



Oak Bay Climate Change Task Force

Final Report

Recommendations to Reduce Greenhouse Gas Emissions in Oak Bay

March 2008

Committee Members:

Mayor Christopher Causton, Chair
Councillor Frank Carson
Matt Fairbarns
Maximilian Huxley
Rob Janus
Councillor Nils Jensen
Lynne Milnes
Brian Sharp
Teresa Waddell, Coordinator

Retired Member: Jennifer Ellis

In Memoriam: Roger Colwill

PURPOSE:

The mission of the Oak Bay Climate Change Task Force has been to analyze and report to Council on ways and means of promoting the reduction of greenhouse gas emissions within the District of Oak Bay, both in the community at large and within the municipal organization.

BACKGROUND:

The Urgency of the Issue

Climate Change is considered by many to be the most serious threat facing the world today. In November 2007, the IPCC (Intergovernmental Panel on Climate Change), the most authoritative voice on the issue, released its most recent report stating that global warming is “unequivocal” and that human-generated greenhouse gas emissions are responsible for this warming. Globally, greenhouse gas emissions have increased by 70 percent since 1970, and today’s atmosphere contains over 32 percent more carbon dioxide than was present in the early 1900s (IPCC 2007). Consequently, global average temperature has risen by 0.6 degrees Celsius since 1900, and an unprecedented continuous warming of 0.2 degrees Celsius per decade is forecasted (IPCC 2007).

Rising average temperatures have and will increasingly be implicated with increases in the frequency and intensity of severe weather events, such as wind storms, heat waves and cold spells, flooding, drought, and other extreme weather events. In addition to increasing weather related disasters, climate change will also seriously affect water, forest and agricultural resources and urban infrastructure. Locally, Oak Bay has arguably already felt the impacts of climate change with record-breaking heat, cold, rainfall and high winds all being recorded in the last few years. With its close proximity to the ocean and water infrastructure that is periodically under threat, residents of Oak Bay have considerable cause for alarm.

Commitments to Climate Action

Municipal governments have a key role to play in addressing climate change, as it is estimated that half of Canada’s greenhouse gas emissions are under the direct or indirect control or influence of municipal governments. As a signatory to the Climate Action Charter, the District of Oak Bay has pledged to work with the Province, UBCM, and other signatory local governments to take steps to positively affect climate change. By signing the statement of commitment, Oak Bay has recognized the need to take action on reducing greenhouse gas emissions and has committed to becoming carbon neutral in its own operations by 2012. In addition to carbon neutrality, the District has pledged to measure and report on the community’s emissions profile and to work to create a compact, more energy efficient community.

Resources and Opportunities

Climate change has become a key priority in British Columbia with the actions of local, regional and provincial governments. A plethora of organizations at the local, regional, Provincial and Federal level have emerged to initiate actions on climate change. Opportunities are significant, but are often overlapping and time limited. Recognizing the limited staff and resources available at the municipal level, initiatives are being developed in an increasingly accessible fashion. However, to access the resources and opportunities available to the District of Oak Bay, staff resources will need to be dedicated to liaising with external organizations on climate change.

Capital Regional District (CRD) Climate Action Service:

In January 2008, a CRD staff report was submitted to the CRD Board outlining the development of a Climate Action Service (Bylaw No. 3510) be established at the CRD to undertake regional monitoring and reporting on air quality and GHG emissions; **collaboration and cooperation with members on climate action and adaptation**; and information dissemination and public education.

On February 13, 2008, the CRD Board approved:

- \$100,000 to be considered in 2008 budget deliberations for a full-time climate action coordinator, half-time research and administrative support and air quality monitoring for commencement in June 2008
- Establishment of an inter-municipal/administrative committee to coordinate the climate action service.
- Service establishment Bylaw No. 3510 received third reading. The bylaw has been sent to participating members asking for consent to adoption.

Community Energy Association:

Funding Community Energy and Climate Change Initiatives. A Guide to Funding and Resources for BC Local Governments. 2008. See detailed funding and resource list (Appendix B).

Green Buildings BC for Local Governments - FREE program assists local governments in navigating through the building retrofit process, creating momentum and buy-in with staff and council, and providing guidance on the magnitude of the opportunity for your local government.

<http://www.greenbuildingsbc.com>

Alternative Energy Branch, Ministry of Energy, Mines and Petroleum Resources:

Opportunities for Local Government Action on Energy Efficiency. Part 1 and Part 2 available at: http://www.em.gov.bc.ca/AlternativeEnergy/EnergyEfficiency/community_solutions.htm.

Funding available through:

- Innovative Clean Energy Fund
- Community Action on Energy Efficiency (CAEE) program.

Ministry of Community Services:

- Community Energy and Emissions Initiative (CEEI)
- Green Communities Rating System
- Smart Planning for Communities

UBCM:

- Greenhouse Gas Action Guide - A compilation of straightforward, cost-effective actions intended as a resource to assist municipalities in implementing immediate actions to reduce GHGs. <http://www.ghgactionguide.ca>
- Green Communities Committee and Working Groups
- Climate Action Charter

FCM Partners for Climate Protection:

- Green Municipal Fund - can provide grants of up to \$350,000 for up to half the cost of developing local action plans and sustainable community plans.

Mitigation versus Adaptation

Recognizing the threat posed by climate change, governments have initiated strategies to reduce greenhouse gas emissions, thereby attempting to mitigate the effects of climate change. However, it has been increasingly recognized that in addition to mitigating climate change, adaptation to changing climatic conditions will inevitably be required. A number of adaptation studies have been initiated and are now being released.

→ *From Impacts to Adaptation: Canada in a Changing Climate*. Natural Resources Canada. March 7, 2008. Available at: http://adaptation.nrcan.gc.ca/assess/2007/index_e.php

→ *Capital Region Climate Change Adaptation Study, Phase 1: Project Scoping*. CRD, June 2007. Available at: www.crd.bc.ca/rte/greenhse.htm

The Oak Bay Climate Change Task Force

The inaugural meeting of the Oak Bay Climate Change Task Force took place in May, 2007. Initially, the Committee gained a regional context in its meeting with representatives from the Capital Regional District (CRD). The status of the CRD's Community Energy Plan was presented and the facilitative role the CRD offered to play with regard to climate change was discussed. The Committee obtained the 2004 Oak Bay Community and Corporate emissions inventory from the CRD for reference in its deliberations (Appendix A).

Given the broad topic of climate change, the Committee divided itself into three categories to focus its investigation. The resulting sub-committees were delineated as follows:

1. Transportation
2. Lifestyle
3. Buildings and Land Use

The sub-committees deliberated over the summer and produced final recommendations in the fall of 2007. Considerable discussion took place, and the most prominent areas to affect change were considered, such as municipal operations, bylaws, and education or engagement of the public. On November 28, 2007, the Oak Bay Climate Change Task Force reconvened and the sub-committees presented their final recommendations. Subsequently, the Committee's draft report was made available to the residents of Oak Bay and a public meeting was held on January 30, 2008, to receive feedback. After discussing the public's recommendations, the Committee has now finalized its report to Council.

REPORT OF THE SUB-COMMITTEES

Transportation Sub-Committee Final Report

Sub-committee Members:

Councillor Frank Carson, Sub-Committee Chair
Lynne Milnes
Brian Sharp

LIST OF TRANSPORTATION RECOMMENDATIONS:

In the Capital Region, transportation related activities contribute the largest proportion of greenhouse gas emissions, consisting of 52 percent of total greenhouse gases emitted. Currently, in Oak Bay, emissions from transportation constitute 32 percent of the total Municipal emissions (see Greenhouse Gas and Energy Use Inventory for the Capital Region, 2004).

To reduce transportation related greenhouse gas emissions in Oak Bay, the Transportation Sub-committee makes the following recommendations organized into three categories:

1. Municipal Operations:

With just under one hundred vehicles, the Municipality is responsible for producing a substantial proportion of total greenhouse gases produced in Oak Bay. The Municipality should take a leadership role and encourage staff to take energy consumption seriously. Staff should be applauded for the steps they have taken to reduce energy consumption so far; however, a more concerted effort should be made by the Municipality to reward and encourage “green” behavior and purchasing practices.

The Transportation Sub-committee proposes that the Municipality of Oak Bay consider the following recommendations to adjust internal operations to reflect a commitment to a reduction of greenhouse gas emissions from its fleet and equipment.

- *Draft and pass an anti-idling bylaw.* In spite of cold weather, many people run their vehicles for long periods of time unnecessarily, and residents should have an avenue to report this behavior. Combined with an educational component, an anti-idling bylaw would set a behavioral pattern. With regards to enforcement, it was noted that like the “poop and scoop” bylaw, tickets would rarely be needed, as the community generally polices itself. The current anti-idling signs are advisory, and they could easily be changed to reflect the mandatory nature of the bylaw. Consider a unique anti-idling sticker for the Municipal fleet. Example: City of Victoria – “Idling gets you nowhere.”
- *Continue to support and promote the use of alternative fuels, such as hybrids and biodiesel.* Information had been received by BC Transit, Parks and Public Works regarding fuel options and efficiencies, and it was noted that biodiesel was the cleanest, most efficient option currently available. B20 biodiesel has proven effective in reducing greenhouse gas emissions and the program should be maintained and promoted. The sub-committee understands from the electric vehicle pilot, that the market does not yet offer an electric vehicle appropriate for Parks and Public Works. However, given the negative social and environmental consequences associated with plant-based fuels, and the complexity of the ever-changing fuel market, Staff should be continuously made aware of the state of the art in fuel technology.
- *Where at all possible, the Police and Fire departments should choose fuel-efficient vehicles for all future purchases.* Police and Fire vehicles are symbolically important in reflecting Oak Bay’s commitment to a concern for climate change. Where possible, police and fire departments’ staff should avoid idling, and consider hybrid/fuel efficient technology that may enable the continued use of electrical equipment without engine idling.
- *All future tools and landscaping equipment should be replaced as required with the most fuel-efficient, clean technology available.* With a small cost increase, mowing and landscaping equipment should be replaced as necessary with cleaner technology. Ultimately, the Municipality should continue to broaden the factors accounted for in purchasing decisions to incorporate environmental factors.

2. Public Transit:

- *Adopt the employer-based ProPass program* offered by BC Transit in which a bus pass is offered to employees through a payroll deduction. Employees are given a 16 percent discount over a 12 month period as well as a tax credit. The ProPass program is used by the CRD, the City of Victoria, and serves over 1000 Provincial civil servants, as well as many smaller businesses. To make the service viable, Oak Bay would need a minimum of 25 interested employees. To initiate the program, it is suggested that the Municipality canvass employees for their interest, and if it appears to be viable, the Municipality should contact BC Transit to facilitate the adoption of the program.

- *Develop a promotional transit use program at Oak Bay middle and high schools.* With the recent transition of Monterey to a middle school, a great deal of traffic congestion issues have arisen. Because the #2 bus stop does not stop directly in front of Monterey school, many parents may not be aware of the transit option. BC Transit may consider re-routing the bus if Monterey requested. There is a substantial need to provide information and awareness regarding the benefits and safety of transit to the schools and parents. The Municipality should forge a partnership with BC Transit and schools to promote transit as a safe and cost-effective mode of transportation. The Municipality should facilitate discussion between the PAC at Monterey and BC Transit to improve routes. In addition, Oak Bay should encourage BC Transit to promote its services and publicize its routes to schools.
- *Develop a promotional transit program for seniors.* The senior ratio in Oak Bay is one of the highest in Canada, and with driving becoming difficult with age, transit is an attractive option for many seniors. However, the bus system can be complicated and intimidating for seniors, so an effective transit program that targets seniors would have to include the recognition of seniors' needs and a training component. With support from BC Transit, classes could be offered at Monterey, where passes and information could be distributed. Seniors are currently offered a monthly rate of \$42.00 and a single fare of \$1.40, and those who are on a supplement are offered a rate of \$45.00 per year. Although the senior fare is affordable, to promote senior transit use, BC Transit could be encouraged to offer seniors free (or discounted) transit use during a particular day, or time of day.
- *Create a "Village Shuttle."* Encourage BC Transit to re-examine the infrequently used #1 bus and potentially re-route it to create a "village shuttle" that would run between James Bay, Cook Street, Fairfield and Oak Bay. Alternatively, the #2 bus could be re-routed to extend to James Bay and then continue along Fairfield, thereby achieving somewhat the same goal.
- *Improve information and amenities at bus stops.* Establishing bus stops as safe and pleasant places to be plays a key role in increasing transit usage. Things to consider: schedule information, lighting, seating, shelter. Advertising can often fund bus stop improvements. BC Transit has allocated a \$10,000.00 budget to match bus stop improvement contributions from municipalities and Ron Drolet of BC Transit has encouraged Oak Bay to take advantage of this opportunity. Consider beautifying bus stops (improve the colour and schedule information), thereby promoting transit use in Oak Bay.

3. Alternative Transportation:

- *Substantially improve proper cyclist parking.* There is a noticeable lack of proper parking areas for bikes in the Oak Bay region. Existing bike parking areas are often crowded and are utilized beyond their capacity, most notably at the Recreation Center. The Municipality should install covered bike racks at the Recreation Center and at a location on the Avenue (estimated cost: \$20,000.00). Practical bike racks should also be installed at Estevan Village and along Cadboro Bay road at popular destinations. The Municipality should consider bike racks with a "staggered" design borrowed from Europe which may hold double the number of bikes. A Vancouver-based company has offered to custom-make these staggered bike racks, or a construction request could be put out to industry and the project could be bid on. Suggestion: three spots could be removed from the angle parking at Oak Bay and Wilmot, and be replaced by a covered bike rack and a handicap parking spot. This would be visually appealing and would send a good message. The parking fund may potentially be used to fund this project.

- *Install cyclist indicating squares at busy intersections.* The City of Victoria has installed three trial bike squares; “L” shaped painted areas on the cement in front of and beside the right vehicle lane to allow cyclists to get ahead of traffic at intersections. These areas legitimize the cyclist’s presence on the road, thereby increasing cyclists’ safety. There is currently one at Wharf and Johnson, Hillside and Douglas, and Blanchard and Finlayson. The cost is roughly \$200.00 per installation. The Municipality should consider installing bike squares at busy intersections such as Fort and Foul Bay, Foul Bay and Oak Bay, Cedar Hill X Road and Henderson, and other busy intersections. Some intersections would require the cooperation of neighboring municipalities. An educational component may be necessary as the blue boxes might not be self-explanatory to everyone. Also, bike squares should be installed at intersection locations where cyclists can activate the traffic signal, thereby legitimizing their presence on the road (Goldsmith and Foul Bay).
- *Increase the use of intermittent bike lanes to improve cyclist visibility.* A considerable proportion of Oak Bay residents feel that bike amenities deserve greater attention than traditionally received. Bike lanes provide a symbolic reminder of the presence of cyclists. It is not practical to have bike lanes everywhere as many roads are simply not wide enough. However, intermittent use of bike lanes can greatly increase cyclist visibility and presence on the road. Where no parking is permitted and the road is wide enough, the Municipality should install bike lanes. Example: Beach Drive along side the Victoria Golf Course.

Lifestyle Sub-Committee Final Report

Sub-committee Members:

- Rob Janus, Sub-Committee Chair
- Matt Fairbarns
- (Roger Colwill)
- (Jennifer Ellis)

LIST OF LIFESTYLE RECOMMENDATIONS:

Unlike the Transportation and Buildings Sub-committees, the Lifestyle Sub-committee’s focus was a bit more elusive, yet extensive. The Sub-committee spent a considerable amount of time discussing the ideological and societal issues involved with climate change and the challenges associated with affecting change. The question of how to reach the consciousness of the public was negotiated and some time was spent differentiating between **WHAT** to do and **HOW** to do it. In other words, the difference between lifestyle changing recommendations to reduce GHG emissions was contrasted with how to get the public to enact these changes.

As the Sub-committee generated ideas to encourage energy efficient behavior, it was noted that many recommendations fell into a category of recommendations that could appear on a brochure or informational guide. These items, such as “use clotheslines instead of dryers,” were identified as “what” people should do, actual lifestyle changes that will reduce greenhouse gas emissions. On the other hand, many recommendations fell into a category of “how” the municipality can encourage the adoption of particular lifestyle activities.

To encourage energy efficient, and thus greenhouse gas reducing lifestyle behavior, the Lifestyle Sub-committee makes the following recommendations:

1. Reach out to children; they are great teachers for their parents. (Fun ecological footprint activity where kids are made aware of their ecological footprints, sponsor a children's art competition for a cloth bag to identify OB)
2. Develop the green business theme at the Village.
 - offer complementary cloth bags with green OB logo
 - customers could receive a discount for using cloth bags thereby providing an incentive to use them, rather than focusing on restricting the use of plastic
 - decorate Village with green banners
 - develop a green shopping guide, illustrating green products and what businesses are doing
 - encourage businesses to offer a discount to cyclists
3. Run a column in Oak Bay News promoting GHG reduction. Feature an environmental 'hero' in the community.
4. Appoint a 'Sustainability Officer,' to act as a Municipal resource for green solutions and potentially develop and implement CCTF recommendations. (AND/OR) Look to the CRD for environmental staff to aid in the implementation of the Committee's recommendations; or seek an agreement with a couple of other smaller municipalities to share an environmental employee.
5. **Encourage the CRD to take a leadership role in implementing steps to reduce greenhouse gas emissions in the region, thereby reducing redundancy between municipalities and harnessing efficiencies.**
6. Promote an Event to encourage GHG reductions.
 - Walk to the Village Day, Farmer's Markets, Earth Day celebrations, Local First Festival, etc
7. Create a forum for Climate Change Communication, possibly web-based. (onedayoakbay.ca) Include a Carbon Footprint Calculator. Measure residents' reductions, track achievements. An avenue for suggestions and information.
8. Initiate a Climate Change Café.
9. Encourage flexible Work arrangements for staff.
10. Solicit energy efficient suggestions from Oak Bay residents and offer a reward.
11. Increase the frequency of soft plastic recycling and availability.
12. Encourage the CRD to take up the soft plastic recycling initiative. Oak Bay could be used as a pilot community for the recycling of soft plastics.
13. Education initiatives.
 - Offer courses at Oak Bay Rec.
 - Facilitate a public debate around OB and climate change (densification?), possibly in conjunction with a Lecture Series.
 - Vegetable gardening mentorship
 - Water conservation education (rain barrel distribution)
 - Tree planting program
14. Hire a green consultant to develop and implement ideas to reduce GHGs.
15. Develop a local carbon offset program that links contributions to direct GHG reducing benefits in Oak Bay.
16. Develop a brochure and/or fridge magnet with top actions residents can do to reduce GHGs.
17. Rain collectors, or cisterns, easy-to-install, excellent water-saving devices, should be encouraged for new developments.

Whats: Items to include on Top Ten Things Oak Bay **Residents** can do to reduce GHGs:

- Use compact fluorescent light bulbs, recycle properly
- Use clotheslines instead of dryers
- Wash cloths in cold water
- Take shorter showers
- Turn down hot water heater, consider a tank-less water heater, or put hot water heater on a timer, insulate hot water heater
- Use a programmable thermostat, or turn thermostat down, put on a sweater
- Switch to energy efficient appliances and Replace old inefficient appliances (fridges >15 years, washing machines > 10 years, no real savings with dryers)
- Maintain appliances, change air filters
- Fill dishwasher and washing machine
- Install low-flow showerheads and low-flush toilets
- Reduce stand-by power wastage (significance debated)
- Improve computer energy efficiency
- Use fans, or house design, to reduce demand for AC
- Switch from gas to electric or push mowers
- Use reusable water containers instead of disposable bottled water
- Buy less, try to rent equipment
- Reduce use of synthetic fertilizers and pesticides
- Conserve and recycle paper
- Grow your own vegetables
- Shop locally
- Buy organic food
- Use cloth bags
- Reduce packaging
- Plant a tree
- Support local businesses
- Know what you produce. Use a Carbon Calculator.
- Eat less meat – considered one of the highest contributors to GHGs
- Fly less
- Simplify your lifestyle, Reduce, Reuse and Recycle
- Share unused items within community, expand recycling area at the dump
- Green social events: green birthday parties, green weddings

Buildings and Land Use Sub-Committee Final Report

Sub-committee Members:

Councillor Nils Jensen, Sub-Committee Chair

Roger Colwill

Max Huxley

LIST OF BUILDINGS AND LAND USE RECOMMENDATIONS:

The Sub-committee discussed many ideas on how best to change building bylaws, regulations and construction methods that would lead to a reduction of greenhouse gas emissions.

Two central themes emerged.

The first theme resulted from the recognized fact that greenhouse gas emissions result from commuting to and from work by car. The Sub-committee therefore considered ways to permit densification in Oak Bay, allowing more people to live close to their work, thus reducing their dependence on the car. Concentrating population in areas closer to centres of employment would also allow for expansion and enhancement of public transportation.

A second theme revolved around new construction and renovations. Given that Buildings are the main contributor to greenhouse gas emissions in Oak Bay, accounting for 59 percent of the community's total emissions, steps to alter buildings to improve their energy efficiency were generated. Although most electricity used in buildings is generated from relatively clean hydro-electric sources, electricity demand increasingly exceeds local supply. Few people are aware that BC has been a net importer of electricity since 2000, with imports growing to between 12 – 14 percent of total BC electricity consumption in 2005 (Ministry of Energy, Mines and Petroleum Resources). Much of the imported energy is derived from coal, gas, and nuclear sources (BC Hydro and the David Suzuki Foundation).

The Sub-committee discussed ways to reduce green house gas emissions through incentives to discourage house demolition, regulate construction, use best practices and energy efficient renovations. The Sub-committee also generated miscellaneous recommendations.

1. DENSIFICATION

Main recommendations to permit densification and preserving the current housing:

- a. Permit secondary suites.
- b. Allow subdivisions while maintaining ecological values.
- c. Permit smaller houses on smaller lots.
- d. Develop areas for duplexes and multiplexes.
- e. Permit cluster housing and spot zoning for multiple dwellings.
- f. Create bare land stratas.
- g. Permit larger homes to be subdivided internally.

2. CONSTRUCTION

Main recommendations for new construction, major renovations and demolitions:

- a. Create incentives that will encourage a house being moved or deconstructed rather than being demolished. Set disincentive permit fees for demolition.
- b. Work with the regional government to create guidelines for facilities that are set-up to receive materials from deconstructed houses.
- c. Create a legal requirement for a home owner to consider house moving or house reconstruction before being permitted to demolish. Create information and guidelines to assist residents in this regard.

- d. Create a municipal position of Sustainability Officer who would become a resource person for green building solutions and a variety of other issues such as providing information and assistance regarding house moving and deconstruction. Considerable funding opportunities are available and this municipal resource person could provide the link between the growing resources available and Oak Bay.
- e. Create incentives for building energy efficient homes and buildings such as discounts on permits and Provincial funding. Promote the Federal government's ecoEnergy rebate program for energy efficient home renovations.
- f. Create a Best Practices Information Package to guide/assist residents in improving building and energy efficiency.
- g. To encourage many of these recommendations, the Municipality should host a forum or workshop, mirrored after the successful "Sustainable Saanich" building event. Abundant information is available and many companies have created green solutions, it is mainly a matter of integration and dissemination of information.
- h. Require new construction or larger renovations to have alternative (non-greenhouse gas producing) heat sources to be used for anticipated energy consumption above a set level.
- i. Require on-demand hot water heating.
- j. Consider renewable energy sources for municipal operations.
Heating Our Communities: Renewable Energy Guide for Local Governments in BC. 2007.
Available at: <http://www.communityenergy.bc.ca>.
- k. Permit and encourage residents to generate their own energy such as geothermal and wind. As part of this, develop guidelines for geo-thermal heating for homes.
- l. Do energy audits on selected types of residences and publicize results and suggestions for improvements.
- m. Create energy efficiency reports to accompany sale of homes - encourage senior levels of government with jurisdiction (Province/Federal/Regional) to make this a requirement for selling a home.
- n. Use net metering and "Smart" meters for new homes and incentives/encouragement to install them for existing homes.
- o. Permit rain water collection systems.
- p. Set Minimum LEED standards for house construction.
- q. Develop regulations to encourage buildings to be built with maintenance-free exteriors.
- r. Discourage high-maintenance windows in new houses or non-heritage renovations.
- s. Create a regulation to limit the amount of waste permitted during new construction. Consider applying this to major renovations also.

- t. Create incentives that will encourage the construction of longer lasting buildings.
- u. Request the Province to review regulations and requirements for exhaust fans to reduce the amount of air exhausted from buildings and thereby reducing the demand for heated replacement air.
- v. Require rain water containers for water to be used for outdoor gardening.
- w. Review the feasibility of requiring the retention of storm water to be held on the property.
- x. Large homes use substantially more energy and are generally more energy inefficient. BC has the largest houses in Canada, with an average 2700 sq.ft. A tax shifting solution should be developed, involving a “luxury tax” on the excessive energy consumption of larger homes. An incremental tax should be placed on building permits for new developments that exceed a certain square footage or certain expected energy requirement.

3. MISCELLANEOUS

- a. Expand the urban forest cover. The relationship between forests and climate change are rigorously debated. However, until scientists prove otherwise, because trees remove carbon dioxide from the atmosphere, as well as many other important ecological functions, forest cover should be expanded in Oak Bay.
- b. Review the need for boulevard watering and reduce mowing schedules.
- c. Consider geothermal heating options for community – promote geothermal heating plants to serve municipal operations and private homes.
- d. Following a municipal energy use audit, develop a program to ensure municipal buildings are energy efficient and healthy.
- e. Consider heat exchangers in waste water sewers as proposed in the Dockside Green – City of Victoria agreement. Heat exchanged could be used by the municipality, the region or private homes.
- f. Provide municipal funding to create an Oak Bay “One Day” internet portal for a green municipality that would be maintained and operated by community members (see for example <http://www.onedayvancouver.ca/portal.php>). Alternately, network with or expand the “One Day CRD” website to include Oak Bay initiatives.

APPENDIX A**Oak Bay Community Emission Inventory**

Reproduced from:

Greenhouse Gas and Energy Use Inventory for the Capital Region 2004

Oak Bay had an estimated population of 18,800 in 2004, with an average of 3.3 persons per household (Statistics Canada, 2001 Census). Energy use and GHG emissions are summarized in three different categories below.

Table 2.28**Building Energy Use and GHG Emissions for Oak Bay**

	Source	GHGs (tonnes)				Energy (GJ)
		CO ₂	CH ₄	N ₂ O	eCO ₂	
1995	Natural Gas-residential	2,462	0.04	0.04	2,476	46,160
	Natural Gas-commercial	4,768	0.09	0.09	4,797	89,406
	Natural Gas-Industrial	1,372	0.03	0.03	1,381	25,731
	light fuel oil-residential	15,320	1.07	0.03	15,351	213,824
	LPG Commercial Use	1,071	0.02	0.08	1,095	3,715
	LPG Residential Use	438	0.01	0.03	448	1,518
	Woodstove/Fireplace	0	0.00	0.00	0	40,060
	Electricity - residential	0	0.00	0.00	5,666	334,399
	Electricity - commercial	0	0.00	0.00	1,728	101,980
	Electricity - industrial	0	0.00	0.00	18	1,087
	Total 1995				32,961	857,880
2004	Natural Gas-residential	9,847	0.19	0.18	9,907	184,638
	Natural Gas-commercial	5,068	0.10	0.09	5,099	95,021
	Natural Gas-Industrial	1,459	0.03	0.03	1,467	27,347
	light fuel oil-residential	11,531	0.86	0.02	11,557	160,948
	LPG Commercial Use	1,138	0.02	0.08	1,164	3,948
	LPG Residential Use	465	0.01	0.03	476	1,614
	Woodstove/Fireplace	0	0.00	0.00	0	42,576
	Electricity - residential	0	0.00	0.00	3,286	358,419
	Electricity - commercial	0	0.00	0.00	932	101,686
	Electricity - industrial	0	0.00	0.00	29	3,118
	Total 2004				33,916	979,315
2012	Natural Gas-residential	10,663	0.20	0.20	10,728	199,937
	Natural Gas-commercial	5,488	0.11	0.10	5,521	102,894
	Natural Gas-Industrial	1,579	0.03	0.03	1,589	29,613
	light fuel oil-residential	12,487	0.93	0.03	12,514	174,284
	LPG Commercial Use	1,233	0.02	0.09	1,260	4,275
	LPG Residential Use	504	0.01	0.04	515	1,748
	Woodstove/Fireplace	0	0.00	0.00	0	46,103
	Electricity - residential	0	0.00	0.00	3,558	388,117
	Electricity - commercial	0	0.00	0.00	1,009	110,112
	Electricity - industrial	0	0.00	0.00	31	3,376
	Total 2012				36,726	1,060,459

Table 2.29
Transportation Energy Use and GHG Emissions for Oak Bay

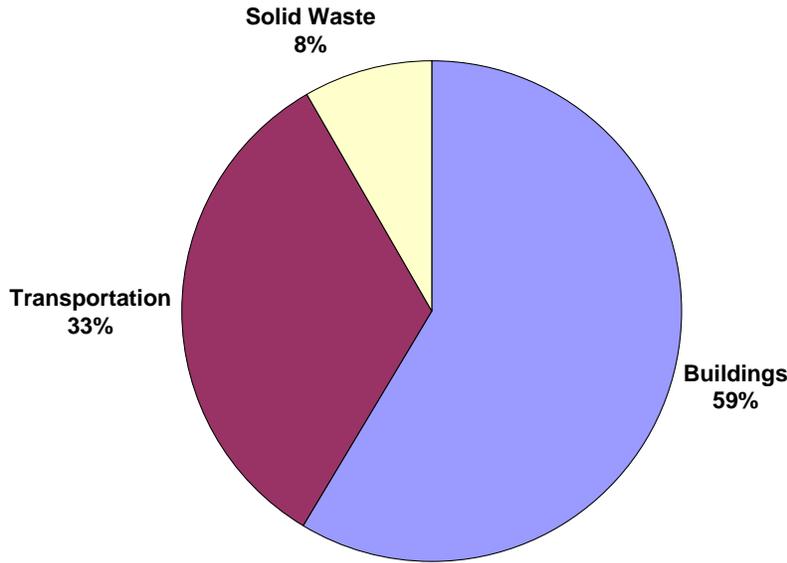
	1995	2004	2012
Annual kms	53,435,718	55,645,754	60,256,461
Gasoline consumption (l)	7,014,386	6,359,490	6,811,164
Diesel consumption (l)	654,828	943,933	1,010,974
Energy Use (GJ)	278,234	265,636	284,502
CO ₂ (tonnes)	18,880	17,431	18,615
CH ₄ (tonnes)	9.28	5.08	2.64
N ₂ O (tonnes)	3.81	3.51	3.75
CO₂e (tonnes)	20,255	18,624	19,835

Table 2.30
Solid Waste GHG Emissions for Oak Bay

Year	CH ₄ released (tonnes)	CH ₄ recovered (tonnes)	net CH ₄ released (tonnes)	CO ₂ e (tonnes)
1995	562	45	517	10,851
2004	385	164	221	4,635
2012	410	191	218	4,582

A diagram of community GHG emissions (in eCO₂ amounts) by source category for 2004 is shown on the following page. Currently, emissions from Buildings constitute 59% of the total for Oak Bay.

Figure 2.8: GHG Emission Summary (in eCO₂) for Oak Bay in 2004



Oak Bay Corporate Emission Inventory

The corporate energy use and GHG emission inventory for Oak Bay, as shown in Table 3.14, is currently incomplete, with water/sewage and the natural gas portion of the building group remaining to be accounted for.

The Municipality of Oak Bay submitted vehicle fleet data for 1995 and 2004, but the information did not include fuel consumption or kilometres travelled on a per-vehicle basis. However, GHG emissions can be readily determined from total fuel consumption for the fleet, and the necessary data were supplied for the years 2000 and 2004. These amounts are shown below, and do not include GST:

2000 gasoline:	100,133 litres @ \$64,707.00 total cost
2000 diesel:	103,144 litres @ \$55,910.00 total cost
2004 gasoline:	119,302 litres @ \$92,718.00 total cost
2004 diesel:	101,507 litres @ \$63,670.00 total cost

*** Please take note of the considerable increase in gasoline use (approximately 18 percent)**

The 2000 fuel consumption amounts were used to estimate 1995 consumption. The amount of diesel for 1995 was set to the 2000 value, whereas the gasoline amount was scaled down to 76,172 litres, based on the rate of increase between 2000 and 2004. The total number of vehicles in the Oak Bay fleet has increased from 94 in 1995 to 102 in 2004.

The Oak Bay Municipal Hall was included in the CRD energy management audits as shown in Table 3.5, and related consumption amounts can be used in the building portion of the corporate inventory. Some attention should be applied to the current inputs for street lighting; one electrical account for 1995 may be missing, which leads to the current situation of 2004 consumption dramatically higher than the 1995 amount.

Table 3.14
Corporate Energy and GHG Inventory for Oak Bay

Vehicle Fleet

	Fleet Numbers	Total Fuel Consumption (litres)	Total Energy Consumed (GJ)	Total GHG Emissions (kg)			
				Carbon Dioxide (CO ₂)	Methane (CH ₄)	Nitrous Oxide (N ₂ O)	Carbon Dioxide Equivalent (CO ₂ e)
2004	102	220,809	8,184	558,667	53	89	587,374
1995	94	179,316	5,660	461,349	87	53	479,555
Forecast - 2012	n/a	n/a	8,863	604,957	58	96	636,043

Buildings

	Electrical Energy Consumed (kWh)	Natural Gas Consumed (GJ)	Total Energy Consumed (GJ)	Total GHG Emissions (kg)			
				Carbon Dioxide (CO ₂)	Methane (CH ₄)	Nitrous Oxide (N ₂ O)	Carbon Dioxide Equivalent (CO ₂ e)
2004	4,170,907	0	15,015	0	0	0	137,640
1995	5,169,400	0	18,610	0	0	0	289,486
Forecast - 2012	4,516,501	n/a	16,259	0	0	0	149,045

Street Lighting

	Electrical Energy Consumed (kWh)	Total Energy Consumed (GJ)	Total GHG Emissions (kg)			
			Carbon Dioxide (CO ₂)	Methane (CH ₄)	Nitrous Oxide (N ₂ O)	Carbon Dioxide Equivalent (CO ₂ e)
2004	1,181,626	4,254	0	0	0	38,994
1995	230,740	831	0	0	0	12,921
Forecast - 2012	1,279,534	4,606	0	0	0	42,225

Water/ Sewage

	Electrical Energy Consumed (kWh)	Total Energy Consumed (GJ)	Total GHG Emissions (kg)			
			Carbon Dioxide (CO ₂)	Methane (CH ₄)	Nitrous Oxide (N ₂ O)	Carbon Dioxide Equivalent (CO ₂ e)
2004	0	0	0	0	0	0
1995	0	0	0	0	0	0
Forecast - 2012	0	0	0	0	0	0