



**SUSTAINABILITY**

# THE CLIMATE-FRIENDLY CITY



The Cool Vancouver Task Force's

# **Community Climate Change Action Plan:**

*Creating Opportunities*

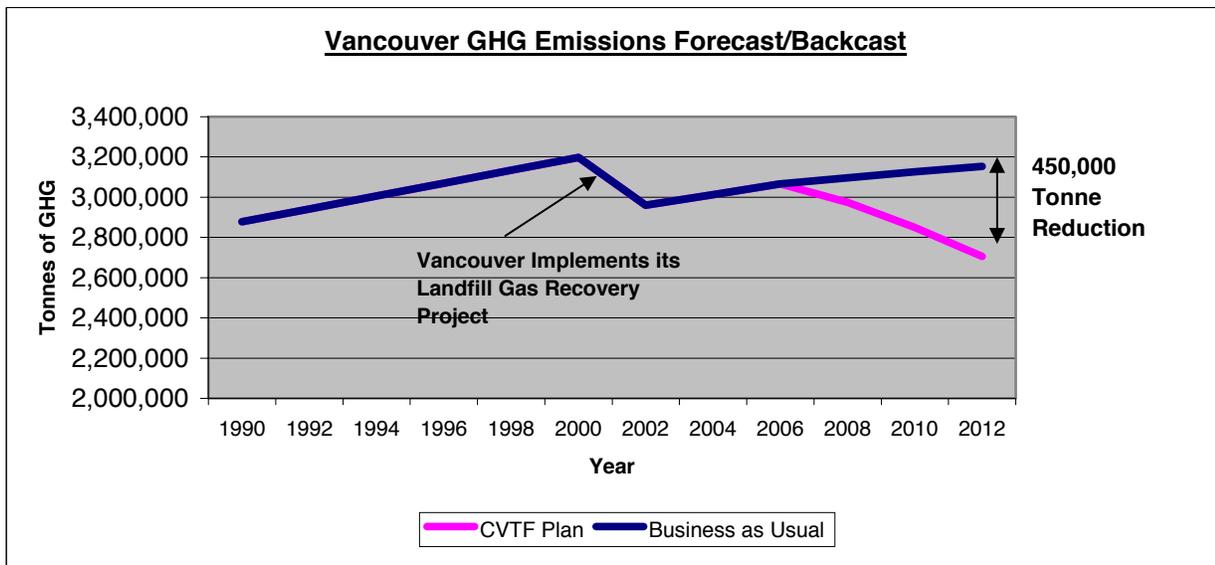


March 29, 2005

## EXECUTIVE SUMMARY

Vancouver's Community Climate Change Action Plan (Community CCAP) presents a comprehensive and systematic approach to the challenge of climate change while simultaneously creating numerous new opportunities for improved air quality, health and fitness, transportation demand management, personal mobility, cost savings, employment, economic development, and community building and empowerment. It focuses on enabling and motivating individuals, businesses, and institutions to reduce their building and transportation related energy use as this is responsible for over 80% of the greenhouse gas emissions in Vancouver. This Plan is the product of a year and a half of work by the Cool Vancouver Task Force (a complete list of member organisations is available in *Appendix A1*) and numerous additional stakeholders, the public, City staff, and technical consultants.

The Community CCAP establishes an emissions reduction target for Vancouver of six percent below 1990 levels by 2012 to reflect Canada's commitments under the Kyoto Protocol. Achieving this target will require us to reduce our greenhouse gas emissions by roughly 450,000 tonnes per year from projected 2012 levels.



It is important to point out that this plan is only the beginning. Experts around the world agree that a 6% reduction in greenhouse gas emissions is only the first step in addressing climate change and much deeper emissions reduction will be required in the coming years.

The recommended initial actions get us moving on the highest priority initiatives that offer the most cost effective and immediate opportunities for emissions reductions based on the magnitude of potential reductions, existing or soon to start partner initiatives, and external funding. Some of the strategies described in the plan require further work with stakeholders and the development of implementation and funding partnerships before concrete programs can be developed.

The main elements of new City activity in the Plan include strategies and initial actions for:

- **Community Engagement** through the media, special events, and the creation of funding mechanisms for community leaders.
- **Housing Energy Efficiency** by harmonizing the marketing of funding, programs, and services between institutions and private businesses while utilising regulation when appropriate (mostly for new buildings).
- **Commercial and Institutional Building Energy Efficiency** through the promotion of an environmental performance recognition system for existing buildings, by facilitating access to existing retrofit resources, and by supporting best operating practices.
- **Community Energy Systems and Supply** by exploring the technical feasibility and business model for developing a False Creek Sustainability Precinct around proven and viable community energy systems, while enabling the easy integration of future clean energy sources, and by exploring opportunities for alternative energy systems in conjunction with ongoing infrastructure and development work city-wide.
- **Transportation Alternatives** through the increased provision of walking, cycling, and transit infrastructure and service as well as the promotion of these travel modes through school programs, parking strategies, and improved safety measures.
- **Vehicle and Fuel Efficiency** in partnership with other public and private organisations to advocate for improved national fuel efficiency standards, to support the purchase of more efficient vehicles, to promote best operating practices, and to support the market development of new vehicle technologies and fuels.

Recognising that the Community CCAP is likely going to be used as a template or learning tool for other municipalities, it also includes brief sections on **Smart Growth**, **Waste Management**, and **Industrial Emissions**. These topics are central to municipal climate change planning but are not discussed in detail as Vancouver is already very successful in these areas (Smart Growth and Waste Management) or, in the case of industry, it is not a major sources of greenhouse gas emissions in our city.

The Community CCAP establishes the multi-sectoral strategies and actions required for Vancouver to realise a 6% reduction in greenhouse gas emissions from 1990 levels by 2012. This Plan builds upon the programs and funding offered by other institutions by connecting Vancouver residents and businesses to available resources while also initiating innovative and practical new programs. The implementation of this Plan will transform programs and targets into real change, yield numerous health, mobility, and economic co-benefits to the City and its citizens, and will position Vancouver as a leader in effective action enabling us to leverage our activities with substantial external funding and new partnerships.

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## 1.0 Introduction

Changes in the earth's climate, largely resulting from the greenhouse gases that are emitted when fossil fuels are burned to produce electricity, heat our homes, and power our vehicles, are viewed by many experts as the most significant environmental challenge facing the planet today. On February 16<sup>th</sup>, 2005 the Kyoto Protocol went into effect, obligating Canada to meet its greenhouse gas reduction commitments. This plan identifies key strategies and initial actions to be taken to address this challenge in Vancouver.

While this plan focuses primarily on the first step of how we can reduce Vancouver's greenhouse gas emissions by 6% from 1990 levels by 2012, it also describes:

- o actions that should be taken now to enable further reductions beyond 2012; and
- o recognizes that the climate has already begun to change and recommends steps to help us anticipate and prepare for those changes.

A 6% reduction in greenhouse gas emissions is not sufficient to prevent climate change and there are clear indications much more significant reductions will be required if we hope to avoid earth changing consequences. While this plan represents only the first step, it is not an insignificant one. When you take into account population growth, an absolute reduction of 6% below 1990 levels would require a reduction of over 25% on a per person basis. This first step represents a very important change in direction for Vancouver and the nation as a whole regarding our use of fossil fuels. *To build off of this new direction, the City will work to establish a new, longer range emissions reduction target prior to 2012.*

As this plan illustrates, this important first step is ambitious but entirely achievable **if** the community, both residents and businesses alike, embrace the challenge. **This is Vancouver's plan**; it was developed jointly by the Cool Vancouver Task Force (with representatives ranging from non-government organizations to the Board of Trade) and the City. It has incorporated the input of all major stakeholders as well as the public at large. Most of the changes required are outside the City's ability to regulate or control - if the plan is to be successful, the entire community must get engaged.

This plan:

- o provides some contextual information on climate change, Vancouver's emissions, and the reduction target;
- o describes the strategy for wide-spread community engagement that will be essential for success;
- o provides specific context, strategies, and recommended initial actions for emission reductions in residential and commercial buildings, through energy systems, by reducing automobile usage, and by making vehicles and their fuels more efficient
- o concludes with implementation considerations including organisational structure and resourcing, measurements, etc.

### 1.1 Climate Change

Climate change refers collectively to changes in climates around the world resulting from increased accumulations of "greenhouse gasses" in the atmosphere, the most prevalent of which is carbon dioxide (CO<sub>2</sub>). These greenhouse gasses trap the sun's rays causing the planet to warm – an effect similar to a greenhouse. While the global average temperature change is slight, this warming results in significant regionally specific changes in the climate.

While natural processes, such as the decomposition of trees, emit large amounts greenhouse gases, the total amount of these gases in the atmosphere has historically been kept in balance by other natural processes, such as the growth of new trees (a process referred to as sequestration). The rapid increase in the use of fossil fuels for transportation, heat, and power is releasing large amounts of carbon into the atmosphere that has been trapped in the earth's crust for thousands of years and is upsetting the natural balance. In Vancouver, addressing climate change by reducing greenhouse gas emissions is synonymous with reducing the direct or indirect use of fossil fuels including those used to move vehicles, heat our buildings and water, and generate electricity<sup>1</sup>. This climate change plan is also Vancouver's community energy plan and improved energy and fuel efficiency is used synonymously with greenhouse gas emission reductions.

At a national or global scale, increased carbon sequestration through means such as reforestation may play a role in addressing climate change. At the urban scale, while planting trees has many positive social and environmental benefits, the amount of carbon sequestered is not sufficient to play a meaningful role in a climate change plan.

The impacts of climate change are regionally specific but for Vancouver they are likely to include:

- summer droughts
- winter flooding
- increased frequency of extreme weather events
- fluctuations in energy and water supplies
- species extinction mainly resulting from habitat changes
- new diseases

While these local impacts are of considerable concern, the impacts of climate change in the developing countries are expected to be much more significant and could result in major social upheavals and population displacements. With large populations living close to coasts, rising sea levels and increasingly frequent and intense tropical storms could be devastating. In addition, most developing countries do not have the financial resources or infrastructure in place to deal with these events or disruptions of food supply, new diseases, landslides, etc.

## **1.2 Vancouver Context**

Vancouver is a city of nearly 600,000 citizens at the heart of a metropolitan region of nearly 2.1 million people. Located on Canada's south-western Pacific coast, Vancouver enjoys a relatively moderate climate. Partially because of its climate and attractive location, it is an appealing destination for both immigration and national migration; Vancouver is expecting that its population will increase nearly 30% from 1990 levels by 2012.

A combination of factors, including natural limitations on horizontal growth and a transportation planning approach that limits the priority placed on automobiles, has resulted in densification and the development of walkable, mixed-use communities. As a result of this "smart growth", our per capita greenhouse gas emissions are less than half of those for most other Canadian municipalities. Compact communities close to employment nodes have resulted in overall decreases in automobile travel by residents and the average residential energy intensity is decreasing as growth is accommodated in more efficient, higher density building forms.

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<sup>1</sup> While much of British Columbia's power is produced from hydro-electricity, our hydro-electricity capacity peaked in 1995; since that time all new demand has effectively been met with natural gas or coal generated electricity production.

In addition to Vancouver's planning approach and development trend, the City is very committed to addressing climate change. The City of Vancouver was one of the original signatories to the national Partners for Climate Protection initiative and in December, 2003 the City approved a Corporate Climate Change Action Plan outlining the steps and committing the resources to realize a 20% reduction in greenhouse gas emissions below 1990 levels by 2010 from its own operations. This included energy use in its own civic facilities, buildings, and fleets. The Corporate Plan was developed to be useful as a model for community change:

- o the actions required to make these significant reductions are largely expected to pay for themselves; and
- o many of the initiatives have been designed so as to be replicable by individuals and corporate citizens alike.

Some of the challenges that Vancouver faces in reaching its greenhouse gas reduction target include:

- o increasing carbon intensity of electricity as our power increasingly comes from fossil fuel powered generation;
- o the combination of energy prices that are amongst the lowest in North America with low usage due to our mild climate makes the economics of energy conservation less attractive than in many other jurisdictions
- o a regional approach to transit planning and our compact development pattern has the demand for transit surpassing supply capacity.

### **1.3 Greenhouse Gas Emissions Profiles and the Reduction Target**

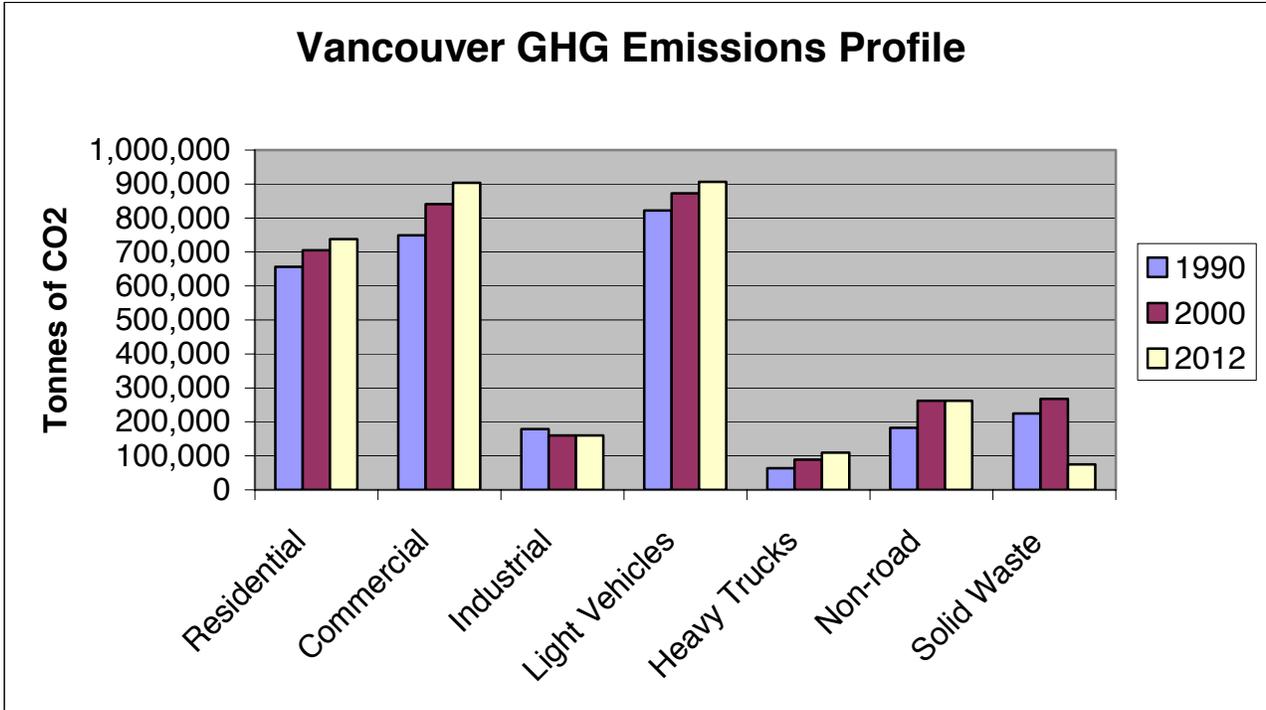
The greenhouse gas emissions profile for Vancouver (below) illustrates the relative contributions of buildings, vehicles, industry and other sources. The 2012 projection is based on "business as usual" as suggested by historical trends. It is immediately evident that the three largest greenhouse gas emission sources in Vancouver are residential buildings, commercial buildings, and light vehicles such as cars, small trucks and mini-vans.<sup>2</sup> A detailed discussion of the methodology, data sources, and assumptions inherent in this backcast and forecast is presented in *Appendix A2: Vancouver Community Greenhouse Gas Emissions Profile Methodology*.

The scale of emissions from existing sources far exceeds those associated with growth projected between now and 2012. As a result, meeting a 2012 reduction target cannot be based solely on improving the energy performance of new buildings and vehicles, but must have a central focus on reducing energy use and associated emissions from existing sources through building energy retrofits, fuel switching and operational improvements.

Other important implications of the emissions profile (both what is included as well as what is excluded) are discussed below.

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<sup>2</sup> It is important that the reader does not confuse greenhouse gas emissions with "common air contaminant" emissions. In this report, unless specified otherwise, emissions refer to greenhouse gas emissions.



**Solid Waste and Landfill Gas Recovery**

The solid waste greenhouse gas emissions in Vancouver’s greenhouse gas emission profile are largely caused by the decomposition of organic materials, such as food scraps, yard waste and paper, at landfills. Vancouver and the Greater Vancouver Regional District have been very successful in limiting these emissions through programs such as recycling and the landfill paper ban. Even more significantly, between 2000 and 2003 Vancouver implemented a large scale landfill gas recovery and cogeneration project that reduced solid waste related greenhouse gas emissions by 75% (a reduction of 200,000 tonnes per year) while simultaneously generating enough electricity to power 11,000 homes and to heat a nearby greenhouse.

Without the landfill gas recovery and cogeneration project, a 6% reduction target would not have been a realistic goal for Vancouver to pursue.

**Notable Omissions from the Profile**

Greenhouse gas emissions that are significant at the regional and national scale but are not included in Vancouver’s emissions profile include those from air travel and transportation, heavy rail goods movement, and marine transportation. The City’s ability to impact or even influence these emissions is very limited, and would require significant program attention from a provincial or national level.

In addition, while there is considerable energy “embodied” in the production of food, materials, and consumer goods, it is nearly impossible to measure the associated greenhouse gas emissions unless this production occurs within the City – the emissions associated with production of goods are attributed to the specific location where the production occurred. This plan does not outline a strategy to reduce these impacts, but citizens should be aware that consumption of food, materials, and consumer goods contribute to global greenhouse gas emissions. In general, the greater the distance

from production to consumption points, the larger the emissions that could be attributed to a particular product.

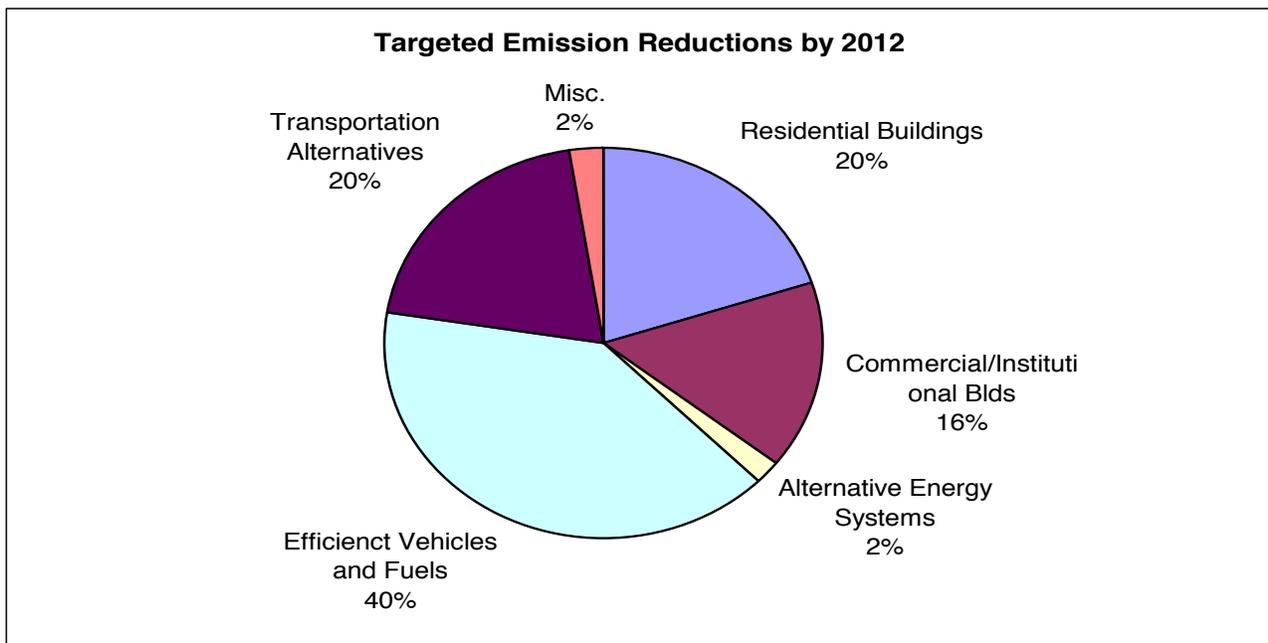
### Greenhouse Gas Emissions Reduction Target

The Cool Vancouver Task Force recognized the importance of setting a target that would challenge the entire community to make real emissions reductions. At the same time, the target had to be one that could be achieved through concerted and coordinated efforts. The Cool Vancouver Task Force has recommended Vancouver adopt a 6% reduction target in greenhouse gas emissions from 1990 by 2012.

In order to quantify the total emission reductions required to meet the 6% reduction target the following annual emissions inventory numbers have been established:

- 1990 GHG emissions for Vancouver = 2.9 million tonnes (6.0 tonnes/person)
- 6% reduction from 1990 baseline = 2.7 million tonnes
- 2012 Business-as-usual forecasted GHG emissions = 3.2 million tonnes

Meeting the 6% emission reduction target means that Vancouver must reduce its forecasted annual GHG emissions by **450,000 tonnes** between now and 2012 - this would translate into per capita emissions of 4.3 tonnes. A breakdown of where these emission reductions are targeted to come from is illustrated below:



Note that while Alternative Energy Systems plays a relatively small role in meeting the 2012 target, it is expected the strategies and actions in this part of the Plan will play a rapidly increasing and very significant role beyond 2012.

## 1.4 Understanding This Plan

Based on Vancouver's greenhouse gas emissions forecast and the opportunities for reducing those emissions, we have organized this plan into the following seven categories:

- Community Engagement (essential for reductions in all categories)
- Residential Buildings (existing and new)
- Commercial Buildings (including institutional facilities)
- Energy Systems (alternative sources of energy such as ground source heat, cogeneration, etc.)
- Transportation Alternatives (walking, cycling, transit)
- Vehicle and Fuel Efficiency
- Implementation Considerations (organizational structure, measurement, reporting)

Each of the following sections describes the goal or targeted emission reductions from the strategies in that section, provides some important contextual information, describes the general strategies to meeting the 2012 target, and provides specific recommended actions to initiate implementation of those strategies.

## 2.0 Community Engagement

### OBJECTIVE

***Change individual and corporate behaviours with regard to transportation choices, vehicle operations, and energy efficiency.***

### 2.1 Context

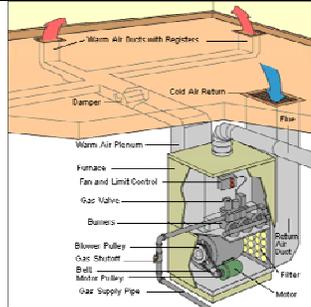
Greenhouse gas emissions relating to individual choices in residential energy use and personal mobility account for over half of all emissions in Vancouver. If we are to achieve our greenhouse gas emission reduction target, Vancouver residents must come to embrace a number of changes in their personal choices. As such, engaging the entire community through outreach efforts by the City, other organizational partners and community leaders is the first and single most important element of this plan. The remaining sections of the plan describe ways in which these other players can make individual changes easier and more attractive.

The key strategies for Vancouver's *community outreach* are to:

- create a shared community vision;
- connect individuals to the resources required to facilitate the desired behaviour changes;
- engage partners with a wide diversity of interests; and
- to empower community champions to lead the way.

There are numerous small and large ways in which an individual can reduce their energy usage and therefore their greenhouse gas emissions. These methods range from using compact fluorescent lights in high use areas to buying an energy efficient furnace. The federal government, through Environment Canada, has developed one program to help individuals learn about and make changes. The One Tonne Challenge is a national program to encourage Canadians to reduce their greenhouse gas emissions. The One Tonne Challenge is being promoted widely through several information channels, which is helping to raise awareness and enable action by individuals. Visit <http://www.climatechange.gc.ca/> for a comprehensive listing of the ways in which you can help to meet the greenhouse gas reduction target, improve our air quality, save money, and get healthier all at the same time.

The table below identifies the top ten behaviours that will provide the greatest impact for the cost and effort required. The list starts and ends with two opportunities that arise infrequently, but would have large and lasting impacts. The changes identified below are appropriate for homeowners and renters alike. Even if a landlord is unwilling to help pay for the up-front costs, many of these steps pay for themselves so quickly that a renter could realise the financial benefits directly.

Opportunity	Typical Annual Savings	Savings over 5 yrs	Estimated Cost	Other Benefits	
<p><b>Purchase an EnerGuide Evaluation</b> prior to home renovations</p> <p>- an EnerGuide evaluation provides accurate information on energy savings opportunities for your home.</p>	\$250	\$1,250	<p>\$75 - \$150 for evaluation</p> <p>Incremental costs of energy efficient retrofits varies</p>	<p>Access to federal grants and low rate financing.</p> <p>Typical grants in BC are \$1,500</p> <p>Increased resale value of home</p> <p>Increased health and comfort of home</p>	
<p><b>Draft Proof</b> (caulking and weather stripping) home</p>	\$100	\$500	\$500 - \$800	<p>Increased comfort through reduced drafts and street noise</p>	
<p>Install a <b>high efficiency furnace</b> upon replacement</p>	\$250	\$1,250	\$600 <sup>3</sup>	<p>Increased safety from combustion spillage</p> <p>Improved indoor air quality</p>	

<sup>3</sup> Based on the cost to upgrade from a mid efficient furnace

<p>Install a <b>low-flow showerhead</b></p>	<p>\$25</p>	<p>\$125</p>	<p>\$10 -\$50</p>	<p>Never run out of hot water</p>	
<p>Turn your <b>thermostat</b> down at night or when on holiday</p>	<p>\$100</p>	<p>\$500</p>	<p>Free!</p>	<p>A cooler room facilitates sound sleep Vegetables left out less likely to spoil</p>	 <p>©2001 HowStuffWorks</p>
<p>Keep your <b>vehicle well maintained</b></p>	<p>\$200</p>	<p>\$1000</p>	<p>Varies but should be part of regular maintenance</p>	<p>Reduced air pollution Increased reliability Increased durability</p>	
<p>Measure your vehicle's <b>tire pressure</b> once a month and reduce vehicle <b>idling</b> by 5 minutes/day</p>	<p>\$200</p>	<p>\$1000</p>	<p>Free!</p>	<p>Reduced air pollution Increased safety Increased tire life</p>	

<p>Buy the most <b>fuel-efficient vehicle</b> that meets your everyday needs</p>	<p>\$300</p>	<p>\$1,500</p>	<p>\$0</p>	<p>Different vehicles in the same class range in fuel economy with no incremental capital cost.</p>	
<p>Leave your car at home for your work <b>commute</b> one day per week</p>	<p>Variable</p>			<p>Improved health and fitness</p> <p>Reduced air pollution</p> <p>Sense of community</p>	

In addition to the measures listed above, there are significant opportunities to reduce greenhouse gas emissions by eating more locally produced fruits and vegetables, as these require less energy and resources to produce and transport. This plan does not highlight several opportunities to reduce greenhouse gas emissions through our general purchasing habits, as these emissions are very difficult to measure and are unlikely to contribute toward our emissions reduction target.

If this plan is to succeed, Vancouver citizens must make those changes (small or large) that work for them and celebrate their contribution to being part of the climate change solution. In this way, neighbours and friends help each other play their role in a positive manner.

## Barriers

Despite all of the benefits to individuals and society in making these behavioural changes, there are a number of barriers to community-wide changes in behaviours and attitudes.

- **Awareness:** Generally low level of awareness by the general public about the connection between energy consumption by individuals in their homes and vehicles, and the resulting impacts on the environment.
- **Cost and Convenience:** Encouraging changes in people's behaviour in relation to energy consumption and fuel usage faces the real and perceived barriers of cost and convenience (both at home and in their transportation choices).
- **Delayed Gratification:** While these behaviour changes offer many benefits to the individual, as well as society in general, these benefits are often not immediate.
- **Responsibility:** Even when the benefits and ability to change rest directly with the individual, there is often a perception that "someone else" should be responsible for making the change happen.
- **Societal Norms:** Societal norms and practices are still structured in such a manner that some forms of sustainable energy consumption are viewed by mainstream society as marginal or fringe behaviour.
- **Long-term Commitment:** The success or failure of a community outreach program cannot be measured in fiscal years or electoral terms; Vancouver must be prepared to engage in these changes for a minimum of 7 years and a sustainable shift may take a generation or more.

The remainder of the Community Outreach section of this plan describes these behaviour changes, and describes the strategy and priority actions that the City can pursue to begin the subtle but fundamental shift in how people use energy in Vancouver.

## 2.2 Strategies and Initial Actions

As described earlier, most of Vancouver's greenhouse gas emissions are directly related to individual choices and decisions; if our ambitious community greenhouse reduction target is to be achieved there needs to be widespread sense of both individual responsibility as well as power for making the required incremental changes in our lives. Vancouver's strategy to foster this environment is to create a shared community vision based on common values, to connect individuals to the resources to make changes easy, to engage partners with a wide diversity of interests, and to empower community champions to lead the way.

As a first step, the City is currently engaged in extensive community research process, combining qualitative research (focus groups), quantitative research (telephone surveys), and participatory

community research through Open Space Technology sessions. The research program has been designed to identify key market segments, barriers to beneficial behavioural changes within those market segments, and potential motivators and triggers for change. Results of this research will be used to inform a comprehensive and detailed community engagement plan for climate change. This strategy will include specific initiatives that offer the greatest promise to act as catalysts for wide-spread behavioural change.

With the help of federal funding under the One Tonne Challenge program, the City has a full-time Community Outreach Coordinator tasked with the responsibility of coordinating the development and implementation of the Community Outreach strategy.

## S2 Engagement Strategy

### A Create a Shared Vision

In order to make the required fundamental shift in how Vancouver uses energy, it will be essential to create a shared sense of purpose and accomplishment among individuals, non-profit organizations, neighbourhoods, communities and businesses with the aim of galvanizing the community in pursuit of a common goal and vision. It is easy to say but a considerable challenge to do. Recognizing that all of these steps will take time, some of the factors to address include:

- Long-term commitment
- Create a unifying message and “umbrella” brand for greenhouse gas reduction initiatives in Vancouver and make them visible throughout the community over time
- Position the Community Climate Change Action Plan and the overall “umbrella” brand in a wider context than environmental benefits, tailoring messages to connect with personal motivators and triggers within different segments of the Vancouver population. Focus must be to encourage small first steps as a means of generating momentum and a sense of shared success.
- Establish a Community Leadership Council that brings together leaders from the City, business, the non-profit sector, and the community to provide the direction, support and commitment of their organizations.

#### **Initial Actions**

- A2.i Secure a long-term resource commitment from Council to ensure greenhouse gas reduction initiatives in the community remain a priority until at least 2010.
- A2.ii Develop a name, visual identity, brand and slogan for the Community CCAP that will be applied to all communications and marketing materials. The brand must be bold, memorable and compelling.
- A2.iii Conduct launch advertising to position the umbrella brand and raise awareness of Vancouver’s commitment to reaching Kyoto targets and reducing greenhouse gas emissions.
- A2.iv Conduct a coordinated, proactive media relations campaign with mainstream, community and multicultural media to build awareness for the Community CCAP and to highlight successes and action in the community.
- A2.v Identify existing and develop new annual public and community events that will generate community and media interest in Vancouver’s Community CCAP initiatives.

S2 Engagement Strategy

**B Develop Diverse Partnerships**

The ways in which individuals will identify with the “shared vision” and their motivations for changing their own behaviour are likely to vary greatly. By coordinating our efforts with a wide diversity of partners and by supporting their programs where appropriate, we can make the shared vision personally relevant to the greatest number of people and enhance each of the separate initiatives. These partners will include existing organizations and programs that are currently promoting at least one of the same behaviours described in this Plan. Program partners will include environmental protection, energy conservation, outdoor recreation, social responsibility, air quality, health and fitness, safety, personal savings and others.

*INITIAL ACTIONS*

A2.vi Identify existing programs in the community focused on health, safety and the environment (i.e., *Way to Go*, Action Schools, Vancouver School Board’s Cool Schools initiatives, BOMA’s “Go Green” Program), and find ways to support and extend the reach and impact of these programs with additional resources and tools.

A2.vii Coordinate with corporate leaders and business associations to establish support for and participation in Climate Change Action Plan initiatives.

S2 Engagement Strategy

**C Empower Community Champions**

A shared vision that is meaningful to the entire community requires more than just a unifying “brand” and message; it must be relevant to individual interests and values. The best way to connect such a wide diversity of people and their interests to a common goal is to work with people that they trust and who understand them, such as teachers, involved neighbours, religious leaders, or the head of a local community group. In order to encourage these community champions to engage their friends and neighbours, the City and its other partners must develop tools that are useful to these champions and make resources available to them. By placing these resources into the hands of community champions, we can unleash their creativity and commitment.

Two significant groups that will receive particular focus in this outreach effort are multi-cultural communities and youth. Over half of Vancouver’s population has a first language other than English and, in order to realize widespread shifts in the entire community’s behaviours with regard to energy, it will be critical to work with the unique strengths of the multi-cultural communities and communicate with these citizens in an effective way.

Similarly, youth offer two unique opportunities. First they can act as powerful influencers in family decisions and behaviours. In addition, facilitating their role in broader community action not only taps into their energy and creativity, but it also prepares the future leaders of tomorrow.

*INITIAL ACTIONS*

A2.viii Identify, map, engage, and support existing community organizations, school programs, and networks as a means of encouraging change and identifying useful tools that could be provided to assist them. These groups include, but

will not be limited to, youth and environmental organizations, multicultural communities, churches, community and neighbourhoods associations.

- A2.ix Develop and fund a community grant program that provides resources to capable community champions and non-governmental organizations that have a well conceived plan or initiative to reduce greenhouse gas emissions consistent with this Community Climate Change Action Plan

S2 Engagement Strategy

D **Connect Individuals to Tools**

While a common vision and empowered community champions can create strong motivators for change, if there are significant barriers to actually making this change, such as cost or convenience, the likelihood of a change decreases. The majority of this Community Climate Change Action Plan describes ways in which organisations such as the City, TransLink, the federal government and others can make the desired behaviour changes as easy and attractive as possible through information, incentives, programs or other means.

*INITIAL ACTIONS*

A2.x Launch a central Web portal that provides residents with relevant information to their situation that will become the “go-to” place for information, tools, resources and support for community actions to reduce greenhouse gas emissions.

A2.xi Ensure that the communications of all City initiated and/or funded programs include links to relevant tools.

### 3.0 Smart Growth

The most important long-range strategy for managing housing and transportation related green house gas emissions in an urban context is land use planning for higher density, mixed use, walkable communities – frequently referred to as smart growth. Vancouver’s history of smart growth development<sup>4</sup>, along with our relatively mild climate, are the key reasons that greenhouse gas emissions on a per capita basis are about ½ to 1/5 what they are in other Canadian cities. Not only is this a fundamental approach to limiting and even reducing greenhouse gas emission in the long term, land-use planning is largely within the control of local governments enabling them to take meaningful, independent action. It is important to note though, that land-use change is relatively slow and therefore, other than development already under way (e.g. South East False Creek, Fraser Lands, C-2 housing above shops, and Knight & Kingsway Neighbourhood Centre) cannot be central in meeting a short-term reduction goal like 6% by 2012.

The reason smart growth development is key to limiting and reducing greenhouse gas emissions is that it reduces dependence on the automobile while simultaneously supporting the development of a more energy efficient built form. Higher density development that incorporates a mix of uses such as housing, employment, retail, and recreation in relatively close proximities make it easier to walk or cycle for a more of our daily trips. At the same time, higher densities also make transit increasingly cost effective and enable better service. As a result of building housing close to jobs in Vancouver and maintaining sites for services close to the core, emissions from cars and light trucks increased less than 6% from 1990 to 2000 despite a population increase of 18% and a shift towards less fuel efficient vehicles. AirCare and ICBC data indicates that while the total number of Vancouver insured vehicles increased over this period, the distance traveled per vehicle and the total distance traveled by all vehicles actually decreased. This finding is consistent with the results of TransLink’s 1999 Trip Diary Study that indicated that automobile trips originating in Vancouver decreased slightly, in terms of both mode share and the total number of trips.

In addition to reducing the reliance on automobiles for personal mobility, higher density development frequently includes a greater amount of attached housing. Townhouses, apartments and condominiums are often smaller than single family, detached homes and require less energy to heat. Exterior walls and windows along with roofs are where a home losses most of its heat. When homes share one or more walls and/or are stacked one atop another, there is less heat loss area for each individual home.

#### **Initial Actions**

- A3.i Continue supporting the principles of smart growth when considering major transportation and land use decisions. Increasing density around rapid transit stations and ensuring that Vancouver’s growth includes new employment opportunities are particularly important.

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<sup>4</sup> Some of Vancouver’s notable smart growth approaches since the early 80’s include the successful mixing of housing, retail, and office space downtown; the mixed-use residential/commercial development along transit lines throughout the city; encouragement of job and housing intensification at transit stations; allowing secondary suites throughout the single family neighbourhoods; and planning for neighbourhood centres combining ground-oriented moderate density housing, retail and services in single family neighbourhoods.

## 4.0 RESIDENTIAL BUILDINGS

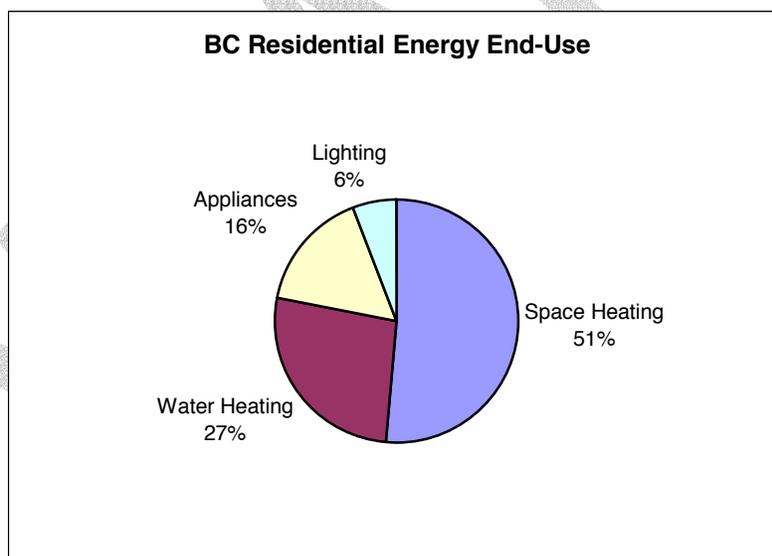
### Goal

**Reduce annual greenhouse gas emissions resulting from energy use in residential buildings by 12% (or 90,000 tonnes) by 2012**

- 25% of detached housing improve energy efficiency by 30% through retrofits (38,000t)
- 35% of all housing improve energy efficiency by 15% through appliance replacements and do-it-yourself improvements (38,000t)
- Retrofit non-market housing to improve energy performance by 15% (9,000t)
- 25% improvement in efficiency for new construction compared to 2000 by 2012 (5,000t)

### 4.1 Context

Residential energy use in Vancouver accounted for just over one fifth of all of Vancouver's Greenhouse Gas emissions in 2000. Over three quarters of energy use in the home is for space and water heating. Improving the efficiency of heating appliances such as furnaces and hot water tanks, reducing residential heat loss with improved insulation, windows and draft-proofing, and reducing the amount of hot water used are key in achieving significant greenhouse gas emission reductions in the residential sector.



Existing detached/semi-detached housing are responsible for the majority of the residential greenhouse gas emissions and have greatest opportunities for voluntary retrofits (resulting from high percentage of owner occupation and focus of existing incentives). These form the first priority for residential action in this plan.

- The EnerGuide for Existing Housing (EGH) program provides homeowners with an unbiased rating of *their* home's energy performance and customized information on how energy is used in their home. This enables them to evaluate and prioritize home energy improvement opportunities.

- Home owners that undertake retrofits and measurably improve their EnerGuide for Houses rating receive federal grant money relative to their energy performance improvement (typically in the \$1,000 range)
- BC Hydro, Terasen Gas, VanCity, and numerous furnace manufacturers frequently offer financial incentives for energy efficient retrofits and appliance replacements

Some of the most significant barriers to home energy efficiency improvements that need to be overcome include:

- High initial cost for major retrofits and uncertainty regarding the potential savings
- Lack of awareness and information regarding home energy retrofit opportunities and benefits, partially because every house is unique
- Lack of awareness of do-it-yourself improvement opportunities, how to identify and locate quality goods and services, and government/utility programs and incentives
- Inconvenience
- Landlords are typically responsible for housing improvements but in most cases the benefits of improved energy performance are experienced by the renter

## 4.2 Strategies and Initial Actions

Home energy retrofits will depend upon resident demand, convenience, and financial benefit.

### S4 Residential Buildings Strategy

#### A Develop a Shared, User-Focused Information Resource

Effective community outreach, creating a market for home energy efficiency, and promoting do-it-yourself improvements all will depend (in-part) on providing reliable, easy-to-access, and useful information to residents. While numerous information sources are available (Government of Canada, utilities, non-government organizations, etc.), there is no one place where Vancouver residents can turn to for easily accessible information that is relevant to them regarding home energy efficiency. Correspondingly, public institutions do not have a unified message on this matter.

In order to maximize convenience and effectiveness, current information and resources should be offered to residents in such a way that it is relevant to their needs and opportunities. It must take into account their housing type and tenure, language preferences, and information access modes.

This information should include:

- Opportunities for, and benefits to, improving the energy efficiency of their home
- How to identify and locate quality goods and services to improve the energy efficiency of their home
- How to undertake small do-it-yourself home energy efficiency improvements
- What rebates, grants, incentives, and financing is currently available for the improvements they are considering

### S4 Residential Buildings Strategy

#### B Create a Market for Energy Efficiency

There are many large and small improvements that can be done to most homes that are both cost effective and environmentally beneficial. If large scale home energy improvements are to be achieved, it will be essential to create a market for them.

Community engagement (as described in Section 2.0 ) that makes citizens more aware and committed to the opportunities, incentives, and benefits of energy efficiency are an important start to creating a market, but these alone are unlikely to result in widespread home energy improvements.

Central to creating a market for these changes is to create business opportunities relating to the promotion of energy efficiency for companies involved in home renovations and financing. Contractors, hardware/appliance stores, and financial institutions are typically who the public deal with when considering a small or large home improvement project – these players will be the most effective in “selling” energy efficiency if they have the tools and there is a benefit for them to do so. Working with these natural “first contact points” helps to create demand, makes energy efficient choices more convenient, and makes energy efficiency more financially appealing because only the incremental cost for the more efficient option need be recovered through the cost savings.

Additional private partners could include realtors and private property assessors that support and recognize the value of energy efficiency in the services they provide to their customers.

#### *INITIAL ACTIONS*

- A.4i Build a partnership with utilities, contractors (and their associations), financial institutions, hardware stores, and other business interests to develop, maintain and cooperatively promote a shared, user-focused information resource and related materials (Web, print, etc.) on home energy efficiency improvements. Community outreach and marketing activities of all the partners would direct the public to this shared resource which in turn, would direct homeowners and renters alike to all of the relevant public resources and private services available to assist them in improving the energy efficiency of their home.
- A.4ii Develop and deliver a training session for all public and private sector staff that interact with the public to educate them about the “shared information resource” and to motivate them to promote energy efficiency improvements.

#### S4 Residential Buildings Strategy

##### **C Support Do-It-Yourself Improvements**

Major home energy improvements such as replacing an appliance, furnace, or windows are fairly expensive undertakings and will be difficult for many residents, especially renters, to seriously consider based on energy considerations alone. For those residents not already considering a major home improvement, there are a number of simple changes they can make around their home to measurably reduce energy consumption and save money.

Supporting these do-it-yourself improvements can include:

- Clearly identifying relevant small improvements and their benefits
- Providing user-friendly information to assist in identifying and locating quality products as well as information to make installation easy for those that fail to qualify as “handy”
- Providing incentives utilizing innovative and easy access delivery mechanisms

#### *INITIAL ACTIONS*

- A.4iii Work with utilities and building consultants/contractors to identify and guide the implementation of priority “do-it-yourself” home energy improvements
- A.4iv Develop and pilot a “do-it-yourself” home energy improvement incentive program

S4 Residential Buildings Strategy  
D **Retrofit Non-Market Housing**

There are approximately 21,000 non-market housing units in Vancouver comprising nearly 9% of the total stock. BC Housing and non-market housing groups own and operate the majority of the units while the City itself is responsible for the remainder.

The City has committed to improving the energy performance of the non-market housing that it owns and operates as part of its Corporate Climate Change Action Plan. In addition, BC Housing is presently developing a pilot program to retrofit those non-market housing units that it owns and operates. If their pilot proves to be successful, they aim to expand the program to those units owned and/or operated by non-profit groups as BC Housing is largely responsible for funding their operations.

Using lessons from Toronto, there may be an additional opportunity to use these non-market housing retrofits as case studies and demonstration projects to catalyze greater retrofit activity in multi-family market housing.

S4 Residential Buildings Strategy  
E **Support Multi-Family Building Retrofits in Partnership with Central Decision Makers**

While individual households within multi-family housing developments, such as condominiums or rental apartments, will be able to cost effectively reduce their energy use through a variety of small improvements, deeper energy reductions will require more centralized and coordinated action.

Both Terasen and BC Hydro offer free walk-through audit services to identify potentially cost-effective energy efficiency improvements, many of which have payback periods of less than three years. For many buildings, these include activities such as:

- Heating, ventilation, and hot water system maintenance and control adjustments
- Common area (and external) lighting upgrades and washing machine replacements
- Improved windows, insulation, and air barriers when undertaken at time of building remediation (i.e. leaky condos)

In addition, the utilities and the Federal Government also have retrofit incentive programs.

To facilitate greater retrofit activity in multifamily buildings, government and local utilities will need to work closely with housing organizations such as property management companies, strata corporations, and homeowner/renter associations to determine what tools would be most useful to them when considering energy efficiency improvements. As only about half of the buildings with water egress problems (the “leaky condos”) have already had remediation work completed, tools to support the remaining building owners and managers will be a high priority as many efficiency opportunities are much more cost effective when work on the building envelope is already planned for other reasons.

*INITIAL ACTIONS*

- A4.v Develop and distribute information on energy efficiency improvement opportunities and resources that should be considered when undertaking building remediation work for “leaky condos”
- A4.vi Development a comprehensive multi-family housing retrofit strategy in consultation with stakeholders and through an evaluation of similar existing programs

S4 Residential Buildings Strategy  
F Utilize Appropriate Regulatory Mechanisms

There are a number of regulatory approaches for building and appliance performance that, *if used appropriately*, could be very effective in reducing energy usage. While the City has only limited regulatory jurisdiction over energy efficiency in existing buildings, it should exercise those powers it does have (especially regarding new construction) while working with the Provincial and Federal Governments to ensure that they do the same (with regards to buildings, building components such as windows, and appliances).

The bulk of new housing built in the city will be multi-family developments. The City of Vancouver's recent action to update the Vancouver Building Bylaw to reference the 2001 version of ASHRAE90.1 will increase the energy efficiency requirement for multi-family and large commercial/institutional buildings by approximately 13%. While this is the most aggressive building efficiency bylaw of any municipality in Canada, Vancouver is well positioned to pursue even greater performance levels from new buildings and is presently developing a comprehensive green building strategy. This strategy, expected to be complete by spring of 2006, will signal to developers the City's intention to require a further 12% energy performance improvement in new large residential and commercial buildings by 2010. The combined 25% improvement is consistent with current federal green building incentive money (CBIP) and LEED Canada prerequisites.

Vancouver developers are at the leading edge of the green building movement in North America. As a result of their learning associated with the planning of South East False Creek as well as through their own market assessment and initiative, 20% of all LEED registered green buildings in Canada are in Vancouver, where only 2% of the nation's population resides.

To help designers and developers gain experience with advanced energy performance standards, all wood frame and concrete buildings in South East False Creek will be required to meet R2000 (or Energuide 80) or CBIP standards respectively. In addition, the City is presently considering allowing buildings on some select sites in the city to exceed the maximum height limitations; buildings on these sites should be required to meet a higher standard of energy and environmental performance.

While the opportunities for the City to effectively regulate energy performance for existing housing is much more limited, a preliminary analysis of the market penetration and economics for high efficiency replacement furnaces in detached houses suggest this may be one opportunity for the City to effectively exercise its regulatory powers.

Most regulatory tools for energy efficiency rest with the Provincial and Federal governments. The BC Ministry of Energy and Mines is currently assessing appliance efficiency standards and is considering regulatory and taxation approaches to improved energy efficiency. Due to changes in technology and building practice, it will be important that these regulations are reviewed regularly to ensure that they continue to be an effective tool in supporting improved energy efficiency.

*INITIAL ACTIONS*

- A4. vii Evaluate, consult, and report back on requiring high efficiency replacement furnaces in existing detached houses in Vancouver.

**5.0**

## COMMERCIAL AND INSTITUTIONAL BUILDINGS

### Goal

***Reduce annual greenhouse gas emissions resulting from energy use from Commercial and Institutional Buildings by 8% (or 70,000 tonnes) by 2012***

- 25% of medium and large commercial buildings improve energy efficiency by 20% through a combination of retrofits, equipment replacement, and operator training (17,000t)
- 20% of small commercial buildings improve energy performance by 15% through a combination of small retrofits and equipment replacement (9,000t)
- 85% of institutional buildings improve energy efficiency by 15% through a combination of retrofits, equipment replacement, and operator training (28,000t)
- 25% improvement in efficiency for new construction compared to 2000 by 2012 (5,000t)

### 5.1 Context

Energy use in commercial and institutional buildings in Vancouver accounted for just over one quarter of all of Vancouver's greenhouse gas emissions in 2000, essentially tied with light duty vehicles as the single largest source in the city. While many commercial buildings in Vancouver have implemented energy improvements with short payback periods, changing market conditions and aging building stock provide new opportunities for more ambitious energy use reductions.

Vancouver's business community and institutions have a history of embracing energy improvements that establishes the foundation for additional action. Of note, Langara College has received national awards recognizing its energy performance improvements and Vancouver schools have the lowest average energy usage in the province. The Building Owners and Managers Association (BOMA's) relatively new "Go Green" program is increasing awareness of energy use and its impacts amongst building owners and may provide a good, industry accepted mechanism for action.

While some local institutions have or are currently planning some significant energy improvement programs, the long-term ownership that is typical for institutional facilities means that there are still significant energy savings opportunities to be realized. Some important factors that provide optimism that significant additional improvements in energy performance and therefore reductions in greenhouse gas emissions are possible include:

- new institutional commitments to improved energy efficiency (City of Vancouver = 20% by 2010, the BC Building Corporation = 12% in provincial buildings by 2007; and Vancouver Coastal Health Authority is planning a comprehensive energy retrofit program)
- energy price increases
- renewed BC Hydro commitment to energy conservation through Power Smart funding as well as other utility and government incentive and assistance programs
- a significant portion of Vancouver's medium and large commercial buildings will require energy equipment replacements (due to age) in the next 5-10 years
- significant provincial funding for seismic upgrades in Vancouver schools has recently been announced (\$87.5 million for 16 Vancouver schools in the first 3 years) – as over 80% of Vancouver schools have been identified as requiring seismic upgrades, this presents a number of new and cost effective opportunities for efficiency improvements
- despite their high upfront costs, many energy improvements are very good financial investments over the medium to long term

- improved maintenance, operator training, and building recommissioning may all offer ways to realize immediate and very cost effective energy savings

While these new or renewed opportunities provide reason for optimism, it would not be responsible to assume that significant energy efficiency improvements are assured. Some of the barriers to be addressed include:

- Energy costs are not a significant portion of operational expenses and are not (yet) a significant factor in attracting or retaining building tenants
- Institutions (and small commercial owners/operators) have limited access to resources and strong core service/business responsibilities take a higher priority than emission reductions
- Commercial building owners/operators are not confident that capital investments in energy improvements can be recovered upon sale of the building
- Unlike the common practice amongst professionally managed buildings, the lease language for small commercial buildings may not provide the owner with a mechanism to recover retrofit costs from the tenants who would be benefiting from the decreased energy costs
- complexity/inflexibility/lack of familiarity with existing retrofit programs, funding, and retrofit services
- Lack of staff time to pursue opportunities
- Budgeting protocols often don't support investments in energy efficiency

## 5.2 Strategies and Initial Actions

### S5 Commercial Buildings Strategy

#### A Facilitate Access to Existing Resources

There are many existing programs, funding sources, and services available to facilitate energy efficiency improvements in existing commercial and institutional buildings yet access to these resources is limited due to lack of familiarity amongst building managers. In addition, managers may be sceptical of the resources available. Developing mechanisms to make it easier for staff to understand and evaluate what tools are available to them would compliment these programs and lead to greater uptake.

In addition, many facility managers do not have the time to pursue changes to these existing programs that would make them more “user-friendly”. Many programs are designed and delivered by people without the opportunity to develop a good understanding of the needs of their target users. A shared advocacy strategy to propose changes to these programs would remove the burden for change from any single manager, create a strong unified voice for the desired changes, and ultimately could increase uptake of these programs to the benefit of all.

Some ways to achieve these that will need to be explored with both institutional and commercial building managers include:

- A mechanism to facilitate peer-to-peer sharing
- Coordinated, external presentations on relevant topics
- Creation of a user-responsive database of funding and support programs offered by a wide range of institutions (GVRD, BC Hydro, Terasen, senior government, etc...)
- Access to a coordinated team of experts that could assist managers in developing and implementing a retrofit program and coordinate advocacy for changes to funding programs

#### *INITIAL ACTIONS*

- A.5i Establish a program and venue where managers and staff of different institutions can share their respective information and experiences on a regular basis regarding the successes and challenges of instituting retrofits. This group can be used to leverage resources across institutions and to advocate for program development and changes to most effectively and efficiently serve their needs.
  
- A.5ii Seek resources and partners to provide commercial and institutional owners with expert technical and program assistance to facilitate their access to existing resources and expedite building retrofits. For institutional buildings, this may include working with BC Green Buildings to actively deliver their programs and services in Vancouver.

#### S5 Commercial Buildings Strategy

##### **B Use Existing Systems to their Potential**

Complex energy and control systems, staff turn-over, and changing user requirements over time often result in a situation where building energy systems that are not being operated to their peak efficiency.

The efficacy of specialized building operator training in reducing the use of energy in existing buildings has been well proven in Ontario and 16 U.S. States by independent evaluators. Evaluations of programs from the Northwest Energy Efficiency Council and the Northeast Energy Efficiency Partnership programs indicate electrical savings per building operator averaging between 115,000 kWh/yr to 230,000 kWh/year and gas savings of 980GJ. The payback for building owners for these programs is only a few months.

The BC Ministry of Energy and Mines has been working with BOMA, Douglas Collage and other partners to provide this training for building operators in BC. The City should work with this partnership to promote program uptake.

Similar results have been shown when the building systems in an existing facility are recommissioned to match user profiles and maximize system performance. Recommissioning costs range from \$10,000 - \$50,000 and have been shown to reduce total energy consumption by 5-15% resulting in simple paybacks (based on energy savings alone) that are typically less than two years. Promoting building recommissioning may be another or complementary approach to maximize the efficiency of existing building systems.

#### *INITIAL ACTIONS*

- A.5iii Work with the BC Ministry of Energy and Mines, utilities, BOMA, and other stakeholders to promote Building Operator Training and determine the potential for building recommissioning

#### S5 Commercial Buildings Strategy

##### **A Create a Market for Energy Efficient Commercial Space**

Building owners and managers respond to the demands of their tenants and potential tenants; if the environmental, and more specifically the energy, performance of buildings was important to potential tenants, these projects would become a higher priority for the owners and managers of these buildings.

For new construction, Leadership in Energy and Environmental Design (LEED) provides an unbiased, externally “certified” way of measuring and recognizing a new building’s design from an environmental perspective. The rapid growth in recognition of LEED in Vancouver has begun to change the way new buildings are developed. A similar, commonly recognized tool for evaluating the energy performance of an existing building or office space would be an important first step in transforming the commercial building market. In order for such a tool to be effective, it may need to recognize the diversity of “starting points” and the incremental approach that is typically used when “improving” existing buildings. BOMA’s newly released “Go Green – Comprehensive” which moves beyond just assessing opportunities for energy efficiency and into taking action on those opportunities already has industry support and could be or form the foundation of such a recognition system.

*INITIAL ACTIONS*

A.5iv Evaluate BOMA’s “Go Green – Comprehensive” and other building energy performance rating systems for existing buildings and work with stakeholders to make recommendations on the adoption or development of one for the Vancouver market.

S5 Commercial Buildings Strategy

**D Develop Mechanisms to Connect Long Term Investment Capital to Efficiency Opportunities**

Many energy efficiency opportunities offer good investment opportunities but only for those committed to long-term investments with limited financial upside for the first 5-10 years. In both the institutional and commercial building sectors, there are real barriers to long-term investments that do not directly relate to core business activities.

Clearly demonstrating the return-on-investment potential and creating mechanisms to connect long-term investment capital to energy savings projects in an elegant fashion could result in significant energy efficiency retrofit activity. The challenge will be to create mechanisms that are not overly complex (legal or otherwise) or entail too much uncertainty.

Some possibilities are to connect the financial liability of the capital improvement to the property not the current owner, or to enable buildings managers to buy the services that energy provides (such as heat, cooling, etc) from third party investors that would “own” the infrastructure that provides those services.

*INITIAL ACTIONS*

A5.v Develop a generalized business case for longer payback retrofits and research possible financial and legal tools to enable long term capital to be invested in energy efficiency projects

S5 Commercial Buildings Strategy

**E Senior Leadership Commitment**

There are widely varying levels of activity and commitment to energy conservation even amongst organizations that are operating facilities in very similar regulatory, financial, and organizational environments. While they have similar access to resources, those organizations or institutions with demonstrated senior level commitment to energy performance find a way to make energy conservation projects work.

The City can work with the various organizations and institutions to raise the profile of energy conservation and promote senior leadership commitment to substantive action on reducing

greenhouse gas emissions. Possible initial members of a “leadership council” might include Chair of the Board for Vancouver Coastal Health, Vancouver School Board, BC Hydro, Vancity and others. The purpose of this ‘leadership council’ would be to advance the knowledge and understanding of energy and climate change issues among member organisations, to act as an advocacy group for responsive and adequate funding/financing mechanisms, and to recognise member accomplishments.

S5 Commercial Buildings Strategy

**F Utilize Appropriate Regulatory Mechanisms**

Similar to the regulatory mechanisms described in Section 3.1.6, the same approaches can be used to limit emissions from new commercial/institutional buildings and energy using appliances. The Vancouver Building Bylaw along with provincial and federal building and appliance standards are key tools that the City should utilize or advocate for. Vancouver’s recent update of the Building Bylaw to require ASHRAE 90.1 (1999) and its Green Building Strategy (under development) also apply to large commercial and institutional buildings

DRAFT

## 6.0 Community Energy Systems and Supply

Community energy systems are those systems that use district heating and cooling, combined heat and power (cogeneration), distributed generation, waste heat recovery, thermal storage, local sources of renewable energy (such as biomass, micro-hydro, wind, solar etc), local integration, and other related systems to provide a local supply of low-emissions energy. In the long run, the overall strategy of optimizing and evolving the system is just as important as which technologies are applied at any given time. In particular, the elegant combination of simple technologies implemented using a systems approach is key. The system design must allow for incremental growth and enable today's proven technologies to easily integrate with or be replaced by new ones.

While some pilot opportunities relating to the Olympic Village, South East False Creek, and the Sustainability Precinct have the potential of yielding measurable greenhouse gas emission reductions by 2012, the real significance of community energy systems are that they establish a foundation for significant future greenhouse gas reductions. In addition, the community energy system approach would provide new economic development opportunities for local businesses and institutions while potentially impacting emissions globally by the successful demonstration and subsequent replication of this approach.

### Goals

To develop flexible, low impact and renewable energy supply systems and delivery networks within the city over time in order to:

- Decrease emissions significantly in the long run;
- Increase the range of affordable energy supply options for the city in the face of rising energy costs;
- Claim economic opportunities associated with systems; and
- Institutionalize a progressive approach to energy within the city
- ***Reduce annual greenhouse gas emissions from new development in the Sustainability Precinct by 8,000t by 2012***

### Benefits

There are many benefits associated with the development of energy supply and local energy systems including:

- Reducing regional greenhouse gas emissions and air quality emissions through local, clean generation of energy;
- Economic development through investment and management of these systems;
- Supporting an ethic of innovation in the city and the development industry, as well as providing local demand for innovative companies, technologies, and expertise;
- Enhancement of the city's reputation as a "green" city;
- Innovations in technology and its application will play a central role in addressing global greenhouse gas emission reductions with the potential to create significant new export opportunities for local businesses;
- Establishing some forces to support more stable energy prices in the city; and
- Others

## 6.1 Context

- Energy efficiency of buildings and transportation will only take the city so far over the long run – ultimately we need to develop "green" sources of energy – and there are many benefits to

- developing some of these within the city;
- The carbon intensity of electricity will continue to rise along with costs in the short to medium terms;
- Natural gas for local consumption will eventually be drawn from global supplies, and as such, will become increasingly subject to significant market price fluctuations;
- The costs of the technology for alternative energy supply and distribution systems is decreasing;
- Terasen, BC Hydro and independent power producers are pursuing partnerships with cities, developers and others in the development of local green energy sources;
- Municipalities have unique opportunities to establish energy utility corporations within their jurisdiction.

### **Barriers**

Some of the barriers to the development of energy systems in the city include:

- The initial cost of technology for solar, geo-thermal, waste heat, district systems or other energy sources is often greater than conventional electricity and natural gas solutions;
- BC energy prices are relatively low resulting in long simple paybacks for new systems – longer term investment strategies, even with attractive returns, are more complex and less “market friendly”;
- BC’s utility regulations (BCUC) can make the creation and operation of local energy supply companies by private interests highly complex and resource intensive;
- Energy supply is not commonly considered as a core business of the City or expected to be addressed with innovations in the development industry; and
- Knowledge barriers exist in many areas.

## **6.2 Strategies and Initial Actions**

*In order to claim the opportunities that community energy supply and systems can offer the city to meet its environmental and economic goals, and to overcome the barriers to them, a four pronged strategy should be pursued.*

### **S6 Energy Systems and Supply Strategy**

#### **A Technology and Business Model Research**

The City should gather partners and commission a summary of existing research into the opportunities for energy systems in an urban context and use this study to prioritize systems that are already viable and can be implemented strategically, as well as identify additional required research. This study should at a minimum examine heating, cooling and electricity systems and technology and should focus on those systems where Vancouver has a competitive advantage.

The City should identify current alternative energy supply systems in use in the city and gather data on their performance and more widespread applicability.

The City should investigate potential business models for the development and operation of energy systems and identify opportunities and roles for City involvement.

Some municipalities (including a number of local examples) have established City-owned energy utility corporations in order to manage their involvement, interests and investments in alternative energy systems and related issues, including the purchasing of green power and future carbon trading opportunities.

## *INITIAL ACTIONS*

- A6.i Undertake technology and business-case feasibility (and preliminary design) studies for an Energy Precinct anchored in the Olympic Village but incorporating the entire False Creek Flats. This area is expected to have significant development by 2010 that will require mostly new infrastructure to service, contains a promising mix of uses and energy profiles, and has a number of important stakeholders very interested in or already committed to “green development”
- A6.ii Undertake a preliminary feasibility study (including technological, economic, and environmental impact assessments) and customer interest assessment for deep water cooling for the central business district. Due to the nature of such systems applied at a large scale there may be a unique role for the City to play but the window of opportunity is limited as many of the chillers in the central business district are likely to be replaced in the next 5 – 10 years.

## S6 Energy Systems and Supply Strategy

### **B Pilot projects**

The City should work with partners to identify several pilot projects for installation and monitor their performance and viability for more widespread application. High priority pilot projects include those with strong short term economics; large scale developments; developments with considerable earth work on City or Parks land, and those with time-limited windows of opportunity.

Priority projects for initial consideration could include:

- An energy precinct system (heating and electricity networks) associated with the Olympic Village, South East False Creek, and the False Creek Flats;
- The solar lighting pilot project currently under consideration with BCIT and BC Hydro;
- Waste sewer heat recovery (e.g.: Molson, SEFC, others).

- A6.iii Implement a solar public lighting pilot. This project has current momentum, provides a high visibility demonstration, and if successful will be cost neutral to a standard installation thereby offering good expansion potential.

## S6 Energy Systems and Supply Strategy

### **C Identify and Evaluate Infrastructure Systems Opportunities**

The City should develop a strategy to reduce the costs of energy systems by installing infrastructure (e.g., pipes, wires, conduits) to support future energy systems in conjunction with ongoing infrastructure installation, maintenance and upgrading activities of roads, sewers and other infrastructure.

## 7.0 INDUSTRY

While industrial users frequently consume large amounts of energy and therefore can offer significant reduction potential, they only account for 5% of Vancouver's greenhouse gas emissions. The relatively low amounts of industrial emissions in Vancouver are a direct reflection of the fact that there is very little industry remaining within the city limits.

In many other jurisdictions, working with industry to identify opportunities to reduce energy use can play a very significant role in reducing green house gas emissions. While industry in Vancouver does not have a significant focus in this Plan, partnership opportunities for energy conservation, cogeneration, and waste heat recovery are worth exploring.

### *INITIAL ACTIONS*

- A7.i Develop a relationship with the remaining significant industrial green house gas emitters in Vancouver to develop an understanding of their energy use profile, their efficiency awareness and commitment, and to facilitate their connection with existing utility and federal programs and funding to support energy conservation.

## 8.0 Transportation Alternatives

### Goal

***Reduce total distance traveled by Vancouver registered light duty vehicles such as cars and small trucks by 10% (for a 90,000 tonne GHG reduction) by 2012***

### 8.1 Context

In Vancouver, passenger vehicles were responsible for about 870,000 tonnes of greenhouse gases (GHG) in 2000, or about one-quarter of all community GHG emissions. This plan contains two independent approaches to reducing greenhouse gas emissions from light duty vehicles: 1) decrease the amount of driving Vancouver residents do, and 2) improve vehicle and fuel efficiency for those trips that require the use of a car. In this section of the Plan we describe strategies to reduce the total distance traveled by Vancouverites using light duty vehicles.

Driving less will mean switching some trips to alternatives (e.g., walking, cycling, transit and car-pooling) and eliminating or linking some automobile trips. The City currently supports alternatives to driving through initiatives such as providing facilities for walking and cycling, supporting traffic calming and school traffic safety programs, providing general safety/awareness programs, managing parking and providing transit stop and priority facilities.

Policies and actions for transportation in Vancouver are guided by the Vancouver Transportation Plan (1997) and Downtown Transportation Plan (2002). The City's plans also support the Greater Vancouver region's long range transportation plan - Transport 2021 (1993). Increasing support of transportation alternatives, including a large increase in transit service, is a fundamental strategy in all of these plans and the approaches they propose are consistent with those described here. This Community Climate Change Plan complements existing transportation plans by providing a concrete greenhouse gas reduction target, by detailing specific actions that the City can undertake in the short term to expedite vehicle trip reductions, and by including new approaches that have been demonstrated as effective since the completion of the transportation plans.

In order to further facilitate the shift towards transportation alternatives, this plan details strategies and actions that the City can undertake to:

- be more proactive in ensuring adequate facilities and services are in place to support alternatives to driving;
- to actively promote and support individual decisions to use alternative transportation when it is practical; and
- apply a systematic and cooperative approach to transportation demand management.

#### 8.1.1 Ambitious, Achievable Target

Targeting a 10% reduction in vehicle travel from “business-as-usual” forecasts within a seven year time frame is quite ambitious when compared to transportation plans from other jurisdictions in Canada and the United States. While this is an aggressive target, a number of tangible factors provide optimism to believe that it is achievable with adequate implementation resources and community engagement.

To start, while Vancouver is already a fairly dense city with numerous neighbourhood “mixed use” hubs, new growth is almost entirely occurring in parts of the city where people can live very close to

employment, shopping, services, and recreational opportunities. Mixed land use at higher densities helps support “access by proximity” and efficient transit services, making trips by walking, cycling and transit more viable. The growth in greenhouse gas emissions from passenger vehicles between 1990 and 2000 would have been much more significant if owners of Vancouver vehicles had not already started to reduce their vehicle use. Based on Air Care recorded mileage, both the average distance driven by Vancouver registered vehicles and per capita greenhouse gas emissions decreased during this period.

The table below further illustrates this trend away from the automobile towards alternative forms of transportation by Vancouver residents.

**Change in Number of Vancouver Trips by Mode Over a 24-hour Period** (1999 TransLink Trip Diary Study)

Mode	1994		1999		% Change ('94 – '99)
	Trips	Share	Trips	Share	Trips
<b>Auto Driver</b>	780,000	50%	762,000	46%	- 2%
<b>Transportation Alternatives</b>					
<b>Transit</b>	277,000	18%	311,000	19%	+ 12%
<b>Walk</b>	232,000	15%	312,000	19%	+ 34%
<b>Bike</b>	20,000	1.3%	44,000	2.7%	+ 127%

The number of single occupant car trips declined slightly while transit, walking and cycling mode shares all increased significantly. This trend towards decreasing total auto driver trips occurred during a period of rapid population growth; while the number of people moving to Vancouver continues to increase, the forecasted rate of growth is only about half of that during the 1990's.

Complementing these historical trends towards alternative transportation are significant increases in resources planned or allocated toward supporting alternatives including:

- TransLink's 10-year Outlook, covering roughly the same time period as this Plan, targets the **largest expansion of transit services ever** in this region;
- Vancouver's new Development Cost Levy makes significant **new resources available** to support transportation alternatives in the city;
- Federal Government funding for transportation alternatives is increasing as demonstrated by Transport Canada's Urban Transportation Showcase program (awarded in 2003) that includes **\$8.8 million in transit and related improvements** in Greater Vancouver
- Vancouver has a proposed \$9.5 million of alternative transportation projects and programs under Natural Resources Canada's Opportunities Envelope and has requested \$4.5 million in funding support (decision pending, spring 2005);
- The **growing toolkit of innovative but proven approaches** for supporting transportation alternatives such as targeted marketing, car sharing, innovative use of parking, etc.; and
- The **integrated approach** proposed in this plan that clearly identifies **concrete actions** that the city can take and the resources required to do so.

While these trends and new resources all provide convincing reasons for optimism, they must be tempered by an awareness of the real challenges that must be overcome to achieve our target.

### 8.1.2 Transit Capacity and Other Challenges

Services such as U-Pass, Sky Train expansion, B-Line and Community Shuttle bus service have been very successful in shifting drivers to transit. The success of these programs, the conduciveness of Vancouver's layout to transit usage, and our rapidly expanding population have led to a problem that most North American cities only dream about; transit demand is at or exceeding capacity for much of the day.

Overcrowding can result in passengers being passed by, and longer and less comfortable transit trips, which can be a deterrent to retaining existing transit users or attracting new ones. Although TransLink's 2005-2007 Three Year Plan calls for increasing transit funding, most resources will need to go towards meeting existing service needs. As a result, early implementation actions in this plan focus on other alternatives, especially active transportation.

Other common challenges to increasing the use of transportation alternatives include:

- **fixed costs** of automobile ownership – “the payments are being made anyway, I may as well use it”
- *inconvenience* (real or perceived) - including time, inclement weather, “cargo” capacity, etc.
- **flexibility** such as requiring a car for work purposes or needing to respond to unforeseen circumstances
- **safety** concerns (real or perceived) – including driver behaviour, lack of dedicated routes, street crossings, and personal security on the street or at transit stops
- **lack of secure and convenient end-of-trip facilities** including bicycle parking, showers, lockers, etc.
- **lack of awareness** of alternatives and their associated benefits

The strategies and actions recommended in this Plan have been developed to address these types of barriers and make the use of transportation alternatives as easy and desirable as possible.

### 8.1.3 Cobenefits

Because transit is expected to be at capacity for the first half of the implementation period of this plan, many of the initial actions described in this plan focus on increased use of active transportation modes. In addition to reducing greenhouse gas emissions, increased use of transportation alternatives (especially active modes) results in numerous significant concomitant benefits including:

- Reducing other “common air contaminant” or smog emissions from vehicles helps to **reduce respiratory health problems** such as the risk and severity of aggravated asthma, respiratory infections, chronic bronchitis, etc.
- Promoting **improved health and fitness** - A sedentary lifestyle is associated with a two-fold increase in the risk of cardiovascular mortality and researchers calculate that \$2.1 billion in direct health costs in Canada and 21,000 premature deaths were attributable to physical inactivity in 1999.
- **Reducing environmental impacts** on surrounding water bodies via the transfer of exhaust particulate, brake linings, tire wear, oil leaks, etc.
- **Reducing the need for expanding road** and bridge capacity.

- Helping to **reduce the number of vehicle collisions** – there are significantly more deaths resulting from auto accidents in Vancouver than from homicide (73% more in 2002).
- Reducing impacts of automobiles on **community livability** (e.g., noise, short-cutting, etc.).
- **Improving goods movement** (by reducing the number of vehicles on truck routes).
- **Save money** - Based on the Canadian Automobile Association’s 2004 “Driving Costs”, the average annual cost of owning and operating a typical passenger vehicle, driven 16,000 km a year, is about \$9,500 (*excluding parking costs*). By comparison, the cost of a year’s worth of monthly transit passes in Vancouver (3 zones) for two adults is about \$3,100, or over \$6,000 less.

#### 8.1.4 Integrated Approach

Successfully implementing a program to increase the use of transportation alternatives requires an integrated approach; the effectiveness of efforts to promote transit, cycling, or other alternatives would be greatly undermined if those alternatives were not viable choices for people and similarly, providing alternatives without increasing people’s awareness of and comfort with the options and their benefits would be similarly limited. Because of the integrated nature of successful comprehensive transportation alternative initiatives, it is very difficult to accurately quantify the effectiveness of individual strategies; program outcomes are very contextual.

The integrated strategies outlined in this plan include:

- 1 **Increase Viable Transportation Alternatives to Single Occupant Vehicles**
  - A. Continue “Smart Growth”
  - B. Increase Supply of Transit, Cycling, and Walking Infrastructure and Services
  - C. Increase Other Alternatives (car-sharing, van pools, etc)
- 2 **Support the Use of Transportation Alternatives**
  - D. Marketing of Transportation Alternatives
  - E. Enhancing Alternative Transportation Programs at Schools
  - F. Use Parking to Encourage Alternatives
  - G. Improving Safety Education and Enforcement
- 3 **Systematic Approaches to Transportation Alternatives**
  - H. Regional Travel Pricing
  - I. Coordinate with Regional Initiatives
  - J. Review Best Practices
  - K. Monitor Progress

## 8.2 STRATEGIES FOR TRANSPORTATION ALTERNATIVES

Reaching the planned emission reduction target for Transportation Alternatives will require some initiatives in existing City and regional transportation plans to be expedited. New opportunities that have emerged since the creation of existing transportation plans will also need to be explored. The strategies fall under three general categories: provide viable alternatives, support use of alternatives, and apply systematic approaches.

## 8.2.1 Increase Viable Transportation Alternatives to Single Occupant Vehicles

### S8 Strategies to Increase Viable Transportation Alternatives

#### A INCREASE SUPPLY OF TRANSIT, CYCLING, AND WALKING FACILITIES AND SERVICES

Shifting single occupant automobile trips to other modes requires an adequate supply of transportation alternative infrastructure and services that are safe, convenient and reliable. Lack of adequate supporting infrastructure and services can be a barrier to trying an alternative mode, or result in a negative experience if an alternative is tried but found to be inadequate. Although the City and TransLink already dedicate significant resources to alternatives, an increased focus on addressing existing needs and future growth is proposed.

With regard to on-street infrastructure, the City provides facilities for walking, cycling and transit priority. The need for additional infrastructure in these areas can be addressed most effectively by an increase in City capital funding, leveraged by additional contributions from other levels of government. For cycling, there are additional needs for both on-street and off-street parking, as well as off-street end of trip facilities (i.e., showers and lockers in buildings).

#### *Initial Actions*

- A8.ii Place greater priority on funding for pedestrians, cyclists, transit priority and other local transportation alternatives in future Capital plans.
- A8.iii Support TransLink's planned review, through MRTAC, of increasing flexibility in its Minor Capital cost-sharing program, to assist the City in leveraging capital funding for pedestrians, cyclists and transit priority.
- A8.iv Request the provincial government expand their Cycling Network Program, to assist the City in leveraging capital funding for cyclists.
- A8.v Request the federal government both expands funding for GHG reduction programs (e.g., Opportunities Envelope Fund, Urban Transportation Showcase, etc.) that assist the City in leveraging capital and operating funding for transportation alternatives while also making employer funded transit passes tax exempt.
- A8.vi Review and report back on public bicycle parking for the downtown and other major destinations, including:
  - An implementation schedule for Streetscape Amenities program racks and lockers
  - The feasibility of installing bike lock rings on parking meters
  - Improving information on the location of public bicycle parking
- A8.vii Review and report back on the following measures for bicycle parking and end of trip facilities:
  - Reviewing whether existing facilities and requirements will meet future demands
  - Considering a relaxation to allow the conversion of existing parking spaces to bicycle parking
- A8.viii Pursue the creation of bike stations (bike storage and service centres) at one or two strategic locations in the downtown through re-zonings, including reporting back on any incentives that may be necessary.

The plan recognizes the major role of transit in moving people around the City and region. It is important that transit be comfortable, fast, and convenient, with sufficient supply to meet demand. In addition to the need for increased transit supply in Vancouver, measures that enable buses to move faster will achieve multiple goals such as:

- o allowing the fleet to provide more service than would otherwise be possible;
- o providing a more competitive and reliable service to users; and
- o raising the 'status' of transit vehicles relative to other users such as the automobile.

Realising these goals will have the effect of making transit service more attractive to existing and potential new users. Measures that can be adopted to speed buses may include the use of express bus routes, reserved lanes, queue-jumpers, signal priority, and enhanced boarding procedures.

- A8.ix Request the TransLink Board to allocate sufficient transit resources to continue addressing Vancouver's existing service needs, residential and business growth, and demand for additional services such as U-Pass that achieve significant mode shifts from driving.
- A8.x Work with TransLink through processes such as the Vancouver/UBC Area Transit Plan to seek additional opportunities to implement measures that facilitate more rapid bus movement and loading in a targeted fashion.

## **S8 Strategies to Increase Viable Transportation Alternatives**

### **B INCREASE OTHER ALTERNATIVES**

There are a number of other viable alternatives to the single occupant vehicle that should be further supported in Vancouver. Car and van-pools effectively reduce greenhouse gas emissions for trips that are too far for walking and cycling and they are not dependant on transit service investments. In addition, car-sharing or car co-ops have been shown to effectively reduce automobile travel by having users pay "per use".

#### **Initial Actions**

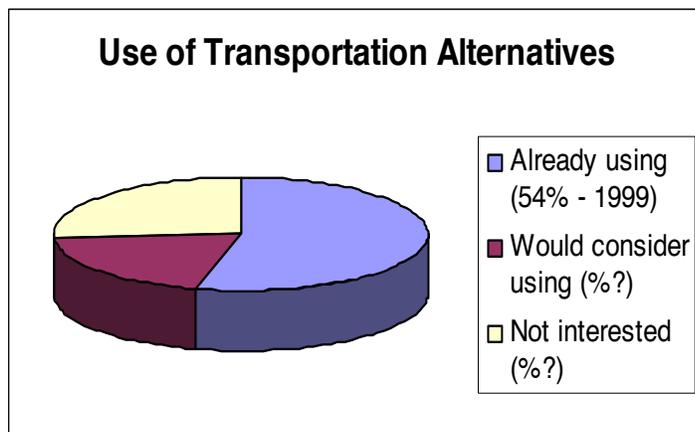
- A8.xi Support van-pooling initiatives of the Jack Bell Foundation by:
  - helping to create awareness and use of the Foundation's recently enhanced on-line ride-matching service
  - reviewing the feasibility of increasing the length of the northbound Georgia St. bus lane that is accessible to van pools
- A8.xii Expand car-sharing by
  - working with car-sharing organizations to address parking access challenges
  - encouraging car-sharing in new developments
  - seeking other opportunities to support expansion

## **8.2.2 Support the Use of Transportation Alternatives**

## **S8 Strategies to Support the Use of Transportation Alternatives**

### **C MARKETING TRANSPORTATION ALTERNATIVES**

An expanded City role in Transportation Demand Management would include a marketing approach that looks at three main segments relating to use of Transportation Alternatives:



**Already Using:**

Increase the recognition of existing efforts through awards, events, etc.

**Would Consider Using:**

Identify and implement new initiatives to remove barriers, to shift to “Already Using”

**Not Interested:**

Improve awareness of the impacts of automobile use and benefits of alternatives, to shift to “Would Consider Using”

Conclusions on what is needed to create a major shift from the automobile to other transportation alternatives in the report “*TransLink/BCAA Transportation Options Research (2003)*” included:

- Ongoing communication campaigns to address:
  - Lack of awareness of viable alternatives, negative impacts of auto use, and what the positive impact would be if everyone converted one or two trips to other modes
  - Perception by some drivers that others (trucks, buses, industry, etc.) are much more significant sources of emissions
- Recognition that time and money are key factors underlying transportation choice
- Political will from all levels of government

To increase its effectiveness, the marketing approach should also:

- Include an integrated package of measures that contains both incentives and disincentives
- Market the co-benefits of GHG emission reductions
- Work closely with key partners, such as TransLink and others

*Initial Actions*

A8.xiii Incorporate the marketing of transportation alternatives in the community engagement program (Section 2.0 of this Plan) to help empower individuals to increase their use of non-auto modes. The Community Engagement Program should include highly visible community events, recognition and awards, and community grants to empower NGO’s and community leaders to engage all residents of Vancouver in the use of transportation alternatives.

To help support the engagement of the community, improved information on walking and cycling travel times would be needed to:

- Provide comparative information for data collected on automobile travel times, to increase awareness of the competitiveness of walking and cycling for many trips
- Assist pedestrians and cyclists with route planning and trip time allocation

A8.xiv Develop web-based tools for estimating pedestrian and bicycle travel times and assisting with trip planning.

**S8** Strategies to Support the Use of Transportation Alternatives  
**D** **ENHANCING ALTERNATIVE TRANSPORTATION PROGRAMS AT SCHOOLS**

According to TransLink's 1999 Trip Diary Survey, up to 8% of automobile trips over a 24-hour period are grade-school (Kindergarten to Grade 12) related. With these trips being short distances for most families, and of routine nature, they are good candidates for alternative modes. However, although the number of children being driven to school by parents decreased slightly in 1999, this level is still considerably higher than what it was in the previous decade. Focusing on school trips also provides an opportunity to foster life-long sustainable transportation habits in students, and obtain broader mode shifts, through the influence children have on family transportation choices. In addition, national data shows that two-thirds of Canadian children are not active enough for the purposes of optimal growth and development and childhood obesity is increasing at an alarming rate; the increased use of active transportation by school children would help to reverse these trends.

In Vancouver, the Way to Go School Program (sponsored by ICBC and local AutoPlan Brokers) provides elementary school children and their parents with assistance in developing their own strategies for helping to reduce school traffic. A comprehensive manual is provided for use by parent and school volunteers. Although the program has been successfully implemented in some Vancouver schools, its reliance on volunteers creates challenges with increasing its uptake and providing continuity from year to year. Increased support from the City, including removal of some of the barriers to volunteering, would greatly enhance the growth of the program. At the high school level, Better Environmentally Sound Transportation developed an award winning school trip reduction program called Off-Ramp. However, federal funding for the pilot project ran out, and the program has had to be placed on hold.

***Initial Actions***

- A8.xv In partnership with the School Board, increase support of existing programs that encourage student and parent use of alternative transportation for trips to and from elementary and high schools, including:
- providing additional City staff support
  - funding additional agency staff for school-based programs
  - providing operating grants to help offset volunteers' administrative costs, and to fund programs and special events
  - seeking funding partners to enable the provision of capital grants to school-based groups for cost-sharing additional bicycle parking facilities

**S8** Strategies to Support the Use of Transportation Alternatives  
**E USING VEHICLE PARKING TO SUPPORT ALTERNATIVES**

Vehicle parking pricing and supply can help determine whether a single occupant automobile or another mode is the most desirable choice for making a trip. Although increasing parking pricing and reducing supply within Vancouver supports transportation alternatives, there are practical limits on how much the City can do on its own, without driving economic activity to other areas of the region. Limiting parking supply is most effective in areas that are well served by transit.

The City provides public off-street parking (mostly in the Central Business District), through the Vancouver Parking Corporation (operator of EasyPark parkades). Although there are already various initiatives that support transportation alternatives in City parkades, greater use of transportation alternatives would be supported by developing a coordinated plan that includes capital funding for bicycle parking and end of trip facilities in high demand areas.

**Initial Actions**

- A8.xvi Develop a comprehensive strategy to use parking supply and pricing for both on-street and off-street parking in the Metropolitan Core and other locations undergoing significant change (e.g. RAV stations) to support greenhouse gas reductions.
- A8.xvii Work with the Vancouver Parking Corporation to improve access, rate incentives and bicycle facilities at EasyPark parkades, to encourage greater use of alternatives such as bicycles, van-pools, car-pools and car-sharing.

**S8** Strategies to Support the Use of Transportation Alternatives  
**F IMPROVING SAFETY EDUCATION AND ENFORCEMENT**

Providing improved walking and cycling infrastructure by itself will not be enough to shift trips from driving, if pedestrians and cyclists do not feel safe using these facilities. Areas that Police and Engineering staff could review further include:

- Improving enforcement of unsafe behaviour by pedestrians crossing streets, by motorists and cyclists with respect to pedestrians, and by motorists with respect to cyclists
- Emphasizing related education and encouragement initiatives
- Considering legislative changes that would help increase enforcement resources, such as reducing the time traffic enforcement staff spend on court related activities

In addition, cycling can be encouraged by increasing the confidence and ability of cyclists to travel safely on streets where space is shared with motor vehicles.

**Initial Actions**

- A8.xviii Work with the Vancouver Police Department to develop a strategy to increase pedestrian and cyclist safety through enhanced enforcement and education.
- A8.xix Work with TransLink, the Park Board, the School Board and other stakeholders to make Traffic Skills Bicycling Courses widely available and encouraged for children and adults.

## 8.2.3 Systematic Approaches for Transportation Alternatives

### S8 Strategies for Systematic Approaches for Transportation Alternatives

#### G REVIEWING AUTOMOBILE PRICING

Methods of paying for road facilities and automobile operating costs, can act as a disincentive to using other modes of transportation. These include:

- *Infrastructure and Service Costs* - Payment by individuals through fixed costs such as annual property taxes, versus fees more closely related to use
- *Vehicle Insurance Costs* - Annual flat rate premium costs, versus distance-based premiums that reflect actual daily, monthly or annual vehicle use
- *Fuel Costs* - Relatively inexpensive fuel costs in North America, versus significantly higher costs in other areas such as Europe

#### **Initial Actions**

- A8.xviii Encourage TransLink and the GVRD to complete in 2006, the following work outlined in TransLink's 2005-2007 Three Year Plan and 10-Year Outlook:
- Regional Parking Strategy
  - Regional Tolling Policy
- A8.xix Request the provincial government and the Insurance Corporation of BC work with the City and TransLink, on developing a local pilot project for distance based insurance.

### S8 Strategies for Systematic Approaches for Transportation Alternatives

#### H COORDINATING WITH THE REGIONAL INITIATIVES

Automobile trips and their emissions are not confined to Vancouver's municipal boundaries. Policies and actions by TransLink, the GVRD and nearby municipalities will impact how successful Vancouver is at reaching its GHG emission reduction targets. Accordingly, coordinating Vancouver's initiatives other initiatives in the region will be important.

TransLink's OnBoard program helps Greater Vancouver employers reduce vehicle that they and their employees generate. Transportation alternatives explored through OnBoard include a discounted monthly transit pass through payroll deduction, car and van pooling, ride matching, car sharing, cycling, walking, parking management strategies, teleworking and shuttle buses. The City can take a more pro-active role in supporting these regional initiatives and encouraging TransLink to deliver them to Vancouver businesses, and residents that commute to worksites outside Vancouver.

#### **Initial Actions**

- A8.xx Request TransLink include a review of GHG emission impacts/reductions in all major transportation plans, including the Vancouver Area Transit Plan.
- A8.xxi Request that the Greater Vancouver Regional District work with TransLink to develop a regional action plan to reduce vehicle GHG emissions, including identifying the potential role that the Air Care program could play.
- A8.xxii Work with the TransLink and its On Board program to help increase its effectiveness in supporting employer Transportation Demand Management, including work trips made by Vancouver residents to other municipalities.

**S8** Strategies for Systematic Approaches for Transportation Alternatives  
**I** **REVIEWING BEST PRACTICES**

Strategies, knowledge and technology for addressing emissions from vehicles are continuing to evolve. The Federal government's Urban Transportation Showcase Program is currently reviewing a number of initiatives across Canada that demonstrate and evaluate integrated approaches to reducing GHG emissions. The City is one of TransLink's partners for their Greater Vancouver Showcase that includes initiatives such as a pilot TravelSmart marketing program. Final reports on the results of Showcase demonstrations should be available in 2007. Other programs being developed such as Seattle's "One-Less-Car" may also be applicable in Vancouver.

**Initial Actions**

A8.xxiii Continue to review and report on best practices for reducing passenger vehicle emissions.

**S8** Strategies for Systematic Approaches for Transportation Alternatives  
**J** **MONITORING PROGRESS**

Translating the City emission reduction target into mode share targets will assist with monitoring and planning emission reduction initiatives. Important considerations are:

- Including a format that is comparable to regional Trip Diary data and federal Census transportation data
- Recognizing that each local area in Vancouver is unique, and should preferably have its own targets; this will help give residents, employees and employers a clearer understanding of how their community needs to contribute

Air Care data was used to help inventory the City's 1990 and 2000 emissions from passenger vehicles. However, planned changes that will decrease the frequency in which newer vehicles are required to report for testing, will make the period between odometer readings too long to be useful for further emission inventories. Accordingly, an alternative method of collecting odometer readings will need to be found.

**Initial Actions**

A8.xxiv Update Vancouver's Transportation Plan targets, to include 2012 mode share targets that reflect the objective of reducing GHG emissions from passenger vehicles by 10%.

A8.xxv Review the cost to provide extra funding for TransLink's next Trip Diary Study, to collect additional mode share and trip purpose data for each Vancouver community.

A8.xxvi Request the provincial government and the Insurance Corporation of BC work with the City on developing a pilot project for collecting vehicle mileage data on an annual basis.

## 9.0 Vehicle and Fuel Efficiency

### Goal

*Reduce GHG emissions by 180,000 tonnes through improved vehicle, operational, and fuel efficiencies*

- *Federal fuel efficiency standards for light vehicles improve by 25%*
- *20% Bio-diesel and 10% ethanol fuel blends commonly used in vehicles*
- *Other operational improvements such as more regular tire inflation, reduced idling, etc., gain significant minority public involvement*

### 9.1 Context

Mobile sources such as cars, trucks, and heavy-duty construction equipment are expected to account for over 1.1 million tonnes of GHG emissions (over 35% of all Vancouver emissions) by 2012. While the support and promotion of alternatives to single occupant vehicle travel are key to both this plan as well as city and regional transportation plans, the fact remains that the automobile will remain the main mode for many types of trips. *The single greatest and likely most cost effective approach to reducing greenhouse gas emissions in Vancouver (in the short term) is to advocate for, support, and promote improved vehicle and fuel efficiency.*

This can be achieved by:

- advocating for more stringent fuel economy standards;
- promoting/supporting the purchase of more fuel efficient vehicles;
- encouraging more fuel efficient driver and maintenance habits;
- supporting the market uptake of more efficient and renewable fuels; and
- by working with fleets to promote best business practices for efficient vehicle operations.

The recent federal launch of the National Fleet Challenge that shares most of these strategies provides a timely opportunity for partnerships in improving vehicle and fuel efficiencies.

### 9.2 Strategies for Vehicle and Fuel Efficiency

#### **S9** Vehicle and Fuel Efficiency Strategy

##### **A** Advocate for Federal Fuel Efficiency Standard Improvements

While fuel efficiency standards are outside of the City's regulatory powers, working with the federal government to ensure they act on their own plans to increase fuel efficiency standards will be one of the most important actions that Vancouver can take to reduce greenhouse gas emissions.

The federal government has proposed a 25% improvement in fuel efficiency standards and during the last federal election all of the major political parties indicated they would adopt the recently developed California tailpipe GHG emission standard as a means of achieving this. According to the California Air Resources Board (CARB), the incremental vehicle cost to achieve the 25% reduction in 2014 would be between \$539 - \$851 (USD). Based on today's fuel prices, fuel savings for a typical Canadian car that travels 20,000 km per year would pay back that incremental cost in less than three years of driving.

The fuel efficiency of the Canadian fleet has not improved significantly since the mid 1980s. We are increasingly purchasing heavier and more powerful vehicles. However, improved technologies and

more stringent emissions regulations now provide us with clean and efficient vehicle options. Today, fuel efficiency standards in Asia and Europe are up to 45% more efficient than Canadian standards which are currently among some of the least stringent regulations in the world

Since the typical vehicle in the GVRD will be on the road for approximately 18 years, vehicles purchased today will have a long term impact on the region's emissions and standards must change soon and be updated regularly to take advantage of technological innovations.

### ***Initial Actions***

- A9.i City Council should work with NGO's, municipalities, and other agencies to implement an effective advocacy strategy for federal government adoption of stricter fuel efficiency standards.

## **S9 Vehicle and Fuel Efficiency Strategy**

### **B Support Efficient Vehicle Selection**

While total vehicle usage (distance driven) by Vancouverites has decreased in recent years, our GHG emissions have continued to increase due to the fact that we are driving heavier, less efficient vehicles. Choosing a vehicle that is fuel efficient can reduce GHG emissions and save money. Social marketing will help inform consumers to the impacts their vehicle choice will have on climate change. The City and other organizations can use policy and regulatory powers to further encourage fuel efficient vehicles.

One approach to support the purchase of smaller and/or more efficient vehicles would be to raise consumer awareness of the long term impacts that their vehicle purchase has, promote considerations of fuel economy in purchase decisions, and provide information on how to access a larger or more power vehicle for occasional uses.

Many people purchase a vehicle that will meet all of their anticipated needs, regardless as to how often those "needs" actually occur, resulting in the regular use of a much larger and less efficient vehicle than is required. Promoting the use of rental or car-share vehicles to meet these occasional use needs would enable consumer to purchase a vehicle suitable to their normal requirements; the interest alone on the purchase cost savings may be able of paying the occasional rental costs.

Other efficient vehicle options available today include hybrids and diesel powered vehicles which are generally 20 – 40% more efficient than similar gasoline vehicles. Changes in diesel technology and emission regulation changes now result in diesel engines that are as clean as many of today's gasoline engines, and new technologies and regulations will continue to make diesels cleaner. In many European countries, diesels now account for up to 50% of new vehicle sales, while diesels make up less than 1% of passenger vehicles in the Vancouver region. Hybrids can offer significant increases in fuel efficiency, particularly for city driving. Toyota, Honda, Ford, and General Motors now offer vehicles with hybrid systems, and it is expected that other manufacturers will be offering more hybrids in the near future.

### ***Initial Actions***

- A9.ii In its review of initiatives to improve the way parking can better support greenhouse gas emissions reductions (A8.xvi), the City should:
- consider ultra-compact vehicle parking standards to increase parking availability for ultra compact vehicles and decrease parking costs as less space is required
  - incorporate parking access, incentives, and public awareness opportunities for high efficiency vehicles

## **S9** Vehicle and Fuel Efficiency Strategy

### **C** Promote Efficient Vehicle Operations

Working with governmental, institutional and industry partners to promote efficient vehicle operations could have a significant impact on greenhouse gas emissions if new habits are widely adopted. Improved vehicle operations like keeping tires inflated and avoiding unnecessary idling is easy for individuals to implement, is free or cost effective, and can significantly reduce vehicle emissions.

#### **Tire Inflation and Vehicle Maintenance**

How well a vehicle is maintained will have a large impact on how efficiently it operates. Engines that are not maintained properly will not be as efficient as well maintained vehicles, and their fuel consumption may increase by up to 50%. Tires that are under inflated by only 10% can increase the vehicle's fuel consumption by 2% or more. Recent studies indicate that over 56% of vehicles had at least one tire under inflated by over 10%, and 23% of vehicles had at least one tire under inflated by over 20%. Simple maintenance is effective in reducing fuel consumption, increasing vehicle reliability, and lowering the long term maintenance costs for vehicle operators.

#### **Idle Free Program**

"Idling gets us nowhere" is a popular refrain for many idle free programs. According to Natural Resources Canada, restarting a vehicle will use less fuel than if it was left idling for 10 seconds, and idling can actually increase the wear and damage to an engine. Idling is also not an effective means to "warming up" a vehicle; today's modern engines do not need to idle for more than 30 seconds before driving, and idling will not warm up the other vehicle components. Due to changes in cooling systems, an idling diesel engine in a modern large truck will generally cool down much faster if it was shut off. Idling can burn up to 4 litres of fuel per hour, and therefore promoting idling awareness is a simple method for reducing emissions. According to Natural Resources Canada calculations, if each Vancouver driver reduced their idling by five minutes per day, we would avoid producing 22,300 tonnes of CO<sub>2</sub> each year and would save approximately \$8 million annually in fuel costs.

The most effective method to reduce vehicle idling is citizen awareness. Currently, the GVRD and BEST are working on an education program for Vancouver schools. An idle free by-law with appropriate enforcement would complement this education program for the broader community.

#### **Fuel Efficient Driving**

The way a vehicle is driven can lead to significant increases in fuel consumption. It has been shown that vehicle operators who use fuel efficient driving techniques can reduce their fuel consumption by over 10% on average. The techniques used for fuel efficient driving are generally the same as defensive driving techniques, so drivers can also reduce their likelihood of having accidents.

#### **Initial Actions**

- A9.iii The City should work with the National Fleet Challenge and the Automobile Retailers Association of BC to implement an expanded Tire Inflation Program aimed at improving awareness of tire inflation in the community through their members.
- A9.iv The City should work with the GVRD, Better Environmentally Sound Transportation, and Natural Resources Canada to implement an Idle Free Awareness Program for the region.
- A9.v The City should expand the idle free by-law and enforcement program to include all vehicles

## **S9** Vehicle and Fuel Efficiency Strategy

### **D** Market Development of Innovative Vehicle Technologies

One opportunity to not only reduce Vancouver's greenhouse gas emissions but to have a much more significant global impact is by supporting the market development of clean new technologies. Some of the world leaders in innovative new transportation technologies are based in the Vancouver region. Seeking responsible applications for these emerging technologies will reduce our local emissions, stimulate the economy, and could help to make these technologies cost effective for developing countries and thereby have a major impact on greenhouse gas emissions world wide.

#### **Natural Gas Engines**

Natural gas is one of the cleanest and most efficient burning petroleum fuels available but most medium and heavy duty natural gas engines use spark-ignition engines which are not as efficient as diesel cycle engines. New technologies are expected to make the spark-ignition natural gas engines more efficient in the near future. Westport Innovations is a Vancouver based company at the leading edge of market development of diesel cycle engines for natural gas, and these engines will offer the benefits of clean combustion combined with the much higher efficiencies of a diesel cycle engine.

#### **Hybrid Trucks and Busses**

Medium and heavy duty hybrid electric vehicles have the potential for significant improvements in fuel efficiency, and they are particularly suited for city driving. A hybrid uses a combustion engine (gasoline, diesel, or other fuel), an electric motor, and a battery system to power the vehicle. The battery is charged by the engine during normal driving, or it is charged through the electric motor during braking. One way a hybrid is more efficient is that it recovers energy normally lost during braking, and this is why hybrids are more efficient in city driving versus highway driving. Applications like delivery vans, taxis, and urban transit buses can be ideal applications for a hybrid drive system since these vehicles "stop and go" for most of their operating day in city driving conditions.

#### **Fuel Cell Vehicles**

Fuel cells are often touted as the ultimate "zero emission" power system and the locally based Ballard Power Systems is considered the world leader in the development of this technology. However, the overall emissions of a fuel cell are very dependant on how the hydrogen is produced. "Clean", low-carbon hydrogen can come from solar energy, wind power, geothermal power, hydro electricity, and nuclear power, but there are other concerns with many of these sources. Today, most of the world's hydrogen is produced from natural gas, and there are issues with carbon dioxide production and the use of a non-renewable feedstock. There are some technologies being developed to sequester the carbon released during hydrogen production from natural gas, and improved processes will increase the efficiency of hydrogen production. The combination of these improvements with the increased efficiency of fuel cells over combustion engines may lead to the potential for significant reductions in greenhouse gas emissions.

##### *Initial Actions*

- A9.vi The City should implement the Vancouver Fuel Cell Vehicle pilot program with Fuel Cells Canada
- A9.vii The City should work with the GVRD, TransLink, and other partners to further develop and pilot the use of medium and heavy duty hybrid electric vehicles

## **S9** Vehicle and Fuel Efficiency Strategy

### **E Fuel Market Transformation – Renewable Fuels**

Today, most transportation uses non-renewable fossil fuels which release carbon into the atmosphere where it remains indefinitely and is not “recaptured”. Eventually, these sources of energy will become difficult and uneconomical to obtain. Ultimately, we will have to find renewable sources of energy to power our economy. One of the most significant barriers to market adoption of proven clean fuel technologies is incompatibility with existing engine technologies and the cost of developing a new fuel distribution system. As such, renewable fuels that can take advantage of current distribution and engine systems will have a distinct advantage in the short and medium term. Today, there are two renewable fuel options available with the potential to change the fuel market immediately.

#### **Biodiesel**

Biodiesel is a renewable fuel that can be used in most diesel engines without any required modifications and can be distributed using the existing infrastructure.

Biodiesel is produced from vegetable oils, animal fats, used cooking oils, and even waste grease from the sewer system. One variation, which is most accurately classified as a synthetic diesel, can even be produced from wood waste. The carbon released to the atmosphere upon combustion of Biodiesel is recaptured when new plants are grown to provide additional feedstock for further fuel production. As an added advantage, biodiesel produced from a “waste” feedstock is another way of recycling and reducing waste.

Biodiesel is typically blended with petroleum diesel to make up 5% - 20% of the blended fuel (B5 - B20). Over the entire fuel cycle, from growing the crops to the end use of the fuel, pure biodiesel can reduce overall greenhouse gas emissions by 62% - 92% and a B20 blend will reduce GHG emissions by 12% - 18%. The use of biodiesel has been increasing over the past few years. Currently, there are over 300 fleets in the United States using biodiesel, and many fleets in Canada have run demonstration tests or are currently using biodiesel, including the City of Vancouver.

The City is working with a number of other local municipalities, the provincial government, the National Fleet Challenge, and other partners to develop and implement an initiative to transform the local diesel fuel market to incorporate biodiesel blends. This project is based around a large scale demonstration of the viability of this fuel and a commitment to its purchase by municipal fleets (as described in the City of Vancouver’s Corporate Climate Change Action Plan). By “proving” this fuel, educating other fleet operators, and stimulating demand this partnership aims to address some of the barriers to widespread use of biodiesel, not the least of which is production cost. If the cost of biodiesel and other renewable fuels becomes cost neutral, the major obstacle for their acceptance in the marketplace will be removed and widespread adoption of these fuels would be possible. This project has received over \$265,000 of federal funding and will officially be launched at the Biodiesel 101 Workshop on March 30, 2005.

#### **Ethanol**

Ethanol has been used as a fuel additive for several years, and almost all gasoline engines today can run on a mixture of up to 10% ethanol (E10) without any modifications, and many vehicles can run fuel blends up to 85% ethanol (E85). Currently, most ethanol is produced from corn or grains with processes that require significant amounts of energy, and therefore the overall greenhouse gas reduction potential of ethanol is reduced. There are new more efficient processes being developed that use the non-food portion of crops (e.g. the cellulose found in wheat and corn stalks) to produce ethanol, and they have the potential to double the GHG reductions of ethanol blended fuels to 6-8% for an E10 blend. If these more efficient production processes are proven effective, ethanol could play a significant role in this renewable fuels strategy.

*Initial Actions*

- A9.viii The City should continue to work with its partners on developing the local biodiesel market with the goal of obtaining a cost effective supply of biodiesel or similar renewable fuels.

**S9** Vehicle and Fuel Efficiency Strategy

**F** **Promote Best Practices for Fleet Operators**

The City can work with the National Fleet Challenge and local partners to develop and distribute business case information on and promote the adoption of best fleet operations practices to reduce fuel consumption by fleet operators. These practices can include vehicle selection, maintenance, reduced idling, driver training, etc.

Because fleet vehicles log more miles than personal vehicles and are managed as business asset reducing operating costs is relevant to fleet owners and operators. One of the most significant barriers to the adoption of best operations practices is that operators lack reliable and relevant information about best practices and existing fleet efficiency tools. The business case for implementing fuel efficient strategies and technologies in many fleets is required for fleet operators to have confidence in the value of changing the way they currently operate their fleet.

The City can help to promote these best practices by demonstrating and documenting them in their own fleet and by working with its partners to deliver information on these practices to fleet operators. Another important role would be the development of a rating system to evaluate the environmental performance of a fleets operations along the lines of the LEED rating system for buildings. Such a measurement tool helps fleet operators ensure they are using the best practices. It also has the potential to transform how fleet services are delivered by providing socially responsible fleet customers with an objective “certification” they can require of fleet service providers.

*Initial Actions*

- A9.ix Work with partners and industry associations to expand the knowledge of hybrid vehicle benefits, develop business case tools, and provide financial programs to allow the further purchase and operation of hybrid taxis and courier vehicles.
- A9.x Review municipal policies and regulatory abilities to promote hybrid taxi use, with the aim of having all taxis part of a showcase hybrid taxi fleet in time for the 2010 Olympic Games.
- A9.xi Work with TransLink to leverage regional knowledge of hybrid bus systems, particularly the experiences gained from the 235 hybrid buses now operating in the Seattle transit systems, in order to determine the applicability and cost efficacy of this technology to the next cycle of regional transit fleet purchases.
- A9.xii Work with partners to develop a Green Fleet Certification program.
- A9.xiii Review municipal policies and regulatory abilities to promote hybrid taxi use, with the aim of having all taxis part of a showcase hybrid taxi fleet in time for the 2010 Olympic Games.
- A9.xiv Work with Natural Resources Canada, industry associations, and other partners to promote efficient vehicle operations and maintenance programs that include elements such as efficient driver training, tire inflation, engine maintenance, idle free bylaw observation, and route optimization.

## 10.0 Solid Waste and Landfill Gas

The solid waste green house gas emissions in Vancouver are largely caused by the decomposition of organic materials such as food scraps, yard waste, and paper at landfills. Vancouver and the GVRD have been successful in greatly limiting these emissions through initiatives such as recycling, a paper ban at landfills, and landfill gas recovery and cogeneration. In addition to these steps, Vancouver reduced its solid waste related greenhouse gas emissions nearly 80% (approximately 200,000 tonnes) between 2000 and 2003 by implementing the Vancouver Landfill Gas Recovery and Cogeneration Project.

Despite these successes, the products that Vancouver businesses and residents consume (food, clothes, cars, etc.) all require energy to produce, package, and transport to our city and homes. This “embodied” energy and its related green house gas emissions are significant but largely invisible under Vancouver’s measurement system because most of these goods are produced outside of the city and the majority of the transportation is international or interprovincial trucking, rail, and marine. In general, the priorities for action to reduce these indirect solid waste emissions follow the well known hierarchy of *Reduce, Reuse, Recycle*.

In the development of this Plan, the City requested that the Provincial Government expand its product stewardship initiatives by acting on its plans to add milk containers to the existing beverage container program and to add electronic products to the Stewardship program. Product stewardship places the responsibility for managing packaging, from creation through recycling, onto the industry that creates it.

### 10.1 Material Bans from Disposal

Because paper products consist of organic material, decomposition of paper in the landfill contributes to methane production, a powerful GHG. A significant amount of paper continues to be landfilled in spite of the existing ban and an extensive recycling network that provides an alternate disposal means.

- A10.i The City should request that the GVRD strengthen enforcement of the existing paper ban at all waste handling facilities.

### 10.2 Beneficial Use of Landfill Gas

The Vancouver landfill currently collects landfill gas from all areas of the landfill where it is practical to do so. The landfill gas is beneficially utilized as fuel to generate electricity as well as heat a nearby greenhouse. In 2003, beneficial use of landfill gas at the Vancouver landfill reduced GHG emissions by approximately 200,000 tonnes per year due to the destruction of methane. There are further emissions reductions when one considers that the electricity generated is “green” and that less natural gas is used by the greenhouse for its operations.

- A10.ii The City should continue to expand its landfill gas collection system when practical as the landfill develops and continue to search out new ways to maximize energy recovery and greenhouse gas reductions from landfill gas.

## **11.0 Implementation Considerations**

### **11.1 Resourcing and Organizational Structure**

A strong focus will be needed to meet the greenhouse gas reductions target established in this plan, starting immediately and continuing up until 2012. While broad community and stakeholder engagement will be required and implementing the City's own actions will involve the leadership of many departments, the City's Sustainability Group will have responsibility to coordinate implementation of this Plan.

While this Plan has been accompanied with a request to City Council for six full time positions and funds for the first year of implementation, further exploration will help to determine the appropriate long-term funding mechanism(s). Because a significant amount of the funding and activity will depend on external sources and partners, the City's resourcing mechanisms must be flexible enough to respond to opportunities as they arise.

In addition to City resources, this plan envisions external contributions will play a significant role in the success of its implementation. In preparing this Plan, City staff and Cool Vancouver partners were successful in securing considerable implementation funds from a number of sources.

- The BC Ministry of Energy and Mines has earmarked several hundred thousand dollars (final amount to be negotiated) of their Opportunities Envelope funding for building energy efficiency incentives in Vancouver.
- Environment Canada has committed \$200,000 over two years for community engagement through their Community One Tonne Challenge.
- Federation of Canadian Municipalities committed \$100,000 for the plan development.
- Western Economic Diversification, have committed \$230,000 towards the bio-diesel market transformation initiative the City is undertaking with several other partners.
- The GVRD has committed \$58,000 towards a variety of plan elements including the plan development, the expansion of car-sharing, and the bio-diesel market transformation (through a City fleet demonstration).

In addition to these, the City has a strong proposal for \$4.5 million of federal funds over two years currently under consideration by Natural Resources Canada for implementation of a variety of transportation alternative programs and projects.

Numerous other funding sources have been identified and early conversations suggest considerable interest in supporting initiatives described within this plan.

#### **Emissions Reduction Measurement, Reporting, and Trading**

As with every new program, measuring and evaluating performance will represent a vital ingredient in the success of this plan. The City will be required to build the measurement and evaluation tools from scratch, given that municipal climate change plans of this scale do not have any significant history. An effective performance measurement system is built on a foundation of several key elements.

- Clear and measurable targets
- Measurement tools and protocols that are reasonably simple to create and use by many people

- Reporting that is timely, oriented to the goals, and distributed regularly and widely
- Designed to foster both accountability and continuous improvement
- Transparency in its creation and execution

Many new initiatives that have seen both success and wide public support included performance measurement systems that engaged third party representatives. In part, this step was taken to ensure transparency and to build credibility. To some extent, such an approach has been an acknowledgement of the challenges of doing effective performance evaluation internally. For this initiative, the City must look to build its own internal capacity, especially given the need to assess what elements are having the desired impacts. The creation of a leadership council presents an opportunity to gain an added measure of public support for climate change initiatives and ensure transparency in their implementation. Done properly, this approach offers the best possible approach to performance measurement and evaluation.

The rest of this section highlights some initial questions related to measurement. One of the early steps in implementing this plan will be to establish additional, specific performance indicators for each of the elements to be implemented. At a minimum, these indicators should be in place no later than the first annual report.

### **Measurement**

The methodology for determining Vancouver's emissions profile described in *Appendix A2* establishes the *general* approach for continuing to monitor our progress towards meeting our overall reduction target. The approach to light-duty vehicle emissions currently relies upon AirCare tested vehicle mileage data. This is not expected to be a useful data source in the future because AirCare's mandate is scheduled to expire in 2006 and, even if this mandate is renewed, their intent is to shift the testing frequency from two to three years.

In order to establish a base emissions profile for any given year in the future using our current approach, it will be necessary to work with ICBC to begin to collect vehicle mileage upon registration renewal and be willing to share this data on a geographical basis or to develop another method for determining light-duty vehicle greenhouse gas emissions.

While the emissions profile approach provides a useful general tool, it will be necessary to develop specific measurement approaches for individual initiatives. These specific measures will be needed to determine the impacts of specific initiatives and will be necessary if the City decides to pursue emissions trading opportunities. In addition, the current emissions profile approach will not reflect the impact of a number of promising and important initiatives such as an idle-free campaign or bylaw, or a tire inflation program because while they will reduce fuel consumption, they will not impact the total distance traveled by Vancouver vehicles.

### **Reporting**

It is envisioned that the Sustainability Group will report back to Council on the implementation of this plan on an annual basis. A comprehensive emissions profile will not be prepared every year due to the effort required to do so, but should be undertaken at least once prior to evaluating our final success in meeting the 2012 reduction target.

### **Emissions Trading**

The City must develop an improved understanding of emissions trading and its inherent protocols. Emissions trading may offer opportunities to finance additional or existing emissions reduction initiatives. Even if the City does not pursue this option in the near term, documenting the ongoing

efficacy of specific emissions reduction measures in a way that is likely to satisfy the requirements of emissions trading will ensure that this potentially significant option available on an ongoing basis.

### **Climate Change Adaptations**

This Climate Change Plan provides detailed strategies and actions for reducing greenhouse gas emissions in an effort to mitigate global and local climate changes. While it is very important to mitigate the changes in our climate, it is also important to recognise that the climate has already begun to change and even under the best case scenarios is expected to continue to change until the amount of greenhouse gasses in the atmosphere stabilises. As such, it will be necessary to anticipate and prepare for the expected impacts of climate change that cannot be avoided.

The City should develop a better understanding of the range of anticipated climate change impacts, evaluate our health, water, energy, and other systems to assess their vulnerability to these changes, and develop an Adaptation and Resilience Strategy to reduce the negative consequences of those changes.

This might include planning for:

- Increased extreme weather events and the reliability of essential services;
- Longer, drier summers and wetter winters with reduced snow pack;
- Increases in instances in Vancouver of diseases from warmer climates;
- Increases in sea level; and
- Others

In the development of an adaptation strategy, opportunities to integrate it with existing health, health, infrastructure, and emergency plans must be pursued, including Police, Fire, the Health Authority, E-Comm and others.