Richmond and focus development along this corridor;
- updates of the City Centre Transportation Plan, the City Centre Area Plan and the On-Road Cycling Network Plan starting in 2006;
- completion of the No. 3 Road Corridor Streetscape Study, initiated in July 2005, to identify strategies and policies to encourage transit-oriented development along the corridor and make No. 3 Road more pedestrian and cycling friendly;
- initiation of a Parks and Open Space Strategy in 2006;
- implementation of a voluntary water metering program for single-family homes; and,
- the City's on-going fuel conservation and anti-idling program for its vehicle fleet.

It is expected that some indicators will show significant progress as a result of these initiatives.

An accompanying 2005 SOE Update Technical Report has been prepared to assist the City with future updates and to ensure a consistent methodology is used for updating the indicators. In addition, data issues and recommendations for future updates of the SOE report are included in the Technical Report.

## Future Updates

It is anticipated that:

1. the next State of the Environment report will be prepared and released in 2008, 10 years after the first report.
2. The 2008 report will incorporate data from the 2006 Census of Canada as well as data up to the end of 2007 for many of the indicators in this report.
3. Subsequent State of the Environment reports are prepared every 5 years coinciding with the release of data from future Government of Canada Censuses.



## Acronyms and Abbreviations

ACE	Advisory Committee on the Environment (City of Richmond)
ALR	Agricultural Land Reserve
AQI	Air Quality Index
CAC	Common Air Contaminant
CSO	Combined Sewer Overflow
CSR	Contaminated Site Regulation
ESA	Environmentally Sensitive Areas
FCM	Federation of Canadian Municipalities
FREMP	Fraser River Estuary Management Program
FVRD	Fraser Valley Regional District
GHG	Greenhouse Gas
GJ	Gigajoule (one billion joules)
GVRD	Greater Vancouver Regional District
kWh	kilowatt hour (electricity consumption)
LWMP	Liquid Waste Management Plan
MOE	Ministry of Environment (BC)
NEF	Noise Exposure Forecast
NMT	Noise Monitoring Terminals
NO <sub>x</sub>	Nitrogen Oxides
O <sub>3</sub>	Ozone
OCP	Official Community Plan
PCP	Partners for Climate Protection
POPAS	Privately Owned Publicly Accessible Spaces
PM <sub>10</sub>	Particulate Matter (10 microns or less)
SOE	State of the Environment
TSS	Total Suspended Solids
VOCs	Volatile Organic Compounds
WWTP	Waste Water Treatment Plant
WQI	Water Quality Index
WQO	Water Quality Objectives

## For Further Information

### General – Richmond (available at [www.richmond.ca](http://www.richmond.ca))

- City of Richmond. Official Community Plan. Original Adoption Date: March 15, 1999. Bylaw 7100
- Westland Resource Group. State of the Environment Report: Richmond, 1998 (1998). Prepared for the City of Richmond.
- AXYS Environmental Consulting Ltd. Richmond State of the Environment: 2001 Update Report (December 2001). Prepared for the City of Richmond.
- City of Richmond. Richmond's Environmental Project Guidebook: A Community Guide of Environmentally Oriented Projects (January 2001).
- City of Richmond Annual Reports.
- City of Richmond Demographic Hot Facts.

### General – Fraser Basin, Georgia Basin, and GVRD

- Fraser Basin Council ([www.fraserbasin.bc.ca](http://www.fraserbasin.bc.ca)).
  - Fraser Basin Council. January 2003. A Snapshot on Sustainability: State of the Fraser Basin Report ([www.fraserbasin.bc.ca/publications/fbc\\_reports.html](http://www.fraserbasin.bc.ca/publications/fbc_reports.html)).
- Greater Vancouver Regional District ([www.gvrd.bc.ca](http://www.gvrd.bc.ca)).
  - Livable Region Strategic Plan ([www.gvrd.bc.ca/growth/lrsp.htm](http://www.gvrd.bc.ca/growth/lrsp.htm)).
  - Livable Region Strategic Plan Annual Reports (<http://www.gvrd.bc.ca/growth/publications.htm>).
  - Transport 2021 (<http://www.gvrd.bc.ca/growth/transport2021.htm>).
  - Sustainable Region Initiative. ([www.gvrd.bc.ca/sustainability/](http://www.gvrd.bc.ca/sustainability/))
  - Sustainable Region Initiative Reports ([www.gvrd.bc.ca/sustainability/reports.htm](http://www.gvrd.bc.ca/sustainability/reports.htm)).
- Georgia Basin Futures Project ([www.basinfutures.net](http://www.basinfutures.net)).
- Government of Canada and Province of British Columbia. Spring 2002. Georgia Basin-Puget Sound Ecosystem Indicators Report ([www.env.gov.bc.ca/spd/gbpsei/index.html](http://www.env.gov.bc.ca/spd/gbpsei/index.html)).

### Context: Population Growth

- Statistics Canada, Census of Canada ([www.statcan.ca](http://www.statcan.ca)).
- BC Stats ([www.bcstats.gov.bc.ca/](http://www.bcstats.gov.bc.ca/)).
- City of Richmond. Hot Facts: Population ([www.richmond.ca/\\_\\_shared/assets/pp\\_hf\\_16248.pdf](http://www.richmond.ca/__shared/assets/pp_hf_16248.pdf)).
- GVRD. March 2003. 2001 Census Bulletin #1: Population and Dwelling Counts ([www.gvrd.bc.ca/growth/pdfs/Census2001-Population.pdf](http://www.gvrd.bc.ca/growth/pdfs/Census2001-Population.pdf)).

## Preserve a Sustainable Agricultural Base

- Agricultural Land Commission ([www.alc.gov.bc.ca](http://www.alc.gov.bc.ca)).
- City of Richmond. January 2002. City of Richmond & Richmond Farmers Institute Agricultural Profile Report ([www.richmond.ca/services/planning/agriculture/profile.htm](http://www.richmond.ca/services/planning/agriculture/profile.htm)).
- City of Richmond. May 2003. City of Richmond & Richmond Farmers Institute Agricultural Viability Strategy ([www.richmond.ca/services/planning/agriculture/viability.htm](http://www.richmond.ca/services/planning/agriculture/viability.htm)).
- City of Richmond. April 2005. Hot Facts: Agriculture ([www.richmond.ca/\\_\\_shared/assets/pp\\_hf\\_2710900.pdf](http://www.richmond.ca/__shared/assets/pp_hf_2710900.pdf)).
- GVRD. February 2003. 2001 Census Bulletin #2: Census of Agriculture ([www.gvrd.bc.ca/growth/pdfs/Census2001-Agriculture.pdf](http://www.gvrd.bc.ca/growth/pdfs/Census2001-Agriculture.pdf)).
- Smart Growth BC. 2005. Protecting Agricultural Land: A Citizen's Guide ([www.greebelt.bc.ca](http://www.greebelt.bc.ca)).
- West Coast Environmental Law. Protecting the Working Landscape ([www.wcel.org](http://www.wcel.org)).

## Protect Natural Areas and Provide Parks and Trails

- City of Richmond. 2003. 2010 Richmond Trails Strategy: Linking People, the Community and Nature.
- City of Richmond. 2005 (draft). Live, Connect, Grow: Parks, Recreation and Cultural Services. A Master Plan for 2005 to 2015 ([www.richmond.ca/\\_\\_shared/assets/Master\\_Plan\\_2005\\_to\\_201511617.pdf](http://www.richmond.ca/__shared/assets/Master_Plan_2005_to_201511617.pdf)).
- City of Richmond. March 2001. Criteria for the Protection of Environmentally Sensitive Areas: A Design Manual for Developers, Conservations and Designers who are Working in or Near Richmond's Natural Areas ([www.richmond.ca/services/environment/policies/natural.htm](http://www.richmond.ca/services/environment/policies/natural.htm)).
- City of Richmond. January 2001. Richmond's Environmental Project Guidebook: A Community Guide of Environmentally Oriented Projects ([www.richmond.ca/services/environment/action/guidebook.htm](http://www.richmond.ca/services/environment/action/guidebook.htm)).
- Fraser River Estuary Management Program ([www.fraserbasin.bc.ca/programs/gvspr.html#5](http://www.fraserbasin.bc.ca/programs/gvspr.html#5)).
- GVRD Biodiversity Strategy ([www.gvrd.bc.ca/growth/biodiversity.htm](http://www.gvrd.bc.ca/growth/biodiversity.htm)).

## Reduce Resource Consumption and Emissions

- GVRD 2004 Livable Region Strategic Plan Annual Report ([www.gvrd.bc.ca/growth/pdfs/2004\\_LRSP\\_AnnualReport.pdf](http://www.gvrd.bc.ca/growth/pdfs/2004_LRSP_AnnualReport.pdf)).
- GVRD. Emissions Inventory ([www.gvrd.bc.ca/air/inventory\\_reports.htm](http://www.gvrd.bc.ca/air/inventory_reports.htm)).
- Province of British Columbia's Ministry of Environment Product Stewardship Program - including e-waste initiative ([www.env.gov.bc.ca/epd/epdpa/ips/index.html](http://www.env.gov.bc.ca/epd/epdpa/ips/index.html)).
- BC Hydro ([www.bchysro.com](http://www.bchysro.com))
- Terasen Gas ([www.terasengas.com](http://www.terasengas.com))

## Build Compact and Complete Communities

- GVRD 2003 Livable Region Strategic Plan Annual Report ([www.gvrd.bc.ca/growth/lrsp/2003Report.pdf](http://www.gvrd.bc.ca/growth/lrsp/2003Report.pdf)).
- GVRD. March 2003. Population Density in Greater Vancouver: 1991-2001 ([www.gvrd.bc.ca/growth/pdfs/PopDensity.pdf](http://www.gvrd.bc.ca/growth/pdfs/PopDensity.pdf)).
- Smart Growth BC. 2004 BC Sprawl Report ([www.smartgrowth.bc.ca/downloads/Sprawl2004.pdf](http://www.smartgrowth.bc.ca/downloads/Sprawl2004.pdf)).
- GVRD. March 2002. 2001 Census Bulletin #5 – Dwelling Type and Tenure ([www.gvrd.bc.ca/growth/pdfs/Census2001-Dwellings.pdf](http://www.gvrd.bc.ca/growth/pdfs/Census2001-Dwellings.pdf)).
- GVRD. Livable Centres Website ([www.gvrd.bc.ca/livablecentres](http://www.gvrd.bc.ca/livablecentres)).
- City of Richmond City Centre Area Plan ([www.richmond.ca/services/planning/ocp/history/ocp201.htm](http://www.richmond.ca/services/planning/ocp/history/ocp201.htm)).
- Housing Prototypes ([housingprototypes.org](http://housingprototypes.org)).
- Canada Mortgage and Housing Corporation ([www.cmhc.ca](http://www.cmhc.ca)).
- GVRD Buildsmart ([www.gvrd.bc.ca/buildsmart](http://www.gvrd.bc.ca/buildsmart)).

## Increase Transportation Choice

- GVRD 2003 Livable Region Strategic Plan Annual Report ([www.gvrd.bc.ca/growth/lrsp/2003Report.pdf](http://www.gvrd.bc.ca/growth/lrsp/2003Report.pdf)).
- Smart Growth BC. 2004 BC Sprawl Report. ([www.smartgrowth.bc.ca/downloads/Sprawl2004.pdf](http://www.smartgrowth.bc.ca/downloads/Sprawl2004.pdf)).
- Greater Vancouver Trip Diary Survey. 1994, 1999, 2004. BC Ministry of Transportation and TransLink ([www.translink.bc.ca/files/board\\_files/meet\\_agenda\\_min/2005/06\\_22\\_05/4.4tripdiary.pdf](http://www.translink.bc.ca/files/board_files/meet_agenda_min/2005/06_22_05/4.4tripdiary.pdf)).
- McMillan, Sarah. November 2004. Toward a Livable Region? An Evaluation of Business Parks in Greater Vancouver. Prepared for School of Community and Regional Planning, UBC
- TransLink. September 2000. Richmond Area Transit Plan Summary Report. ([www.translink.bc.ca/files/pdf/plan\\_proj/area\\_plans/richmond\\_summary\\_report.pdf](http://www.translink.bc.ca/files/pdf/plan_proj/area_plans/richmond_summary_report.pdf)).
- City of Richmond – Canada Line Rapid Transit Project ([www.ravrapidtransit.com](http://www.ravrapidtransit.com)).
- About Cycling in Richmond ([www.richmond.ca/services/ttp/cycling/about.htm](http://www.richmond.ca/services/ttp/cycling/about.htm)).
- Richmond Cycling Routes ([www.richmond.ca/services/ttp/cycling/local.htm](http://www.richmond.ca/services/ttp/cycling/local.htm)).
- Richmond City Bicycle Planning ([www.richmond.ca/services/ttp/cycling/planning.htm](http://www.richmond.ca/services/ttp/cycling/planning.htm)).
- Better Environmentally Sound Transportation ([www.best.bc.ca](http://www.best.bc.ca)).
- The Victoria Transportation Policy Institute ([www.vtpi.org](http://www.vtpi.org)).
- British Columbia Cycling Coalition ([www.bccc.bc.ca](http://www.bccc.bc.ca)).
- Vancouver Area Cycling Coalition ([www.vac.bc.ca](http://www.vac.bc.ca)).

## Maintain Clean Water, Land and Air and Minimize Noise

- Greater Vancouver Regional District ([www.gvrd.bc.ca](http://www.gvrd.bc.ca)).
- Ministry of Environment: ([www.env.gov.bc.ca/pac/airquality.htm](http://www.env.gov.bc.ca/pac/airquality.htm)).
- BC Lung Association ([www.bc.lung.ca/services/services\\_air.html](http://www.bc.lung.ca/services/services_air.html)).
- AirCare program ([www.aircare.ca](http://www.aircare.ca)).
- Vancouver International Airport Authority. Vancouver International Airport Authority 1995-2015 Master Plan ([www.yvr.ca/authority/whoweare/future.asp](http://www.yvr.ca/authority/whoweare/future.asp)).
- Vancouver International Airport Authority. October 2004. Environmental Management Plan. ([www.yvr.ca/pdf/authority/emp100104.pdf](http://www.yvr.ca/pdf/authority/emp100104.pdf)).
- GVRD. GVRD Air Quality Management Plan ([www.gvrd.bc.ca/air/planning\\_plans.htm](http://www.gvrd.bc.ca/air/planning_plans.htm)).
- GVRD 2004 Livable Region Strategic Plan Annual Report ([www.gvrd.bc.ca/growth/pdfs/2004\\_LRSP\\_AnnualReport.pdf](http://www.gvrd.bc.ca/growth/pdfs/2004_LRSP_AnnualReport.pdf)).
- Fraser River Estuary Management Program ([www.bieapfrempp.org/main\\_frempp.html](http://www.bieapfrempp.org/main_frempp.html))
- Fraser River Action Plan (FRAP) of Environment Canada, publications list ([www.rem.sfu.ca/FRAP/PDF\\_list](http://www.rem.sfu.ca/FRAP/PDF_list))
- Georgia Basin Ecosystem Initiative ([www.pyr.ec.gc.ca/georgiabasin/Index\\_e.htm](http://www.pyr.ec.gc.ca/georgiabasin/Index_e.htm))

## Provide Environmental Leadership by the City

- City of Richmond. February 2001. Environmental Purchasing Guide: A Reference Guide for City of Richmond Staff to Stimulate Market Development Opportunities for Environmentally Preferred Products ([www.richmond.ca](http://www.richmond.ca)).
- City of Richmond City Hall Features ([www.richmond.ca](http://www.richmond.ca)).
- U.S. Green Building Council ([www.usgbc.org](http://www.usgbc.org)).
- Canada Green Building Council ([www.cagbc.org](http://www.cagbc.org)).
- GVRD Buildsmart ([www.gvrd.bc.ca/buildsmart](http://www.gvrd.bc.ca/buildsmart)).

# Acknowledgements

A wide diversity of individuals were involved in providing data for this report, participating in meetings and workshops, and reviewing and providing editing for drafts of the report. The consultants would like to acknowledge their contribution for improving the quality and focus of this report and for their commitment to Richmond's environment.

## Members of Richmond's Advisory Committee on the Environment

Councillor Linda Barnes (Council liaison)  
Councillor Sue Halsey-Brandt (former Council liaison)  
Eric Fiss (staff liaison)  
James Collins (Co-Chair of ACE)  
Gordon Kibble (Co-Chair of ACE)  
Tom Chan  
Evelyn Feller  
Nathan Gregory  
Alan Markovic  
Alan Ngo  
Mike Radu  
Dr. Amador Remigio  
Dalip Sandhu  
Paul Schaap  
Sam Sugita  
Richard Tse  
Stephany Walker  
James Watson  
Zhaoguo (William) Xie  
Haihua Yan  
Louis Zivot

## Other Agencies and Organizations

Clark Lim, *TransLink*  
Ken Kuo, *TransLink*  
Graeme Brown, *TransLink*  
Christina DeMarco, *GVRD*  
Bob Denboer, *GVRD*  
Susan Haid, *GVRD*  
Ken Reid, *GVRD*  
Dina Matterson, *BC Hydro*  
Sharon McCarthy, *Terasen*  
Lee Robson, *Terasen*  
Tony Pellett, *Agricultural Land Commission*

## City of Richmond

David Brownlee (Project Coordinator)  
*Special Projects Planner*  
Julie Beers  
*Environmental Coordinator*  
Sara Badyal  
*Planner 1*  
Chris Blackwell  
*Water Department*  
Joan Caravan  
*Transportation Planner*  
Helen Chan  
*Project Engineer*  
Margot Daykin  
*Assistant Manager - Environmental Programs*  
Jamie Esko  
*Parks Planner*  
Eric Fiss  
*ACE Staff Liaison*  
Phil Hogg  
*Manager, Facility Operations & Maintenance*  
Stuart Jones  
*Planner Analyst*  
Emy Lai  
*Sanitation & Recycling Assistant*  
Morgan Muir  
*Graphics Coordinator, Production Centre*  
Frank Sciberras  
*Supervisor, Mapping & Production Centre*  
Elena Paller  
*Engineering*  
Yvonne Stich  
*Parks Planner*  
Matthew Zipchen  
*Consultant for eco-industrial networking in Richmond*



# Key Facts for Richmond

## Land Area

	City Centre	City of Richmond
Land Area (excluding lakes) (ha)	818	12,862

## Population and Dwelling Count

	City Centre	City of Richmond
Census Population (2001 unadjusted)	28,635	164,345
Population Estimate by City of Richmond (2005)	40,290	181,940
Census Dwelling Count (2001 unadjusted)	14,413	58,272

## Demographics (2001 Census)

	City of Richmond	BC
% of population aged 65 years and older	11.8%	13.6%
Median Age (years)	38.5	38.4
Average Household Size (persons/household)	2.9	3.0

## Private Dwellings (2005 Estimate by City of Richmond)

	City Centre	% of Dwellings in City Centre	City of Richmond	% of Dwellings In City
Single-family	930	5.4%	28,100	45.5%
Two-family	110	0.6%	1,280	2.0%
Townhouse	3,380	19.8%	13,370	21.7%
Apartment	12,650	74.1%	18,950	30.7%
Total	17,070	100%	61,690	100%

## Employment (2001 Census)

	City of Richmond	BC
Population 15+ in Labour Force, 2000	79,505	
Average Household Income, 2000	\$ 60,724	\$ 57,593

## Greenspace and Renewable Working Landscapes

	Total Lands (ha)	% of Total Land Area
Agricultural Land Reserve, 2005 (ALC estimate net of roads)	4,717	36.7%
Agricultural Land Reserve, 2005 (Gross area – including roads)	5,179	40.3%
City and School Board Parks, 2005	768	5.97%
Regional Parks (GVRD), 2005	121	0.94%
Crown Provincial Terrestrial, 2005 (Land Only) <sup>1</sup>	52	0.41%
Crown Federal Lands, 2005 (Land Only) <sup>2</sup>	172	1.33%
Nature Trusts / Conservancies, 2005 <sup>3</sup>	130	1.01%
Privately Owned Park Areas, 2005	5.8	0.05%
Total Parks and Protected Areas, 2005	1,248	9.71%
Terrestrial Designated Environmentally Sensitive Areas, 2005	1,578	12.3%
Net Greenspace (Overlaps Removed), 2005	6,423	49.93%

## Transportation

Length of Trails, 2005	49 km
Length of Bike Lanes, 2005	26 km
Length of Multi-user Separate Pathways, 2005	8.5 km
Length of Dykes with Multi-user Pathways, 2005	17 km
Transit Boardings, Richmond Bus Depot, 2005	16.3 million passengers/year
#98 B-Line Daily Ridership, weekdays, 2005	20,000 passengers/day
Median Length of Commuter Trips, 2001	6.7 km

## Utilities Consumption

	Total	Per Capita Value
Annual Residential Water Consumption, 2004	55 million litres per day	314 litres per capita per day
Amount of Waste Water Treated, 2004	79 million litres per day	450 litres per capita per day
Residential Electricity Consumption, 2004	542,719,412 kWh	3028 kWh per capita per year
Single-family Dwelling Natural Gas Consumption, 2004	100.4 GJ	28.7 GJ per capita per year

<sup>1</sup> Portions of the South Arm Marshes Wildlife Management Area are included in the Crown Provincial totals.

<sup>2</sup> The Federal Protected Areas includes the Sea Island Conservation Area.

<sup>3</sup> The lands owned by Nature Trusts / Conservancies include land in the South Arm Marshes Wildlife Management Area on Rose Island, Kirkland Island, and Gunn and Williamson Islands. Swishwash Island is also included in this total.





## City of Richmond

---

6911 No. 3 Road  
Richmond, BC V6Y 2C1  
Phone: 604-276-4000  
[www.richmond.ca](http://www.richmond.ca)