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APPENDIX 1 - CLIMATE ACTION CHARTER



RECEIVED

AUG 06 2015

CITY OF PORT ALBERNI

Ref: 158952

July 29, 2015

His Worship Mayor Mike Ruttan
and Members of Council
City of Port Alberni
4850 Argyle St
Port Alberni, BC V9Y 1V8

Dear Mayor Ruttan and Councillors:

On behalf of the joint Provincial-Union of British Columbia Municipalities (UBCM) Green Communities Committee (GCC), we would like to extend our congratulations for your successful efforts to measure and reduce your corporate greenhouse gas emissions for the 2014 reporting year.

As a signatory to the Climate Action Charter (Charter), you have demonstrated your commitment to work with the Province and UBCM to take action on climate change and to reduce greenhouse gas emissions in your community and corporate operations.

The work that your local government has undertaken to measure and reduce its corporate emissions demonstrates strong climate leadership and sets the stage for broader climate action in your community. As British Columbia begins developing a new climate action plan, your leadership and commitment continues to be essential to ensuring the achievement of our collective climate action goals. For more information about BC's Climate Leadership Plan, go to <http://www.newsroom.gov.bc.ca/2015/05/bc-names-climate-leadership-team.html>.

The GCC was established under the Charter to support local governments in achieving their climate goals. In acknowledgement of the efforts of local leaders, the GCC is again recognizing the progress and achievements of local governments such as yours through the multi-level Climate Action Recognition Program. A description of this program is enclosed for your reference.

As a Charter signatory who has completed a corporate carbon inventory for the 2014 reporting year and has demonstrated familiarity with the Community Energy and Emissions Inventory, you have been awarded Level 2 recognition – 'Measurement.'

.../2

Mayor Mike Ruttan
and Members of Council
Page 2

In recognition of your achievements, the GCC is very pleased to provide you with climate action community branding for use on official websites and letter heads. An electronic file with the 2014 logo will be provided to your Chief Administrative Officer. Also enclosed is a 2014 Climate Action Community window decal, for use on public buildings.

Congratulations again on establishing your corporate emissions inventory and your overall progress. We wish you continued success in your ongoing commitment to the goal of corporate carbon neutrality and your efforts to reduce emissions in the broader community.

Sincerely,



Gary Paget
Acting Assistant Deputy Minister
Local Government Division
Ministry of Community, Sport and
Cultural Development



Gary MacIsaac
Executive Director
Union of British Columbia Municipalities

Enclosures



GCC Communiqué on the Climate Action Recognition Program

In acknowledgment of the ongoing efforts of local leaders, the joint Provincial-UBCM Green Communities Committee (GCC) is pleased to be continuing the **Climate Action Recognition Program** for BC local governments for the 2014 reporting year. This is a multi-level program that provides the GCC with an opportunity to review and publicly recognize the progress and achievements of each Climate Action Charter (*Charter*) signatory.

Recognition is provided on an annual basis to local governments who demonstrate progress on their *Charter* commitments, according to the following:

Level 1: Progress on Charter Commitments

All local governments who demonstrate progress on fulfilling one or more of their *Charter* commitments will receive a letter from the GCC acknowledging their accomplishments.

Level 2: Measurement

Local governments who have completed a corporate carbon inventory for the reporting year and demonstrate that they are familiar with the Community Energy and Emissions Inventory (CEEI) will receive a 'Climate Action Community 2014' logo, for use on websites, letter head and similar.

Level 3: Achievement of Carbon Neutrality

Local governments who achieve carbon neutrality in the reporting year will receive a 'Climate Action Community – Carbon Neutral 2014' logo, for use on websites, letter head and similar.

To be eligible for this program, local governments will need to complete a Climate Action Revenue Incentive Program (CARIP)/ Carbon Neutral Progress Survey and submit it online to the Province in accordance with the program guidelines. Determination of the level of recognition that each community will receive will be based on the information included in each community's annual CARIP report. Additional information on CARIP reporting is available online at:

www.cscd.gov.bc.ca/lgd/greencommunities/carip.htm .

From: [Hill, Jennifer CSCD:EX](#)
Subject: Green Communities Committee Climate Action Award - Green Community Electronic Files
Date: Sunday, August 17, 2014 11:11:54 AM
Attachments: [CAC-logo2013-CMYK-digital.tif](#)
[CAC-logo2013-CMYK-print-greyscale.eps](#)
[CAC-logo2013-CMYK-print-lrg.eps](#)
[CAC-logo2013-CMYK-print-sm.eps](#)
[CAC-logo2013-web150.png](#)
[CAC-logo2013-web300.png](#)

This letter is being sent by Jennifer Hill on behalf of Lois-Leah Goodwin, Executive Director, Intergovernmental Relations and Planning, Ministry of Community, Sport and Cultural Development.

Dear Chief Administrative Officer:

As a signatory to the Climate Action Charter (Charter), your local government has demonstrated its commitment to work with the Province and the Union of BC Municipalities (UBCM) to take action on climate change and to reduce greenhouse gas emissions in your corporate operations and the broader community.

As you may already be aware, the joint Provincial-UBCM Green Communities Committee (GCC) has established the multi-level [Climate Action Recognition Program](#) as a way of acknowledging the progress and efforts being taken by local government leaders as they work to achieve their climate goals.

As a Charter signatory who has completed a corporate carbon inventory for the 2013 reporting year and has demonstrated familiarity with the Community Energy and Emissions Inventory, your local government has been awarded Level 2 recognition – ‘Measurement.’

A formal letter of recognition has been sent to your Council/Board acknowledging this accomplishment. The GCC is also very pleased to provide you with ‘green community’ branding for use on official websites and letter heads. An electronic file with this logo is attached to this email. If you have any questions about the use of the file or about your Charter commitments more generally, please contact Jennifer Hill, Manager, Intergovernmental Initiatives by email at: Jennifer.Hill@gov.bc.ca or by telephone at: 250-387-0089.

On behalf of the GCC, I would like to extend our congratulations to your local government for its efforts to reduce greenhouse gas emissions in its corporate operations and community over the 2013 reporting year and to wish your community continued success in its ongoing progress.

Sincerely,

Lois-Leah Goodwin

Green Communities Committee, Provincial Representative
Executive Director, Intergovernmental Relations and Planning Branch, MCSCD
Phone: 250 356-1128
Email: loisleah.goodwin@gov.bc.ca

Jennifer Hill, MCIP | RPP

Manager, Intergovernmental Initiatives
Intergovernmental Relations and Planning Branch
Ministry of Community, Sport and Cultural Development
6th Floor, 800 Johnson Street
Victoria, BC V8W 9T2
(T) 250-387-0089

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This email was virus checked by the City of Port Alberni's Sophos UTM 9 email security.
<http://www.portalberni.ca>

THE BRITISH COLUMBIA CLIMATE ACTION CHARTER

BETWEEN

THE PROVINCE OF BRITISH COLUMBIA (THE PROVINCE)

AND

THE UNION OF BRITISH COLUMBIA MUNICIPALITIES (UBCM)

AND

SIGNATORY LOCAL GOVERNMENTS

(THE PARTIES)

(1) The Parties share the common understanding that:

- (a) Scientific consensus has developed that increasing emissions of human caused greenhouse gases (GHG), including carbon dioxide, methane and other GHG emissions, that are released into the atmosphere are affecting the Earth's climate;
- (b) the evidence of global warming is unequivocal and the effects of climate change are evident across British Columbia;
- (c) reducing GHG emissions will generate environmental and health benefits for individuals, families, and communities;
- (d) climate change and reducing GHG emissions are issues of importance to British Columbians;
- (e) governments urgently need to implement effective measures to reduce GHG emissions and anticipate and prepare for climate change impacts;
- (f) protecting the environment can be done in ways that promote economic prosperity; and
- (g) it is important to take action and to work together to share best practices, to reduce GHG emissions and address the impacts of climate change.

(2) The Parties acknowledge that each has an important role in addressing climate change and that:

- (a) The Province has taken action on climate change, including commitments made in the 2007 Speech from the Throne, the BC Energy Plan, and the Western Climate Initiative on climate change;
- (b) Local Governments have taken action on climate change, including planning livable, sustainable communities, encouraging green developments and transit oriented developments, and implementing innovative infrastructure technologies including landfill gas recapture and production of clean energy; and

- (c) these actions create the foundation for the Parties to be leaders in affecting climate change.

(3) This Charter acknowledges that:

- (a) The interrelationship between each Order of Government's respective jurisdictions and accountabilities with respect to communities, and activities related to and within communities, creates both a need and an opportunity to work collaboratively on climate change initiatives;
- (b) both Orders of Government have recognized a need for action, both see that the circumstances represent a Climate for Change in British Columbia, and both are responding; and
- (c) the actions of each of the Parties towards climate change will be more successful if undertaken jointly with other Parties.

(4) The Parties share the common goals of:

- (a) Fostering co-operative inter-governmental relations;
- (b) aiming to reduce GHG emissions, including both their own and those created by others;
- (c) removing legislative, regulatory, policy, or other barriers to taking action on climate change;
- (d) implementing programs, policies, or legislative actions, within their respective jurisdictions, that facilitate reduced GHG emissions, where appropriate;
- (e) encouraging communities that are complete and compact and socially responsive; and
- (f) encouraging infrastructure and a built environment that supports the economic and social needs of the community while minimizing its environmental impact.

(5) In order to contribute to reducing GHG emissions:

- (a) Signatory Local Governments agree to develop strategies and take actions to achieve the following goals:
 - (i) being carbon neutral in respect of their operations by 2012, recognizing that solid waste facilities regulated under *the Environmental Management Act* are not included in operations for the purposes of this Charter.
 - (ii) measuring and reporting on their community's GHG emissions profile; and
 - (iii) creating complete, compact, more energy efficient rural and urban communities (e.g. foster a built environment that supports a reduction in car dependency and

energy use, establish policies and processes that support fast tracking of green development projects, adopt zoning practices that encourage land use patterns that increase density and reduce sprawl.)

(b) The Province and the UBCM will support local governments in pursuing these goals, including developing options and actions for local governments to be carbon neutral in respect of their operations by 2012.

(6) The Parties agree that this commitment to working together towards reducing GHG emissions will be implemented through establishing a Joint Provincial-UBCM Green Communities Committee and Green Communities Working Groups that support that Committee, with the following purposes:

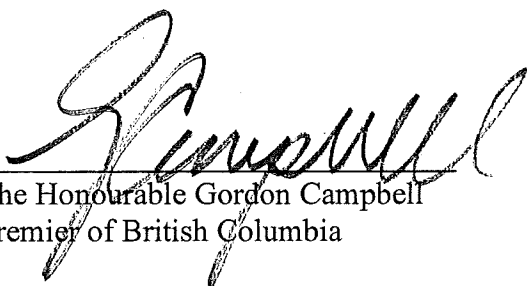
- (a) To develop a range of actions that can affect climate change, including initiatives such as: assessment, taxation, zoning or other regulatory reforms or incentives to encourage land use patterns that promote increased density, smaller lot sizes, encourage mixed uses and reduced GHG emissions; development of GHG reduction targets and strategies, alternative transportation opportunities, policies and processes that support fast-tracking of green development projects, community gardens and urban forestry; and integrated transportation and land use planning;
- (b) to build local government capacity to plan and implement climate change initiatives;
- (c) to support local government in taking actions on becoming carbon neutral in respect of their operations by 2012, including developing a common approach to determine carbon neutrality for the purposes of this Charter, identifying carbon neutral strategies and actions appropriate for the range of communities in British Columbia and becoming reporting entities under the Climate Registry; and,
- (d) to share information and explore additional opportunities to support climate change activities, through enhanced collaboration amongst the Parties, and through encouraging and promoting climate change initiatives of individuals and businesses within communities.

(7) Once a common approach to carbon neutrality is developed under section (6)(c), Signatory Local Governments will implement their commitment in 5 (a) (i).

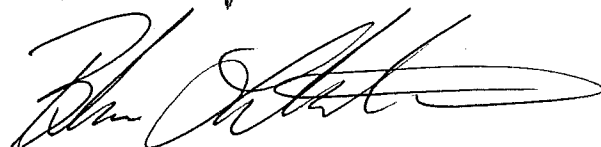
(8) To recognize and support the GHG emission reduction initiatives and the climate change goals outlined in this Charter, Signatory Local Governments are invited by the other Parties to include a statement of their initiatives and commitments as an appendix to this Charter.

(9) This Charter is not intended to be legally binding or impose legal obligations on any Party and will have no legal effect.

SIGNED on behalf of the PROVINCE OF BRITISH COLUMBIA by:


The Honourable Gordon Campbell
Premier of British Columbia


Date: September 26, 2007


Honourable Blair Lekstrom
Minister of Community Development

Date: ~~September 26, 2007~~

August 5, 2008

SIGNED on behalf of the UNION OF BRITISH COLUMBIA MUNICIPALITIES by:



Director Susan Gimse and
President of the Union of British
Columbia Municipalities

Date: September 26, 2007

SIGNED on behalf of the SIGNATORY LOCAL GOVERNMENT:

CITY OF PORT ALBERNI

(NAME OF LOCAL GOVERNMENT)

by: 

Mayor Ken McRae

Date April 23, 2008

Appendix
GHG reduction initiatives or commitments of Signatory Local Government

Addendum to
The British Columbia Climate Change Action Charter

For

CITY OF PORT ALBERNI

is committed to

1. Implementing existing plans

Port Alberni City Council formed a Climate Change Committee in 2007. This select Committee of Council was appointed for the purpose of investigating practical actions for the City and the community to help to reduce negative impacts of climate change.

The Committee's final report to Council expected in May, 2008 is intended to:

- Propose public awareness materials for informing the public on their own practical initiatives that may reduce negative impacts of climate change.
- Identify potential procedures for the City to reduce its carbon footprint without significant cost.
- Develop strategies and actions to achieve the following goals for the City:
 - Being carbon neutral in respect of operations by 2012
 - Measuring and reporting on the community's Green House Gas emissions profile
- Create a complete, compact, more energy efficient community

The City of Port Alberni is partnering with the International Centre for Sustainable Cities. The first step in addressing sustainability planning is to undertake a community assessment.

2. Continue to pursue activities

- A Recycling and solid waste management plan administered by the Alberni-Clayoquot Regional District will be implemented in the City during 2008

3. Preparing new plans, bylaws, policies, etc.

- An Anti-idling policy for City vehicles was adopted by Port Alberni City Council at their April 14th, 2008 regular meeting
- The City of Port Alberni is a partner in the Hupacasath First Nation's China Creek green micro-hydro generation project

STATUS OF CONSIDERATION OF THE BC CLIMATE ACTION CHARTER

As of November 17, 2011, **180 BC Local Governments** have signed the British Columbia Climate Action Charter.

1. 100 Mile House
2. Abbotsford
3. Alert Bay
4. Anmore
5. Armstrong
6. Ashcroft
7. Barriere
8. Belcarra
9. Bowen Island
10. Bulkley Nechako Regional District
11. Burns Lake
12. Cache Creek
13. Campbell River
14. Canal Flats
15. Capital Regional District
16. Cariboo Regional District
17. Castlegar
18. Central Coast Regional District
19. Central Kootenay Regional District
20. Central Okanagan Regional District
21. Central Saanich
22. Chase
23. Chetwynd
24. Chilliwack
25. Clearwater
26. Clinton
27. Coldstream
28. Columbia Shuswap Regional District
29. Colwood
30. Comox, Town
31. Comox Valley Regional District
32. Coquitlam
33. Courtenay
34. Cowichan Valley Regional District
35. Cranbrook
36. Creston
37. Cumberland
38. Dawson Creek

39. Delta
40. Duncan
41. East Kootenay RD
42. Elkford
43. Enderby
44. Esquimalt
45. Fernie
46. Fort St. John
47. Fort St. James
48. Fraser Fort George Regional District
49. Fraser Lake
50. Fraser Valley Regional District
51. Fruitvale
52. Gibsons
53. Golden
54. Gold River
55. Grand Forks
56. Granisle
57. Greenwood
58. Harrison Hot Springs
59. Highlands
60. Hope
61. Houston
62. Hudson's Hope
63. Invermere
64. Islands Trust
65. Kamloops
66. Kaslo
67. Kelowna
68. Kent
69. Keremeos
70. Kimberley
71. Kitimat Stikine Regional District
72. Kootenay Boundary Regional District
73. Ladysmith
74. Lake Country
75. Lake Cowichan
76. Langford
77. Langley, City
78. Langley, Township
79. Lantzville
80. Lillooet
81. Lions Bay

82. Logan Lake
83. Lumby
84. Lytton
85. Mackenzie
86. Maple Ridge
87. Masset
88. McBride
89. Merritt
90. Metchosin
91. Metro Vancouver
92. Midway, Village of
93. Mission
94. Montrose
95. Mount Waddington, Regional District
96. Nakusp
97. Nanaimo City
98. Nanaimo, RD
99. Nelson
100. New Denver
101. New Hazelton
102. New Westminster
103. North Cowichan
104. North Okanagan, Regional District
105. North Saanich
106. North Vancouver City
107. North Vancouver District
108. Northern Rockies Regional Municipality
109. Oak Bay
110. Okanagan-Similkameen Regional District
111. Oliver
112. Osoyoos
113. Parksville
114. Peace River Regional District
115. Peachland
116. Pemberton
117. Penticton
118. Pitt Meadows
119. Port Alberni
120. Port Alice
121. Port Clements
122. Port Coquitlam
123. Port Hardy
124. Port McNeill

125. Port Moody
126. Port Edward
127. Pouce Coupe
128. Powell River City
129. Powell River Regional District
130. Princeton
131. Prince George
132. Prince Rupert
133. Qualicum Beach
134. Queen Charlotte
135. Quesnel
136. Radium Hot Springs
137. Revelstoke
138. Richmond
139. Rossland
140. Saanich
141. Salmo
142. Salmon Arm
143. Sayward
144. Sechelt
145. Sicamous
146. Sidney
147. Skeena Queen Charlotte Regional District
148. Slocan
149. Smithers
150. Sooke, District
151. Spallumcheen
152. Sparwood
153. Squamish
154. Squamish Lillooet Regional District
155. Strathcona Regional District
156. Summerland
157. Sunshine Coast Regional District
158. Surrey
159. Tahsis
160. Taylor
161. Telkwa
162. Terrace
163. Thompson Nicola Regional District
164. Trail
165. Tofino
166. Tumbler Ridge
167. Ucluelet

168. Valemount
169. Vancouver
170. Vanderhoof
171. Vernon
172. Victoria
173. View Royal
174. Warfield
175. Wells
176. Westside
177. West Vancouver
178. Whistler
179. White Rock
180. Williams Lake

Non Signatories

1. Alberni-Clayoquat Regional District
2. Burnaby
3. Hazelton
4. Kitimat (District)
5. Sechelt Indian Band
6. Silverton
7. Stewart
8. Zeballos
9. Resort Municipality of Sun Peaks

APPENDIX 2 - ICSC MOU



MEMORANDUM OF UNDERSTANDING

September 2008

This is a Memorandum of Understanding between the **International Centre for Sustainable Cities (ICSC)** and the **City of Port Alberni** concerning membership in the Sustainable Cities: *PLUS Network*.

The City of Port Alberni agrees to:

1. Commit to a path of sustainability (for example, by formally endorsing sustainability principles such as Local Agenda 21, the Melbourne Principles, the Aalborg Charter, or others).
2. Adapt its planning frameworks/ processes to incorporate a long-term time horizon (e.g., including a 100-year vision, a 30-year strategy and shorter-term plans for implementation).
3. Use an integrated (comprehensive) planning approach - incorporating environmental, social, cultural and economic well-being, preferably at both the local and regional level.
4. Identify a short-term project that illustrates action towards long-term sustainability. (This can be an existing project that will be profiled in *PLUS Network* communications).
5. Acknowledge the interests of all community members (e.g., by using a participatory planning process involving citizens, city representatives/ staff as well as private and educational sectors).
6. Establish a reference group/sustainability team that guides the city on its path toward sustainability and in its involvement with the *PLUS Network*.
7. Identify a *PLUS Network* contact person.
8. Share its experiences in integrated long-term planning and short-term action projects with other members of the *PLUS Network* (e.g., through *PLUS Network* events, such as the biennial conference, peer-exchange workshops, the *PLUS Network* website and other electronic and print media).
9. Provide sufficient resources to participate in the *PLUS Network*. This includes at a minimum: staff time and financial resources associated with the communities' long-term planning initiatives; local costs of workshops hosted in the community; annual *PLUS Network* membership fees; and travel expenses for attending some meetings.

Agreed and Accepted:

Ken McRae
Mayor
City of Port Alberni

Dr. Nola Kate Seymour
President and CEO
International Centre for Sustainable Cities

Municipal Sustainability Leadership Training





co-creating for urban sustainability



municipal sustainability leadership training

Municipal governments around world have made a formal commitment to move their operations and their cities towards more sustainable futures – futures that maximize the social, environmental and economic well being of their citizens. Faced with increasingly complex problems such as reducing carbon emissions, lowering rates of crime, poverty and homelessness and more recently with the challenges of rapid urbanization and ageing populations, cities have rooted their policy frameworks in the concept and values of sustainable development.

Municipalities are also faced with the growing need to do ‘more with less’ as they struggle to fund basic infrastructure and services while continuing to deliver value to their citizens.

Solving these complex challenges requires a new approach to leadership in municipalities; an approach that enables leaders to recognize where stability and certainty are appropriate (such as maintaining a clean and safe water supply) while introducing innovation, when new thinking, new ideas and new solutions are required (such as integrated solutions to energy security, carbon emissions, and economic marginalization). Finding this balance between innovation and stability is the key to successfully renewing our cities to face the challenges of the 21st century. But for each city this balance will be reached in different ways. Our approach offers a collaborative and custom designed process tailored to the needs of your city.

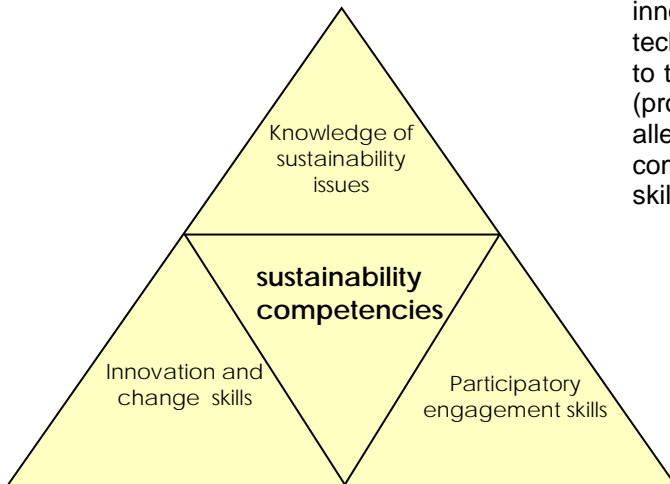
sustainability + innovation + participatory engagement

the service : co-creating a sustainability leadership program

Sustainable Cities International, in collaboration with leadership development consultants, is offering a service to municipalities that will help build leadership capacity amongst their staff and within their community to meet their sustainability goals. The service is grounded in the concept of co-creation which ties together two elements; design thinking – a methodology increasingly used by businesses and less frequently by the public sector to build personal and organizational capacity for innovation and; participatory decision making (both in policy design and implementation). This 'human centered' approach to innovation is the key to creating sustainable futures; for a product, a service, an organization or a city.

Through an intensive workshop, the consultant team will work with municipal staff (human resources, communications and engagement professionals and sustainability practitioners) to incorporate local issues, knowledge and experience into the design of a leadership program. This unique, 'upfront' design process enables the municipality to identify and build upon its own assets and those of its community, thus creating greater capacity for continued learning and development.

Recognizing that training professionals is not solely about deepening the understanding of sustainability issues but is equally about strengthening the skills and values required for its delivery, the process seeks to integrate design thinking competencies (such as innovation and collaboration), with the more technical aspects of sustainability as they apply to the services and operations of a municipality (provision of water, waste, housing or the alleviation of poverty). Rounding out the competencies will be participatory engagement skills.



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municipalities have different needs than businesses

Although municipalities share some of the same challenges as businesses in embracing innovation, they are also confronted by unique conditions that impede the introduction of innovation to their organizations. For example; instead of meeting a single, financial bottom line, municipalities are committed to a broader public service mandate or the 'triple' bottom line of social, environmental and economic well being; as organizations they are strongly siloed vertically (between other orders of government) and horizontally (between professional and policy domains); unlike many businesses, municipalities are often risk averse in part due to their need for public transparency; and they work in absence of any market signals and lack access to funding to support creative, new ventures. This program has been designed to capture the best of experience of innovation in the business sector while responding to the unique challenges faced by public sector leaders.



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the service

The service consists of intensive two day workshops with a team of municipal staff. Selection of the staff will be through dialogue between Sustainable Cities International and the client municipality. External participants may be appropriate depending on its size and the approach that the municipality takes in its service delivery. (e.g. smaller municipalities may rely to a greater extent on external consultants or partnerships with community agencies).

The outcome of the workshops will be a framework for a leadership training program for the municipality.

Potential modules for a Sustainability Leadership Program:

- **Global and local trends and drivers in sustainability**
- **The municipality's commitment to and work on sustainability**
- **Understanding self**
- **Innovation and creativity for sustainability**
- **Tools for sustainability decision making**
- **Collaboration + teamwork**
- **Design thinking and systems thinking**
- **Leading change for sustainability**

workshop sessions

Day 1: Local Sustainability Assets

- Welcome and overview of the workshop
- Introductions
- Local sustainability issues
- Spheres of influence
- Defining sustainability

Day 2: Leadership for Sustainability

- What is sustainability leadership?
- Identifying skills and behaviours for sustainability leadership
- Leadership challenges
- Designing a framework for a leadership program

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workshop leaders

Patricia Gordon

Pat has over 20 years of experience of working in local government in Canada and the UK, during which time she has been at the forefront of sustainability planning and projects. In her role as Sustainability Manager she led the imagineCALGARY project – one of the largest community visioning and planning exercises in the world. She also led Plan It Calgary a multi year sustainable transportation and land use plan for the City of Calgary. While working on local food initiatives in the UK, Pat led a team that introduced the country's first accredited farmer's market in the City of Bath.

Recognizing that sustainability practitioners require more than knowledge of the issues, Pat has identified 'human centered' design thinking as a way to bring together the knowledge and skills for success.

Pat has led training sessions for municipal staff in many topics related to sustainability including; climate change, energy, local food initiatives and smart growth. She has a Bachelors of Science in Geography and a Masters of Science in Earth Science and the Environment.

Bryan Krafchik and Nicky Fried

Bryan and Nicky, managing partners of AKKADIS, are social entrepreneurs with a mission to work with organizations to positively enhance the world around them. They use principles of innovation, creativity, collaboration, systems and design thinking to support employees to develop the skills and behaviors to positively embrace sustainability and champion its adoption. Their focus is to work with organizations that have strong social mandates.

Currently, AKKADIS delivers the Introductory and Innovation in Sustainability modules for Metro Vancouver's Sustainability Leadership Program. In addition, they are working closely with credit unions in Dawson Creek and Salmon Arm to design and manage innovative team building and transformation programs. Nicky has been providing communications training for the past 11 years to the City of Vancouver.

Nicky is an innovator and expert in storytelling and uses it to support change collaboration in organizations. She has worked with public sector organizations to embed storytelling as a means of illustrating desired behaviors. Nicky teaches storytelling and other communication related topics through Simon Fraser University's Writing & Publishing program.

Bryan is a highly creative program designer, with a focus on developing organizational transformation programs. He has worked across the globe. His experience ranges from developing community participation initiatives for the South African Museum, through to creating and managing Exel's global skills program for managers in the developing world. More recently, Bryan managed the largest change initiative ever undertaken by Best Buy Canada, in support of that organization's social responsibility mandate to its employees.

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Theresa Kingston

With over 30 years experience working in local government, Theresa is the Manager of Human Resources and Community Development for the City of Port Alberni. In her Human Resources role she is responsible for all aspects of employee development including hiring, training, performance management, labour relations and leadership development. In her Community Development role, Theresa supports public participation processes, sustainability initiatives and works with a large number of community groups addressing community issues.

For the past three years Theresa has been a volunteer with the Federation of Canadian Municipalities, Migrant Labour Rights Project in Sichuan Province, China. Her contribution included developing resources and providing training to local governments on citizen-centred approach to service delivery and public participation processes.

Theresa has also provided training on Community Development, Strategic Planning, Team Building, Board Governance, Youth Engagement and Volunteer Management throughout Western Canada working primarily with the RCMP and the NGO and volunteer sectors. Theresa has a Diploma in Public Sector Management from the University of Victoria and a Masters of Arts in Leadership and Training from Royal Roads University.

Sustainable Cities International

Sustainable Cities International is a registered not-for-profit organization based in Vancouver, Canada. Operating since 1993, the mission of Sustainable Cities is to catalyze action on urban sustainability with cities around the world. We work by connecting and mobilizing people through the process of co-creating.

For further information on this service or to address the unique needs of your municipality please contact:

Patricia Gordon, Director
Sustainable Cities International

Vancouver, BC Canada

pgordon@icsc.ca

1 604 569 0965 x 305 (work)

1 250 893 5193 (cell)

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The Sustainability Leadership Collaborative

- **Supporting local government in developing leadership for sustainability**

To deliver a sustainable future requires a new way of thinking for employees, and a new approach to leadership. Future leaders will operate at all levels within local government, they will have the ability to think systemically and innovatively and will be able to influence, lead, communicate and make effective, game-changing decisions.

This is a complex challenge. Leaders will have to strike a balance between maintaining stable, predictable municipal services, and innovating to achieve sustainability goals.

- **Offering a clear path to leadership for sustainability**

Through an intensive two-day workshop, the Sustainability Leadership Collaborative will work with select municipal staff to incorporate local issues and knowledge into the design of a sustainability leadership framework that



MUNICIPAL LEADERS ARE FACING:

- Increasingly complex social and environmental issues
- A challenging global economy
- The need to do more with less

meets local needs. This unique, 'upfront' design process enables the local government client to identify and build on its own assets and those of its community, thus creating greater capacity for continued learning and development.

The output from the workshop is a framework for a sustainability leadership program, taking into account local values, goals, strengths and needs, as well as existing learning resources.

The **Sustainability Leadership Collaborative** is a joint initiative between Sustainable Cities International and Akkadis Change Practice.

To find out more about the Sustainability Leadership Collaborative, contact:

Pat Gordon, *Sustainable Cities International*

Tel: 1.250.893.5193

Email: pgordon@icsc.ca

Bryan Krafchik, *Akkadis Change Practice*

Tel: 1.604.727.4297

Email: bryan@akkadis.com

This process is inspired by the work of Metro Vancouver. In 2010 Metro Vancouver developed and launched a sustainability leadership program within its organization. The framework developed by Metro Vancouver is the foundation on which we base our work. We are grateful to Metro Vancouver for their support in sharing their innovative practices with us.



Sustainable Cities

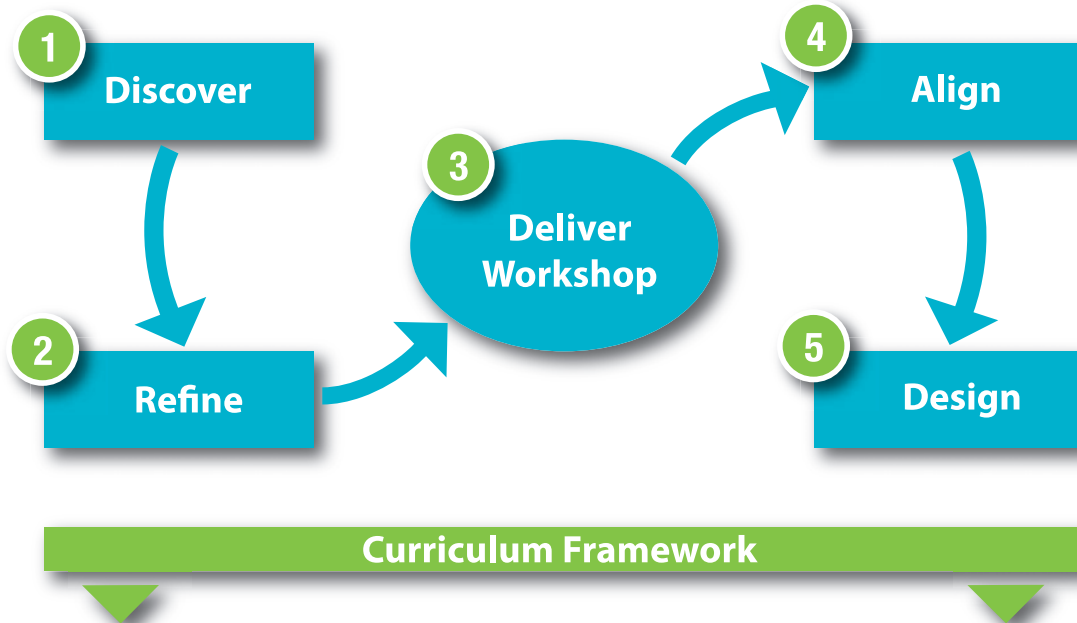
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www.akkadis.com

Local Government: Sustainability Leadership Development

A Collaborative Process



The Phases of Process

- 1 **Discover** organizational and community sustainability needs
- 2 **Refine** workshop to meet organization's needs
- 3 **Deliver** two-day workshop
- 4 **Align** program requirements with existing programs in the organization
- 5 **Design** sustainability leadership framework (including tender instructions)

Potential modules for a Sustainability Leadership Program:

Each program is customized, but there are certain topics that crop up again and again:

- Global and local trends and drivers in sustainability
- Understanding the role of communications and participatory engagement
- Understanding self
- Managing change
- Appreciative inquiry
- Innovation and systems thinking
- Sustainability topics and tools (global and local)
- Collaboration and teamwork

The overall process is a collaborative effort between key municipal staff and the consulting team.



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APPENDIX 3a - CLIMATE CHANGE COMMITTEE 2007

Climate Change Committee

The City established a Climate Change Committee in the Fall of 2007 for the purpose of investigating practical actions for the City and the community to help to reduce negative impacts of climate change.

Membership included;

Councillor Charles Mealey - Chair
Larry Ransom, representing SD #70
John Mayba,
Penny de Waal,
Jen Fisher Bradley,
Chris Alemany,
Robert Gunn
Jonah Zryd

Staff Resources assigned:

Russell Dyson – City Clerk
Guy Cicon – City Engineer

The Climate Change Committee met regularly and submitted its final report to Council on May 28th, 2008. Shortly thereafter Council met with the members of the Climate Change Committee to review in detail the seven recommendations of the report.

On July 14, 2008 meeting Council considered and approved 7 separate motions in response to the recommendations of the Climate Change Committee's report. At this point the mandate of the committee was completed.

City of Port Alberni Climate Change Committee Terms of Reference

Purpose

The Climate Change Committee is a select Committee of Council appointed for the purpose of investigating practical actions for the City and the community to help to reduce negative impacts of climate change.

Membership

- Councillor Mealey, Chair
- School District #70 Appointment
- Residents at large, a maximum of 6, selected to include a broad range of interests and ages.
- Staff resources to include the City Engineer and the City Clerk

Procedures

- The Committee shall adopt a meeting schedule but will structure its activities to complete the required tasks within the reporting deadline.
- Minutes of the meetings will be forwarded to Council for information and action as required.
- The City's procedures apply to the conduct of business.

Term

The Committee will serve until the completion of a final report to be presented to the Council for the City of Port Alberni, at the Regular Meeting of April 21, 2008.

Contents of the Report

- Propose public awareness materials for informing the public on their own practical initiatives that may reduce negative impacts of climate change.
- Identify potential procedures for the City to reduce its carbon footprint without significant cost.
- Develop strategies and actions to achieve the following goals for the City:
 - Being carbon neutral in respect of operations by 2012
 - Measuring and reporting on the community's Green House Gas emissions profile
 - Creating a complete, compact, more energy efficient community.

The Committee may:

- Network with other local governments to identify best practices.
- Network with local agencies to summarize the initiatives and opportunities for collaboration.

CLIMATE CHANGE COMMITTEE

Executive Summary

The Climate Change Committee convened from December 2007 – May 2008 to advise on implementation of the City's commitment under the Climate Action Charter to mitigate the negative impacts of climate change.

The City has committed to be carbon neutral in respect of its operation by 2012. In 2007, the City produced around 2000 tonnes of carbon dioxide equivalent with an energy bill of over \$1 million. To become carbon neutral, this will need to be reduced where possible and the remainder offset, by purchasing or investing in reductions elsewhere. Reductions could also lead to significant cost savings which is important given current energy cost increases.

Leadership from the City is also important to help reduce carbon dioxide emissions in the wider community. Up to 45% of emissions in the wider community (related to transport, buildings and waste) are, or can be, influenced in some way by local government. Carbon dioxide emissions from vehicles are the major emission source in BC communities, and because of escalating gas prices, the committee suggests a focus on reducing transport related emissions. The City can also influence urban density and energy efficiency through its planning process and co-sponsor public education activities with local organizations.

Extreme weather and weather-related events pose the greatest climate risk for the Valley and these are expected to increase in intensity and frequency over time. In the longer term, this is predicted to translate to average increases in precipitation of 5% (mainly falling in winter) and rises in temperature of average 2 degrees C. Adapting to these changes has implications for some City operations in the short-medium term and the longer term environmental, social and economic implications need to be taken into account across key organizations in the region. If recent changes in Arctic ice are any indication, the pace of climate change may be faster than current thinking allows, and may require a level of flexibility in our responses that our society is not currently set up for. If this worst case develops there will be a need for the City to gain a more in-depth understanding of its vulnerabilities and the risks it faces than this report presents.

The Committee recommends the following:

1. Establish a GHG management capability within the City responsible for managing emission reduction and offset activities and accounting and reporting on the City commitment to be carbon neutral (Action 1)
2. Establish a Climate Action Team which can network effectively across City Government, Regional District, First Nations and community/business groups, building capacity among stakeholders to address the more strategic adaptation and emission reduction issues (Actions 4 through 9).
3. Adopt least cost, highest impact measures to reduce City GHG emissions and reduce energy costs (Action 2)

4. Establish a carbon offset/reduction fund as an internal account and earmark sufficient start up funds (Action 3)
5. Update City purchasing policy, planning and development regulations and bylaws to encourage low carbon development in the community. (Actions 5)
6. Hold a public forum to discuss this report, develop community priorities for energy saving and energy efficiency and identify groups that would be willing to combine efforts with the City to take on longer term community project development (such as commuter trails and local food production) and public education functions. (Action 6)
7. Take forward infrastructure projects that enable the community at large to reduce GHG emissions, with a priority being to develop and implement a bike and walking trail master plan for the City. (Actions 4 and 7 and Appendix B)

Contents

Part 1: How can the City meet commitments under the Climate Action Charter?

1. What is Climate Change?
2. What are Green House Gases (GHGs)?
3. How much green house gas does the City of Port Alberni produce?
4. How can City operations become Carbon Neutral by 2012?
5. What actions might the City take to promote a more compact, energy efficient community?

Part 2: How might Climate Change affect our community?

7. How does climate change affect the weather?
8. What might this mean for the Alberni Valley?
9. What actions might the City take to adapt to the impacts of Climate Change

Appendixes

- Appendix A Climate Change Committee Terms of Reference
- Appendix B Summary List of Potential Funding Sources

Acknowledgements

Part 1: How can the City meet commitments under the Climate Action Charter?

"We used immense amounts of creativity, ingenuity and adaptability on the way up the energy upslope, and there's no reason for us not to do the same on the down slope... If we collectively plan and act early enough there's every likelihood that we can create a way of living that's significantly more connected, more vibrant and more in touch with our environment than the oil-addicted treadmill that we find ourselves on today".

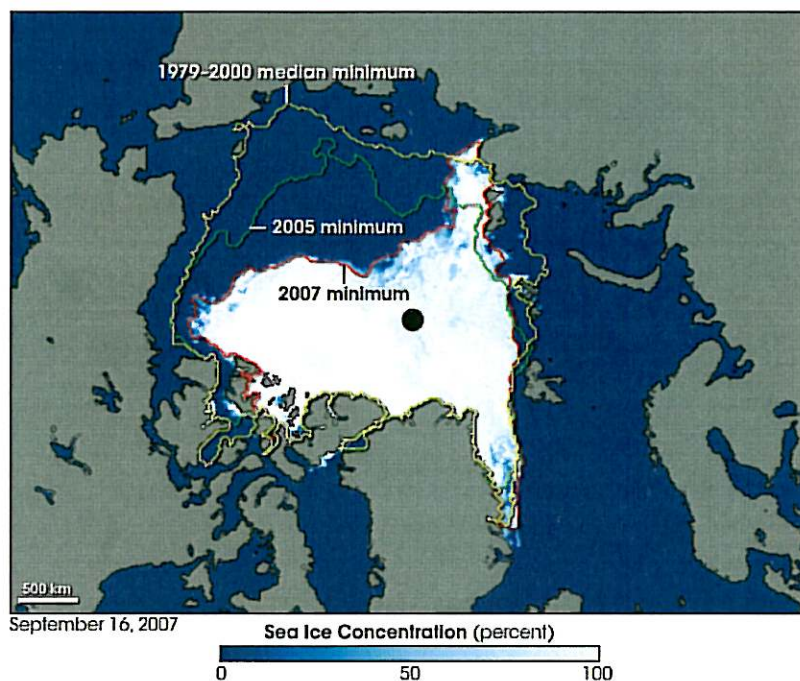
Transition Towns 2008

The IPCC's most recent assessment report concludes that it is "*unequivocal*" that the Earth's climate is warming, "*as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global mean sea level.*"

1. What is Climate Change?

Climate Change can be defined as a **significant change in weather patterns in relation to long term trends for the same area**. It can be caused by emissions of heat trapping gases, called 'greenhouse gases' (GHGs) to the atmosphere, which occur from both natural sources (such as volcanic or solar activity) as well as from human related activities.

After assessing millions of years of climate and CO₂ records, leading scientists from around the world who make up the Intergovernmental Panel on Climate Change (IPCC)¹ have reported major advances in our understanding of climate change.

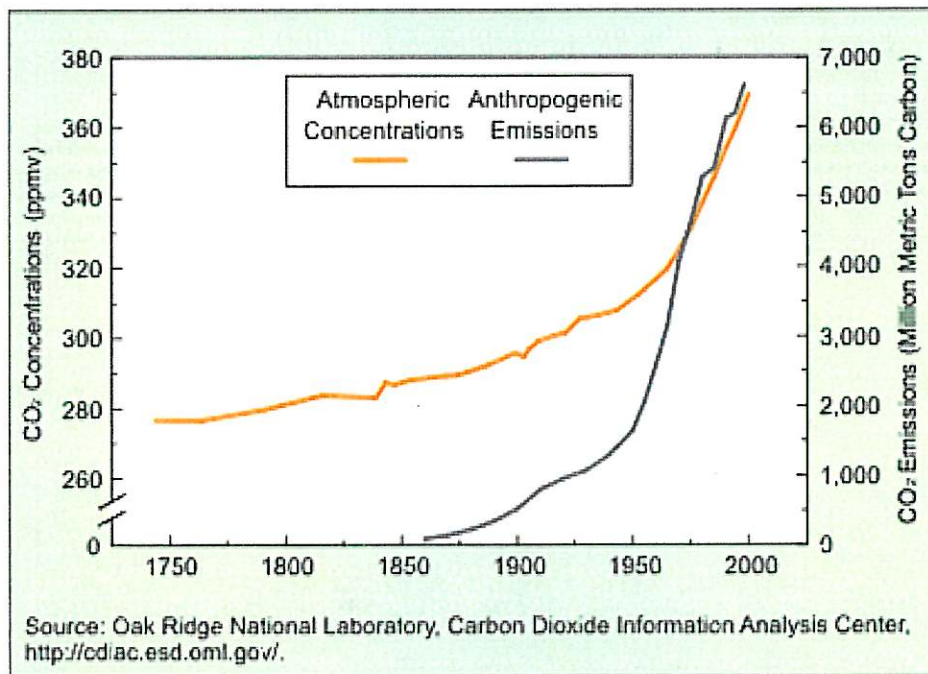


¹ IPCC Fourth Assessment Report: Climate Change Science. 1,200 Authors and 2,500 scientific reviewers from more than 130 different countries.

In September 2007 (above, red line), a record low area of sea-ice was measured in the Arctic Ocean. On March 1, 2008 Norwegian scientists warned that if the 2008 summer follows pattern of past years, the Arctic could be free of ice this summer (2008), many others believe it could be ice free in 5-6 years. (<http://www.canada.com/vancouver/news/story.html?id=643c7cba-bb80-4b52-a2a9-a266b607c31d&p=1>) The loss of the Arctic ice cap would mean far more heat captured by the Arctic ocean... the effect on weather patterns from this loss is still being studied. The Arctic ice cap has not been ice free in the summer for at least 1.1 million years.

The IPCC report also confirms that the current atmospheric concentration of carbon dioxide and methane, the two important heat-trapping gases, “exceeds by far the natural range over the last 650,000 years.” Since the dawn of the industrial era, concentrations of both gases have increased at a rate that is “very likely to have been unprecedented in more than 10,000 years.”

The report finds that it is “very likely” that emissions of heat trapping gases from human activities have “caused most of the observed increase in globally averaged temperatures since the mid-20th century.” (graph X)² and calls for global action to reduce emissions of these gases to try and slow the pace and extent of future predicted increases in temperature.



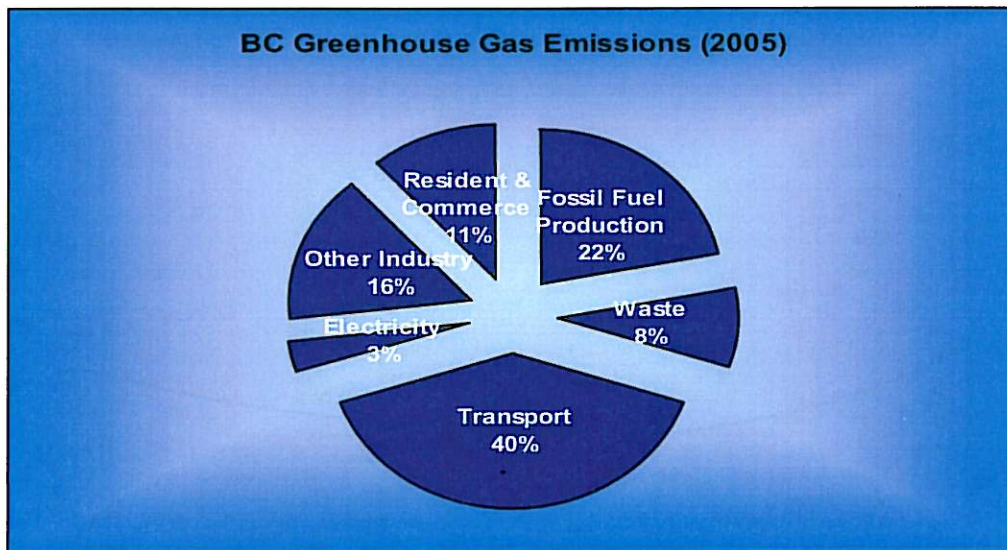
² Greenhouse Gases, Climate Change, and Energy – Energy Information Administration - <http://www.eia.doe.gov/oiaf/1605/qcccebro/chapter1.html>

2. What are Green House Gases (GHGs)?

The most common GHGs, in order of warming potential in the atmosphere, are Nitrous Oxide, Methane, and Carbon Dioxide (CO₂). It is customary to report greenhouses gases as a single measure, metric “**tonnes of carbon dioxide equivalent**” or **tCO₂e**, which takes into account the different warming potential. The main source of GHGs is from the combustion of fossil fuels and crude oil which forms the backbone of the economies of the developed and developing world. Major sources of GHGs in British Columbia in 2005 are shown in Figure 1, and arise from the following activities.

- **Combustion of fossil fuels used to generate electricity.** Although most of the electricity produced in BC is generated in hydroelectric stations, a small amount is generated in diesel and natural-gas-fired power stations. BC also imports power from other jurisdictions outside of the province, many of which produce power less cleanly than BC (for example, from coal).
- **Combustion of fossil fuels in transportation.** Most of our transportation modes (shipping, aviation, trains and cars) are powered directly by the combustion of fossil fuels. Transportation is the single largest contributor to GHG emissions in BC.
- **Combustion of fossil fuels for space and water heating.** In BC, buildings account for around 11% of GHG emissions. The majority of this is from natural gas consumption, although propane and heating oil also play a role.
- **Decomposition of organic wastes.** Organic wastes, including paper, wood, waste food and sewage solids all emit GHGs as they decompose. In aerobic conditions, decomposition largely produces carbon dioxide. However, under anaerobic conditions, such as in landfills and some sewage lagoons, decomposition produces significant quantities of methane, a more potent GHG.
- **Destruction of “carbon sinks”.** Trees, other plants and soils absorb and store carbon dioxide from the atmosphere. Natural (eg such as pine beetle) and industrial destruction of forests, green space and other ecosystems within a community causes the release of that carbon dioxide into the atmosphere, and prevents the ecosystem from absorbing further carbon dioxide. The impact of carbon released as a result of the pine beetle epidemic may alter the current contributions of greenhouse gas emissions for BC.

Figure 1. Sources of GHG emissions in British Columbia 2005



Source: GHG Assessment Guide for Local Governments, Feb 2008

Figure 1 shows that transportation is the largest emitter of GHGs in our province. Table 1 below compares different modes of personal transport, showing clearly the impact that more fuel efficient vehicles can have on minimizing emissions. For example, a 180 km return journey to Nanaimo results in CO₂ emissions of about 18 kg in a fuel efficient car, 36 kg in an average car and 58 kg in an SUV or pickup. An air trip from Nanaimo to Toronto, on an as-the-crow-flies distance of 3418 km, results in 939 kg.

Table 1

Comparison of Efficiencies and Emissions of Transportation

Means of transport	Fuel Efficiency (km per Lt)	CO ₂ emissions per km
Bicycle	na	0
Bus – well used service	28 – 50 kpl per passenger	80 – 45 g
Rail – normal suburban	18 – 52 kpl per passenger	130 – 100 g
Fuel efficient car	18 – 23 kpl	130 – 100 g
Rail – high speed few stops	14 – 28 kpl per passenger	165 - 80 g
Average car	10 – 16 kpl	200 – 145 g
Air (long haul)	8 -12 kpl per passenger	330 – 210 g
Large cars, SUV's etc	5 – 9 kpl per passenger	400 – 250 g
Air (short haul)	4 – 8 kpl per passenger	460 – 300 g

Since the 1950s, the use of crude oil and the refined petroleum products it can create, have led to a nearly exponential growth in the amount of energy available to the world and a corresponding growth in CO₂ emissions. However, we are now considered by some to be on a “bumpy crude plateau³” where new supply is roughly cancelling out declining regions such as the North Sea, US and Mexico. According to Jeff Rubin, Chief Economist of CIBC World Markets, “whether we are already at the peak of world oil production remains to be seen, but it is increasingly clear that the outlook for oil supply signals a period of unprecedented scarcity”. Crude oil prices per barrel are forecast to average \$150 by 2010 and \$200 by 2012 with unleaded gas reaching \$2.25 per litre. These increasing fuel prices, combined with the need to cut GHG's, are a powerful incentive to reduce our fuel consumption.

3. How Much Green House Gas does the City of Port Alberni Produce?

GHG emissions are usually classified into 3 different groups⁴. Our ‘GHG inventory’ for the City focuses on the first two groups, because these emissions are always reported in GHG inventories.

Scope 1: Direct GHG emissions

Direct GHG emissions occur from sources that are owned or controlled by the City. The main City emissions are:

- CO₂ from natural gas consumption in city buildings
- Emissions from fuel combustion (gas and diesel) resulting from city fleet operation, and
- Nitrous oxide from nitrogenous fertilizers applied to city landscapes.

CO₂ emissions from sewage aeration ponds are biogenic and thus not included as an emission source. Methane and nitrous oxides are also unlikely to be generated from an aerobic shallow pond such as that used by the City, provided it is well managed.⁵ There may be methane generated as a result of processing hake waste as long as it remains untreated at source. However, there are no means to estimate the volume of methane from this source at this time.

Scope 2: Electricity indirect GHG emissions

Accounts for GHG emissions from the generation of purchased electricity consumed by the City operations. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated.

Scope 3: Indirect Emissions

The third group, are indirect emissions and are optional for inclusion in a GHG inventory. These are dealt with in Section 6.

³ Bumpy Crude Oil Plateau in the Rear View Mirror: April 2008: <http://www.theoil Drum.com/node/3793>

⁴ Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard, Revised Edition, World Business Journal for Sustainable Development, World Resource Institute

⁵ 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 5 Ch. 6

The amount of greenhouse gas emissions directly attributable to the operations of the City, or from purchased electricity totalled 1,994 tonnes of carbon dioxide-equivalent (tCO₂e) in 2007 at a cost of over \$1 million to the City.

Scope 1 and 2 GHG Emissions from City Operations, Port Alberni 2007

Source	Total Consumption	Tons CO ₂ emitted (tCO ₂ e) ⁶	% of Emissions	Cost to City
Natural Gas (buildings)	21830 GJ	1113	56%	\$261,061
Electricity	8712891kWh	192	10%	\$503,121
Transportation (diesel)	187420 litres	517	26%	\$187,420 ⁷
Transportation (gas)	71360 litres	172	8%	\$ 71,360 ⁸
Fertilizers (N,P,K)	7023kg	3	0%	
TOTAL		1997	100%	\$1,022,962

These data are based on actual consumption figures for all sources, from externally generated records and using emissions factors recommended by the provincial government. These are believed to be the most significant Scope 1 and 2 emissions but need to be properly verified. **The scope of the City inventory should also be confirmed when Provincial Guidance is issued on what is to be included in the carbon neutral definition.**

How much GHG does City land absorb? Trees store carbon at quite high rates, each 100kg of completely dry wood contains about 44kg of carbon, which required about 72kg of CO₂ from the atmosphere to produce through photosynthesis. However, when trees are cut some of this carbon is released from those parts of the tree that are burnt, allowed to decay etc, while some is stored longer in wood and wood products used for construction and other longer term uses. If the size of the lands and size and type of the trees on the forest lands owned by the City could be surveyed, a Mean Annual Increment could be determined, which could be used to estimate the amount of carbon being stored by these patches of timber annually. It is not clear whether the City will be able to account this as an annual off-set. However, if allowable, additionality of sequestration eg. through improved management, would have to be demonstrated. It would have to ensure that these trees were not cut down.

⁶ tCO₂e are calculated using emission factors recommended in GHG Emissions Assessment Guide for local governments in British Columbia, Version 1 Feb 2008.

⁷ Estimated at \$1 per litre

⁸ ibid

4. How Can City Operations become Carbon Neutral by 2012?

What is carbon neutral? Being carbon neutral is like having a balanced financial book, with equal expenditure, and revenue, at the end of the year. That is to say if we produce 1,994 tons of CO₂ equivalent in a given year, we must either reduce these through carbon reduction projects or offset them through carbon storage (also called carbon sequestering) projects, so as to reduce the overall amount of CO₂ that the City produces in that year to net zero. Offset projects may be local or involve buying into projects elsewhere – the carbon market.

The provincial government defines carbon neutral in this way, but it has not yet determined what must be included in the carbon production figure. Our inventory assumes only Scope 1 and 2 emissions will be included.

What's the financial bottom line? Assuming there is no reduction and that all emissions must be neutralised, the annual cost for the City of being carbon neutral from 2012 would be \$49,857⁹ (based on 2007 emissions and using the existing provincial rate of \$25 per ton).

The following three actions are suggested for Council to meet its goal of being carbon neutral by 2012.

Action #1 - Set up a GHG management capability for the City

An essential first step will be to assign responsibilities for GHG management and ensuring that staff who will carry out the basics of GHG management are adequately trained and can allocate adequate time to essential tasks (including identifying and managing emissions reductions and offsets, accounting, monitoring and reporting GHG emissions and staying abreast of guidance and funding opportunities). Procedures also need to be put in place within City operations that would facilitate the gathering of necessary data on an annual basis. An outreach function to the wider community will also be necessary and GHG management staff should be active in the proposed Climate Action Team. The City will need to examine whether this can be done within existing capacity.

Action #2 - Adopt least cost, highest impact measures to reduce GHG emissions

Natural gas is by far the biggest GHG emissions source (56%) as well as being a significant cost to the City. Use is mainly during winter months. A breakdown of use by facility in 2007 shows that Echo Pool and the Multiplex together account for 65% of natural gas use (costing \$97,000 and \$65,000 per year respectively). RCMP, Public works, Fire Hall, Parks and Recreation wood buildings account for a further 25%. The remaining gas users are small but also need to be evaluated. For example, Glenwood Centre and City Hall both consume similar amounts of natural gas per year (\$7,000 each) although their usage is far different.

Historical records show that consumption is fairly static and is forecast to remain static as no major new building projects are anticipated. Costs will, however, continue to rise as the price of gas increases.

⁹ \$25 x total emissions (1,994 tCO₂e). The current rate of \$25 is that currently set aside by the Provincial government as an offset per ton of emissions generated from Staff travel and represents an average of carbon prices across different markets.

The City should assess current efficiency against established benchmarks (eg consumption/m²) as well as usage levels of buildings relative to cost and identify options to reduce emissions which could include: i) efficiency improvements eg such as through improved insulation or equipment upgrades, ii) alterations in building use or schedules iii) fuel switching, including feasibility for use of ground source energy, heat recovery from the sewage treatment plant or other alternative energy sources to help reduce reliance on gas.

Vehicle emissions

The priority in the short term should be improved fleet management because this can generate significant emissions and cost reductions (for example banning idling of vehicles, introducing more efficient routing and work scheduling – especially for garbage trucks or reducing the size of the fleet) at little or no cost. The Climate Action Partnership (CAP) is developing an online fleet management tool to assist municipalities with identifying ways to reduce GHG emissions from the fleet.

Fuel consumption is reasonably static, however, costs could rise by up to 30% in 2008. With escalating fuel prices in mind, costs and benefits of converting the fleet to hybrid or electric should be assessed.

Electricity

A third priority would be to reduce electricity use. Electricity consumption is far less significant for GHG emission reduction (unless the electricity baseline is equalized across Canada) but important for reducing costs as electricity accounts for over half of the City energy bill. For example, an overall reduction of 20% in electricity consumption would generate savings of \$100,000.

There are around 65 different Hydro accounts in the City, of which sewage aerators, Multiplex, Echo Pool and street lighting account for 57% of total consumption. Another 8 facilities account for a further 26%. Historical data show that consumption is fairly static and likely to remain so, as no major new buildings are anticipated.

The larger consumers should be the initial focus of activity, however, potential to improve efficiency, facilities management and usage and other opportunities should be assessed for all facilities using, for example, LED technology in existing City buildings and street lights. Electricity use for water supply and sewage makes up 30% of total consumption and generates 58 tCO₂e. A constructed wetland could be used to improve sewage treatment and reduce long term operational costs. Reductions in per capita water consumption would also help reduce GHG emissions. Other opportunities include reducing water consumption.

Fertilizer

Fertilizer use has already been significantly reduced through good management practice including user education to accept a longer cut of grass which not only requires less nutrient but is also good for weed prevention and water consumption; conservative watering during the cooler evening and mornings; use of slow release formulations of nutrient to prevent leaching and lessen frequency of application; improving cultural practices such as aeration and topdressing. Further reductions in Nitrous Oxide emissions could be achieved by substituting organic fertilizer.

The potential for emissions reductions across all sources, and associated costs, should be reviewed and the least cost options identified and evaluated. For example, switching from natural gas to electricity would reduce CO₂ emissions by almost half (980 tonnes) but would add approximately \$170,000 (70%) per year to the City's energy bill based on current prices and consumption. Investment in alternative energy sources would need capital investment but may generate payback in the form of cost savings.

Action #3 - Establish an offset/reduction account

In spite of reduction efforts there will inevitably be a portion of emissions that will need to be offset. The City needs to identify a strategy for doing this and consider starting to put aside funds to an internal offset account. The example below shows how the purchase of offsets could start by 2010 and rise incrementally to balance 50% of tCO₂e emissions by 2012 (approximately \$25,000), the remaining 50% having been achieved through phased reduction in emissions over the next four years.

Where would funds come from? Offset/carbon reduction funds could be built up by earmarking a portion¹¹ of cost savings on reduced energy consumption resulting from measures proposed in Action #2. However, a modest start up fund would be necessary to fund investments in reductions. Such funds could also be used as matching funding to leverage project funding from external sources. Appendix C provides a list of possible funding sources. Less significant in cost terms but demonstrating visible commitment and leadership, the City could also consider following the Provincial Government lead and start setting aside \$25 per tonne of CO₂e generated by official staff travel¹².

What would the funds be used for? The funds should be able to be used for City emission reduction projects as well as to purchase offsets. Offsets could include projects which either sequester carbon within the city or reduce emissions in the wider community. This might prove to be more cost effective than reducing the City emissions as well as providing an opportunity to be innovative in GHG management. Examples of possible local projects could be to:

- Carry out a review of all forests on City lands and creek valleys and determine the baseline for current carbon sink potential and ways of increasing their ability to retain carbon – new plantings, removal of decaying matter and invasive species etc.
- Plant shrub and Tree (Fruit or native) boulevards.
- Encourage organic gardening in the community, since organic soil is a carbon sink.
- Investments to increase transit ridership.
- Retrofitting of buildings for energy efficiency.
- Investment in local food production and distribution to reduce GHG emissions from transport.

¹¹ A portion of savings would be eaten up by rising energy prices, especially for fuel.

¹² This would vary according to transport type eg efficient car 0.325 cents/km; average car average 0.65 cent/km, large car/SUV 1 cent/km, long haul flight 0.825 cent/km, short haul flight 1.15 cent/km.

A key outstanding question is what criteria and standards will govern what may or may not be counted as an offset in annual accounting or as a carbon credit that can be sold. Guidelines will be issued by the Provincial Government Offsets but in general, offsets are required to undergo a proper process of project-level accounting with baselines, determination of additionality, monitoring plans, validation, and verification. This may well predispose towards projects that can more easily establish a baseline and larger projects that can absorb the transaction costs of accounting and verification. As it is not required to be carbon neutral until 2012 there is time to explore the feasibility of various options and to identify the best strategy.

The newly established Pacific Carbon Trust will provide a clearing house for reduction projects and offsets under the Climate Action Charter. It is currently being designed but envisaged as selling offsets to municipalities at an established rate (eg \$25 dollars per ton), purchasing credits from municipalities that wish to sell them and reinvesting the Trust funds in green projects in BC that will generate credits.

Possible phased timeline for City to become Carbon Neutral 2008-2012

(based on example of 2,000 tCO₂e baseline in 2008)

Time	Indicative End of Year Targets
2008	City GHG Baseline tCO ₂ e/year established City GHG management/accounting system operational, focused audits of key facilities carried out. Develop proposals to access funding. Offset fund established as internal fund account. Baseline Emission tCO₂e = 2000
2009	Target of 600 tCO ₂ e (30 %) reductions on 2008 baseline from reduction in use of natural gas and improved fleet management. Feasibility of further reduction projects and community/city offset schemes or offset purchase explored as guidelines are developed. \$ contributions to offset fund from staff travel and energy cost savings Balance of emissions tCO₂e = 1400
2010	Target of 280 tCO ₂ e (20%) new GHG reductions on 2009 baseline from low cost investments (funded from energy cost savings + external funding where available) 100 tCO ₂ e offset from community sequestration schemes or purchase on market (\$2,500) Balance of emissions tCO₂e 2010 = 1020
2011	Target of 100 tCO ₂ e (10 %) new reductions on 2010 balance 300 tCO ₂ e cumulative offset from community sequestration schemes or offset purchase on market (\$7,500) Balance of emissions tCO₂e = 720
2012	Target of 20 tCO ₂ e (3.5%) new reductions on 2011 balance 1020t CO ₂ e cumulative offset from community sequestration schemes or offset purchase on market (\$25,500) Balance emissions tCO₂e = 0

5. What actions might the City take to promote a more compact, energy efficient community?

In addition to the Scope 1 and 2 emissions covered in the inventory, there is a third category **Scope 3 Indirect Emissions**. These emissions are a consequence of the activities of the City, but occur from sources not owned or controlled by the City and are usually optional for inclusion in an inventory. We are assuming the City does NOT need to account for Scope 3 emissions for being carbon neutral in its operations. However, the City DOES need to consider its influence on these emissions and take action to help reduce them as part of its commitment to help develop a more compact, energy efficient community under the Climate Action Charter. It is important for the City to show leadership and commitment, both in addressing its own emissions as well as helping the community reduce its emissions and improve energy efficiency in whatever way it can.

Scope 3 emissions potentially include:

- Emissions from the municipal landfill site
- Emissions resulting from contracts, leases or purchase agreements conducted by the City
- Emissions as a consequence of local government decisions around land use and infrastructure which greatly influence buildings (residential and commercial sectors), transportation (urban sprawl and the use of transit vs. driving) and waste. One study estimates up to 45% of emissions in the wider community are or can be influenced in some way by local government¹³.
- City staff official travel in non city owned vehicles is also a Scope 3 emission.

The following are four actions the City can take to realise this part of its commitment.

Action #4 - Better understand and quantify the community carbon footprint

Where possible the City could start to compile baseline estimates on key 'scope three' emissions to help track the potential for developing CO₂ reduction projects in the wider community and for public awareness raising. Depending on eligibility, some projects might be used to offset City emissions or sold as credits to the Carbon Trust. A quantitative understanding of the regional carbon footprint might also assist in accessing capital or grant funds.

Action #5 - Update City purchasing policy, planning and development regulations and bylaws to encourage low carbon development in the community

Priorities identified by the Committee are:

¹³ Figure estimated by the Community Energy Association, based on Environment Canada's 2004 emissions data for British Columbia.

Planning

- Linking approvals for future developments, private or public, to demonstrate how it can minimize its carbon footprint, for example by promoting best practice such as LEED for design features, materials, equipment and or processes that use a renewable energy source or recycle energy and by providing incentives where appropriate e.g. waiving development permit fees and other land development costs.
- Review of zoning bylaw for housing alternatives to increase density
- Identify sites within the city for the development of high-density, walk able urban villages. Encourage high density residential development and retail development in these zones and limit it elsewhere. Possible walk able villages could be centered on sites such as Argyle and 3rd, 10th and China Creek, 10th and Redford, 10th and Roger, Johnson and Cherry Creek and the two quay areas.

Purchasing policy

- Include requirements to account for and minimize carbon footprint as part of selection criteria for major City contracts, purchases, leases etc.

Bylaws

- Introduce bylaws which encourage city residents to produce their own power (wind generator height restrictions, solar heaters, solar panels);
- Introduce bylaws which encourage backyard food production so as to promote the 100 mile diet (now officially endorsed by MoA);

Forthcoming regulatory changes, Bill 27, Local Government Green Communities Statutes Amendment Act, 2008, which is currently under discussion by the House, proposes a number of changes to the legal framework relevant to local government addressing greenhouse gas emissions. The proposed amendments will also require community development plans and regional growth plans to include greenhouse gas emissions reduction targets and strategies. http://www.leg.bc.ca/38th4th/1st_read/gov27-1.htm

Action #6 - Promote public awareness on possible mitigation actions

The City can play an important role in public education, sponsoring key activities jointly with local organizations that can help build community capacity and action. It is recommended that the city hold a public forum to discuss this report, develop community priorities for energy saving and energy efficiency and who would be willing to combine efforts with the City to take on city project development and public education. Possible activities include:

- Showcasing and publicizing demonstrations e.g. of solar, wind power for public buildings as part of the City carbon neutral strategy
- Publishing an annual carbon account and management plan
- Co-sponsor training on GHG management for local businesses eg through community futures (eg the Carbon Trust provides three sessions for groups of about businesses to walk them through managing their own carbon footprint at a total cost of \$1,000 – this is being done in Tofino/Ucluelet)
- An annual competition for innovation/best practice in the community – household, small business

- Conferences/tradeshows eg on green building, alternative energy systems, how to increase local food production and promote the Vancouver Island Diet

Action #7- Promote infrastructure projects that enable the community at large to reduce GHG emissions.

Greater effort is needed to encourage use of buses, walking and cycling. As the price of gasoline increases citizens will gradually change their habits, judging by the response in other developed countries. However, the City needs to make walking and cycling easier, especially between both sides of town through creation of multi use commuter trails and bicycle routes.

There is an urgent need for a trail and bike masterplan which includes, for example, Roger Creek crossing and other links to valley trails. A low carbon transport master plan needs to be produced which complies with requirements to obtain funding support for implementation, and should include a full range of measures such as park and ride, no drive zones, air care for commercial vehicles etc.) The City might also work with BC Transit on a possible electric bus pilot project and adopt measures to improve bus ridership. One proven method of increasing transit ridership many times over is to offer a free service. More shelters and benches, as well as improved schedules, are needed to make transit an attractive option.

GHG reductions from some projects such as district heating, landfill gas utilization and composting may become tradable in the voluntary offset market. Intermediaries such as the Green Municipalities Corporation, a part of FCM, are set up to help municipalities access the carbon market. It does not appear that capturing methane from Port Alberni's landfill is presently economically viable.¹⁴

What other municipal jurisdictions are doing to reduce GHG's – some examples from other BC communities

The municipalities of Whistler, Courtenay, Vancouver, and Ladysmith have all implemented a number of similar strategies to deal with climate change. These initiatives include:

- i) improved recycling and solid waste management services, with some jurisdictions looking into the collection of landfill methane gas for power generation purposes.
- ii) the development or improvement of non-vehicular transportation, such as the development of cycling lanes and walking paths.
- iii) the improvement of public transit methods and incentives for the public to use them.

All of these municipalities have also launched awareness and education campaigns, as well as offering incentives for domestic energy efficiency based on Energy guide ratings, and the encouragement of the economic sector in achieving low GHG emissions levels.

Each municipality has independently reviewed its own fleet of city vehicles, and is attempting to improve efficiency. Domestic bylaws for GHG reductions have also been passed, or are planned, for each municipality. Whistler and the City of Vancouver have both set laws regarding domestic idling and vehicle maintenance. Additionally, bylaws regarding air quality have also been considered.

¹⁴ The rule of thumb used by GMC is that landfill gas emissions need to be >10,000 tCO₂e per annum for a project to be economically feasible for them to invest in. The most recent study conducted by ACRD identified 2029 as the year by which landfill gas capture might be an economically viable option.

The City of Vancouver has also considered the implementation of an energy delivery networks within city limits to reduce unnecessary waste. Alternative energy sources are such as fuel cell and hybrid power, along with bio-diesel and ethanol fuels are being investigated or implemented for city and transit fleets.

Vancouver has implemented a food security policy, promoting local production of food.

<http://vancouver.ca/commsvcs/socialplanning/initiatives/foodpolicy/>

Ladysmith, in partnership with VIHA, has done the research to develop a food security policy. Montreal has a community garden for every 2500 households as part of its policy. Toronto has developed a shade policy in response to an initiative of the Canadian Cancer Society but also as a climate change response.

Part 2: How Might Climate Change Affect Our Community?

"...even after introducing significant measures to reduce greenhouse gas emissions, some additional degree of climate change is inevitable and would have economic, social and environmental impacts on Canada and Canadian communities. Although impacts would vary on a regional basis, all areas of the country and virtually every economic sector would be affected."

From Impacts to Adaptation: Canada in a Changing Climate, Natural Resources Canada 2008

7. How does climate change affect the weather?

The IPCC report predicts with strong confidence that weather events will generally intensify and that storms, hurricanes, and typhoons will become more frequent and more powerful. The temperature of the ocean is the energy source of world weather cycles. In the last 40 years the average global temperature went up 2 tenths of a degree Celsius and represents the largest effect of global warming. The world ocean is expected to heat up in the next 40 years 2 to 10 times as much as it did in the last 40 years. So, we know that all kinds of weather will continue to intensify, whilst predicting the where and the when will become even more difficult.

Here in the Alberni Valley, we can expect:

- winds to increase in intensity and turbulence
- more intense rainfall events
- more intense snowfall events
- more unusual types of weather like hail, thunder and lightning
- more unseasonable weather
- hotter hot spells

Scientists using computer models and simulations have been able to create some possible outcomes as to how these chaotic and more extreme events will add up into climate averages¹⁵. The models are being improved and are expanding in scope and detail every year. The current regional predictions for coastal areas of BC, are:

- Average temperature rise of 2 degrees Celsius in both summer and winter by 2050, however, the range of their predictions is between 1 and 3 degrees (which is higher than the average global predictions).

¹⁵ Dr Andrew Weaver, School of Earth and Ocean Sciences at the University of Victoria

- Coastal BC precipitation models show wide variability with a range of values between 2% less to 10% more rain and a mean value of 5% more by 2050. It is suggested that most change will occur in winter rainfall, with little change in summer precipitation, or perhaps longer periods of drought. The present average rainfall is about 1950mm per year in the City.

Increased temperatures in summer will result in the ground drying more rapidly. Increased temperatures in winter mean that snow pack will not be as reliable as in the past to supplement summer stream flow. It is also worth noting that, with the overall trend to global warming, high and low pressure systems will both be more intensified, which will lead to extremes of cold as well as heat.

How certain are these predictions? Every model has an uncertainty with it and current models give predictions over wide areas (currently 100 x 100km grids) and so do not take into account the many micro-climates on Vancouver Island. There is high confidence that the Pacific Northwest will warm (all models project warming). However, predicted changes in precipitation are less certain than changes in temperature and changes in summer precipitation are less certain than changes in winter precipitation. It is possible that winter precipitation increases may be underestimated.

It is helpful to remember the difference between climate and weather. Climate is a mathematical average of many weather events. Weather is the events as they actually happen. The average temperature, for example, cannot tell us whether that average is made up of events close to the average (moderate weather) or if it is made up of events much above and below average (more extreme weather).

While the increase in global average temperatures is the unequivocal result of increasing GHGs, the exact weather at any time and place remains as unpredictable as ever. What we do know is that increasing the energy in a closed system (as global weather is) will certainly increase the intensity of events within the system.

8. What might this mean for the Alberni Valley?

Extreme weather and weather-related events pose the greatest climate risk for the Valley. British Columbia's Provincial Emergency Program (BC-PEP) records extreme weather events that cause personal and economic losses due to infrastructure damage. From 2003 to 2005, the frequency, severity and costs of extreme events recorded by BC-PEP rose dramatically as a result of wildfires, storm surges, heavy rains causing flooding and landslides, and drought. Warmer winter weather, resulting in ice jams, freezing rain and rain-on-snow events, also resulted in economic losses. These events cost BC taxpayers an average of \$86 million per year in payouts of disaster financial assistance, compared to an average of \$10 million per year from 1999 to 2008. Data specific to Alberni Valley are not currently available.

Impacts on current and future water supplies, hydroelectric power generation, fisheries and river ecosystem integrity are also significant concerns for BC. Most of BC's alpine glaciers are retreating rapidly and many may disappear in the next 100 years.

Coupled with reduced snow pack and warmer spring temperatures, this will result in earlier spring freshets, warmer river temperatures, declining summer flows and increasing peak flows in many of BC's watersheds. The City water supply on China Creek could be negatively affected by these changes. The dams and the weir on Great Central and Sproat Lakes would help maintain lake levels, despite reductions in snow pack. Agriculture might possibly benefit from an extended agricultural season, but will also become more difficult due to extreme and unseasonable weather.

In British Columbia, relative sea-level change differs from the global trend due to vertical land movements. During the twentieth century, sea level rose 4 cm in Vancouver, 8 cm in Victoria and 12 cm in Prince Rupert, but dropped by 13 cm in Tofino (BC Ministry of Water, Land and Air Protection, 2002). For this reason it is difficult to make local predictions about sea-level rise.

Within this context and drawing on priorities identified by other municipalities some key areas which may merit attention by the City are as follows:

Factors	Possible Effects based on current predictions
Water Supply and Quality	Reduced snow pack would lead to implications for China Creek water supply and could bring forward significantly the need to tap Somass River or Great Central Lake as an alternative source. Water quality issues arise around heavier and more prolonged rainfall especially where other stress factors exist, such as logging.
Erosion and Flooding	Implications for land use planning and zoning, especially with regard to floodplains. Any rise in sea level will cause problems for sewage ponds and exacerbate existing storm water issues on 3 rd Avenue in heavy rainfall and at high tides. A sea level rise of 0.5 metres would leave 3 rd Avenue flooded for significant periods of time. Progressively more saturated steep slopes may give way more frequently to more landslides.
Energy	The connection between climate change and water will also increasingly impact energy planning and management. BC Hydro power generation capacity is vulnerable to declining water supply and changing river flow patterns. By 2025 electricity demand in BC is expected to be 30-60% higher than 2005. BC Hydro's plan is that the majority of this is to be met by greater conservation and efficiencies and from other renewable sources. Studies on the costs of climate change adaptation identify significant increase in energy consumption as a major contributor to cost increase.
Infrastructure and Maintenance	Increased maintenance costs (especially storm water, flood and transport related) and possible shortened lifespan of existing infrastructure.
Emergency Services	Increase in frequency and costs of extreme weather events can be expected. Should consider the adequacy of existing emergency response plans.
Economic Development	Economic development policy is needed to take into account climate change vulnerabilities and risks as well as opportunities eg forest and fishery dependent communities vulnerable to increasing climate risks whereas benefits are expected for summer tourism as well as the emerging renewable energy/waste management and local food production industry. Insurance costs are also rising.
Food Security and Self Dependence	Decreased ocean capacity to produce protein rich foods and vulnerability and disappearance of First Nations' indigenous food supply. More locally produced food will become key in the face of rising transport costs, and global food security issues. Local non-marine food sources will be affected negatively due to specific extreme weather events. The carbon sinking capacity of organic soils will be a big plus in creating carbon offset markets in the rural and urban farming mix. Interdependence and projects that promote community resiliency should be considered as ways to raise local food production.
Population Dynamics	Population growth prediction is for the City to remain around 18,000 with the population ageing. As impacts of climate change or mitigation strategies for other regions kick in, there is a possibility that our region will become a more desirable place to be. City may consider its capacity to adapt to a range of possible population growth scenarios.
Health	Climate change is expected to change distributions of diseases such as Lyme disease and tick-borne encephalitis, and to increase rates of Salmonella and other food borne infections in Europe and North America (WHO 2008) and West Nile virus. Our ageing population will also be increasingly vulnerable to extremes of heat and cold and service interruptions as result of extreme weather events.
Vulnerability	While the community has shown resilience in the past, the population is getting older with a much higher proportion of traditionally more vulnerable groups to health risks, to economic shocks as well as signalling a decline in the traditionally high levels of volunteerism associated with strongly resilient communities.

It is not possible to easily predict the pace of climate change – will it be gradual over 50 years or perhaps subject to sudden shifts? - nor predict the social, economic and environmental impacts of climate change and how they will play out. Climate change is also only one of many stressors and vulnerabilities which need to be looked at in terms of the 'cumulative impact' on a community. Economic stressors already exist in the form of our shrinking industrial base, recent price increases for energy and food, tightening credit and increased insurance costs, many of which are likely to intensify in future. This accumulation affects the overall vulnerability and attitude of an ageing population with obvious impacts on the community as well as posing limitations on City future revenue potential.

At the same time studies on the economic impact of climate change on municipal infrastructure and the built environment identify significant capital and maintenance cost increases over time, as well as significant increase in energy demand and costs (eg for air conditioning), even where adaptation measures are taken¹⁶.

9. What actions might the City take to help the community adapt to the impacts of climate change?

Drawing on the experience of other municipalities, the following actions might be considered in the short-medium term.

Action #8 - Build Knowledge Capacity

- Increase public awareness of climate change and its projected impacts on the community, for example by ensuring public access to up to date and locally relevant information on climate change impacts and adaptation measures individuals can take.
- Increase the technical capacity to prepare for climate change impacts, for example, conducting or learning from more in depth analyses of impacts in a specific area, evaluating the flexibility of current built, natural and human systems to adapt to a possible range of change scenarios including conducting community assessments of vulnerability and risk.
- “Mainstream” information about climate change vulnerabilities, risks, and preparedness into planning, policy, and investment decisions for example by ensuring design criteria for new infrastructure projects or upgrades take into account future, as well as past, climate conditions. The implications for scope and delivery of emergency response services might also be assessed as well as the need for a food security policy.

Recommendation: Establish a Climate Action Team which can network effectively across City government, regional district, First Nations and community/business groups. The Climate Action team will help build community partnerships and intercommunication that underpin the capacity (resilience and systems integrity) to adapt to potentially rapid or significant change and also help to take forward the carbon reduction and energy conservation agenda (Part 1).

Action #9 - Increase Adaptive Capacity of built, natural, and human systems in the community in priority areas

Possible Short-medium term considerations for City Operations

- Strengthen municipal watershed protection provisions working with the provincial government
- Improve water conservation to help delay the eventual need to tap Central Lake and associated capital costs
- Separate storm water from combined sewers
- Increase storm water capacity including reducing asphalt within the city limits¹⁷
- Restrict development density in the floodplains
- Start tracking impact of climate change/weather instability on operational costs to identify problem areas
- Consider how the City can use incentives or subsidies to encourage private land owners to plant and maintain trees within the city
- Consider how the City can use incentives and subsidies to encourage land owners to produce food within the City, encourage local experimentation with food production and development of acclimatised varieties.
- Ensure preservation of the existing forest canopy

¹⁷This also has a potential cost saving function given that price of asphalt more than doubled from \$35 to \$40 a tonne to \$75 to \$80 in the last 5 years and is likely to increase further.



APPENDIX 3 - FOOD SECURITY & CLIMATE CHANGE COMMITTEE 2015

CITY OF PORT ALBERNI

Food Security and Climate Change Committee Terms of Reference

Establishment:

By resolution dated January 12, 2015, Council has established a sub-committee to be known as the “*Food Security and Climate Change Committee*”.

Mandate:

The *Food Security and Climate Change Committee* is a Standing Committee of Council appointed for the purpose of making recommendations to Council with respect to urban food security and climate change concerns affecting the community.

Membership:

The Committee shall be comprised of members as follows:

- Four members appointed from the community at large appointed by the Mayor.
- One member appointed by the executive of Alberni Valley Transition Town Society
- One member appointed by the executive of the Alberni Environmental Coalition
- One member of City Council appointed by the Mayor.

Timing and Term:

- Members appointed from the community at large shall serve a two year term with a maximum of two consecutive terms.
- Ex-officio members appointed by external agencies shall be appointed annually by the agency with no restriction on length of term.
- The Council member shall be appointed annually.

Governance:

- The City’s Procedures Bylaw applies to the conduct of the Committee’s business.
- The Committee shall adopt a meeting schedule and will structure its activities to complete the required tasks within the reporting schedules provided.
- The Committee will elect a Chairperson from among its members.
- The Committee will appoint a member to take minutes of meetings which will be approved by the membership and forwarded to the City Clerk. Meeting minutes will be forwarded to Council for information.
- Designated staff member(s) will provide logistical support to the Committee as required, and may attend meetings

Duties and Responsibilities:

- The Committee will familiarize itself with City and community documentation already existing with respect to food security and climate change. This should include but not be limited to:
 - The Province's *Climate Action Charter* which the City signed onto in 2007
 - The City's *Climate Change Committee Final Report* (2008)
 - 2007-2014 Sustainability Progress Report and Plan
 - Port Alberni Community Assessment: Taking Action for Community Sustainability Planning (2008)
 - Alberni Valley Agricultural Plan ACRD (2011)
- The Committee shall review best practices from other communities world-wide with a view to providing recommendations in regards to preparation of an education strategy in response to rising costs and scarcity of food as well as leadership with regards to climate change awareness and response.
- The Committee shall liaise and build partnerships with community organizations involved in food security and climate change in our community including the ACRD, Alberni Valley Transition Town Society, and the Alberni Environmental Coalition.
- The Committee shall provide reports on a regular basis, at least semi-annually, to City Council in addition to meeting minutes required to be forwarded to the City Clerk.
- The committee may request information from City Staff regarding technical, operational or legislative matters respecting the City of Port Alberni in connection their review. Such requests for information shall be made to the City Manager.

Fuel - Volume to Energy to Emission Conversion Factors

Fuel Type	Unit Measure	Energy Factor (Gigajoule)	Emission Factor (tCO ₂ e)	Emission Factor (tCO ₂ e)
		GJ/unit	t/GJ	t/unit
Gasoline	litre	0.03500	0.06213	0.00217
Diesel	litre	0.03830	0.06675	0.00256
Bio-Diesel	litre	0.03567	0.06866	0.00245
Natural Gas	gigajoule	1.00000	0.04986	0.04986
Natural Gas	cum	0.03843	0.04986	0.00192
Propane	litre	0.02531	0.05966	0.00151
Heating Oil	litre	0.03880	0.06742	0.00262
Locomotive Fuel	litre	0.04173	0.07405	0.00309
Electricity	kWh	0.00360	0.02500	0.00009

Data from Provincial Ministry of Environment publication:

"2012 B.C. BEST PRACTICES METHODOLOGY FOR QUANTIFYING GREENHOUSE GAS EMISSIONS" - September 2012 (Tables 1, 2, 3 & 7.)

Carbon Tax Calculation Form
Under the Climate Action Revenue Incentive Program

Local Government Name:	CITY OF PORT ALBERNI
Contact Information:	
Name:	ANN HOPKINS
Position:	DIRECTOR OF FINANCE
Telephone Number:	250-720-2821
Email address:	ann_hopkins@portalberni.ca

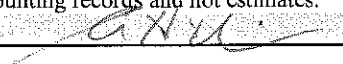
**Calculation of carbon tax paid directly by the local government
for fuel purchased between July 1 and December 31, 2008:**

Fuel Type	Unit measure	Number of Taxable Units Purchased ¹	Tax Rate per unit	Estimate of Carbon Tax paid
Most common fuels in a local government context:				
Gasoline	Litre	41613.8	0.0234	973.76292
Diesel	Litre	114604.6	0.0269	3082.86374
Bio-Diesel ²	Litre		0.0269	0
Natural Gas	Gigajoule ³	9737.7	0.4966	4835.74182
Natural Gas	m ³		0.019	0
Propane	Litre	8198.15	0.0154	126.25151
Other fuels which are taxed:				
Heating Oil	Litre	2753.2	0.0269	74.06108
Locomotive Fuel	Litre	44277	0.0269	1191.0513
Heavy Fuel Oil	Litre		0.0315	0
Aviation Fuel	Litre		0.0246	0
Jet Fuel	Litre		0.0261	0
Kerosene	Litre		0.0254	0
Naphtha	Litre		0.0255	0
Methanol	Litre		0.0109	0
Butane	Litre		0.0176	0
Ethane	Litre		0.0098	0
Refinery Gas	m ³		0.0176	0
Coke Oven Gas	m ³		0.0161	0
Coal -- Low Heat Value ⁴	Tonne		17.77	0
Coal -- High Heat Value ⁴	Tonne		20.77	0
Coke	Tonne		24.87	0
Petroleum Coke	Litre		0.0367	0
Tires -- shredded ⁵	Tonne		23.91	0
Tires -- whole ⁵	Tonne		20.8	0
Peat	Tonne		10.22	0

Total Carbon Tax Paid: 10283.73237

1. Only list fuels that were purchased for the local government's own use, on which carbon tax was paid, and where that carbon tax was not refunded or recovered from another party (e.g., through a lease arrangement). Also do not include any fuels that were exempted from carbon tax (for more information on exemptions see the *Carbon Tax Act* and its Regulations); also see footnote 2 with respect to bio-diesel
2. Only the proportion of bio-diesel that is conventional hydrocarbon-based diesel is taxed; consequently, for bio-diesel, you must pro-rate the purchase amount to ensure it corresponds to the hydrocarbon-based portion only. For example, a 10,000 litre purchase of B10, which is 10% bio-diesel and 90% hydrocarbon-based diesel, would be recorded as 9,000 litres (i.e., 10,000 litres X 90% hydrocarbon-based diesel)
3. Marketable Natural Gas may be recorded at either Gigajoules or m³
4. Low Heat Value Coal includes Sub-Bituminous Coal; High Heat Value Coal includes Bituminous Coal
5. Only include tires if they are combusted

I declare that the information contained in this Carbon Tax Calculation Form is true and correct and based on actual accounting records and not estimates.

	ANN HOPKINS	5-Feb-09
Signature of Financial Officer	Name (Please Print)	Date

Carbon Tax Calculation Form
Under the Climate Action Revenue Incentive Program

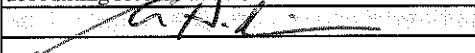
Local Government Name: Contact Information: Name: Position: Telephone Number: Email address:	CITY OF PORT ALBERNI
	ANN HOPKINS
	DIRECTOR OF FINANCE
	250-720-2821
	ann_hopkins@portalberni.ca

**Calculation of carbon tax paid directly by the local government
for fuel purchased between January 1 and December 31, 2009:**

Fuel Type	Unit measure	Units Jan - June	Rate per unit	Units July - Dec	Tax Rate per unit	Estimate of Carbon Tax paid
Most common fuels in a local government context:						
Gasoline	Litre	35729.68	0.0234	42096.5	0.0351	2313.661662
Diesel	Litre	98093.5	0.0269	86666.1	0.0404	6140.02559
Bio-Diesel ¹	Litre		0.0269	(Not taxed this period)		0
Natural Gas	Gigajoule ²	13349	0.4966	8767.8	0.7449	13160.24762
Natural Gas	m ³		0.019		0.0285	0
Propane	Litre	6943.73	0.0154	7299.7	0.0231	275.556512
Other fuels which are taxed:						
Heating Oil	Litre	4258.7	0.0269	2239	0.0404	205.01463
Locomotive Fuel	Litre	22973	0.0269	49281	0.0404	2608.9261
Heavy Fuel Oil	Litre		0.0315		0.0473	0
Aviation Fuel	Litre		0.0246		0.0369	0
Jet Fuel	Litre		0.0261		0.0392	0
Kerosene	Litre		0.0254		0.0381	0
Naphtha	Litre		0.0255		0.0383	0
Methanol	Litre		0.0109		0.0164	0
Butane	Litre		0.0176		0.0264	0
Ethane	Litre		0.0098		0.0147	0
Refinery Gas	m ³		0.0176		0.0264	0
Coke Oven Gas	m ³		0.0161		0.0242	0
Coal -- Low Heat Value ⁴	Tonne		17.77		26.66	0
Coal -- High Heat Value ⁴	Tonne		20.77		31.16	0
Coke	Tonne		24.87		37.31	0
Petroleum Coke	Litre		0.0367		0.0551	0
Tires -- shredded ⁵	Tonne		23.91		35.87	0
Tires -- whole ⁵	Tonne		20.8		31.2	0
Peat	Tonne		10.22		15.33	0
Total Carbon Tax Paid:						24703.43211

1. Only list fuels that were purchased for the local government's own use, on which carbon tax was paid, and where that carbon tax was not refunded or recovered from another party (e.g., through a lease arrangement). Also do not include any fuels that were exempted from carbon tax (for more information on exemptions see the *Carbon Tax Act* and its Regulations); also see footnote 2 with respect to bio-diesel
2. Only the proportion of bio-diesel that is conventional hydrocarbon-based diesel is taxed; consequently, for bio-diesel, you must pro-rate the purchase amount to ensure it corresponds to the hydrocarbon-based portion only. For example, a 10,000 litre purchase of B10, which is 10% bio-diesel and 90% hydrocarbon-based diesel, would be recorded as 9,000 litres (i.e., 10,000 litres X 90% hydrocarbon-based diesel)
3. Marketable Natural Gas may be recorded at either Gigajoules or m³
4. Low Heat Value Coal includes Sub-Bituminous Coal; High Heat Value Coal includes Bituminous Coal
5. Only include tires if they are combusted

I declare that the information contained in this Carbon Tax Calculation Form is true and correct and based on actual accounting records and not estimates. I am also aware of the requirement to report publicly by December 31, 2010.

	Ann Hopkins	4-Feb-10
Signature of Financial Officer	Name (Please Print)	Date

Carbon Tax Calculation Form
Under the Climate Action Revenue Incentive Program (CARIP)

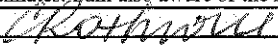
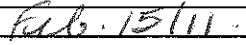
Local Government Name:	City of Port Alberni
Contact Information:	
Name:	Cathy Rothwell
Position:	Director of Finance
Telephone Number:	250 720 2821
Email address:	cathy_rothwell@portalberni.ca

**Calculation of carbon tax paid directly by the local government
for fuel purchased between January 1 and December 31, 2010:**

Fuel Type	Unit measure	Units	Tax Rate per unit, January 1, 2010 to June 30, 2010	Units	Tax Rate per unit, July 1, 2010 to December 31, 2010	Carbon Tax paid
Most common fuels in a local government context:						
Gasoline	Litre	34161.3	0.0333	35303.5	0.0445	2708.57704
Diesel	Litre	73249.6	0.0384	75049.1	0.0511	6647.79365
Bio-Diesel*	Litre	2929.1	0.0384	3653.1	0.0511	299.15085
Natural Gas	Gigajoule ²	9292.8	0.7449	5155.3	0.9932	12042.45068
Natural Gas	m ³		0.0285		0.038	0
Propane	Litre	5181.5	0.0231	5782	0.0308	297.77825
Other fuels which are taxed:						
Heating Oil	Litre	2929.4	0.0384	2757.8	0.0511	253.41254
Locomotive Fuel	Litre	40216	0.0384	39960	0.0511	3586.2504
Heavy Fuel Oil	Litre		0.0473		0.063	0
Aviation Fuel	Litre		0.0369		0.0492	0
Jet Fuel	Litre		0.0392		0.0522	0
Kerosene	Litre		0.0381		0.0522	0
Naphtha	Litre		0.0383		0.051	0
Methanol	Litre		0.0164		0.0218	0
Butane	Litre		0.0264		0.0352	0
Ethane	Litre		0.0147		0.0196	0
Refinery Gas	m ³		0.0264		0.0352	0
Coke Oven Gas	m ³		0.0242		0.0322	0
Coal -- Low Heat Value*	Tonne		0.2666		0.3554	0
Coal -- High Heat Value*	Tonne		0.3116		0.4154	0
Coke	Tonne		0.3731		0.4974	0
Petroleum Coke	Litre		0.0551		0.0734	0
Tires -- shredded ²	Tonne		0.3587		0.4782	0
Tires -- whole ²	Tonne		0.312		0.416	0
Peat	Tonne		0.1533		0.2044	0
Total carbon tax paid						25835.41341

1. Only list fuels that were purchased for the local government's own use, on which carbon tax was paid, and where that carbon tax was not refunded or recovered from another party (e.g., through a lease arrangement). Also do not include any fuels that were exempted from carbon tax (for more information on exemptions see the *Carbon Tax Act* and its Regulations)
2. Bio-diesel blends must be prorated in order to claim the diesel and bio-diesel portions on the appropriate line. The proportion of the blend (B5, B10, B15 etc) that is conventional hydrocarbon-based diesel is included on the diesel line; consequently, the bio-diesel pro-rated amount must be entered on the bio-diesel line. For example, a 10,000 litre purchase of B10, which is 10% bio-diesel and 90% hydrocarbon-based diesel, would be recorded as 9,000 litres hydrocarbon-based diesel (90% of 10,000 purchased litres) and bio-diesel would be recorded as 1000 litres (10% of purchased bio-diesel).
3. Marketable Natural Gas may be recorded at either Gigajoules or m³
4. Low Heat Value Coal includes Sub-Bituminous Coal; High Heat Value Coal includes Bituminous Coal
5. Only include tires if they are combusted

I declare that the information contained in this Carbon Tax Calculation Form is true and correct and based on actual accounting records and not estimates. I am also aware of the requirement to report publicly by December 31, 2011.

	Cathy Rothwell, Director of Finance	
Signature of Financial Officer		Date

Actions Taken to Reduce Energy Consumption and GHG Emissions

1.1. COMMENT

The City of Port Moody, along with the Province of BC and the United Kingdom signed the Climate Action Charter (CAC) in 2009. The Charter is a commitment to reduce energy consumption and GHG emissions by 10% by 2012. The City of Port Moody has taken several actions to meet this target. In 2009, the City of Port Moody signed the Charter and agreed to publish reports on their energy consumption and GHG emissions. The City of Port Moody has also implemented several energy conservation measures, such as installing energy-efficient lighting and equipment, and promoting energy conservation to employees and the public. The City of Port Moody will continue to monitor its energy consumption and GHG emissions and report on its progress in the future.

1.2. MEASURE

Corporate Greenhouse Gas Emissions

Question	Answer	Additional Information
Has your local government taken steps to reduce greenhouse gas emissions from energy and emissions inventory? Please identify the measures taken.	Yes	City has been part of 2007 for the Corporate Green House Gas Inventory. Completion of Green House Gas Inventory for 2007. GHG Report is being prepared for Community Green House Gas Inventory.

Community-wide Measurement Actions

Question	Answer	Additional Information
Has your local government taken steps to reduce and monitor greenhouse gas emissions? Please identify the measures taken.	Yes	City has been part of 2007 for the Corporate Green House Gas Inventory. Completion of Green House Gas Inventory for 2007. GHG Report is being prepared for Community Green House Gas Inventory.

1.3. PLAN

Question	Answer	Additional Information
Does your local government have targets, policies and programs to reduce greenhouse gas emissions? Please identify the measures taken.	Yes	City has been part of 2007 for the Corporate Green House Gas Inventory. Completion of Green House Gas Inventory for 2007. GHG Report is being prepared for Community Green House Gas Inventory.

1.4. BUDGET

Question	Answer	Additional Information
Does your local government have a budget for energy conservation and greenhouse gas emissions? Please identify the measures taken.	Yes	City has been part of 2007 for the Corporate Green House Gas Inventory. Completion of Green House Gas Inventory for 2007. GHG Report is being prepared for Community Green House Gas Inventory.

Does your OCP(s) have targets, policies and actions to reduce GHG emissions, as per the requirements under the *Local Governments Act (LGA)*? If yes, please identify the targets set. If no or in progress, please comment.

Yes

Setting targets and policies is in progress, though not formalized. Actions have been taken to reduce GHG emissions - see Section 1.4.

1.4. ACT

CORPORATE ACTIONS

Please describe the corporate actions you have taken this year and propose for next year to reduce GHG emissions and energy consumption. Examples of tools you may have used include:

- a) Planning tools (e.g. Green Fleet Action Plan, Resource Management Plan, Corporate Climate Action Plan)
- b) Policy tools (e.g. Civic Building Policy, Fuel Efficiency Policy, Green Purchasing Policy, Green Infrastructure Policy)
- c) Other (e.g. corporate car share program, civic building retrofits, LED street lighting, building operator training, green driving education, other educational programs and staff awareness initiatives)

Corporate Actions

To reduce GHG emissions and energy consumption

Actions Taken This Year

HVAC System Upgrades Pool, Firehall, District Energy Study (focus on alternative uses of industrial waste energy), Report from Climate Change Committee (focusing on creation of a climate action document), Community Assessment from Sustainable Cities (takes stock of current community assets, community capacity, and provides for a future vision of the community as it relates to sustainability). Summary Document on taking steps towards sustainability (provides an outline of what has been accomplished thus far, and where we should go from here - was prepared in collaboration with Greenhouse Gas Inventory)

Proposed Actions for Following Year

HVAC upgrades proposed for Echo Centre, Continued negotiation with industry regarding use of steam plant energy to heat buildings along a specific corridor which has significant corporate and community buildings with significant Greenhouse Gas Emissions (gas, gas fired boilers), Proposal for the formation of a committee to look at sustainability and oversee the monitoring of the corporate and community inventory.

COMMUNITY-WIDE ACTIONS

Please describe the community-wide actions you have taken this year and propose to take next year to reduce GHG emissions and energy consumption in the sectors below. Examples of tools you may have used include:

- a) Planning and Policy tools (e.g. Climate Action Plan, Energy Plan)
- b) Regulatory tools (e.g. Development Permit Areas, Zoning, Development Cost Charge adjustments)
- c) Incentive tools (e.g. energy audit rebate program, fast tracking green developments)
- d) Other (e.g. Sustainability checklists, development guidelines, educational programs, and public awareness initiatives)

Community-wide Actions	Actions Taken This Year	Proposed Actions for Following Year
To reduce transportation-related GHG emissions and energy consumption (i.e. through both transportation and land use actions)	Added Sunday Transit Service, Development of walking trails and trail networks, more fuel efficient, upgraded fire protection equipment	Proposed fuel efficient utility vehicles.
To reduce building-related GHG emissions and energy consumption	Development Permits, and Zoning to encourage small lot residential construction	Considering Secondary Suite Policy
To reduce water and waste-related GHG emissions and energy consumption	Change to bi-weekly garbage pickup in support of community recycling program through ACRD, Restricting and enforcing amount of Garbage picked up to 2 standard 80 litre cans.	Review water & sewer rates and usage to encourage conservation, Sewer and Water study regarding conservation based pricing, explore organic waste pickup/composting program.
To enhance carbon sink capacity through natural resource protection and enhancement	Creation of Community Forest, Preservation of City Greenspace by encouraging major construction with conditions for the protection of greenspace.	Completion of Forest Stewardship Plan, Completion of Harvesting Plan
Additional actions	Raised awareness through education of public, with regards to garbage/recycling, marketing tourism and eco friendly activities.	Will continue raising awareness through education of public with regards to garbage/recycling, marketing tourism and eco friendly activities.

Carbon Tax Calculation Form
Under the Climate Action Revenue Incentive Program

Local Government Name:	City of Port Alberni
Contact Information:	
Name:	Cathy Rothwell
Position:	Director of Finance
Telephone Number:	250 720 2821
Email address:	cathy_rothwell@portalberni.ca

**Calculation of carbon tax paid directly by the local government
for fuel purchased between January 1 and December 31, 2011:**

Fuel Type	Unit measure	Units	Tax Rate per unit, January 1, 2011 to June 30, 2011	Units	Tax Rate per unit, July 1, 2011 to December 31, 2011	Carbon Tax paid
Most common fuels in a local government context:						
Gasoline	Litre	34999.4	0.0445	38479.3	0.0556	3696.92238
Diesel	Litre	76911.8	0.0511	90670	0.0639	9724.00598
Bio-Diesel ²	Litre	3691	0.0511	4503.9	0.0639	476.40931
Natural Gas	Gigajoule ³	10140.1	0.9932	4204.7	1.2415	15291.28237
Natural Gas	m3 ³		0.038		0.0475	0
Propane	Litre	4000.2	0.0308	6194	0.0385	361.67516
Other fuels which are taxed:						
Heating Oil	Litre	3101.1	0.0511	2016.3	0.0639	287.30778
Locomotive Fuel	Litre	24213	0.0511	44936	0.0639	4108.6947
Heavy Fuel Oil	Litre		0.063		0.0788	0
Aviation Fuel	Litre		0.0492		0.0615	0
Jet Fuel	Litre		0.0522		0.0653	0
Kerosene	Litre		0.0522		0.0653	0
Naphtha	Litre		0.051		0.0638	0
Methanol	Litre		0.0218		0.0273	0
Butane	Litre		0.0352		0.044	0
Ethane	Litre		0.0196		0.0245	0
Refinery Gas	m3		0.0352		0.044	0
Coke Oven Gas	m3		0.0322		0.0403	0
Coal -- Low Heat Value ⁴	Tonne		0.3554		0.4443	0
Coal -- High Heat Value ⁴	Tonne		0.4154		0.5193	0
Coke	Tonne		0.4974		0.6218	0
Petroleum Coke	Litre		0.0734		0.0918	0
Tires -- shredded ⁵	Tonne		0.4782		0.5978	0
Tires -- whole ⁵	Tonne		0.416		0.52	0
Peat	Tonne		0.2044		0.2555	0
Total Carbon Tax Paid:						33946.29768

1. Only list fuels that were purchased for the local government's own use, on which carbon tax was paid, and where that carbon tax was not refunded or recovered from another party (e.g., through a lease arrangement). Also do not include any fuels that were exempted from carbon tax (for more information on exemptions see the *Carbon Tax Act* and its Regulations)

2. Bio-diesel blends must be prorated in order to claim the diesel and bio-diesel portions on the appropriate line. The proportion of the blend (B5, B10, B15 etc) that is conventional hydrocarbon-based diesel is included on the diesel line; consequently, the bio-diesel pro-rated amount must be entered on the bio-diesel line. For example, a 10,000 litre purchase of B10, which is 10% bio-diesel and 90% hydrocarbon-based diesel, would be recorded as 9,000 litres hydrocarbon-based diesel (90% of 10,000 purchased litres) and bio-diesel would be recorded as 1000 litres (10% of purchased bio-diesel).

3. Marketable Natural Gas may be recorded at either Gigajoules or m3

4. Low Heat Value Coal includes Sub-Bituminous Coal; High Heat Value Coal includes Bituminous Coal

5. Only include tires if they are combusted

I declare that the information contained in this Carbon Tax Calculation Form is true and correct and based on actual accounting records and not estimates. I am also aware of the requirement to report publicly by December 31st using the CARIP Progress Report.

Signature of Financial Officer

Cathy Rothwell

Date

Jan 26/12

CLIMATE ACTION REVENUE INCENTIVE PROGRAM (CARIP) PUBLIC REPORT

For Reporting Year = 2011

Community-Wide Actions

1.1 MEASURE

Community Wide Measurement Actions

QUESTION

Have you been using the *Community Energy and Emissions Inventory (CEEI)* to measure progress? What else have you been using instead of/in addition to CEEI?

ANSWER

Yes

ADDITIONAL INFORMATION

The CEEI is being reviewed. At the present, the City's focus remains on its corporate GHG.

1.2 PLAN

Community Wide Targets

QUESTION

Do your OCP(s) have targets, policies and actions to reduce GHG emissions, as per the requirements under the *Local Governments Act (LGA)*? If yes, please identify the targets set. If no or in progress, please comment.
If you are a Regional District, does your RGS have targets, policies and actions to reduce GHG emissions, as per the requirements under the *Local Governments Act (LGA)*? If yes, please identify the targets set. If no or in progress, please comment.

ANSWER

In Progress

ADDITIONAL INFORMATION

Targets and policies are in process of being formalized. Please refer to Corporate Actions.

1.3 REDUCE

Supportive Community-Wide Actions

Please describe the supportive community-wide actions you have taken in 2011 (or propose to take in 2012) to contribute to reducing GHG emissions and energy consumption in your community.

Supportive actions refer to activities that provide a framework or foundation for direct actions to be implemented. These include the development of committees or new staff positions, education and engagement, feasibility studies, policy development and engagement with programs and partnerships.

If your actions do not fit into the given categories please describe them under "other actions".

Some of the actions reported in these categories in 2010 can be found here:

Supportive Community-Wide Actions

Broad Planning (e.g. creation/revision of OCPs, CEPS, transportation plans)

Building and Lighting (e.g. developed green building policy, increased density in the downtown)

Energy Generation (e.g. signed on to provincial solar ready regulation, explored options for bioheating for buildings)

Green Space (e.g. developed urban forestry policy, adopted park acquisition policy)

Transportation (e.g. developed sustainable transportation plan, completed bicycle master plan)

Waste (e.g. introduced composting and recycling education programs)

<http://www.cscd.gov.bc.ca/lga/greencommunities/carip.htm>

Actions Taken in 2011

Transportation plan revision in progress to make bus routes more efficient and increase ridership

Basement suite regulations/zoning under review to allow secondary suites

Biomass project study in progress that is examining feasibility of converting public building heating systems from natural gas

Park acquisition policy in place, Forest Stewardship Plan, Harvesting Plan

Bike lanes completed on Redford Street, public transit changes in progress, trail networks ongoing

Composting programs are being reviewed in conjunction with ACRD. Recycling is contracted out to ACRD and under review for improvements/enhancements

Proposed Actions for 2012

Completion of modifications to transportation plans expect early 2012 in collaboration with BC Transit; the OCP is proposed to be updated in 2012.

Continued action as in 2011

Completion of study and implementation of biomass energy project pending Council approval

Continued action as in 2011

Continued action as in 2011

Continued action as in 2011

Water/Sewer (e.g. participated in water smart initiatives, implemented Water Action Plan, introduced rebates on low flush toilets)

Other Actions

Liquid Waste Management Plan in place; water system upgrade studies in progress

Storm and sewer pipe separation continues, water system upgrades, sewer system upgrades

Direct Community-Wide Actions

Please describe the **direct community-wide actions** you have taken this year and propose to take next year to contribute to reducing GHG emissions and energy consumption in your community.

Direct actions refer to activities that can be directly implemented by local government.

If your actions do not fit into the given categories please describe them under "other actions".

Lists of some of the actions reported in these categories in 2010 can be found here:

<http://www.gov.bc.ca>

Community-Wide Direct Actions

Actions Taken in 2011

Proposed Actions for 2012

Buildings (e.g. implement use of sustainability checklists and development permit guidelines for new buildings)

Development permits and zoning to encourage small lot residential construction

Energy Generation (e.g. implement district energy, geothermal, solar)

District Energy Plan in final consultative stages

Transportation (e.g. implement bike lanes, pedestrian paths, upgrade transit service and infrastructure, improve roads, parking fees etc.)

Transportation plan revision in progress to make bus routes more efficient and increase ridership, bike lanes

Waste (e.g. introduce composting and recycling programs)

Composting programs are being reviewed in conjunction with ACRD. Recycling is contracted out to ACRD and under review for improvements/enhancements

Water/Sewer (e.g. implement water conservation and reduction initiatives)

Water and sewer rates and usage under review - conservation based pricing

City Council approval of the new Water and Sewer Rate Structure enhancements to asset management

Green Space (e.g. plant trees, conserve forest etc.)

Other Actions

1.4 COMMUNITY-WIDE INNOVATION

Is there any activity that you have been engaged in over the past year(s) that you are particularly proud of and would like to share with other local governments? Please describe and add links to additional information where possible.

Forest Stewardship Plan, Harvesting Plan **Continued action as in 2011**
completed

Raised awareness through education of public with regards to garbage and recycling, marketing tourism and eco friendly activities **Continued action as in 2011**

Answer

CLIMATE ACTION REVENUE INCENTIVE PROGRAM (CARIP) PUBLIC REPORT For Reporting Year = 2011

Corporate Actions

2.1 MEASURE

Corporate Measurement Actions

QUESTION

What steps has your local government taken toward completing its corporate emissions inventory (e.g. corporate assets gathered, related to energy and fuel data and calculated GHG emissions from energy use)?

What tool are you using to measure, track and report on your corporate emissions (e.g. SMARTtool, other tools including excel spreadsheets)?

Answer

Corporate Green House Gas Inventory completed.

Excel

2.2 REDUCE

Supportive Corporate Actions

Please describe the **supportive corporate actions** you have taken in 2011 or propose to take in 2012 to contribute to reducing GHG emissions and energy consumption within your corporate boundary.

Supportive actions refer to activities that provide a framework or foundation for direct actions to be implemented. These include the development of committees or new staff positions, education and engagement, feasibility studies, policy development and engagement with programs and partnerships.

If your actions do not fit into the categories provided, please describe them under "other actions".

<http://www.gov.bc.ca>

Lists of some of the actions reported in these categories in 2010 can be found here:

Supportive Corporate Actions

Actions Taken in 2011

Proposed Actions for 2012

Broad Planning (e.g. developed corporate climate action plan)

Completed in 2007

Building and Lighting (e.g. developed energy reduction plan for all corporate buildings)

Reminders and signage to turn lights off and to conserve energy

Energy Generation (e.g. undertook feasibility study of green energy generation for civic buildings)

Biomass project study in progress that is examining feasibility of converting public building heating systems from natural gas to biomass

Transportation (e.g. created anti-idling policy for city vehicles, bike to work week promotion)

Transportation plan revision in progress to make bus routes more efficient and increase ridership, bike lanes

Waste (e.g. completed waste audit of City Hall)

Limits imposed on amount of garbage, paper recycling program in place, changed to recycled office paper

Water/Sewer (e.g. completed study of sewer and water energy use)

Liquid Waste Management Plan in place; water system upgrade studies in progress

Other Actions

Continued as in 2011

Storm and sewer pipe separation continues, water system upgrades, sewer system upgrades

Direct Corporate Actions

Please describe the **direct corporate actions** you have taken in 2011 and propose to take in 2012 to contribute to reducing GHG emissions and energy consumption within your corporate boundary.

Direct actions refer to activities that can be directly implemented by local governments.

We encourage you to report all the corporate actions that contribute to reduced emissions even if they might not directly contribute to the achievement of your carbon neutral commitment. For example, the introduction of recycling programs do not contribute to carbon neutrality but is a direct action to reduce GHG emissions.

If your actions do not fit into the given categories please describe them under "other actions"

Some of the actions reported in these categories in 2010 can be found here:

Direct Corporate Actions

Building and Lighting (e.g. energy efficiency retrofits to municipal buildings)

Energy Generation (e.g. implemented heat recovery systems, solar)

Fleet (e.g. anti-idling policies for fleet vehicles, purchasing of hybrid)

Waste (e.g. introduction of composting and recycling programs and education)

Water/Sewer (e.g. initiated water conservation and reduction initiatives)

<http://www.cscd.gov.bc.ca/lgd/greencommunities/carip.htm>

Proposed Actions for 2012

Energy audit on city buildings done
New roof for City Hall

Replaced natural gas heating systems with HVAC systems at Fire Hall and Echo Aquatic Centre
Replace natural gas heating systems with new boilers for RCMP building

Composting programs are being reviewed in conjunction with ACRD. Recycling is contracted out to ACRD and under review for improvements/enhancements

Liquid Waste Management Plan in place; water system upgrade studies in progress
Storm and sewer pipe separation continues, water system upgrades, sewer system upgrades

Forest Stewardship Plan, Harvesting Plan Continued action as in 2011
completed;
tree planting on boulevards

Green Space (e.g. planting of trees)

Other Actions

2.3 CORPORATE INNOVATION

Is there any activity that you have been engaged in over the past year(s) that you are particularly proud of and would like to share with other local governments? Please describe and add links to additional information where possible.

Answer

The progress made on our asset inventory (PSAB rules) and development of new sustainable rate structures for sewer and water infrastructure renewal

Carbon Tax Calculation Form
Under the Climate Action Revenue Incentive Program

Local Government Name: Contact Information: Name: Position: Telephone Number: Email address:	City of Port Alberni
	Cathy Rothwell
	Director of Finance
	250 720 2821
	cathy_rothwell@portalberni.ca

**Calculation of carbon tax paid directly by the local government
for fuel purchased between January 1 and December 31, 2012:**

Fuel Type	Unit measure	Units	Tax Rate per unit, January 1, 2012 to June 30, 2012	Units	Tax Rate per unit, July 1, 2012 to December 31, 2012	Carbon Tax paid
Most common fuels in a local government context:						
Gasoline	Litre	33299.5	0.0556	28776.1	0.0667	3770.81807
Diesel	Litre	89168.1	0.0639	76664.8	0.0767	11578.03175
Bio-Diesel ²	Litre	4693.1	0.0639	4035	0.0767	609.37359
Natural Gas	Gigajoule ³	10780.6	1.2415	4096.1	1.4898	19486.48468
Natural Gas	m ³		0.0475		0.057	0
Propane	Litre	3390.4	0.0385	8696.7	0.0462	532.31794
Other fuels which are taxed:						
Heating Oil	Litre	2196.8	0.0639	747.7	0.0767	197.72411
Locomotive Fuel	Litre	21858	0.0639	0	0.0767	1396.7262
Heavy Fuel Oil	Litre		0.0788		0.0945	0
Aviation Fuel	Litre		0.0615		0.0738	0
Jet Fuel	Litre		0.0653		0.0783	0
Kerosene	Litre		0.0653		0.0783	0
Naphtha	Litre		0.0638		0.0765	0
Methanol	Litre		0.0273		0.0327	0
Butane	Litre		0.044		0.0528	0
Ethane	Litre		0.0245		0.0294	0
Refinery Gas	m ³		0.044		0.0528	0
Coke Oven Gas	m ³		0.0403		0.0483	0
Coal -- Low Heat Value ⁴	Tonne		0.4443		0.5331	0
Coal -- High Heat Value ⁴	Tonne		0.5193		0.6231	0
Coke	Tonne		0.6218		0.7461	0
Petroleum Coke	Litre		0.0918		0.1101	0
Tires -- shredded ⁵	Tonne		0.5978		0.7173	0
Tires -- whole ⁵	Tonne		0.52		0.624	0
Peat	Tonne		0.2555		0.3066	0

Total Carbon Tax Paid: 37571.47634

- Only list fuels that were purchased for the local government's own use, on which carbon tax was paid, and where that carbon tax was not refunded or recovered from another party (e.g., through a lease arrangement). Also do not include any fuels that were exempted from carbon tax (for more information on exemptions see the *Carbon Tax Act* and its Regulations)
- Bio-diesel blends must be prorated in order to claim the diesel and bio-diesel portions on the appropriate line. The proportion of the blend (B5, B10, B15 etc) that is conventional hydrocarbon-based diesel is included on the diesel line; consequently, the bio-diesel pro-rated amount must be entered on the bio-diesel line. For example, a 10,000 litre purchase of B10, which is 10% bio-diesel and 90% hydrocarbon-based diesel, would be recorded as 9,000 litres hydrocarbon-based diesel (90% of 10,000 purchased litres) and bio-diesel would be recorded as 1000 litres (10% of purchased bio-diesel).
- Marketable Natural Gas may be recorded at either Gigajoules or m³
- Low Heat Value Coal includes Sub-Bituminous Coal; High Heat Value Coal includes Bituminous Coal
- Only include tires if they are combusted

I declare that the information contained in this Carbon Tax Calculation Form is true and correct and based on actual accounting records and not estimates. I am also aware of the requirement to report publicly by March 8th using the CARIP Reporting Template.

Signature of Financial Officer *C. Rothwell*

Date FEB 7/13

CLIMATE ACTION REVENUE INCENTIVE PROGRAM (CARIP) PUBLIC REPORT

For Reporting Year = **2013**

GENERAL INFORMATION	Fill in the boxes below
Name of Local Government	City of Port Alberni
Member of Regional District (RD)	Alberni Clayoquot
Regional Growth Strategy (RGS) in region	
Population	17,743
Report Submitted by	
Name	Cathy Rothwell
Title	Director of Finance
Email	cathy_rothwell@portalberni
Phone	.ca 250 720 2821

CLIMATE ACTION REVENUE INCENTIVE PROGRAM (CARIP) PUBLIC REPORT

For Reporting Year = 2013

Community-Wide Actions

1.1 MEASURE		
Community Wide Measurement Actions QUESTION	ANSWER	ADDITIONAL INFORMATION
<p>Have you been using the <i>Community Energy and Emissions Inventory</i> (CEEI) to measure progress? What else have you been using instead of/in addition to CEEI?</p>	Yes	The CEEI is under review. Reductions in community solid waste tonnages are under way. At present, the City is directing its focus on its corporate GHG.
1.2 PLAN		
Community Wide Targets QUESTION	ANSWER	ADDITIONAL INFORMATION
<p>Do your OCP(s) have targets, policies and actions to reduce GHG emissions, as per the requirements under the <i>Local Governments Act</i> (LGA)? If yes, please identify the targets set. If no or in progress, please comment.</p>	In Progress	OCP amendment to set targets scheduled for Council adoption in 2014. The amendments include objectives for reduction of corporate GHG emissions by 70% by 2020 (refer to page 23 of Sustainability Report submitted with 2012 Final CARIP report. Actions to further reduce community GHG emissions are stated in Section 7 of the Sustainability Progress Report, pages 17-21.
1.3 REDUCE		
<i>Supportive Community-Wide Actions</i>		
Supportive Community-Wide Actions	Actions Taken in 2013	Proposed Actions for 2014
<p>Broad Planning (e.g. creation/revision of OCPs, CEPs, transportation plans)</p>	<p>Modifications to transportation plan with BC Transit completed - route efficiencies and scheduling. The OCP has been updated and includes collaboration with the community.</p>	<p>Monitoring ridership in collaboration with BC Transit; continued review and update of OCP. Expand bus service to include most statutory holidays.</p>

<p>Building and Lighting (e.g. developed green building policy, increased density in the downtown)</p>	<p>The Zoning Bylaw review was completed and Council adoption is expected early 2014; applicable bylaws encourage densification. Monitoring of LED and induction street lighting continued.</p>	<p>Continued requests for proposal for development of City owned properties; development of derelict building policy; continue to monitor LED and induction street lighting.</p>
<p>Energy Generation (e.g. signed on to provincial 'solar ready' regulation, explored options for bioheating for buildings)</p>	<p>District Energy Biomass project consultation continued and modified, moved to 2014 capital budget. Grant funding obtained.</p>	<p>Pending Council approval, construction of the District Energy project will commence. The project will provide clean energy to heat City facilities and various institutions.</p>
<p>Green Space (e.g. developed urban forestry policy, adopted park acquisition policy)</p>	<p>The City maintains a Parkland Reserve fund for parkland acquisition per provincial regulations. Subdivision and Development Bylaw has been reviewed with regard to requirements for installation of street trees.</p>	<p>Continuation as in 2013.</p>
<p>Transportation (e.g. developed sustainable transportation plan, completed bicycle master plan)</p>	<p>Continued trail building and enhancements. Installation of 4 electric car charging stations completed. Continued regional collaboration with trails master development plan.</p>	<p>Roger Creek Trail development proposed and approved by Council for 2014 budget.</p>
<p>Waste (e.g. introduced composting and recycling education programs)</p>	<p>Organic waste program is being studied with regional district. Continued solid waste reduction, and promotion of recycling.</p>	<p>Continuation as in 2013.</p>
<p>Water/Sewer (e.g. participated in water smart initiatives, implemented Water Action Plan, introduced rebates on low flush toilets)</p>	<p>Continued storm and sewer pipe separation, water system upgrades, new sewer system infrastructure purchased. Liquid Waste Management and Water Conservation Plan adopted.</p>	<p>Continued storm and sewer pipe separation, replacements and upgrades, new storm main installs at Coal Creek, Maitland St. Sewage treatment system construction to begin. Phase 1 of Bainbridge water system upgrade commenced.</p>
<p>Other Actions</p>	<p>Continued support of Air Quality Council Woodstove Exchange Program. Fire Dept. performing inspections and giving recommendations.</p>	<p>Continued as in 2013.</p>
<p>Direct Community-Wide Actions Community-Wide Direct Actions</p>	<p>Actions Taken in 2013</p>	<p>Proposed Actions for 2014</p>

<p>Buildings (e.g. implement use of sustainability checklists and development permit guidelines for new buildings)</p>	<p>Zoning bylaw review completed, includes secondary suite policy. Promotion of densification to encourage small lots for residential construction.</p>	<p>Adoption of bylaw changes finalized May 2014. Continued promotion of densification to encourage small lots for residential construction.</p>
<p>Energy Generation (e.g. implement district energy, geothermal, solar)</p>	<p>Continued investigation and study of District Energy System, modifications, and scope changes.</p>	<p>Implementation is pending Council and public approval of funding strategy (borrowing). Grant funds approved.</p>
<p>Transportation (e.g. implement bike lanes, pedestrian paths, upgrade transit service and infrastructure, improve roads, parking fees etc.)</p>	<p>Cycling and trails master plan under development. Transit routes and schedule modifications implemented in collaboration with BC Transit. 4 Electric car charging stations installed around city.</p>	<p>Roger Creek Trail development proposed and approved by Council for 2014 budget.</p>
<p>Waste (e.g. introduce composting and recycling programs)</p>	<p>Composting program under discussion with regional district. Recycling program contracted to regional district is being reviewed for enhancements.</p>	<p>Composting program under discussion with regional district. Funding included for this initiative in 5 year plan. Recycling program contracted to regional district is being reviewed for enhancements.</p>
<p>Water/Sewer (e.g. implement water conservation and reduction initiatives)</p>	<p>Liquid Waste Management and Water Conservation Plan adopted. Water and sewer rates increased. Sewer infrastructure purchased - will raise efficiency of treatment.</p>	<p>Construction of new sewage treatment facility to commence. Water and sewer rate increases pending Council approval.</p>
<p>Green Space (e.g. plant trees, conserve forest etc.)</p>	<p>Subdivision and Development bylaw updated for street tree requirements; Parks & Recreation policy updated regarding street tree placement. The City maintains an inventory of approximately 3,000 street trees, owns approx. 300 Ha forested lands; and operates a Community Forest outside City boundaries that is under a Forest Stewardship Plan and Harvesting Plan that models best practices in forestry operations.</p>	<p>Continuation as in 2013. City owned "Plywoods" land Lot C proposed park development, pending Council approval.</p>
<p>Other Actions</p>	<p>Policies in place for Forest Stewardship Plan and Harvesting Plan. Reserves bylaws in place for parkland acquisition. Consultative work continuing on organic waste collection.</p>	<p>Continuation as in 2013.</p>

1.4 COMMUNITY-WIDE INNOVATION

Is there any activity that you have been engaged in over the past year(s) that you are particularly proud of and would like to share with other local governments? Please describe and add links to additional information where possible.

Answer

Pending Council approval, construction of the District Energy Biomass project will commence. The project will provide clean energy to heat City facilities and various institutions.

CLIMATE ACTION REVENUE INCENTIVE PROGRAM (CARIP) PUBLIC REPORT

For Reporting Year = **2013**

Corporate Actions

2.1 MEASURE		
Corporate Measurement Actions	Answer	
<p>QUESTION</p> <p>What steps has your local government taken toward completing its corporate emissions inventory (e.g. corporate assets identified related to energy and fuel data and calculated GHG emissions from energy use)?</p> <p>What tool are you using to measure, track and report on your corporate emissions (e.g. SMARTtool, other tools including excel spreadsheets)?</p>	<p>Environmental Sustainability Progress Report & Plan 2007-2012 adopted by Council. Plan was attached to 2012 CARIP report. Continuing reductions as per Plan.</p> <p>Custom designed Excel spreadsheets.</p>	
2.2 REDUCE		
Supportive Corporate Actions	Actions Taken in 2013	Proposed Actions for 2014
<p>Supportive Corporate Actions</p> <p><i>Broad Planning (e.g. developed corporate climate action plan)</i></p> <p><i>Building and Lighting (e.g. developed energy reduction plan for all corporate buildings)</i></p> <p><i>Energy Generation (e.g. undertook feasibility study of green energy generation for civic buildings)</i></p>	<p>Continued monitoring of energy and emissions initiatives implemented with the Environmental Sustainability Progress Report & Plan.</p> <p>Promotion of energy conservation; renovations planned with conservation as major factor.</p> <p>Consultation completed with regards to District Energy Bimoass System to supply City facilities and institutional customers with clean energy.</p>	<p>Continued monitoring of energy and emissions initiatives implemented with the Environmental Sustainability Progress Report & Plan.</p> <p>Promotion of energy conservation; renovations planned with conservation as major factor.</p> <p>Construction to begin in 2014 pending Council approval.</p>

Transportation (e.g. created anti-idling policy for city vehicles, bike to work week promotion)

Anti idling policy has been in place for years. Cycling and trails master plan in progress. Route and schedule modifications to transit in collaboration with BC Transit. "Pathway to Success" trail project completed in partnership with School Dist 70. 4 electric car charging stations installed around City; walkway completed on Grandview St.

Cycling and trails master plan in progress. Roger Creek Trail development proposed and has Council approval.

Waste (e.g. completed waste audit of City Hall)

Continued exploration of paperless billing options and electronic file storage systems. Paperless agendas for Council meetings established. Composters installed in City Hall gardens for organic waste collected in staff kitchen areas.

Continued exploration of paperless billing options and electronic file storage systems. Continued use of recycled office paper. Dumpster replaced with garbage cart to better manage significant reduction in garbage. Continuation of successful kitchen composting at City Hall.

Water/Sewer (e.g. completed study of sewer and water energy use)

Liquid Waste Management Plan in place. Water system upgrade studies completed. Rates increased to cover capital construction costs. Purchased sewer system infrastructure that will significantly increase efficiency in waste water treatment. Construction of new storm mains.

Proposed water and sewer rates increases pending Council approval, to cover infrastructure improvements. Construction to commence on sewage treatment facility and Phase 1 of Bainbridge water supply upgrade. Renewal and upgrade of mains; separation of storm and sewer pipe, new storm mains and upgrades.

Other Actions

Direct Corporate Actions

Building and Lighting (e.g. energy efficiency retrofits to municipal buildings)

Actions Taken in 2013

Energy efficient retrofits completed or in progress: HVAC system and lighting for City Hall; windows for Fire Hall, HVAC system for Echo Centre; roof for Echo Aquatic Centre; mechanical and lighting retrofits for Multiplex and Glenwood Centre; roof for Russell Park Fieldhouse.

Proposed Actions for 2014

Proposed energy efficient retrofits include: window replacements at Echo Centre and City Hall, Council approval in place.

<p>Energy Generation (e.g. implemented heat recovery systems, solar)</p>	<p>Heat recovery systems City Hall & Echo Centre; dehumidifier at Aquatic Centre recovers and recirculates water</p>	<p>Monitor for efficiency and reduction of GHGs with reduced fuel consumption.</p>
<p>Fleet (e.g. anti-idling policies for fleet vehicles, purchasing of hybrid)</p>	<p>Two aged pickup trucks replaced with new fuel efficient vehicles; anti-idling policy in place; heavy trucks are class 8 (low emission); 5% biodiesel used in all diesel fueled equipment</p>	<p>Proposed in budget: replacement of aging vehicles with new, fuel efficient vehicles; replacement of propane fueled Zamboni with electric Zamboni. Approved by Council.</p>
<p>Waste (e.g. introduction of composting and recycling programs and education)</p>	<p>Continued use of office paper with recycled content; paperless agendas for Council and staff. Staff composting program implemented; ongoing consultative work re organic waste collection</p>	<p>Continuation as in 2013.</p>
<p>Water/Sewer (e.g. initiated water conservation and reduction initiatives)</p>	<p>Liquid Waste Management and Water Conservation Plan adopted by Council; water system upgrade plans completed; waste water treatment plans ongoing; sewer infrastructure purchased; new storm mains installed.</p>	<p>Construction to commence on Bainbridge water system upgrade; and sewage treatment facility. Renewals and replacements of sewer, water, and storm drains, and separation of storm and sewer.</p>
<p>Green Space (e.g. planting of trees)</p>	<p>Subdivision and Development bylaw updated for street tree requirements; Parks & Recreation policy updated regarding street tree placement. The City maintains an inventory of approximately 3,000 street trees, owns approx. 300 Ha forested lands; and operates a Community Forest outside City boundaries that is under a Forest Stewardship Plan and Harvesting Plan that models best practices in forestry operations.</p>	<p>Continued implementation of appropriate species of street trees - refer to page 20 of Sustainability Progress Report filed with 2012 CARIP report. Continued operation of community forest as in 2013.</p>
<p>Other Actions</p>	<p>Continued raising of awareness through education of public re garbage and recycling; marketing tourism and eco-friendly activities.</p>	<p>Continuation as in 2013.</p>

2.3 CORPORATE INNOVATION

Answer

Is there any activity that you have been engaged in over the past year(s) that you are particularly proud of and would like to share with other local governments? Please describe and add links to additional information where possible.

District Energy Plan: pending Council approval of project funding strategy; grant funding approved for biomass energy system that will provide clean energy to heat City facilities and a number of institutions. Sustainable water and sewer rate structures implemented. Policies in place for park acquisition, Forest Stewardship Plan, Harvesting Plan. Refer to Sustainability Progress Report attached to 2012 CARIP report.

You MUST fill this in for the 2013 reporting year.

CLIMATE ACTION REVENUE INCENTIVE PROGRAM (CARIP) PUBLIC REPORT

For Reporting Year =

2013

Prior to completing this section, please ensure that you are familiar with the "Becoming Carbon Neutral guidebook" available on the BC

[BC Climate Action Toolkit Website](#)

Carbon Neutral Progress Reporting

Is this your Final or Interim CARIP Report for 2013 ? Emissions/Offsets	Final Tonnes CO2e Enter Values in White Boxes	
Annual corporate emissions using SMARTTool or equivalent inventory tool	2352	(+)
<i>Emissions from services delivered directly by the local government</i>	2101	
<i>Emissions from contracted services</i>	251	
Less: GHG reductions being claimed for this reporting year from Option 1 - GHG reduction project	0	(-)
<i>Energy Efficient Building Retrofits and Fuel Switching</i> <i>Solar Thermal</i> <i>Household Organic Waste Composting</i> <i>Low Emissions Vehicles</i>		
Less: GHG reductions being claimed for this reporting year from Option 2 - GHG reduction projects <i>Please list all Option 2 Projects Implemented (insert title of the projects(s) as per project plan template. If you have more than two Option 2 projects you can add more lines at the bottom of this sheet)</i>	0	(-)
<i>Option 2 Project A</i> <i>Option 2 Project B</i>		

<i>Sum of Other Option 2 Projects (if you have added projects below)</i>	0
Less: Offsets purchased for this reporting year (Option 3). Please identify your offset provider in the offset provider information section below.	
Balance of corporate emissions for this reporting year. <i>(If the corporate emissions balance is zero, your local government is carbon neutral for this reporting year)</i>	2352
Making Progress on Your Carbon Neutral Commitment If your community has not achieved carbon neutrality for this reporting year please describe the actions that you intend to take next year to move you toward your carbon neutral goal.	
<p><i>The City established through bylaw in 2012, Port Alberni Carbon Trust, to which the City is making annual contributions of \$25 per tonne of total annual corporate emissions. Contribution for 2013 (made in 2014) is \$58,800. This statutory fund is designated for projects that will reduce the City's GHG emissions. Partial funding for the electric Zamboni is being provided by this fund in 2014. For more specifics on planned projects, please refer to the Sustainability Plan that was submitted with the 2012 report.</i></p>	
Additional "Option 2" Projects <i>Option 2 Project C</i> <i>Option 2 Project D</i> <i>Option 2 Project E</i> <i>Option 2 Project F</i> <i>Option 2 Project G</i> <i>Option 2 Project H</i>	
Offset Provider Information (i) Please Identify the name(s) of your offset provider(s) (Please answer below):	

(-)

=

(ii-a) The offsets being claimed in this CARIP Report were purchased from the offset provider(s) indicated above prior to making this CARIP report public (please indicate yes or no):

OR

(ii-b) There is a signed agreement in place between the reporting local government and the offset provider(s) indicated above to purchase the offsets by no later than June 1, 2014 (please indicate yes or no):

Climate Action Revenue Incentive Program (CARIP) Public Reporting - Carbon Neutral Progress Survey 2014

<http://fluidsurveys.com/surveys/irpb/carbon-neutral-progress-reporting/3435676913d91b9c470c016b8c12eb2b8b607bd5/>

Filled Friday, May 29, 2015

Welcome and Introduction

WELCOME and INSTRUCTIONS

Welcome to the new online format of the Carbon Neutral Progress Survey! [Reporting Process and Key Deadlines](#) We have made some exciting improvements to the CARIP public reporting process this year by moving to a new online survey format. The online survey format is intended to streamline and enhance the annual CARIP reporting process. As outlined in the CARIP Program Guide for 2014 Claims, B.C. local governments must complete and submit to the Province two online surveys – the Climate Actions Survey and the Carbon Neutral Progress Survey – and make the reports generated from those surveys public by the following dates: Climate Actions Survey – March 8, 2015 Carbon Neutral Progress Survey – June 2, 2015 These two online surveys replace the CARIP Public Reporting Template used in previous years. The surveys provide the same opportunity for local governments to describe actions, undertaken in 2014 and planned for 2015, to reduce GHG emissions and create more complete, compact and energy efficient communities. A CARIP public reporting attestation form, signed by the Financial Officer, must also be completed for each survey and submitted to the Province. For more information on the grant program requirements, please see the CARIP Program Guide for 2014 Claims at: <http://www.cscd.gov.bc.ca/lgd/greencommunities/carip.htm> [Key Differences in the New Online Carbon Neutral Progress Survey](#) Prior to completing this Carbon Neutral Progress Survey, please ensure that you are familiar with *Becoming Carbon Neutral: A Guide for Local Governments in British Columbia* available on the BC Climate Action Toolkit website. The Carbon Neutral Progress Survey replaces the Carbon Neutral Progress Reporting worksheet in the previous CARIP Public Reporting Template. Although the information you will be reporting is very much the same as under the previous template, the Survey is organized differently. Key differences are: Some questions have been reworded and re-ordered. Two questions related to the purchase of offsets have been deleted. Two questions related to ‘making progress towards’ and Green Communities Committee (GCC) Climate Action recognition level have been added. [General Guidance](#) After reading these instructions, it is recommended that you click through the survey tabs to familiarize yourself with the layout and information needed to complete the survey. You can navigate through the survey using the ‘next’ and ‘back’ buttons at the bottom of each survey page or by clicking on the

tabs at the top of each survey page (please do not use the browser's back and forward buttons or your information may not be saved). The 'save and continue later' button at the bottom of each page allows you to save the survey and complete it later. There is also a 'Local Government Information' tab. This tab is the last page of the survey and must be completed in full prior to submitting the survey. Use the 'submit' button located on the 'Local Government Information' tab to submit your survey. Please be sure that it is your local government's complete and final 2014 Carbon Neutral Progress Survey, and submit the survey once only. After submitting your survey, please ensure that you download a copy of the report from the 'Thank You' page and make that report public by the date identified in the CARIP Program Guide for 2014 Claims (<http://www.cscd.gov.bc.ca/lgd/greencommunities/carip.htm>). You will note that the report generated includes the instructions provided to you in this survey, as a result, you may want to remove these instructions prior to making your report public.

FAQs

How can I save and complete my survey later? Click on the 'save and continue later' button that is located at the bottom of each page. You will be prompted to provide your email address so that the link to access your saved survey can be emailed to you, and/or you can bookmark or copy the link provided. How can I send the survey to others to work on? Follow the instructions above for 'save and continue later', and then forward the link to others to work on. Please note: You may want to save a Word copy of the report for yourself, prior to forwarding the link.

Can multiple people work on the survey at one time? No, only one person can work on the survey at any one time, or you will risk some of your responses not being processed. The Government of BC will not collect, use, or disclose personal information using SurveyMonkey. Please be aware however that IP addresses are collected by SurveyMonkey itself, and these IP addresses and other information collected will be stored on SurveyMonkey's servers located outside of Canada. This survey is voluntary and a response is encouraged, not required. Please do not provide any third-party information (i.e. talk about others) in your responses to the survey.

Measuring Corporate GHG Emissions

MEASURING CORPORATE GHG EMISSIONS

Q1. Did you measure your local government's corporate GHG emissions in 2014?

Many local governments use SMARTTool, a web-based inventory and reporting tool, to track and measure their corporate GHG emissions. If your local government has chosen to use another inventory tool, please make sure that you are using the same methodologies and emission factors as SMARTTool. The most recent edition of the B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions provides this information and is available on the BC Climate Action Toolkit. If you would like to know more about using SMARTTool to measure GHG emissions, please contact Jennifer Hill at Jennifer.Hill@gov.bc.ca or 250-387-0089.

Survey Navigation Tip: If you are not yet measuring your local government's GHG emissions, a 'no' answer to this question will bring you directly to the 'Making Progress Towards Carbon Neutrality' page of the survey when you click 'Next'.

Yes

Reporting Corporate GHG Emissions and Reductions

REPORTING CORPORATE GHG EMISSIONS AND REDUCTIONS

A local government's Total Corporate GHG Emissions include direct and contracted GHG emissions that result from the delivery of "traditional services". Traditional services - services that are commonly provided by a majority of local governments and include: administration and governance; drinking, storm and waste water; solid waste collection, transportation and diversion; roads and traffic operations; arts, recreation and cultural services; and fire protection. Direct GHG emissions - emissions that are generated by the delivery of a traditional service by local government staff or a subsidiary organization. Contracted GHG emissions - emissions that are generated by the delivery of traditional services by contractors on behalf of local governments. For more information, see *Becoming Carbon Neutral: A Guide for Local Governments in British Columbia* and *The Workbook: Helping Local Governments Understand How to be Carbon Neutral in their Corporate Operations*.

Reporting Emissions

Q2. What were your local government's 2014 corporate GHG emissions from services delivered directly by your local government?

(in tonnes of carbon dioxide-equivalent, tCO₂e)

2097

Q3. What were your local government's 2014 corporate GHG emissions from contracted services?

(in tonnes of carbon dioxide-equivalent, tCO₂e)

209

Total Corporate GHG Emissions for 2014 = 2306.0 tCO₂e

Reporting Reductions and Offsets

To be carbon neutral, a local government must: balance their TOTAL corporate GHG emissions by undertaking Option 1 (GCC-supported) or Option 2 (alternative) community GHG emissions reduction projects that meet project eligibility requirements; and/or; purchase carbon offsets from a credible offset provider.

Q4. If applicable, please report the 2014 GHG emissions reductions being claimed from Option 1 GHG Reduction Projects.

Energy Efficient Building Retrofits

0

Solar Thermal

0

Household Organic Waste Composting

0

Low Emission Vehicles

0

Avoided Forest Conversion

0

Reductions from Option 1 Projects = 0.0 tCO₂e

Q5. If applicable, please list the names of and report the 2014 GHG emissions reductions being claimed from Option 2 GHG Reduction Projects.

Option 2 Project Name	GHG Emissions Reduced
(No response)	(No response)
(No response)	(No response)
(No response)	(No response)

Reductions from Option 2 Projects = 0 tCO₂e

Q6. If applicable, please report the number of offsets you purchased from an offset provider for the 2014 reporting year.

NOTE: Please do not include any climate action reserve funds in your response. Some local governments have put funds that they would otherwise use to purchase offsets into climate action reserve funds. A climate action reserve fund is a way of setting aside funding for emission reduction projects, and worth publicly reporting, but does not get a local government to carbon neutrality under the GCC's Carbon Neutral Framework.(in tonnes of carbon dioxide-equivalent)

(No response)

Q7. If you have purchased offsets, please identify the name of your offset provider.

(No response)

Total Reductions from Projects and Offsets for 2014 = 0.0

Corporate GHG Emissions Balance

Your local government's Corporate GHG Emissions Balance is the difference between total corporate GHG emissions (direct + contracted emissions) and the GHG emissions reduced through GCC Option 1 and Option 2 projects and/or the purchase of offsets.

Corporate GHG Emissions Balance for 2014 = 2204.0

If your Corporate GHG Emissions Balance is negative or zero, your local government is carbon neutral. Congratulations!

Survey Navigation Tip: If your local government is carbon neutral for 2014, you can skip directly to the GCC Climate Action Recognition Program survey page by clicking on that tab in the list of tabs at the top of the page.

Making Progress Towards Carbon Neutrality

MAKING PROGRESS TOWARDS CARBON NEUTRALITY

Even if your local government did not measure corporate GHG emissions or achieve carbon neutrality for the 2014 reporting year, by identifying and committing to taking actions next year to bring you closer to carbon neutrality, your local government is meeting the spirit of the Climate Action Charter.

Q8. If you did not achieve carbon neutrality in 2014, did you undertake any of the following commonly reported corporate GHG reduction activities?

- Undertook civic building energy efficient retrofits
- Set aside funds in a climate action reserve fund
- Developed a corporate operations GHG emissions reduction plan

Q9. If you did not achieve carbon neutrality in 2014, please identify up to three key actions for 2015 that will help you make progress towards becoming carbon neutral.

Variable	Response
[Actions_2015.0] Q9. If you did not achieve carbon neutrality in 2014, please identify up to three key actions for 2015 that will help you make progress towards becoming carbon neutral.	District Energy System feasibility
[Actions_2015.1] Q9. If you did not achieve carbon neutrality in 2014, please identify up to three key actions for 2015 that will help you make progress towards becoming carbon neutral.	Solid waste reduction
[Actions_2015.2] Q9. If you did not achieve carbon neutrality in 2014, please identify up to three key actions for 2015 that will help you make progress towards becoming carbon neutral.	Food Security and Climate Change Committee

Q10. Are you familiar with the Community Energy and Emissions Inventory (CEEI)?

Familiarity with your community's CEEI helps qualify you for Level 2 of the GCC Recognition Program. For more information about CEEI, please see: <http://www.toolkit.bc.ca/community-energy-and-emissions-inventory-initiative>

Yes

GCC Climate Action Recognition Program

GREEN COMMUNITIES COMMITTEE (GCC) CLIMATE ACTION RECOGNITION PROGRAM

The joint Provincial-UBCM Green Communities Committee (GCC) is pleased to be continuing the Climate Action Recognition Program again this year. This multi-level program provides the GCC with an opportunity to review and publicly recognize the progress and achievements of each Climate Action Charter (Charter) signatory. Recognition is provided on an annual basis to local governments who demonstrate progress on their Charter commitments, according to the following: Level 1 - Progress on Charter Commitments (L1): for local governments who demonstrate progress on fulfilling one or more of their Charter commitments Level 2 - Measurement (L2): for local governments who have measured their Corporate GHG Emissions for the reporting year and demonstrate that they are familiar with the Community Energy and Emissions Inventory (CEEI) Level 3 - Achievement of Carbon Neutrality (L3): for local governments who achieve carbon neutrality in the reporting year

Q11. Based on your local government's 2014 CARIP Public Report, please check the GCC Climate Action Recognition Program level that best applies:

Level 1 - Progress on Charter Commitments

Local Government Information

LOCAL GOVERNMENT INFORMATION

Variable	Response
LOCAL GOVERNMENT INFORMATION Name of Local Government	Port Alberni, City of
LOCAL GOVERNMENT INFORMATION Name of member Regional District (RD)	Alberni-Clayoquot
LOCAL GOVERNMENT INFORMATION Regional Growth Strategy (RGS) in your region	No
LOCAL GOVERNMENT INFORMATION Population	10,000-49,999

Submitted by:

Variable	Response
Submitted by: Name	Cathy Rothwell
Submitted by: Position	Director of Finance

Submitted by: | Email

cathy_rothwell@portalberni.ca

Submitted by: | Telephone # (ten digit)

250-720-2821

This year we replaced the CARIP Public Reporting Template with two online surveys to streamline and improve the reporting process. We would like to know what you think.

Please check the answer that best describes your thoughts on how the Carbon Neutral Progress Survey and the new survey process compares to the previous year's process.

Much improved

Before submitting your survey, please ensure that it is your local government's complete and final 2014 Carbon Neutral Progress Survey. Please submit this survey only once.

Is this your local government's complete and final 2014 Carbon Neutral Progress Survey?

Yes

Once you have submitted your survey, be sure to download your survey report from the 'Thank You' page and use it as your public report.

Natural Gas Consumption - City of Port Alberni



Annual Consumption (GJ)

Customer 1452542	Meter Number	Location (POD)	2007	2008	2009	2010	2011	2012	2013	2014
Other Buildings			210.0							
Williamson Park	880956	3701 Craig Rd	24.8	25.4	19.5	9.8	10.5	10.7	11.2	10.8
Recreation Park	932310	3301 Seventh Ave	0.0	12.4	27.4	44.1	51.0	43.7	44.3	37.9
Train Station	932415	HARBOUR ROAD	93.4	90.8	93.0	55.5	64.6	86.6	81.5	91.1
Harbour Quay	932418	5441 Argyle St	87.8	111.5	94.2	68.5	85.2	79.6	70.3	64.6
Gyro Youth Centre	948553	A 3245 Seventh	249.2	257.4	235.1	282.8	283.4	274.5	269.8	225.2
City Hall	948560	4851 Argyle St	522.4	583.5	688.7	593.4	572.8	518.4	336.2	212.6
Fire Hall	948586	3700 10th Ave	1,015.4	926.6	810.2	727.4	757.4	684.3	692.6	513.2
A.V. Multiplex	948611	3738 Roger St	5,812.5	5,229.9	5,379.8	4,878.0	5,063.4	4,680.1	4906.0	4,344.2
Echo Park	948613	4201 Wood Ave	908.7	853.0	924.8	830.7	784.5	749.6	626.8	566.3
Echo Community	948614	4251 Wallace St	54.8	21.6	19.0	18.6	18.7	22.2	75.8	104.6
Aquatic Centre	948615	4256 Wallace St	8,844.4	7,495.0	6,938.6	5,425.6	3,620.9	3,312.3	3277.8	4,004.3
Library	948616	A 4255 Wallace St	128.9	74.5	76.2	41.4	31.3	40.5	42.7	43.1
Public Works	948623	4151 6th Ave	1,278.0	1,299.1	1,339.0	1,297.9	1,374.8	1,358.1	1240.8	1,078.0
Parks Yard Building	948624	A 4150 6th Ave	243.7	241.4	248.0	227.2	251.7	247.1	228.0	210.5
Glenwood Centre	948626	4481 VIMY STREET	569.4	594.5	588.4	492.2	564.0	589.4	507.0	458.3
RCMP Detachment	953111	4445 Morton St	1912.9	1965.6	1935.5	1623.6	2154.9	1723.9	1857.8	1,241.2
			21956	19782	19417	16617	15689	14421	14269	13206



POWER CONSUMPTION

ENERGY CONSUMPTION Kwh

		2007	2008	2009	2010	2011	2012	2013	2014
BUILDINGS									
Building	McLean Mill	125,590	129,609	138,227	139,709	129,689	127,738	123,133	124065
Building	Multiplex	1,651,980	1,575,960	1,692,180	1,528,620	1,356,480	1,404,840	1,572,060	1570020
Building	Health Unit (Co-op)	173,120	167,680	154,800	127,440	126,720	63,200	0	0
Building	Community Policing Office	10,194	8,870	8,665	3,180	389	0	4,240	4314
Building	RCMP Building - Morton St	389,280	382,920	397,320	396,120	350,880	377,400	387,360	360120
Building	Harbour Quay	137,673	116,055	106,526	128,073	72,714	85,935	81,013	76565
Building	Industrial Heritage Truck Museum	357,900	373,200	295,200	203,209	150,225	161,859	108,109	114307
Building	City Hall	192,688	194,210	211,977	211,540	174,052	144,720	134,880	142880
Building	Train Station	20,096	17,174	12,044	15,752	9,150	43,384	20,786	18364
Building	Round House	20,160	28,500	19,680	29,940	20,520	14,026	20,696	21127
Building	Gyro Youth Centre	18,573	16,174	14,679	21,011	14,475	16,718	12,195	14289
Building	Old Public Safety Building	86,560	10,320	12,800	14,560	0	0	0	0
Building	Works Yard Complex	245,541	252,937	242,490	238,608	198,446	156,017	205,917	206909
Building	Parks Yard Buildings	80,709	82,743	84,391	81,568	72,630	62,592	80,917	84937
Building	Echo Park Complex - Wood Ave	35,940	32,700	34,680	35,520	29,400	78,188	35,700	28560
Building	Glenwood Centre	84,360	84,540	86,040	81,660	71,040	35,400	72,600	67440
Building	Fire Hall	116,340	119,100	122,940	137,280	88,500	76,080	102,840	106680
Building	Echo Community Centre Complex	1,095,952	1,154,977	1,191,475	1,264,392	1,429,189	108,245	1,392,250	1450226
Building	Parks Fieldhouses (5)	98,284	89,941	70,860	87,245	83,261	1,568,082	93,961	96204
Building	SPCA	695	698	699	700	697	18,973	695	692



ENERGY CONSUMPTION Kwh

POWER CONSUMPTION		2007	2008	2009	2010	2011	2012	2013	
WATER & SEWER									
Water	Somass Pump Station	19,200	20,000	15,780	12,160	20,800	18,880	18,560	20800
Water	Anderson/Cowichan Valve Chamber	19,615	18,931	16,641	23,028	9,961	0	0	0
Water	Cowichan Reservoirs/Pumpstation	113,760	95,040	73,760	104,000	92,640	103,680	62,880	44,480
Water	Bainbridge Pumpstation	129,240	115,440	98,760	174,360	198,240	250,920	218,760	248,160
Water	China Creek Intake	44,300	49,617	60,601	57,859	46,516	48,928	58,065	45,927
Water	3rd Ave Regulator Chamber	4,105	4,156	3,859	0	0	0	2,955	3,252
Water	Wood Ave Irrigation Pumpstation	2,723	3,266	1,425	553	201	50	184	0
Water	Burde Reservoir/Pumphouse	11,277	11,074	12,365	16,105	14,562	15,595	12,936	13,808
Water	Arrowsmith Pumphouse	7,785	8,074	9,098	18,548	13,992	13,261	11,710	12,143
Water	Johnston Reservoirs/Pumpstation	107,820	102,060	110,700	108,360	106,200	83,520	102,420	92,700
Sewer	Wallace Pumpstation	135,720	135,720	118,080	157,620	126,840	122,189	121,994	128,776
Sewer	Argyle Pumpstation	227,640	137,880	249,142	517,680	364,080	339,600	315,840	303,840
Sewer	Maitland Overflow Valve	0	0	0	320	235	276	276	270
Sewer	4th Ave Pumpstation	20,107	17,499	17,373	28,693	16,210	18,845	16,707	16,665
Sewer	Margaret Pumpstation	41,040	36,000	39,600	45,000	40,140	45,540	39,600	45,000
Sewer	Josephine Pumpstation	36,993	31,925	31,290	41,083	35,657	39,613	36,070	31,566
Sewer	Sewage Lagoon	1,779,600	2,064,000	1,898,700	1,984,500	1,821,900	2,007,300	2,492,400	2,025,600



POWER CONSUMPTION

LIGHTING.

		2007	2008	2009	2010	2011	2012	2013	2014
Street Lights	BC Hydro Supplied (wooden poles)	461,795	462,949	462,439	461,930	462,544	463,960	469,462	475061
Street Lights	City owned (steel davit and post)	420,441	420,894	392,483	389,770	394,284	399,937	401,376	411597
Traffic Lights	Signals, flashers, Xwalks,	32,288	32,920	33,051	32,494	29,362	29,607	24,337	25197
Parking Lots	Lot lighting	37,458	43,927	18,862	18,288	15,151	17,840	19,428	19092
Parks & Fields	Lighting, scoreboards, trailers	89,832	96,037	89,091	96,197	94,055	93,699	41,215	76461

EMERGENCY

Tsunami Prep.	Tsunami Warning System Speakers	48	48	48	1,857	9,830	9,912	2,378	288
RCMP Boat		15,952	3,461	10,898	15,227	21,423	14,288	16,814	15009

		2007	2008	2009	2010	2011	2012	2013	2014
ANNUAL CITY TOTALS		8,704,388	8,753,242	8,665,737	9,055,779	8,317,302	8,684,861	8,935,719	8,543,792
check total		8700374	8749226	8,476,938	9051759	8354767	8,883,839	8935719	8543792
		4014	4016	188799	4020	-37465	-198978		
SUBTOTALS									
	Buildings	4,941,635	4,838,308	4,897,673	4,746,127	4,378,457	4,543,397	4,449,352	4487699
	Water & Sewer	2,700,925	2,850,682	2,757,174	3,289,869	2,908,174	3,108,197	3,511,357	3032987
	Outside Lighting & Emergency	1,057,814	1,060,236	1,006,872	1,015,763	1,026,649	1,029,243	975,010	1023106
	Buildings	56.8%	55.3%	56.5%	52.4%	52.6%	52.3%	49.8%	52.5%
POWER	Water & Sewer	31.0%	32.6%	31.8%	36.3%	35.0%	35.8%	39.3%	35.5%
	Outside Lighting & Emergency	12.2%	12.1%	11.6%	11.2%	12.3%	11.9%	10.9%	12.0%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Adjusted for 2009 missing billings for Hydro Streetlights
September to December 2009

Adjusted for 2011 & 2012 for resale of power to Yellowridge
Construction related to new ADSS construction



Propane Use (litres)	Year							
	2007	2008	2009	2010	2011	2012	2013	2014
City Fleet	10,570	16,646	14,243	10,964	10,194	12,087	9,961	4696
McLean Mill	37,628	43,180	29,767	31,303	34,112	28,054	57,259	30299
Roundhouse & other Heritage	200	250	220	1,683	250	1,573	288	991
Total	48,398	60,076	44,230	43,950	44,556	41,714	67,508	35,986

APPENDIX 5 - MAJOR CITY FACILITIES SUMMARY & FACILITY ENERGY REPORTS

CITY OF PORT ALBERNI - MAJOR FACILITIES LISTING

FACILITY	DESCRIPTION	AGE
City Hall	Administration/Engineering/Planning/Council	1958
Public Works Complex	Works Yard, Parks Yard, Mech shops, stores, trucksheds	1966
Fire Hall	Fire Ops, admin, 3 bay Fire Equipment Storage, 2 stories,	1967
RCMP Detachment	Police ops, admin, jail, municipal support, one storey	2006
Harbour Quay	Restaurants, shops, market, clocktower, pier, waterfront walk	1980
Alberni Valley Multiplex	Twin Ice facility, 1800 seat capacity one sheet	2001
Glenwood Centre	Multipurpose Hall - conc floor	1930
Gyro Youth Centre	Kitchen, Recreation Hall, meeting space, youth clinic, meeting space.	1930
Echo Community Centre	Meeting space, seniors centre, museum, library	1967
Echo Aquatic Centre	Pool, fitness centre,	1967
Bob Dailey Stadium	Covered stadium seats, track & field facilities, lighted field	1992
McLean Mill	Steam Train terminus, steam sawmill, National Historic Site	1920
Port Alberni Station	Historic Train Station - Alberni Pacific Railway Museum leased to industrial heritage soc.	1912
Rollin Art Centre	Art Gallery, Gardens - leased to Community Arts Council	1930
Industrial Heritage Museum	logging/rail equipment museum former ice rink - leased to industrial heritage Society	1963
Echo Park Complex	Field house, meeting rooms, equipment storage, concession	1992
Tebo Industrial Building	Leased to North Island College	1983



Shift Energy
GROUP



Energy Study Results For:

Alberni Valley Multiplex

6 JULY 2012



Alberni Valley Multiplex

Submitted By:



Primary Contact:

Colyn Strong
Principal
Shift Energy Group
1 – 306 Water St
Vancouver, BC V6B 1B6
t. (778) 960-7828
e. colyn@shiftenergygroup.com

Date:

July 6, 2012

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Summary | Multiplex

Shift Energy Group Inc “Shift” was engaged to provide a detailed energy study and review of financial incentive opportunities for the Alberni Valley Multiplex facility. A detailed BC Hydro Energy Study consisting of mechanical, electrical and control efficiencies were reviewed at the Multiplex. The results are outstanding. It is estimated that if all measures were implemented a reduction in energy consumption of over 40% of the measured baseline can be achieved. Innovative heat reclaim opportunities offer the City the potential for long term natural gas savings. In addition, a concept project involving the new high school was identified and warrants a year of data analysis to support further discussions with SD 70. A summary of results and action plan is outlined below.



Project Summary

We have reviewed in detail the energy study completed by SES Consulting and Accent Refrigeration. We have summarized below the projects we recommend for implementation:

Project Summary	Cost	Incentive	Annual Savings	Payback (years)	GHG (tons)
Mechanical	\$ 319,100	\$ 38,500	\$ 43,200	7.4	103.5
Controls	\$ 47,500	\$ 11,500	\$ 26,800	1.8	41.5
Lighting	\$ 38,000	\$ 9,500	\$ 9,030	4.2	2.1
Soft Costs	\$ 60,000				
Total	\$ 464,600	\$ 59,500	\$ 79,030	5.1	147.1

✓ Estimated energy savings are equivalent to powering 68 homes!

The summary above varies slightly from what’s recommended in the energy study. The differences are related to the following projects:

Low E Rink Ceilings

With a payback including incentive of close to 9 years (excluded soft costs) we felt it was not economically justifiable.

HID to T5 retrofit in the Weyerhaeuser Arena

We understand from discussions with City staff that everyone is satisfied with the performance and aesthetics of the existing bi-level HID lighting that was retrofitted in recent years. We therefore believe the City would not be interested in this project. New T5 lighting would dramatically reduce energy consumption while emitting equal light output but would look aesthetically different. Some rinks in the lower mainland (City of Richmond) have opted for this conversion.



ProjectDetails

Below are details of the individual projects we recommend for implementation:

			Annual Savings				
Mechanical Project Description	Cost	Payback	\$	GJ	kW	kWh	GHG
Mycom M compressor	\$ 48,000	5.4	\$ 8,900	0	50	88,600	1.9
VFD on brine pump	\$ 17,800	3.8	\$ 4,700	0	0	88,400	1.9
VFD on condenser fan	\$ 9,500	3.3	\$ 2,900	0	0	55,000	1.2
De-superheating hot water HR	\$ 49,300	4.3	\$ 11,400	740	0	0	36.7
Condenser heat recovery	\$ 194,500	12.7	\$ 15,300	1270	-25	-48,500	61.8
Total Mechanical Projects	\$ 319,100	7.4	\$ 43,200	2010	25	183,500	103.5

			Annual Savings				
Control Project Description	Cost	Payback	\$	GJ	kW	kWh	GHG
Lobby HVAC control upgrade	\$ 6,500	3.3	\$ 1,900	120	0	1,600	6
OA lockout / WP	\$ 2,500	4.6	\$ 500	40	0	0	1.8
Enhanced morning warm up	\$ 500	6	\$ 100	10	0	0	0.3
Dressing room control upgrades	\$ 3,000	0.9	\$ 3,500	220	0	2,500	10.8
Connect heat pumps to DDC	\$ 8,000	5.3	\$ 1,500	0	0	28,300	0.6
DHW NTSB	\$ 2,000	1.2	\$ 1,700	110	0	500	5.5
Vending misers	\$ 1,000	4	\$ 300	0	0	4,800	0.1
Power factor correction	\$ 10,000	5	\$ 2,000	0	0	0	
Connect heaters to BAS	\$ 3,000	1.8	\$ 1,600	90	0	5,300	4.5
Summer shut down	\$ 1,000	0.3	\$ 3,000	0	280	0	
Dew point sensor	\$ 4,000	1	\$ 3,800	230	0	5,600	11.6
Demand response	\$ 5,000	0.8	\$ 6,100	0	200	0	
Ice temperature setup	\$ 1,000	1.2	\$ 800	0	0	15,500	0.3
Total Control Projects	\$ 47,500	1.8	\$ 26,800	820	480	64,100	41.5

			Annual Savings				
Lighting Project Description	Cost	Payback	\$	Maint	kW	kWh	GHG
T12 to T8 h/w retrofit	\$ 4,400	2.8	\$ 900	\$ 660	30	11,000	0.2
LED h/w retrofit	\$ 11,800	2.4	\$ 2,900	\$ 1,930	82	38,600	0.8
LED screw-in/snap-in lamps	\$ 800	2.6	\$ 200	\$ 110	7	2,500	0.1
Fluorescent linear lamps only	\$ 20	1.0	\$ 10	\$ 10	0	100	0.0
Incandescent to LED replacement	\$ 80	8.0	\$ 10	\$ -	1	100	0.0
New lighting control	\$ 20,900	9.1	\$ 2,300	\$ -		43,200	1.0
Total Lighting	\$ 38,000	4.2	\$ 6,320	\$ 2,710	120	95,500	2.1



ActionPlan

We recommend working with Fortis BC to access greater financial incentives now available through a Custom program similar to BC Hydro. The program was introduced in June and the projects identified in the energy study should attract sizable incentives. As well we recommend reviewing other means for financial incentives including the Green Municipal Fund.

We have suggested the following options for implementation:

Option 1: Plan, budget & implement all suggested energy conservation measures:

Project Summary	Cost	Incentive	Annual Savings	Payback (years)	GHG (tons)
Mechanical	\$ 319,100	\$ 38,500	\$ 43,200	7.4	103.5
Controls	\$ 47,500	\$ 11,500	\$ 26,800	1.8	41.5
Lighting	\$ 38,000	\$ 9,500	\$ 9,030	4.2	2.1
Soft Costs	\$ 60,000				
Total	\$ 464,600	\$ 59,500	\$ 79,030	5.1	147.1

Option 2: Split out the heat reclaim projects for an even more attractive payback while further incentive are sought for the heat reclaim portion:

Project Summary	Cost	Incentive	Annual Savings	Payback (years)	GHG (tons)
Mechanical	\$ 75,300	\$ 18,825	\$ 16,500	4.6	5
Controls	\$ 47,500	\$ 9,375	\$ 26,800	1.8	41.5
Lighting	\$ 38,000	\$ 9,500	\$ 9,030	4.2	2.1
Soft Costs	\$ 40,000				
Total	\$ 200,800	\$ 37,700	\$ 52,330	3.1	48.6

Project Summary	Cost	Incentive	Annual Savings	Payback (years)	GHG (tons)
Heat Reclaim	\$ 243,800	\$ 20,000	\$ 26,700	9.1	98.5
Soft Costs	\$ 30,000				
Total	\$ 273,800	\$ 20,000	\$ 26,700	9.5	98.5



Study Results | Conclusion

The Alberni Valley Multiplex Facility represents great opportunities for energy cost savings. The bundled implementation options above result in annual operating cost savings of close to \$80,000. A new Custom Incentive program from Fortis BC could yield sizable financial incentives that significantly reduce the payback period for the Heat Reclaim projects. In all, it is possible that energy consumption be lowered by more than 40%!



Shift Energy
GROUP



Lighting & Boiler Assessment for:



Glenwood Centre – 4480 Vimy St

23 May 2012



Glenwood Centre

Attention:

Mark Zenko – Facility Operations Supervisor

Submitted By:



Primary Contact:

Colyn Strong
Principal
Shift Energy Group
1 – 306 Water St
Vancouver, BC V6B 1B6
t. (778) 960-7828
e. colyn@shiftenergygroup.com

Date:

May 23, 2012

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Executive Summary

I. Overview

Shift Energy Group Inc “Shift” was requested to provide a Lighting & Boiler Assessment to analyze electricity and natural gas savings opportunities at Glenwood Centre located at 4480 Vimy St in Port Alberni BC. This 16,000 ft² building was constructed in the 1960’s and is primarily used as recreation/sport centre.

A gas-fired boiler provides space heating for the building. Pumps circulate heated water to the perimeter baseboard heating system in the washrooms, change-rooms and the force-flow units in the multi-purpose areas.

The interior lighting systems are primarily T12 linear fluorescents with a small number of Metal Halides.

II. Consumption and Benchmarking

The facility currently produces 28 tonnes of annual CO₂ emissions based on the following energy consumption data.

2011 Data	Consumption	Cost (\$)
Gas	564 GJ	\$11,178
Electricity	88,860 kWh	\$7,830
Total Cost		\$19,008

** Note: Emission factors of 51.0 kg CO₂/GJ for natural gas and 0.022 kg CO₂ / kWh for electricity in BC

2011 will be used as a baseline in measuring savings

III. Recommended Projects

We have identified some excellent opportunities to reduce electricity and gas consumption in the facility and recommend the implementation of the following projects:

- 1) T12 lighting upgrade
- 2) Boiler upgrade

IV. Business Case

Project Summary	Cost	Incentive Estimate	Annual Savings	Payback (years)	GHG (tonnes)
Mechanical	\$36,000	\$8,000	\$2,993	9.4	7.7
Lighting	\$36,700	\$7,500	\$3,133	9.3	0.6
Energy Efficiency Consulting	\$7,500				
Total Recommendations	\$80,200	\$15,500	\$6,126	10.6	8.3

V. Outcomes

There are excellent opportunities for reducing energy consumption and greenhouse gas emissions at Glenwood Centre. The gymnasium has lower than normal use which has resulted in a higher than normal payback period. That being said, following the implementation of the proposed measures, we expect the facility to achieve a 28% reduction of total energy use.

The boiler is quite dated and will need replacement in the near future. Updating to new efficient technology and the use of controls will result in significant energy savings.

Lighting levels and quality will remain the same or be improved despite the large reduction in associated electrical consumption. The implementation of the recommended lighting upgrades will also result in the removal of now obsolete T12 hardware and lamps that will soon be unavailable for purchase.

If our recommendations are implemented the facility will operate much more efficiently, and have improved system infrastructure allowing the facility to operate for many more years. As well, the project will help demonstrate the City of Port Alberni's commitment to reducing taxpayer costs and greenhouse gas emissions.



Assessment Methodology

Timing of Work

This assessment started on March 2nd, 2012 and involved a site visit to gather inventory information and investigate site conditions. This included a review of the building HVAC and lighting systems. This assessment was completed in May 2012.

Methodology

The primary purpose of this assessment was to identify and evaluate opportunities to dramatically reduce energy consumption at Glenwood Centre. Our goal in this analysis was to seek projects that reduce net energy consumption by at least 20%. To do this we have gathered up-to-date site inventory information of mechanical and electrical systems that consume significant amounts of energy. We then analyze the utility billing history for the site. Beyond that we created a list of potential conservation projects and evaluated the business case associated with these ideas. Project costs are estimated, and the energy savings are projected using a combination of reasonable assumptions and spreadsheet based modelling.

Consulting team

Colyn Strong – Lighting Assessment

Natalie Yao – Mechanical Engineering



Description of Facility & Systems

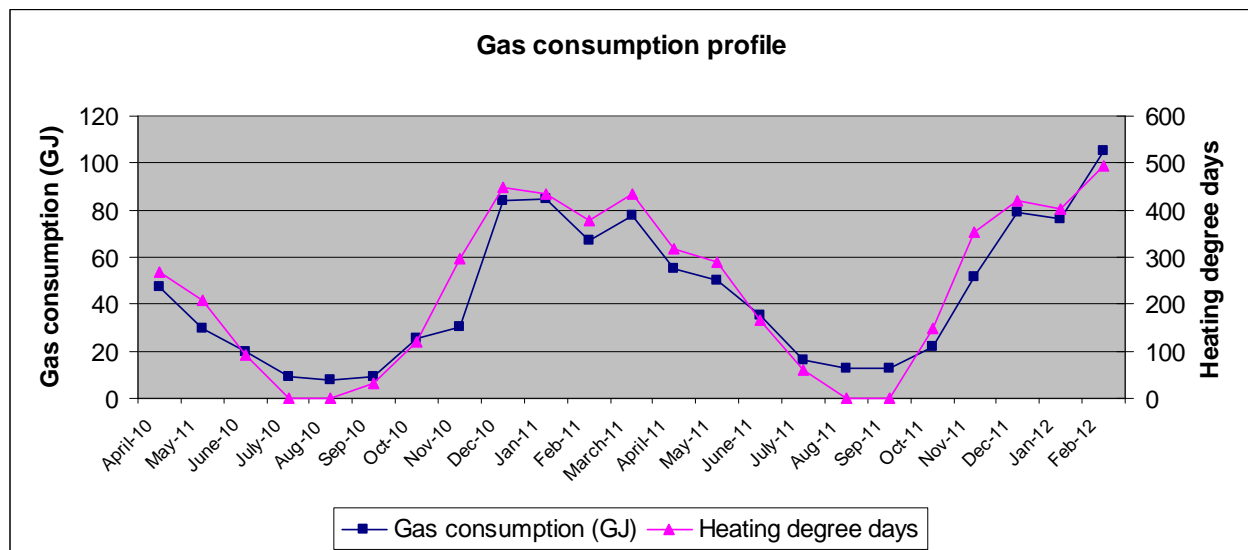
I. Overview

The Glenwood Centre building located in Port Alberni BC was originally constructed in the 1960's. The building is primarily used as recreation / Sports Centre but is occasionally rented for special events. The building has a couple small offices, a cafeteria, skate rental shop and is equipped with change-room and washroom facilities.

The building is approximately 16,000 sq². Based on the schedule provided, Glenwood Centre is open for approximately 50 hours per week during the day and a further 6 hours per week in the evening for rollerblading.

II. Mechanical

Gas Consumption Profile



The above consumption graph shows that usage correlates well to outdoor temperature. Annual usage has been slightly higher during 2012/2011 than it was during 2011/2010.

Space Heating Boiler

The building is heated by a BRYAN water tube cast iron boiler with the output of 980,000 BTU/h. The boiler was reportedly installed in 1967. There are typical signs of wear and tear, with it showing some rust, leaking and heat damage. Although it is not exactly known, it is our opinion the boiler efficiency is likely to be around 65%.

Space Heating Terminal Units

Six force-flow unit heaters supply heating and air recirculation in the gym area. Perimeter baseboards supply heating for the washrooms and change rooms.

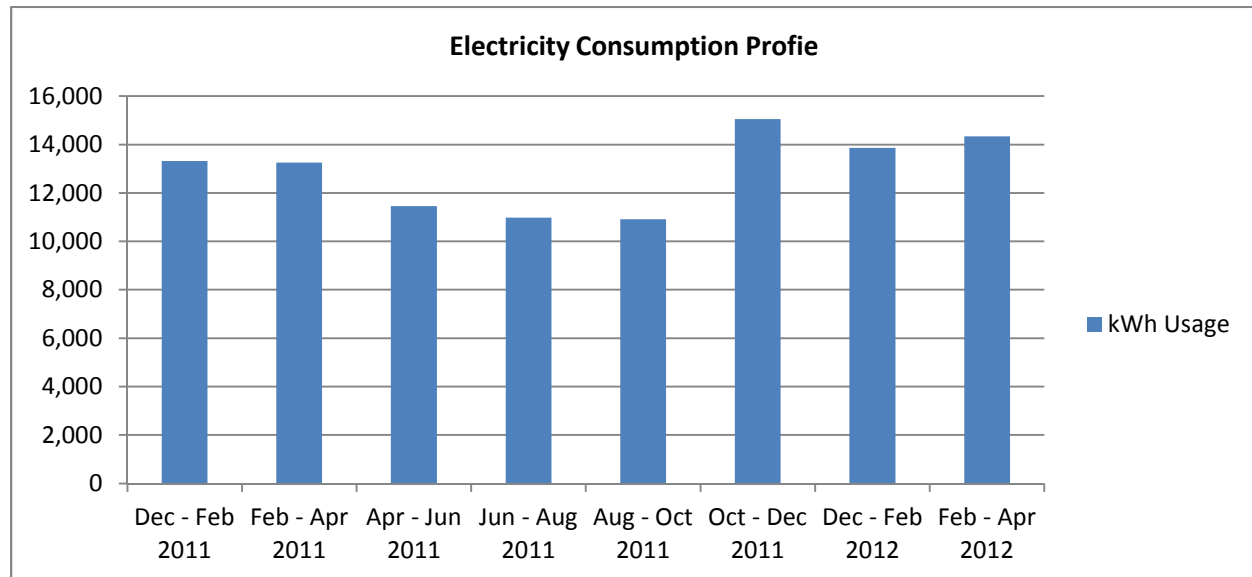
There are no heating controls in the gym area. The forced air heating units are controlled by interlocking with the boiler control, which is turned on and off when the boiler/circulator starts and stops. A time clock is set by staff on site, yet there is no clear time schedule available.

Domestic Hot Water Heating

Domestic hot water is provided by a 45,000 BTU/h gas fired JETGLAS water heater. This direct gas fired water heater provides domestic hot water for the site. The DHW heater is on 24 hours a day, 365 days a year. This type of hot water heater typically has an efficiency rating of around 80% and short lifespan of 5 to 7 years.

III. Lighting

Electricity Consumption Profile



The above graph shows that consumption is fairly steady throughout the year. Consumption lowers slightly in the summer months and is likely related to the forced-flow unit heaters not operating when the boiler is off.

Lighting Systems

The interior lighting systems in the building are primarily T12 linear fluorescents with some Metal Halide fixtures, as well as CFL and incandescent exit signs. Lighting is switched by line voltage switching. Based on observations and conversations with staff, there appears to be a strong culture of turning lights off when the gym is not in use.

Light level measurements were taken in all areas and either meet or exceed IESNA recommended minimums.



Energy Conservation Opportunities

The primary objective of this assessment was to identify and analyse energy conservation opportunities at Glenwood Centre. The rate schedule used in this analysis for financial savings estimates are presented in the table below. The electricity rates are based on schedule 1500, whereas the gas consumption rates are based on the most recent gas bills. The financial savings estimates include the Harmonized Sales Tax. For Greenhouse Gas estimates we have used emissions factors of 0.022 kg CO₂e / kWh of electricity in BC, and 51.0 kg CO₂e / GJ for gas.

Rate Schedules

Utility	Rate
Electricity Consumption	\$0.091 / kWh
Natural Gas Consumption	\$19.82 / GJ

A number of potential conservation opportunities have been analyzed and are broken down in this section between mechanical equipment and lighting upgrades. A detailed explanation as well as an estimated cost and energy savings potential are summarized for these projects.

Gas and electricity savings calculations are based on a 2011 energy consumption baseline.

I. Report Limitations

It should be noted that the energy savings estimates have been based on the information available at the time of report writing, and have made certain assumptions on the future operation of the facility. Since the consultant has no control over the future operation of the facility such as ongoing maintenance and modifications, the estimates in this report are not guaranteed.

II. Mechanical Measures

A summary of the analysis for the recommended mechanical upgrades as well as the detailed descriptions for each project are presented below:

Mechanical Measures Summary

Item	Description	Cost	Incentive Estimate	Payback (Years)	Annual Savings		
					\$	GJ	GHG (tns)
a	Boiler Upgrade	\$35,000	\$8,000	10.8	\$2,497	126	6.4
b	Control Upgrade	\$1,000		2.0	\$496	25	1.3
	Total Control	\$36,000	\$8,000	9.4	\$2,993	151	7.7

a) Mid Efficiency Boiler Upgrade

The existing boiler is approximately 45 years old and well past its service life. We recommend replacing this boiler with a new near condensing boiler with an efficiency rating up to 85%. This upgrade will result in significant gas savings for the building.

We included an incentive of approximately \$8,000 into our analysis based on the current Fortis BC Efficient Boiler program. Please note that this program is currently under revision, and there will be changes regarding terms and conditions in June 2012.

b) Control Upgrade

We recommended that a programmable thermostat and occupancy sensors be installed in the large multi-purpose room to ensure the boiler and forced air unit heaters are turned off when the area is unoccupied. The exact savings will be dependent on the occupancy schedule and therefore unpredictable. We believe however, that it is reasonable to achieve at least 5% annual savings (or 25 GJ) on current space heating usage. This would save almost \$500 annually.

We also analyzed the replacement of the existing domestic hot water heater. The high payback did not warrant inclusion in this report. We recommend replacement with a high (95%) efficiency model under your regular maintenance replacement program.

III. Electrical Measures

A summary of the analysis for the recommended lighting upgrades as well as the detailed descriptions for each project are presented below:

Lighting Measures Summary

Item	Description	Cost	Incentive Estimate	Payback (years)	Annual Savings				
					\$	Maint	kW	kWh	GHG
a	T12 Retrofit	\$4,375	\$1,500	5.7	\$402	\$100	1.8	4,420	0.1
b	Other hardwire retrofit	\$30,000	\$5,500	11.8	\$1,421	\$650	6.0	15,613	0.3
c	Exit sign retrofit	\$1,325	\$500	3.7	\$121	\$100	0.2	1,328	0.0
d	New lighting control	\$1,000		2.9	\$340			3,732	0.1
	Total Lighting	\$36,700	\$7,500	9.3	\$2,283	\$850	8.0	25,093	0.6

a) T12 Retrofit

The facility currently has a significant amount of T12 linear flurescent luminaires remaining in the building. This form of lighting is outdated and very inefficient compared to modern technology. These linear T12's can be upgraded by simply changing the ballasts and lamp holders inside the existing light fixtures. We recommend taking advantage of low wattage T8 extra long life T8 lamps wherever possible. This will reduce consumption by over 40% while maintaining the same light output and improving lighting quality. Details regarding the quantity and replacement lamp and ballast for each fixture type can be found below:

i. F40T12 – 2 4’ lamps: 52 units

Existing 2 lamp T12 luminaires are to be retrofitted with new T8 ballasts and lamps. The intention of this project is to upgrade the T12 fixtures with new energy efficient T8 components (2 lamp – 4’ 25W F32T8 extra long life lamps) with instant start normal ballast factor ballasts suitable for the operation of 2 lamps.

ii. F40T12 – 2 4’ lamps: 8 units

Existing 2 lamp T12 luminaires in the washrooms are to be retrofitted with new T8 ballasts and lamps. The intention of this project is to upgrade the T12 fixtures with new energy efficient T8 components (2 lamp – 4’ 25W F32T8 extra long life lamps) with programmed start normal ballast factor ballasts suitable for the operation of 2 lamps.

iii. F96T12 – 2 8’ lamps: 1 unit

The existing 2 lamp 8’ T12 luminaire in the cafeteria storage room is to be retrofitted with a new T8 ballast with 2 lamps. The intention of this project is to upgrade the T12 fixtures with new energy efficient T8 components (2 lamp – 4’ 25W F32T8 extra long life lamps) with programmed start normal ballast factor ballasts suitable for the operation of 2 lamps.

b) Other hardwired retrofit

The main gym area currently has 8’ High Output T12’s as the main lighting source. This form of lighting is outdated and very inefficient compared to new modern technology. We recommend taking advantage of new High Output T5 fixtures with 54W lamps. This will reduce consumption by almost 50% while improving the light output and quality. Details regarding the quantity and replacement lamp and ballast for each fixture type can be found below:

i. F96T12 – 2 8’ lamps: 55 units

All existing 2 lamp 8’ High Output T12 luminaires are to be retrofitted with new 2 lamp 4’ High Output T5 fixtures. The intention of this project is to upgrade the T12 fixtures with new energy efficient T5 components (2 lamp – 4’ 54W F54T5 lamps) with instant start normal ballast factor ballasts suitable for the operation of 2 lamps.

c) Exit Sign Retrofits – 10 units

All incandescent and CFL exit signs should be retrofit to LED

d) New Lighting Control

A couple opportunities for lighting control were identified. We recommend installing line voltage switch occupancy sensors in each of the washrooms. As well, providing a switch for the two entrance fixtures that can be turned off when the facility is not in use. Note that maintenance savings are expected but were not factored into this analysis.



Financial Analysis

The following table presents the financial analysis of the project described above:

Item	Description	Cost	Incentive Estimate	Payback (years)	Annual Savings	Life Expect.			
							NPV	IRR	ROI
a	Mechanical	\$36,000	\$8,000	9.4	\$2,993	25	\$30,704	12%	167%
b	Lighting	\$36,700	\$7,500	9.3	\$3,133	10	(\$1,000)	3%	7%
	Energy Efficiency Consulting	\$7,500							
Total Recommendations		\$80,200	\$15,500	10.6	\$6,126		\$14,246	7%	86%

*NPV & IRR calculations are based on a 2% fuel cost escalation and 4% discount rate.

Financial Incentives:

Shift Energy Group estimates the City of Port Alberni is eligible for a BC Hydro Incentive of approximately **\$7,500** for lighting upgrades. In addition, the City qualifies for a boiler incentive of approximately **\$8,000** from Fortis BC.

Note: Fortis BC is currently undergoing changes to their boiler incentive packages.



Energy Efficiency Consulting

In order to allow an accurate analysis of the overall cost of this retrofit we estimate the required consulting budget to be approximately \$7,500. This includes cost to cover more detailed development of lighting specs, coordination of financial incentives and verification reporting.



Conclusion

Glenwood Centre is an inefficient building but with low use. We have identified a number of significant energy saving opportunities for the facility's heating and lighting systems.

Significant savings will be achieved by upgrading the existing lighting system. The lighting upgrade produces a longer than normal payback as a result of low facility use. That being said, upgrading the lighting systems will be necessary as Government eliminates the distribution of the T12 product. We therefore recommend taking advantage of existing BC Hydro incentives while they are available.

We also recommend upgrading the existing gas fired boiler, which is well past its service life. Upgrading to a properly sized, mid-efficiency near condensing boiler will significantly reduce consumption.

If our recommendations are implemented we expect energy consumption to be reduced by 28%.



Shift Energy
GROUP



Energy Study Results For:

Echo Aquatic & Community Centre

City Hall

31 JULY 2011



City Hall | Echo Aquatic & Community Centre

Submitted By:



Primary Contact:

Colyn Strong
Principal
Shift Energy Group
1 – 306 Water St
Vancouver, BC V6B 1B6
t. (778) 960-7828
e. colyn@shiftenergygroup.com

Date:

July 31, 2011

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- Appendix B: SES Energy Study – City Hall1-E1



Phase 1 Echo Centre & City Hall

Shift Energy Group Inc “Shift” was engaged to provide energy studies and a review of financial incentive opportunities for Echo Aquatic & Community Centre (Echo Centre) and City Hall buildings. Lighting and associated control efficiencies were analyzed at Echo Centre while a complete energy audit consisting of mechanical, electrical and control efficiencies were reviewed at City Hall. The results are outstanding. It is estimated a reduction in electricity consumption of over 50% of the measured baseline can be achieved at Echo Centre. While a comprehensive lighting retrofit and boiler upgrade at City Hall will save approximately 20% in annual electricity and gas costs. More capital intensive upgrades at City Hall will achieve ever greater savings. A summary of results and action plan is outlined below.



Project Results

Echo Centre:

Measure	Cost Estimate	Savings			Payback
		\$	Maintenance	kWh	
Lighting Retrofits	\$61,800	\$13,157	\$7,500	179,554	3.0
Lighting Controls	\$19,500	\$2,643		54,046	7.4
Total	\$81,300	\$15,800	\$7,500	233,600	3.2

- ✓ Estimated kWh savings are equivalent to powering 22 homes!

City Hall:

Measure	Cost Estimate	Savings			Payback	
		\$	Maintenance	kWh		GJ
Lighting Retrofits	\$17,900	\$2,819	\$1,400	27,904	4.2	
Lighting Controls	\$3,200	\$781		7,806	4.1	
Mid-Efficiency Boiler Upgrade	\$35,000	\$3,000			150	11.7
DDC Projects	\$61,500	\$4,400		25,240	100	14.0
Total	\$117,600	\$11,000	\$1,400	60,950	250	9.9

- ✓ Estimated energy savings are equivalent to powering 12 homes!

The detailed energy study results are presented in Appendices A & B.



ActionPlan

We have reviewed in detail the energy studies for both Echo Centre and City Hall. As a result we recommend the following options for implementation:

Option 1: Lighting + City Hall Boiler Upgrade

Measure	Cost Estimate	Savings				Payback
		\$	Maintenance	kWh	GJ	
Lighting Retrofit – Echo Centre	\$61,800	\$13,157	\$7,500	179,554		3.0
Lighting Controls – Echo Centre	\$19,500	\$2,643		54,046		7.4
Lighting Retrofit – City Hall	\$17,900	\$2,819	\$1,400	27,904		4.2
Lighting Controls – City Hall	\$3,200	\$781		7,806		4.1
Mid-Efficiency Boiler Upgrade – City Hall	\$35,000	\$3,000			150	11.7
Financial Incentives	\$17,500					
Engineering	\$17,500					
Construction Management & Admin	\$23,500					
Total Bundle	\$160,900	\$22,400	\$8,900	269,310	150	5.1

1. Contract lighting upgrades for both facilities simultaneously
2. Include for much needed upgrade in boiler infrastructure at City Hall
3. Comprehensive lighting upgrades maximize existing financial incentive opportunities
4. Upgrade T12 fixtures prior to technology becoming obsolete
5. Note: On-going savings in Boiler maintenance costs not included

Option 2: Lighting Only

Measure	Cost Estimate	Savings				Payback
		\$	Maintenance	kWh	GJ	
Lighting Retrofit – Echo Centre	\$61,800	\$13,157	\$7,500	179,554		3.0
Lighting Controls – Echo Centre	\$19,500	\$2,643		54,046		7.4
Lighting Retrofit – City Hall	\$17,900	\$2,819	\$1,400	27,904		4.2
Lighting Controls – City Hall	\$3,200	\$781		7,806		4.1
Financial Incentives	\$13,500					
Engineering	\$11,500					
Construction Management & Admin	\$18,500					
Total Bundle	\$118,900	\$19,400	\$8,900	269,310	0	4.2

1. Contract lighting upgrades for both facilities simultaneously
2. Comprehensive upgrades maximize existing financial incentive opportunities
3. Upgrade T12 fixtures prior to technology becoming obsolete



Phase 1 Conclusion

Both Echo Centre and City Halls buildings represent great opportunities for energy cost savings. The bundled implementation options above result in annual operating cost savings of approximately \$30,000. In addition, the existing T12 lighting technology is being phased out in 2012. We anticipate the BC Hydro incentive programs for savings associated with this technology will be eliminated midway through 2012. As a result we strongly recommend proceeding with option 2 at a very minimum.



Shift Energy
GROUP



Lighting & Boiler Assessment for:



Public Works Site – 4150 6th AVE

23 May 2012



Public Works

Attention:

Mark Zenko – Facility Operations Supervisor

Submitted By:



Primary Contact:

Colyn Strong
Principal
Shift Energy Group
1 – 306 Water St
Vancouver, BC V6B 1B6
t. (778) 960-7828
e. colyn@shiftenergygroup.com

Date:

May 23, 2012

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Executive Summary

I. Overview

Shift Energy Group Inc “Shift” was requested to provide a Lighting & Boiler Assessment to analyze electricity and natural gas savings opportunities at the Public Works Site located at 4160 6th AVE in Port Alberni BC. The site consists of two buildings with a total area of a 33,058 ft². We’ll describe the building directly on 6th AVE as the “Main Building”. The Main building is 20,018 ft². We’ll call the lower building the “Parks Yard Building”. The Park Yard building is 13,040 ft². There is a third electricity meter for the site lighting requirements. For analysis purposes we have combined the consumption of the site with the Main building.

II. Consumption and Benchmarking

The facility currently produces 89 tonnes of annual CO₂ emissions based on the following energy consumption data.

2011 Data	Consumption	Cost (\$)
Gas – Main Building	1,386 GJ	\$27,470
Gas – Parks Yard Building	253 GJ	\$5,026
Total Gas Consumption	1,639 GJ	
Electricity – Main Building / Site	169,786 kWh	\$14,958
Electricity – Parks Yard Building	78,668 kWh	\$6,930
Total Electricity Consumption	248,454 kWh	
Total Cost		\$54,384

** Note: Emission factors of 51.0 kg CO₂/GJ for natural gas and 0.022 kg CO₂ / kWh for electricity in BC

2011 will be used as a baseline in measuring savings

III. Recommended Projects

We have identified some excellent opportunities to reduce electricity and gas consumption on the site and recommend the implementation of the following projects:

- 1) T12 lighting upgrade
- 2) Boiler upgrade
- 3) Furnace upgrade
- 4) Controls installation

IV. Business Case

Project Summary	Estimated Cost	Incentive Estimate	Annual Savings	Payback (years)	GHG Savings (tonnes)
Mechanical	\$62,250	\$12,500	\$8,324	6.0	21.4
Lighting	\$39,250	\$12,850	\$6,551	4.0	1.4
Energy Efficiency Consulting	\$10,000				
Total Recommendations	\$111,500	\$25,350	\$14,875	5.8	22.8

V. Outcomes

There are excellent opportunities for reducing energy consumption and greenhouse gas emissions at Public Works Site. Following the implementation of the proposed measures, we expect the site to achieve at least a 25% reduction of total energy use and greenhouse gas emissions.

The boiler is quite dated and will need replacement in the near future. Updating to new efficient technology and the use of controls will result in significant energy savings. As well, upgrading the furnace and the use of controls on the infra-red heaters in the workshops will significantly reduce energy savings in the parks yard building.

Lighting levels and quality will remain the same or be improved despite the large reduction in associated electrical consumption. The implementation of the recommended lighting upgrades will also result in the removal of now obsolete T12 hardware and lamps that will soon be unavailable for purchase.

If our recommendations are implemented the facility will operate much more efficiently, and have improved system infrastructure allowing the facility to operate for many more years. As well, the project will help demonstrate the City of Port Alberni's commitment to reducing taxpayer costs and greenhouse gas emissions.



Assessment Methodology

Timing of Work

This assessment started on March 2nd, 2012 and involved a site visit to gather inventory information and investigate site conditions. This included a review of the building HVAC and lighting systems. This assessment was completed in May 2012.

Methodology

The primary purpose of this assessment was to identify and evaluate opportunities to dramatically reduce energy consumption at the Public Works Site. Our goal in this analysis was to seek projects that reduce net energy consumption by at least 20%. To do this we have gathered up-to-date site inventory information of mechanical and electrical systems that consume significant amounts of energy. We then analyze the utility billing history for the site. Beyond that we created a list of potential conservation projects and evaluated the business case associated with these ideas. Project costs are estimated, and the energy savings are projected using a combination of reasonable assumptions and spreadsheet based modelling.

Consulting team

Colyn Strong – Lighting Assessment

Natalie Yao – Mechanical Engineering



Description of Facility & Systems

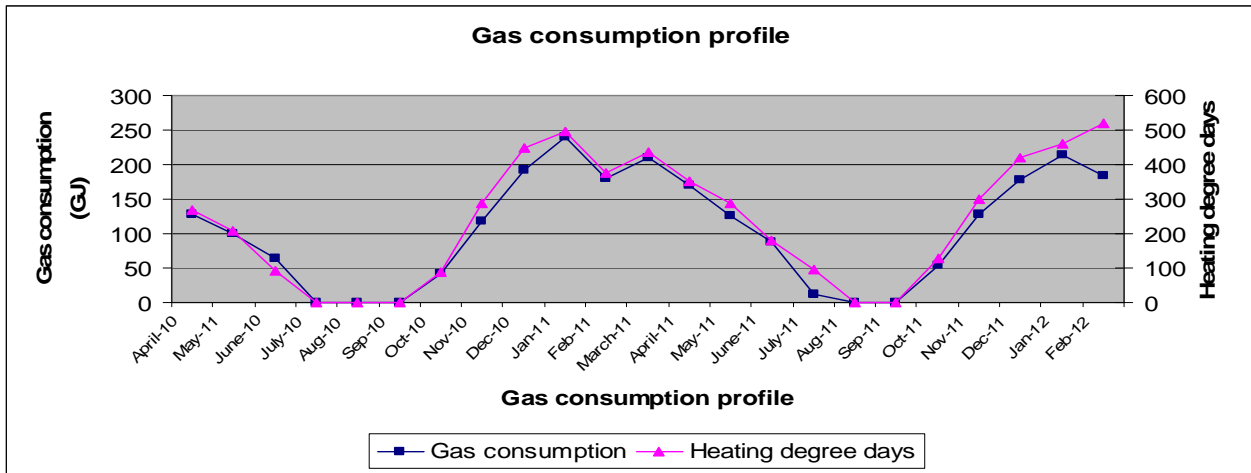
I. Overview

The buildings at the Public Works Site located in Port Alberni BC were originally constructed in the 1960's. The two buildings are used as staff offices, workshops, and storage with attached and detached garage bays.

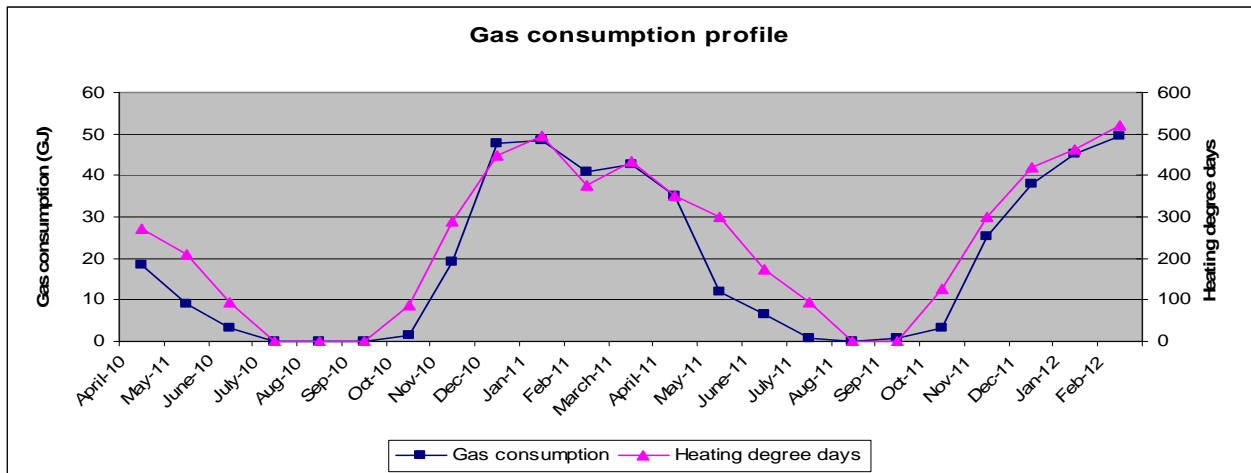
The main building (6th Avenue frontage) is approximately 20,018 ft². The lower parks yard building is approximately 13,040 ft². Based on the schedule provided, both buildings are occupied for approximately 10-12 hours per day including evening janitorial services. It was observed that a large portion of the exterior garage bay lighting is on 24/7.

II. Mechanical

Gas Consumption Profile - Main Building



Gas Consumption Profile - Parks Yard Building



The above consumption graphs show that usage correlates well to Heating Degree Days (HDD). HDD is a measure of how cold the outdoor temperature is.

Space Heating - Main Building

Space heating is mainly provided by a Cleaver Brook gas fired boiler with an input of 1,046,000 BTU/h. Although there is no sign of an installation date it is believe the boiler is original to the construction of the building. This would make the boiler approximately 45 years old. The boiler provides heating water for the radiant floor loop (attached garages), the perimeter radiant heating loop (office areas), and the forced flow heating units (throughout the workshops and storage areas). Facility staff noted that the boiler is operating 24/7 for about nine months every year with a three month shut down during the

summer. In addition to the boiler there are a couple of manually controlled electric baseboards in the central office areas.

Domestic Hot Water Heating - Main Building

Domestic Hot Water is supplied by two 23 liters 120 Volt 1500 Watt Electric SPACE SAVER water heaters.

Controls - Main Building

80% of forced flow heating units are controlled by Johnson Controls wall mounted thermostats. The temperature is set to 70F and “AUTO” setting allows the unit to turn on and off as the temperature changes. The other 20% is controlled by simply “on/off” manual switches.

Space Heating - Parks Yard Building

A 120,000 BTU/h (input) gas fired LENNOX furnace supplies heated air for the office area. The furnace is reportedly 45 years old.

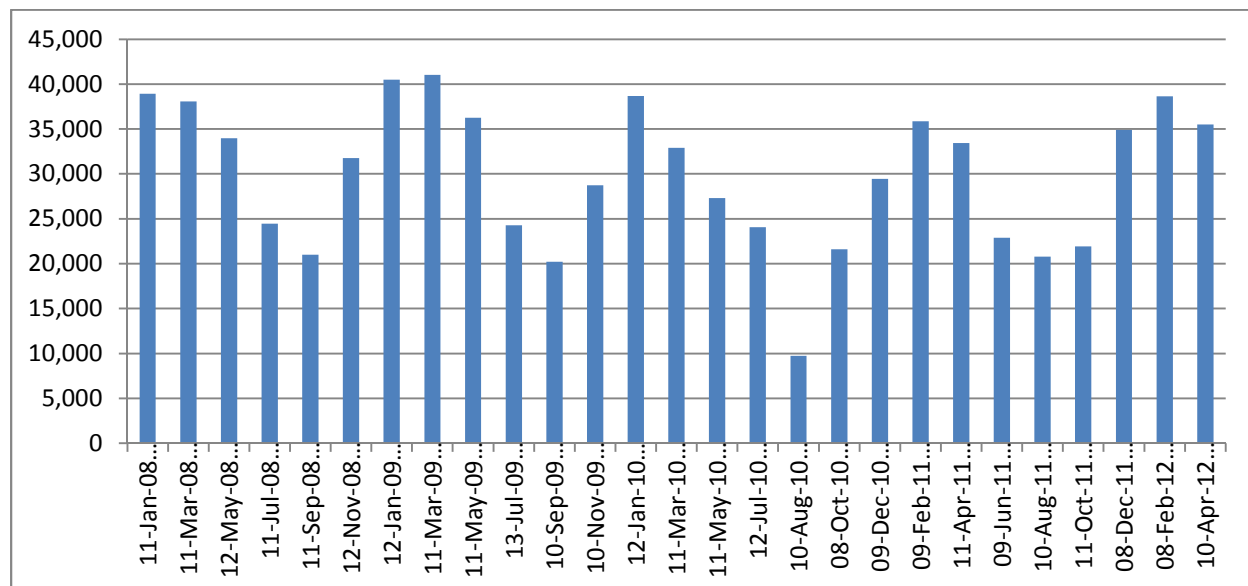
The workshops are heated by two gas fired SRP infra-red tube heaters with an input of 80,000 BTU/h and 40,000 BTU/h respectively.

Controls - Parks Yard Building

The office area is controlled by a programmable wall mounted thermostat. The infrared tube heaters in the workshops are controlled by Johnson wall mounted thermostats. During the site visit, the unoccupied two workshops were very warm and still being heated by the two infrared tube heaters.

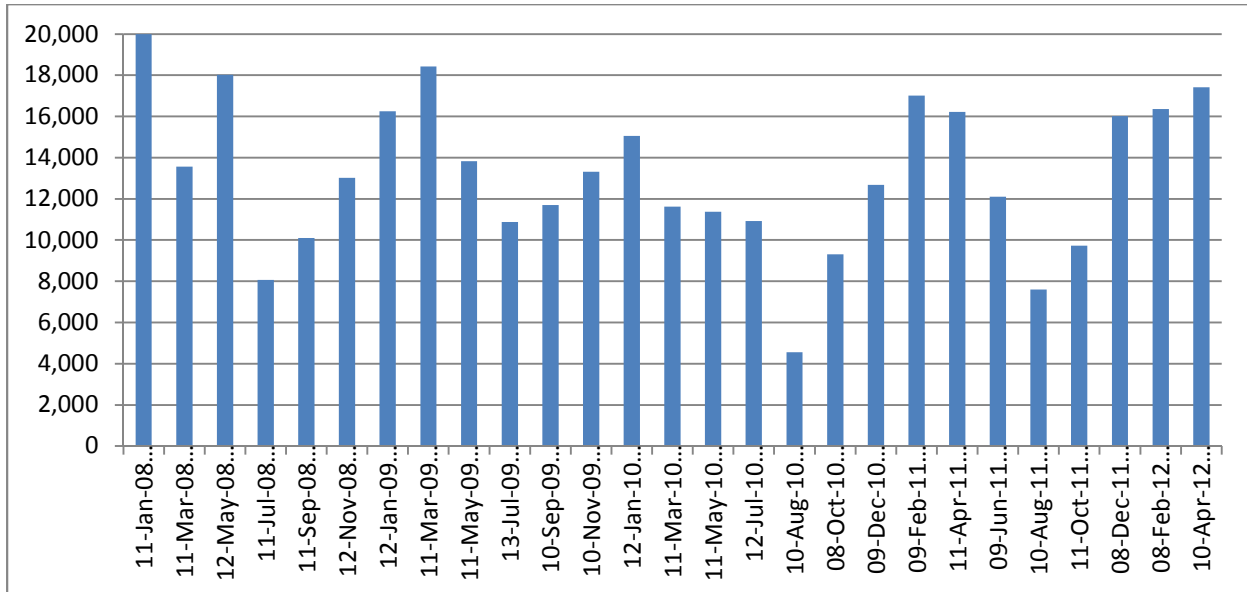
III. Lighting

Electricity Consumption Profile (kWh) - Main Building & Site



The above graph shows that consumption is fairly steady throughout the year. Consumption lowers in the summer months. This is consistent with longer daylight hours. As well, heating related motors and pumps will not be operating when the boiler is off.

Electricity Consumption Profile – Parks Yard Building



The above graph shows that consumption has varied throughout the years. Although consumption lowers in the summer months, it is not as symmetrical as one would expect. This is usually a result of infrequent use and represents an opportunity for increased controls.

Lighting Systems

The interior lighting systems of the building are primarily T12 linear fluorescents. The garage area of the main building has recently had a few T5 fixtures added. Lighting is switched by line voltage switching. Based on observations and conversations with staff, lights appear on during the majority of the day.

Light level measurements were taken in all areas and either meet or exceed IESNA recommended minimums. It is recommended that during the design phase de-lamping be considered in a number of the workshop areas, especially in the parks yard building.



Energy Conservation Opportunities

The primary objective of this assessment was to identify and analyse energy conservation opportunities at the Public Works Site. The rate schedule used in this analysis for financial savings estimates are presented in the table below. The electricity rates are based on schedule 1500, whereas the gas consumption rates are based on the most recent gas bills. The financial savings estimates include the Harmonized Sales Tax. For Greenhouse Gas estimates we have used emissions factors of 0.022 kg CO₂e / kWh of electricity in BC, and 51.0 kg CO₂e / GJ for gas.

Rate Schedules

Utility	Rate
Electricity Consumption	\$0.091 / kWh
Natural Gas Consumption	\$19.82 / GJ

A number of potential conservation opportunities have been analyzed and are broken down in this section between mechanical equipment upgrades and lighting upgrades. A detailed explanation as well as an estimated cost and energy savings potential are summarized for these projects.

Gas and electricity savings calculations are based on a 2011 energy consumption baseline.

I. Report Limitations

It should be noted that the energy savings estimates have been based on the information available at the time of report writing, and have made certain assumptions on the future operation of the facility. Since the consultant has no control over the future operation of the facility such as ongoing maintenance and modifications, the estimates in this report are not guaranteed.

II. Mechanical Measures

A summary of the analysis for the recommended mechanical upgrades as well as the detailed descriptions for each project are presented below:

Mechanical Measures Summary

Item	Description	Cost	Incentive Estimate	Payback (years)	Annual Savings		
					\$	GJ	GHG
a	Boiler Upgrade	\$55,000	\$12,500	6.7	\$6,382	322	16.4
b	Furnace Upgrade	\$3,500		8.8	\$396	20	1.0
c	Control Upgrade	\$3,750		2.4	\$1,546	78	4.0
	Total Control	\$62,250	\$12,500	6.0	\$8,324	420	21.4

a) Boiler Upgrade

The existing boiler is far beyond the end of its efficient life and should be replaced. The overall operating efficiency is likely to be in the 60-70% range. Consideration should be given to upgrading to more efficient boilers, which can achieve a combustion efficiency 85% or higher.

Considering one of the main heating loops is used for radiant floor system, the application of high efficiency full condensing boilers is ideal. The lower temperature requirement will ensure the boiler is operating in condensing mode with an efficiency of 89% or higher. Consideration should also be given to installing a multiple boiler system that can be controlled in stages in lieu of installing a single boiler capable of supplying the peak demand of all loads.

Based on improving the efficiency over the existing by 25%, upgrading to condensing boilers should reduce gas consumption by 322 GJ, saving over \$ 6,000 and reducing GHG emissions by 16 tonnes every year.

We included an incentive of approximately \$12,500 into our analysis based on the current Fortis BC Efficient Boiler program. Please note that this program is currently under revision, and there will be changes regarding terms and conditions in June 2012.

b) Furnace Upgrade

The existing furnace is considered to be low efficiency by today's standards. We recommend replacing this furnace with a high-efficiency energy star furnace with AFUE more than 95 %. This upgrade in efficiency will result in annual gas savings 20.4 GJ for this site.

c) Control Upgrade

The existing heating controls in the main building and workshops in the Parks Yard are basic wall mounted thermostats or manual on/off switches. It is unlikely the temperature would be set back at night or when the area is not occupied. Ideally each thermostat would be replaced with programmable thermostats. In the Parks Yard workshops the inclusion of occupancy sensors would dramatically reduce run-time while maintaining a desired minimum temperature set-back. Based on current usage, we feel an annual gas reduction of 78 GJ is achievable. This is equivalent to savings over \$ 1,500 per year.

III. Electrical Measures

A summary of the analysis for the recommended lighting upgrades as well as the detailed descriptions for each project are presented below:

Lighting Measures Summary by Building

Main Building & Site	Cost	Incentive Estimate	Payback (years)	Annual Savings				
				\$	Maint	kW	kWh	GHG
T12 Retrofit	\$12,500	\$5,000	4.5	\$1,382	\$275	5.0	15,186	0.3
Other hardwire retrofit	\$10,000	\$3,000	4.0	\$1,472	\$285	6.0	16,181	0.4
New lighting control	\$3,500	\$850	3.3	\$794			8,720	0.2

Parks Yard Building	Cost	Incentive Estimate	Payback (years)	Annual Savings				
				\$	Maint	kW	kWh	GHG
T12 Retrofit	\$7,500	\$2,500	4.2	\$934	\$270	3.5	10,268	0.2
Other hardwire retrofit	\$3,000	\$750	3.6	\$510	\$120	0.6	5,609	0.1
New lighting control	\$2,750	\$750	3.9	\$508			5,582	0.1

Total Lighting Measures for Public Works Site

Item	Description	Cost	Incentive Estimate	Payback (years)	Annual Savings				
					\$	Maint	kW	kWh	GHG
a	T12 Retrofit	\$20,000	\$7,500	4.4	\$2,316	\$545	8.5	25,454	0.6
b	Other hardwire retrofit	\$13,000	\$3,750	3.9	\$1,983	\$405	6.6	21,790	0.5
c	New lighting control	\$6,250	\$1,600	3.6	\$1,302			14,302	0.3
	Total Lighting	\$39,250	\$12,850	4.0	\$5,601	\$950	15	61,546	1.4

a) T12 Retrofit

The facility currently has a significant amount of T12 linear flurescent luminaires remaining in the building. This form of lighting is outdated and very inefficient compared to modern technology. These linear T12's can be upgraded by simply changing the ballasts and lamp holders inside the existing light fixtures. We recommend taking advantage of low wattage T8 extra long life T8 lamps wherever possible. This will reduce consumption by over 40% while maintaining the same light output and improving lighting quality. Details regarding the quantity and replacement lamp and ballast for each fixture type can be found below:

i. F40T12 – 2 4’ lamps: 78 units

Existing 2 lamp T12 luminaires are to be retrofitted with new T8 ballasts and lamps. The intention of this project is to upgrade the T12 fixtures with new energy efficient T8 components (2 lamp – 4’ 25W F32T8 extra long life lamps) *with instant start normal ballast factor ballasts* suitable for the operation of 2 lamps.

ii. F40T12 – 2 4’ lamps: 215 units

Existing 2 lamp T12 luminaires in the washrooms are to be retrofitted with new T8 ballasts and lamps. The intention of this project is to upgrade the T12 fixtures with new energy efficient T8 components (2 lamp – 4’ 25W F32T8 extra long life lamps) with *programmed start normal ballast factor ballasts* suitable for the operation of 2 lamps.

b) Other hardwired retrofit

The exterior bays (both attached & stand-alone) currently have 8’ High Output T12’s as their lighting source. This form of lighting is outdated and very inefficient compared to new modern technology. We recommend taking advantage of new High Output T5 fixtures with 54W lamps. This will reduce consumption by almost 50% while improving the light output and quality. As well, we found that a large number of these fixtures are on 24/7. We suggest installation a photocell combined with timer to significantly reduce run-hours when it’s not necessary. Details regarding the quantity and replacement lamp and ballast for each fixture type can be found below:

i. F96T12 – 2 8’ lamps: 19 units

All existing 2 lamp 8’ High Output T12 luminaires are to be retrofitted with new 2 lamp 4’ High Output T5 fixtures. The intention of this project is to upgrade the T12 fixtures with new energy efficient T5 components (2 lamp – 4’ 54W F54T5 lamps) with *instant start normal ballast factor ballasts* suitable for the operation of 2 lamps.

ii. F96T12 – 2 8’ lamps: 15 units

All existing 2 lamp 8’ High Output T12 luminaires are to be retrofitted with new 2 lamp 4’ High Output T5 fixtures. The intention of this project is to upgrade the T12 fixtures with new energy efficient T5 components (2 lamp – 4’ 54W F54T5 lamps) with *programmed start normal ballast factor ballasts* suitable for the operation of 2 lamps.

c) New Lighting Control

A couple opportunities for lighting control were identified. We recommend installing line voltage switch occupancy sensors in all offices and most workshop and storage rooms. As well, we recommend installing photocells and timers on a number of exterior bays where lighting is currently on 24/7. Note that maintenance savings are expected but were not factored into this analysis.



Financial Analysis

The following table presents the financial analysis of the project described above:

Item	Description	Cost	Incentive Estimate	Payback (years)	Annual Savings	Life Expect.			
							NPV	IRR	ROI
a	Mechanical	\$62,250	\$12,500	6.0	\$8,324	25	\$113,522	19%	643%
b	Lighting	\$39,250	\$12,850	4.0	\$6,551	10	\$32,563	24%	148%
	Energy Efficiency Consulting	\$10,000							
Total Recommendations		\$111,500	\$25,350	5.8	\$14,875	17.5	\$127,142	18%	259%

*NPV & IRR calculations are based on a 2% fuel cost escalation and 4% discount rate.

Financial Incentives:

Shift Energy Group estimates the City of Port Alberni is eligible for a BC Hydro Incentive of approximately **\$12,850** for lighting upgrades. In addition, the City qualifies for a boiler incentive of approximately **\$12,500** from Fortis BC.

Note: Fortis BC is currently undergoing changes to their boiler incentive packages.



Energy Efficiency Consulting

In order to allow an accurate analysis of the overall cost of this renovation we estimate the required consulting budget to be approximately \$10,000. This includes cost to cover more detailed development of lighting specs, coordination of financial incentives and verification reporting.



Conclusion

We have identified a number of significant energy saving opportunities for the Public Works Sites heating and lighting systems.

Significant savings will be achieved by upgrading the existing lighting systems. The lighting upgrade has a simple payback of 4 years and represents a sizable return on investment. As well, upgrading the lighting systems will be necessary as Government eliminates the distribution of the T12 product. We have procured financial incentive of approximately \$12,500 and recommend taking advantage of these BC Hydro incentives while they are still available.

We also recommend upgrading the existing gas fired boiler serving the main building and a new high efficiency furnace serving the parks yard building. Both are well past their service life. Upgrading to properly sized, high efficiency condensing boilers with controls will significantly reduce consumption. The mechanical upgrades offer very high returns on investment over the expected life of the associated equipment.

If our recommendations are implemented we expect energy consumption to be reduced by 25%.

APPENDIX 6 - FLEET AND FUEL CONSUMPTION

TITLE: VEHICLE IDLING POLICY				
EFFECTIVE DATE: April 14, 2008	DEPARTMENT: Engineering	AUTHORIZED BY: Council	REPLACES: Original	PAGE 1 OF 1

1. POLICY

City of Port Alberni Vehicle Idling Policy.

That the operator of a City of Port Alberni fleet vehicle limit the idling time of the vehicle to less than 2 minutes.

Exceptions:

- When the engine is required to power auxiliary equipment such as hoists, lifts, and other mechanical and safety equipment.
- Where a vehicle is not expected to restart due to mechanical problems.
- Assisting on an emergency scene.
- When the ambient temperature is below 0 Celsius there is a 10 minute maximum idling time.

2. PURPOSE

The purpose is to limit unnecessary idling of the City of Port Alberni fleet vehicles in order to reduce operation costs, harmful air emissions, and reduce greenhouse gas emissions.

3. SCOPE

The policy applies to the entire fleet of vehicles and equipment in use by the employees of the City of Port Alberni.

4. RESPONSIBILITY

City of Port Alberni employees that operate City vehicles are responsible to limit the idling time as described in the policy.

Supervisors are responsible for the enforcement of the policy. Employees not complying with the policy will be subject to discipline under the Discipline Policy.

5. DEFINITIONS

6. REFERENCES and RELATED STATEMENTS OF POLICY AND PROCEDURE

7. PROCEDURE

8. ATTACHMENTS

VEHICLE & EQUIPMENT LIST Nov. 2013

UNIT #	DESCRIPTION	YEAR	VEH	FUEL	DEPARTMENT
1	White / GMC Pumper Truck	1992	V	D	Fire Hall
2	Emerg. Ladder Truck	1997	V	D	Fire Hall
4	Freightliner / Pumper Truck	2000	V	D	Fire Hall
5	Spartan / Firetruck	2010	V	D	Fire Hall
8	Ford / F550 Emerg.	2006	V	D	
10	Dodge Dakota	2007	V	G	Fire Hall
12	International / Tanker Truck	1978	V	G	Fire Hall
14	Hallmark Box Trailer	2006	T	N	Fire Hall
15	Dodge / Pick- up	1998	V	G	Fire Hall
13	Chevrolet Silverado P/U	2011	V	G	Fire Hall
140	GMC 5500 utility truck	2007	V	D	Public Works Sewer Dept.
141	Dodge 5500 Service truck	2009	V	D	Public Works
150	Dodge 3500 Flat Deck	2008	V	G	Mechanic Shop
151	Dodge 2500 p/ u	2008	V	G	Carp. Shop
153	Chevrolet p/u	1994	V	G	Public Works - Fuel truck - (Ecav.)
154	Ford Ranger P/U 4X4	2008	V	G	Streets Chargehand - Harold Schut
159	Ford econo van	1995	V	G	City Hall - Surveyors - B Wong
160	Ford econo van	1995	V	G	City Hall - Water Works - Paul Gr.
163	GMC Sonoma p/u	1998	V	G	City Hall - Surveyors - Dan W
165	Ford Ranger p/u	1998	V	G	Mechanic Supt - W Cheveldave
168	Ford F150 p/u	2003	V	G	Sewer Chargehand - D Goddard
169	Ford F350 - paint truck	2004	V	G	Public Works - Jeff Gingras
170	Ford Ranger p/u	2005	V	G	Utility Superintendent - B Mousley
171	Ford Ranger p/u	2008	V	G	Streets Supt - Wilf Taekema
200	EZ. Loader boat Trailer	2007	T	N	Public Works - Lagoon Boat
240	GMC 5500 Service truck	2007	V	D	Public Works
258	GMC crew cab	1996	V	D	Public Works
259	GMC dump	1998	V	D	Single axle dump
260	GMC dump	1999	V	D	Single axle dump
262	Volvo dump truck tandem	2002	V	D	Public Works
263	Ford dump	2004	V	D	Utility dump
264	Volvo dump truck tandem	2005	V	D	Public Works
265	Volvo dump truck tandem	2007	V	D	Public Works
266	Freightliner truck	2011	V	D	Public Works
267	Volvo dump truck tandem	2013	V	D	Public Works
300	Tiger Sabre boom Mower	2004	O	N	Public Works
302	John Deere Backhoe	2007	V	D	Public Works -
303	Case Backhoe	2009	V	D	Public Works - Niel Ruel
304	Cat Forklift GP40	1995	V	P	Public Works
332	Tampo wheel compactor	1962	T	N	Public Works
336	Rebco Trailer 6 X 10	2008	T	N	Public Works Emerg. Response
337	Rebco Trailer 5 X 8	2008	T	N	Public Works Emerg. Generator

UNIT #	DESCRIPTION	YEAR	VEH	FUEL	DEPARTMENT
338	Exprees Trailer	2000	T	N	Public Works
340	John Deere grader	1998	V	D	Public Works
342	Linkbelt Excavator 145X3DZ	2013	V	D	Public Works
350	John Deere loader	2005	V	D	Public Works
355	Volvo grader	2005	V	D	Public Works
359	Trailer with water tank	1983	T	N	Public Works U - Built Trailer
360	White / Hercules	1984	T	D	Public Works - Genset on trailer
361	John Deere 100Kw	2012	T	D	Public Works - Genset on trailer
367	Langfab Pup Trailer	2006	T	N	Dump Box
369	Britco Trailer	1990	T	N	Model 10X24 Lunchroom Trailer
370	Trailer Fldck (Nicholls)	1990	T	N	Public Works (Yellow)
372	Stanley Hydraulic power unit	1991	T	D	HP -175
376	John Deere loader	1992	V	D	Public Works
377	Ingersoll Rand	1992	T	D	P125DWD Air Compressor (Trailer)
378	Hi - Sander	1992	O	N	Model - E2020-8
382	Swensen Sander	1993	O	N	Model - EVRGH-100 (stainless)
383	Shoring Trailer	1994	T	N	North West Custom Trailer
385	Target	1995	O	G	Pavement Cutter
386	Langfab Pup Trailer	1995	T	N	Dump Box
388	JCTR flatdeck-lowbed triple axle	1996	T	N	JC Trailer AT - 3
389	Wellscargo travel trlr for sewer	1997	T	N	Camera Equipment
393	Miller Welder (Portable)	1997	O	D	Big - 40
395	Bomag roller	1995	V	D	Public Works
396	Express flatdeck	1998	V	N	Public Works
398	Swenson Sander	2001	O	N	EV100 (stainless)
399	New Holland tractor	2004	V	G	Public Works
410	Tymco Sweeper	2006	V	D	Public Works - Al Loiselle
426	Volvo Garbage	1998	V	D	Public Works
432	Sterling Garbage truck	2006	V	D	Public Works
433	International Garbage truck	2012	V	D	Public Works
434	International Garbage truck	2012	V	D	Public Works
435	International Combo Hydro-vac	2012	V	D	Public Works - Flusher truck
436	Curotto Automated Container	2012	O	N	Public works
518	Chevrolet p/u	2003	V	G	Water works
519	Ford Ranger p/u	2004	V	G	Public Works
520	Ford F350 service truck	2005	V	G	Water works - Roman Wiatr
521	Chev.3500 service truck	2012	V	G	Public Works - Chargehand (water)
522	Toyota tacoma 4X4	2014	V	G	Public Works - water utility
602	Ford Ranger p/u	2000	V	G	Multi-Plex
603	Ford Ranger p/u	2000	V	G	Parks & Rec
604	U- Built Box trailer	2000	T	N	Parks & Rec
605	U- Built Box trailer	2000	T	N	Parks & Rec
607	Bandit brush Chipper	1999	T	G	Parks & Rec
608	Zamboni	2003	V	P	Parks & Rec / Arena
610	Ford F250 p/u	2005	V	G	Parks & Rec
611	Upright (Manlift)		T	N	Parks & Rec /Multiplex - X - 20N
612	Toro Mower	2005	V	G	Parks & Rec

UNIT #	DESCRIPTION	YEAR	VEH	FUEL	DEPARTMENT
613	Ford F550 haul all	2006	V	G	Parks & Rec Garbage truck
614	GMC 5500 Hort. Utility	2005	V	G	Parks & Rec - Mary Sahn
615	GMC 5500 Utility truck	2005	V	G	Parks & Rec
616	Chev cube van	2004	V	G	Parks & Rec - Carpenter
618	Portable Welder U-Built trler	1973	T	D	Parks & Rec
619	Ford E350 15 pass. Van	2006	V	G	Parks & Rec
620	Rebco (Trailer)	2005	V	N	Parks & Rec
621	Multi - Quip. Cement mixer	2006	T	G	Parks & Rec
622	Ford F350 P/U	2007	V	G	Parks & Rec - Carpenter
623	Nissan Forklift	2000	V	P	Parks & Rec / Multiplex
624	John Deere Tractor	2007	V	D	Parks & Rec
625	Kubota F3680 Mower	2010	V	D	Parks & Rec
626	Tycrop Spreader	2007	V	N	Parks & Rec
627	Ford Ranger P/U	2008	V	G	Parks & Rec
629	GMC 3500 4 X 4 P/U	2011	V	G	Parks & Rec
630	Toyota tacoma	2013	V	G	Parks & Rec - Jake Colyn
631	Calkins Canoe trailer	1978	T	N	Parks & Rec
632	Toyota tacoma	2013	V	G	Parks & Rec - Mark Zenko
635	Express Custom Trailer	1990	T	N	Parks & Rec
638	Pull Tank	1977	T	N	Paks & Rec
639	Boat Trailer canoe's ect.	1981	T	N	Parks & Rec
660	U - Built Equipment trailer	1989	T	N	Parks & Rec
671	Ty crop spred	1992	T	N	Parks & Rec
675	Ford E150 Bus	1992	V	G	Parks & Rec
679	Zamboni	1992	V	P	Parks & Rec / Arena
683	GMC p/u	1994	V	G	Industrial Haritage S
707	Ubuilt Gen. Trailer	1981	T	D	Radio Club (Al Whinney)
714	Chevrolet Astro	1993	V	G	R.C.M.P. Speed Watch
718	Pontiac TransAm	1993	V	G	Dare vehicle
719	Chev Cavalier	2003	V	G	City Hall
720	Ford F Star Van	2004	V	G	City Hall - Bylaw Enforcement
721	Dodge Caliber	2007	V	G	City Hall - Building Inspector
7759	Ford Van (ex firehall)	1989	V	G	McLean's Mill

47 G= Gas
40 D= Diesel
4 P= Propane
31 N= None

84 V= Vehicle (self mobile)
31 T= Trailer
7 O= Other (insert or stationary)

Number of Vehicle Upgraded since 2007 23 27%

VEHICLE REPLACEMENTS AND ESTIMATE FUEL SAVINGS 2007-2013														
Vehicle or Equipment Asset Use	New Unit Purchased							Old Unit Replaced						
	New Unit #	Year Asset In Service	Unit Description	Diesel or Gas	Avg. Use (km/yr) or (hours/yr)	Est Fuel Efficiency (l/100 km) or (l/hr)	Est Annual Fuel Use (Litres)	Old Unit #	Year In Service	Unit Description	Est Fuel Efficiency (l/100km) or (l/hr)	Est Annual Fuel Use (Litres)	Est .Fuel Savings Gas (litres)	Est. Fuel Savings Diesel (litres)
Pickup (Shop)- Engineering	150	2008	2008 Dodge 3500 PU w/Flatdeck	G	4300	35	1505	152	1990	Ford F350 Pickup	37.3	1604	98.9	
Pickup (Carpenter)- Engineering	151	2008	2008 Dodge 2500 PU	G	5400	24.4	1318	153	1994	CHEV 1TON PICKUP	29.3	1582	264.6	
Pickup (Streets Cgehand)- Engineering	154	2008	2008 Ford Ranger Super Cab PU	G	17000	17.1	2907	166	1998	CHEV 1/2 TON PICKUP	19.8	3366	459	
Pickup - Parks & Rec	627	2008	2008 Ford Ranger PU	G	4000	25.7	1028	684	1994	GMC 1/2 Ton Pickup	36.5	1460	432	
Forklift - Engineering	304	2009	#304-1995 Cat GP40 Forklift	P	400	2.3	920	397	180	Hyster Forklift	2.3	920	0	0
Service Truck Sewer- Engineering	141	2009	2009 Dodge 5500 (Sewer)	D	9100	29.6	2694	167	1998	CHEV 1 TON PICKUP	42.6	3877		1183
Backhoe/Loader - Engineering	303	2009	#303-2009 Case 580SM Backhoe	D	700	8.4	5880	392	1997	Case Backhoe	6.3	4410		-1470
Fire Engine	5	2010	2010 Spartan Gladiator Pumper	D	0	0	0	3	1984	1984 INTERNATIONAL PUMPER	0	0		0
Asphalt Repair Truck- Engineering	266	2010	2011 Freightliner Asphalt Truck	D	6400	46.4	2970	261	2000	FREIGHTLINER ASPHALT TRUCK	46.4	2970		0
Tractor Mower - Parks & Rec	625	2010	2010 Kubota F3680 Tractor Mower	D	360	4.4	1584	606	2000	KUBOTA ROTARY MOWER	3.3	1188		-396
Sweeper -Parks & Rec	628	2010	2010 Smithco Sweeper	D	80	2.2	176	689	1995	TORO TURF SWEEPER	3	240		64
Rescue Truck - Fire	8	2011	2006 Ford F550 Rescue Truck	D	0	0	0	17	1987	#17-1987 GMC Rescue Van	0	0		0
Pickup - Fire Department	13	2011	2011 Chev Silverado PU	G	0	0	0	19	1997	#19-1997 Ford 4x4 PU	0	0	0	
Flusher/Vac Truck - Engineering	435	2011	2012 International Flusher/Vac	D	3000	142.2	4266	431	2002	Volvo/Vactor Flusher Truck	304.2	9126		4860
Automated Garbage Trk - Engineering	433	2011	2011 Labrie Auto Garbage Trk	D	7000	139.5	9765	427	2004	CONDOR STERLING GARBAGE T	130	9100		-665
Automated Garbage Trk - Engineering	434	2011	2011 Labrie Auto Garbage Trk	D	7000	135.5	9485	429	2006	AUTOCAR GARBAGE TRUCK	138.9	9723		238
Pickup - Parks & Rec	629	2011	2011 GMC Sierra 3500 PU	G	1700	38.5	655	161	1997	Chev S10 Extra Cab PU	20.8	354	-300.9	
2012 Chev 1 T Gas	521	2012	2012 Chev 1 T Gas	G	12800	36.9	4723	517	2000	Ford F350 Pickup	26.2	3354	-1369.6	
Dumptruck (Tandem) - Engineering	267	2012	2013 Volvo Tandem Dumptruck	D	11800	63	7434	262	2002	Volvo Tandem Dump	60	7080		-354
Excavator (tracked) - Engineering	342	2013	Linkbelt Excavator 145X3DZ	D	350	9.4	3290	341	2006	Hitachi Excavator ZX200LC	12.9	4515		1225
Pickup (compact) - Parks & Rec	630	2013	Toyota Tacoma	G	13500	15.2	2052	603	2000	Ford Ranger PU	18.5	2498	445.5	
Pickup (compact) - Parks & Rec	632	2013	Toyota Tacoma	G	8200	15.2	1246	602	2000	Ford Ranger PU	15.9	1304	57.4	
Pickup (compact 4X4) - Eng Waterwks	522	2014	Toyota Tacoma 4X4 New May/14	G	23000	18.5	4255	519	2004	Ford Ranger 4X4 PU	26	5980	1725	

Fuel Type	Measure	Energy Factor (Gigajoule)	Emission	Est. Fuel Savings (litres)	Est GHF Savings (tCO2e)	Gas	Diesel
Gasoline	litre	0.03466	0.002			1812	4685
Diesel	litre	0.0387	0.003			17	

**Estimate of Fuel Consumption by City Contractors
engaged in Operation and Maintenance.**

CONTRACTOR	VEHICLE /FUEL TYPE	2007	2008	2009	2010	2011	2012	2013	2014
		Fuel Used (L)	Fuel Used (L)	Fuel Used (L)	Fuel Used (L)	Fuel Used (L)	Fuel Used (L)	Fuel Used (L)	Fuel Used (L)
Ace Flagging	Light Truck/Gasoline	1500	1900	1875	1275	1500	1400	1400	1400
Asplund	Light Truck/ Gasoline	100	100	100	100	100	100	100	100
	Bucket Truck/Diesel	200	200	200	200	200	200	200	200
Bailey Electric Co Ltd.	Van Small bucket/ Gas	6000	7000	5500	4000	3700	5682.51	5682.51	6036
	Ig Bucket Truck/Diesel	203	316	144	172	47	0	0	0
Industrial Heritage Society	Van/ Gasoline	1800	1600	1500	2000	1856	1900	1560	1560
	Mower/ Diesel	250	225	210	190	345	187	1295	1295
	Propane	200	250	220	200	250	182	288	288
Mainroad Pavement Marking	Light Truck / Gasolin	75	60	60	50	50	50	50	50
	Paint Truck Diesel	300	300	300	300	300	300	300	300
SPCA	Van / Gasoline	1463	1354	1432	1314	1276	1300	1300	1300
	TOTAL Gasoline	10938	12014	10467	8739	8482	10432.5	10092.5	10446
	TOTAL Diesel	953	1041	854	862	892	687	1795	1795
	TOTAL Propane	200	250	220	200	250	182	288	288

Est.Fuel Use (Gasoline) for Staff Business Use Mileage

Year	Total Mileage (km)	Avg Fuel Efficiency (L/100km)	Estimated Fuel Used (L)
2007	22885	12.50	2861
2008	33114	12.25	4056
2009	40325	12.00	4839
2010	24959	11.75	2933
2011	24895	11.50	2863
2012	25000	11.50	2875
2013	25000	11.50	2875
2014	25000	11.00	2750

APPENDIX 7 - INFRASTRUCTURE INVENTORY



CITY OF PORT ALBERNI - ENGINEERING DEPARTMENT INFRASTRUCTURE INVENTORY SUMMARY

* updated to end of 2011

1. CITY AREA

Land Area	1893 Ha
Water Area	257 Ha
Total Area	2150 Ha

2. WATERWORKS

Watershed - China Creek basin	6202 Ha	
- Bainbridge Lake Catchment	1310 Ha	
Intakes (Surface Supply)	3	
- China Creek - gravity	24,451	m3/day permit
- Bainbridge Lake - pumped	9,763	m3/day permit
- Somass River - pumped	13,564	m3/day permit
Total Permitted Volume	47,778	m3/day permit
Dams	3	
- China Creek - intake - concrete El. 184m (603.7')	5000	m3 storage
- Lizard Lake - concrete/earthfill (440 acre ft) El. 732m (2401.6')	578,000	m3 storage
- Bainbridge Lake - earthfill (1000 acre ft) El.150m (492')	1,230,000	m3 storage
	1813000	
Pumpstations	5	
- Bainbridge - 2x50 HP @ 2508 gpm	100	Hp
- Somass - 2x60 HP @ 750 gpm ea. - 1x125 HP @ 1390 gpm	245	Hp
- Cowichan - 2x60 HP @ 2400 gpm - 1x5 HP @ 65 gpm	125	Hp
- Johnston - 4x60 HP @ 800 gpm ea. - 1x7.5 HP @ 120 gpm - 2x145 HP diesel @ 2100 gpm	538	Hp
- Arrowsmith - 2x5 HP @ 65 ea.	10	Hp
Total Pumpstation Horsepower	1018	Hp
Chlorination Stations	3	
- Bainbridge Pumpstation (gas injection)		
- Somass Pump/Intake (gas injection)		
- Johnston Pumpstation (gas injection)		
Chlorine Residual Test Points - Daily	10	
Bacterial Test Locations - Monthly	20	
Reservoirs	5	
- Upper Cowichan - floating cover El.158m	11,250	m3 1962/1963
- Lower Cowichan - floating cover El.146m	6,750	m3 1937
- Burde - floating cover El.86.8m	6,750	m3 1947
- Johnston - 2 cells, concrete El.66.8m	9,000	m3
- Arrowsmith - 1 cells, steel tank El.173.6m	250	m3
Total Reservoir Storage Volume	34,000	m3

Supply mains HDPE- 500mm	3.60 km
Supply mains Steel - 1200mm	0.11 km
Supply mains PVC- 500mm	1.51 km
Supply mains steel- 600mm	4.81 km
Total Supply Mains	10.03
Distribution mains < 150mm	88.9 km
Distribution mains 200-300mm	48.5 km
Distribution mains > 300mm	25.5 km
Total Distribution Mains	162.9 km
Distribution mains - Asbestos Cement	77.5 km
Distribution mains - Cast Iron	32.5 km
Distribution mains - P.V.C.	35.0 km
Distribution mains - Ductile Iron	7.6 km
Distribution mains - Galvanized Iron	0.0 km
Distribution mains - Steel	0.8 km
Distribution mains - Wood Stave	0.0 km
Distribution mains - Type Unknown	9.5 km
	162.9
Pressure Reducing Stations	20
Pressure Zones	12
Line Valves	1570
Air Valves	63
Hydrants (City)	729
Hydrants (Private)	69
Connections - Residential	6419
- Commercial	314
- Industrial	13
- City	64
	6810
Meters (Active)	6810
Meter Size Breakdown	
15 or 19 mm inside City	6388
15 or 19 mm outside City	51
25mm inside	98
25mm outside	1
40mm inside	84
40mm outside	2
50mm inside	125
50mm outside	5
75mm inside	29
75mm outside	2
100mm inside	10
100mm outside	1
150mm inside	7
150mm outside	4
over 150mm	3
	6810
Average Annual Volume Served	5,991,408 m3
Peak Day Usage	21,352 m3
Minimum Day Usage	1,409 m3
Average Day Usage	10,959 m3

3 SEWER & DRAINAGE

Connections	6519
Storm Sewers	100.3 km
Sanitary & Combined Sewers	158.1 km
Sanitary & Combined Manholes	2276.0
Storm Manholes	1380.0
Catchbasins	2366
Grit Chambers	11
Sump Manholes	19
	Pipe Type
PVC Sanitary & Storm	59.6 km
AC Sanitary & Storm	53.9 km
Conc Sanitary & Storm	84.4 km
Vit Sanitary & Storm	26.2 km
Reline Sanitary & Storm	2.1 km
Other Sanitary & Storm	6.7 km
Unknown Sanitary & Storm	25.6 km
	258.5 km
	Pipe Diameter
150mm and less	19.8 km
200mm	102.6 km
250mm	38.0 km
300mm	34.8 km
350mm	3.8 km
375mm	10.7 km
400mm	3.4 km
450mm	10.2 km
500mm	2.2 km
525mm	2.3 km
600mm	10.9 km
>600mm	13.6 km
mixed & unknown	6.2 km
	258.5
Sewage Pumpstations	5
- Wallace - 2x40 Hp @ gpm, 1x10 hp jockey	90 Hp
- Argyle - 2x140 Hp @ 250l/sec- only one at a time	280 Hp
- Josephine - 2x20 Hp submersibles	40 Hp
- Margaret - 2x20 Hp @ 1200 gpm	40 Hp
- 4th Ave - 2x10 Hp @ 400 gpm, submersibles	20 Hp
Storm Liftstation	1
- Margaret - 2x 75 Hp @ 20,000gpm	150 Hp
Forcemains	8.9 km
Storm Outfalls	107
Combined Overflows	4
Flood Gates	25
Major Culverts > 900mm	52
Ditches	9 km
Sewage Treatment Facility (Lagoon)	1
Aeration - 2 x 30HP (splash), 3 x 25 HP self-aspirating, 2 x 75 HP (splash), 2 x 30HP (directional) =	345 HP
Capacity (Volume)	80,000 m3
Average Flow	18,896 m3/day
Max Flow	58,500 m3/day
Min Flow	1,604 m3/day
Permit PE 297 - Flow (Continuous)	34,100 m3/day permit

- BOD5 (Monthly)	25mg/l average 2l	70 mg/l permit
- TSS (Monthly)	48mg/l average 2l	70 mg/l permit
- DO (Weekly)	3.3 mg/l average 2011	
Annual Volume Treated		6,897,032 m3

4. STREETS

Curb and Gutter Streets	107.3 km
Centre Strip Paved Streets	46.6 km
Unpaved Roads	0.4 km
Lanes	54.5 km
Sidewalks	135.0 km
Traffic Signal Controllers	9
- 3rd Ave @ Argyle - full signal	
- 3rd Ave @ Napier - full signal	
- Redford St. @ 10th - full signal	
- Redford St. @ Stamp - full signal	
- Stamp Ave. @ Roger - full signal	
- Stamp Ave.@ Pulp Mill - ped signal	
-10th Ave. @ Wallace - full signal	
-10th Ave. @ Roger - full signal	
-10th Ave. @ China Creek - ped signal	
Total Streetlights	1456
Street Lights (Hydro Owned/ 100W HPS)	622
Street Lights (Hydro Owned/ 150W HPS)	355
Street Lights (City Owned HPS)	385
Street Lights (City Owned MV)	47
Street Lights (City Owned F)	47
Stop\Yield Signs	718
Bus Stops	182
Crosswalks	231
Centerline Marking	62.3 km
Parking Lots	12
Bridges	12
- Victoria Quay/Roger Cr.-steel/conc 4 span	43 m long
- Gertrude St/Roger Creek-steel/conc,3 span	42.5 m long
- Gertrude St/Kitsuksis Cr.- timber 3 span	42 m long
- 3 rd Ave/Dry Cr.- Conc.-30m wide,2 span	7.3 m long
- 4th Ave/Dry Creek - timber 1 span	7.3 m long
-Josephine St - wood - 1 span	3.6 m long
- Mary St - conc - 2 span	5.4 m long
- Dry Creek @ Log Train Trail - pedestrian 1 span	26 m long
- Kitsuksis Dyke near Stirling Field - pedestrian timber 3span	42 m long
- Kitsuksis Dyke near Spencer Park - pedestrian timber 1 spa	20.7 m long
- Helen St - pedestrian timber 1 span	6 m long
- Roger Creek Park - pedestrian 1span	13.3 m long

5. SOLID WASTE

Residential Customers	6317
Commercial Loose Customers	51
Commercial Bin Customers	263
Average Annual Total Tonnage Hauled	6357 tonnes
Average Annual Residential Tonnage	2944 tonnes
Average Annual Commercial Tonnage	3343 tonnes

City of Port Alberni

Water Conservation Plan



Prepared for:

City of Port Alberni
4850 Argyle Street
Port Alberni, B.C. Canada
V9Y 1V8

Prepared by:

AquaVic Water Solutions Inc.
PO Box 3075 STN CSC
R-Hut McKenzie Avenue
University of Victoria
Victoria, B.C. Canada V8W 3W2

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1. Introduction

1.1. Purpose

The purpose of this report is to provide a water conservation plan for the City of Port Alberni.

Water is a finite resource, and it is critical for the health of all ecosystems and human communities. The City of Port Alberni recognizes the value of the region's natural water resources, and the need to ensure a continuing reliable and safe supply of water for all residents. The City began working with residents to conserve water as early as the 70's and later in 2000 with the introduction of residential metering. This document is the City's first strategic Water Conservation Plan.

1.2. Why this is Important

The main drivers for conserving water are scarcity, cost savings and access to funds. While scarcity is not an immediate issue, the current supply may eventually approach capacity. Bringing Sproat Lake online would greatly improve supply but that is not a given at this point.

Reducing water usage reduces operations and maintenance costs, and infrastructure costs. Two important factors affecting these costs are average day demand (ADD) and maximum day demand (MDD). Reducing ADD for example, means that the City will spend less on consumables like electricity and chlorine. A high MDD means that pumping and treatment infrastructure are working hard on peak days when probability of expensive unscheduled maintenance is higher. Water conservation measures aim to reduce these factors.

Reducing water usage also impacts wastewater. Less water consumed means less wastewater to treat.

Planning for and implementing water conservation also increases chances of success in obtaining senior government grants by demonstrating effective use and management of this valuable resource. The City has applied for funding to support the water treatment plant project outlined in [1].

1.3. Scope

As part of a broader water management program this report provides the necessary information and framework to support successful long-term planning and implementation of water conservation. This plan focuses on the areas within the City boundary, while considering the overall Alberni Valley area and other jurisdictions involved in water supply and management in the region.

1.4. Report Roadmap

This report is organized into the following sections:

- Section 1 – Introduction, this section;
- Section 2 – Methodology – how this work was carried out;
- Section 3 – History and Forecast – what we know about the City and what we can predict;
- Section 4 – Goals and Targets – what a water conservation plan aims to achieve;
- Section 5 – Proposed Measures – what specific activities are planned;
- Section 6 – Implementation Strategy – details about who will lead the activities, how, and when;

2. Methodology

Water conservation planning aims to reduce water use by implementing water conservation measures also known as water demand management measures. This section describes the methodology used to set targets and select water conservation measures for Port Alberni.

Review History and Forecast

Data on system water production and end point water consumption was obtained and organized into a water usage model. We held discussions with staff to understand consumption patterns over the past years and to assess potential future changes to consumption patterns and what may be the consequences.

Set Goals and Targets

Review the benefits to water conservation and associated goals that are relevant to Port Alberni. Set specific targets in terms of reductions to specific measurable system parameters.

Develop Short List of Conservation Measures

Together with City Staff, the entire list of conservation measures¹ was reviewed and those measures that were likely to be relevant to the City were added to a short list.

Scoring Measures against Criteria

Each measure on the short list was discussed and given four scores from 1-5 in each of the following criteria:

- How easy is the measure to implement?
- How affordable is the measure to the City?
- How acceptable would the measure be to the rate payers?
- How effective is the measure likely to be in reducing consumption?

The total score of each measure was noted and discussed in relation to priorities. Higher scoring measures in general were viewed as more favorable and higher priority. The details of this scoring review are found in Appendix E.

Develop an Implementation Schedule with Staff

Each measure was finally reviewed once again with Staff and placed into a schedule to be implemented in one of the next 3 years.

¹ There is a wide range of conservation measures that are applicable within the City of Port Alberni. The *Alberni Valley Regional Water Study Update* [1] provides a detailed description of a number of conservation measures. It emphasizes the need to reduce peak summer water use and provides numerous options for reducing outdoor water use. The US Environmental Protection Agency (EPA) provides comprehensive documentation [5] on water conservation planning. The POLIS Water Project offers a different approach to water conservation [4]. Additional documentation related to this report is outlined in the References.

3. History and Forecast

Forecasting water use allows water supply managers to anticipate and prepare for the future requirements of a water supply system. They also allow managers to identify goals for water conservation that reduce system costs and minimize pressure on the natural environment. Water use forecasts are prepared by looking at historical water use and population and making projections based on this and other information that may influence future water use.

3.1. Historical System Demand

Port Alberni regularly measures system flows and universally meters water connections in order to monitor and evaluate system performance and bill for water use. The data obtained illustrate the effects of population size and water conservation measures on total water demand.

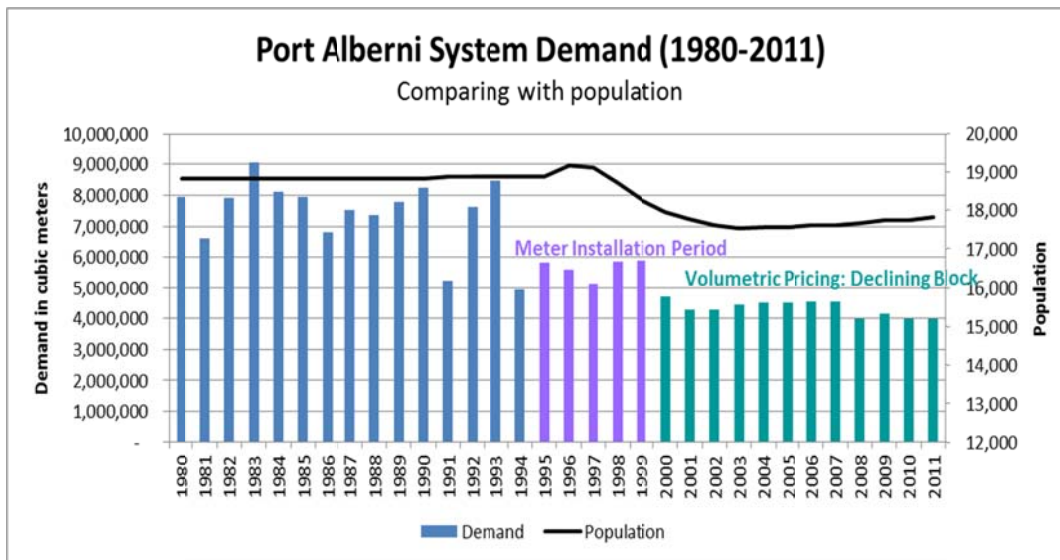


Figure 3.1: Port Alberni Total Water Production and Population 1980 to 2011

Figure 1.1 above confirms that universal metering is one of the most effective measures in reducing demand. Port Alberni has been implementing metering since the 1970's (commercial) and completed universal metering of residential customers around 2000. The figure above shows that annual water production to meet demand decreased significantly around the time meters were being introduced and has maintained this lower level since².

Figure 1.1 above also shows that while population has effectively been static over the past decade, water demand has decreased slightly. This effect is being observed in many communities throughout British Columbia and is evidence of the success of certain water conservation measures.³

² Decreases in demand were also due to the fact that industrial and commercial activity reduced from 1995 to 2010 [1] and that Port Alberni population declined by about 8% from 1996 to 2003.

³ For example, the British Columbia building code requires the use of certain water efficient appliances and devices. The steady annual occurrence of home renovations and new developments are causing the proliferation of water efficient devices and appliances. Even if domestic water use behaviour doesn't change, the introduction of these devices and appliances will result in reduced average per capita water demand.

3.2. Comparing Metered and Non-Revenue Water

The following chart shows the source of water demand in the City. Because the City universally meters its customers, all billable water consumption is known. Comparing total billable consumption with the system total tells us that *non-revenue* water for the system is about 23% shown in this chart.

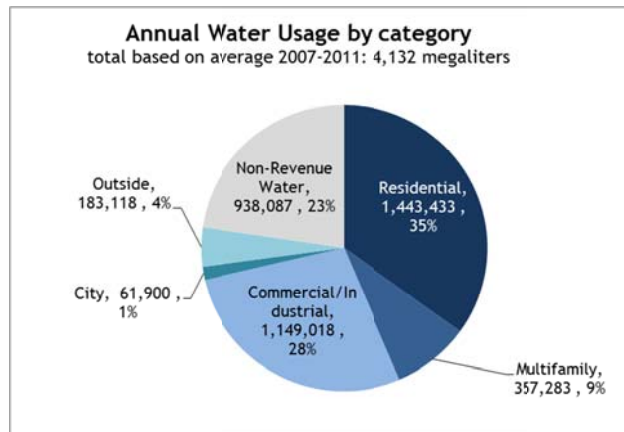


Figure 3.2: Port Alberni Annual Water Usage by Customer Category

3.3. Demand Characteristics

The following graph shows the history of City demand characteristics over the past 3 decades. It shows that maximum day demand (MDD is the dark blue line) and average day demand (ADD is the middle blue line) have decreased and leveled off. This is largely due to the introduction of universal metering.

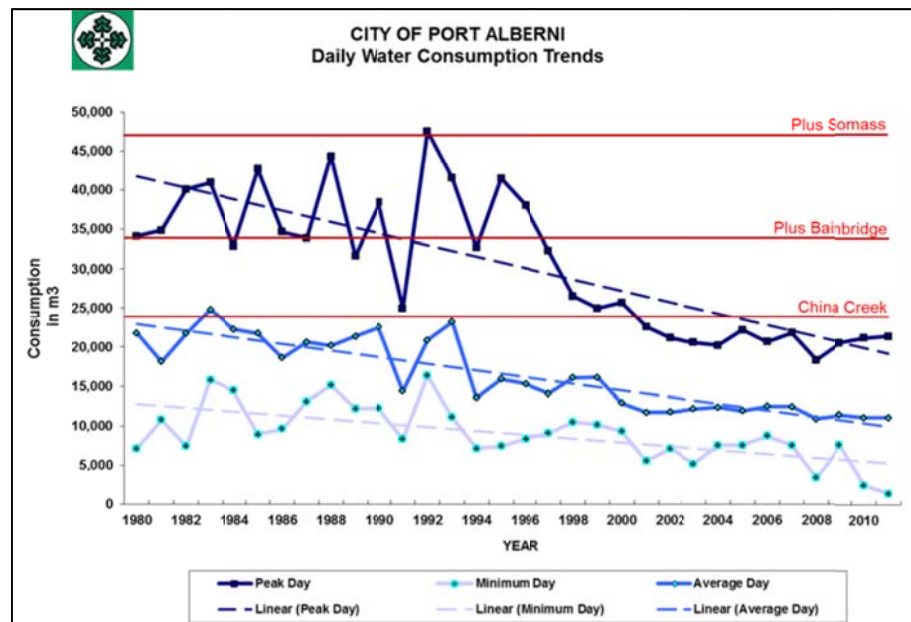


Figure 3.3: Port Alberni Daily Consumption Trends (1980-2011)

These two system parameters are important factors affecting operating and maintenance costs, infrastructure costs and future upgrades to capacity. Reducing ADD means less overall annual consumption which will result in reduced pumping and chemical expenses.

MDD also affects pumping and treatment. Reducing MDD means infrastructure is not working as hard during peak days which reduces the probability of unscheduled maintenance which can be expensive. The red lines in the chart show the licensed capacity limits of the various sources: China Creek alone, China Creek + Bainbridge Lake and the highest red line is total system licensed capacity including emergency supply from Somass River. If MDD exceeds these, then new sources may need to be developed.

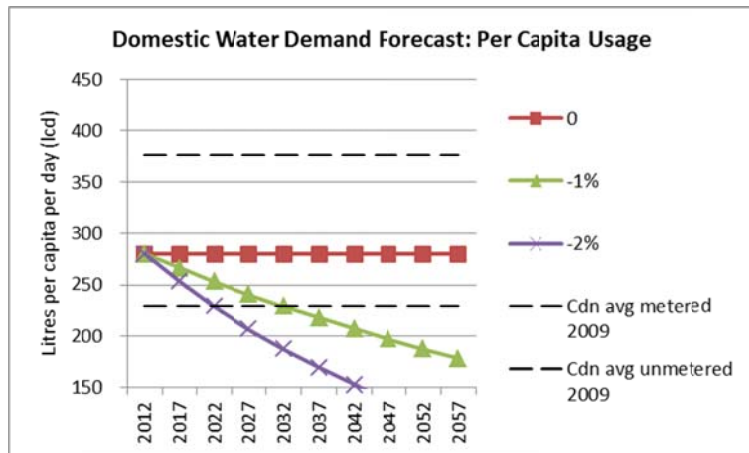
3.4. Population Projections

City of Port Alberni planning staff projects a long term growth rate of 0.5 – 0.75% per annum. By this projection, City population could be in the range of 20,000 to 25,000 by 2050. The total Alberni Valley population is projected to grow from 25,000 in 2009 to between 30,000 and 35,000 people by the year 2050 (Koers, 2010).

3.5. Per Capita Demand Forecast

Once again thanks to universal metering, domestic water demand for the City of Port Alberni is well known. This chart provides a forecast for per-capita domestic water demand.

Figure 3.4: Port Alberni 50 Year Per-Capita Domestic Water Demand Forecast

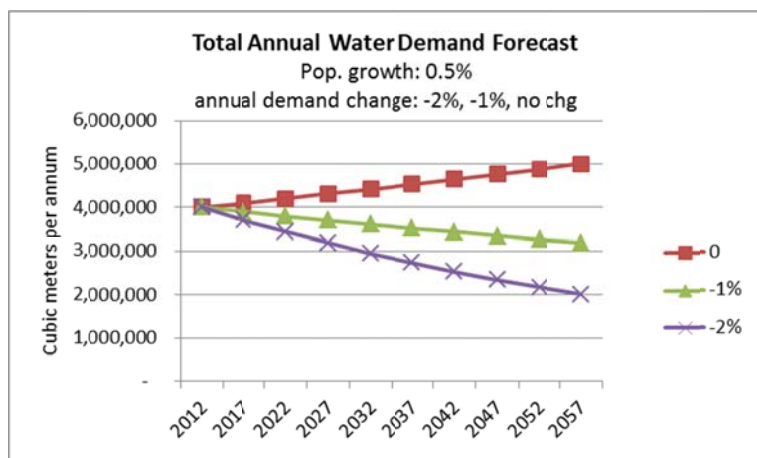


The Figure 3.4 above shows the average annual per-capita water demand in litres per person per day (lpcd) for both metered (229 lpcd) and unmetered (376 lpcd) Canadian communities. Port Alberni per-capita demand is between these averages at 282 lpcd. This chart suggests that there are opportunities for reducing City average day demand by reducing per-capita daily demand. With modest annual reductions to per-capita domestic demand (1% per annum) the City could reach the 2009 Canadian national average by 2032.

3.6. Total System Demand Forecast

This figure forecasts total system demand showing a range of changes in annual demand of 0 to -2%.

Figure 3.5: Port Alberni 50 Year System Demand Forecast Total



4. Goals and Targets

This section outlines the goals and targets that a community would like to realize from water conservation. These goals and targets are aligned with the City's Strategic Plan Goal number 1: A responsible, livable and environmentally sustainable community.

4.1. Water Conservation Goals

Benefits from water conservation may be divided into three categories: protecting the natural environment; reducing water supply and wastewater costs; and improving water supply as shown here:

Table 4.1: Water Conservation Goals

Protect the natural environment
1. Protect and preserve natural water resources.
2. Reduce the amount of greenhouse gases (GHG) that are produced when treating and moving water and wastewater.
Reduce water supply and wastewater costs
3. Extend life of existing infrastructure.
4. Eliminate, reduce, or postpone the costs of new infrastructure, including reservoirs, treatment facilities, pumping stations and pipelines.
5. Reduce operating costs associated with repair, treatment and power use.
6. Avoid new source development costs.
Ensure water supply demands are being met
7. Improve ability to provide water services with water of appropriate quality and quantity to meet customer needs.
8. Ensure requirements for fire protection are being met.
9. Improve drought and emergency preparedness.

4.2. Reduction Targets for the City

To achieve the goals listed in Table 4.1, the amount of water that is taken from the environment, treated, delivered to homes and businesses, and then, in some cases, discharged as wastewater must be reduced.

The following targets have been chosen in support of the goals list in Table 4-1:

1. Reduce annual average household water use by 18% (from 282 lcd to 229 lcd) by 2032 to match the Canadian 2009 average. This requires an average 1% annual reduction in per-capita water demand as shown in Figure 3.2.
2. Reduce unmetered non-revenue water from 23% to 10% by 2015. This is achieved mainly through a system water loss control strategy.
3. Reduce maximum day peaking factor currently at 1.8, to 1.6 or less by 2020. This is achieved mainly by reducing summer outdoor water use.

5. Proposed Measures

Water conservation planning aims to reduce water use by implementing water conservation measures also known as water demand management measures. This section of the plan outlines those water conservation measures that are proposed for implementation by the City.

5.1. Improve Water Use Accounting

Water conservation planning is a long-term and cyclical process, requiring review and elaboration of plans as information becomes available, situations change, and conservation measures that have been implemented are evaluated for their success. Fundamental to managing demand is to first understand where water is being used.

Implementing a system of water use accounting is a necessary first step in developing strategies for loss control. The costs of water leakage can be determined by looking at the costs associated with water supply treatment and delivery. Lost water produces no revenue. Repairing leaks can be costly but can produce substantial savings in water and money over time.

Next Steps for the City:

- Update annual water balance sheet giving a breakdown of system water use. The annual water balance sheet typically has the following format.

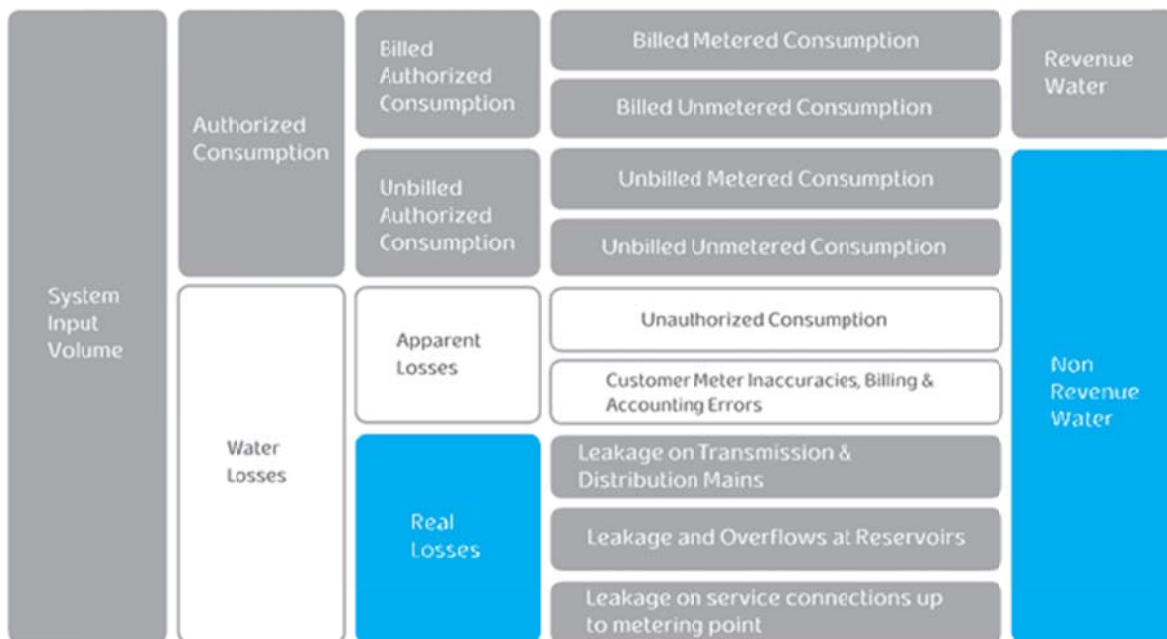


Figure 5.1: Annual Water Balance Sheet

- Improve reporting of municipal non-revenue water uses: fire-fighting, flushing;
- Investigate anomalies in winter water use data including whether some customers may be practising winter bleeding or other elevated winter uses.
- Develop a meter testing, calibration, repair and maintenance program; identify potential inaccuracies due to age;
- Upgrade meters for large users.
- Investigate the cost of upgrading and develop a pilot program to install fixed network continuous meter reading in specific locations;
- Analyze network model and identify locations for district (zone) meters;
- Develop a leak detection and repair strategy;
- Develop a plan to conduct a night-flow analysis;
- Calculate infrastructure leakage index ILI;
- Review potential benefits and costs of pressure management;

5.2. Residential Inclined Block Rate Structure

Residential has been a Constant Rate

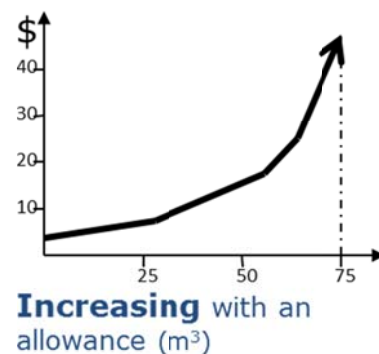
As of 2012, the rate structure in the City is a declining block rate. The first block in this structure allows for 1,133 m³ per trimester (this is equal to 283 m³ per month, 9.4 m³ per day, or almost 4,000 l/ca/d.) This block amount is well beyond the typical per capita usage so few City residents will ever consume water beyond the first block. The net effect is that residential users effectively see a constant rate.

Introducing an Inclined Block Rate

Introducing an inclined block rate to the residential customer category may encourage further demand reductions – and particularly maximum day demand resulting from outdoor summer use. Adding another tier to the water price sends a specific message to customers: that excess water use is discouraged and will cost more. This price signal will motivate some individuals to change behaviour and consume less “excessive” water. This is mainly summer outdoor use such as irrigation and outdoor washing.

Next Steps...

The City has undertaken a Water Rate Study during the year 2012 and will be passing a new bylaw with adjustments to rates for 2013.



5.3. Enhanced Billing Information

Universal metering empowers users to affect their water costs. This is achieved at the point of billing by presenting users with their metered consumption and the resulting cost based on a price structure. Meter reads and volume pricing alone provide great incentive to reduce consumption. The greatest reductions are achieved by combining these with additional information on “how” to reduce consumption. Additional information can include the following:

Next Steps...

- Reporting per-capita demand for residential customers and comparing this with other comparable communities in BC and Canada;
- Providing a system average and noting where individual users are relative to the average;
- Reminding top users that they are the biggest consumers;
- Reminding users of some cost effective approaches to reducing water consumption;

5.4. Outdoor Water Use Efficiency

Outdoor water use in the summer tends to be the biggest contributor to maximum day demand. The following measures can lead to reductions in outdoor use and help minimize max day demand.

Next Steps...

- Encourage the use of water efficient landscape and irrigation designs; provide a guide to homeowners and landscapers on water efficient landscaping;
- Provide examples of water efficient landscaping at public sites;
- Investigate a program to offer one-time discounts on water bills for water efficient garden designs / irrigation systems connected to sensor / professionally installed irrigation systems;
- Review and update water-use regulations bylaw;

5.5. Indoor Water Use Efficiency

Indoor water use represents a significant portion of average day demand. The most effective measures to help reduce indoor water use are related to installing water efficient devices and appliances. There is a natural uptake of these devices already: each year as homes and businesses are renovated, older devices and appliances are replaced with newer more efficient ones. The City can encourage and support this trend in several ways:

Next Steps...

- Provide brochures reminding users of the most cost-effective water efficient devices and appliances. Include in brochures indoor leak awareness education as well: dripping faucets, running toilets etc...
- Investigate offering a rebate for certain water efficient fixtures, appliances, and major commercial equipment;
- Visit and audit large commercial users; collaborate with them in developing a plan for upgrading fixtures and other commercial equipment;
- Present water smart awards for reducing usage;

5.6. Public Engagement

Passive Engagement

Information and education are of major importance in a conservation program. They support changes in the water use patterns of consumers. Customers who are informed and involved are more likely to support conservation goals. Elements of an information and education program may include:

- Understandable water bills
- Informative water bills
- Landscaping guidelines
- Winter bleeding guidelines
- Rainwater Harvesting guidelines
- Indoor water conservation guidelines
- Water bill inserts
- School programs
- Public education program
- Workshops
- Advisory committee
- Website related content including comparisons within and outside the community

Active Engagement

Providing information in a passive way is important to the overall water conservation program. However, it is more effective to be interactive and engage the public directly. The City will investigate how it can better reach the public in a more interactive way by exploring the following approaches:

Next Steps...

- Investigate undertaking a survey of the public to better understand public behaviours and expectations;
- Investigate developing online interactive content for the website: water conservation calculators, water conservation-oriented videos; other applications including games related to water conservation;

6. Implementation Strategy

This section outlines how this water conservation plan will be implemented. Implementation schedules on the subsequent two pages will be filled out as more details are known: who will be involved and when certain activities will be undertaken.

6.1. Adoption of the Plan

City Staff will review this plan with Council and pending approval by Council Resolution, a final version of this plan will be adopted and implemented by City Staff.

6.2. Monitoring and Evaluation

The City will continue to gather data on flows and consumption and report annually on the results including the following system parameters:

- Total system production
- Tri-annual and annual consumption for each customer and totals for each customer category
- Per-capita domestic demand
- System average day and maximum day demand

The City will plot these parameters on a graph along with earlier historical values. A trend line will be adjusted annually to show whether the City is on track to meet the targets outlined in previous sections.

6.3. Implementation Schedule

A schedule for implementing the selected water conservation measures is presented in Table 6.1.

Table 6.1: Implementation Schedule for Short-Term (2013 – 2015) Measures

Measure	Required Action	Internal Responsibility	Action Partners	Action Schedule			Notes
				2013	2014	2015	
Improve Water Use Accounting	Annual update of Water Balance Sheet including Infrastructure Leakage Index (ILI)	Eng.		✓	✓	✓	
	Improve Reporting of Municipal non-revenue water uses	Eng.			✓		
	Develop a meter testing program	Eng.		✓			Accuracy analysis underway
	Upgrade meters for large users	Eng.		✓			Included in 2013 operations budget (\$40,000)
	Investigate continuous metering technology	Eng.		✓			Research and meeting with suppliers
	Investigate, pilot, launch district metered areas	Eng.				✓	
	Conduct night-flow analysis	Eng.				✓	
	Develop a leak detection and repair strategy	Eng.				✓	
Inclined Block Rates	Conduct rate review study and implement inclined block rates	Eng.		✓	✓		
Enhanced Billing Information	Reporting domestic demand statistics and comparing with other communities	Eng. & Finance		✓			
	Reporting domestic average and noting relative position on individual bills	Eng. & Finance		✓			
	Reminding top users	Eng. & Finance		✓			

Measure	Required Action	Internal Responsibility	Action Partners	Action Schedule			Notes
				2013	2014	2015	
	Reminding users of key conservation strategies at home	Eng. & Finance			✓		
Outdoor Water User Efficiency	Develop Water Efficient Gardening Guide	Eng. & Parks		✓			
	Water Efficient Gardening examples at public sites	Eng. & Parks				✓	
	Examine one-time discounts on water bills for water efficient designs	Eng. & Parks				✓	
	Review and update water use regulation bylaw	Eng.			✓		Review and upload to website
Indoor Water User Efficiency	Explore rebates for water efficient fixtures	Eng.			✓		
	Visit and audit large users	Eng.		✓			
	Explore water smart award program	Eng.			✓		
Public Engagement	Public Survey on Water Conservation	Eng.			✓		
	Online Interactive Content	Eng.			✓		

References

- [1] Koers & Associates Engineering Ltd., (2010). Alberni Valley Regional Water Study Update (Final Report). Available at: <http://www.acrd.bc.ca/cms/wpattachments/wpID249atID804.pdf>
- [2] BC Ministry of Environment (2008). Living Water Smart, British Columbia's Water Plan. Available at: <http://livingwatersmart.ca/book/>
- [3] Brandes, O.M & Brooks, D.B. (2007). The Soft Path for Water in a Nutshell. Available at: <http://poliswaterproject.org/publication/23>
- [4] Wong, J., Porter-Bopp, S., & Brandes, O. (2009). Water Conservation Planning Guide For British Columbia's Communities. POLIS Toolkit Series 1.0. Available at: <http://poliswaterproject.org/publication/243>
- [5] U.S. Environmental Protection Agency (1998). Water Conservation Plan Guidelines. Available at: <http://epa.gov/watersense/pubs/guide.html>
- [6] Environment Canada (2011). Municipal Water Use Report. Available at: http://www.ec.gc.ca/Publications/B77CE4D0-80D4-4FEB-AFFA-0201BE6FB37B/2011-Municipal-Water-Use-Report-2009-Stats_Eng.pdf

Appendix A: Water System Profile for Port Alberni

The City of Port Alberni is supplied from a surface water intake on China Creek, supplemented by stored water in Bainbridge Lake. The China Creek intake consists of a dam across the river at elevation 184 m.

In 2005, the Hupacasath First Nation established a hydro-electric generating station on China Creek, taking water upstream from the water supply intake, and discharging downstream of the intake. An agreement between the City of Port Alberni and the Hupacasath First Nation (3) governs the joint use of the Creek with appropriate priority provisions for water supply and fisheries release.

The China Creek watershed above the intake is 5,700 ha in area. A dam on Lizard Lake provides an off-line watershed storage volume of 545,000 m³ that is released during the summer if creek flows drop below minimum values.

The China Creek supply is subject to frequent turbidity spikes in response to high runoff. When turbidity threatens to exceed 1 NTU, the supply from China Creek is shut down and water is then drawn from Bainbridge Lake, which has a live storage volume of 1,230,000 m³. Water from Bainbridge Lake can flow to the City distribution system by gravity to the Lower and Upper Cowichan reservoirs, or by pumping under high demands. A pump station at the Lower Cowichan reservoir can transfer water to the Upper Cowichan Reservoir as well.

The water supply is chlorinated at the Bainbridge pump station. The total licenced capacity is 34,240 m³/day (24,450 from China Creek and 9,790 from Bainbridge). The hydraulic capacity of the supply system is 24,500 m³/day from China Creek and 15,700 m³/day from Bainbridge Lake.

The City maintains an emergency source on the Somass River, with a licenced capacity of 13,565 m³/day and a hydraulic capacity of the pump station of 17,000 m³/day. This source of water is chlorinated. It is only used in emergency conditions because of poor water quality in the summer months from fish runs and agricultural runoff upstream.

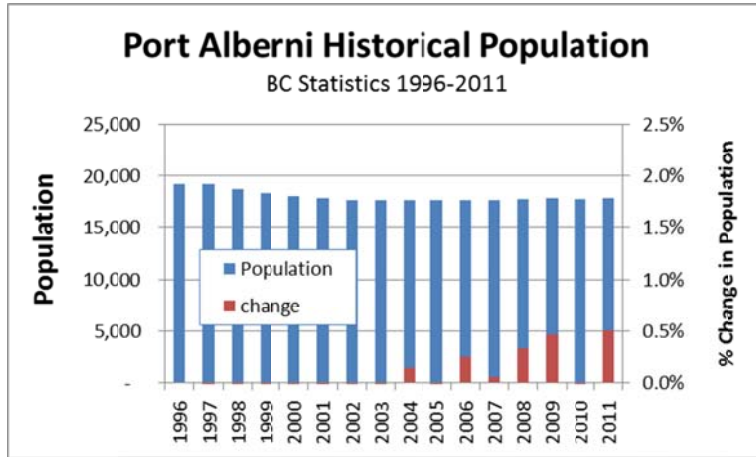
The City water distribution system is divided into several pressure zones, controlled by the main distribution reservoirs at Upper and Lower Cowichan, Burde Street, and Johnston Street, most of which are interconnected by pressure reducing valve stations. The various pressure zones originated as the system developed with merging of separate systems after amalgamation of North and South Alberni, further complicated by the variable topography and the presence of several deep ravines with few road crossings.

Since 1995 the City has also incorporated the Sahara Heights and Arrowsmith Heights Water Users Communities, and integrated the distribution systems of these areas with the City's water system.

The City is also currently in the process of negotiating a partnership to supply Beaver Creek Improvement District with water.

The City completed universal metering of all residential connections in 2005 and is now fully metered.

Figure A1: Port Alberni Population 1996 to 2011



The population of Port Alberni declined by about 8% from around 1995 to 2003. Industrial and commercial activity during this time also declined (Koers, 2010). The population of Port Alberni has steadily increased over the past decade.

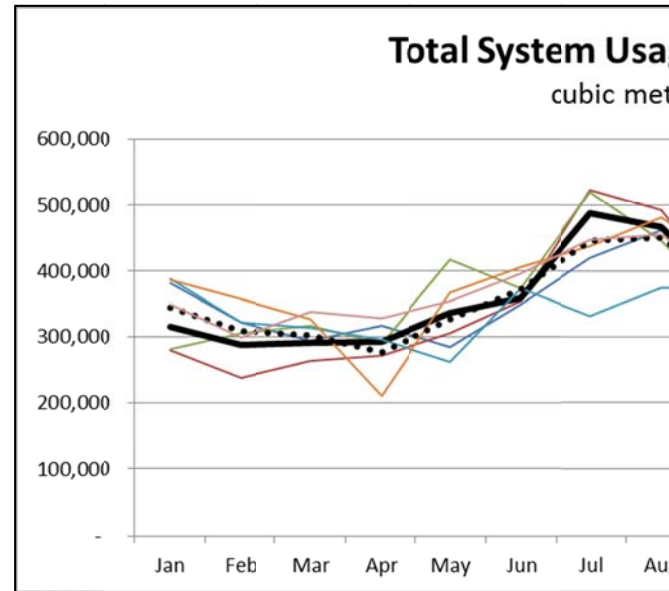


Figure A3: Port Alberni Population Projection

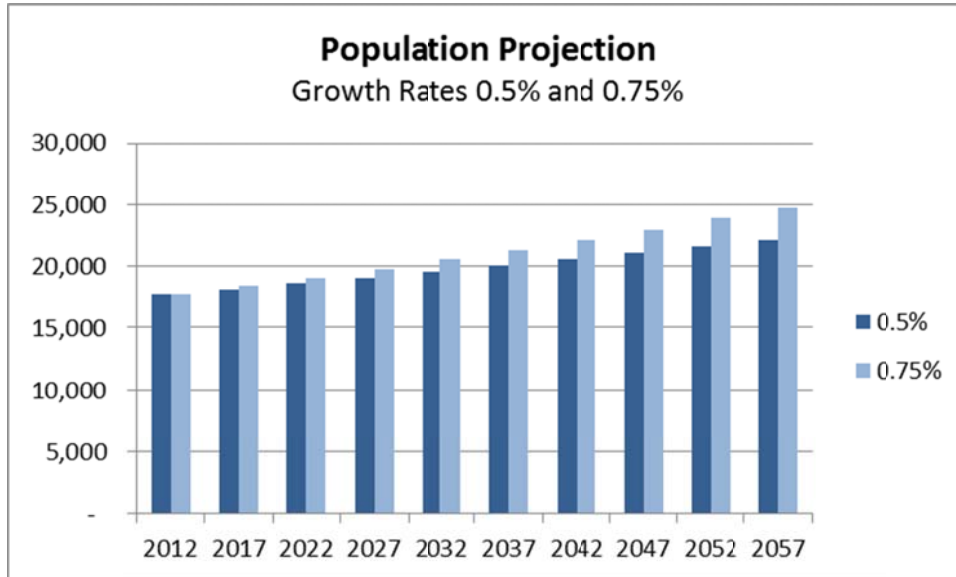


Figure A4: Port Alberni Projected Total Annual Demand

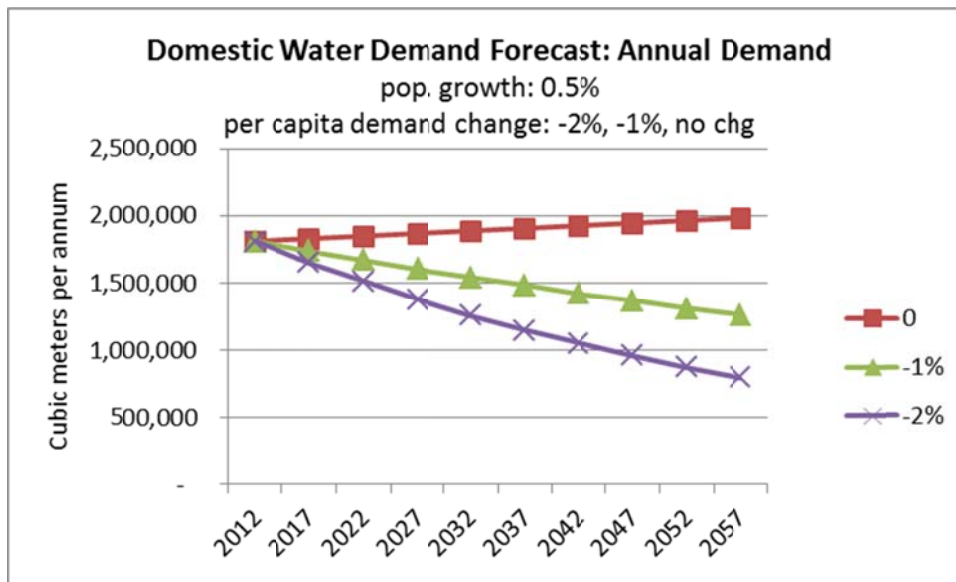


Figure A2: Port Alberni Monthly Water Demand 2006-2011

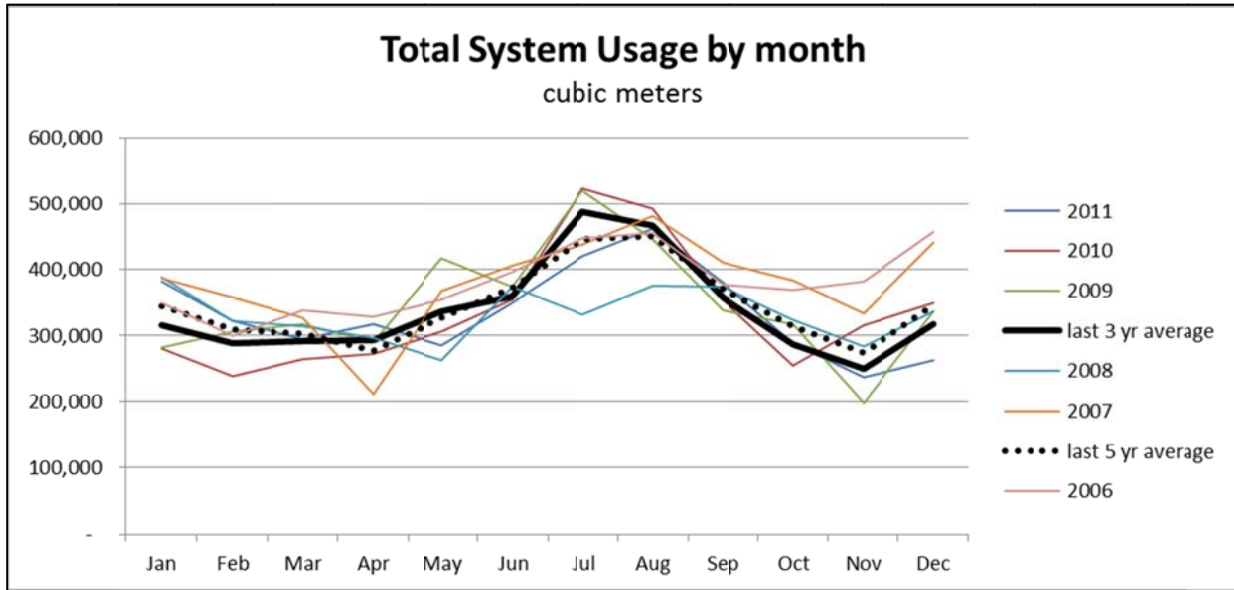


Figure A3: Port Alberni Population Projection

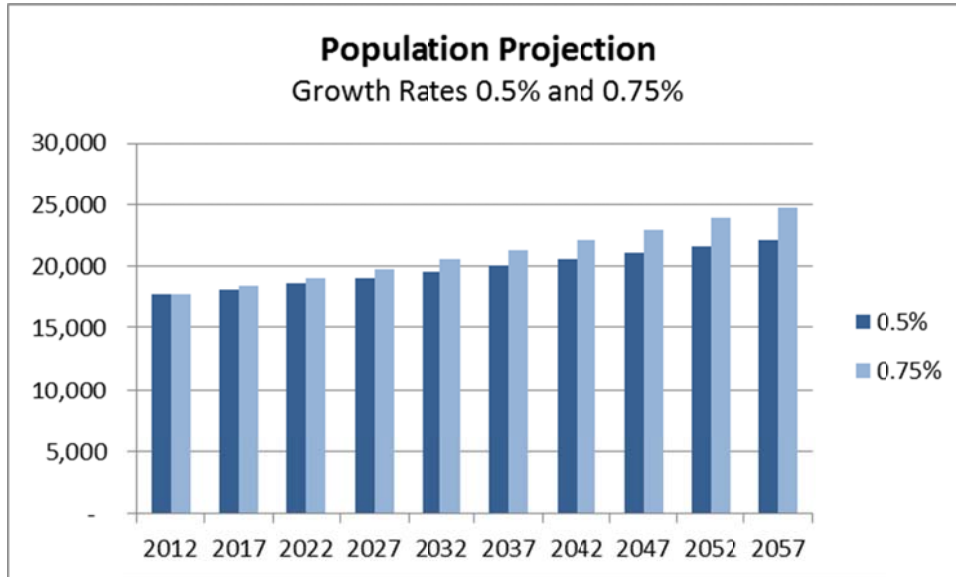
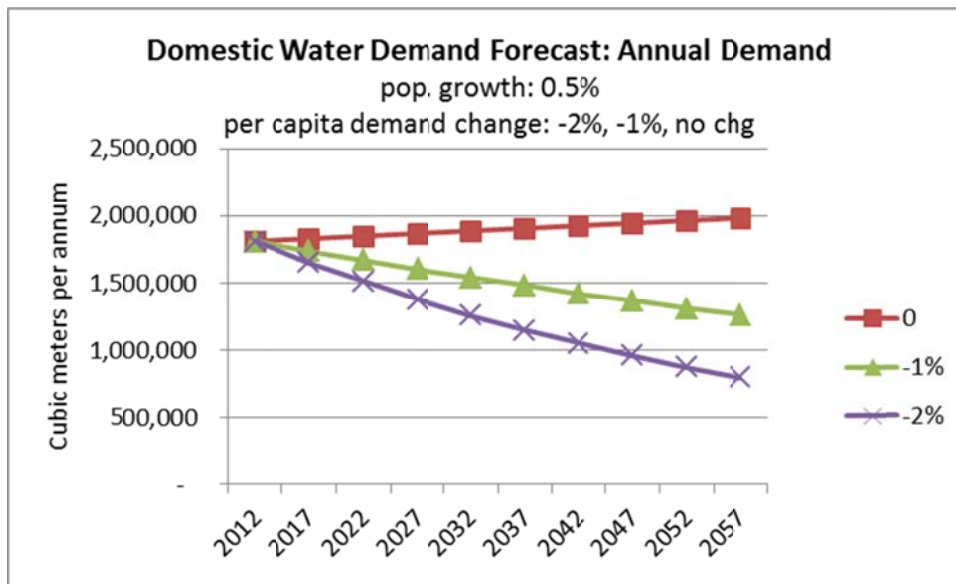


Figure A4: Port Alberni Projected Total Annual Demand



Appendix E: Water Conservation Measures Review

Water Conservation Priorities	
High Priority	0
Medium Priority	0
Low Priority	0

Port Alberni Water Conservation Measures Shortlist

	Criteria 1 Easy to Do	Criteria 2 Affordable	Criteria 3 Acceptable	Criteria 4 Effective	Total	Priority
Universal Metering, Pricing & Billing						
M1 Develop a meter testing, calibration, repair and maintenance program; identify potential inaccuracies due to age; upgrade meters for large users; adopt continuous metering technology	2	4	4	2	12	2013
M2 Send notices to high users	4	4	3	3	14	2013
M3 Provide information with water bill comparing use to other users	2	3	5	3	13	2013
Water Accounting						
M4 Complete an annual water balance sheet	5	5	5	1	16	2013
M5 Identify cause of high winter use	3	3	5	3	14	2013
Non-Revenue Water Control						
M6 Develop a non-revenue water control strategy	3	3	5	5	16	2013
Develop Infrastructure Leakage index						
Night Flow analysis						
High winter use investigation						2013
Analyze network model to and develop DMA strategy						2013
Improve reporting of non-revenue water						
Pressure Management						
Develop a leak detection & repair strategy						2013
Public Awareness and Involvement						
M9 Develop new brochures e.g. Landscape Guide to Water Efficiency, Indoor Water Conservation	3	3	4	1	11	2013
M10 Develop a website including water use calculators and brochures	3	3	4	1	11	2013
Outdoor Water Use Efficiency						
M13 Showcase water efficient landscape and irrigation designs at public sites	2	2	4	1	9	TBC
M14 Offer one-time discounts on water bills for water efficient garden designs / irrigation systems connected to sensor / professionally	1	3	3	3	10	TBC
M15 Review and update water-use regulations bylaw	3	3	3	3	12	2013
Indoor Water Use Efficiency						
M16 Offer a rebate for water efficient fixtures, appliances, and major commercial equipment	2	2	4	3	11	TBC
M17 Visit and audit large users; present water smart awards for reducing usage	3	4	4	4	15	2013

Appendix F: Notes

Summary of Discussion between Guy, JP and Chris Downey (Koers)
Email JP to Guy & Chris – August 9, 2012

Context

Development of PA Water Conservation Plan. Two equally important drivers are scarcity and cost savings. The current supply may approach capacity in the future. Bringing Sproat Lake online will greatly improve supply but that is not a given at this point. Reducing water usage will also reduce the cost of service and increase chances of success in getting a senior govt grant for WTP project. There are two main categories of costs – O&M, and infrastructure. Many factors affect these costs including three fundamental service characteristics outlined below.

Average Day Demand (ADD)

Average day demand affects operating costs, especially treatment costs; capital costs can also be affected when certain thresholds are exceeded.

PA Domestic per capita demand is 281 Lcd – Canadian average domestic per capita demand for metered communities is 229 Lcd

It is reasonable to expect per capita demand to decrease further.

Natural uptake of water efficient appliances and devices is contributing about 0.5% to 2% decreases per annum in many communities across BC.

Introducing inclined block rates to customers may further encourage water use reductions, particularly in the summer.

PA unmetered non-revenue water (leaks, flushing, fire dept) is about 20% - JP thinks majority of that is attributable to leaks – needs further investigation.

The master meter readings indicate elevated water use during winter months, suggesting possible winter bleeding –needs further investigation.

Future pump stations and reservoirs will need to be designed with ADD in mind.

Leak Detection – DMA metering – repair leakage around existing reservoirs

Pressure Management - controlling PRVs with SCADA at night, reducing pressure to reduce nighttime leaks

Maximum Day demand (MDD)

Max day demand affects the Capacity of the source (pumping and treatment)

In the past few years, MDD for PA (pop 17,000) has been about 1,250 Lcd.

The proposed regional water system total maximum day demand requirement based on population of 30,000 using 1,000 Lcd.

Residential summer use may be largest contributor to MDD.

Have lots of distribution storage but it's ageing; PA will need to make critical decisions soon about upgrades to distribution storage.

Maximum hour demand (MHD)

Max hour - 32,000 m³/day = 360 - 380 lps → 1,850 lcd

MHD impacts main distribution water pipework – MHD is indirectly impacted by focusing on reducing MDD.

Chris has a hydraulic model of City water and sewer infrastructure.

Developing specific targets for MHD may be too technical for now – City may review again in a future update to the WCP.

APPENDIX 8 - OFFICE PAPER USE

**CITY OF PORT ALBERNI
PAPER USE**

FACILITY	PAGES TONNES GHG 2012	PAGES TONNES GHG 2013	PAGES TONNES GHG 2014
City Hall – Upstairs	423,880 4.8	464,576 4.8	431,896 3.46
City Hall – Downstairs	104,044 1.3	107,172 1.4	79,669 1.0
Echo Centre & Multiplex	458,308 5.8	335,765 4.3	338,416 4.3
Works & Park Yards	72,010 0.9	69,566 0.9	68,152 0.9
Fire Hall	37,782 0.5	33,961 0.4	33,377 0
Other Locations	303 0.0	0 0.0	290 0.0
TOTAL	1,096,327 13.3	1,011,040 11.8	951,800 10.1

* Equal to approximately 125 trees per year.

** Emissions Factors from Table 6 of 2012 B.C. BEST PRACTICES
METHODOLOGY FOR QUANTIFYING GREENHOUSE GAS EMISSIONS

Table 6: Office Paper

PCR Content (%)	Emission Factor (kg CO ₂ e/ pkg)		
	8.5" x 11"	8.5" x 14"	11" x 17"
0	6.358	8.094	12.743
10	6.123	7.795	12.272
20	5.888	7.496	11.802
30	5.653	7.197	11.331
40	5.418	6.898	10.860
50	5.184	6.599	10.390
60	4.949	6.300	9.919
70	4.714	6.001	9.449
80	4.479	5.703	8.978
90	4.244	5.404	8.508
100	4.010	5.105	8.037

Note: emission factors for office paper are based on a 500-sheet package of 20-pound bond paper

APPENDIX 9 - STREET TREE/ FOREST SEQUESTRATION

Estimate of GHG Sequestered by City Forest Lands & Street Trees

Forested Land Location	Area (ha)	% Forested	Forested Area (ha)	t GHG seq /ha/yr	t GHG Seq
Ship Creek south of Anderson Lands	10.9	80%	8.7	3.00	26
Ship Creek Ravine Lands	9.2	100%	9.2	3.00	28
Comox / 15th /Maquinna Lands	52.7	100%	52.7	3.00	158
Weaver Park and Coal Creek Lands	3.2	70%	2.2	3.00	7
Dry Creek Ravine and Park Lands	70.6	90%	63.5	3.00	191
Roger Creek Ravine and Park Lands	70.9	90%	63.8	3.00	191
Lands to north behind Pacific Rim Mall	6.7	90%	6.0	3.00	18
Cherry Creek Ravine Lands	6.9	100%	6.9	3.00	21
Kitsuksis Creek Ravine and Park Lands	16.5	95%	15.7	3.00	47
Lugrin Creek Lands	8.4	70%	5.9	3.00	18
Lands adjacent to Westporte Place	28.6	95%	27.2	3.00	82
Paper Mill Dam Park	18.3	75%	13.7	3.00	41
Somass and Seaton Parks	20.2	100%	20.2	3.00	61
McLean Mill	12.6	40%	5.0	3.00	15
Totals	335.7	90%	300.8		902

Street Trees	Type Trees	# Trees	t GHG /tree/yr	t GHG Seq
Planted trees in boulevards and City Parks	deciduous	2928	0.03	87.84
Sub Total (tonnes/yr CO2 equiv sequestration)				88
TOTAL ESTIMATED CO2 SEQUESTRATION BY TREES				990

**City of Port Alberni Parks Department
STREET TREE INVENTORY**

STREETS	BETWEEN	TYPE	NUMBERS	TOTAL
11 th Avenue	Ravenhill & Scott St.	Pissardi Plum, Kwanzan	33, 2	35
11 th Avenue Park	Park area	Maples	27	27
11 th Avenue	Off Ravenhill (cul de sac)	Green Ash	6	6
12 th Avenue	Dunbar & Argyle	Kwanzan	10	10
12 th Avenue	Bruce Street & Neill Street	Kwanzan	19	19
14 th Avenue	North & South off Comox	Green Ash, Kwanzan	6, 10	16
15 th Avenue	China Creek & Church	Maples	10	10
15 th Avenue	Neill & Fowlie Crescent	Maples	7	7
16 th Avenue	China Creek & Church	Pissardi Plum, Hornbeams	4, 5	9
16 th Avenue Park		Kwanzan, Pissardi Plum	2, 0	2
17 th Avenue	Argyle & Church Road	Maples	23	23
18 th Avenue	Off Argyle (cul de sac)	Pissardi Plums	4	4
2 nd Ave Parking		Catalpa	2	2
3 rd Ave Median	Centre Strips	Maples, London Planes	10, 16	26
3 rd Avenue	Dunbar & Redford	Pissardi Plums, Cherry	40, 2	42
3 rd Avenue	Argyle & Mar Street	Hornbeam, Kwanzans, Ash, Maple	8, 8, 8	24
4 th Avenue	North & South off Neill	Pissardi Plums	16	16
4 th Avenue	Argyle & Montrose	Maples	27	27
5 th Avenue	Neill St & Scott St	Pissardi Plums	4	4
6 th Avenue	Roger St. & Wallace including parking lot	Pissardi Plums	7	7
7 th Avenue	Neill Street & Scott Street	Pissardi Plums, Hawthorn, Kwanzan	10, 7, 1	18
8 th Avenue	Wallace & Roger	London Planes, Maple	17, 1	18
8 th Avenue	Redford & North Park	Pissardi Plums	40	40
8 th Avenue	Bruce St & Neill St	Maples	36	36
9 th Avenue	Dunbar & North Crescent	Pissardi Plums, Maples, Birch	13, 8, 3	24
9 th Avenue	Redford & Burde	Kwanzans	5	5
9 th Avenue	Montrose & Bruce St	Pissardi Plums	16	16
Adelaide	Johnston & Southgate	Maples, Hawthorn	4, 5	9
Adelaide	Johnston & Burke	Pissardi Plums	7	7
ADSS	Shrub Bed	Pine, Hornbeam	1, 1	2
Alderwood	10 th Ave & 8 th Avenue	Pissardi Plums	4	4
Anderson Ave	Redford & Maitland	Mountain Ash, Hornbeam	36, 4	40
Anderson Ave	Ravenhill & Scott St	Kwanzan, Maple	15, 7	22
Angus	3 rd Avenue & 5 th Avenue	Maples, London Planes	13, 14	27
Arena	9 th Avenue & Dunbar	Cherry, Hornbeam	9, 3	12
Argyle	10 th Ave & Anderson Ave	Mountain Ash	15	15
Argyle	Anderson Ave & 18 th Ave	London Plane, Green Ash	27, 17	44
Argyle	Kingsway & Harbour Rd	Maples	17	17

Athletic Hall		Pissardi Plums, Maples	10, 7	17
Beale St	Off Helen	Mountain Ash	18	18
Beaufort	Off Helen	Pissardi Plums	17	17
Bishop	Craig & Grieve Road	Pissardi Plums	32	32
Bishop	Johnston Road & Craig	London Plane, Maples	1, 20	21
Blair Park	Burms	Deciduous		0
Blair Park	Open Areas	Deciduous	21	21
Bob Dailey Stadium		Maples	19	19
Bruce Street	7 th Avenue & 10 th Avenue	Maples, Pissardi Plums	3, 19	22
Burke Boulevard	Helen & Margaret	Tulipifera, Plane, Kwanzans	1, 1, 20	22
Bute Street	10 th Ave & 11 th Ave	Maples	2	2
Bute Street	9 th & 10 th Avenue	Maples	10	10
Cameron Drive	Mallory & Rita	Mountain Ash	20	20
Cameron Drive	Rita & Hamilton	Kwanzan	27	27
Cedarwood Centre		Kwanzan, Pissardi Plums	1, 4	5
China Creek	16 th Ave & 18 th Ave	Pissardi Plums	16	16
China Creek	8 th Ave & 10 th Ave	Pissardi Plums, Maples	5, 5	10
Comox Street	Anderson & 15 th Street	Green Ash, Kwanzan	4, 7	11
Craig Street	Ian Avenue & Michigan	Pissardi Plums	40	40
Dunsmuir	Off Strathcona	Maples	20	20
Echo Centre		Kwanzans, Maples, Birch	33, 7, 1	41
Echo Baseball	3 Field Perimeter	Oaks, Beech, Maple	5, 3, 6	14
Echo Fieldhouse		Fir, Maple, Cherry	1, 9, 5	15
Echo Fieldhouse		Locust	10	10
Echo Baseball	3 Field Perimeter	Tulip, Planes, Dawn Redwood	10, 4, 4	18
Elizabeth	Lathom & Glenside	Hornbeams, Ash	6, 13	19
Elizabeth	Southgate & Burke Blvd.	Maples, Blairians Plum, Cherry	27, 0, 1	28
Firehall		Kwanzan, Red Maple	5, 1	6
Fowle Crescent	Neill & 15 th Street	Hornbeam	19	19
Gertrude	Roger St. & Burke	Maples, Hawthorn	20, 14	34
Glenside	Ian Avenue & Bishop	Pissardi Plums	53	53
Glenside Cres.	Spencer St. & Tracks	Kwanzan, Pissardi Plums	1, 27	28
Glenwood Centre		Hemlock, Pine, Birch	4, 4, 4	12
Glenwood Park		Kwanzan, Pissardi Plums	0, 3	3
Government Office	Johnson at Victoria Quay	Hawthorne, Birch, Linden	3, 2, 2	7
Hamilton Drive	Cameron & Motion	Pissardi Plums, Maples	28, 12	40
Harbour Quay	Lawn, Stores, Parking Lot	Linden, Kwanzans, Maples	3, 4, 31	38
Haslam	Tebo & Cherry Creek	Kwanzan, Pissardi Plums	13, 20	33
Helen	Burke & Lathom	Kwanzan	20	20
Helen	Johnson Road & Burke	Pissardi Plums	15	15
Hill Grass	Off 18 th Avenue	Pissardi Plums, Hornbeams	1, 4	5

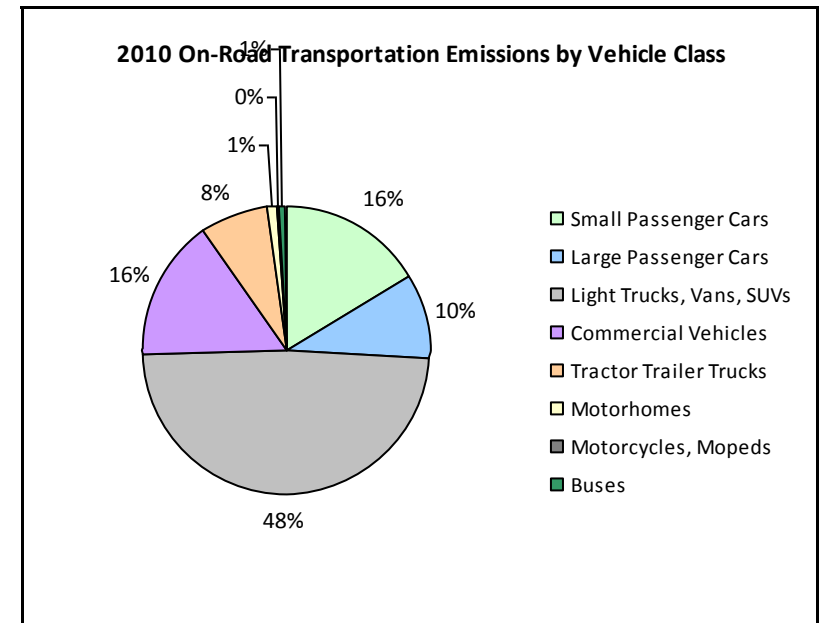
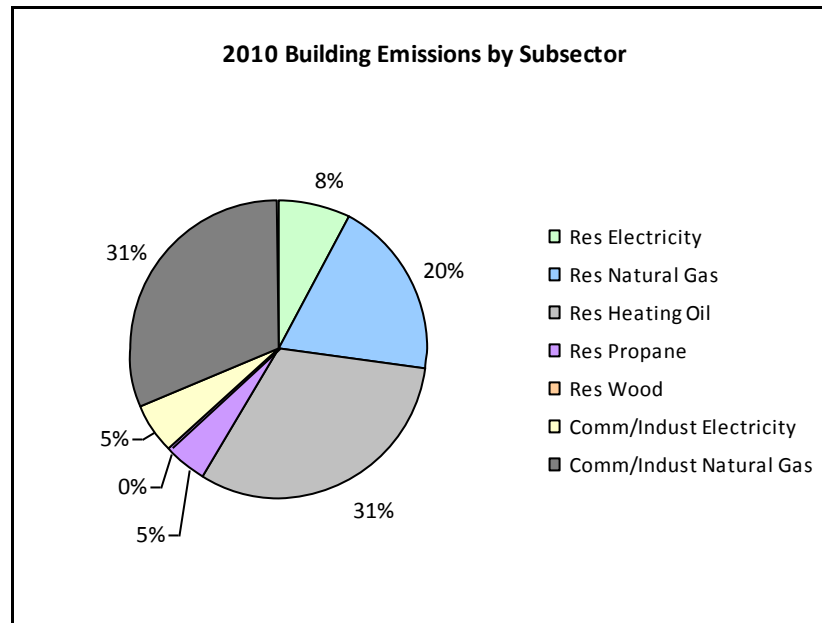
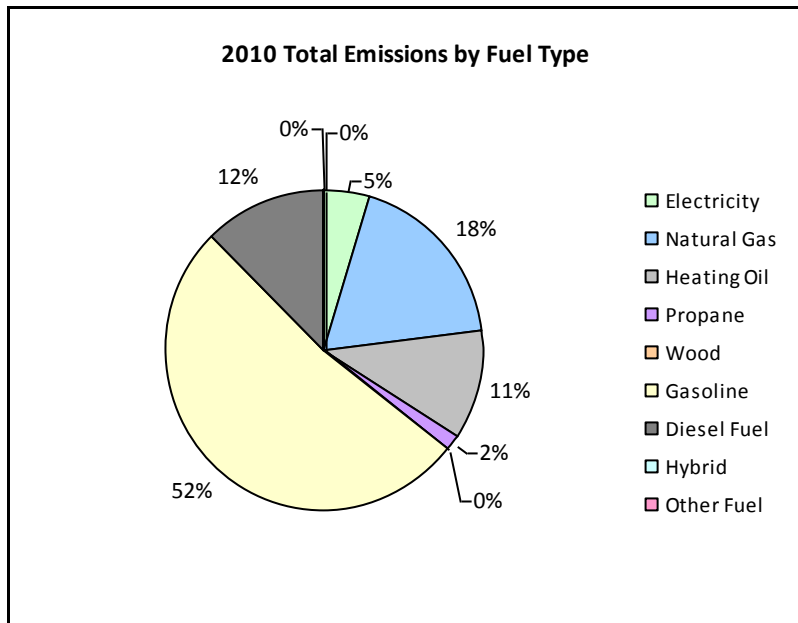
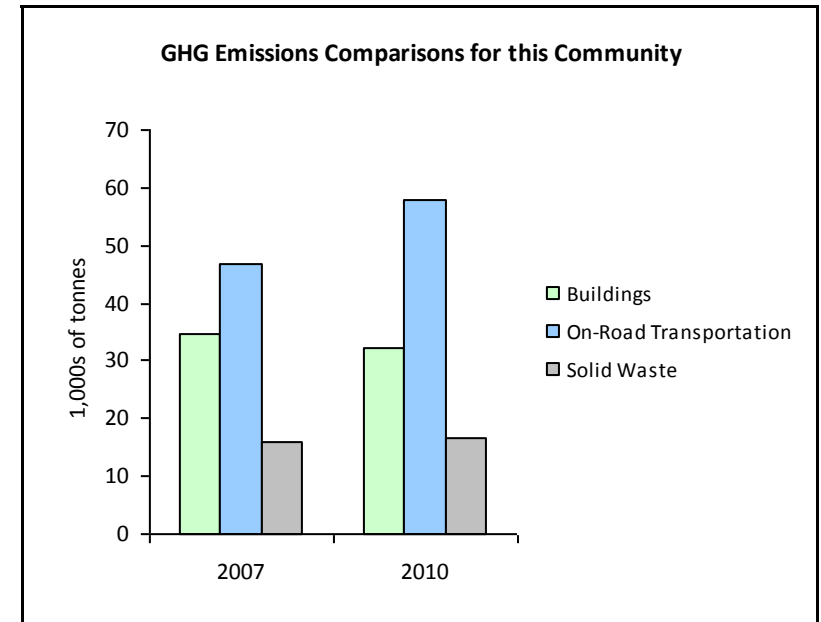
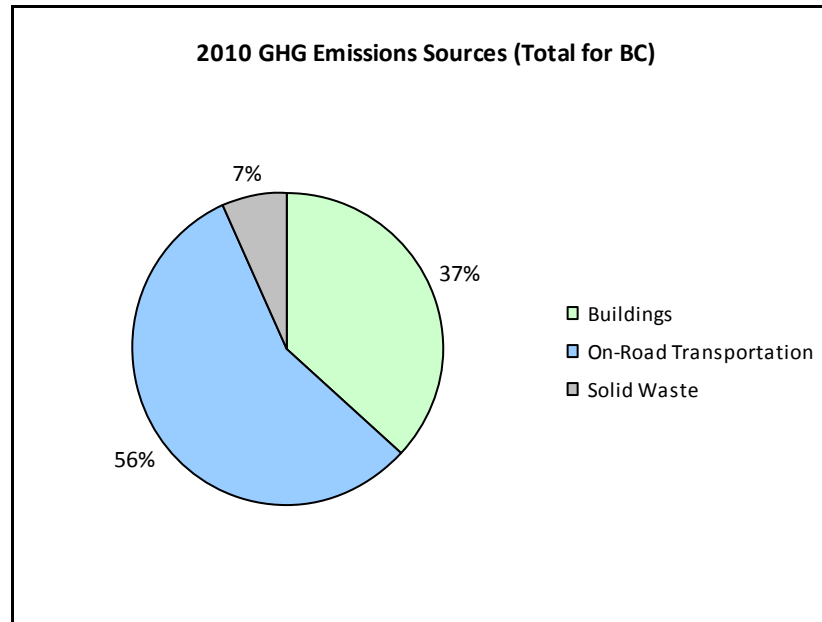
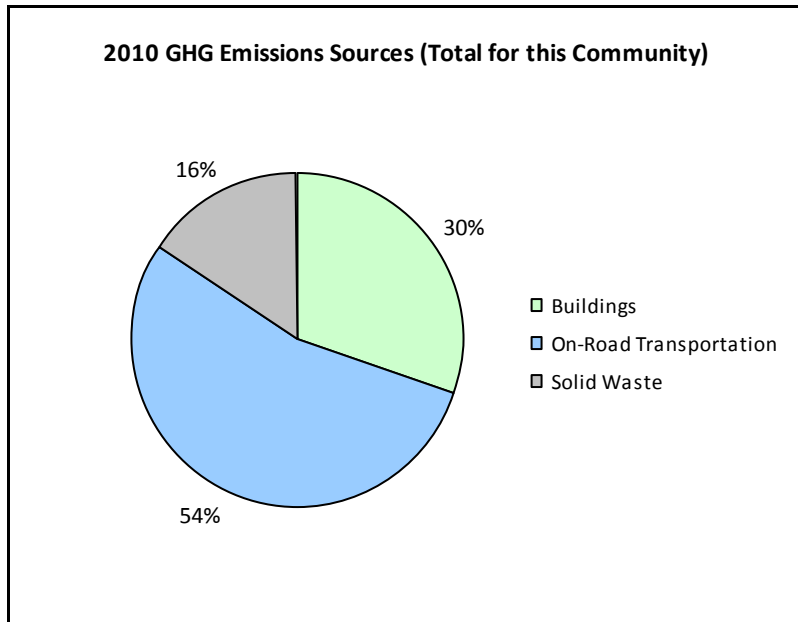
Ian Avenue	Johnston Road & Craig	Kwanzans, Pissardi Plums	3, 41	44
Johnston Road	Helen & Victoria Quay	Kwanzans	38	38
Kingsway Parking Lots		Plane, Tulipifera, Sweetgum	15	15
Kitsuksis Dyke	Along Walkway	Willows, Cherry, Locust	4, 1, 7	12
Kitsuksis Dyke	Burms	Evergreen, Deciduous	53, 61	114
Klitsa Park		Poplars	10, 50?	60
Klitsa Park		Pissardi Plums, Maples, London Planes	3, 6, 12	21
Lathom	Ian Avenue & Margaret	Hawthorn, Kwanzan	2, 90	92
Leslie	Johnston Road & Craig	Maples	43	43
Maitland	6 th Avenue & 5 th Avenue	Mountain Ash	3	3
Mallory Drive	Off Cameron	Maples	7	7
Mar	3 rd Avenue & 5 th Avenue	Maples	19	19
Margaret	South & Burke Blvd.	Accolade Cherry	24	24
Marina		Birch, Oak, Evergreen	2, 1, 11	14
Marina		Pissardi Plum, Maples	9, 11	20
May Street	Beaufort & Beal Street	Kwanzans	6	6
McIntyre Drive		Maples	14	14
Meadow Street	Off Josephine	Kwanzans	16	16
Michigan	Tebo & Cherry Creek	Pissardi Plums	20	20
Montrose	3 rd Avenue & 5 th Avenue	Maples	9	9
Morgan	North & South	Cherry, Plum	43, 30	73
Morrison Road	Cul de sac	Hornbeam, Mountain Ash	1, 16	17
Morton	7 th Avenue & 10 th Avenue	Kwanzan	20	20
Morton	Cameron & Hamilton	Pissardi Plums, Kwanzan	19, 16	35
Mulhern	Haslam & Cherry Creek	Pissardi Plums	7	7
Neill Street	11 th Avenue & 9 th Avenue	Kwanzan	9	9
Neill Street	15 th & 17 th Avenue	Pissardi Plums, Hornbeam	1, 9	10
Penny Lane		Magnolia, Redwood, Cherry	1, 1, 11	13
Penny Lane		Birch	2	2
Princess	Johnston Road & Leslie	Kwanzans, Plum, Maples	6, 1, 28	35
Ravenhill	Anderson & 11 th Avenue	Green Ash	4	4
RCMP		Kwanzans, Maple	1, 3	4
Recreation Park	Whole Park	Hawthorne, Plum, Maple	1, 3, 20	24
Recreation Park	Whole Park	Locust, Cherry, Poplar	12, 8, 2	22
Redford Strip		Jap. Cherries, Kwanzan	33, 2	35
Regina	Craig & Johnston Rd	Kwanzans	37	37
Rex	Ian Avenue & Tebo	Hornbeams, Mountain Ash	7, 34	41
Russell Park		Maples, Plums, Planes	50, 10, 4	64
Scott Street	Off Anderson (cul de sac)	Cherry	8	8
Scott Street	5 th Avenue & 12 th Street	Pissardi Plums, London Planes	3, 10	13

Scott Street	Anderson & 14 th Avenue	Cherry	6	6
Side of City Works		Maples	4	4
Southgate	Gertrude & Victoria Quay	Accolades, Maples	5, 2	7
Southgate	Johnston & Gertrude	Kwanzans	29	29
Spencer	Lathom & Glenside Cres.	Pissardi Plums	20	20
Stirling Park		London Planes	26	26
Stirling Park		Maple	4	4
Strathern Park		Vine Maple, Beech	6, 1	7
Sweeney & Echo Major	Perimeter edges	Maples, Hornbeams	18, 14	32
Tebo Avenue	Johnston Rd. & School	Littleleaf Lindens	55- 25	25
Train Station		Maples, Cherry	3, 1	4
Upper Dry Creek	Jessica States Memorial	Cherry	3	3
Victoria Quay		Cherries, Kwanzans, Maples	13, 2, 4	19
Williamson Park		Maple, Ash, Plane	9, 1, 4	14
Wood Street	Exton & Redford St.	Pissardi Plums	15	15
Wood Median		Maples, Beech	11, 1	12
Echo Park Parking Lot		Crab Apple	5	5
Northwest Sweeney	Lawn Bowling Island Turnaround	Gingho, Eastern Redbud, Maples	3, 5, 3	11
Booth Bench		Service Berry	3	3
Harbour Quay Marina		Linden	11	11
Sweeney W Side		Maple, Chestnut, Beech	4, 2, 2	8
Multiplex		Omrika Spruce, Vine Maple	5, 4	9
Echo Minor Softball		Maples, Cedars, Planes, Firs	42, 4, 2, 2	50
Westport		Cedar Maple	60	60

Port Alberni City

Draft 2010 Community Energy and Emissions Inventory

Monitoring and reporting on progress towards greenhouse gas emissions reduction targets



Port Alberni City Draft 2010 Community Energy and Emissions Inventory

Monitoring and reporting on progress towards greenhouse gas emissions reduction targets

Core Items

On-Road Transportation		2007					2010				
		Connections	Consumption	Avg VKT (km)	Energy (GJ)	C02e (t)	Connections	Consumption	Avg VKT (km)	Energy (GJ)	C02e (t)
Small Passenger Cars	Hybrid	<10	644 L	20,100	2	2	<10	3,239 L	19,200	11	8
	Gasoline	3,082	3,432,676 L	14,400	120,144	8,166	3,260	3,859,701 L	15,100	135,090	9,099
	Diesel Fuel	56	70,194 L	23,700	2,688	192	76	102,370 L	24,600	3,921	280
	Other Fuel						<10	1,699 L	21,200	65	3
Large Passenger Cars	Hybrid	13	10,593 L	24,100	37	25	40	46,189 L	24,100	162	95
	Gasoline	1,722	2,281,349 L	13,800	79,847	5,440	1,706	2,350,264 L	14,100	82,259	5,515
	Diesel Fuel	26	17,460 L	10,300	669	48	13	6,703 L	11,800	257	18
	Other Fuel	<10	8,470 L	20,500	324	13					
Light Trucks, Vans, SUVs	Hybrid	<10	1,194 L	18,400	4	3	<10	9,415 L	24,100	33	22
	Gasoline	4,899	9,491,568 L	15,800	332,205	22,768	5,571	11,349,765 L	16,300	397,242	27,072
	Diesel Fuel	305	458,122 L	10,900	17,546	1,247	208	323,671 L	12,300	12,397	881
	Other Fuel	37	53,045 L	11,400	2,032	81	25	35,972 L	10,600	1,378	55
Commercial Vehicles	Gasoline	485	886,422 L	16,900	31,025	2,083	705	1,803,755 L	16,800	63,131	4,241
	Diesel Fuel	402	1,002,164 L	17,400	38,383	2,697	570	1,785,676 L	19,400	68,391	4,805
	Other Fuel	16	27,357 L	11,800	1,048	42	<10	15,640 L	11,600	599	24
Tractor Trailer Trucks	Gasoline	<10	5,134 L	10,700	180	12	<10	2,855 L	16,600	100	7
	Diesel Fuel	112	1,124,995 L	37,600	43,087	3,027	119	1,696,090 L	38,900	64,960	4,564
Motorhomes	Gasoline	94	100,118 L	15,800	3,504	234	94	87,068 L	15,800	3,047	204
	Diesel Fuel	52	67,811 L	15,800	2,597	182	50	65,192 L	15,800	2,497	175
	Other Fuel						<10			0	0
Motorcycles, Mopeds	Gasoline	170	59,125 L	21,500	2,069	138	206	79,106 L	21,500	2,769	185
Buses	Gasoline	29	32,096 L	18,400	1,123	76	37	97,794 L	16,400	3,423	230
	Diesel Fuel	26	111,558 L	18,800	4,273	300	20	99,419 L	17,500	3,808	268
	Other Fuel	<10	2,821 L	10,800	108	4					
Totals		11,526	19,244,916 L	15,424	682,895	46,780	12,700	23,821,583 L	16,149	845,540	57,751

Port Alberni City Draft 2010 Community Energy and Emissions Inventory

Monitoring and reporting on progress towards greenhouse gas emissions reduction targets

Buildings		2007				2010			
		Connections	Consumption	Energy (GJ)	C02e (t)	Connections	Consumption	Energy (GJ)	C02e (t)
Residential	Wood	N/A	175,951 GJ	175,951	65	N/A	170,327 GJ	170,327	63
	Heating Oil	N/A	146,839 GJ	146,839	10,351	N/A	142,146 GJ	142,146	10,020
	Propane	N/A	25,321 GJ	25,321	1,545	N/A	24,511 GJ	24,511	1,495
	Natural Gas	2,225	138,277 GJ	138,277	7,052	2,299	124,471 GJ	124,471	6,348
	Electricity	8,066	104,115,006 kWh	374,814	2,568	8,202	101,379,158 kWh	364,965	2,501
Commercial/Small-Medium Industrial	Natural Gas	338	219,345 GJ	219,345	11,187	282	199,464 GJ	199,464	10,173
	Electricity	1,110	74,006,898 kWh	266,425	1,826	1,051	71,149,472 kWh	256,138	1,755
Totals		11,739		1,346,972	34,594	11,834		1,282,022	32,355

Solid Waste		2007				2010			
		Connections	Consumption	Energy (GJ)	C02e (t)	Connections	Consumption	Energy (GJ)	C02e (t)
Community Solid Waste	Solid Waste	0	14,097 t	N/A	15,973	0	13,838 t	N/A	16,689
Totals		0			15,973	0			16,689

Memo Items

Buildings		2007				2010			
		Connections	Consumption	Energy (GJ)	C02e (t)	Connections	Consumption	Energy (GJ)	C02e (t)
Large Industrial	Natural Gas	1		0	0				
	Electricity	1		0	0	1		0	0
Totals		2			0	1			0

Totals for Transportation, Buildings and Solid Waste

Fuel Type	2007 (Population: 17,622)			2010 (Population: 17,752)		
	Consumption	Energy (GJ)	CO2e (t)	Consumption	Energy (GJ)	CO2e (t)
Hybrid	12,431 L	43	30	58,843 L	206	125
Gasoline	16,288,488 L	570,097	38,917	19,630,308 L	687,061	46,553
Diesel Fuel	2,852,304 L	109,243	7,693	4,079,121 L	156,231	10,991
Other Fuel	91,693 L	3,512	140	53,311 L	2,042	82
Wood	175,951 GJ	175,951	65	170,327 GJ	170,327	63
Heating Oil	146,839 GJ	146,839	10,351	142,146 GJ	142,146	10,020
Propane	25,321 GJ	25,321	1,545	24,511 GJ	24,511	1,495
Natural Gas	357,622 GJ	357,622	18,239	323,935 GJ	323,935	16,521
Electricity	178,121,904 kWh	641,239	4,394	172,528,630 kWh	621,103	4,256
Solid Waste	14,097 t	0	15,973	13,838 t	0	16,689
Grand Totals		2,029,867	97,347		2,127,562	106,795

Supporting Indicators

No new supporting indicator data have been provided in the 2010 reports. Work is currently underway to produce a complete second round of data for the indicators below in the 2012 reports (available in 2014). In the interim, we are including the same supporting indicator data that was provided in the 2007 reports. Feedback is requested on all supporting indicators; please contact us directly at CEEIRPT@gov.bc.ca

Housing Type - Private dwellings by structural type

Housing type is important for reducing building-related GHG emissions and energy consumption. A trend toward fewer single family dwellings indicates an increase in residential density, which is known to reduce transportation-related GHG emissions.

	1996		2001		2006	
	Units	%	Units	%	Units	%
Single Detached House	5,400	42	5,615	74	5,440	71
Semi-Detached House	205	2	205	3	185	2
Row House	300	2	350	5	390	5
Apartment, Duplex	360	3	140	2	240	3
Apartment, 5 storeys or higher	125	1	105	1	115	2
Apartment, under 5 storeys	820	6	965	13	1,110	15
Other Single Attached House	35	0	30	0	15	0
Movable Dwelling	115	1	155	2	155	2

Commute to Work - Employed labour force - by mode of commute

An increase in the number of people choosing to walk, cycle and use transit reduces GHG emissions. More compact, complete, connected communities should see an increase in the use of these transportation modes.

	1996		2001		2006	
	Units	%	Units	%	Units	%
Car, Truck, Van as Driver	5,455	79	5,160	81	5,360	77
Car, Truck, Van as Passenger	420	6	525	8	675	10
Public Transit	65	1	95	1	80	1
Walked	665	10	425	7	610	9
Bicycle	130	2	50	1	55	1
Motorcycle	15	0	45	1	15	0
Taxicab	30	0	30	0	0	0
Other Method	110	2	25	0	125	2

Parks and Protected Greenspace

Parks and protected greenspaces are important for the protection and enhancement of community carbon sinks.

	2009	
	Units	%
National Parks	0	0
Provincial Parks / Protected Area	0	0
Local Parks	45	2
Agricultural Land Reserve	86	4
Other land use	1,874	93
Total Parks and Protected Area	45	2
Total Land Area	2,005	100

* Total is net of Indian Reserves
 * Quantity of parkland may be underestimated
 *

Residential Density

Increasing residential densities is known to reduce vehicle use resulting in fewer transportation-related GHG emissions. There are many additional benefits from more compact development.

	2009
Total Land Area	2,005
Residential Density (people per net ha)	10
Population	17,741
Net Land Area (ha) *	1,812

* Net of Crown land, parks, Indian Reserves, water features, airports, ALR, waste disposal

Commute Distance

Shorter commute distances generally reduce GHG emissions by increasing the likelihood of people walking, cycling or using transit. Commute distance is also indicative of the 'completeness' of a community from an employment perspective.

	2006	
	Units	%
Less than 5 km	4,905	82
5 to 9.9 km	325	5
25 km or more	630	11
15 to 24.9 km	35	1
10 to 14.9 km	55	1

Port Alberni City
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Monitoring and reporting on progress towards greenhouse gas emissions reduction targets

Supporting Indicators Under Consideration

Work is currently underway to produce a second round of supporting indicators with new data for the 2012 reports (available in 2014). These reports will include new data for the five supporting indicators included in the 2007 and 2010 Reports:

- **Housing Type:** Private dwellings by structural type
- **Commute to Work:** Employed labour force - by mode of commute
- **Commute Distance**
- **Residential Density**
- **Parks and Protected Greenspace**

And in addition, for the 2012 reports we are working to be able to include:

- **Proximity to Transit**
- **Building Energy Intensity**
- **Building Floor Space**
- **Waste Diversion**

We are continuing to work towards reporting on even more supporting indicators in the future including:

- **Proximity to Services** (e.g. destinations such as grocery store, school, other retail etc.)
- **Transit Ridership**
- **Water Use**
- **Impervious Surface Cover:** % change in impervious surface cover
- **Tree Canopy Cover:** % change in tree canopy cover
- **District Energy:** # and energy output (e.g. buildings connected, energy consumed in GJ or kWh) of district energy systems by energy type e.g. renewable or non-renewable)
- **On-Site Renewable Energy:** # and energy output (in GJ or kWh) from households producing and/or consuming on-site renewable heat (e.g. biomass, solar thermal, geo-exchange) and/or electrical (e.g. solar photovoltaic, small wind, small scale hydro) energy
- **Energy Recovery** from waste energy (GJ or kWh) recovered from waste (e.g. from landfill gas, sewage treatment, industrial operations, farm)

Please give us feedback by contacting us directly at CEEIRPT@gov.bc.ca

Many local governments have been undertaking a significant amount of climate action in both the corporate and community-wide spheres, as demonstrated in both the public reports from the Climate Action Revenue Incentive Program (CARIP) <http://www.cscd.gov.bc.ca/lgd/greencommunities/carip.htm>, and on the <http://toolkit.bc.ca> website. These two resources may be helpful to those who are interested in learning from other BC local governments. The toolkit also contains additional information and resources including decision-support/planning frameworks and tools for undertaking actions to reduce GHG emissions and energy consumption.

This is your local government's 2010 Community Energy and Emissions Inventory (CEEI) Report

What is a CEEI Report?

CEEI Reports are a result of a multi-agency effort to provide a province-wide solution to assist local governments in BC to track and report on community-wide energy consumption and greenhouse gas (GHG) emissions as well as supporting indicators every two years. CEEI Reports are one of the many resources available through the Climate Action Toolkit (<http://www.toolkit.bc.ca>), a web-based service provided through the ongoing collaboration between UBCM and the Province.

The 2010 CEEI reports are offered in DRAFT at this time

We encourage feedback from our communities across the province as we continue to review the data through the summer of 2012. Should you have any questions or concerns, please take the time to contact us directly at CEEIRPT@gov.bc.ca

Why does my local government need a CEEI Report?

A community energy and GHG emissions inventory can be a valuable tool that helps local governments plan and implement GHG and energy management strategies, while at the same time strengthening broader sustainability planning at the local level. CEEI reports fulfill local governments' Climate Action Charter commitment to measure and report their community's GHG emissions profile, establish a base year inventory for local governments to consider as they develop targets, policies, and actions related to BC's Local Government Act requirements, fulfill Milestone One requirements for those local government members of the Federation of Canadian Municipalities' (FCM's) Partners in Climate Protection (PCP) program, as well as supporting local government efforts to monitor progress towards Regional Growth Strategy objectives.

A first in North America!

CEEI is a first in North America and a first step for BC communities. The 2010 CEEI Reports are based on best available province-wide data. The accuracy and detail of CEEI reports will continue to improve to meet increasing local and provincial government information needs. Improvements have been made from the original draft 2007 CEEI Reports posted in Spring 2009. These include estimates for residential heating oil, propane and wood use, breaking out small from large industrial buildings, including updated land-use change and new agricultural sectors as 'memo items'.

For More Information

The full list of all BC local government 2010 CEEI Reports, User Guide, Technical Methods and Guidance Document, and additional information on the Supporting Indicators are available at: <http://www.env.gov.bc.ca/cas/mitigation/ceei/index.htm> For guidance on target setting and community actions, go to <http://www.toolkit.bc.ca> and <http://www.cd.gov.bc.ca/lgd/greencommunities/targets.htm>

Notice to the Reader

This CEEI Report uses information from a variety of sources to estimate GHG emissions. While the methodologies, assumptions and data used are intended to provide reasonable estimates of greenhouse gas emissions, the information presented in this report may not be appropriate for all purposes. The Province of BC and the data providers do not provide any warranty to the user or guarantee the accuracy or reliability of the data contained in this report. The user accepts responsibility for the ultimate use of such data. We need your help to make these reports better, where you do note inaccuracies, please contact us.

APPENDIX 11 - SOLID WASTE TONNAGES

CITY OF PORT ALBERNI ENGINEERING DEPARTMENT

Residential and Commercial Landfill Tonnages

	2007		2008		2009		2010		2011		2012		2013		2014	
	Res (tonnes)	Com (tonnes)	Res (tonnes)	Com (tonnes)	Res (tonnes)	Com (tonnes)	Res (tonnes)	Com (tonnes)	Res (tonnes)	Com (tonnes)	Res (tonnes)	Com (tonnes)	Res (tonnes)	Com (tonnes)	Res (tonnes)	Com (tonnes)
Jan	295	322	286	294	216	322	213	222	153	202	197	191	225	175	222	141
Feb	232	280	232	270	197	221	189	200	133	180	179	182	187	149	178	133
Mar	250	319	253	260	213	298	223	229	153	226	179	184	191	157	208	147
Apr	272	267	272	288	234	257	205	199	147	192	198	189	227	180	214	170
May	310	339	256	288	210	232	208	210	164	205	225	204	228	165	213	163
Jun	258	311	252	282	237	263	210	208	167	192	193	186	207	166	215	140
Jul	291	293	275	281	228	226	135	196	140	185	217	190	229	193	230	153
Aug	288	300	235	273	230	220	153	201	171	193	216	173	154	178	207	134
Sep	271	267	258	282	247	253	168	219	165	203	198	165	230	174	235	159
Oct	313	316	251	291	227	233	150	194	169	191	241	196	225	148	242	150
Nov	268	311	235	258	220	260	163	221	166	200	208	179	199	150	211	142
Dec	253	295	199	225	230	232	153	219	175	182	196	170	211	158	256	171
Total	3300	3621	3,005	3,290	2,689	3,017	2,170	2,519	1,904	2,350	2,447	2,208	2,513	1,993	2,631	1,803

Recycling Curbside Sept 2008
 Weekly 2 cans to Biweekly 2 cans July 3rd 2010
 Biweekly to Weekly 1- 80 litre can April 2011
 Automated Weekly Jan 2012

APPENDIX 12 - DISTRICT ENERGY SYSTEM BACKGROUND INFORMATION

District Energy Feasibility Study for the City of Port Alberni



Prepared for the City of Port Alberni
Prepared by Stephen Salter PEng, LEED® AP
Farallon Consultants Limited

Farallon
Design is Anticipation™

July 16, 2012

Disclaimer

The information in this study has been compiled to offer a preliminary assessment of the potential for an integrated municipal district energy system in Port Alberni, BC. The author has prepared this document at the request of the City of Port Alberni, solely for this purpose.

Reasonable skill, care and diligence has been exercised to assess the information acquired during the preparation of this study, but no guarantees or warranties are made concerning the accuracy or completeness of this information. This document, the information it contains, the information and basis on which it relies are subject to changes that are beyond the control of the author. The information provided by others is believed to be accurate, but has not been verified.

This study includes estimates of costs and revenues that should not be relied upon for design or other purposes without verification. The author does not accept responsibility for the use of this study for any purpose other than that stated above and does not accept responsibility to any third party for the use, in whole or in part, of the contents of this document. This study applies to the City of Port Alberni and cannot be applied to other jurisdictions without analysis. Any use by the City of Port Alberni, its sub-consultants or any third party, or any reliance on or decisions based on this document, are the responsibility of the user or third party.

Estimates of revenues from resources in this study do not consider questions of ownership of those resources. No firms or other entities identified herein have endorsed or agreed to proposed options that would require their participation.

The materials contained in this report (text, tables, figures and drawings included herein) are the copyright of Farallon Consultants Limited. The City of Port Alberni is given permission to reproduce the materials, and to make full use of the report and its contents. Use of these materials by other parties must be given in writing by Farallon Consultants Limited.

Cover photo shows the City of Port Alberni with the Somas River in the foreground, with a view to the East. Used here under the Creative Commons agreement.

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1. Executive Summary

Background

The City of Port Alberni is interested in developing sustainable community projects that will reduce greenhouse gas emissions, support regional sustainability objectives, support local employment, and provide non-tax revenues.

In 2010, the City of Port Alberni's Economic Development Manager commissioned a study of Integrated Resource Recovery options. The study determined that conditions in Port Alberni appeared to be favourable for a district energy system. After considering an industrial partnership to provide energy for the system, the City has focused on developing an Integrated Municipal Energy System it would own and operate.

Innovation

The Integrated Municipal Energy System would incorporate three technical innovations: a three-line district heating distribution system, a direct contact condensing economizer, and an adsorption chiller that will make use of heat from the system to replace the Hospital's existing chiller.

The City could also use an innovative arrangement to help finance the utility: offering shares in the utility to district energy subscribers and the community.

This project represents a reasonable balance among the three issues of risk, benefits, and practicality. To the knowledge of the author and the City of Port Alberni, the technical innovations proposed in this Study have not been integrated into a single system elsewhere. The components however, have been proven individually, which reduces overall risk.

Conclusions

Port Alberni appears to have the necessary conditions for a successful district energy system, including adequate energy demand in public buildings (West Coast General Hospital, North Island College, Alberni District Secondary School, long-term care facilities, Alberni Valley Multiplex, Echo Aquatic & Fitness Centre), a relatively small distribution system, a site for the Energy Centre, and a reliable source of biomass. The City also has the technical, administrative, construction experience, and utility experience capacity to implement this project.

Recommendations

The City should proceed to the conceptual design phase, initiate stakeholder consultations, and accelerate the discussions with district energy clients as the first step toward forming energy supply agreements.

2. Glossary

ACRD	Alberni-Clayoquot Regional District
BAU	Business as Usual
BDT	Bone Dry Tonne of biomass
CO ₂ e	Carbon dioxide equivalent
DES	District Energy System
DHW	Domestic Hot Water
GHG	Greenhouse Gas
GJ	Gigajoule of energy
GWh	Gigawatt hours of electricity
GWP	Global Warming Potential
HHV	Higher Heating Value of biomass
IPCC	Intergovernmental Panel on Climate Change
IRR	Integrated Resource Recovery
LEED	Leadership in Energy and Environmental Design
LHV	Lower Heating Value of biomass
MURBS	Multi-Unit Residential Buildings
MWe	Megawatts of electrical energy
MWth	Megawatts of thermal energy
VIHA	Vancouver Island Health Authority

3. Background

In 2010, the City of Port Alberni's Economic Development Manager commissioned a study of resource recovery options. The study was completed by Farallon Consultants Limited, with 50% funding provided by the BC Ministry of Community, Sport, and Cultural Development.¹

The study determined that conditions in Port Alberni are favourable for a District Energy System, since several large users of heat such as the West Coast General Hospital, North Island College, Alberni District Secondary School, long-term care facilities, multi-family residential buildings, the Alberni Valley Multiplex recreation facility, and the Echo Aquatic & Fitness Centre are located within modest distances of each other. Further, interest in district energy has been expressed in writing by the Vancouver Island Health Authority, the Alberni-Clayoquot Regional District, and School District 70.

Other conditions that favour a District Energy System in Port Alberni include the Provincial greenhouse gas legislation and associated carbon tax; the availability of urban wood waste and sawmill residues; the availability of land owned by the City for the system; the availability of grants to reduce the capital cost of the system; and the availability of low-cost financing for municipal green energy projects from the Federation of Canadian Municipalities.

In 2011, Farallon worked on the City's behalf to determine the best source of heat for a district energy system. Two main alternatives emerged at that time: form a partnership with the Catalyst Paper operation, or build a facility that would produce heat from waste urban wood and forest residues.

Also in 2011, an application for funding under the EcoEnergy Innovation Initiative was prepared for a system that would be jointly owned with Catalyst Paper. The ranking of the City's application was not high enough to be successful, but did place the application on a stand-by list. In January, 2012 however, Catalyst Paper announced restructuring that resulted in uncertainty concerning the company's ability to become a commercial and operating partner. As a result of this uncertainty, the City has explored the option of developing a biomass boiler as the source of heating for a district energy system.

This report includes an assessment of the feasibility of developing a district energy system in Port Alberni that can incorporate a number of technological innovations that will improve its effectiveness and efficiency, and that will have wide application in other communities. The report also includes estimates of capital costs, operating costs, and revenues for an integrated biomass energy system.

¹ Farallon Consultants Limited. 2010. *Integrated Resource Recovery Options for the City of Port Alberni*. 55pp.

4. Methodology

This feasibility study builds on the work completed in the *Integrated Resource Recovery Options for the City of Port Alberni* (June, 2010). The current study was completed in the following steps:

1. Buildings with the potential to connect to a district energy system were identified as those having a hydronic, natural gas heating system, and those without a hydronic system but that consume significant quantities of domestic hot water heated by electricity.
2. Building owners as well as technical, and management personnel were interviewed concerning their interest in district energy and their current energy expenditures. The energy plants of the largest buildings were also toured to understand system temperatures and configurations.
3. The energy consumption of new buildings (the new high school and Athletic Hall) was estimated based on typical seasonal patterns, NRCAN averages, and floor areas.
4. Based on this information, the current cost of generating heat in these buildings was modelled.
5. Options for providing heat to the district energy system were developed, including a biomass boiler.
6. An evaluate was made of the quantities and quality of biomass available in the region. The Alberni-Clayoquot Regional District was contacted concerning their interests in diverting wood waste to an energy system, and in reducing air pollution from uncontrolled burning of wood waste.
7. Recognizing the need to generate heat efficiently from moist biomass, and to match the energy requirements of existing building energy systems, a conceptual design for a district energy system that could operate efficiently with lower-quality biomass, and that could provide cooling as well as heating was developed. The design incorporates a three-line district energy distribution system, a condensing stack gas economizer, and an adsorption chiller.
8. Vendors of key components of the system were contacted for performance and cost information, which has been included in the engineering and economic models for this study.
9. Various routings for the district energy system were tested, and the capital costs, annual costs, and energy revenues for the system were estimated.
10. Mass and energy balance modelling was completed to evaluate the proposed configuration and to confirm the required equipment capacities.
11. The NRCAN RETScreen International model was used to estimate peak capacities required for the biomass boiler as well as for the natural gas peaking and back-up boilers.
12. Other potential collaborators, including the Vancouver Island Health Authority, North Island College, BC Hydro, and the University of Northern British Columbia were contacted concerning their interest in exchanging expertise and information with the City of Port Alberni, as the district energy system is developed.

5. Potential Clients for District Energy

Of the twenty buildings identified as potential candidates for district energy, eleven larger buildings were chosen for modelling in a first phase of development of the system. These buildings consume an estimated 48,000 GJ/year on an energy basis, which is approximately 60,000 GJ/year on a natural gas basis, and represent approximately 80% of the load of the original twenty buildings. Buildings that could be connected to the district energy system in the first phase could be served by a relatively small 3 km district energy network.

Table 1 Potential Phase I District Energy Clients

Ownership	Building
Public, VIHA	West Coast General Hospital
Public, City	Echo Aquatic Centre & Library
Public, SD70	New High School
Private	Athletic Hall
Public, City	Multiplex
Public	North Island College
Public	Pioneer Towers
Public	Heritage Place
Public	Echo Village
Public	Fir Park Village
Public, City	Public Works Yard

Note that the Echo Aquatic Centre and Library share a single facility, and would form one connection to the district energy system.

Buildings that could be considered for connection to the district energy system in a second phase of development include:

Table 2 Potential Phase II District Energy Clients

Ownership	Building
Public, City	Echo Park Field House
Public, SD70	Wood Elementary School
Public, City	Glenwood Building
Public, SD70	SD70 Bus Depot
Private	Best Western Hotel
Private	Alberni Towers
Public, City	RCMP Building
Private	Cygnets Apartments
Private	Oak Ridge Apartments
Private	Cathedral Place Apartments
Private	BC Hydro Building, Wallace Street

Buildings that could be considered for connection to the district energy system in a third phase of development include:

Table 3 Potential Phase III District Energy Clients

Ownership	Building
Public	Port Alberni Fire Hall
Private	Abbeyfield Supported Living
Private	John Paul II Catholic School

The figure below shows the estimated energy demand of Phase 1 buildings by month. Details of the energy consumption are shown in Appendix 2 - Estimated Building Energy Demand by Month.

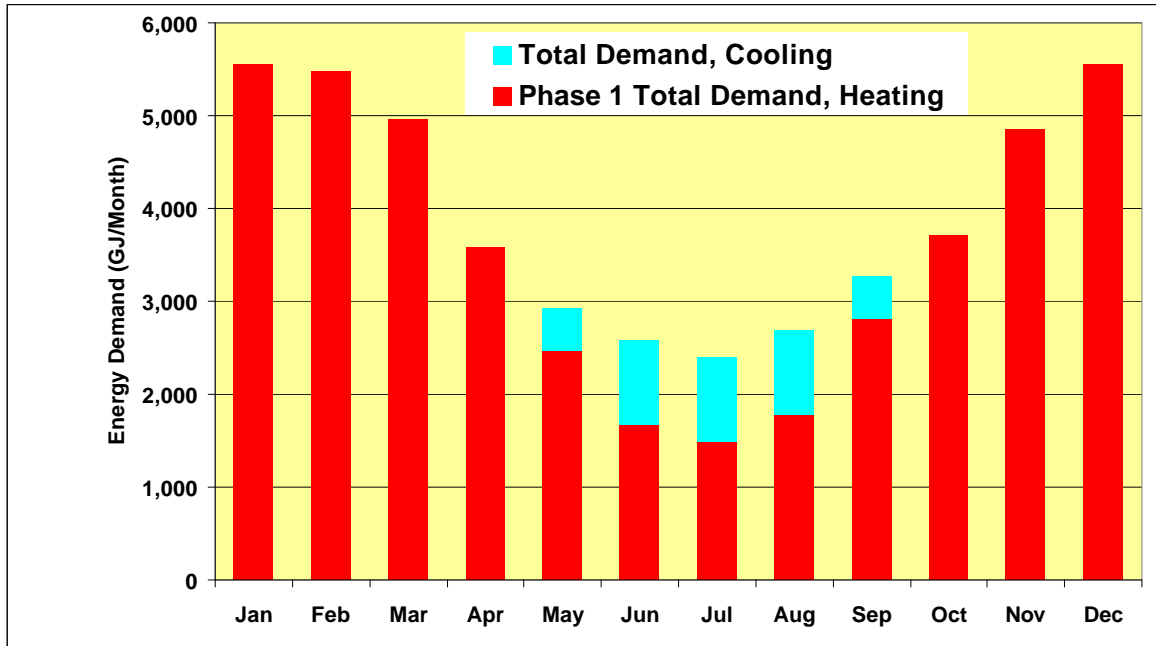


Figure 1 DES Energy Demand by Month, Phase I

The graph shows that demand for energy during the summer months remains relatively high, a pattern that reflects the type of buildings in Phase 1. These buildings include the Hospital, long-term care facilities, and recreation centres that use more hot water than average throughout the year. The blue bars in the graph also show the demand for district energy that could be used to operate an adsorption chiller to provide cooling in the Hospital during the summer. The effect of adding this cooling load to help level the demand for energy during the seasons.

6. Description of the District Energy System

6.1 Potential Energy Sources

The initial Integrated Resource Recovery report completed for the City of Port Alberni identified three potential sources of energy for a district heating system:²

- Cogeneration of heat and electricity from wood residues;
- Heat pumps to recover low-temperature (~40°C) industrial waste heat; and
- Steam from the Catalyst Paper industrial wood residue boiler.

Representatives of the City of Port Alberni, Catalyst Paper, and Farallon Consultants Limited met at several points during 2011 to discuss the idea of a district energy system based on steam from the Catalyst Paper mill. From the point of view of Catalyst Paper, the timing for a project that would generate more electricity appeared to be favourable, since BC Hydro has expressed interest in purchasing additional electricity from the company. In addition, the economizer in the Catalyst Paper power boiler was scheduled to be replaced, which would result in a small increase in the efficiency of the boiler, and therefore will slightly reduce the amount of wood residues consumed per unit of steam generated.

Discussions were also held concerning the option of developing a combined gasification system to displace natural gas in the Catalyst Paper operation, and to also provide heat to the district energy system. In January, 2012 however, Catalyst Paper announced restructuring, and as result the City decided to develop its own source of heat for the district energy system.

The proposed district energy system would include three main parts:

- 1) An Energy Centre to provide heat to the District Energy System (DES) piping network;
- 2) DES piping to distribute heat from the Energy Centre to client buildings; and
- 3) Energy Transfer Stations to bring heat from the DES piping into individual client buildings.

6.2 Energy Centre

The Energy Centre will include a biomass burner with capacity to meet approximately 85% of the total *energy demand* of the district energy system, and approximately 50% of the peak *power demand*. Based on the experience of comparable systems elsewhere, this sizing of the biomass system is expected to result in the lowest overall cost. Incremental biomass boiler capacity could be added to meet additional demand in the future.

² Farallon Consultants Limited. 2010. *Integrated Resource Recovery Options for the City of Port Alberni*. 55pp.

The Energy Centre will also include infrastructure for receiving and storing five days of fuel, and for automatically conveying fuel from storage to the biomass boiler, natural gas boilers to meet peak demand and for back-up, and with pumps and controls for the district energy system piping network. The boiler capacities are shown in Table 4 below.

Table 4 Energy Centre Boiler Capacities

Boiler Type	Capacity
Base-loaded Biomass Boiler	1.8 MW
Peaking/Back-up Boiler #1 (Natural Gas)	2.0 MW
Peaking/Back-up Boiler #2 (Natural Gas)	2.0 MW
Total Installed Capacity	5.8 MW

The Energy Centre would also include equipment such as natural gas back-up boilers, pumps, water treatment equipment, and controls. The equipment in the Energy Centre can operate with automatic controls, but require part-time monitoring and maintenance.

Pollution control equipment in the form of a cyclone and an electrostatic precipitator will limit particulate emissions from the biomass boiler to less than 20 mg/m³ of stack gases.

The best location for the Energy Centre appears to be the Public Works Yard, since it is located in an industrial/commercial area, truck access along 6th Avenue to Wallace Street is simple, the land is owned by the City, and City employees will be available to monitor and maintain the Energy Centre equipment. The backgrounds, training, and current duties of employees in the Public Works Department are compatible with the skills required to operate this equipment. Training for Public Works employees in the operation of biomass and natural gas boilers can be provided by the equipment manufacturers. In the figure below, the boundary of the Public Works yard is outlined in yellow, and a potential location of the Energy Centre is shown in blue.

Trees to the east and north of the Energy Centre would provide a natural barrier for sight, noise, and dust between the Energy Centre and commercial buildings to the east. The activities of the Energy Centre would be compatible with the current use of the Public Works yard.



Figure 2 Potential Location for the Energy Centre

6.3 District Energy System Piping

It is helpful that the City of Port Alberni controls the rights of way for much of the proposed district energy system distribution routing. Approximately 70% of the trenching for the district energy system

could be routed through parks, fields, and grass-covered rights-of way along Wallace Street, Roger Street, and the east side of 10th Avenue between Wallace Street and Roger Street. As a result, the excavation costs for the district energy system piping installation in Port Alberni are expected to be lower than average.

The City of Port Alberni's Planning Department was engaged in choosing the proposed route for distribution piping in Phase 1, which is shown in Figure 4. The figure shows two areas (outlined in blue) where the City is encouraging higher density and development: one near Redford Street to the south, and the North Island College Future Expansion Site. The presence of a district energy



Figure 3 District Energy Piping³

³ Courtesy of the Revelstoke Community Energy Corporation

system will be attractive to developers who understand its benefits, including price certainty, and the ability to re-allocate boiler utility space in new buildings for revenue-producing purposes. District energy based on a low-carbon source such as biomass will also help developers to achieve credits under the LEED®⁴ criteria.

In addition, an affordable housing development in the vicinity of the West Coast General Hospital is in the early planning stages. If this development proceeds, it could be provided with low-carbon energy at a lower cost than conventional alternatives. When new buildings are designed to work with district energy, the space that would otherwise have been allocated for boilers and related equipment can be reprogrammed for other uses, and the owner also saves the cost of new boilers.



Figure 4 Proposed DES Routing, Phase I

The City could also consider finishing the surface of the district energy system piping route as a bicycle route and walking trail. If the trail were extended to connect the Hospital and North Island College, then a loop would be formed. This *Local Energy Path*⁵ could begin at the Energy Centre, and incorporate small information displays to describe the district energy system as well as the buildings that are connected to it along the way. Since the disturbed earth would need to be finished in some manner (e.g. by reseeding), the cost of developing this trail would be relatively low.

The City could also consider opportunities for sharing space in the district energy system piping trench with other municipal utility piping, and also offering space in the trench to communications companies.

⁴ Leadership in Energy & Environmental Design

⁵ Inspired by the title of the Amory Lovins book, "Soft Energy Paths".

An alternative route would extend in an arc from the Energy Centre, east on Wallace Street, north on 10th Avenue, east on Roger Street, then south via the BC Hydro right of way to the Hospital. Although this route would be slightly shorter than the route proposed above, the route would also make connecting additional buildings south of Wallace Street more difficult in the future.

Figure 5 below shows the Wallace Street right of way: the photo was taken at the Eastern side of the City near the West Coast General Hospital, looking West in the direction of the Public Works yard.



Figure 5 Wallace Street Right of Way

6.4 Building Energy Transfer Stations

Buildings identified as potential candidates to connect with the district energy system already incorporate hydronic heating systems, in which a natural gas boiler delivers hot water to radiators within the building. In these buildings, the connection to a district energy system would be completed through an Energy Transfer Station (ETS) that replaces the building's natural gas boiler as a source of energy. The Energy Transfer Stations are very compact, and building owners can consider removing their existing natural gas boilers after connecting to a district energy system.

Energy Transfer Stations include a heat exchanger such as the one pictured in Figure 6, along with energy metering equipment and controls. The cost of the station would be carried by the district energy utility, and is included in the capital cost estimates in this study.



Figure 6 District Energy Heat Exchanger

Port Alberni's Advantages



- Large concentration of heat consumers**
- Consumers are close to sources of heat**
- Biomass is available**
- City of Port Alberni owns rights of way**
- Enthusiastic community**

Gasifier - Tolko Industries



Gasifier - Dockside Green



APPENDIX 13
- PROVINCIAL SUPPORTING DOCUMENTS

2013 B.C. BEST PRACTICES
METHODOLOGY FOR QUANTIFYING
GREENHOUSE GAS EMISSIONS
INCLUDING GUIDANCE FOR PUBLIC SECTOR
ORGANIZATIONS, LOCAL GOVERNMENTS AND
COMMUNITY EMISSIONS



Ministry of Environment
Victoria, B.C.
December, 2013

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1. Introduction

This document sets out the current best practices for quantifying and reporting greenhouse gas emissions from B.C.'s provincial public sector organizations, local governments and communities. B.C.'s best practices represent a robust and continually improving catalogue of emissions factors and emissions calculation methodologies that have drawn heavily on protocols established by the World Resources Institute and the Climate Registry, and published emission factors from authoritative sources such as: Natural Resources Canada, Environment Canada, the US Environmental Protection Agency and the UK Department of Environment, Food and Rural Affairs. This document also represents the consolidation of the previously stand alone versions of Public Sector, Local Government and Community Energy and Emissions Inventory emissions methodology guides. It can be used by anyone using these other documents, or other groups who wish to calculate their organization's corporate emissions. (Please note that the private sector entities subject to the B.C. Greenhouse Gas Inventory Report and Reporting Regulation must utilize quantification methods prescribed by the Regulation.)

Measuring greenhouse gas emissions is an important first step for improving the management of those emissions, and the activities/operations responsible for producing those emissions. Whether or not an organization plans to go carbon neutral, measuring and managing emissions can result in cost savings, increased organizational efficiencies and better asset management.

This document provides a consistent approach for measuring emissions that will allow any organization that is required to or wishes to voluntarily measure their greenhouse gas emissions a way to do so that is consistent with up to date best practices, and provides comparable emissions reporting province-wide.

1.1 Principles for Specifying Emission Factors

The following principles have been established by the province to guide the development of the greenhouse gas emissions (GHG) emission factors and estimation methods found in this document:

- 1) If information allows, the preference is to identify emission factors that best reflect individual circumstances, for example, an organization's particular source of electricity or fuel. Over time the government will seek to develop and apply B.C.-specific emission factors to improve the accuracy of GHG tracking.
- 2) Where B.C.-specific information is not available, standardized emission factors from national and international data sources will be used. In particular, factors will be taken from Canada's National GHG Inventory Report (NIR),¹ and other recognized sources (see Section 1.3).
- 3) A key principle is to facilitate emissions tracking and ensure that measurement and reporting requirements are not overly burdensome or costly. Therefore, in certain cases (such as where an emissions source is too small to justify additional data gathering by an organization) the government will provide simplified methods for estimating emissions.

¹ Environment Canada. (2013). *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990-2011*. Submission to the United Nations Framework Convention on Climate Change.

- 4) In developing simplified estimation methods, upper bound assumptions will be used in accordance with the principle of conservativeness – erring on the side of overestimating rather than underestimating emissions.

1.2 GHG Emission Factors Defined

Emission factors are expressed in kilograms (kg) or metric tonnes (t) of GHG emissions per unit of consumption activity. Typically, the factors for a given category of activity – for example, building energy or fleet fuel consumption – are expressed in common units to enable comparison across different fuel types, travel modes, etc.

The Carbon Neutral Government Regulation lists six distinct greenhouse gases or groups of gases: carbon dioxide (CO₂); methane (CH₄); nitrous oxide (N₂O); hydrofluorocarbons (HFCs); sulphur hexafluoride (SF₆); and perfluorocarbons (PFCs). For most organizations, the primary GHGs emitted in significant amounts are the three principal gases associated with fuel combustion for energy (CO₂, CH₄ and N₂O) and, to a much lesser extent, HFCs released from refrigeration and air conditioning equipment.²

In the case of liquid fossil fuel blends with biofuel (e.g., ethanol, biodiesel), gasoline or diesel are combined with varying proportions of biofuels (e.g., E10, B5, B20), resulting in emission factors that are weighted averages of the biofuel and fossil fuel factors. However, since international rules require the separate reporting of biogenic emissions from combustion (see Section 2.1); the CO₂ emissions from the biofuel component (Bio CO₂) must be calculated and reported separately from those of the fossil fuel component.

Wherever possible, emission factors are specified by individual gas. In certain instances, an aggregate factor for multiple gases is provided in kg or t of CO₂ equivalent (CO₂e) emissions. CO₂e is the standard unit for measuring and comparing emissions across GHGs of varying potency in the atmosphere (see Section 1.3).

1.3 Global Warming Potentials and Emissions Calculations

Greenhouse gases vary in their ability to trap heat in the atmosphere (radiative forcing)³. “Global warming potential” (GWP) is a measure of this ability. The GWP of a GHG accounts for both the immediate radiative forcing due to an increase in the concentration of the gas in the atmosphere, and the lifetime of the gas. The GWP for each GHG is expressed as the ratio of its heat trapping ability relative to that for CO₂. By definition then, the GWP of CO₂ equals one while CH₄, for example, has a GWP of 21, indicating that it’s radiative forcing is 21 times that of CO₂. In other words, releasing one tonne of CH₄ is equivalent to releasing 21 tonnes of CO₂, which can also be expressed as 21 tonnes of carbon dioxide equivalent (CO₂e). See Annex 8.2 for complete list of GWPs for all gases covered by the *Greenhouse Gas Reductions Targets Act (GGRTA)*.

² In British Columbia, PFCs and SF₆ are produced primarily in aluminum and magnesium smelting/processing and semiconductor manufacturing. SF₆ is also used as a cover gas in electricity transmission equipment.

³ The term “radiative forcing” refers to the amount of heat-trapping potential for a GHG, measured in units of power per unit of area (watts per metre squared).

GWPs are particularly important within the context of emissions reporting since international protocols require the reporting of both individual GHGs and their carbon dioxide equivalents (CO₂e). For this reason, the calculation of GHG emissions generally involves (1) multiplying the emission factor for a GHG by an appropriate measure of consumption (activity) to produce the corresponding emissions for that GHG and then (2) multiplying those emissions by its GWP to produce the corresponding CO₂e emissions.

The primary source document for emission factors is the *British Columbia Greenhouse Gas Inventory Report 2010* (PIR).⁴ Where provincial data is not available, the factors from Environment Canada's *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990-2011* have been used.^{5,6}

International documents, such as the Climate Registry's *General Reporting Protocol*,⁷ have been used for some emission factors. B.C.-specific emission factors have been developed in other cases, using data provided by energy companies and business travel providers.

The emission factors reported in this document represent the B.C. government's understanding of the factors appropriate for emission sources and fuel types in 2013. As experience is gained with estimating GHG emissions, the list of emission factors may be expanded. It is also expected that the factors themselves and other key inputs (e.g., energy conversion factors, GWPs) will be updated as GHG measurement methodologies and data sources evolve.

1.4 Users/Audience

1.4.1 Public Sector Organizations

In November 2007, British Columbia enacted legislation to establish provincial goals for reducing greenhouse gas (GHG) emissions. Under the *Greenhouse Gas Reductions Targets Act (GGRTA)*, the B.C. public sector must be carbon neutral in its operations for 2010 and every year thereafter.⁸ Beginning for the 2008 calendar year, provincial public sector organizations (PSOs)⁹ are required to report annually, in accordance with the *GGRTA* and the *Carbon Neutral Government Regulation (CNGR)*.

The *CNGR* defines the activities or emission sources that are "in scope" for the purposes of PSO emission reporting and offsetting. Since it was introduced in 2008, "in scope" activities/sources have been clarified through a series of policy decisions, which have been summarized in the Scope Summary Document which is available at the following [link](#).

⁴ British Columbia (2012). *British Columbia Greenhouse Gas Inventory Report 2010*. Annex 10.3 provides standardized factors for stationary and mobile fuel consumption and other emitting activities.

⁵ Environment Canada (2013). *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990-2011*.

⁶ The PIR factors match most of those found in the NIR, however, for simplicity and ease of use, the PIR factors will be referenced throughout this document where the data is available in both documents.

⁷ The Climate Registry (2013). *General Reporting Protocol*, Version 2.0 & 2013 Climate Registry Default Emission Factors. B.C. is a member of the Climate Registry, which is a cross-border initiative to develop common measurement, verification and reporting requirements for GHG emissions. See: www.theclimateregistry.org.

⁸ See www.env.gov.bc.ca/cas/legislation/index.html#GGRTA, for the *Greenhouse Gas Reduction Targets Act*, Bill 44 – 2007 and the *Carbon Neutral Government Regulation*, B.C. Reg. 392/2008. The legislation also requires core government business travel to be carbon neutral as of October 2007. This requirement does not apply to the broader provincial public sector, as defined in Note 12.

⁹ PSOs encompass core government entities funded through the Consolidated Revenue Fund (e.g., ministries, special offices, and tribunals) and broader public sector agencies – health authorities, school districts (K-12), colleges and universities, and Crown corporations under the Government Reporting Entity.

The government has developed its own web-based applications to assist with GHG measurement and reporting. “SMARTTool” calculates and reports the emissions from PSO buildings, supplies (paper) and fleet vehicles and equipment. “SMARTTEC,” the SMART Travel Emissions Calculator, computes the GHGs from government business travel and reports the emissions through SMARTTool. The emission factors and methodologies documented in this report are used by both applications to estimate GHG emissions.

The following sections of this document apply directly to PSOs for their in-scope activities:

- Section 2: Stationary Sources: Buildings, Etc
- Section 3: Indirect Emissions: Supplies (Paper)
- Section 4: Mobile Sources: Fleet
- Section 5: Business Travel (Provincial Government only)¹⁰
- Section 7: Sample Calculation
- Section 8: Annexes – Glossary of Terms, Global Warming Potentials, Building Energy Estimation Methods, etc.

For each activity category, a brief description is given along with an explanation of data sources and emission factor calculations.

1.4.2 Local Governments

The majority of local governments in B.C. have voluntarily signed the Climate Action Charter (CAC), committing to develop strategies and take actions to achieve the following goals:

- being carbon neutral in respect of their operations by 2012;¹¹
- measuring and reporting on their community’s GHG emissions profile; and
- creating complete, compact, more energy efficient rural and urban communities

Under the Climate Action Charter the joint Provincial Government – Union of British Columbia Municipalities (UBCM) Green Communities Committee (GCC) was created to support local governments in planning and implementing climate change initiatives. The Carbon Neutral Working Group (the working group) was established to advise the GCC in carrying out this mandate with respect to corporate carbon neutrality. The GCC and the working group collaborated to produce the Carbon Neutral Workbook (the Workbook), which provides guidance to local governments on what is in scope to measure and offset within the boundaries of their corporate emissions. The boundaries for calculating emissions are based on the energy used in the delivery of traditional local government services:¹²

- Administration and Governance;
- Drinking, Storm and Waste Water;

¹¹ Solid waste facilities regulated under *the Environmental Management Act* are not included in operations for the purposes of this Charter.

¹² Within the traditional service sectors not all emissions will be captured. Any emissions related to the operation and maintenance of traditional services are included. Emissions related to new construction, business travel, employee commuting and materials are not included.

- Solid Waste Collection, Transportation and Diversion;
- Roads and Traffic Operations;
- Arts, Recreational and Cultural Services; and
- Fire Protection.

With its own commitment to a carbon neutral public sector for 2010, the BC government developed a web-based application to assist with GHG measurement and reporting. “SMARTTool” calculates and reports the GHG emissions from buildings, fleet vehicles and equipment, paper and travel (the latter for core government only).

Local governments may choose to use SMARTTool, but the GCC also supports the use of other GHG measurement tools for the purposes of the Climate Action Charter. To ensure methodology, emission factors and outputs from other tools are consistent and comparable with SMARTTool results, a local government choosing to use another inventory and reporting tool will be required to meet the following standards:

1. Use the same corporate boundaries as defined in the Workbook;
2. Use the GHG measurement methods and emission factors in this guide, and updates as provided by the Climate Action Secretariat
3. Complete and adhere to the Business Processes Checklist
4. Report on annual total corporate emissions and offsets as calculated by a GHG inventory tool (via an Energy Consumption Summary Reporting Template); and
5. Obtain Chief Administrative Officer (CAO)/ Chief Financial Officer (CFO) attestation that all of the above listed actions were taken (via the *Self Certified Business Process Checklist*).

All of the supporting materials for these standards are available on the Climate Action Toolkit website at: <http://www.toolkit.bc.ca/resource/becoming-carbon-neutral-workbook-and-guidebook>

The primary purpose of this document is to detail the emission factors and methodology used for calculating and reporting local government emissions. Emission factors express the mass of GHGs resulting from a specific kind of activity (e.g., how many kilograms of carbon dioxide are produced by burning one litre of gasoline in a car). The document is also designed to provide background information regarding how the emissions factors were determined; including references to source materials and any calculations applied to emissions factors.

This document will be periodically revised to reflect changes or clarifications to the emission factors, methodologies and scope. Local government users should ensure that they are using the most current version of this document each year. These will be housed on the Toolkit website at: www.toolkit.bc.ca

By understanding and applying the information contained in this methodology document and completing the *Self Certified Business Process Checklist for SMARTTool/ Alternative Tool* available at www.toolkit.bc.ca, local governments can be assured that their GHG emissions inventory are accurate and consistent with those being developed by local governments across British Columbia

1.4.3 Other Users (Communities/Academics/Consultants/etc.)

Other potential users of this document include the broad community of users of the Community Energy and Emissions Inventory (CEEI) reports, energy and emissions modelling and planning consultants, energy utilities, academic researchers and non-governmental organizations. It is also worth noting that the CEEI is gaining increasing exposure outside of B.C. as international audiences begin to recognize the leading-edge work that is occurring.

Typically the CEEI reports are released along with a Technical Methods and Guidance Document that details the process by which the greenhouse gas emissions estimates in the CEEI reports are produced. Using common emission factors and referring to this document in the specific guidance material for the CEEI program will ensure comparability across the different programs referenced above.

1.5 Structure of this Report

The remainder of this report provides the information necessary to understand how the emissions factors were determined, what they are and how to apply them to calculate emissions from a given activity/source. The information provided in this document should be used by organizations to calculate emissions and ensure their inventories are consistently based on the standard approach developed by Ministry of Environment and used by SMARTTool.

Sections 2, 3, 4, 5 and 6 provide the emissions factors for stationary, indirect, mobile, business travel and agricultural sources respectively. In each of these sections and for each activity category, a brief description is provided along with an explanation of data sources and emission factor calculations. The data sources and calculations are provided to ensure accountability and transparency in emissions reporting.

Section 7 provides a sample calculation based on the emission factor, energy conversion factor and global warming potentials provided in this document. It provides an example for how emissions are calculated from a given activity, and can be used as the basis for calculating emissions factors using the information provided in this document.

2. Stationary Sources: Buildings, Etc

GHG emissions are produced from activities associated with the lighting, heating and cooling of facilities, and the powering of machinery and equipment within those facilities.¹³

2.1 Direct Emissions: Stationary Fuel Combustion

Description: Several different fossil fuels may be consumed in buildings: natural gas; propane; light fuel oil (No. 2 heating oil); kerosene; marine diesel; diesel fuel; and gasoline. In addition, several organizations burn wood fuel and wood waste in some of their buildings. For the purposes of SMARTTool reporting and in alignment with international reporting requirements, biogenic

¹³ See www.env.gov.bc.ca/cas/legislation/index.html#GGRTA for the *Carbon Neutral Government Regulation*, B.C. Reg. 392/2008.

emissions (BioCO₂) from biomass combustion, including wood, wood waste, ethanol, biodiesel and biomethane must be reported.¹⁴

For biomass combustion, BioCO₂ emissions must be reported separately from CH₄ and N₂O emissions¹⁵. PSOs are only required to offset the CH₄ and N₂O emissions from biomass combustion. Any organization considering biomass should be aware that there are ongoing international discussions around the proper treatment of biomass and how to best account for the BioCO₂ storage and emissions of different harvested wood products (e.g. waste wood vs. virgin wood) and the associated forest management practices occurring on the land base. The risk of future accounting changes will be minimized to the extent that biomass is diverted from waste streams, that biomass is used for the most appropriate long-term purposes and that non-waste biomass comes from sustainably managed forest lands.

In SMARTTool, stationary fuel consumption data are entered either in common units of energy usage (i.e., Gigajoules – GJ) or are converted to GJ within the application itself.

Data sources: The standardized emission factors for stationary fuel combustion can be found in two sources; Table 34 of the 2010 PIR,¹⁶ and the 1990-2011 NIR as follows.¹⁷

- The natural gas CO₂ emission factor is taken from Table A8-1 (NIR) under the entry “British Columbia – Marketable”.
- The natural gas CH₄ and N₂O emission factors are taken from Table A8-2 (NIR) under “Residential, Construction, Commercial/Institutional, Agriculture”.
- The propane emission factors are taken from Table A8-3 (NIR) under the entries for “All Other Uses”.
- The light fuel oil, kerosene and diesel emissions factors are taken from Table A8-4 (NIR) (with light fuel oil and kerosene falling under “Forestry, Construction, Public Administration and Commercial/Institutional” and diesel falling under “Refineries and Others”).
- The gasoline and marine diesel emissions factors are taken from Table A8-11 (NIR) under the respective entries for “Off-Road Gasoline” and “Diesel Ships”.
- The wood emissions factors are taken from Table A8-26 (NIR) under the entries for “Wood Fuel/Wood Waste Industrial Combustion” and “Conventional Stoves Residential Combustion”.

¹⁴ The CO₂ released to the atmosphere during combustion of biomass is assumed to be the same quantity that had been absorbed from the atmosphere during plant growth. Because CO₂ absorption from plant growth and the emissions from combustion occur within a relatively short timeframe to one another (typically 100-200 years), there is no long-term change in atmospheric CO₂ levels. For this reason, biomass is often considered “carbon-neutral” and the Intergovernmental Panel on Climate Change (IPCC) *Guidelines for National Greenhouse Gas Inventories* specifies the separate reporting of CO₂ emissions from biomass combustion. See: IPCC (2006), *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, p. 5.5; and the Climate Registry (2013), *General Reporting Protocol Version 2.0*, p. 36.

¹⁵ Based on current international standards, British Columbia already reports the CH₄ and N₂O portions of biomass combustion as line items in the Provincial Inventory Report. BioCO₂ biomass emissions are currently reported as memo items.

¹⁶ British Columbia (2012). *British Columbia Greenhouse Gas Inventory Report 2010*, pp. 67-68.

¹⁷ Environment Canada (2013). *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990-2011*, Annex 8 pp. 193-207.

Energy conversion factors to convert to GJ from cubic metres of natural gas and litres of liquid fuels are from Statistics Canada’s most recent *Report on Energy Supply and Demand in Canada (RESO)*.¹⁸

Calculations: In B.C., the *Renewable and Low Carbon Fuel Requirements Regulation (RLCFR)*¹⁹ sets benchmarks for the amount of renewable fuel in the provinces transportation and heating fuel blends. Effective January 1st, 2011, fuel suppliers are required to incorporate renewable fuel contents of 5% for gasoline and 4% for diesel into the sum of total fuel sold at a provincial level. In SMARTTool, for any given volume of reported gasoline consumption, 95% of the fuel is fossil fuel gasoline and the remaining 5% is ethanol. For Diesel, 96% is fossil fuel diesel and 4% is biodiesel.

Additionally, FORTIS has launched its renewable natural gas product for customers in the Lower Mainland, Fraser Valley, Interior and the Kootenays. Eligible customers have the option of designating a percentage of their natural gas usage as renewable natural gas by paying a percentage premium. FORTIS purchases biogas, inserts it into its distribution network and allocates it to customers according to the percentage premium they paid. The renewable natural gas component displaces the equivalent amount of conventional natural gas and is a renewable fuel source. For any given volume of reported FORTIS natural gas where the biomethane premium has been purchased; customers will enter the premium portion as biomethane consumption in GJs into SMARTTool, and the remainder will be entered as natural gas consumption in GJs into SMARTTool. The emission factors in Table 1 have been calculated by applying the energy conversion factors shown to the emission factors in Table 2: Source Emission Factors – Stationary Fuel Combustion. The original emission factors were adjusted only to convert them from grams to kg per unit of fuel use, except in the case of gasoline and diesel fuels, where the numbers were adjusted to account for the renewable fuel content under the *RLCFR*.

Table 1: Stationary Fuel Combustion

Fuel Type	Energy Conversion Factor	Emission Factor (kg/ GJ)				
		Bio CO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Natural Gas	0.03856 GJ/ m ³	–	49.69	0.0010	0.0009	49.99
Propane	0.02531 GJ/ L	–	59.54	0.0009	0.0043	60.88
Acetylene ²⁰	0.05480 GJ / m ³	–	67.87	*	*	67.87
Light Fuel Oil	0.03880 GJ/ L	2.75	67.42	0.0007	0.0008	67.68
Kerosene	0.03768 GJ/ L	–	67.25	0.0007	0.0008	67.51
Diesel Fuel	0.03830 GJ/ L	2.75	66.75	0.0035	0.0104	70.05
Marine Diesel	0.03830 GJ/L	2.75	66.75	0.0039	0.0287	75.73
Gasoline	0.03500 GJ/ L	3.19	62.13	0.0771	0.0014	64.18
Wood Fuel – Industrial (50% moisture)	0.00900 GJ/ kg	93.33	–	0.0100	0.0067	2.29
Wood Fuel - Residential	0.01800 GJ/ kg	94.22	–	0.8333	0.0089	20.26

¹⁸ Statistics Canada (2013). *Report on Energy Supply and Demand in Canada 2011*, p. 121.

¹⁹ See <http://www.empr.gov.bc.ca/RET/RLCFRR/Pages/default.aspx> for the *Renewable and Low Carbon Fuel Requirements Regulation*, B.C. Reg. 394/2008.

²⁰ Values were calculated based on data from: The Climate Registry (2013). *General Reporting Protocol*, Climate Registry default emission factors Released April 2, 2013. These values can be used as conservative estimates for all welding gases.

B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions

Ethanol (E100)	0.02342 GJ/L	63.79	–	a	a	a
Biodiesel (B100)	0.03567 GJ/L	68.66	–	b	b	b
Biomethane	0.03135 GJ/ m ³	49.35	–	c	c	c

^a Gasoline CH₄ and N₂O emission factors (by mode and technology) are used for ethanol.

^b Diesel CH₄ and N₂O emission factors (by mode and technology) are used for biodiesel.

^c Natural Gas CH₄ and N₂O emission factors (by mode and technology) are used for biomethane.

* Note: Literature on CH₄ and N₂O emissions from Acetylene could not be obtained.

Table 2: Source Emission Factors – Stationary Fuel Combustion²¹

Fuel Type	Units	Bio CO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Natural Gas	kg/ m ³	–	1.916	0.000037	0.000035	1.928
Propane	kg/ L	–	1.507	0.000024	0.000108	1.541
Acetylene	kg/m ³	–	3.719	*	*	3.719
Light Fuel Oil	kg/ L	0.0980	2.616	0.000026	0.000031	2.626
Kerosene	kg/ L	–	2.534	0.000026	0.000031	2.544
Diesel Fuel	kg/ L	0.0980	2.557	0.000133	0.0004	2.684
Marine Diesel	Kg/L	0.0980	2.557	0.00015	0.0011	2.901
Gasoline	kg/ L	0.0747	2.175	0.0027	0.00005	2.247
Wood Fuel – Industrial (50% moisture)	kg/ kg	0.840	–	0.00009	0.00006	0.020
Wood Fuel - Residential	kg/ kg	1.696	–	0.015	0.00016	0.365
Ethanol (E100)	Kg/L	1.494	–	a	a	a
Biodiesel (B100)	Kg/L	2.449	–	b	b	b
Biomethane	Kg/m ³	1.547	–	c	c	c

^a Gasoline CH₄ and N₂O emission factors (by mode and technology) are used for ethanol.

^b Diesel CH₄ and N₂O emission factors (by mode and technology) are used for biodiesel.

^c Natural Gas CH₄ and N₂O emission factors (by mode and technology) are used for biomethane.

* Note: Literature on CH₄ and N₂O emissions from Acetylene could not be obtained.

2.2 Indirect Emissions: Purchased Electricity for Stationary Sources

Description: In a hydroelectric-based power system such as British Columbia's, the GHG emissions from electricity can vary significantly from year to year. This variation is influenced by both the quantity purchased by consumers, and variation in water supply conditions and reservoir levels. During years with low stream flows and/or low reservoir levels, available hydro power must be supplemented through fossil-fuel (thermally) generated electricity purchased from neighbouring jurisdictions and/or through increased use of local thermal generation leading to higher provincial

²¹ See Environment Canada (2013). *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990-2011.*, and British Columbia (2012). *British Columbia Greenhouse Gas Inventory Report 2010.*

GHG emissions. During years with higher stream flows and/or high reservoir levels, less thermal power is needed and GHG emissions are relatively lower.

Emissions also differ among B.C.'s electric utilities with each having different ratios of hydro to thermal power in their supply mixes. Depending on their building locations, consuming organizations may acquire electricity from BC Hydro, FortisBC or a municipal distributor.²² In addition, some organizations may currently have properties in other provinces (e.g. Alberta and Ontario) and countries (e.g. England, Japan and China).

Some organizations purchase Renewable Energy Certificates (REC's), Green Rights or Green Power from Green Power suppliers. In the case of PSOs, emissions reduced by purchasing RECs are only recognized in jurisdictions where 50% or more of the power is produced from fossil fuel generators and where it has been demonstrated there is a reasonable level of assurance that the REC's are appropriately verified.

SMARTTool captures data on electricity consumption in kilowatt-hours (kWh) and makes the conversion to GJ of energy.

Data sources: BC Hydro reported GHG emissions in its Annual Report and as part of a Global Reporting Initiative (GRI) Index up until 2013.²³ This reporting included domestic purchases of electricity from independent power producers (IPPs), which together accounted for the largest share of BC Hydro's reported emissions (74 percent in 2010). They now report their GHG emissions on their website.²⁴ The emissions associated with electricity imports for domestic use are not included. This exclusion will be evaluated as more information becomes available and as policy evolves in regard to imported electricity.²⁵ Taken from the BC Hydro website, the emission factor reported in Table 3 below for BC Hydro represents the sum of emissions from BC Hydro power facilities and IPP purchases, divided by the electricity generated at those sources.²⁶

While FortisBC and the municipal distributors do not publicly report GHG emissions, their emissions can be estimated from electricity supply data. Information on the recent (2009) supply mix was obtained directly from utility contacts.

For all provinces, the NIR reports annually on total GHG emissions, electricity generation and GHG intensity for public utilities as a whole,²⁷ thus the most recent version of the NIR is used for buildings in other provinces.

²² There are six municipal electric utilities, respectively serving Grand Forks, Kelowna, Nelson, New Westminster, Penticton and Summerland.

²³ See Indicator EN16(2) of the GRI Index at: http://www.bchydro.com/about/accountability_reports/2011_gri/f2011_environmental_EN16_2.html

²⁴ See http://www.bchydro.com/about/sustainability/climate_action/greenhouse_gases.html

²⁵ Under voluntary international GHG protocols, BC Hydro is not required to measure and report the emissions from purchased electricity – either domestic or imported – that is passed on to consumers. BC Hydro has chosen to voluntarily report the emissions from domestic IPP purchases, but import-related emissions are not yet included in its GHG inventory. Starting in 2011, importers of electricity are required to report GHG emissions associated with the generation of this electricity under B.C.'s *Reporting Regulation*.

²⁶ See http://www.bchydro.com/about/sustainability/climate_action/greenhouse_gases.html

²⁷ See, Environment Canada (2013). *National Inventory Report 1990-2011 Part 3*, Table A13-7 for Ontario, and A13-10 for Alberta.

For properties in other countries, information is available from the International Energy Agency (IEA) on CO₂ emissions per kWh from electricity and heat generation.²⁸ The published three year rolling averages (2008-2010) for individual countries were incorporated into this report. These data can be used to estimate emission factors for fossil fuel combustion in international cities.

Calculations: In Table 3 below, the BC Hydro emission factor is based on the reported GHG Intensity for the utility's total domestic supply. The emission factor of 14 tonnes CO₂e per Gigawatt-hour (GWh) has been calculated as an average of BC Hydro's GHG intensities for 2010 through 2012.²⁹ A rolling three-year average is used to partially smooth out the annual fluctuation in the electricity emission factor due to changing water conditions.³⁰

The FortisBC emission factor of 3 tCO₂e/ GWh has been estimated using a weighted average of the GHG intensity of Fortis' own hydroelectric plants, purchased hydro and other renewable electricity, and purchases from BC Hydro. In calculating this average, a zero emission factor was assigned to existing hydro and other renewable (energy from wood waste) generation and purchases, which accounted for just over three-quarters of the utility's 2009 supply.³¹ The BC Hydro emission factor was then applied to the remaining purchases in the supply mix.

Since the cities of Grand Forks, Kelowna, Penticton and Kelowna acquire all of their electricity from FortisBC, they are assigned the FortisBC emission factor. Likewise, the City of New Westminster is redistributes BC Hydro electricity and so is given its emission factor. The City of Nelson's municipal utility, Nelson Hydro, generates about 55 percent of its annual electricity requirements from a local hydro plant and purchases the rest from Fortis.³² These supply shares and the Fortis emission factor have been used to estimate a weighted average emission factor of 1.4 tCO₂e/GWh.

The electricity emission factors for Alberta and Ontario are the three-year (2009-2011) average values reported for "Overall Greenhouse Gas Intensity" in the 1990-2011 NIR.³³ Their large magnitude relative to the B.C. emission factors reflects the substantially higher shares of fossil-fired generation in the supply mix, particularly in Alberta's case. Going forward, if additional emission factors are needed for facilities in other provinces, they will be calculated in the same manner as those for Alberta and Ontario.

The emission factors for the U.K., India, Japan, China and Hong Kong required no further calculations as their values were already calculated and published as CO₂e emissions per kWh from electricity and heat generation³⁴.

²⁸ See IEA (2012), *2012 CO₂ Emissions for Fuel Combustion – Highlights*, pp. 111-113.

²⁹ The reported GHG intensities were 23, 9 and 9 tCO₂e/GWh, respectively, for 2010, 2011 and 2012.

³⁰ Since there is a lag in collecting and reporting GHG emissions data, the emission factor estimated for the most recent calendar year of data available (e.g., 2011) may not necessarily reflect the water conditions in the current year for which emissions are being measured (e.g., 2013). Averaging over a three-year period will reduce the year-to-year differences.

³¹ Wood waste generated electricity has been assigned a zero emission factor given that the CO₂ emissions from biomass are not included in Fortis' GHG inventory under international reporting rules.

³² See: www.nelson.ca/EN/main/services/electrical-services.html.

³³ Environment Canada (2013). *National Inventory Report 1990-2011 Part 3*, Table A13-7, p. 72 for Ontario, and Table A13-10, p. 75 for Alberta.

³⁴ See IEA (2012), *2012 CO₂ Emissions for Fuel Combustion – Highlights*, pp. 111-113.

Table 3: Purchased Electricity

Public Utility	Emission Factor (tCO ₂ e/ GWh)	Emission Factor (kgCO ₂ e/ GJ)
BC Hydro ³⁵	14	4
Kyuquot Power	14	4
FortisBC	3	1
City of Grand Forks	3	1
City of Kelowna	3	1
Nelson Hydro	1.4	0.4
City of New Westminster	14	4
City of Penticton	3	1
City of Summerland	3	1
Alberta	823	229
Ontario	111	31
United Kingdom	470	131
India	936	260
Japan	424	118
China	790	219
Hong Kong	748	208

Note: Energy Conversion Factor = 0.0036 GJ/kWh

2.3 Indirect Emissions: District Energy Systems, Purchased Steam, Hot Water, Etc. for Stationary Sources

Description: A number of organizations use energy such as steam to heat buildings. Some (e.g., UBC, Vancouver Coastal Health Authority) produce heat, use a portion for their own consumption and sell the surplus. Others purchase heating and/or cooling from a commercial district energy supplier, such as Vancouver’s Central Heat Distribution Ltd. These providers meet the definition of a District Energy System: *a community scale network of pipes that with the aid of steam, hot or chilled water carry thermal (i.e. heating and/or cooling) energy services to a collection of buildings in a defined geographic area.* This thermal energy can be created using a variety of input feedstock fuels including biomass (forest, agricultural, municipal solid waste), biogas, renewable energy forms (e.g. geo-exchange), natural gas, and cool water. As such, it provides the opportunity to utilize locally available fuels to generate hot and cool space conditioning at a community scale and, importantly, the opportunity to centrally substitute feedstock fuels over time. This is an important way for communities to create sustainable,

³⁵ The BC Hydro emissions factor also applies to emissions from 74 independent power projects that are off of the North American grid, but that sell power to BC Hydro. Some of these include the Central Coast Power Corporation (Ocean Falls in Bella Bella), the Clean Power Operating Trust (Hluey Lake in Dease Lake), the Coastal Rivers Power LP (Sandspit), and XEITL Limited Partnership (Pine Creek in Atlin).

resilient energy delivery systems and manage risks of being dependent on any one fuel or technology.”³⁶

Where an organization produces heating or cooling for its own consumption, the resulting GHG emissions are determined by applying the appropriate combustion emission factors to the quantity of fuels consumed by the system (refer to section 2.1). Where an organization purchases heating or cooling from another entity, estimating emissions requires information on the fuels consumed as well as and the generation, distribution and system efficiencies.

Data sources: The average efficiency of district energy systems can vary significantly depending on characteristics such as the age of the plant, distribution losses and operation and maintenance practices. A District Energy emissions calculator based on the General Reporting Protocol³⁷ has been developed for the 2013 reporting year for organizations to help them determine which of the tiers in Table 4 below they should use for emissions measurement and reporting purposes. Having calculated an emissions intensity using the calculator, an organization should compare it with the thresholds set out in Table 4. The organization should select the one tier where the calculated value falls between the upper and lower thresholds. The calculator can be found at: <http://www.env.gov.bc.ca/cas/mitigation/pdfs/DES-Calculator.xlsx>. Organizations that previously entered their purchased steam in pounds or kg into SMARTTool for conversion into GJ of energy will be able to continue doing so. Note the previous tiered steam emission factors for steam (Natural Gas at 65%, 75%, and 85%) from the 2012 BC Best Practices Document have been carried over into the new tiers in Table 4. The RESD provides an average conversion factor for translating kg of steam into GJ of energy³⁸

Organizations should document all of the variables they input into the calculator as a record for the reference of other/future staff, for annual Self Certification purposes and possible third party verification. This documentation should be updated on an annual basis as system efficiencies will vary based on local climate, exposure, occupancy patterns, heating controls, insulation, and other factors. Documentation should also be sent to climateactionsecretariat@gov.bc.ca. Use the same email address for any questions about the foregoing.

Note: Where a PSO produces heating/cooling energy and sells a portion to another PSO, the producer must either report that quantity of energy sold as a negative value in SMARTTool, or separately identify the emissions from the sales using the District Energy calculator. These emissions are then deducted from the producer’s GHG inventory to avoid double counting when aggregating emissions across the B.C. public sector. However, if an organization produces heating/cooling energy and sells a portion to another organization that is not a PSO, they must report in full the emissions produced from the generation and distribution of that energy.

³⁶ See the International District Energy Associations (2013) definition at: <http://www.districtenergy.org/what-is-district-energy>

³⁷ The Climate Registry (2013). *General Reporting Protocol*, Version 2.0

³⁸ Statistics Canada (2013). *Report on Energy Supply and Demand in Canada 2011*. p. 121

Table 4: District Energy Systems: Emission Tiers/Thresholds

Example Fuel Type(s) and System	Tier	tCO ₂ e/GWh	tCO ₂ e/GJ
		Lower – Upper Thresholds	Lower – Upper Thresholds
Biomass at 65% system efficiency	1	50.45 - 84.39	0.0140 - 0.0233
25% Natural Gas / 75% Renewable at 75% system efficiency	2	84.40 – 118.29	0.0234 - 0.0328
50% Natural Gas / 50% Renewable at 85% system efficiency	3	118.30 - 152.19	0.0329 - 0.0422
50% Biomass / 50% Natural Gas at 65% system efficiency	4	152.20 - 186.09	0.0423 - 0.0516
75% Natural Gas / 25% Renewable at 75% system efficiency	5	186.10 – 220.09	0.0517 - 0.0610
Natural Gas at 85% system efficiency	6	220.00 - 253.89	0.0611 - 0.0704
Natural Gas at 75% system efficiency	7	253.90 - 287.79	0.0705 - 0.0798
Natural Gas at 65% system efficiency	8	287.80 - 321.69	0.0799 - 0.0893
Gasoline at 75% system efficiency	9	321.70 - 355.59	0.0894 - 0.0987
Gasoline at 65% system efficiency	10	355.60 and higher	0.0988 and higher

2.4 Direct Fugitive Emissions: Stationary Air Conditioning and Refrigeration

Description: Fugitive emissions from stationary air cooling are attributed to the leakage and loss of HFC and PFC based coolants from air conditioning and commercial type refrigeration systems. Coolant loss can occur during the manufacturing, operation, and disposal of such equipment.

Data sources: The Climate Registry offers three methods for reporting and/or estimating emissions from stationary air conditioning and refrigeration. The “Mass Balance” and “Simplified Mass Balance” methods can be used to measure and report coolant loss when information on system charges, top-ups, coolant disposal and coolant recycling is available. The Climate Registry also provides a “Screening Method” to estimate fugitive emission releases from HFC and PFC coolants when detailed information is not available.³⁹

Calculations: Emissions from stationary air conditioning and refrigeration for the BC Government were calculated using both the “Simplified Mass Balance” and “Screening Method” using HVAC incident report log and equipment inventory information.

Table 5: GHG Emissions from Stationary Air Conditioning and Refrigeration across the B.C. Government (Consolidated Revenue Fund) Portfolio

Year	Calculation Method	Calculated tCO ₂ e	Total 2008 CRF GHG tCO ₂ e	HFC Composition
2007	Simplified Mass Balance	2.33	104,753	0.0022%
2008	Simplified Mass Balance	6.61	104,753	0.0063%
2007/8	Screening Method	2.75	104,753	0.0026%

³⁹ The Climate Registry (2013). *General Reporting Protocol Version 2.0*, pp. 123-133.

Use of either method produced emissions estimates significantly less than 1% for PSOs. This is attributable in part to the prevalence of R-22, an HCFC based coolant that is not in scope for reporting under the CNGR, and in widespread use amongst PSO's.

Based on these estimates, it is expected that the fugitive emissions from stationary cooling are significantly less than 1% (approximately 0.01%) of each PSOs/local governments' total GHG footprint. If these fugitive emissions are also onerous to measure and collect, PSOs/local governments should examine the "how to treat small emissions" decision tree in the Annex 8.3.

Organizations who wish to voluntarily report on HFC and PFC emissions from stationary cooling may use the "Mass Balance" or "Simplified Mass Balance" methods as described in Chapter 16 of Climate Registry's General Reporting Protocol⁴⁰ to calculate and report emissions from these sources. Depending on the method chosen, organizations may require detailed information on refrigeration system purchases, servicing, and retirement.

3. Indirect Emissions: Supplies (Paper)

Another source of indirect emissions is the purchase of paper.

Description: Emission factors for office paper are differentiated by size and the percentage of post-consumer recycled (PCR) content. In practice, the PCR content can range between 0 and 100 percent.⁴¹

Three different sizes of office paper (any colour) are currently in scope – 8.5" x 11", 8.5" x 14" and 11" x 17". In each case, data on the number of 500-sheet (20lb) packages are entered into SMARTTool.

Some organizations may have begun to use alternative paper types such as wheat, eucalyptus, sugarcane, bamboo, etc. While these papers likely have emission factors that differ from conventional paper, limited literature is currently available on their carbon intensity. As a best approximation, the emission factors in Table 6 for 100% PCR of the corresponding paper size should be applied to these alternative papers.

Data sources: Ideally, it would be best to specify emission factors that accurately reflected the manufacturing process for specific paper purchases. In the absence of paper-specific information, proxy emission factors have been derived from the Environmental Paper Network (EPN) Paper Calculator.⁴² This tool assesses the lifecycle impacts of paper production and disposal and is updated regularly with peer-reviewed data.

The Paper Calculator inputs the paper grade (e.g., copy paper), quantity by weight and PCR content and estimates the associated GHG emissions in pounds of CO₂e.

⁴⁰ The Climate Registry (2013). *General Reporting Protocol Version 2.0*, pp. 123-133.

⁴¹ See the Copaper Database at www.canopyplanet.org/EPD/index.php for a listing of papers available in the Canadian marketplace and their PCR contents.

⁴² See: <http://c.environmentalpaper.org/baseline>

Table 6: Office Paper

PCR Content (%)	Emission Factor (kg CO ₂ e/ pkg)		
	8.5" x 11"	8.5" x 14"	11" x 17"
0	6.358	8.094	12.743
10	6.123	7.795	12.272
20	5.888	7.496	11.802
30	5.653	7.197	11.331
40	5.418	6.898	10.860
50	5.184	6.599	10.390
60	4.949	6.300	9.919
70	4.714	6.001	9.449
80	4.479	5.703	8.978
90	4.244	5.404	8.508
100	4.010	5.105	8.037

Note: emission factors for office paper are based on a 500-sheet package of 20-pound bond paper weighing 2.27, 2.89 and 4.55 kg, respectively, for the three paper sizes.

Calculations: To generate the emission factors in Table 6, the weight of a 500-sheet package was first determined for each paper size. This weight (in metric tons) and the PCR content were then entered into the Paper Calculator and the resulting estimate of GHG emissions was converted from lbs to kg CO₂e. Emission factors for other PCR contents (e.g., 85 percent) can be interpolated by averaging between the values shown.

It should be noted that, unlike the other emission factors within this document, the entries in Table 6 are lifecycle emission factors.⁴³

4. Mobile Sources: Fleet

An organization's fleet of vehicles and equipment is a further source of GHG emissions. Two categories of emissions are tracked:

- ◆ Direct emissions from fossil fuels combustion in vehicles and equipment; and
- ◆ Fugitive emissions from mobile air conditioning systems.

4.1 Direct Emissions: Mobile Fuel Combustion

Description: Emission factors are specified for seven transport modes:

- ◆ Light-duty vehicles
- ◆ Light-duty trucks (including SUVs and minivans)
- ◆ Heavy-duty

⁴³ Lifecycle emissions account for all emissions relating to the production, use and disposal of a product, including the extraction of raw materials, product manufacturing and intermediate transport steps.

- ◆ Motorcycles
- ◆ Off-road vehicles and equipment (e.g., snowmobiles, ATVs, lawnmowers and trimmers, tractors, construction equipment)
- ◆ Marine
- ◆ Aviation

Ten fuel types have different emission factors associated with them:

- ◆ Gasoline
- ◆ Diesel
- ◆ Propane
- ◆ Natural gas
- ◆ Biodiesel
- ◆ Ethanol
- ◆ Marine Gasoline
- ◆ Marine Diesel
- ◆ Aviation Gasoline
- ◆ Aviation Turbo Fuel

SMARTTool captures data on fuel consumption in litres by mode of transport and fuel type. This information is required because the emission factors for CH₄ and N₂O vary by vehicle type and transport mode.

Hybrid electric vehicles are not identified separately since their fuel consumption is captured under gasoline cars and trucks. The higher fuel economy of these vehicles relative to conventional gasoline cars and trucks is reflected in lower overall fuel consumption, and therefore lower GHG emissions. Hydrogen powered transit busses and electric vehicles produce zero emissions at the tail-pipe and are therefore not included in emissions reporting.

Data sources: Table A8-11 of the 1990-2011 NIR and Table 34 of the 2010 PIR⁴⁴ provide emission factors for mobile fuel combustion sources.⁴⁵ The factors for gasoline and diesel cars and trucks vary with emission control technology which correlates with vehicle age⁴⁶.

For the purposes of estimating an organization's emissions, the default emission factors are "Tier 1" for gasoline-fuelled light cars and trucks, "Three-Way Catalyst" for gasoline heavy trucks and "Advance Control" for all diesel-fuelled on-road vehicles.⁴⁷ The majority of fleets are likely vehicles dating from the mid-1990s, when the introduction of these technologies began in the U.S. Table A8-11 in the NIR also contains emission factors for propane and natural gas vehicles, motorcycles ("Non-Catalytic Controlled"), off-road vehicles, gasoline boats, diesel ships, aviation gasoline and turbo fuel and renewable or biofuels (biodiesel and ethanol). In practice, biofuels are blended with fossil fuels, specifically gasoline or diesel, in varying proportions (e.g., E10, B5, B20), so that the actual emission factor is a weighted average of the biofuel and fossil fuel factors.

⁴⁴ British Columbia (2012). *British Columbia Greenhouse Gas Inventory Report 2010*, p. 67-68.

⁴⁵ Environment Canada (2013). *National Inventory Report 1990-2011*, Part 2, p. 198.

⁴⁶ *Ibid.*, pp.42-44

⁴⁷ The NIR defines light-duty cars and trucks as those with a Gross Vehicle Weight Rating (GVWR) of 3,900 kg or less and heavy duty as those vehicles with a GVWR greater than 3,900 kg. *Ibid.*, p. 42.

However, since international rules require the separate reporting of biogenic emissions from combustion (see Section 2.1) the CO₂ emissions from the biofuel component must be calculated and reported separately from those of the fossil fuel component.

In B.C., the *RLCFR* sets benchmarks for the amount of renewable fuel in the province's transportation and heating fuel blends.⁴⁸ Effective January 1st, 2011, fuel suppliers are required to incorporate renewable fuel contents of 5% for gasoline and 4% for diesel into the sum of total fuel sold at a provincial level. For any given volume of reported gasoline consumption, 95% of the fuel is fossil fuel gasoline and the remaining 5% is ethanol. For Diesel, 96% is fossil fuel diesel and 4% is biodiesel. Where applicable, the emissions factors listed in Table 7 below have been adjusted to account for the renewable fuel content under the *RLCFR*. Please note that the regulation does not affect the CH₄ or N₂O factors.

Calculations: With the exception of natural gas, the NIR emissions factors in Table 7 have been converted from grams to kilograms by fuel consumption. This is the only change that has been applied to these factors, except in the case of gasoline and diesel fuels, where the numbers were adjusted to account for the renewable fuel content under the *RLCFR*.

The natural gas emission factor has been converted from kg/L to kg/kg of compressed natural gas – the form in which the fuel is dispensed at the pump. Table 8 outlines how this conversion is done.

⁴⁸ Aviation fuels have no similar regulation

Table 7: Fleet Fuel Consumption

Transport Mode	Fuel Type	Units	Emission Factor				
			Bio CO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Light-duty Vehicle ^a	Gasoline	kg/ L	0.0747	2.175	0.00023	0.00047	2.326
	Diesel	kg/ L	0.0980	2.556	0.000051	0.00022	2.625
	Propane	kg/ L	–	1.510	0.00064	0.000028	1.532
	Natural Gas ^b	kg/ kg	–	2.723	0.013	0.000086	3.023
Light-duty Truck (includes SUV and Minivan) ^a	Gasoline	kg/ L	0.0747	2.175	0.00024	0.00058	2.360
	Diesel	kg/ L	0.0980	2.556	0.000068	0.00022	2.626
	Propane	kg/ L	–	1.510	0.00064	0.000028	1.532
	Natural Gas ^b	kg/ kg	–	2.723	0.013	0.000086	3.023
Heavy-duty ^a	Gasoline	kg/ L	0.0747	2.175	0.000068	0.00020	2.238
	Diesel	kg/ L	0.0980	2.556	0.00011	0.000151	2.605
Motorcycle	Gasoline	kg/ L	0.0747	2.175	0.00077	0.000041	2.204
Off-Road (Vehicle/ Equipment)	Gasoline	kg/ L	0.0747	2.175	0.0027	0.00005	2.247
	Diesel	kg/ L	0.0980	2.556	0.00015	0.0011	2.900
Marine	Gasoline	kg/ L	0.0747	2.175	0.0013	0.000066	2.223
	Diesel	kg/ L	0.0980	2.556	0.00015	0.0011	2.900
Aviation	Gasoline	kg/ L	–	2.342	0.0022	0.00023	2.460
	Turbo Fuel	kg/ L	–	2.534	0.000034	0.000071	2.557
Various	Biodiesel ^c	Kg/ L	2.449	0	e	e	e
	Ethanol ^d	kg/ L	1.494	0	f	f	f

Note: emission factors for fleet fuel consumption are based on Tier 1 or Advance Control emission control technologies.

^a Based on Tier 1 or Advance Control emission control technologies.

^b Adapted from Table 34 of the 2010 PIR factors and converted to kg of compressed natural gas.

^c Diesel CH₄ and N₂O emission factors (by transport mode) used for biodiesel.

^d Gasoline CH₄ and N₂O emission factors (by transport mode) used for ethanol.

^e Diesel CH₄ and N₂O emission factors (by mode and technology) are used for biodiesel.

^f Gasoline CH₄ and N₂O emission factors (by mode and technology) are used for ethanol.

4.2 Natural Gas Vehicle Emission Factors

Light-duty natural gas vehicles are fuelled with compressed natural gas, which is measured in kilograms. Federal regulations require that natural gas be dispensed on a cents per kilogram basis; however some receipts may show consumption in GLEs (Gasoline Litre Equivalent). In this case, multiply the per GLE pump price by 1.516 to arrive at kilograms of natural gas. One kilogram of

natural gas has the same amount of energy as 1.516 litres of gasoline⁴⁹. The NIR and PIR provide emission factors for the mobile combustion of natural gas in grams per litre (g/ L).^{50, 51} As a result, these factors do not align with the common unit for compressed natural gas measurement at the pump.

SMARTTool specifies emission factors in kg of emissions per unit of consumption – also kg in the case of compressed natural gas. Table 8 shows the calculations that have been performed to convert the 1990-2011 NIR/2010 PIR emission factors to the format used by SMARTTool. In particular, this involves adjusting for the density of natural gas in its gaseous state at standard temperature and pressure (STP).⁵²

Table 8: Natural Gas Vehicle Emission Factor Calculations

Step	Units	CO ₂	CH ₄	N ₂ O
1. Obtain natural gas emission factors from the 2010 NIR (at STP)	g/ L	1.89	0.009	0.00006
2. Convert to g/ m ³ by multiplying by 1,000 (L/ m ³)	g/ m ³	1,890	9	0.06
3. Convert to g/ kg by dividing by 0.694 (density of natural gas at STP in kg/ m ³)	g/ kg	2,723.3	13.0	0.086
4. Convert to kg/ kg by dividing by 1 000 (g/ kg)	kg/ kg	2.723	0.013	0.000086

4.3 Direct Fugitive Emissions: Mobile Air Conditioning

Description: Atmospheric releases of HFCs can occur throughout the lifecycle of motor vehicle air conditioning (MVAC) units. Unlike a building’s HVAC, however, MVAC servicing is not part of the regular service schedule. Moreover, fuel consumption, which is measurable, does not provide insight into MVAC use. Given differences in climate, usage on the coast is likely to be very different from that in the interior.

Data sources: The Climate Registry offers a “Screening Method” for estimating emissions based on an upper bound capacity charge for MVAC equipment multiplied by an operating emission factor.⁵³ This method has been used to calculate a default emission factor, in kg of HFCs per vehicle. In order to apply the default factor, organizations must provide the number of vehicles in its fleet with MVAC.

The Climate Registry recommends an upper bound capacity charge of 1.5 kg and an operating emission factor of 20 percent of capacity per year for mobile air conditioning.⁵⁴ The most common refrigerant used in MVAC is HFC-134A, with a global warming potential of 1,300.

⁴⁹ Canadian Natural Gas Vehicle Alliance: <http://www.cngva.org/en/home/vehicles-stations/natural-gas-refuelling-stations.aspx>

⁵⁰ Environment Canada (2013). *National Inventory Report 1990-2011 Part 2*, p. 198. These emission factors relate to natural gas in its gaseous state as it flows through a pipeline, prior to compression.

⁵¹ British Columbia (2012). *British Columbia Greenhouse Gas Inventory Report 2010*, p. 67.

⁵² The natural gas density of 0.694 kg/m³ at STP is based on the *British Columbia Greenhouse Gas Inventory Report 2010*, p. 68

⁵³ The Climate Registry (2013). *General Reporting Protocol Version 2.0*, pp. 128-133.

⁵⁴ The Climate Registry (2013). 2013 Climate Registry Default Emission Factors – Released April 2, 2013, Table 16.2, p. 41.

Calculations: Multiplying the 1.5 kg capacity charge by the 20 percent operating emission factor and converting to CO₂e emissions yields a default emission factor of 390 kg CO₂e per vehicle per year. Using this emission factor in conjunction with fleet inventory information, the total estimate for emissions from mobile cooling was less than 1% of the BC Government’s (Consolidated Revenue Fund) total GHG inventory for 2008.

Table 9: Per Vehicle Estimate of HFCs from Mobile Air Conditioning

Greenhouse Gas (kg)	Emissions per Vehicle per Year (kg CO ₂ e)
Hydrofluorocarbons	390

^a default emission factor for HFCs from mobile air conditioning are emissions which consist of HFC-134a.

Organizations typically have two options for calculating and reporting mobile cooling emissions.

Organizations with information on the MVAC servicing for their fleets (e.g., for transit fleets) may use these data to report their HFC emissions directly using the Climate Registry’s “Simplified Mass Balance Approach.”⁵⁵ This method requires information on the quantities of each refrigerant used and recovered from MVAC equipment reported directly.

Organizations without access to detailed mobile refrigerant information may estimate and report their annual refrigerant use at 390 kg CO₂e per each vehicle with air conditioning. This value provides a conservative estimate of emissions resulting from HFC-134a use.

5. Business Travel

Under the Carbon Neutral Public Sector commitment, only core government organizations that report through the Consolidated Revenue Fund (e.g., ministries, special offices, tribunals) are required to track and report the emissions from the business travel of public officials.

Calculating indirect emissions from business travel requires methodologies that differ from those for buildings and fleet emissions. Typically, information on volumes of fuel consumed is not readily available for business travel modes because it is proprietary to private entities such as airlines, taxi companies and rental car agencies. Consequently, depending on the travel mode, one of two methodologies for calculating GHG emissions was used:

1. Estimating fuel consumption using an average fuel efficiency and distance travelled, and then applying an emission factor; or
2. Applying an emission factor in GHGs per passenger-kilometre travelled to the estimated travel distance.

5.1 Travel Emissions Based on Fuel Efficiency

Description: For taxis, rental cars and business use of personal vehicles, average fuel efficiencies have been estimated by vehicle and fuel type. Vehicle types are: (1) cars (including hybrid electric

⁵⁵ The Climate Registry (2013). *General Reporting Protocol Version 2.0*, pp. 123-133.

vehicles); and (2) pickup trucks/SUVs. Fuel types are: (1) gasoline; (2) diesel; (3) propane; and (4) natural gas. Fuel efficiencies are expressed in litres per 100 kilometres driven.

In the case of ferries, an average fuel efficiency has been similarly estimated, expressed in litres per passenger-100 km travelled.

Data sources: For road travel, both the US Environmental Protection Agency (EPA) and NRCan publish “city” and “highway” fuel economy ratings by vehicle manufacturer and model.⁵⁶

It is expected that most government travel falls between the conditions modeled for city and highway driving, tending closer to city estimates.⁵⁷

In 2008, the EPA established new best practices for measuring fuel economy that indicated lower fuel efficiency – or increased L/100 km – than previous measurements.⁵⁸ Accordingly, fuel economy ratings that predate 2008 need to be adjusted upwards.

The Insurance Corporation of British Columbia (ICBC) maintains non-public records of the composition of the provincial vehicle fleet. These data were used to develop weighted average fuel efficiencies for the vehicle and fuel types in Table 10.

Distances for road travel were derived from the Ministry of Transportation’s DriveBC road distance calculator.⁵⁹

For ferry travel, neither BC Ferries nor Environment Canada currently publishes comprehensive data on GHG emissions. However, public data on fuel consumption, route length and passenger capacity have been previously available from various BC Ferries sources and have been used in estimating average fuel efficiency.⁶⁰

An average fuel efficiency factor of 0.2 kWh/km has been supplied for electric vehicles.⁶¹ It should be noted that when charging an electric vehicle at a building owned by your organization, the emissions for charging the vehicle will likely already be attributed to your organization’s stationary emissions profile.

Calculations: In the case of road travel, an uplift factor of 7.8 percent was applied to the 2007 NRCan fuel economy ratings for city driving – to better reflect real-world fuel efficiencies. NRCan city ratings were then applied to 2007 ICBC data on the provincial vehicle stock by model, year, fuel type and other characteristics to derive average fuel efficiency estimates for each vehicle/fuel type listed in Table 10.

⁵⁶ US EPA (2013). *Model Year 2013 Fuel Economy Guide*, and NRCan (2013), *Fuel Consumption Guide 2013*.

⁵⁷ The NRCan city ratings have been used here for a number of reasons. For example, most highway driving in the province’s metropolitan areas is characterized by considerable congestion, leading to higher fuel consumption. In the Interior, fuel efficiencies are likely to be higher than the theoretical (best practices) NRCan ratings, given weather and terrain. As a result, the city ratings can be assumed to capture some of the actual highway driving efficiencies in B.C. and lead to a more conservative estimate of the GHG emissions from business road travel.

⁵⁸ See: www.epa.gov/fueleconomy/.

⁵⁹ See: www.th.gov.bc.ca/popular-topics/distances/calculator.asp.

⁶⁰ British Columbia Ferry Services Inc. (2006). *Fuel Consumption Reduction Plan*, p. 8; BC Ferries (2013). *Routes and Schedules Regional Index*; and BC Ferries (2013). *Variety...The Spice of Our Fleet*.

⁶¹ See: <http://www.livesmartbc.ca/blog/2012/plugin-BC-ready-set-charge.html>

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To calculate GHG emissions, the quantity of fuel consumption was first estimated by multiplying the average fuel efficiency for the particular vehicle/fuel type by the kilometres driven. Then, the appropriate emission factor was applied to this fuel consumption estimate.

For ferries, the average fuel efficiency in Table 19 (Annex 8.4) has been estimated using 2005/06 data on diesel consumption for five ferry routes. These fuel data were extrapolated to all 22 ferry routes based on route distance and horsepower. Fuel efficiencies in litres per passenger-100 km were then calculated by dividing the total diesel consumption for each route by the route distance and the estimated passenger load (assuming 80 percent of the ferry's total passenger capacity). These fuel efficiencies were then averaged over the 22 routes to yield 5.1 L/passenger-100 km.

To calculate ferry emissions, the average fuel efficiency was multiplied by the passenger distance travelled and the emission factor for marine diesel then applied to the resulting fuel consumption figure. Distance travelled is based on route length as travelled by the ship, as opposed to the straight line distance between starting and destination points. For more information refer to Annex 8.4.

Table 10: Travel, Fuel Efficiency Based Emission Calculations

Travel Mode	Vehicle/Fuel Type	Average Fuel Efficiency ^a	Emission Factor (kg/L) ^b				
			Bio CO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}
Car (includes Taxi)	Gasoline	10.3 L/100 km	0.0747	2.175	0.00023	0.00047	2.326
	Diesel	7.7 L/100 km	0.0980	2.557	0.000051	0.00022	2.626
Car (includes Taxi)	Hybrid	7 L/100 km	0.0747	2.175	0.00023	0.00047	2.326
	Natural Gas ^c	5.4 kg/100 km ^d	–	2.723	0.013	0.000086	3.023
	Propane	8.2 L/100 km	–	1.510	0.00064	0.000028	1.532
Light Truck (includes SUV and Minivan)	Gasoline	14.7 L/100 km	0.0747	2.175	0.00024	0.00058	2.360
	Diesel	12.5 L/100 km	0.0980	2.557	0.000068	0.00022	2.627
	Hybrid	10 L/100 km	0.0747	2.175	0.00024	0.00058	2.360
	Natural Gas ^c	8.3 kg/100 km ^d	–	2.723	0.013	0.000086	3.023
	Propane	12.6 L/100 km	–	1.510	0.00064	0.000028	1.532
Electric Vehicle	Electricity	20 kWh/100 km	–	0.025 ^e	–	–	0.025 ^e
Ferry	Diesel	5.1 L/psg-100 km	0.0980	2.557	0.00015	0.0011	2.901

^a From Natural Resources Canada, ICBC, and BC Ferries sources (see Data Sources, below.)

^b From Environment Canada 1990-2010 NIR.

^c Emission factors adapted from NIR figures, converted to kg of natural gas, the common units for vehicle natural gas.

^d kg/ 100km figure for Natural Gas calculated based on 1.516 L/ kg gasoline equivalency.

^e kgCO₂ per kWh

5.2 Travel Emission Based on Travel Distance

Description: GHG emissions for bus, skytrain, sea bus, rail, airplane and helicopter travel are all calculated using emission factors in kg CO₂e per passenger-kilometre. The categorization of airplane travel into three ranges of haul distance attempts to reduce the significant variation in emissions, since trips of comparable length are more likely to have similar aircraft types and flight patterns. However, it is recognized that the emission factors in Table 11 below are approximations and that actual emissions from airplane travel varies significantly from one trip to the next.

Data sources: NRCan publishes information on total Canadian GHG emissions and passenger-km for a number of transportation modes, including urban transit (city buses) and inter-city buses.⁶² The most recent year of data is 2010.

While NRCan also publishes aggregate data on GHG emissions and passenger-km for air travel, no breakdown is provided for haul distance. In contrast, the UK Department of Environment, Food and Rural Affairs (DEFRA) has estimated emission factors for three categories of flights: (1) domestic; (2) short haul international; and (3) long haul international.⁶³ For the B.C. government's purposes, these categories have been adopted as follows: (1) the DEFRA domestic emission factor has been applied to short haul flights; (2) the short haul international emission factor has been applied to medium haul flights; and (3) the long haul international emission factor has been applied to long haul flights.⁶⁴

Calculations: The emission factors for urban and inter-city buses were calculated by dividing the NRCan data on total GHG emissions for 2010 by the total passenger-kilometres. To calculate emissions, these emission factors in kg CO₂e/psg-km were then multiplied by the distance travelled. The emissions factors for Skytrain⁶⁵ and Sea Bus^{66,67} travel were calculated in previous years based on emissions data and the total passenger kilometers. For the 2013 reporting year, emissions factors were calculated in the same way based on data directly obtained from TransLink.

The emission factor for rail was calculated by dividing the Transport Canada data on total passenger services fuel consumption in litres for VIA Rail Canada by the corresponding revenue passenger-kilometres⁶⁸.

The airplane emission factors from DEFRA include a nine percent uplift factor. This adjustment is recommended by the Intergovernmental Panel on Climate Change (IPCC) to account for discrepancies between geographical distance and actual flight distance.⁶⁹ These discrepancies can

⁶² NRCan (2013). *Energy Use Data Handbook, 1990 to 2010*, pp. 118 - 125.

⁶³ DEFRA (2013). 2013 Government GHG Conversion Factors for Company Reporting: Methodology Paper for Emission Factors, July 2013, Table 33.

⁶⁴ The DEFRA categories are applied on the basis of distance rather than destination because conditions of European air travel vary substantially from those in B.C. (e.g., a typical Canadian domestic flight is likely to be much longer than a typical UK domestic flight). DEFRA information also includes emissions listed by flight class. However, for ease of use purposes, the average emissions factor for distance-based flight provided in the DEFRA document were used in this document.

⁶⁵ TransLink Sustainability Report (2010). Psg-km data: Appendix 2.7, p.88; Emission data: Appendix 2.8, p.89

⁶⁶ TransLink Sustainability Report (2010). p.88; Emission data: Appendix 2.8, p.89

⁶⁷ TransLink Annual Report (2008). Psg-km data: p. 2

⁶⁸ Transport Canada (2013). Traffic and Fuel Consumption Data, <http://www.tc.gc.ca/eng/programs/environment-ecofreight-rail-report2009-2727.htm>

⁶⁹ IPCC (1999). *Aviation and the Global Atmosphere*, Section 8.2.2.3.

result from conditions such as non-linear routing that is not the shortest direct distance, delays or circling and routings of take-off and landing.

In SMARTTEC, the specified distance is the shortest geographical distance between the starting point and the destination. The nine percent uplift factor was used to adjust for the difference between this shortest distance calculation and the actual travel of the aircraft.

The emission factor for helicopter and floatplane travel was calculated based on 2007 fuel consumption data provided by carriers operating flights between Vancouver harbour and Victoria harbour (Helijet and Harbour Air). Also incorporated in the emission factor is the average passenger load reported by Canadian airlines for 2007 and an estimated flight distance that accounts for the non-direct route between Vancouver and Victoria harbours.

Table 11: Travel Distance Based Emission Calculations

Travel Mode	Vehicle Type	Emission Factor (kg CO₂e/psg-km)
Bus	City	0.1158
	Other (Inter-city)	0.0488
Skytrain		0.0034355
Sea Bus		0.155466
Rail		0.125236
Airplane	Float Plane	0.213
	Short Haul (0 km-463 km)	0.174356
	Medium Haul (463 km-1,108 km)	0.1027
	Long Haul (>1,108 km)	0.120892
Helicopter		0.447

Note: B.C. Government emission factors for travel, distance based emission calculations are derived from NRCan, Transport Canada, DEFRA, Helijet and Translink BC sources (see text).

5.3 Indirect Emissions - Accommodation

Description: In addition to transportation-related GHGs from business travel, indirect emissions result from employee stays in hotels, bed and breakfasts and private accommodation.

Data sources: In March of 2011, InterVISTAS Consulting Inc. published a GHG report on the accommodation emissions for Coast Hotels and Resorts in 2009⁷⁰. The report followed the accounting and reporting guidelines of *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition* published by World Resources Institute and the World Business Council for Sustainable Development.

A total of five properties were evaluated (two in Vancouver, one in Edmonton, one in Victoria and one in Prince George). The properties in Western Canada provide a spatial sampling of locations in

⁷⁰ InterVISTAS Consulting Inc. (2011), *Coast Hotels & Resorts: Greenhouse Gas Report Fiscal Year 2009*

different climates to represent different energy consumption patterns. The properties varied in size from 132 rooms in Victoria to 299 in Edmonton. The intensity based indicators for those five hotels were then extrapolated to 22 hotels in BC and 7 in Alberta.

Calculations: In Table 12 below, the emission factor for a night’s stay has been calculated by dividing the total GHG emissions for the sample hotels by the number of potential room nights assuming full occupancy:

$$\text{Emission Factor (kg/ CO}_2\text{e/ night)} = 51,310 \text{ tonnes CO}_2\text{e} \times 1000 / (7,238 \text{ rooms} \times 365 \text{ nights})$$

From this method, both a domestic BC emissions value (11.90 kg CO_{2e} / night) and a national/international emissions value (20.78 CO_{2e} / night) were derived. The national/international value is a conservative estimate as it incorporates data from electricity generation in Alberta, which results in significantly greater emissions per kilowatt hour than in the rest of Canada due to coal being the primary energy source. Based on 2012 accommodation data from SMARTTEC, 94.03% of core government accommodation stays were domestic within BC and 5.97% were national or international. Based on these figures a weighted average can be calculated to derive a single accommodation factor of 12.43 kg CO_{2e} / night.

This emission factor for hotels has been assigned to the other categories of private accommodation and bed and breakfasts in the absence of available information for those categories.

Table 12: Accommodation

Accommodation Type	Emission Factor^a (kg CO_{2e}/ night)
Hotel Room	12.43
Private	12.43
Bed and Breakfast	12.43

^a Hotel room emission factor is applied to all accommodation types.

6. Community Energy and Emissions Inventory (CEEI) Emission Factors – Agricultural Emission Factors

The 2007 CEEI reports include only enteric fermentation⁷¹. Manure management is excluded because the emissions values used by the NIR do not reflect regional and local variations in the storage and use of manure, and agricultural soils are excluded because we have insufficient information about them at a local level. The CEEI Working Group is currently exploring the possibility of including manure management and agricultural soils emissions in the 2012 CEEI reports, scheduled to be released in 2014.

Furthermore, the categories in the NIR do not include all GHG emissions resulting from agricultural operations. For example, emissions from use of diesel in trucks to deliver hay are included in “transportation”. Emissions from water heaters and space heaters are included in “buildings”. Emis-

⁷¹ Enteric fermentation is a digestive process by which carbohydrates are broken down by microorganisms into simple molecules for absorption into the bloodstream of an animal.

sions from diesel used in tractors would be an “off-road” emission. None of these are included in the “Agriculture” sector of CEEI.

To quote from the 2013 NIR 6.2.2:

“CH₄ emissions are calculated for each animal category/subcategory, for each province, by multiplying the animal population of a given category/sub-category by its corresponding emission factor.”

CEEI calculates emissions based on the number of cattle, hogs and other animals in each regional district. For each regional district, the number of animals is multiplied by the estimated methane emissions from each animal (from the NIR) to give total methane (CH₄) emissions. These are multiplied by a factor converting methane (CH₄) emissions to carbon dioxide equivalents (CO₂e) using the same conversion factor as the NIR and BCPIR for 2010.

Tables 13 below present’s data from the 2013 NIR table A3-17 which shows “CH₄ Emission Factors for Enteric Fermentation for Cattle from 1990 to 2011”. It contains factors for eight different types of cattle, and the factors for each vary from year to year. The 2007 CEEI Reports use 2007 factors (2007 NIR) from this table.

Table 13: CH₄ Emission Factors for Enteric Fermentation for Cattle^{72, 73}

Year	EF(EF)T – kg CH ₄ /head/year							
	Dairy Cows	Dairy Heifers	Bulls	Beef Cows	Beef Heifers	Heifers for Slaughter	Steers	Calves
2007 (2007 NIR)	116.5	74.6	87.8	84.7	71.4	68.0	59.6	43.3
2007 (2013 NIR)	125.0	72.4	87.6	88.1	72.5	61.2	54.5	39.5
2011	127.6	72.4	88.0	85.0	70.2	61.0	54.8	39.6

Table 14 below presents methane emissions from animals other than cattle taken from Table A8-22: CH₄ Emission Factors for Enteric Fermentation for Non-cattle Animals in a version of the 1990-2011 NIR obtained by the ministry. These values are the IPCC Tier 1 default emission factors (IPCC/OECD/IEA 1997).

⁷² Environment Canada (2013). National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990-2011, Table A3-17

⁷³ See IPCC website for related publications, for example: www.ipcc-nggip.iges.or.jp/public/gp/bgp/4_2_CH4_and_N2O_Livestock_Manure.pdf

Table 14: Non-cattle Animal Category – Enteric Fermentation Emission Factor

Non-cattle Animal Category – Enteric Fermentation Emission Factor (kg CH₄/head/year)	
Pigs, Boars, Sows (all weights)	1.5
OTHER LIVESTOCK	
Sheep, Lambs	8
Goats	5
Horses	18
Buffalo, Bison ⁷⁴	55
POULTRY⁷⁵	

⁷⁴ This emission factor is for water buffalo. There are no recognized studies of enteric emissions from bison, so the IPCC Tier 1 water buffalo figure is used here, as it is in the N.I.R.

⁷⁵ Note: poultry does not generate significant methane by enteric fermentation, so poultry was not counted in CEEI

7. Sample Calculation

Table 15 provides a sample application of an emission factor to calculate GHG emissions, based on 100 litres of propane consumption in buildings.

Table 15: Sample Emissions Calculation

Step	Formula	Calculation		
1. Convert the actual consumption to a common unit of measurement.	Actual Consumption (L)	100 L		
	x	X		
	Energy Conversion Factor (GJ/ L)	0.02531 GJ/ L		
	=	=		
	Converted Fuel Consumption (GJ)	2.531 GJ		
2. Calculate the emissions of each GHG using the appropriate emission factor		CO₂	CH₄	N₂O
	Converted Fuel Consumption (GJ)	2.531 GJ	2.531 GJ	2.531 GJ
	x	x	x	x
	Emission Factor by GHG (kg/ GJ)	59.66 kg CO₂ / GJ	.0009 kg CH₄ / GJ	0.0043 kg N₂O / GJ
	=	=	=	=
	Emissions by GHG	151.0 kg CO₂	0.0023 kg CH₄	0.0109 kg N₂O
3. Convert the emissions of each greenhouse gas to CO ₂ equivalency (CO ₂ e) using the appropriate Global Warming Potential		CO₂	CH₄	N₂O
	Emissions by GHG	151.0 kg CO₂	0.0023 kg CH₄	0.0109 kg N₂O
	x	x	x	x
	GWP	1	21	310
	=	=	=	=
	Emissions (kg CO ₂ e)	151.0 kg CO₂e	0.0483 kg CO₂e	3.379 kg CO₂e
4. Sum across the gases to calculate total CO ₂ e emissions	CO₂ + CH₄ + N₂O (all in kg CO₂e)	151.0 kg CO₂e	+ 0.0483 kg CO₂e	+ 3.379 kg CO₂e
	=	=		
	Total CO₂e	154.4kg CO₂e		
5. Convert total emissions from kg to tonnes for reporting purposes.	Emissions in kg CO ₂ e / 1 000 kg / t	154.4 kg CO₂e / 1 000 kg / t		
	=	=		
	Emissions in tonnes CO ₂ e	0.154 t CO₂e		

8. Annexes

8.1 Glossary of Terms and Acronyms

Note: Definitions derived from:

- LiveSmart BC, Glossary (available at: www.livesmartbc.ca/learn/glossary.html).
- IPCC Third Assessment Report, Glossary of Terms (available at: www.ipcc.ch/pdf/glossary/tar-ipcc-terms-en.pdf).
- Market Advisory Committee to the California Air Resources Board (2007), “Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California.”
- World Business Council for Sustainable Development and World Resources Institute (2004), *The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard – Revised Edition*, pp. 96-102.
- The Climate Registry (2013), *General Reporting Protocol Version 2.0*, pp. 160-166.

Table 16: Terms and Acronyms

Abbreviation, Acronym or Measure	Definition
Carbon dioxide (CO₂)	A naturally occurring gas (0.03% of atmosphere) that is also a by-product of the combustion of fossil fuels and biomass, land-use changes, and other industrial processes. It is the principal anthropogenic greenhouse gas. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of 1. (IPCC)
Carbon-equivalent (CO₂e)	“The universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide.” (GHG Protocol) Expressing all GHGs in terms of tonnes of CO ₂ e allows the different gases to be aggregated (LiveSmart BC).
Community Energy and Emissions Inventory	The Community Energy and Emissions Inventory (CEEI) represents energy consumption and greenhouse gas emissions from community activities in on-road transportation, buildings and solid waste. Estimates of land-use change from deforestation activities and enteric fermentation from livestock under the Agricultural sector are also available at the Regional District level.
Biofuel	A fuel produced from dry organic matter or combustible oils produced by plants. Examples of biofuel include alcohol (from fermented sugar), black liquor from the paper manufacturing process, wood and soybean oil.
Direct emissions	Emissions from sources that are owned or leased by a PSO or sources used by local governments to deliver traditional local government services
EDF	Environmental Defense Fund, a US-based environmental organization.
Emission factor	“A factor allowing GHG emissions to be estimated from a unit of available activity data (e.g. tonnes of fuel consumed, tonnes of product produced) and absolute GHG emissions” (GHG Protocol)
Emissions	“The release of substances (e.g., greenhouse gases) into the atmosphere. Emissions occur both through natural processes and as a result of human activities.” (CARB)
Enteric fermentation	Enteric fermentation is a digestive process by which carbohydrates are broken down by microorganisms into simple molecules for absorption into the bloodstream of an animal.

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Abbreviation, Acronym or Measure	Definition
Energy conversion factor	A factor used to convert a quantity of energy from its original physical unit into a common unit of measurement (e.g., GJ).
EPA	(U.S.) Environmental Protection Agency
Fugitive emissions	The unintended or incidental release of greenhouse gases from the transmission, processing, storage, use, or transportation of fossil fuels, GHGs, other substances, including but not limited to HFC emissions from refrigeration leaks and SF ₆ from electric power distribution equipment.
Gigajoule (GJ)	One billion joules, where a joule is a common unit of energy for comparing across fuel types and electricity.
Gigawatt-hour (GWh)	One million kilowatt-hours, enough electricity to power 100 homes for a year.
Global Warming Potential (GWP)	“Greenhouse gases differ in their effect on the Earth’s radiation balance depending on their concentration, residence time in the atmosphere, and physical properties with respect to absorbing and emitting radiant energy. By convention, the effect of carbon dioxide is assigned a value of one (1) (i.e., the GWP of carbon dioxide =1) and the GWPs of other gases are expressed relative to carbon dioxide. For example, in the U.S. national inventory, the GWP of nitrous oxide is 310 and that of methane 21, indicating that a tonne of nitrous oxide has 310 times the effect on warming as a ton of carbon dioxide. Slightly different GWP values for greenhouse gases have been estimated in other reports. Some industrially produced gases such as sulfur hexafluoride (SF ₆), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs) have extremely high GWPs. Emissions of these gases have a much greater effect on global warming than an equal emission (by mass) of the naturally occurring gases. Most of these gases have GWPs of 1,300 - 23,900 times that of CO ₂ . The US and other Parties to the UNFCCC report national greenhouse gas inventories using GWPs from the IPCC’s Second Assessment Report (SAR). SAR GWPs are also used for the Kyoto Protocol and the EU ETS. GWPs indicated in this document also refer to the IPCC’s Second Assessment Report.” (CARB)
Global Reporting Initiative (GRI)	An international initiative that has developed a sustainability reporting framework for organizations to measure and report on their economic, environmental and social performance (see: www.globalreporting.org).
Greenhouse gases (GHGs)	“Greenhouse gases include a wide variety of gases that trap heat near the Earth’s surface, slowing its escape into space. Greenhouse gases include carbon dioxide, methane, nitrous oxide and water vapor and other gases. While greenhouse gases occur naturally in the atmosphere, human activities also result in additional greenhouse gas emissions. Humans have also manufactured some gaseous compounds not found in nature that also slow the release of radiant energy into space.” (CARB)
HVAC	Heating, Ventilating and Air Conditioning
Hydrofluorocarbons (HFCs)	“One of the six primary GHGs. Synthetic industrial gases, primarily used in refrigeration and other applications as commercial substitutes for chlorofluorocarbons (CFCs). There are no natural sources of HFCs. The atmospheric lifetime of HFCs is decades to centuries, and they have "global warming potentials" thousands of times that of CO ₂ , depending on the gas. HFCs are among the six greenhouse gases to be curbed under the Kyoto Protocol.” (CARB)
Indirect emissions	Emissions that are a consequence of the operations of the reporting organization (i.e., PSO, local government, community), but occur at sources owned or controlled by another organization.

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Abbreviation, Acronym or Measure	Definition
Intergovernmental Panel on Climate Change (IPCC)	“Recognizing the problem of potential global climate change, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC) in 1988. It is open to all members of the UN and WMO. The role of the IPCC is to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation. The IPCC does not carry out research nor does it monitor climate related data or other relevant parameters. It bases its assessment mainly on peer reviewed and published scientific/technical literature.” (CARB)
Inventory	“A greenhouse gas inventory is an accounting of the amount of greenhouse gases emitted to or removed from the atmosphere over a specific period of time (e.g., one year). A greenhouse gas inventory also provides information on the activities that cause emissions and removals, as well as background on the methods used to make the calculations. Policy makers use greenhouse gas inventories to track emission trends, develop strategies and policies and assess progress. Scientists use greenhouse gas inventories as inputs to atmospheric and economic models” (CARB)
IPP	Independent Power Producer
kg	Kilogram
kilotonne	1,000 tonnes
km	Kilometre
kWh	kilowatt-hour
L	Litre
lb	pound (weight)
m³	cubic metre
Methane (CH₄)	“One of the six greenhouse gases to be curbed under the Kyoto Protocol. Atmospheric CH ₄ is produced in nature, but human related sources such as landfills, livestock feedlots, natural gas and petroleum systems, coal mines, rice fields, and wastewater treatment plants also generate substantial CH ₄ emissions. CH ₄ has a relatively short atmospheric lifetime of approximately 10 years, but its 100-year GWP is currently estimated to be approximately 21 times that of CO ₂ .” (CARB)
MVAC	Motor Vehicle Air Conditioning
NIR	National Inventory Report (Environment Canada)
Nitrous oxide (N₂O)	“One of the six greenhouse gases to be curbed under the Kyoto Protocol. N ₂ O is produced by natural processes, but substantial emissions are also produced by such human activities as farming and fossil fuel combustion. The atmospheric lifetime of N ₂ O is approximately 100 years, and its 100-year GWP is currently estimated to be 310 times that of CO ₂ .” (CARB)
Office Paper	Multipurpose copy paper for use in laser printers, fax machines and photocopiers or multifunction devices.
Perfluorocarbons (PFCs)	“PFCs are among the six greenhouse gases to be curbed under the Kyoto Protocol. PFCs are synthetic industrial gases generated as a by-product of aluminum smelting and uranium enrichment. They also are used in the manufacture of semiconductors. There are no natural sources of PFCs. PFCs have atmospheric lifetimes of thousands to tens of thousands of years and 100-year GWPs thousands of times that of CO ₂ , depending on the specific PFC.” (CARB)
pkg	Package
PIR	British Columbia's Provincial Greenhouse Gas Inventory Report (Ministry of Environment)

Abbreviation, Acronym or Measure	Definition
PSO	A B.C. public sector organization subject to the government's carbon neutral commitment under the <i>Greenhouse Gas Reduction Targets Act</i> .
RES-D	Report on Energy Supply and Demand (Statistics Canada).
STP	Standard Temperature and Pressure
Sulphur Hexafluoride (SF ₆)	One of the six greenhouse gases to be curbed under the Kyoto Protocol. SF ₆ is a synthetic industrial gas largely used in heavy industry to insulate high-voltage equipment and to assist in the manufacturing of cable-cooling systems. There are no natural sources of SF ₆ . SF ₆ has an atmospheric lifetime of 3,200 years. Its 100-year GWP is currently estimated to be 22,200 times that of CO ₂ ." (CARB)
t	metric tonne, a standard measurement for the mass of GHG emissions, equivalent to 1,000 kg, 1,204.6 pounds, or 1.1 short tons.
U.S.	United States (of America)

8.2 Global Warming Potentials

Table 17 presents the 100-year Global Warming Potentials for the GHGs being tracked by the B.C. public sector. These GWPs are listed in the Carbon Neutral Government Regulation and are the 1995 values from the IPCC's *Second Assessment Report*, as endorsed by Environment Canada and British Columbia, as such, they represent the standard emission factors to be used at this time in greenhouse gas emissions calculations in British Columbia.^{76, 77, 78} These GWP values will likely be updated for 2014 calendar year emissions in parallel with the implementation of updates by the United Nations Framework Convention on Climate Change for national inventory reporting.

Table 17: Global Warming Potentials

Greenhouse Gas	Chemical Formula	100-Year GWP
Carbon dioxide	CO ₂	1
Methane	CH ₄	21
Nitrous oxide	N ₂ O	310
HFC-23	CHF ₃	11 700
HFC-32	CH ₂ F ₂	650
HFC-41	CH ₃ F	150
HFC-43-10mee	C ₅ H ₂ F ₁₀	1 300
HFC-125	C ₂ HF ₅	2 800

⁷⁶ Environment Canada (2013). *National Inventory Report 1990-2011*, p.33.

⁷⁷ British Columbia (2012). *British Columbia Greenhouse Gas Inventory Report 2010*, p. 66

⁷⁸ Greenhouse Gases marked with an asterisk (*) were added from the *Reporting Regulation*.

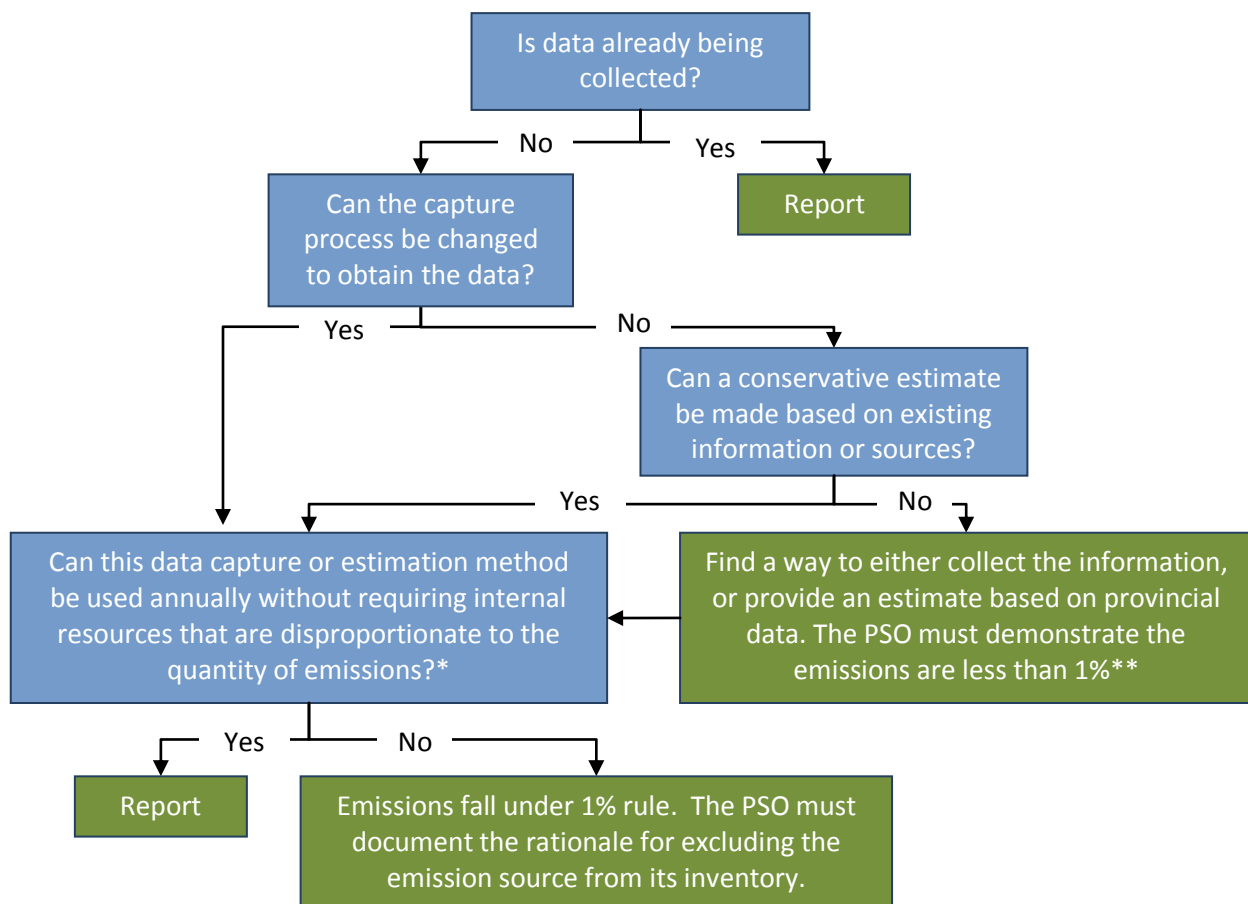
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HFC-134	$C_2H_2F_4$ (CHF ₂ CHF ₂)	1 000
HFC-134a	$C_2H_2F_4$ (CH ₂ FCF ₃)	1 300
HFC-143	$C_2H_3F_3$ (CHF ₂ CH ₂ F)	300
HFC-143a	$C_2H_3F_3$ (CF ₃ CH ₃)	3 800
HFC-152 (*)	$C_2H_4F_2$	43
HFC-152a	$C_2H_4F_2$ (CH ₃ CHF ₂)	140
HFC-161 (*)	C_2H_5F	12
HFC-227ea	C_3HF_7	2 900
HFC-236cb (*)	$C_3H_2F_6$	1 300
HFC-236ea (*)	$C_3H_2F_6$	1 200
HFC-236fa	$C_3H_2F_6$	6 300
HFC-245ca	$C_3H_3F_5$	560
HFC-245fa (*)	$C_3H_3F_5$	950
HFC-365mfc (*)	$C_4H_5F_5$	890
Perfluoromethane (*)	CF_4	6 500
Perfluoroethane (*)	C_2F_6	9 200
Perfluoropropane (*)	C_3F_8	7 000
Perfluorobutane (*)	C_4F_{10}	7 000
Perfluorocyclobutane (*)	c-C ₄ F ₈	8 700
Perfluoropentane (*)	C_5F_{12}	7 500
Perfluorohexane (*)	C_6F_{14}	7 400
Sulphur hexafluoride	SF_6	23 900

8.3 How to Treat Small Emissions Sources

For many organizations, dealing with small emissions sources can be challenging. For Public Sector Organizations, if an emissions source is onerous to collect and is estimated to comprise less than 1% of the organization’s total emissions inventory, it is considered out of scope. This decision tree below was developed to help PSOs/LGs determine whether or not a certain source of emissions falls under this rule, which states that **if an emissions source is estimated to comprise of less than 1% of an organization’s total emissions and is onerous to collect, it is considered out of scope**. It is suggested that other types of organizations follow a similar procedure. If an emissions source is expected to fall under 1% of an organization’s total emissions, the organization should use the following decision tree to determine whether or not it is considered onerous and can be excepted using this rule. Organizations may also refer to alternative methods to address small emission sources such as those outlined in the General Reporting Protocol⁷⁹. For PSOs, if, after using this decision tree, an emissions source is considered out-of-scope under this rule, the source of the emission and the rationale for its exemption should be included as a part of the Carbon Neutral Action Report.

Table 18: How to Treat Small Emissions Decision Tree



* e.g. excessive person-hours of time are required to collect the information that could be put towards data collection and quality control for larger emissions sources

** Is there an alternative method for estimating? Can a formula be created to produce a conservative estimates based on available provincial data? How did you come to the conclusion that it was likely less than 1%?

8.4 Review of Fuel Efficiency Calculation for Ferries

BC Ferries has not yet published a verified emission factor that can be applied to travel calculations. Some data on fuel consumption, route length and passenger capacity however, is available from sources on the BC Ferries website.⁸⁰ Data from these sources has been used in estimating average fuel efficiency.

Fuel consumption information, along with published route and vessel data, was used to determine an average of HP/ L/ km. This information is displayed in Table 19 below.

Table 19: Average Horsepower/ Litre/ Kilometre Calculation for Ferries

Route	Vessel Class	HP	Distance (km)	Fuel Consumption (L)	L/ km	HP/ L/ km
Vancouver – Victoria	Spirit Class	21 394	44.4	4200	95	226.1651
Vancouver – Victoria	V Class	8 941	44.4	2400	54	165.4085
West Van – Bowen Island		7 305	5.6	135	24	303.0222
Alliford Bay – Skidegate		730	6.5	66	10	71.8939
Vancouver – Salt Spring Island		6 000	40.7	1515	37	161.1882
Average HP/ L / km =						185.5356

Diesel fuel consumption was then estimated based on: (1) the calculated average HP/ L/ km figure; (2) route distance; and (3) vessel horsepower information. This was calculated for twenty-two BC Ferry routes based on available information.

Estimated diesel fuel consumption for each route was divided by 80% of each vessel's stated passenger capacity to derive an estimate of fuel consumption per passenger (L/ passenger (psg)). This number was then divided by the route distance to get a fuel efficiency calculation for each route (L/ psg/ km).

Fuel efficiency numbers for calculated routes were an average of 0.051 L/ psg/ km. Fuel efficiency factors in SMARTTEC are stated per 100km, therefore, this factor was multiplied by 100 which results in a figure of 5.10 L/ psg/ 100 km. This fuel efficiency factor was used to estimate fuel consumption for calculating emissions associated with ferry travel.

It was assumed that all fuel consumed for ferry travel by BC Ferries vessels is marine diesel. Emission factors for marine diesel published by Environment Canada were used to calculate emissions detailed in Table 19.

⁸⁰ British Columbia Ferry Services Inc. (2006) www.bcferries.com/; *Fuel Consumption Reduction Plan*, p. 8; BC Ferries (20013), *Routes and Schedules Regional Index*; and BC Ferries (2013), *Variety...The Spice of Our Fleet*.

8.5 SMARTTool Buildings Energy Estimation Method Summary

8.5.1 Introduction

The following information is intended to provide a summary of the three building energy estimation methods which are currently available in SMARTTool. These methods assist organizations in estimating building energy consumption when energy consumption data for an in-scope building is not readily available.

Table 20: Building Estimation Methods Summary

Method	Description	Usage
Gross-up Factor	The gross up factor is used to increase building energy consumption by a factor derived from the ratio of total floor space to floor space where the consumption is known.	Primarily used by BC Government (CRF) organizations to estimate energy consumption for floor space where Shared Services BC does not have access to utility information.
Regional Calculated Energy Intensity Unit (Regional Calc EIU)	Energy estimate is applied using a calculated energy intensity based on reported energy consumption for buildings sharing the same region and energy usage profile.	Primarily used in situations where an organization reports energy consumption for buildings with a profile similar to that which needs to be estimated.
Fixed Energy Intensity Unit (Fixed EIU)	An energy estimate is applied using pre-determined intensity factors which have been calculated using energy intensities from Natural Resources Canada.	Primarily used in situations where organizations do not have sufficient reported data from which to estimate energy consumption for the building that requires it.

8.5.2 Estimation Method Details

Gross-Up Factor:

The basic assumption underlying this approach is that an organization's energy consumption per square meter is the same in buildings where energy data is available and in the buildings where no data is available. The mechanics of this method simply involve dividing the total area of the buildings occupied by the organization by the area for which energy data is available. The resulting ratio is referred to as the Gross Up Factor (GUF). The GUF is then applied to the organization's known energy consumption to estimate its total energy consumption. Gross-up factors can be defined for specific date ranges.

Regional Calculated Energy Intensity Unit (Regional Calc EIU)

The Regional Calculated EIU estimation method allows an organization to estimate its unknown energy use, by building type, from data available from their own similar buildings within the same region, and thus provides a more accurate estimation for disparate regions across the Province.

B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions

For this approach to be useful, there must be sufficient known energy per region per building type within the organization.

This approach requires the calculation of energy use per square meter (i.e., energy intensity) and the application of that energy intensity to the area of like-use buildings. Once consumption is estimated in this way, one applies the appropriate emission factors and GWP to estimate related greenhouse gas emissions.

Table 21: Regional Energy Intensity Unit Estimation Calculation

Step	Formula for each Fuel
1. For similar buildings (i.e.: office) determine the annual consumption amount of each fuel and divide floor space of all the buildings	$\frac{\text{Total fuel use}}{\text{Total square meters of Floor space}} = \text{Annual Energy Intensity Factor (EIU/m}^2\text{)}$
2. Estimate the quantity of each fuel used in the leased space	$\text{Area of leased building} \times \text{Annual Energy Intensity Factor (EIU/m}^2\text{)} = \text{Annual Fuel Use in Leased building (GJ)}$
3. Apply the emission factor by fuel to yield total emissions by fuel	$\text{Emission Factor (kg/GJ)} \times \text{Consumption (GJ)} = \text{Emissions by GHG (kg)}$
4. Apply the global warming potentials to yield total emissions	$\text{Emissions by GHG (kg)} \times \text{GWP} = \text{Emissions (kg CO}_2\text{e)}$
6. Sum across the gases to calculate total CO ₂ e emissions	$\text{CO}_2 + \text{CH}_4 + \text{N}_2\text{O (all in kg CO}_2\text{e)} = \text{Total CO}_2\text{e}$
7. Convert total emissions from kg to tonnes for reporting purposes.	$\frac{\text{Emissions in kg CO}_2\text{e}}{1\,000 \text{ kg / t}} = \text{Emissions in tonnes CO}_2\text{e}$

Fixed Energy Intensity Unit (Fixed EIU)

The Fixed Energy Intensity Unit (EIU) estimation method applies pre-determined energy intensity factors published by Natural Resources Canada (NRC) through the Office of Energy Efficiency

(OEE) Comprehensive Energy Use Database⁸¹. This database includes statistics on energy use by province, building use, type and fuel.

Calculation:

Table 22: Fixed Energy Intensity Unit Estimation Calculation

Step	Formula for each Fuel
1. For each fuel, determine the annual consumption amount.	$\begin{aligned} & \text{EIU (GJ/m}^2\text{)} \times \text{Share(\%)} / 100 \\ & \times \\ & \text{square meters of space} \\ & = \\ & \text{annual consumption amount (GJ)} \end{aligned}$
2. Apply the emission factor by fuel to yield total emissions by fuel	$\begin{aligned} & \text{Emission Factor (kg/GJ)} \\ & \times \\ & \text{Consumption (GJ)} \\ & = \\ & \text{Emissions by GHG (kg)} \end{aligned}$
3. Apply the global warming potentials to yield total emissions	$\begin{aligned} & \text{Emissions by GHG (kg)} \\ & \times \\ & \text{GWP} \\ & = \\ & \text{Emissions (kg CO}_2\text{e)} \end{aligned}$
4. Sum across the gases to calculate total CO ₂ e emissions	$\begin{aligned} & \text{CO}_2 + \text{CH}_4 + \text{N}_2\text{O (all in kg CO}_2\text{e)} \\ & = \\ & \text{Total CO}_2\text{e} \end{aligned}$
5. Convert total emissions from kg to tonnes for reporting purposes.	$\begin{aligned} & \text{Emissions in kg CO}_2\text{e} / 1\,000 \text{ kg / t} \\ & = \\ & \text{Emissions in tonnes CO}_2\text{e} \end{aligned}$

Hybrid Energy Estimations

In some instances, energy data may be available for one fuel in a building; but not for another. It is appropriate then to estimate the unknown fuel using one of the methods above.

Similarly, the regional calculation may be used to estimate one fuel type within a building if similar reported data is available, while other fuels in the same building may use the Fixed EIU for lack of available reported data.

⁸¹ Natural Resources Canada (NRC) through the Office of Energy Efficiency (OEE) Comprehensive Energy Use Database (2011):
http://oee.mcan.gc.ca/corporate/statistics/neud/dpa/trends_com_bct.cfm

8.6 Selected References

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The Workbook

Helping Local Governments Understand How to be Carbon Neutral in their Corporate Operations



3/9/2012

The Workbook v.2

The first version of this workbook was released at the Union of British Columbia Municipalities annual convention in September 2009. The intention at the time was to present the Traditional Services and seek feedback on the boundaries and descriptions. Based on the feedback we received the workbook has undergone revisions which should help clarify and streamline the process.

Workbook v.2 continues to be a living document in that it is draft and subject to future amendments. We look forward to the comments and questions which local governments submit and further refinement of this guidance document.

Throughout this document minor changes and updates have been made. However, the majority of the amendments are located in the descriptions of the Traditional Services near the end of the document. There you will find answers to commonly asked questions and clarifications around scope.

Carbon Neutral Working Group

To date 179 local governments have signed the [BC Climate Action Charter](#) committing to the goal of being carbon neutral in their corporate operations by 2012. The significant uptake of this voluntary Charter demonstrates the leadership role that local governments in BC are willing to take on.

Under the [Climate Action Charter](#) the joint Provincial Government - UBCM Green Communities Committee (GCC) was created to support local governments in planning and implementing climate change initiatives. The Carbon Neutral Working Group (the working group) was established to advise the GCC in carrying out this mandate with respect to corporate carbon neutrality.

The GCC and the working group collaborated to produce this workbook which is intended to support local governments as they begin working on becoming carbon neutral in their corporate operations. The working group, with the support of the GCC, developed a BC local government specific draft definition of carbon neutral corporate operations. This workbook will give you [greater insight](#) with respect to what [corporate carbon neutrality](#) is, provide you with [interim guidance](#) and [clarify the data collection process](#).

What is Carbon Neutral?

Carbon neutral refers to reducing a local government's greenhouse gas emissions as much as possible and balancing the remaining emissions through the

purchase of qualified offsets or GHG reduction projects¹.

There are four key steps to carbon neutrality:

- Measure
- Reduce, ,
- Offset, and
- Report.

Typically the first step is to [measure](#) corporate emissions. This step will help local governments understand the source of their corporate emissions and allow them to develop meaningful reduction strategies. Measuring corporate emissions is a multi-step process which includes: understanding what needs to be measured, identifying the sources of emissions that need to be counted, and collecting data on energy and fuel consumption. This energy and fuel consumption data is then entered into a measurement system that converts it into greenhouse gas (GHG) emissions, providing the local government with a measure of its total corporate GHG emissions. The Green Communities Committee is currently implementing a pilot project to test a common measurement tool called SMARTTool that could be used by all BC local governments.

The next step is to take action to [reduce](#) emissions by developing strategies to improve energy efficiency and reduce fuel consumption. For practical tips, advice and best practices on how to reduce corporate GHG emissions visit the *BC Climate Action Toolkit Website* at: www.toolkit.bc.ca. It is important to remember that reduction activities not

¹ The criteria for a local government GHG reduction project are currently under consideration by the GCC.

only reduce emissions but also save money and local governments should be considering and implementing new reduction strategies and activities on an ongoing basis in order to ensure that they are maximizing their emission reductions and the related cost savings.

Even after reducing fuel/energy consumption, a local government is still likely to produce some GHG emissions and must take the third step to **offset** the remaining corporate emissions to become carbon neutral. In order to achieve carbon neutrality the local government must balance their emissions with either purchased offsets or through GHG reduction projects. Once the corporate emissions are balanced with offsets or GHG reductions a local government has achieved carbon neutrality. The Green Communities Committee is currently developing a framework to help define and guide local government offset investments and GHG reduction projects.

The fourth step to achieving carbon neutrality is to **report** on the GHG emissions produced, offsets purchased or GHG reduction projects undertaken in order to demonstrate a local government has achieved carbon neutrality. Every effort will be made to ensure that reporting requirements are streamlined and harmonized with existing local government reporting requirements to minimize the administrative burden.

Why does carbon neutrality matter?

In order to build resilience, and protect themselves from escalating energy costs, local governments can anticipate and mitigate climate change by reducing

their reliance on fossil-fuel based energy resources.

Sustainable energy resources offer a secure efficient supply and fiscal certainty. Sustainable energy sources such as geothermal heat, wind or solar power are not subject to long term price volatility and substantial cost increases that non-renewable energy sources are. As a result, sustainable energy uses will be the norm in the future.

What emissions will be measured and how?

There are six greenhouse gases (GHGs): carbon dioxide (CO₂) methane (CH₄), nitrous oxide (N₂O), sulphur hexafluoride (SF₆), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). References to GHG emissions are referring to the release of these gases into the atmosphere.

Currently, the **simplest way to measure GHG emissions** is to **track energy consumption data** and then convert the energy data into emissions. Local governments will **not** be expected to track each type of gas or do any complex conversions.

Work is currently underway to develop a simple tool which will help local governments convert energy and fuel consumption data into GHG emissions. This work includes a Pilot with 21 BC local governments to test a web-based measurement tool called SMARTTool. The intention of the Pilot is to see if SMARTTool will work for local governments and enable them to measure their GHG emissions in an efficient and cost effective manner. The Pilot is expected to be completed towards the end of 2010. For more

information on Pilot please contact:
LoisLeah.Goodwin@gov.bc.ca

Why get started now?

For many 2012 seems a long way off, for others it feels like it is right around the corner. Whether you are a local government which subscribes to the “long way off” or “fast approaching” viewpoint there are benefits to understanding and capturing data on energy consumption in the short-term.

Reducing corporate emissions will save money. Some investments will save money immediately others may have a longer payback period. For example, investments in energy retrofits for buildings may have significant upfront costs and it may take several years before the money saved from reduced energy costs equals the amount which was initially invested. However, after the payback period the building will continue to be more efficient and continue to have lower energy costs associated with it. Alternatively, there are investments which have a much shorter payback period such as retrofitting traffic and street lighting with more efficient lighting technology.

Local governments are directly or indirectly paying for energy used in the delivery of services in their communities. Consequently, reducing energy consumption will have a direct benefit to the bottom line because **if you consume less you will pay less**. Getting started on capturing energy consumption data will help you understand where the best emission reduction opportunities are. In turn, this will help you reduce costs sooner.

Taking on the management of your own emissions can be a powerful catalyst in inspiring greenhouse gas emission reductions within your community. Taking a leadership role in corporate reductions and communicating your success can spark interest in the local government work being done to reduce community-wide emissions. It can also focus the attention of community members on how they can reduce their own emissions.

Exercising Leadership, Strengthening Performance

Taking action to **reduce emissions** in local government operations is an opportunity to **improve efficiency, reduce energy costs, and strengthen overall performance** and service delivery. A government’s own operations are a small component of a community’s total emissions; however, **local government leadership** plays a pivotal role in building knowledge that **leads to much deeper emission reductions**.

What criteria did the working group use to develop the definition of corporate operations?

In developing the draft definition the working group considered the following points:

- Equity between local governments based on the services offered,
- Credibility of the system when compared with internationally recognized protocols, and
- Capacity and ease of administration.

Looking for your feedback

Even with the broad representation of local governments on the working group it is expected that the process of capturing data based on the draft definition will reveal issues.

If you decide to begin tracking your emissions now your experience can provide valuable information. The GCC would like to know what tools and resources local governments feel are needed, or would assist, in fulfilling their carbon neutral commitments. The GCC is looking for feedback as it continues to refine the definition of carbon neutrality prior to 2012.

You can send your comments to:
LoisLeah.Goodwin@gov.bc.ca

Corporate operations based on a “Traditional Services” model

The Carbon Neutral Working Group felt that equity amongst all local governments was best served by defining carbon neutrality in relation to those services that are most commonly provided by the majority of local governments. The working group referred to these common services as “traditional services”.

Traditional Services:

- Administration and Governance
- Drinking, Storm and Waste Water
- Solid Waste Collection, Transportation and Diversion
- Roads and Traffic Operations
- Arts, Recreation and Cultural Services
- Fire Protection

By focusing the definition of corporate operations on a traditional services model it ensures that the vast majority of

local governments are counting and offsetting the same emissions. Different carbon accounting systems measure carbon emissions based on different principles. A fundamental principle for the traditional services model is equity. As a result, the traditional service definition focuses less on *who* delivers the service and more on *what* service is delivered.

More detailed explanations of the services are provided later in the workbook, along with typical energy sources associated with each of the services.

What traditional services emissions are included?

Within the traditional service sectors not all emissions will be captured. Any emissions related to the operation and maintenance of traditional services are included. Emissions related to new construction, business travel, employee commuting and materials are not included.

We don't have that service!

Not all local governments offer the same services. In circumstances where a traditional service is not provided directly or indirectly (provided on behalf of a local government by a subsidiary or contractor) by a local government then the local government does not need to consider the service in its corporate operations and there are no emissions for the local government to track.

Guidance in relation to subsidiaries: default approach

The emissions related to a traditional service operated by many subsidiary organizations of a local government are also included. For these purposes, a

subsidiary organization is an organization that, under Generally Accepted Accounting Principles, is included in the local government's financial statements, through full or proportional consolidation or through consolidation on a modified equity basis. A local government's financial statements will typically identify these subsidiary organizations, and the basis of consolidation for each.

Emissions for traditional services operated by subsidiary organizations that are fully consolidated or that are consolidated on a modified equity basis are included in the local government's carbon neutral operations.

For those organizations that are included in the financial statements on a proportional consolidation basis, the local government would include a proportionate share of the emissions related to a traditional service operated by the organization, using the same proportion for emissions as are used for financial statement purposes.

Guidance in relation to subsidiaries: alternative approach

Local governments may choose to follow the default approach for reporting GHG emissions from subsidiary organizations as outlined above. Alternatively, local governments may create their own agreement on how they will share the emissions related to the subsidiary organization. However, the agreement must be unanimous amongst the participating local governments and must result in 100 percent of the GHG emissions being reported.

Calculating emissions for proportionately consolidated organizations: default approach

A Recreation Centre is jointly owned by three local governments: Red, Blue and Purple. The Recreation Centre is included in each of their financial statements. As a proportionately consolidated organization the ownership is divided so that 10% shows on the financial statement of local government Red, 40% on local government Blue, and 50% on local government Purple.

As a result, local government Red is responsible for 10% of the emissions, local government Blue is responsible for 40% of the emissions, and local government Purple is responsible for 50% of the emissions. The local governments are proportionately responsible for the ownership of the organization and its emissions.

How do we begin tracking emissions?

- Understand what the **Traditional Service Areas** are and what services your local government provides;
- Gather information from your energy providers and assess which energy accounts (for example BC Hydro, Fortis, Pacific Northern Gas and/or Teresan accounts) are providing energy to a traditional service area;
- Identify which **subsidiary organizations** provide traditional services and request energy consumption data from these organizations on the amount of energy used to provide the service;
- Identify which emissions from **contracts** providing traditional services are included and request

energy consumption data from these service providers (for example the gas consumption of vehicles used to collect solid waste); and

- As you **negotiate new contracts** or enter into renewal discussions on existing contracts, **consider** including **clauses** in the contract with respect to **emission reductions** and provision of **consumption data** by the contractor.

Guidance in relation to contracted services

Some emissions for services operated on behalf of local governments by **contractors** will be **included** in the **corporate emissions** profile. This will apply to new contracts or upon contract renewal. The types of contracts which would be included would be those which have **reasonably identifiable** energy consumption associated with the delivery of a traditional service. For example, emissions related to consultant services such as planning assistance would not be included but emissions from road maintenance contracts would.

The intention is to capture emissions from sources directly related to the traditional service being provided by the contractor. If a local government has a snow removal contract the emissions from the vehicles clearing snow would be captured, but the emissions related to the contractor's corporate office building would not. Similarly, if a partner organization were operating a recreation centre on behalf of a local government the emissions from the recreation centre would be captured, but the corporate offices of the partner organization, and any vehicles used to travel to and from the corporate office to the recreation centre, would not be included.

Feedback on Contracts:

If you are **already collecting energy consumption or emissions information** from your contractors we would like to learn more from you about the processes you have established to obtain this information.

Feedback from local governments on **tracking fuel/energy use data** from contractors will be invaluable in developing advisory materials. These materials will include information on **which contracts would be included** based on a threshold level of fuel or energy use; as well as, **how to collect, verify and report data**. In addition, further information will be given on **the types of contract provisions** that local governments **could negotiate** as they enter into new contracts or contract renewals in the future.

Data collection

This workbook is **formatted** to allow you to think about each of the **traditional services** individually; however, it is **not necessary to collect data for each of service sector separately**. Each local government receives information from its energy providers. However, what is included within a single energy account may differ. For example, one local government may have a single hydro account for its primary administration building and another local government may have several hydro accounts for a similar building.

What is important is not how the **information** is made available but if the **energy or fuel used** is part of a **traditional service**.

The workbook includes descriptions and examples of the six traditional service sectors for the purpose of explaining the kinds of infrastructure or activities that would be included in each of the services.

What if one energy account provides energy to more than one service?

For smaller communities in particular this may be the case. For example, a local government may have the administration and recreation staff located in one building. If the building has one BC Hydro account for the provision of heat and light for the building then only count the emissions once. A local government may decide to proportionately divide the account for internal purposes, but for the purposes of the Carbon Neutral commitment the information only needs to be reported once.

To get started begin by gathering all of your energy and fuel data. Next, identify what consumption is related to the delivery of traditional services. Some local governments may find that calculating or excluding small “non-traditional” energy consumption is not worth the time required. If that is the case it may be easier, and more cost-effective, to capture all consumption information.

Eventually, in order to ascertain what your local governments’ emissions are the energy consumption data that you collect will need to be converted into greenhouse gas emissions. Local governments will not be required to do any calculations or conversion of energy consumption themselves as this will be done by a data collection tool which is currently under development by the Province in conjunction with the GCC (e.g. SMARTTool which is currently being piloted as previously mentioned in this guidance.). Once developed, the **data collection tool will convert the energy consumption into greenhouse gas emissions** which are commonly reported as **carbon dioxide equivalents or CO₂e**. The calculated CO₂e value of the emissions produced by a local government is what is often referred to as a “carbon footprint”.

Although local governments will not need to do any **calculations** or conversions of **energy consumption** into **CO₂e** some local governments may find that the process of collecting energy data will be followed closely with a desire to know the actual amount of greenhouse gas emissions produces as a result of energy use. Understanding the sources of emissions is an important part of identifying and planning where to reduce emissions.

<i>Quick Scope Guide</i>	
IN SCOPE: Counts as part of corporate footprint	OUT OF SCOPE: Does not count as part of corporate footprint
Traditional Services	Airports
Contracts for Traditional Services	Court Houses
Fuel used for Vehicles, Machinery and Equipment used in a Traditional Service	Buildings owned by the Province or the SUCH sector (covered by Carbon Neutral legislation)
Energy used in buildings in which a Traditional Service is housed (building ownership does not matter)	Landfills and buildings and equipment located at the landfill for the purposes of operating the landfill or processing waste
Fleet vehicles	Janitorial services
Staff vehicles which are used for the delivery of a Traditional Service	Buildings and/or equipment owned by a local government but used for a purpose which is <i>not</i> considered a Traditional Service
Tourism Centres	Staff Commuting
Maintenance	Staff Travel
	Construction
	Materials
	Processing of waste, recyclables or organics

Service Area:

Administration and Governance

This service category includes the local government buildings used for **administration, governance, planning** and **economic development**; as well as, activities associated with the provision of these services. For example, the energy used to execute a regulatory responsibility, such as travel required to conduct building inspections, would be included.

Buildings and Other Structures

In this category it is necessary to capture energy consumption data from the buildings where administration, planning, governance and economic development staff are housed.

Vehicles, Equipment and Machinery

The vehicles included in this category include those used by parking commissioners, building inspectors and other vehicles used by administration staff and any vehicles used by staff who work for subsidiary organizations. For most local governments the vehicles in this category are most likely small municipal vehicles such as cars and small trucks.

Frequently Asked Questions:

Q Is a tourism centre considered part of “economic development”?

A Yes, a tourism centre is considered part of economic development and therefore is within the traditional services boundaries and must be counted.

Q Energy used to execute a regulatory responsibility is included. What does this mean?

A Fuel consumed by a vehicle used to execute a regulatory responsibility such as bylaw enforcement would be considered in scope and that fuel would need to be counted.

Q If staff use their own cars instead of a fleet vehicle do I need to count their fuel consumption?

A Yes, in essence the staff person is contracting the use of his/her car to the local government. If fuel consumption is not readily available it is possible to collect information on the type of vehicle (e.g. mid-sized car), fuel type and kilometres travelled. This information is likely already captured when staff submit expense forms for vehicle use. Note that “travel” is excluded.

Q How do I know how much fuel each vehicle uses?

A There are two ways in which to capture vehicle related emissions. The first is to report on the type of vehicle and the kilometres travelled in a year. With this information an estimation can be made on the GHG emissions related to the vehicle. The other option is to report on fuel use. This data may not be recorded

on a per vehicle basis but by a gas card which is attributed to a particular work group. The data does not need to be presented on a per vehicle basis.

Q Who is responsible for the emissions of Regional District staff who do work on behalf of Municipalities?

A Regional Districts are responsible for the emissions related to housing and transporting their staff even if those staff are doing work on behalf of a Municipality.

Q If we hire consultants to work on our Official Community Plan or Regional Growth Strategy do we count the emissions associated with their travel to our offices or to various municipalities?

A Emissions related to travel are considered outside the corporate boundaries. Additionally, for short travel between local governments for the purposes of meetings and consultation those emissions are also considered out of scope because fuel consumption is not a significant part of the service delivery.

Q What do we do if we do not have building energy consumption data?

A If energy consumption data is not readily available it is possible to use the square footage of the building and the primary use (e.g. offices) to estimate consumption.

Q What if we lease out part of a building, or multiple buildings, to another entity?

A If the service being provided is not a traditional service then you do not need to report it. For example, some local governments own buildings which are used for subsidized housing. The local government owns the space but it is being used for a non-traditional service and therefore is excluded.

Service Area:

Drinking, Storm and Waste Water

In this category it is necessary to capture energy consumption data related to the operation and maintenance of drinking, storm and waste water systems including, but not limited to:

- Water intakes, wells, reservoirs and dams,
- Water treatment facilities,
- Water distribution systems,
- Wastewater collection systems,
- Wastewater treatment systems, and
- Stormwater collection and treatment systems.

Buildings and Other Structures

This service area will include buildings and other structures as well. The energy consumption of all buildings and structures utilized for the operation and maintenance of the drinking, storm and waste water systems must be captured. For example, record the amount of energy used to provide heat and/or light for pump stations.

Vehicles, Equipment and Machinery

The vehicles, equipment and machinery included in this category include those used in the operation and maintenance of the drinking, storm and waste water systems. This would include vehicles used for site inspections, water metre readers, heavy machinery for maintenance or repair, and watershed monitoring. Equipment used for the storage, disinfection and treatment of drinking, storm and waste water treatment is included as are emergency power generators.

Frequently Asked Questions:

Q Is the collection of waste heat from sewer lines in scope?

A No.

Q Do I need to calculate the emissions which come from the wastewater?

A The emissions which come from the wastewater itself do not need to be captured or calculated as part of a local government's corporate footprint.

Service Area:

Solid Waste Collection, Transportation and Diversion

In this category capture energy consumption data related to the collection, transportation and diversion of solid waste. This includes recyclables and composting but does not include the operation of landfills and disposal sites.

Buildings and Other Structures

The buildings associated with the collection, transportation and diversion of solid waste include buildings used to house vehicles and staff as well as transfer stations recycling storage facilities, and buildings at yard and garden waste stations.

Vehicles, Equipment and Machinery

The vehicles included in this category include heavy machinery, dump trucks, garbage, recycling and leaf collection vehicles, and other vehicles associated with the provision of these services. Some of the equipment and machinery that may be included are compactors, chippers, and crushers.

Frequently Asked Questions:

Q How do determine who is responsible for the emissions?

A The local government who is responsible for the service is responsible for the emissions. The service bylaw should indicate who is responsible for providing the service. In some areas it is owned by the Regional District and it is their responsibility: in other areas a Municipality may be responsible for the garbage collection and transport to the transfer station but the Regional District is responsible for the transfer station and the transportation of the waste to the landfill.

Q How far is the transportation of solid waste tracked?

A The transportation of solid waste is tracked until the local government is no longer responsible for the waste. In the example given above the Municipality is only responsible for the waste until it is taken to a transfer station owned by a Regional District. However, if the Municipality owned the transfer station then they would be responsible for it until it left the transfer station.

Q How do we capture emission data if we do not offer garbage collection?

A Some local governments don't collect solid waste and don't contract solid waste collection. Instead, private citizens either take their waste to a designated site or contract a solid waste collector to provide this service. In either of these instances the local government is not involved in the service delivery and therefore is not responsible for capturing related emission data.

Q Are emissions from the operation of the landfill in scope?

A No, only those emissions associated with the collection, transportation and diversion are in scope. As a result, energy/fuel consumption associated with the operation of a landfill or emissions which result from the landfill itself are not included.

Service Area:

Roads and Traffic Operations

In this category capture energy consumption data related to the operation and maintenance of roads and traffic operations. This service area includes operation of roads, trails, street lights and signals, bike lanes, sidewalks and parking lots as well as maintaining these facilities (including such things as routing repair, maintenance, and snow removal etc).

Buildings and Other Structures

The buildings associated with the operation and maintenance of roads and traffic operations include buildings used to house vehicles and staff; as well as, traffic lights and signals and structures related to traffic lights and signals and their controls.

Vehicles, Equipment and Machinery

The vehicles included in this category include snow removal vehicles, all terrain vehicles, road sweepers, salting/sanding vehicles, vehicles used for line painting, patching and other road maintenance activities. Equipment and machinery could include, but is not limited to, lawn mowers, hedge trimmers, and weed eaters.

Frequently Asked Questions:

Q How do I know if roadwork is maintenance or construction?

A Construction work is an infrequent, usually costly, activity that provides benefit for several years and maintenance is an annual expense associated with maintaining the asset. Public Sector Accounting Board (PSAB) 3150 refers to Tangible Capital Assets (TCAs) and the **construction or betterment of these TCAs are often capitalized over a longer period of time.** Conversely, **maintenance is part of the annual expenses associated with the service or assets and necessary to maintain the integrity of the service or asset.** For example, widening, lengthening or resurfacing a road may all be capitalized expenses. If they are capitalized expenses then those projects are construction. However, filling potholes, painting new lines, and clearing debris off the roads are likely reoccurring expenses which are not capitalized and therefore considered maintenance. Only activities related to maintenance are counted for the purposes of carbon neutral as construction is excluded.

Q What if we contract out our road maintenance?

A Any Traditional Services which are contracted out are still considered part of a local government's corporate emissions. The information which you need to collect is that related to the fuel consumed in the provision of the service. Therefore, you do not need to collect information on the energy use of the contractor's buildings only the fuel consumed by the vehicles.

Service Area:

Arts, Recreation, Parks and Cultural Services

This category includes parks, swimming pools, recreations centres, arenas, art galleries, museums, planetariums, cemeteries (grounds), libraries and theatres. Capture all the energy consumption data related to the operation and maintenance of these various services.

Buildings and Other Structures

The buildings associated with the arts, recreation and cultural services include buildings such as swimming pools, recreations centres, arenas, art galleries, museums, planetariums, libraries and theatres as well as any structures used to house equipment and vehicles related to these services.

For services shared with another jurisdiction emission distribution, refer to the example in the text box on page [eight](#) of this document.

Vehicles, Equipment and Machinery

This category includes vehicles such as zambonis, bucket trucks, fleet vehicles, lift trucks and all terrain vehicles. The equipment and machinery includes lawn mowers, hedge trimmers, park maintenance equipment, and equipment required to maintain pool facilities or arenas.

Frequently Asked Questions:

- Q** How do I know if work on a building is maintenance or construction?
- A** Please refer to the answer on maintenance and construction under “Roads and Traffic Operation”.
- Q** Libraries are identified as being a traditional service but there are different types libraries: integrated public libraries, municipal libraries, regional libraries. Are all libraries to be included in the corporate footprint and how do we know if we are responsible for the emissions?
- A** You will need to include the emissions related to the library if it is consolidated into your financial statements. If it is not included in your financial statements then you do not need to include it.
- Q** Do I need to count how much coolant is used by our local government?
- A** A decision has been made to exclude air conditioning in vehicles from the corporate basket; however, many local governments have arenas which require the use of coolants. The Province is currently exploring how and if coolant consumption could be captured in a simple and straightforward manner. It should be noted that most coolants have very high global warming potentials and therefore have a significant and negative impact on the climate. If you have a

system which is leaking coolant it would be best to repair it and possibly switch to a more climate friendly coolant blend.

Q How do I get energy information if the building is owned by the Province?

A Buildings which are owned by the Province or a Public Sector Organization (PSO)ⁱⁱ do not need to be reported by local governments. These buildings are already being counted as per the legislation which mandated carbon neutrality in these sectors for 2010.

ⁱⁱ PSOs are: Schools, Universities, Colleges, Hospitals and Crown Corporations.

Service Area:

Fire Protection

This category includes fire suppression, inspection, education, and outreach. Capture all the energy consumption data related to the provision of fire protection services and maintenance related to the services. If a voluntary fire department is operating a fire protection service on behalf of the local government then emissions from that service would also be included.

Buildings and Other Structures

The buildings associated with fire protection include fire halls and other buildings and structures used to house equipment and vehicles related to fire protection services.

For services shared with another jurisdiction emission distribution, refer to the example in the text box on page [six](#) of this document.

Vehicles, Equipment and Machinery

The vehicles included in this category include fire trucks, water trucks, inspection and education vehicles and any other vehicles used in the provision of fire protection services. The equipment and machinery include pumping for hydrants, water storage and auxiliary power generation.

Frequently Asked Questions:

- Q** Do local governments have to capture energy data from volunteer fire departments?
- A** Yes, local governments need to get data on vehicle fuel consumption and building energy consumption from all fire departments.
- Q** Do local governments need to get data on fuel use of firefighters' personal vehicles?
- A** Commuting to work is not included in the corporate emissions. Therefore, if a firefighter drives to the fire hall for a shift or directly to a fire the fuel consumption is not included as it is considered "commuting". However, if firefighters use their personal vehicles for regular work related travel such as going to a school to run an educational session and expense that travel then those emissions are to be included.
- Q** Are municipal fire halls and volunteer fire halls both included and is the same data captured?
- A** Yes.



APPENDIX 14 - ELECTRIC VEHICLE CHARGING STATIONS

2327 Versant-Nord boulevard, office 120
Quebec (Qc), Canada, G1N 4C2

This usage report covers the period between May 7 2014 and June 9 2015

Location	Number of stations	Total number of sessions	Total connection time (HH:MM)	Total energy (kWh)
Port Alberni - Harbour Quay	2	34	31:54	85,03
Port Alberni - Victoria Quay	2	63	97:10	305,866

SmartTWO™

COMMERCIAL AND INDUSTRIAL GRADE LEVEL 2 EVSE

AVAILABLE CONFIGURATIONS



Single wall mount



Double wall mount



Simple pedestal



Double pedestal



Quadruple pedestal



Single pole mount



Double pole mount

USES

PUBLIC

For public parking, business and store owners who want to provide their customers with EVSEs and generate revenue through charging fees.

PRIVATE

For employers who want to provide their employees with a monitored charging service.

VEHICLE FLEET

For electric vehicle fleet managers who want to maximize the number of EVSEs and control access.

MULTI-RESIDENTIAL

For apartment building managers who want to accommodate their tenants by providing them with EVSEs and thereby generate extra revenue.

ORDERING INFORMATION

See ordering guide or contact us:

EMAIL:
info@addenergietechnologies.com

PHONE:
1 877 505-2674

SPECIFICATIONS	SmartTWO™
ALUMINUM ENCLOSURE	NEMA 3R - Weather and vandalism resistant
CHARGING CONNECTOR	SAE J1772™
CABLE	20 feet
RECHARGE POWER	7.2 kW maximum
SUPPLY VOLTAGE	208VAC or 240VAC
OUTPUT CURRENT	30A maximum
INTEGRATED GFCI CIRCUIT BREAKER	20 mA, auto reset (3 attempts at 15 minute intervals)
FREQUENCY	60 Hz
OPERATING TEMPERATURE	-40°C to 50°C -40°F to 122°F
WEIGHT	Pedestal station: 67 lbs (30 kg) Wall mount station: 45 lbs (20 kg) Pole mount station: 59 lbs (27 kg)
HUMIDITY	Up to 95% (non-condensing)
CONSUMPTION	10 W
LOCAL COMMUNICATIONS NETWORK	2.4 GHz IEEE 802.15.4 meshed network
GLOBAL COMMUNICATIONS NETWORK	3G Cellular or LAN
LED STATUS INDICATOR	GREEN: Available WHITE: In use RED: Out of service
CERTIFICATIONS	CSA certified for Canada

AddENERGIE

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property of AddEnergy Technologies Inc.

Survey sent in April 15/13 @ 2:30 pm



CCI Fund: Charging Station Incentive Final Report

1. *Organization

City of Port Alberni

2. *Contact name

Guy Cicon, City Engineer

3. *Address

4850 Argyle St.

4. *City

Port Alberni

5. *Province

BC

6. *Postal Code

V9Y 1V8

7. *Phone

250-720-2838

8. *E-mail

~~Guy~~ guy-cicon@portalberni.ca

9. *

Project Completion Date (DD/MM/YY):
(Date at which the station was in operation, with all required components complete)

29/03/13

10. *

Please upload your financial report, using the excel template provided (Max file size 10 MB)
*Do not convert file to pdf; uploaded file type should remain .xls or .xlsx

Browse...

11. *Total project costs (from financial report spreadsheet, Cell G32):

12. *Amount payable by CCI Fund (from financial report spreadsheet, Cell G35):

13. *

Please upload scanned copies of all receipts or invoices, numbered to correspond to your financial report. (Max file size 10 MB)
Retain the original copies of receipts for your records for at least one year.

Browse...

14. Upload additional receipt / invoice

Browse...

15. Upload additional receipt / invoice

Browse...

16. Upload additional receipt / invoice

Browse...

17. Upload additional receipt / invoice

Browse...

18. *Have you uploaded your station(s) to the online EV stations finder, PlugShare? (go to www.plugshare.com and click on "Add Public Station" at t

06 15 07

CCI Fund: Charging Station Incentive Final Financial Claim

INSTRUCTIONS: Please fill out all yellow input boxes, other cells will calculate automatically

Organization:	City Of Port Alberni		
Address:	4850 Argyle Street		
City:	Port Alberni	Prov:	BC
Postal Code:	V9Y 1V8		
Organization type:	Local government		

Number of approved charging stations

Maximum CCI Funding

Expenses

Cost category (choose 1 per item)	Vendor	Description	Date	Net cost	PST	Total cost (incl. PST)	Receipt #
Electric vehicle charging equipment	AddEnergie	4-Electric vechile charging staions	Feb.5/13	\$ 16,027.20	\$ 1,717.20	\$ 17,744.40	1
Electrical or engineering design	Bailey Electric Co. Ltd.	Electrical labour & supplies	March 28/13	\$ 7,011.66	\$ 751.25	\$ 7,762.91	2
Trades	City of Port Alberni	Labour charges	March 28/13	\$ 7,138.92	\$ -	\$ 7,138.92	3
...Choose a category				\$ -	\$ -	\$ -	4
...Choose a category				\$ -	\$ -	\$ -	5
...Choose a category				\$ -	\$ -	\$ -	6
...Choose a category				\$ -	\$ -	\$ -	7
...Choose a category				\$ -	\$ -	\$ -	8
...Choose a category				\$ -	\$ -	\$ -	9
...Choose a category				\$ -	\$ -	\$ -	10
...Choose a category				\$ -	\$ -	\$ -	11
...Choose a category				\$ -	\$ -	\$ -	12
...Choose a category				\$ -	\$ -	\$ -	13
...Choose a category				\$ -	\$ -	\$ -	14
...Choose a category				\$ -	\$ -	\$ -	15
Total Project Costs				\$ 20,177.78	\$ 2,468.45	\$ 22,646.23	

Note: Please hand-write a number on all receipts, and attach in the order they appear in the table

Amount payable by CCI fund

Note: Amount payable by CCI fund is 75% of total costs, to a maximum of \$4,000 per station

I affirm that this information is correct, and have attached receipts for all items

Authorized Financial Representative

Print Name _____

Ken Watson

From: Rafael Van Coppenolle <rvancoppenolle@addenergietechnologies.com>
Sent: Wednesday, May 07, 2014 12:55 PM
To: Ken Watson
Subject: stats charging stations
Attachments: Charging stations Port Alberni.pdf

Hi Mr. Watson,

I printed the stats for your charging stations and I attached them to this email.

If you have any questions, I will be pleased to answer them.

Regards,

Rafaël A. Van Coppenolle

Coordonnateur aux ventes

2327, boulevard du Versant Nord, bureau 120

Québec (Québec) G1N 4C2

CANADA

Tél. : (877) 505-2674 ext. 222

www.addenergietechnologies.com



Parc	Nombre de stations	Nombre de sessions totales	Temps de connexion total	Montant total	kWh total
Port Alberni - Harbour Quay	2	5	13:03	0.00	34.543
Port Alberni - Victoria Quay	2	14	8:53	0.00	60.801



City of Port Alberni Active Transportation Plan Final Report



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1.0 Introduction

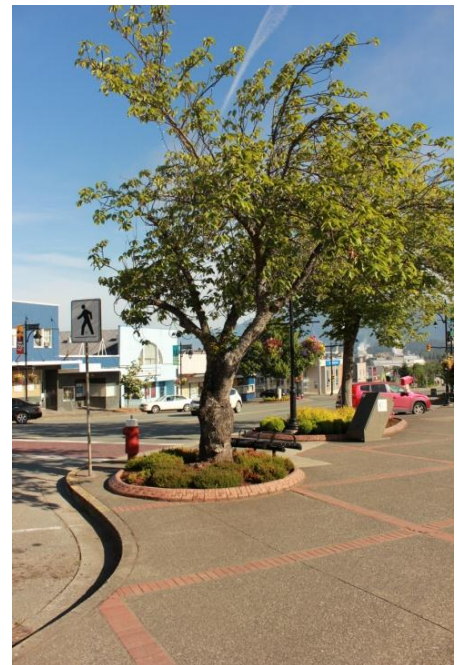
The City of Port Alberni is a vibrant community of nearly 18,000 residents located at the head of the Alberni Inlet on central Vancouver Island. The City is strategically located along Highway 4 in the Alberni-Clayoquot Regional District (ACRD) between Parksville to the east and Ucluelet and Tofino to the west. The City is defined by its geography, as it is located at the heart of the Alberni Inlet and adjacent to Somass River. In addition, the layout of the community is defined by the many hills, creeks and ravines that cut through the City and create natural barriers and amenities for residents travelling throughout the community. According to the 2011 National Household Survey 9% of all trips to work in Port Alberni are made by either walking or cycling. 7.7% of commute trips are made by walking and 1.3% by cycling. This combined active transportation mode share is equal to the provincial average.

The City prepared a Bicycle Route Proposal in 1983 which documents the basis for a bicycle route system that would satisfy both the utilitarian and recreational needs of cyclists in Port Alberni. The Bicycle Route Proposal outlines three overarching goals for cycling in Port Alberni: provide pleasant and functional cycling routes which will increase cyclist safety, establish cycling routes to meet both the recreational and utilitarian needs, and establish cycling as a viable, alternative method of transportation. Most recently, the City's Official Community Plan (2007) includes a number of policies supporting walking and cycling. The Plan documents the City's support for developing a comprehensive system of pedestrian and bicycle corridors that serve to link neighbourhoods, community services and amenities. These documents illustrate the City's goal of promoting and increasing active transportation mode share.

Since the release of the 1983 Bicycle Route Proposal, the City has developed an off-street pathway network but has yet to develop a complementary on-street bicycle network. Additionally, the City has not prepared a plan for pedestrians. There are a number of challenges for walking and cycling in the City including, but not limited to:

- Topography
- Major barriers such as Highway 4 as well as the presence of creeks and ravines;
- Lack of on-street bicycle facilities; and
- Difficult connections within and between several neighbourhoods.

Recently there has been a renewed public interest in cycling in Port Alberni with a petition submitted for safer bicycle routes and requests for facilities such as bicycle racks. Citizens have been meeting with the Mayor and City staff to discuss their concerns. Furthermore, Council has had an initial discussion regarding the potential for designated bike lanes on main roads in the



City. The City has recognized the need to make walking and cycling safe and attractive transportation choices for people of all ages and abilities, for both commuting and recreational purposes. As a result, this report is a comprehensive Active Transportation Plan, which builds on the 1983 Bicycle Route Proposal, to further promote walking and cycling throughout the community.

History and Land Use Development

The City of Port Alberni is located in a region that is rich in resource-based industry and has a long historic connection with the natural environment. The Hupacasath and Tseshaht First Nations have territory within the City of Port Alberni. European settlement of Port Alberni began in the early 1800's and soon grew quickly due to the forestry industry and the unique geographical location of the City, recognized for its port facilities. This period also saw the development of the first sawmills on the City's waterfront. The City of Port Alberni, as it is now, was originally two individual towns. The Town of Port Alberni (incorporated in 1912) and the Town of Alberni (incorporated 1913). The downtown centres of the two towns were referred to as Northport (Alberni) and Southport (Port Alberni).



The City of Port Alberni as it is today was formed in 1967 when the two towns amalgamated. This amalgamation continues to have an impact on the land use patterns seen within the City. The amalgamation resulted in the creation of one City with two distinct downtown cores. This distinction between the two town centres is intensified by the segregation that is a result of the geography and topography in the area. In addition, the development along Alberni Highway has built out commercial activity away from the downtown. Larger scale commercial retail is located in the Johnston Commercial Area in the north eastern segment of the City. This development provides convenient services to residents and visitors travelling along the highway. However, the highway location enables visitors to bypass most of the City and the downtown core. The large number of commercial areas found throughout the City does have a positive impact on travel distance. Within the City the majority of residents are within an 800 metre travel distance from some form of commercial activity. This 800 metre travel distance is an approximate 10-minute walk and outlines the potential opportunities and viability of walking and cycling as alternative travel options.



With an existing network of pedestrian and cycling off-street trails, sidewalks, parks, a variety of commercial activity, and world renowned natural attractions, the City of Port Alberni offers spectacular opportunities for residents and visitors to walk and bicycle for transportation or recreational purposes. The rich network of forest trails and waterfront opportunities associated with the City of Port Alberni's geography in conjunction with the favourable climate has the ability to attract visitors from all over the region and province.

With the Bicycle Route Proposal having been developed in 1983 there is a need for an updated active transportation vision for the

community. This Active Transportation Plan will guide the plans and investment in walking and cycling facilities and support strategies over the next 25 years and beyond. The vision in the Active Transportation Plan must be supported by the strategies and actions of the City of Port Alberni. These strategies are aimed at improving active transportation corridors and increasing network connectivity in the community, the region, and with the extensive trail network. The report will also identify opportunities and outline plans for providing support facilities, programs and policies to further encourage walking and cycling in Port Alberni. Further, the Active Transportation Plan will outline an investment strategy with short, medium and long term priorities. While ensuring that existing and future walking and cycling facilities are safe, enjoyable and accessible for Port Alberni residents and visitors alike.

Promoting walking and cycling as attractive and convenient transportation choices can help reduce automobile dependence, increase physical activity levels, improve public health, reduce infrastructure demands, and create more livable and vibrant communities.

1.1 Study Process

The Active Transportation Plan has been developed over a three phase process, as summarized below:

- **Phase 1: Inventory, Assessment and Setting Future Direction.** This study phase was designed to develop a detailed understanding of the City's existing active transportation facilities. This phase provided a definition of the opportunities and challenges facing the transportation system currently and in the future. This phase also involved reviewing relevant policies and documents that influenced active transportation activity in the City of Port Alberni. This phase was intended to chart the course for the future of walking and cycling in Port Alberni. This was done by establishing the goals and objectives for the Active Transportation Plan and by developing a future network plan for active transportation as well as supportive policies and standards.
- **Phase 2: Implementation Strategy.** The purpose of this phase was to develop an affordable and manageable strategy for implementing the Active Transportation Plan in the City of Port Alberni. This phase took the recommendations outlined in Phase 1 and created a strategy that identified priorities based on short, medium, and long-term timeframes.
- **Phase 3: Reporting.** This phase brought together the components identified in the previous phases and formed the Active Transportation Plan. The Plan ultimately describes the City's desired direction for encouraging walking, cycling and other non-motorized modes of transportation among residents and visitors.

This document addresses all phases of this study process. The document begins with a review of the existing active transportation conditions and provides a detailed inventory and assessment of the pedestrian and cycling facilities. It later goes on to present the results of Phase 2 and 3 of the project. This includes a vision and supporting goals for the future of the active transportation network in Port Alberni, as well as more specific strategies and actions to help the City achieve its goals. The purpose of the final section of this document is to present an implementation

strategy for the Active Transportation Plan, which includes cost estimates, priorities, and a phasing approach.

1.2 Communications and Consultation

The Active Transportation Plan was developed based on input from the public and key stakeholders, using a range of communications and consultation approaches as shown and described below. A summary of the feedback from these events and the survey are provided in **Appendix A**.

- **Site Visits** to observe existing walking and cycling facilities.
- **Stakeholder meeting.** A meeting was conducted on June 4th 2013 and was made up of representatives from a variety of interests. The individuals included representatives from the City of Port Alberni, the RCMP, cycling enthusiasts, and staff from the Regional District of Alberni-Clayoquot.
- **Public Event.** A public input event was held on July 20, 2013. Boards were on display at the Port Alberni Farmers Market where residents had the opportunity to find out more about the plan, the study process, and provide input regarding the proposed Plan and identify any issues and opportunities they identified.
- **Survey.** A survey was developed and made accessible on SurveyMonkey during the months of June and July 2013. The survey was used to obtain input on existing conditions, issues and opportunities as well as preliminary Plan directions. Surveys were available on-line and hard copies were also available at City Hall and the Public Event. Approximately 40 responses were received.

2.0 Setting the Context

This section provides an outline of the planning context for the Active Transportation Plan. This section is designed to describe why the City of Port Alberni wishes to promote walking and cycling and discusses some of the current conditions and influences that relate to transportation and more specifically cycling and walking.

2.1 Why Promote Walking and Cycling

With an extensive network of trails, sidewalks, wide roads, parks, and natural and heritage attractions the City of Port Alberni offers excellent opportunities for residents and visitors to walk and bicycle for transportation and recreation. The exceptional outdoor opportunities associated with the trails and routes that wind through the scenic landscape of Port Alberni include forested areas, waterfront views, historic character, and the proximity to industrial activity. These unique features have the potential to create a pedestrian and cycling network that provides connections to all these amenities and allows pedestrians and cyclists to travel through the city with ease in a safe, connected and accessible network.

Despite these appealing characteristics, there are also a number of natural and physical barriers that can have an impact on walking and cycling in Port Alberni. There is also room for improvement to support and encourage people of all ages and abilities to walk and cycle by ensuring these modes are safe, convenient, and competitive travel options. Communities throughout the world, including the City of Port Alberni, have recognized that increasing walking and cycling mode share will result in a more balanced transportation system that has many benefits. The benefits to supporting an active walking and cycling culture in Port Alberni include:

- **Economic benefits.** Local economic development is a major priority of the City, and a pedestrian- and bicycle-friendly community can contribute to the development of a healthy and diverse local economy in Port Alberni. As a result of its extensive trail network and natural environment people travel to Port Alberni to walk and ride their bicycles for leisure, recreation and sport. A pedestrian- and bicycle-friendly community and atmosphere can attract more visitors to the City who will in turn be patrons of Port Alberni's services and amenities.
- **Quality of life.** A pedestrian- and bicycle-friendly community can encourage a more livable and enjoyable place to be, with a stronger sense of place and freedom of mobility. Communities that support walking and cycling can also contribute to safer streets and improved social interactions.
- **Health.** Walking and cycling are effective conduits for supporting mental and physical health and building a healthier and happier community. The World Health Organization has identified physical inactivity as one of the main leading risk factors for global mortality, and as an underlying factor for many chronic diseases.
- **Decreased costs.** Constructing pedestrian and bicycle facilities are typically cheaper per kilometre than the cost to construct many road infrastructure projects. In turn, residents receive an easy and convenient travel option and decreased congestion, roads experience

less wear and tear, and the City's budget can benefit from a financially sustainable transportation solution.

- **Environmental quality.** Walking and cycling have many environmental benefits, as they can reduce vehicle trips, congestion, air pollution, and can help to reduce greenhouse gas emissions. This can also help in the City's efforts towards climate change mitigation. Environmental sustainability is a priority of the City, and supporting cycling can protect and improve Port Alberni's natural environment. Specific information regarding the City's Greenhouse Gas Emissions is provided in Appendix B.

2.2 Community Context

The City of Port Alberni is a vibrant unique municipality of just under 18,000 residents, located at the head of the Alberni Inlet on central Vancouver Island, approximately 48 kilometres from Barclay Sound. The City has a rich industrial history which continues to this day, based around resource industries, including forestry and fishing. The City offers a deep sea port with direct access to the Pacific Ocean despite being a City located in central Vancouver Island. This geographical location has allowed the city to function as a hub and service centre for the large Alberni-Clayoquot Regional District and communities in Barkley Sound located on the Pacific west coast. The unique mix of industry, history, geography, and eco-tourism opportunities continues to attract visitors to the region.



Port Alberni is a City surrounded by natural beauty and spectacular geography, including a number of fresh water lakes and stunning forests that define its local character and economic development. The City is one of three incorporated areas in the Regional District. The population of the Regional District including the City of Port Alberni is approximately 30,000 residents within a land area of 6597 km². Port Alberni is home to nearly 60% of all residents in the region. The City of Port Alberni covers approximately 20 km² of land area and as mentioned above, it plays a key role for the region. Highway 4 provides the primary access into the region. The City has a

prominent road system that facilitates the movement of people and goods locally and regionally, and is critical to local economic development. BC Transit runs bus service throughout the City.

With substantial road infrastructure and corridors, the City also recognizes the importance of developing a multi-modal and sustainable transportation system. The City has sought improvement opportunities for transit and active transportation in the past, including the 1983 Bicycle Route Proposal and current waterfront plans focusing on providing access and links for pedestrians and cyclists.



This section summarizes key demographics, land use, and transportation characteristics that influence the direction of the Active Transportation Plan.

2.2.1 Demographics

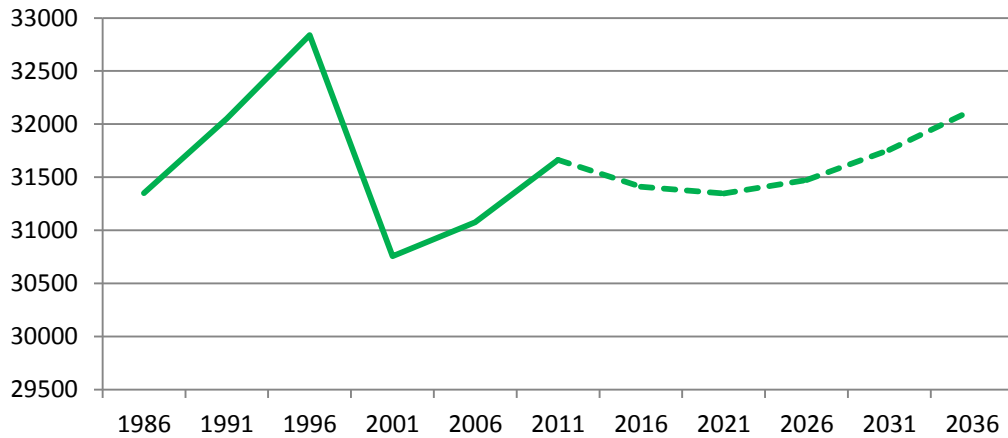
Demographics play a significant role in influencing transportation choices and travel patterns. This section summarizes key demographic characteristics of Port Alberni residents.

- **A gently growing region.** Population growth in Port Alberni and the ACRD are heavily influenced by economic trends. The City's economy is driven by resource based industry and as a result population level tends to fluctuate in relationship to economic prosperity. However, in recent years and future trends see an overall increase in population. The projected population for the Regional District is outlined below in **Figure 1**.

Figure 1

Population Projections for Alberni-Clayoquot Regional District

Source: Statistics Canada

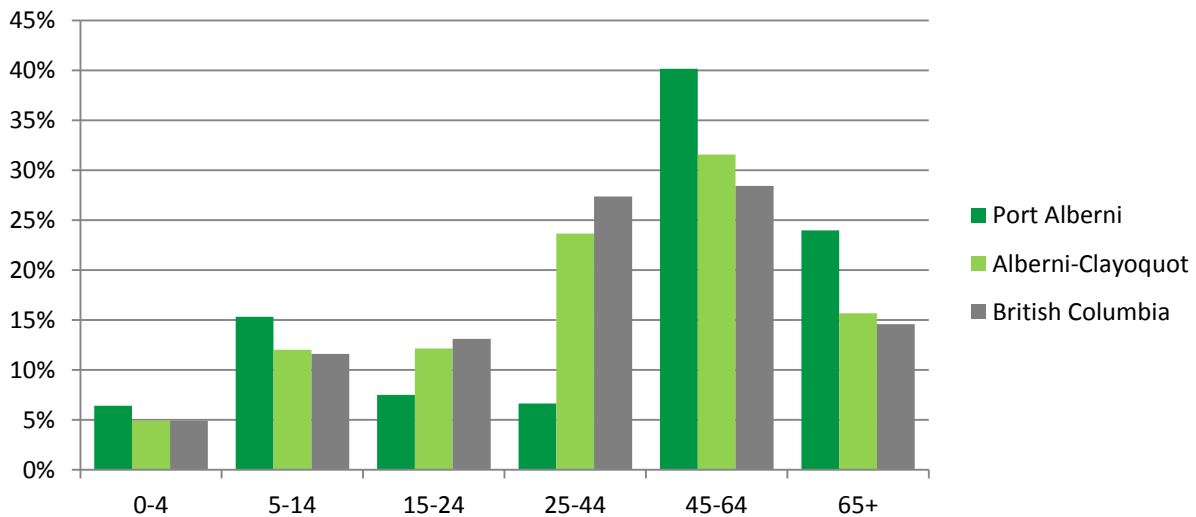


- **An aging population.** Approximately 24% of the City's residents are currently aged 65 and older, with an additional 40% of Port Alberni's residents in their pre-retirement years (45-64 years old). The majority of the residents in Port Alberni are over the age of 45. These percentages are considerably larger than the Provincial and Regional District averages. As the population ages, travel behaviour will change considerably. Seniors and older residents tend to create new and varied transportation needs for the City. For example, seniors tend to be more reliant on non-automobile transportation such as walking, cycling and transit as compared to people in the labour force. Seniors also require accessible, safe, and well-connected transit and active transportation infrastructure to move freely around their communities without a vehicle.

Figure 2

Current Population by Age Group

Source: Regional Transportation Model



- **A young community.** As seen in **Figure 2**, Port Alberni has a significant population of residents that are over the age of 45. The city also has a fairly significant youth population of 30% under the age of 24. The percentage of residents within the age 0-4 and 5-14 are higher than the Provincial and Regional District averages. This segment of the population is particularly important to focus on for travel demand as youth often do not have access to automobiles and are reliant upon transit, walking, cycling and carpooling. By attracting youth to sustainable modes of transportation early in their lives, there is a considerable opportunity to continue these trends into adulthood, although the declining share of the youth population may present challenges in the future.



- **Industry.** Port Alberni has a history rich in resource based industry. There are three major industrial sites currently in operation today including the Catalyst Paper Mill site. The City is also a major port for the region and a hub of economic and industrial activity. This however, results in a waterfront that has considerable industrial activity that for security, safety, and practical issues results in some areas that are not accessible to pedestrians and cyclists. The evidence of the City's industry can also be seen on the roads, as large logging trucks travel along many of the City Streets. The industry is a major contributor to Port Alberni's economy and played a significant role in its history and future.

2.2.2 Land Use

The most significant factor affecting how people travel is the proximity of where people live to where they work, shop and play. The type, scale and mixture of land uses along with the densities of those uses, will largely determine how far, and consequently what mode of transportation, individuals use to get to their destinations. The closer people are to their desired destination, the more opportunities there are for them to walk, cycle, or take transit. Key land uses that act significant trip generators for pedestrians and cyclists are shown in **Figure 3** and described in further detail below.



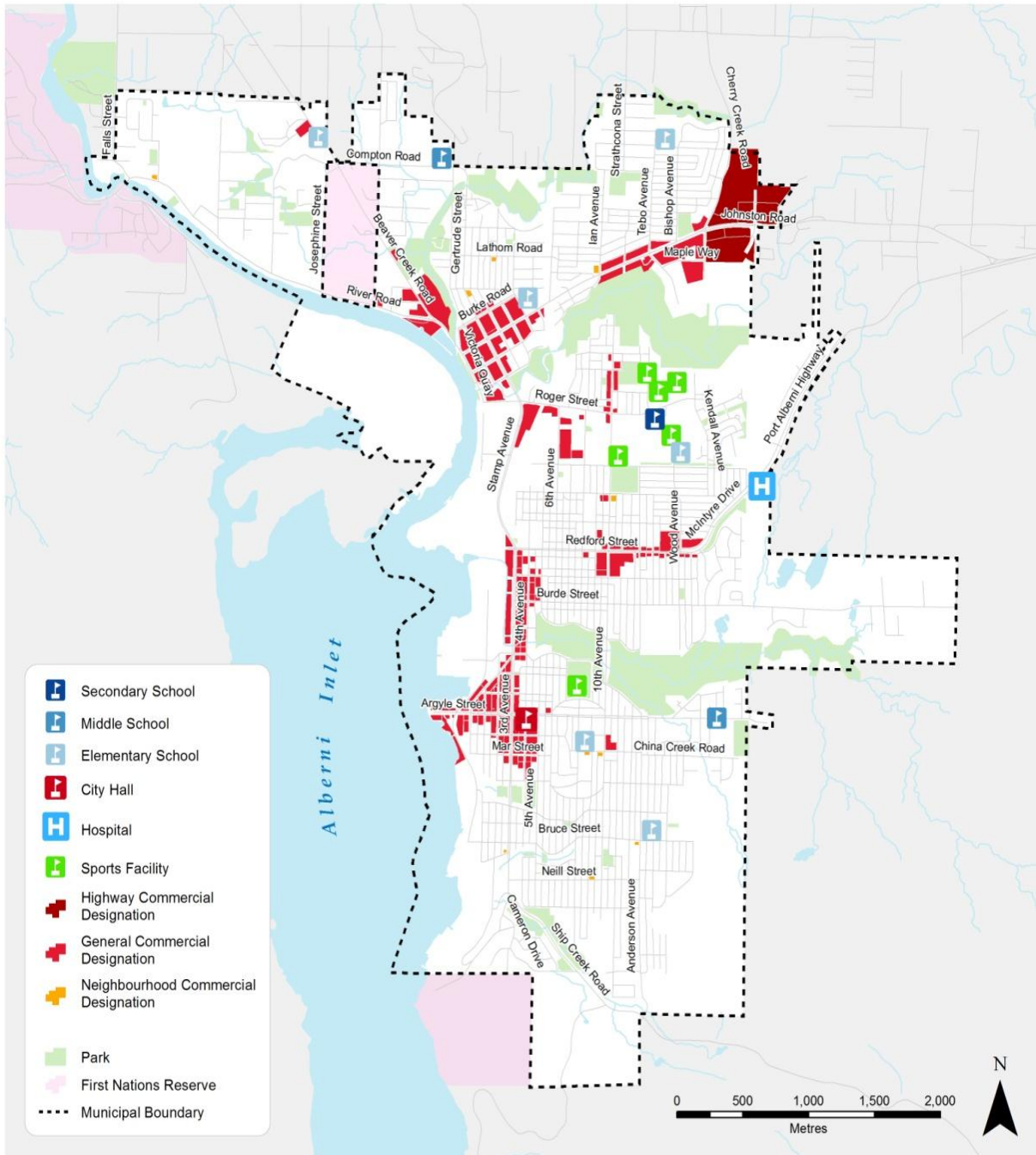
- **Community Size.** Port Alberni is a relatively small municipality, with a total land area of approximately 20km². The City has a population density of 897.9 persons per square kilometre.
- **Commercial areas.** There are several major commercial areas in Port Alberni, which is quite unique for a City of this size. Part of the reason this is the fact that Port Alberni is an amalgamation of two separate cities. The city centres associated with Alberni (Northport)

and Port Alberni (Southport) make up two of the City's commercial areas. There is large scale commercial activity along Highway 4/Johnston Road (Johnston Commercial Area) which includes the Pacific Rim Shopping Centre. A concentration of commercial activity is also located along Redford Street (Redford Commercial Area). With four major commercial areas plus smaller scale commercial developments throughout the City the majority of residents are located within 800m (10 minute walk) of some type of commercial activity.

- **Community facilities.** The important cultural and civic facilities in Port Alberni are located in various areas throughout the City. There is a concentration of sport facilities, including an aquatic centre, and schools located in the area known as Echo Park located along Rogers Street and 10th Avenue. Other facilities such as schools, the hospital and the City Hall are located throughout the City in various locations. Port Alberni also hosts the majority of sport facilities in the Region.
- **Other key employment areas.** Although much of the employment within the City is located in the commercial areas and other community facilities noted above, other key employment areas throughout the City include Industrial lands located along the waterfront, Alberni Harbour Quay, and large scale commercial activity along Johnson Road near the outer boundary of the City.



Figure 3
Key Active Transportation Generators



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- **Schools.** There are nine public schools in Port Alberni, including six elementary schools, 2 middle schools, and one secondary school found in a variety of neighbourhoods in the City. There are also two post-secondary institutions. The schools located in the City of Port Alberni are:

- Maquinna Elementary
- Eighth Avenue Elementary
- Wood Elementary
- Alberni Elementary
- John Howitt Elementary
- Gill Elementary
- Eric J. Dunn Middle School
- AW Neill Middle School
- Alberni District Secondary
- North Island College



- **Parks.** Port Alberni is home to 45 parks and numerous recreational opportunities, including Echo Park, Paper Mill Dam Parks, Dry Creek Park, Gyro Recreation Park, Kaleidoscope Park, 11th Avenue Park, and Blair Park.

2.2.3 Roads and Trails

The City generally has very wide roads that connect to an extensive network of City and

Regional trails. Another defining characteristic of the road and trail system is the hilly topography of Port Alberni.

- **Wide Roads.** The City of Port Alberni is characterized as having wide roads. These roads create both opportunities and challenges for pedestrians and cyclists. The wide roads allow for spacious lanes and a separation of vehicles from cyclists and pedestrians. There is a significant amount of on street parking which creates a buffer for pedestrians. The wide roads also offer great opportunities for on road bike lanes and buffers for cyclists, and provide space for additional pedestrian infrastructure such as curb extensions and pedestrian islands. The wide roads however can create issues for both pedestrians and cyclists. Some of these issues include long crosswalks, which can take time to cross and can make it difficult for vehicles to see pedestrians. The wide roads also provide additional space that vehicles may use to pass others illegally on the right. They can also make it difficult for pedestrians and cyclists to see past parked cars or stopped vehicles.

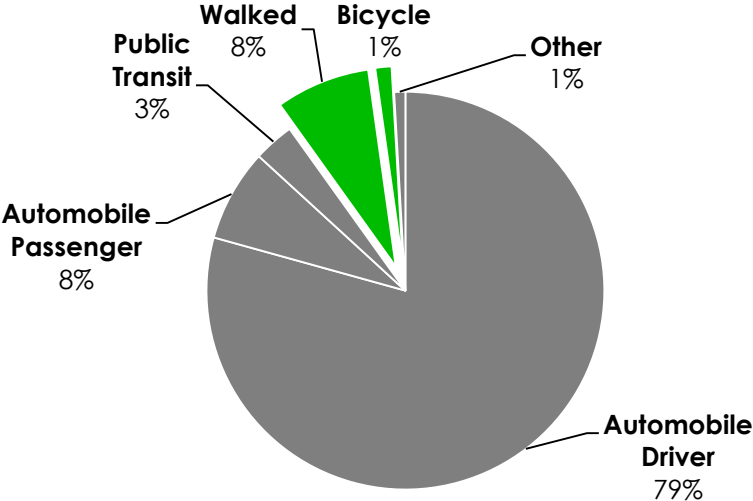


- City and Regional Trail Network.** The City has exceptional access to the region through an extensive trail network. The trail network in and around the City and Region include routes along dykes, creeks, ravines and provides access to many of the recreational amenities throughout the Regional District. Some of the trails are contained within Port Alberni, and the regional connectors have access points and trailheads located within the City. Some of the most popular City trails include: Rogers Creek Nature Trail, Kitsuksis Dike Walking Path, Ship Creek Trail, Maquinna Trail, Grieve Park Trail, Wallace Street Trail, and Maplehurst Trails. Some of the most popular regional trails that have trail heads in Port Alberni include the Log Train Trail and the Alberni Inlet Trail. This project is not looking specifically at these trails however, providing well marked and accessible connections to these trails is an important aspect of this Plan.
- Topography.** Port Alberni has some steep slopes that can have a significant impact on both walking and cycling. A number of locations have slopes that are greater than 8%, which can make walking and cycling difficult, and act as a deterrent. Some of the steepest areas of the City include the Southport Commercial Area and the 10th Ave crossing of Dry Creek. More detail on the topography of the city is provided in **Appendix B**.

2.2.4 Travel Patterns

- Mode Share of Commute Trips.** According to the 2011 National Household Survey, walking and cycling together account for approximately 9% of all trips to work in 2011 (8% walking and 1% cycling trips), as shown in **Figure 4**. The majority of commuter trips in the City are made by car, as 87% of Port Alberni residents use a car to get to work either as a driver or as a passenger. This mode share is relatively average when compared to other communities located in Central and Southern Vancouver Island. Communities with significantly more walking and cycling are Sidney and Duncan (approximately 15% of all trips to work) and Tofino and Victoria (approximately 33-35% of all trips to work). More detailed graphs and information regarding mode trips and green house gas emissions can be seen in **Appendix C**.

Figure 4
 Mode Share of Commute Trips (2011)
 Source: National Household Survey



- **Commute Distance.** Most people will make the decision to walk or cycle if the commute distance is short. In Port Alberni 82% of the trips in the City are 5 kilometres or less and based on findings from the 2011 National Household Survey the medium commuting duration is 10.3 minutes.

2.3 Policy Context

There are a number of relevant plans and strategies that have been developed locally and throughout the region that provide direction on active transportation throughout Port Alberni. The City's active transportation policies and objectives as well as its broader aspirations are contained within many local policy documents which strongly influence transportation movements within and beyond municipal boundaries. In addition, several senior government initiatives provide guidance on regional directions for planning and development of pedestrian and cycling facilities. This section provides an outline of the important policies, plans, and strategies that can help shape the direction of Port Alberni's Active Transportation Plan at both the local and regional and provincial level.

2.3.1 Local Directions

The City has developed several overarching plans and strategies that guide local planning and development activities, and which provide direction on the integration of walking and cycling within the transportation landscape. In particular, three documents provide the overarching framework for the Active Transportation Plan, including the City's Official Community Plan, Corporate Strategic Plan, and the Port Alberni Bicycle Route Proposal. Each are summarized below, in addition to other planning documents developed by the City.

Official Community Plan (2007) is the City's key policy document that is the vision for growth and development throughout the City of Port Alberni. The OCP is a long-range blue-print for decisions made relating to: residential, commercial, and industrial development; the provision and maintenance of parks and recreation amenities; the natural environment; transportation infrastructure and the orderly provision of utilities. The goals and objectives of the Port Alberni Official Community Plan and the future vision (20 years) are outlined below:

- To Support and promote growth patterns that are economically, socially, and environmentally sustainable through efficient land use and development.
- Enhance the economic and social vitality of key areas that can boost the pedestrian experience, stimulates social activity, generates a distinctive experience, and promotes tourism.
- Encourage diversification and promote development of the industrial sector in order to achieve a more stable employment base.
- To protect significant natural ecosystems, habitat, green space linkages, and environmentally sensitive areas, and promote stewardship of these valuable resources.
- Maintaining the environmental quality of the community by providing alternative transportation options, relying less on automobile travel and encouraging community choices that minimize impact on the environment.

- Ensure a range of housing choices and ensure that neighbourhoods are safe, walkable, and well connected by a variety of transportation networks, including pedestrian and bicycle corridors.
- Maintain and enhance where possible the existing inventory of parks, trails, open space, and recreational facilities within the community
- Ensure services are available to promote a vibrant, healthy, united, sage and liveable community.
- Preserve and showcase the rich history and culture of Port Alberni.



To support this vision the Official Community Plan outlines policies in nine key areas: Natural Environment, Parks and Open Space, Community, Residential, Commercial, Industrial, General Economic Development, Home-Based Business, Transportation, and Servicing. When looking specifically at transportation, walking, cycling, and transit are considered important components to the transportation system, as a result the Official Community Plan outlines several key goals and policies that would enhance and expand the City's active transportation network, including:

- Supporting the development of a comprehensive connected system of pedestrian and bicycle corridors that serve to link neighbourhoods, community services and amenities.
- Bicycle corridors shall be developed as:
 - On-road routes through dedicated bicycle lanes or shared automobile/bicycle lanes; and
 - Off-road routes utilizing the primary trail network
- Pedestrian corridors shall include:
 - Sidewalks;
 - Pathways; and
 - Multiple-use trails.
- Providing end of trip facilities including bike parking.
- New developments shall provide connectivity to the existing network of bicycle and pedestrian corridors when physically possible.

Corporate Strategic Plan (2012 - 2016) provides a plan for future policy and resource decisions. The Strategic Plan outlines a mission to *enhance the quality of life of residents and taxpayers by creating a vibrant waterfront community*. The Strategic Plan focuses on a 'Four Pillars' approach recognizing the need for balance between social, environmental economic and cultural perspectives. Transportation is addressed in this plan in a number of ways as it can be a part of all 'Four Pillars', some of the specific objectives related to transportation include:

- Providing sustainable transportation corridors
 - Investigate additional Roger Creek crossing
 - Develop waterfront Industrial Road
 - Investigate additional East Bypass Ring Road

- Provide and sustain needed municipal infrastructure for now and future
 - Implement a sustainable road maintenance program
- Ensure high quality of life through the promotion of active living
 - Draft and implement a Trails and Bikeways Network Master Plan
 - Jointly develop a Master Plan with ACRD and stakeholder input
 - Develop mapping, brochures, signage promoting trails and bikeways
 - Undertake or support others on trail development projects especially those that increase interconnectivity of existing trails
 - Plan and install street improvements, signage and laning that promotes safe cycling routes on City streets

Port Alberni Community Assessment: Taking Action for Community Sustainability Planning (2008).

This report was prepared for the City of Port Alberni to assess the community's readiness to engage in long-term sustainability planning. Through working with the City of Port Alberni and community stakeholders recommendations emerged for the City to focus on long term sustainable planning. Some of the key findings specific to transportation included:

- Expand the trail network in Alberni Valley for tourists and locals
- More trails and outdoor activities
- Improved/integrated transportation network
- More people walking, using bikes, and public transportation
- Reduce reliance on traditional transportation

Port Alberni Environmental Sustainability Progress Report and Plan (2007-2012). This report is a progress report of the City of Port Alberni's commitment in a variety of ways to move toward a more environmentally sustainable community. The focus for transportation is on promoting sustainable transportation. Making recommendations to facilitate public education workshops/engagement in areas directly related to the provision of city services in reference to sustainable transportation.

Age Friendly Report (2013). This report was funded by an Age Friendly grant from the Province of British Columbia. The study process includes focus groups and a survey to identify how age friendly the community of Port Alberni is. In the initial consultation, stakeholders discussed the importance of transportation. Participants voiced the need for more infrastructure and education related to outdoor trails, including benches, connections to services, signage and trail maps. The discussion also noted the need for infrastructure and education for seniors who use mobility scooters.

Waterfront North Study (In progress). This Plan is currently in process and is a study of Port Alberni's Waterfront North Area. The plan focuses on providing a guide to improving access to the waterfront area. The Plan assists in creating policies and prioritizing realistic short, medium, and long-term actions for land use and development. The waterfront study is looking at increasing pedestrian facilities along River Road.

Port Alberni Uptown and Waterfront Redevelopment (2007). This Plan provides strategic recommendations to move forward the implementation of the Shoreline Master Plan and provide direction for the revitalization of Argyle Street and 3rd Avenue in the Uptown area. The

objectives for this report are the same as those identified in the Shoreline Master Plan Review that was undertaken in 2000. Goals identified in this report are noted below. Each of the goals was addressed in terms of a low level of investment and a high level investment. The goals related to active transportation include:

- Improve linkage between waterfront and uptown, up and down Argyle;
- Showcase environmental sustainability;
- Improve appearance and function of 3rd Avenue retail district;
- Improve land use and social conditions of 3rd Avenue retail district;
- East pedestrian crossing of Harbour Road at Argyle;
- Plan redevelopment of the Water Street Wharf/Esso Property area to improve public waterfront access and address economic development;
- Identify redevelopment and waterfront access potential for Plywood Site;
- Allow gradual redevelopment of the Harbour Quay and Fisherman's Harbour area; and,
- Increase waterfront public access.



Strategic Sign Plan (2004). The Strategic Sign Plan is intended to inform both visitors and residents of the different districts within the City. It focuses on identifying and key features within the City and making them well marked and easy to find by everyone. Key destinations identified include Harbour Quay, the historic steam train, and the First Nations Cultural Centre.

Port Alberni Bicycle Route Proposal (1983). In 1983 the City of Port Alberni developed a bicycle route proposal. The purpose of the plan was to outline a bicycle network for the City of Port Alberni that would satisfy the utilitarian and recreational needs of cyclists. The plan identified some goals which included:

- Providing pleasant and functional cycling routes which will increase the safety of cyclists within the City of Port Alberni.
- Establishing cycling routes to meet both the recreational and utilitarian needs of cyclists in Port Alberni.
- Establishing cycling as a viable, alternative method of transportation.

The objectives outlined in the document regarding bikeway development were:

- To serve cyclists commuting to and from various centres in Port Alberni.
- To provide interconnecting links between major and minor routes to create a network serving the entire community.
- To establish design standards compatible to other communities in BC.
- To be compatible with other land uses.
- To establish a policy for the provision of bicycle support facilities (e.g. Parking)

- To utilize rights-of-way whenever possible

The Plan also identifies some long term strategies which include providing public education on bike safety, information on cycle routes, actively encouraging cycling as a form of everyday transport, and encouraging the city to pass policies concerning bicycle legislation. The proposed network identifies Class I (Bike path or bike trail), Class II (bike lanes), and Class III (bike routes) facilities located for the most part along the City's arterial roads.

Key concepts of the plan aim to provide:

- Direct links to key areas
- Accessible routes, close to residential areas (1/2 mile)
- Avoid heavily congested areas (use Angus, Fourth, Montrose and Second Street as detours)
- Different classes of bikeways (Bike path, Bike lanes, Bike routes)
- Signage and markings
- Safety and education programs

2.3.2 External Directions

- **Regional Parks and Trails Policy Report (2008).** This report outlines the current role of regional parks and trails within the ACRD and future direction and vision for the existing and future regional parks and trails. It is identified that the parks and trails are already playing an important role in the lives of residents and visitors and this role has the potential to grow. The report focuses on providing an approach for moving forwards which recommends:
 - Completing an overall plan/vision for regional parks and trails – starting with taking inventory of existing services;
 - Establishing long-term prioritized objectives;
 - Determining the best administration strategy – Regional District vs. Non profit; and,
 - Financing.
- **Climate Action Plan (2008).** The Provincial Government has developed several plans and strategies to encourage alternatives to the single occupant vehicle and reduce greenhouse gas emissions. The Provincial Climate Action Plan sets targets for British Columbia to reduce its GHG emissions by 33% from 2007 levels by 2020 and by 50% by 2050
- **Climate Action Charter (2007).** The Province of British Columbia developed the Climate Action Charter with the Union of BC Municipalities (UBCM) in 2007. Today, almost all of the municipalities in the Province – including Port Alberni– have signed the Charter with a pledge to be carbon neutral by 2012. By signing the Climate Action Charter, local governments commit to measuring and reporting on their community's GHG emissions profile and working to create compact, more energy efficient communities.
- **Alberni Valley Trails Planning Study (2006).** This study was conducted by the Friends of the Log Train Trail Society, a volunteer organization based in the Alberni Valley. The report notes that to date there has been no formal, overall planning for trail development throughout the Alberni Region.

3.0 Existing Conditions

This section describes the existing features of the walking and cycling environment in Port Alberni, including infrastructure, bylaw requirements, safety aspects, topography and land uses that shape walking and cycling in and around the community. Also included are residents' feedback and input on common walking and cycling issues and opportunities within the community. An assessment of the current walking and cycling environment in Port Alberni can provide a good picture of where the City is, and next steps for moving forward with the Active Transportation Plan.

3.1 Walking

Walking is a part of every trip that is made, whether it is made by car, public transit, or bicycle. The pedestrian environment plays a significant role in impacting the frequency of walking trips of residents. If suitable conditions exist within a community – such as having a complete, connected sidewalk network and major destinations nearby to where people live – walking can also be a convenient alternative to the automobile for almost all short trips.

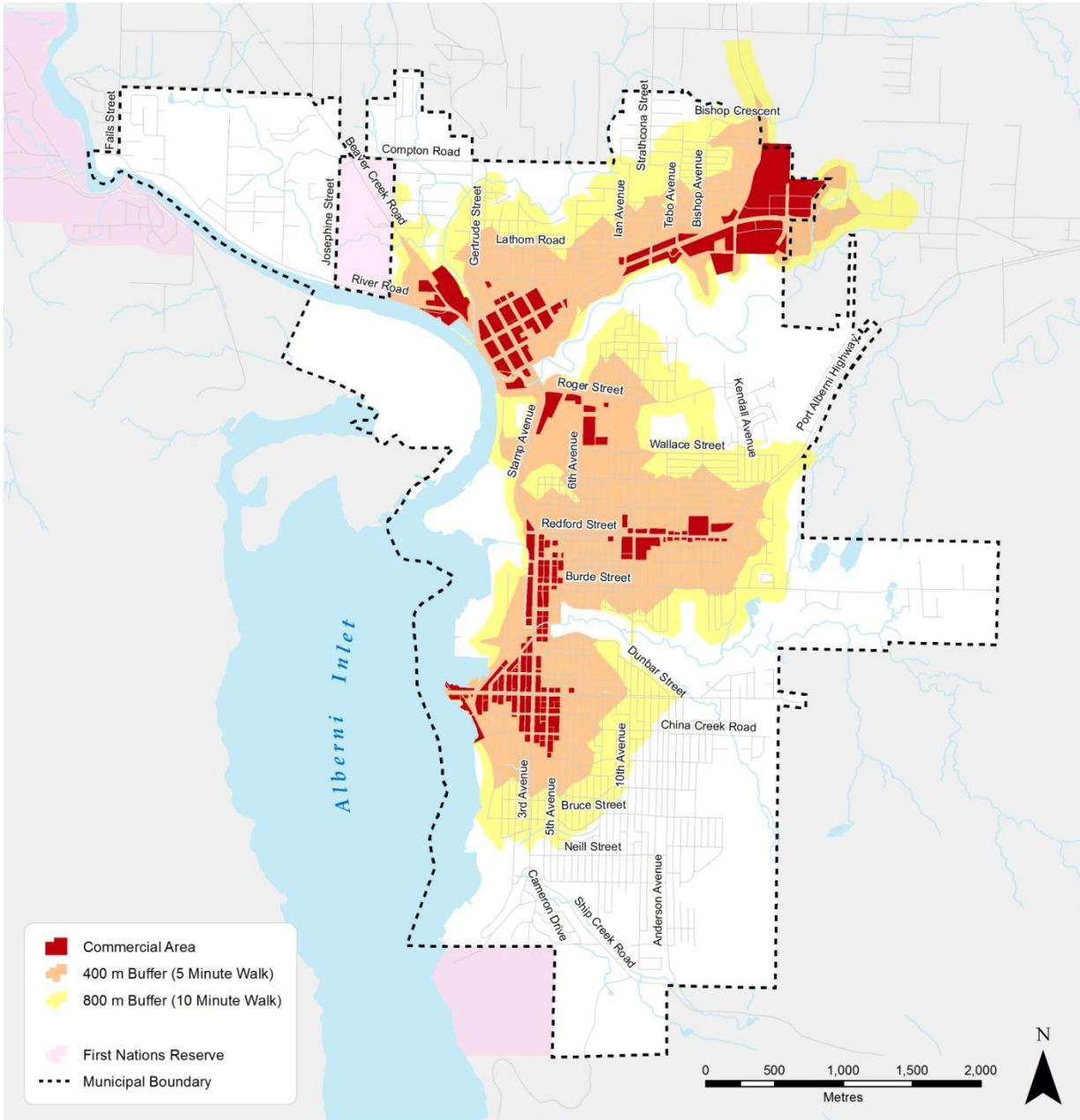
Pedestrian Generators. There are key areas of the community that are significant hubs of pedestrian activity, including the Northport and Southport Commercial areas, Johnston Commercial Area, and Redford Commercial Area. There is also a number of park and recreational facilities particularly Echo Park, located in the central part of Port Alberni, where there is a concentration of sporting and education facilities. Schools, elementary, middle, secondary, and post secondary, are also found throughout the City and are considered generators for pedestrian activity.

Pedestrian Walksheds. Due to the fact that the City of Port Alberni has commercial activity located throughout the City, most residents are within walking distance of commercial uses and



other destinations such as schools and parks. In fact, as shown in **Figure 5**, a significant portion of the City is located within a five- or ten-minute walking distance to key commercial uses throughout the community.

Figure 5
Commercial Walksheds (Five- and Ten-Minute Walking Distance)



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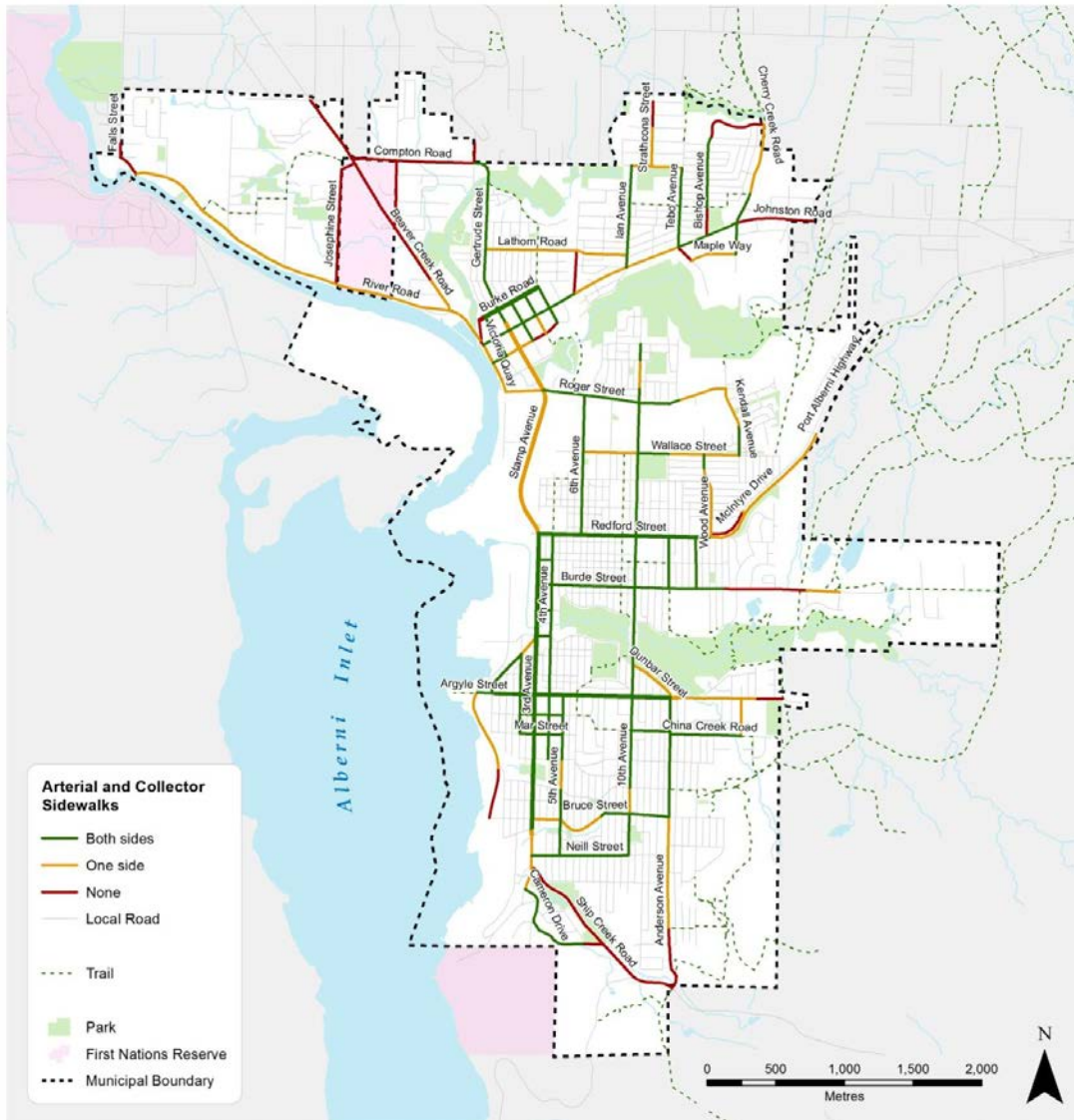
3.1.1 Existing Pedestrian Facilities

Sidewalks and Crossings. Figure 6 identifies the number of sidewalks on the arterial and collector roads in Port Alberni. The map identifies that the majority of collector and arterial roads in Port Alberni have sidewalks on both sides of the road. The commercial core and the major pedestrian routes provide a well connected, safe, and accessible pedestrian network. There are, however, some areas where there are gaps in the network. For example, Anderson Road, 5th Avenue, Bruce Street, 10th Avenue, Kendall Avenue, Johnston Road and Bishop Avenue have areas where there are gaps in the network and the connectivity of the sidewalks is limited by these deficiencies.

There are a number of the local roads that surround the schools and parks in Port Alberni have only one or no sidewalks. The Echo Park area, which is a hub of recreational activity and a significant pedestrian generator would benefit from having a continuous and complete pedestrian network. It is recommended that roads around schools, parks and recreational facilities have sidewalks on at least one side of the street. In most cases the streets in the City of Port Alberni do follow these standards, however there are still opportunities to improve and expand the pedestrian network.



Figure 6
Sidewalks Deficiencies (Arterial and Collector Roads Only)



Many local roads (45%) in Port Alberni do not have sidewalks on either side of the street, 26% have sidewalks on one side and 29% have a sidewalk on both sides of the street. The percentage distribution based on road classification can be seen in **Figure 7**.

Figure 7
Percentage of Sidewalk in Port Alberni

Sidewalks	Arterial	Collector	Local
0 Sidewalks	11%	17%	45%
1 Sidewalk	33%	25%	26%
2 Sidewalks	56%	57%	29%

The City of Port Alberni has approximately 230 crosswalks located mainly on the City's arterial and collector roads. The locations of the 13 traffic signal controlled crossings and their pedestrian features are provided in **Appendix D**.



Pedestrian Safety. A total of 6 collisions involving motor vehicles and pedestrians were reported to ICBC from 2008 to 2012, excluding collisions in parking lots as shown in **Figure 8**. All of the collisions resulted in a pedestrian injury, with no reported fatalities.

Figure 8
Pedestrian Collision Locations

Location	Number of pedestrian collisions
Redford Street & 10 th Avenue	3
Rogers Street & Stamp Avenue	2
Highway 4 & Gertrude Street	1

Traffic Calming. Port Alberni has traffic calming measures in place in a few key areas of the City. Curb extensions are located at select intersections along 3rd Avenue and Argyle Street. In addition, there are a number of 30 km/hr zones found mostly on roads adjacent to schools and parks. These features serve to reduce speeds, discourage high volumes of traffic, and minimize conflicts between different road users.

Accessibility in City of Port Alberni, like in other Vancouver Island communities, is a concern as we see aging populations it is anticipated that there will be an increase in residents with mobility issues. Providing a safe and accessible pedestrian network is imperative to increasing the number of walking trips by individuals with mobility issues. Pedestrian features such as curb let downs and wide sidewalks clear of obstructions can aid in facilitating walking trips for individuals with mobility issues. The City of Port Alberni does have a significant number of curb let downs,

however, many are older designs that could be improved upon, and there are still intersections without let downs.

Scooters. As heard through public consultation, the use of scooters in Port Alberni is a common occurrence. Some of the concerns and suggestions regarding scooters include, scooter education, concerns with visibility on the road and in parking lots, scooter lanes, and sharing the sidewalk with other pedestrians.

Trail Network. The trail network in the City of Port Alberni and the Regional District consists of pathways and trails for both pedestrians and cyclists. Providing better integration of the trail network with existing pedestrian infrastructure would help create a more connected network. Also, providing information at trail heads about the distance of the trail, the elevation gain, level of cell phone service would help improve the already popular trail network.

Barriers. There are several geographical features which act as barriers for pedestrians, including:

- **Development Patterns.** The evidence of the amalgamation of the two towns is still apparent today when looking at land use and development patterns in Port Alberni. The amalgamation of two towns resulted in a number of key commercial areas found throughout the City instead of in one downtown core. This allows for a number of different key destinations being located throughout the City, but has also resulted in a very spread out land use pattern.
- **Ravines,** particularly Dry Creek and Rogers Creek ravines have limited number of crossings, which can make for a much longer travel distance than as the crow flies. The limited number of crossings also, as mentioned creates bottlenecks at key locations.
 - **Bridges**
 - Victoria Quay/Roger Creek
 - Gertrude Street/Roger Creek
 - Gertrude Street/Kitsuksis creek
 - 3rd Avenue/Dry Creek
 - 4th Avenue/Dry Creek
 - **Pedestrian Bridges**
 - Dry Creek – Log Train Trail
 - Kitsuksis Dyke near Stirling Field
 - Kitsuksis Dyke near Spencer Park
 - Helen Street
 - Roger Creek Park

3.1.2 Key Issues and Opportunities

Key issues and opportunities have been identified from input received through the public consultation process. Many residents stated that they enjoy walking along the trails throughout the City, the scenery, and the relatively quiet streets. Respondents were also asked to identify key walking issues, more detailed information on the public consultation process and findings can be found in Appendix A. Some of the key themes identified are summarized below:

- **Bottlenecks and limited direct routes** are a result of the geography of the City. There are a limited number of north south running streets that run through the City. This creates heavy volumes of travel for all modes at certain locations. Some of these locations include 10th Avenue, Stamp Avenue, River Road, and Gertrude Street, and on the bridges;



- **Topography** can act as a significant barrier for walking. Steep hills can create safety concerns and result in a more strenuous commute. There are a number of areas throughout the City that have slopes greater than 8%;



- **Lack of sidewalks and pedestrian infrastructure** make for a fragmented walking network and an unpleasant walking experience. Places identified where walking infrastructure was lacking, inaccessible, very narrow, or unsafe included Beaver Creek Road, Dry Creek, River Road, Johnson Road, 3rd Avenue and Johnston Commercial Area;

- **More Pedestrian amenities** including access to public washrooms, benches and trash bins;
- **Trails** were identified as a positive aspect of the pedestrian network, however, connections to the City's pedestrian network, wayfinding, signage, and trail safety were identified as barriers to trail use. Creating links and easy access from the town was identified as a key opportunity; and
- **Busy crossings** at Rogers Street and Stamp Avenue, Beaver Creek Road, River Road, and Gertrude Street act as a barrier and can be a concern for pedestrians in Port Alberni.

Based on feedback from the community survey and public consultation, residents indicated that walking and the pedestrian environment in Port Alberni could be improved by providing the following:

- **Wayfinding and signage** for pedestrians and cyclists would provide better direction to navigate through the City and access trails and pedestrian routes.
- **More sidewalks**, wider sidewalks and more shoulder facilities to allow for safer separation between cars, cyclists and pedestrians and provide better pedestrian connections throughout the network.
- **Accessibility and safety considerations**, such as curb let-downs, curb extensions, paved routes, pedestrian refuge islands and separate facilities for scooters.

- **Additional pedestrian routes** over the bottlenecked crossings would provide more options for pedestrians and cyclists to navigate the City and avoid high traffic volume and speed locations.
- **Pedestrian amenities** such as garbage bins and dog bags. Other amenities such as benches and water fountains are particularly important in areas of steep topography because they provide places to rest, provide breaks in the trip and offer places to stop and enjoy the views associated with hilly topography.

3.2 Cycling

Cycling in Port Alberni is growing in popularity for both residents and visitors. Developing a safe and strategic bicycle network along with support from education, communication and promotional programs is an important way to support healthy lifestyles. Both this Plan and the City recognize the positive environmental impact of cycling and support it as a viable and attractive mode of transportation. With appropriate facilities, cycling can be time-competitive with both automobiles and transit, particularly over short-to-moderate distances during peak travel periods.

3.2.1 Existing Bicycle Facilities

Existing Bicycle Network. The City's existing on-street bicycle network is currently limited to shared use lanes. The route runs mainly along arterial and collector roads in Port Alberni. The City has installed some signage to indicate to drivers to share the road with cyclists however, the extent of the cycling infrastructure, including bike parking, in Port Alberni is limited. However, the City's off-street bicycle network provides numerous regional trails and pathways that are utilized by cyclists of all abilities.

Regional Integration. As noted through the public consultation process, there are frequent cycling trips that extend beyond Port Alberni's borders. As a result, it is critical to ensure seamless connections to destinations throughout the region. In most cases the routes cyclists use include the trail network or the Pacific Rim/Alberni Highway (Highway 4) which is maintained by the Province of British Columbia Ministry of Transportation. Some of the concerns with cycling on these routes include, debris on the highway shoulder, the rumble strip makes it difficult for cyclists to cross, and safety concerns with sharing the road with fast moving vehicles. Some key roads of concern identified include: Johnson Road when entering and exiting the City, River Road, and Beaver Creek Road.

Difficult and a Limited Number of Crossings. As noted in the previous section, travelling north/south through the City can be very challenging and can act as a barrier for cyclists. The crossings over Rogers Creek have been identified as a particularly dangerous, difficult, and inaccessible route for cyclists. The bridge crossings are narrow, there is potential conflict with heavy traffic volumes, and the limited number of crossings requires cyclists to bike down a hill only to have to climb it again once on the other side.

Signage and Wayfinding. Currently there is limited signage designating bicycle paths. Signage would benefit both cyclists and motorists by clearly identifying shared routes and reiterating that cyclists are valued road users. It would identify the location of bike routes of all road users and make it easier for new or inexperienced cyclists to efficiently find their way through the City and to key destinations. Providing direct links through the City and to some of the major trail heads would help make cycling in Port Alberni more accessible for residents and visitors.

Bicycle-Transit Integration. All buses in Port Alberni are equipped with bicycle racks on the front of busses, with a limit of two bicycles per bus.

Bicycle Parking and End of Trip Facilities. The City of Port Alberni currently has a limited number of parking and end-of-trip facilities. There are a few located at a specific destinations but they are not well known or clearly marked. The City is currently updating its Zoning Bylaw it has the opportunity to add bicycle parking as a requirement of new developments.

Cyclist Safety. There has been some concern in recent years of the safety of cyclists in Port Alberni. Some of the concerns could be addressed by providing better driver and cyclist education.

3.2.2 Key Issues and Opportunities

Through discussion with City of Port Alberni residents a number of cycling issues and opportunities were identified. In regards to cycling, many respondents stated that there were a variety of aspects they enjoyed about cycling in Port Alberni, including the regional trails, the wide streets, and the proximity to a variety of destinations. Respondents were also asked to identify key cycling issues in the community, and the key themes are summarized below (more detailed survey results are found in **Appendix A**):



- **More bicycle lanes and routes** to improve the ease of moving around the community by bicycle with marked lanes and signage;
- **Additional crossings and bottlenecks** were recognized as an issue for cyclists. The existing crossings are narrow and have high traffic volumes. Often cyclists have to ride on sidewalks to cross the bridges safely. The lack of crossings force cyclists to navigate more hills;
- **Conflict** between cyclists and other users, including pedestrians and motorists. Motorists yelling at cyclists, conflict on roads and on sidewalks;
- **End of the trip facilities** are lacking within the City, there are a very limited number of bicycle parking facilities, bike lockers, restrooms etc.;
- **Lack of connections and linkages** within the City and to the trails found throughout the Region. Focusing on providing cyclists and pedestrians access the trails heads easily and without an automobile is an important component of this plan; and,
- **Debris on shoulders** was also identified as an issue for cyclists, particularly along the major routes into and out of the City.

Based on feedback from the survey and public consultation activities, residents indicated that cycling in Port Alberni could be improved by providing the following:

- **Bicycle lanes**, including separated and marked bike lanes;
- **Bicycle parking** at key community destinations, currently the City has a very limited number of parking facilities;
- **Education** programs and information for both cyclists and drivers;
- **Alternative routes** and crossings, identifying some possible alternate crossings to avoid bottlenecked areas; and,
- **Better integration with the trail network** would make access easier to the trails found throughout the City and Region.

4.0 Vision and Goals

The City recognizes the need for a balanced approach to transportation, and that a multi-modal and sustainable transportation system is important to providing better mobility options for residents and visitors alike. The Active Transportation Plan is intended to be an effective tool to support this vision for sustainable transportation and in turn healthier residents. The Active Transportation Plan provides a framework for making walking and cycling safe, convenient, comfortable, and accessible modes of transportation in Port Alberni.



As Port Alberni is a small city with relatively easy access to key destinations, the focus of this plan is on promoting and encouraging walking and cycling as a form of transportation for short distance trips. However, it is also important that the plan focuses on providing access to the off-street network of trails as they are popular for residents and visitors alike. The Active Transportation Plan delivers strategies that provide a comprehensive package of solutions to promote walking and cycling, including

network plans, funding options, programming, and education initiatives. The approach of the Plan was inspired and directed by feedback, comments, and input received from City staff, the community stakeholders, and Port Alberni residents.

This section outlines a visioning direction for the Active Transportation Plan, which has been developed based on feedback received from the community and which builds on the direction from other City documents, including the City's Official Community Plan. The proposed vision and goals will help shape the overall direction for the Active Transportation Plan and serve as the basis from which improvement strategies and actions were identified.

Vision

Port Alberni is a City that is vibrant, rich in history, with unprecedented access to nature and beautiful scenery. It is sustainable and prides itself on providing a comprehensive, safe, connected, and accessible walking and cycling network that encourages active transportation and provides access to the region's trail and recreation amenities.

Goals

In support of this vision, the Active Transportation Plan outlines four goals:

Goal 1: More walking and cycling trips

Goal 2: Better connected and efficient network

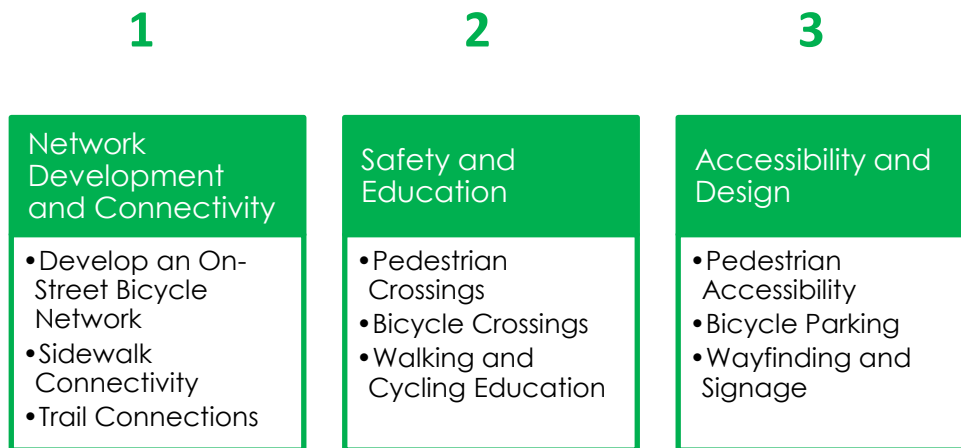
Goal 3: Provide better access to regional trails

Goal 4: Safer walking and cycling

5.0 Strategies and Actions

This section provides a range of more specific strategies to promote walking and cycling in Port Alberni. These are organized into the following three key action areas. There are a number of more specific strategies under each of these three action areas. The strategies of the Plan are intended to guide the City of Port Alberni's planning and capital investment decisions which support the greater use of walking and cycling.

The strategies in this section have been organized into three key action areas as shown below:



Some of the strategies listed are relevant only for cycling, while others apply only to pedestrians and some apply to both. Which group they apply to is outlined in the title of the strategy if it does not specify then it is both.

Action Area 1: Network Development and Connectivity

Expanding and enhancing the walking and cycling network is a fundamental part of making walking and cycling a convenient and attractive travel option in Port Alberni. The on-street network includes the sidewalks and some designated share the road routes around different areas of Port Alberni. The off street network for pedestrians and cyclists includes an extensive network of trails that are a popular attraction for residents and visitors alike. The existing walking network provides good coverage, and the existing infrastructure including, the dyke and regional trail systems and the scenic views create a very positive experience for most residents. Nonetheless, there are still notable gaps in the walking network including fragmented sidewalks, limited accessibility features, and pedestrian amenities that can sometimes make for difficult or inconvenient conditions. As mentioned the off street network of cycling facilities in Port Alberni is extensive. However, the on-street cycling network in Port Alberni is quite limited. By providing a more integrated and connected network of on-street facilities the City can significantly improve the ease of moving around the community by bicycle.

Strategy 1.1: Develop an On-Street Bicycle Network

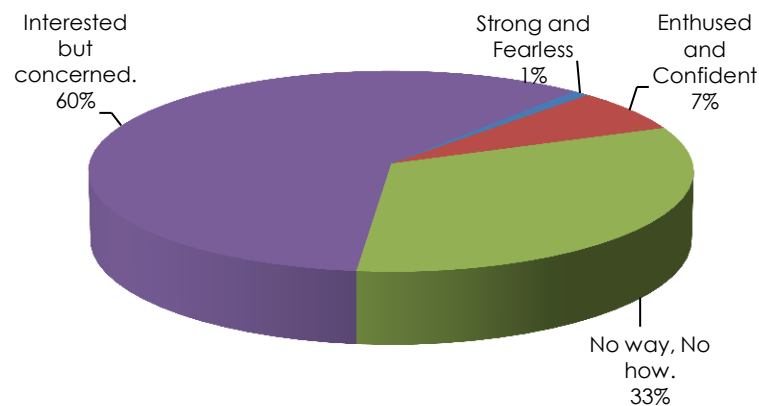
The City of Port Alberni should plan the bicycle network and target infrastructure where there is the greatest opportunity to provide facilities that will produce safe, direct, and comfortable routes and conditions for all cyclists not dependent on skill or ability level. This will provide the best opportunity to increase the number of cyclists and cycling trips within the City.

As a starting point in thinking about how to plan for bicycle networks, the City of Portland, Oregon conducted research to characterize cyclists and potential cyclists, and the typical distribution of these cyclist types in a community, as shown in **Figure 9**.

This research provides an applicable guide for any community designing and developing a bicycle network, with the following categories as a guide:

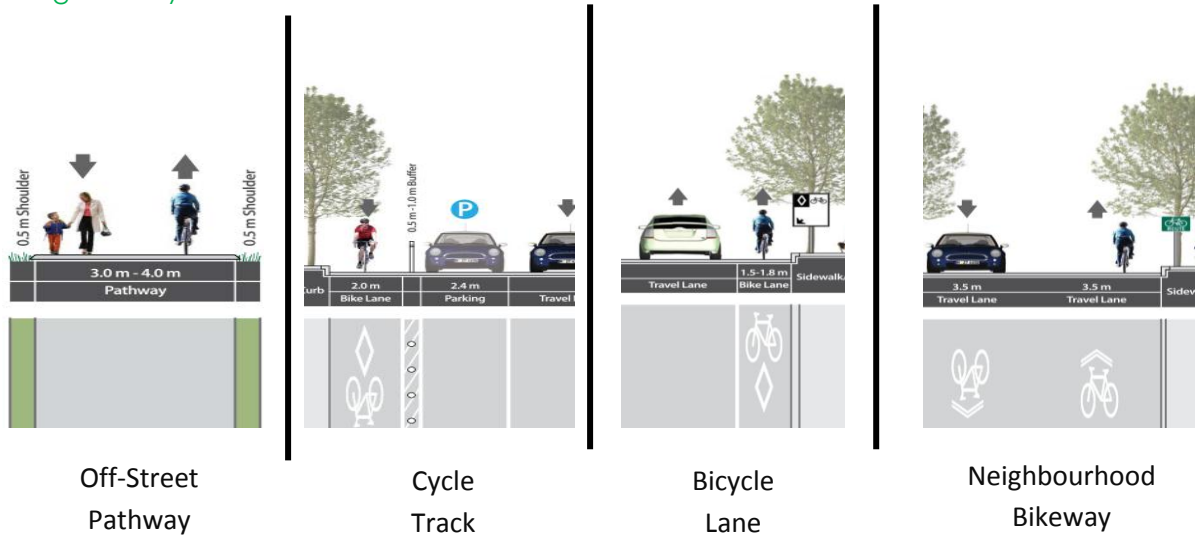
- Strong and the fearless. Those that are highly committed to cycling are already cycling regularly, and will likely cycle regardless of available infrastructure.
- Enthused and Confident. Those that have a high interest in cycling, are confident in their cycling abilities, and will make efforts to cycle as long as reasonable facilities are provided.
- No way, No how. A wide cross-section of individuals who are unlikely to cycle and are not interested in cycling for a variety of reasons including age, health, disability, or other circumstances.
- Interested but concerned. A wide cross-section of individuals who have an interest in cycling as part of their regular travel needs, but have significant concerns (typically related to safety or convenience) that limits their desire and commitment to cycling.

Figure 9
Target Market for Cycling (Portland, OR)



There are a range of different types of bicycle facilities that can be applied in various contexts. For the purposes of the City of Port Alberni's plan, four types of on-street and off-street bicycle facilities can be considered throughout the City, as summarized below and illustrated in **Figure 10**. These facilities are grouped into primary and secondary route facilities to reflect the Bicycle Network Plan included below and in **Appendix E**.

Figure 10
Range of Bicycle Facilities



Primary Route Facilities

- **Off-Street Pathways** are physically separated from motor vehicles and provide sufficient width and supporting facilities to be used by cyclists, pedestrians, and other non-motorized users. Off-street pathways can have paved (i.e. asphalt) or unpaved surfaces, however, paved surfaces provide the greatest level of accessibility. They are also called multi-use paths, as they are used by cyclists, pedestrians and other non-motorized users.
- **Cycle Tracks** are physically separated from motor vehicle travel lanes but are located within the road right-of-way.
- **Bicycle Lanes** are separate lanes that are designated exclusively for bicycle travel and also include pavement markings. Protected or buffered bike lanes provide additional separation between cyclist and vehicle traffic through the use of a painted on-street buffer, using parked cars, or installing bollards or posts.

Secondary Route Facilities

- **Neighbourhood Bikeways** are routes on streets with low vehicle speeds and volumes, which include a range of treatments ranging from relatively basic facilities consisting of signage and pavement markings to bikeways with varying degrees of traffic calming implemented to improve safety for cyclists and other road users.

Strategy 1.2: Increase Sidewalk Connectivity

Port Alberni already has a fairly extensive network of sidewalks throughout the City the majority of streets have sidewalks on one or more sides of the street. This includes the majority of arterial, collector and local roads. However, the City does have a number of areas where there are gaps in the network or where block to block the number of sidewalks varies. This can require unnecessary crossings and can create problems for people with mobility challenges. Also, areas that tend to create pedestrian trips such as, schools, recreational centres, and parks would ideally have sidewalks on both sides of the street, this is not the case of all locations in Port Alberni. The City does not currently have specific guidelines for sidewalk coverage. However, based on precedent from other cities, Port Alberni will work to ensure full sidewalk coverage based on the following criteria:

- Sidewalks on both sides of all urban collector and arterial roads; and
- Sidewalks on both sides of urban local roads that are on routes to schools, parks, commercial areas, regional trails, other community facilities, and bus stops.



Strategy 1.3: Regional Trail Connections

The City of Port Alberni is surrounded by an abundance of natural resources and recreational opportunities. The trail network in and around the City and region include routes along dykes, creeks, ravines and provide access to many of the recreational amenities throughout the Regional District including lakes and Provincial Parks. These off street trails are used by pedestrians and cyclists alike. In order to truly utilize these facilities the trail systems needs to be better integrated with the City's pedestrian and cycling network. This can be done by providing clear, well established access points, signage, and direct pedestrian and cycling route through the City to the trail heads. By integrating the City's on street active transportation network with the off-street network of regional trails it will make the trails more accessible and promote using alternative methods of transportation to access the trails.

The City of Port Alberni will work to provide better connections to the trail network by:

- Providing sidewalk coverage and cycling facilities on routes that access trail heads.
- Look into creating better access and pedestrian and cycling facilities to the City's waterfront, particularly along River Road;



- Wayfinding and signage that identify routes to access points to major trails throughout the City.
- Information regarding the trail, distance, route at trail heads.

Action Area 2: Safety and Education

Safety, both real and perceived, is important in attracting more people to walk and cycle in Port Alberni. As vulnerable road users, pedestrians and bicyclists are subject to a higher level of risk, and a lack of perceived safety can effectively discourage walking and cycling. The prevalence of automobiles and automobile-oriented street design can feel threatening to more vulnerable road users, and the perceived walkability and bikeability of an area becomes inherently linked to safety. In fact, no matter the extent of the networks, if people do not feel safe using the community's sidewalks, trails, or bicycle facilities to get to their destination, then they will likely choose their car. This is why a safe walking and cycling environment is important, in addition to that of comfort and convenience. Safety was addressed by a number of residents in Port Alberni in reference to both cycling and walking.

The main factors Port Alberni residents attributed to making them feel uncomfortable and unsafe were crosswalks, traffic volumes, logging trucks, noise, and pollution. Bicyclists also feel vulnerable on roads with high traffic volumes and speeds. Cyclists in Port Alberni also expressed concerns over the lack of bicycle facilities, conflicts with other road users, unsafe crossings, and bottlenecks at bridge crossings. To overcome these concerns, there are a number of engineering and education strategies that can improve pedestrian and cyclist safety in Port Alberni.

Strategy 2.1 Pedestrian Crossings

The City of Port Alberni currently has 13 signalized intersections along Johnston Road, 3rd Avenue, Stamp Avenue, Redford Street, and Roger Street. The pedestrian crossing features at these intersections vary, but typically include a combination of pedestrian-activated pushbuttons, pedestrian countdown timers, and audible pedestrian signals. To improve pedestrian safety and accessibility at each of these intersections, all signalized intersections should have consistent treatments and be retrofitted to include pedestrian pushbuttons, pedestrian countdown timers, audible pedestrian signals, and other features.

In addition to the signalized intersections, there are a number of pedestrian facility improvements the city should consider:

- **More pedestrian crossings.** A majority of crosswalks are currently located in the Southport area of Port Alberni.
- **Ensuring all intersections between collector and arterial roads have marked pedestrian crosswalks at all legs of the intersection.** In particular, consider the crossings at Redford Street, Johnston Road, Argyle and Wallace Street.
- **Installing curb extensions.** Curb extensions have multiple benefits in reducing pedestrian crossing times, increasing pedestrian visibility and providing a traffic calming effect. All

which are particularly important in Port Alberni due to the large width of most streets. It is recommended that the City continue providing curb extensions on key corridors, such as those that are on routes to school. With curb extensions, additional consideration should be given to cyclists navigation and visibility on the roadway when curb extensions are in place.

- **Incorporate curb letdowns.** Curb letdowns at all intersection approaches ensure the intersection is fully accessible for a range of users.
- **Improve unsignalized pedestrian crossings with a pedestrian-activated signal.** This would be particularly useful along wide arterial streets that can be difficult to cross, such as Argyle Street, Johnston Road, and 3rd Avenue.

Strategy 2.2 Bicycle Street and Bridge Crossings

While cyclists tend to cross in many of the same intersections as pedestrians, there are fewer cyclist crossing features currently available. When designing on-road bicycle routes, intersections are key areas that need particular design attention. It is essential that all road users at an intersection recognize their space on the road through line painting and symbols, such as sharrows, or green paint at intersections and areas where there is the potential for conflict between cyclists and vehicles

Bottlenecking at 10th Avenue, 4th Avenue, and Gertrude Street were identified as major safety concerns for cyclists. The narrow culvert/bridge crossings leave cyclists torn between biking on the sidewalk or travel the narrow crossing on the road with the high traffic volumes. Both options present their own dangers and create an uncomfortable and unappealing environment for cyclists. The City will explore addressing safety concerns at these areas through future consideration of an alternative cyclist and pedestrian crossing over Rogers Creek. The City will be widening the bridge and adding a pedestrian crossing at Gertrude Street bridge over Kitsukis creek in the near future. Further research and consideration of an off street path that follows the E&N Railroad should be explored.



Strategy 2.3 Walking and Cycling Education

Providing walking and cycling infrastructure and facilities is a great step in promoting active transportation, however, it is often not enough. Programs, educational material, and reference information must also be in place to encourage people to walk and cycle in Port Alberni.

Education is considered a 'soft' measure for promoting walking and cycling, as it involves no engineered features or design mechanisms, but involves promoting awareness and informational material about walking and cycling. Providing documents that offer up to date information on local walking and cycling networks (such as trail maps that show recommended

routes and facilities), and programs that teach road safety and cycling skills. By spreading information and awareness about walking and cycling in the community, the City can use cost-effective education initiatives to enable people to feel more safe and comfortable using active modes to get around, while encouraging increased use of pedestrian and cycling facilities. There are a number of education and awareness programs and initiatives that the City can develop, including supporting cycling skills programs, safe routes to schools program, and events such as Bike to Work Week and Bike Month. To do so, the City should continue to identify opportunities to collaborate with appropriate agencies and organizations to promote education and awareness around walking and cycling.

Key areas to focus:

- Ensure that all residents including motorists, pedestrians, and cyclists have the skills, knowledge, confidence and support they need to use the road safely.
- Work with cycling groups and organizations in the City.
- Develop education and awareness programs and initiatives.
- Actively market and promote the active transportation facilities, policies and programs in the City.
- Develop a Bicycle User Map for the City that shows bicycle facilities, regional trail heads, key destinations, transit routes, bicycle parking, and bicycle shops.
- Develop a webpage that focuses on pedestrian and cycling facilities in Port Alberni.
- Develop mobility scooter education and awareness. This is a program that could be delivered through the local seniors' centre or other recreational facilities.

Action Area 3: Accessibility and Design

Neighbourhood design can play a key role in influencing walkability and bikeability of an area. The accessibility, design and function of a street can influence who and how people are able to access the space and can limit who uses the space. There are many ways in which the City can promote universal accessibility and designs that promote walking and cycling for people of all ages and abilities. This section describes some specific strategies that can be implemented to make communities universally accessible, particularly around key destinations and pedestrian and cycling generators. By ensuring that the community is designed to be accessible for seniors, scooters, children, parents with strollers, people with disabilities, cyclists and transit users, the overall experience and level of walkability and bikability will be improved for all residents and visitors.



Strategy 3.1 Pedestrian Accessibility

It is important that the pedestrian network and environment in Port Alberni be accessible and usable by a large cross section of people, including people with disabilities, individuals using scooters, seniors, and parents with children. The design of the walking environment should include accessibility features to accommodate the unique needs of these groups, and to provide better pedestrian circulation for everyone.

One of the clear areas of opportunity in Port Alberni is to ensure that all the signalized intersections have accessible crossing features. There are a number of features that can be added to the pedestrian environment and intersections in particular, that can increase accessibility and the overall appeal and walkability of the City. Some of the features that can make pedestrian crossings safer and accessible include: accessible pedestrian signals, traffic islands, let downs, curb ramps, tactile surfaces and warning strips, and directional guiding strips. This strategy also includes keeping sidewalks well maintained, free of cracks, tree roots, and standing puddles also create an environment more accessible and appealing to pedestrians and other users of the environment.

Providing an accessible pedestrian network is particularly important for scooter users in Port Alberni. Based on feedback scooters are often riding on the road with traffic rather than on sidewalks with pedestrians. Providing sidewalks that are wider, accessible and clear of obstructions would provide enough room for pedestrians and scooter users to share the pedestrian network and would keep scooter users safe and off of the road.

Strategy 3.2 Bicycle Parking

Every cycling trip requires that the bicycle be parked at the end of the trip. In many cases, this means locking the bicycle on the street where there is the potential it could be stolen. The fear of theft or vandalism is a significant deterrent to cycling. Therefore, providing safe and secure on-street parking at key locations throughout the City is a significant means of encouraging cycling in conjunction with developing a comprehensive network of bicycle facilities. The design of the bicycle parking can also be used as form of public art or civic branding, as can be seen in the images below.



Providing facilities for bicycle parking are relatively inexpensive and can be seen as a positive “quick win.” The development of the facilities can also be fun and innovative. This can be done by holding design completions, encouraging the use of creative materials, and personal touches. Additional and/or improved bicycle parking is recommended in key areas of Port Alberni, such as:

- **Key commercial areas**, including Pacific Rim Shopping Centre, locations within the Redford commercial area, and in the commercial areas in both Northport and Southport. It would also be beneficial to provide bicycle parking at the hotels throughout the City.
- **Key cultural and civic facilities** on Rogers Street including Bob Dailey Stadium and numerous sporting fields. At City Hall, and the Alberni Harbour Quay.
- **Schools**, including Maquinna Elementary, Eighth Avenue Elementary, Wood Elementary, Alberni Elementary, John Howitt Elementary, Gill Elementary, Eric J. Dunn Middle School, AW Neill Middle School, Alberni District Secondary and North Island College. Racks already exist at several schools, but would benefit from replacement to a new design type and or more capacity;
- **Parks**, including Paper Mill Dam Park, River Bend Park, Echo Park, Dry Creek Park, Gyro Recreation Park, Kaleidoscope Park, 11th Avenue Park, and Blair Park.
- **Trailheads.**

The bicycle parking locations described above includes locations within both the public and private realm. For locations within public space, the City should work to implement bicycle parking where possible within the road right-of-way. Furthermore the City should continue to provide facilities for their own employees for showering and getting changed in addition to increasing the amount of bicycle parking. In addition to providing facilities for its employees, this also demonstrates leadership on behalf of the City and will help encourage others in the community to follow suit.

For bicycle parking within the private realm there are other cities on Vancouver Island that have added bicycle parking requirements for new buildings, building additions, and expansions to the City's Zoning Bylaw. The City of Port Alberni currently does not have these requirements. However, further discussion is encouraged regarding implementing these requirements into the Zoning Bylaw.

Strategy 3.3 Wayfinding and Signage

One of the easiest and effective ways to support pedestrian and bicycle friendly design is by providing wayfinding information for



users of the sidewalk, trail, and bicycle network. Wayfinding should be simple, easy to read, intuitive, and provide pedestrians and cyclists with a level of confidence that they are travelling the most efficient and accessible route. The City of Port Alberni already has effective wayfinding for motor vehicles, and could benefit from providing signage that is on the smaller pedestrian and cyclist scale. Providing signage throughout the City will ensure that people are aware of key destinations, local and regional trailheads, paths, and bike lanes options. Enhanced wayfinding and signage can include several types of information, including:

- **Route** signs that indicate which streets are designated bicycle routes through the use of bicycle route signs and bicycle symbols on street name signs. Supplementary tabs can be installed below bicycle route signs to indicate major destinations.
- **Wayfinding** signs can indicate directions to key destinations, as well travel distance and estimated walking and cycling time.
- **Educational** signs provide information for cyclists and motorists regarding appropriate use of bicycle facilities, such as "Share the Road" signs and "Yield To..." signs.

Wayfinding can also be beneficial for indicating where bicycle parking facilities are located in both the public and private realm. This could include providing information about the location of bicycle parking racks on the City's website, and also by providing signage to bicycle parking facilities.

6.0 Implementation Strategy

The previous section provided an updated active transportation vision for the City of Port Alberni along with a comprehensive package of strategies and action items that will allow for the City to achieve this vision. The information provided in this section is an implementation and phasing strategy identifying the capital project priorities over the short term (0 to 5 years), medium term (5 to 10 years), and the long term (10 years and beyond). The details of this phasing plan are found in **Appendix F**.

The recommended capital improvements are grouped by Action Area and Strategy. The implementation will be funded through current budget allocations at the municipal level. By identifying projects, Port Alberni has the ability to integrate cycling and pedestrian facilities into road paving, line painting and other ongoing road maintenance operations. Wherever possible, the City should work with other agencies and levels of governments to establish cost sharing agreements or to seek grant opportunities in order to off-set total project costs. The identification of priority active transportation facilities allows the City of Port Alberni and its partners to apply for grants, including the Bike BC- Cycling Infrastructure Partnership Program and gas tax funds.

Action Area 1: Network Development and Connectivity

Strategy 1.1: Develop an On-Street Bicycle Network

An on-street bicycle network map has been developed based on destinations, direct routes, connecting key parts of the city and ease of travel. The proposed On-Street Bicycle Network is provided in **Appendix E**. It is made up of primary and secondary routes that will be developed and built over a 10 year period.

Primary routes are direct routes with higher levels and speeds of car traffic. Therefore, those routes are suitable for cycle lanes on both sides of the street or a separated multi-use pathway, where land exists. Effective signage is also important.

Secondary routes are on quieter streets where it is more comfortable for bikes and cars to share land space. They include connections from primary routes to school and other significant destination. Overtime, these routes will be developed using sharrows, traffic calming features and signage.

New bicycle facilities can typically cost between \$15,000 to \$300,000 per kilometre depending on the number of signs, torch-on symbols or road widening requirements. These costs can be minimized through integrating the projects into ongoing road maintenance and renewal.

Priorities were established based on creating a well connected network and developing key designated bicycle corridors within the City of Port Alberni. Short Term priorities, provided in **Figure 12**, are assigned to facilities that will provide direct routes to key destinations within the City and allow cyclists to travel through the City efficiently. Medium-term priorities were assigned

to proposed bicycle facilities that will expand on the short-term priorities and provide more linkages to key destinations within the City, including commercial areas, town centres and parks and schools. Longer-term priorities are assigned to bicycle routes that will provide access in and around residential areas of the City and provide more regional access.

Figure 12
Summary of Short-Term Bicycle Improvements

Roadway	From	To	Distance (km)
Johnston Rd	Victoria Quay	John St	2.60
Roger St	Victoria Quay	Kendall Ave	1.63
3rd Ave	Cameron St	Redford St	3.08
10th Ave	Scott St	Roger St	3.50
Argyle St	Harbour Quay	10th Ave	1.28

Strategy 1.2: Increase Sidewalk Connectivity

Port Alberni will work to ensure full sidewalk coverage based on the following criteria:

- Sidewalks on both sides of all urban collector and arterial roads;
- Sidewalks on both sides of urban local roads that are on routes to schools, parks, commercial areas, regional trails, other community facilities, and bus stops.

Based on recent construction pricing, a sidewalk is estimated to cost \$200.00 per metre (approximately 125m²). The goal of this plan is to provide sidewalk coverage on both sides of all urban collector and arterial roads and sidewalks on both sides of urban local roads that are on routes to schools, parks, commercial areas, regional trails, other community facilities and bus stops. To make these improvements a significant investment is required, and will need to be implemented over an extended period of time. Priorities have been established based primarily upon providing new facilities to areas of high demand, including those areas that have the potential or already experience high levels of pedestrian volumes. Another key consideration of the prioritization was created a connected pedestrian network that provided access to a number of destinations including the numerous recreational amenities found in the City of Port Alberni.

Priority roads to increase sidewalk connectivity identified include:

- 10th Avenue;
- Anderson Avenue; and,
- Beaver Creek Road.

The sidewalk improvements on these roads have been identified as short-term priorities and are summarized below in **Figure 13**.

Figure 13

Summary of Short-Term Sidewalk Improvements

Roadway	From	To	Distance (m)
Anderson Ave	Ship Creek Rd	Comox St	918
Anderson Ave	Comox St	Bruce St	679
10th Ave	Bruce St	Melrose St	194
Beaver Creek Rd	River Rd	Pierce Rd	3591

Strategy 1.3: Regional Trail Connections

As mentioned throughout the report, the people of Port Alberni highly valued the regional trails for both walking and cycling. To improve regional trail connections it is important for the City of Port Alberni to work internally between the Engineering and Parks and Recreation Departments, as well as externally with the Alberni-Clayoquot Regional District.

To enhance regional trail connections, the City should incorporate trails into the mapping of the on-street walking and cycling facilities and provide signs to direct people to trail heads. The City should work with the Parks Department and ACRD to provide uniformity in signage.

Action Area 2: Safety and Education

Strategy 2.1 Signalized Pedestrian Crossings

To improve pedestrian safety and accessibility at each of these intersections, all signalized intersections should have consistent treatments and be retrofitted to include pedestrian pushbuttons, pedestrian countdown timers, audible pedestrian signals, and other features described in **Figure 14**.

According to current estimates, Pedestrian Countdown Timers cost approximately \$500 each, while Audible Pedestrian Signals are approximately \$940 each. The unit cost of a Pedestrian Push Button system is \$5,000 each.

Figure 14
Pedestrian Crossing Improvements to Signalized Intersections

Intersection Location	Pedestrian Crossing Features		
	Pedestrian Push Button	Pedestrian Countdown Timers	Audible Pedestrian Signals
1. Argyle St & 3 rd Avenue	Existing	Recommended	Existing
2. Napier St & 3 rd Avenue	Existing	Recommended	Recommended
3. Stamp Avenue and Roger Street	Existing	Recommended	Existing
4. Redford St & Stamp Avenue	Existing	Recommended	Existing
5. 10 th Avenue and Redford Street	Existing	Existing (N-S Redford) E-W 10 th Avenue Recommended	Existing
6. 10 th Avenue and Wallace Street	Existing	Recommended	Existing
7. 10 th Avenue and Roger Street	Existing	Recommended	Existing
8. Johnston Road & River Road	Existing	Recommended	Recommended
9. Johnston Road & Gertrude Street	Existing	All directions	Recommended
10. Johnston Road & Helen Street	Existing (N-S Johnston Road) E-W Helen Street Recommended	Existing (N-S Johnston Road) E-W Helen Street Recommended	Recommended
11. Johnston Road & Tebo Avenue	Existing	Recommended	Recommended
12. Johnston Road & Cherry Creek Road	Existing	Recommended	Recommended
13. Johnston Road & Broughton Street	Existing	Recommended	Recommended

Strategy 2.2 Bicycle Street and Bridge Crossings

It is essential that the City pay particular attention to intersections and bridge crossings when implementing the bicycle network. An initial implementation step is providing special treatment for the section at the 10th Avenue dip. As the road is too narrow to provide a full bike lane, it is recommended that coloured pavement markings be implemented to indicate the potential conflict zone between bicycles and vehicles.

The City of Port Alberni recognizes the challenge of ensuring sufficient road space for all road users on the many bridges within the city. The City is working to identify unique solutions for each bridge, and in the long term should ensure that any bridge repair or replacements provides additional space for cyclists and pedestrians to cross safely and comfortably.

Strategy 2.3 Walking and Cycling Education

In addition to the implementation of hard infrastructure, there are many opportunities to educate and celebrate active transportation in the community.

Bike to Work Week. From the consultation, there was interest in the City hosting an event like Bike to Work Week, which is held province-wide in May and June of each year. This could be held in partnership with bicycle groups, the RCMP, schools and local businesses. During Bike to Work Week other cities host celebration stations, car vs. bike races, and commuter competitions between organizations. It is suggested that this event be held with the opening of a new bike facility in the City.

Bicycle User Map. The second education tool is the creation of a Bicycle User Map. This easy to read (and print) map would show bicycle facilities, regional trail heads, key destinations, transit routes, bicycle parking, and bicycle shops. It is recommended that this map be developed once key components of the bicycle network are implemented. In the future, specialized maps for heritage or cultural tours could also be created for both cycling and walking.

Scooter Education. Thirdly, an important education initiative would be scooter education. This could be held by the local seniors centre to provide important information about the legal requirements for scooter driving. There could be an opportunity for joint implementation with the outcomes of the Age Friendly Report.

Action Area 3: Accessibility and Design

Strategy 3.1 Pedestrian Accessibility

To improve pedestrian accessibility, there are three key implementation strategies that the City should implement.

Wider Sidewalks. First, street design standards in the City's servicing bylaw should be updated to provide wider sidewalks to accommodate scooters and ascribe other accessibility features, including lighting and benches.

Sidewalk Maintenance Policy. Secondly, the City should adopt a sidewalk maintenance policy. This policy would include standards for inspection, identifying defects and obstacles, and prioritizing repairs. Many other municipalities have implemented sidewalk maintenance policies. As well, the Municipal Insurance Association may be able assist with questions of liability related to sidewalk maintenance.

Strategy 3.2 Bicycle Parking

There are three implementation strategies to increase bicycle parking in Port Alberni: Bicycle parking at municipal and community facilities, updating the Zoning Bylaw, and partnering with businesses.

The first is to install bicycle parking at all municipal and community facilities. The Farmer's Market has been identified as a priority community facility for bicycle parking. The second strategy is to update the City's Zoning Bylaw to include requirements for bike parking in new developments, especially multi-family and commercial developments. The final strategy is to partner with local businesses to install bicycle parking. This usually involves a cost sharing approach where the municipality and business both contribute to the cost of a bicycle rack that is installed outside of a specific business.

Strategy 3.3 Wayfinding and Signage

In the short term, wayfinding and signage for pedestrian is an important strategy to direct locals and tourists to recreation trails, commercial and service destinations, and tourist attractions. In the long term, wayfinding and signage should also be developed for cyclists as the bicycle network is built.

Summary

The City of Port Alberni has a great opportunity to encourage more cycling and walking in the city with some key improvements in infrastructure and programming. Through the current City budget, partnership with regional and community organizations, and grant funding, strong investments can be made in the short and long-term.

Appendix A- Public Consultation

Stakeholder Meeting

Date: June 5, 2013

Location: City of Port Alberni City Hall

Attendees:

Name	Title	Organization
Guy Cicon	Engineering	City of Port Alberni
Linda Scobbie	Engineering Technologist	City of Port Alberni
Scott Kenny	Director, Parks and Recreation	City of Port Alberni
Jake Martens	Executive Assistant	City of Port Alberni
Bill Brown		
Pat Dahlquist	School Trustee	School District #70 and Advisory Traffic Committee
Bill Collette	Executive Director	Chamber of Commerce
John Mayba		
Dave Gilbert		
Mike Ing	Manager of Planning and Development	Alberni-Clayoquot Regional District
Mike Coady	Staff Sgt.	RCMP
Penny Cote	Electoral Area Director- Area D	Alberni-Clayoquot Regional District
Scott Smith	City Planner	City of Port Alberni
Randy	Street Superintendent	City of Port Alberni

Context

- Growing cycling culture – more involvement
- 2 main advocacy groups similar interests but divided
- Wide roadways
- Character of the city- North and South Port

Specific Areas of Concern

- Johnson Road (corridor) Highway 4 commercial and residential
- Roger and Gertrude is unsafe for pedestrians (high speeds, right turns)
- Gertrude – Spencer Park Bridge is getting pontoons to add 4metre to each side
- Gertrude street bridge – adding independent bridges, widen bridge and sidewalk
- Beaver Creek – narrow and high traffic volumes – telephone poles line the street
- Beaver Creek and Crompton Road
- Crompton road is wider now
- Ministry owns Highway 4 and Johnson Road
- 3rd Avenue make it single lane with bike lanes
- 10th Avenue dip- narrow roadway, industrial traffic
- Marine and Beaver Creek and Highway to Tofino (River Road)
- 10th and Dunbar going north on 10th – cars don't see cyclists or underestimate how fast cyclists are travelling
- 3rd Avenue and Dunbar – Right turn only - Traffic island – positioning of the stop sign
- 3rd and Argyle- Runs into a 4-way stop overnight and Sundays- pedestrians don't know what to do
- Beaver Creek Road
- Highway along Sproat Lake
- Hector Road is a good connector – no hills, nice route to the lake, scenic and not hilly but it is not in great condition (pot holes)
- Ministry of Transportation not adding bike lanes and sidewalks – debris on shoulder/Hwy rumble strips mixed opinion
- Rogers and Stamp
- Beaver and River Road
- Kingsway and 3rd
- Stamp Ave
- Bridges in general
- Hospital to town- lack of shoulder
- Connection between Quay and Maritime- need sidewalk
- Opportunity Areas
 - Johnson Road
 - 3rd Avenue
 - 10th Street
 - River Road

Linkages and Connections

- Arterial vs. collector vs. local
- Show and identify key linkages make it easier to get around and take advantage of the network of trails. Making them more accessible and easy to access from different parts of the City. Make it easy to walk and cycle directly to the trails rather than having to drive to them. Make active transportation part of the entire journey.
- Connections to the west coast

Destinations

- There is a lot of potential
- Places to park bikes
- Connections and linkages between the two points
- Waterfront
- Farmers Market
- Schools
- Aquatic Centre
- People are interested in seeing industry (i.e. Squamish)

Bridges

- Gertude/Compton Rd
 - Upgrades next year (\$250,000)
 - Repave, pedestrian sidewalks on the outside
- 10th Ave (Future)
 - Suspension bridge
- 21st Ave (Future)
 - Stantec completed alignment study
- Gertrude
 - Road
 - Pedestrian footbridge
 - Trestle bridge (steam train)
- Stamp
 - Putting pontoons on outside of bridge
- Kitsecis
- Roger Creek- 10th Ave

End of the Route Facilities

- Bike parking lacking, there is a limited number
- Potential for City/business joint effort for bike parking
- Bike parking in the bylaw – not currently
- Program to sponsor bike racks – competition
- Victoria Quay
- Memorial Bike Racks
- Art welders/Wood workers
- Park and Ride (bikes)
- Washrooms

Trail Network

- Already an extensive network, groundwork is already there
- Log train trail/Alberni Inlet Trail
- Linkages out of the City– River Road
- Spruce Lake
- Show and identify linkages and connections

- Connections between trails and urban areas – easier for pedestrians to access some of the trails are quite steep and harder for cyclists to navigate
- Potential conflict for all users
- Safety concerns – better lighting
- Dyke is great for beginners, it is a comfortable place to cycle
- The trail network is a positive
- Walking trails on east side of the City
- Stakeholders noted that they would cycle the trails more if they could bike there easier – better connections
- Long train trail – better signage
- If people knew how to get there they would use it more
- Sprout Lake – OCP mentions a connecting trail
- Link the regional trails with the City
- International Trails day – ACRD wants to like link their trails better with the City
- Spine Trail

Rogers Creek Crossing

- Pedestrian and cycling bridge
- Some people want to make it a vehicle crossing
- Very steep ravines will make planning and design difficult – might be too steep for cyclists anyway
- 21st Avenue alignment – believe that the OCP shows a map with a road crossing Rogers Creek – OCP has a proposed bypass over Rogers creek – not the 21st Ave crossing though
- Rogers Creek is a bottle neck
- Bridge in front of the mill
- North/South connection
- Currently creates bottlenecks
- Bridge from Tebo to Ian? - Hanging suspension bridge
- Train Tracks Twin Trestle
- A path that takes you down and then back up – very steep, too steep for cyclists
- Pave beside the train tracks, use the walking bridge

Safety Concerns

- Signalized intersections/ bike not able to activate the signal – stuck waiting
- Option for bike push buttons
- Drivers in Port Alberni are not friendly for cyclists
- Drivers yelling at cyclists to use the sidewalk instead of the road
- Sharing the road with logging trucks
- Improve safety Anderson dip and narrowing across the hospital
- A line on the road makes a difference i.e.. Bike lane would go a long way

Pedestrians

- Better delineation of space benefits all users

- Scooter and seniors (age friendly workshop)
 - Linkages
 - Trail maps and signs
 - Maps and priority trails
 - Scooter lanes
 - Better access to malls – currently they are not very accessible
 - Senior population is average but is growing
- Scooters and e-bikes, where do they go? Road or Sidewalk?
- Increasing number of seniors
- Scooters on sidewalks vs. the road
- Very wide streets – there should be room for everyone
- Scooter education workshop
- Walking/peds and safe crossings – education campaign every fall, every year
- Wheelchairs and scooters – wheelchair access – new sidewalks have curb let downs – many don't (old ones) and those that do, they are not in good condition
- A lot of streets without sidewalks or sidewalks on only one side
- Bruce to Mainland
- Arterial – sidewalks are on both sides
- Collectors and locals – sidewalks on at least one side
- Redford/Johnston/etc (Have sidewalks?)
- Walking pedestrian lights – flashing lights - Like them
- Size of the community makes it hard to travel across the City
- Crossing the wide roads- need longer crossing time (for seniors, walking with kids)
- Pacific Rim Mall – think about how people can walk there, what if people decide to walk (it is difficult to get through the parking lot)
- Gaps in the sidewalk
- 5th Avenue sidewalk on only one side
- Walking access to the waterfront
- Dyke has been very useful, creates a healthy lifestyle
- Stamp Ave and River Road only have sidewalks on one side
- Leaving the Quay to get to the Marine Museum
- Access to get around – Scooters
- Map where seniors live
- Banners and flowers make walking more enjoyable

Transit

- The transit system is heavily relied on – bikes and pedestrians are becoming increasingly important
- Ranked the 4th highest in usage for all of British Columbia
- People are using alternative means of transportation already in Port Alberni

OCP & Planning Policies

- Currently working on updating their zoning bylaw
- Land use – increasing density (secondary suites and reducing residential lot sizes)
- Subdivision Bylaw – provide linkages through the subdivisions

- Incorporate the map of the planned bicycle network into the OCP
- Waterfront North Study underway- proposal for promenade along River Rd

Like/Dislike - Cyclists

- Feel safer riding on the road as opposed to the sidewalk
- Blurring the places for cyclists and pedestrians
- Bike lanes would go a long way and make a big difference
- Equal parts engineering and education
- Other cyclists can be worse than drivers – need more education
- Make sure that drivers have cyclists in mind – they are part of the community – not a deterrent
- Think about people who are not as willing
- Lanes – line respect
- Green lanes particularly at the tight spots

Other

- City cycling is still looked down upon, lower income or people that don't have a drivers license
- There are bottle necks throughout the City where there is no alternative for cyclists and pedestrians
- Pinch points – no other way to avoid them - Bridges
- Bridges have limited width of the sidewalk
- Waterfront North Study – Left side will be a promenade – pedestrian/bike walkway
- No truck route yet, proposed
- Maintenance/drops/dips in the road
- Education and mapping
- Argyle and 3rd turns into a flashing light on weekends and evenings
- Age-friendly study is underway and session was held on transportation

Implementation

- Cost effective
- Baby steps
- Staged approach
- Start with low cost measures
 - Mapping
 - Signage – share the road sign along *Stamp Avenue* already make a big difference
 - Painting- including coloured lanes at conflict zones
 - Clearly identifying linkages and connections
- Painted lanes can make a big difference, affordable increase confidence, creates an area that is designed for the cyclists, cars see it as a separate lane, they are not permitted in
- Focus on a few key areas incrementally – key main projects identified by Guy
 - Stamp Avenue

- 3rd
- 10th
- Anderson
- About making affordable, quick changes to get the momentum going
- Speak to funding in the report – being ready and prepared for the grant
- Planning for all ages and abilities
- Need for monitoring (especially during first implementation)
- Education campaign- drivers, cyclists- get ICBC and RCMP involved
- Bike to Work Weed- education, infrastructure unveiling, high profile event
- Grants
 - Provide list of possible grants- ICBC, health, economic development, outdoor recreation



Community Survey and Results

Community Survey

Thank you for your interest in the City of Port Alberni Active Transportation Plan! The Active Transportation Plan will guide the development of the City's pedestrian and cycling networks over the next 25 years and beyond. We would appreciate if you took the time to complete this short survey by **July 15, 2013**.

- Complete the survey online at: www.surveymonkey.com/s/PortAlberniwalkbike
- Drop off or mail completed surveys to:
Guy Cicon
City of Port Alberni
4850 Argyle Street Port Alberni, BC V9Y 1V8

Part 1: Walking

1. Are you a resident or a property owner within the City of Port Alberni?

- Yes
- No
- If yes, please enter your 6 digit postal code: _____

2. What do you like the most about walking in Port Alberni?

3. What do you like least about walking in Port Alberni?

4. How would you describe the level of accessibility when travelling through Port Alberni? Particularly, if you are travelling by scooter, wheelchair, or pushing a stroller. Ex. Number of curb ramps, uneven pavement and obstructions restricting movement.

- Very accessible
- Somewhat accessible
- Not accessible



5. What do you think is most important for improving the walking environment? Please rank these items from 1 through 5, with 1 being the most important to 5 being the least important.

	Most Important				Least Important
More sidewalks	1	2	3	4	5
Pedestrian-controlled intersections	1	2	3	4	5
Trails and pathways	1	2	3	4	5
Benches and places to sit	1	2	3	4	5
Promote safe routes to school	1	2	3	4	5
Other	1	2	3	4	5

Please specify other:

Part 2: Cycling

6. What do you like the most about cycling in Port Alberni?

7. What do you like the least about cycling in Port Alberni?

8. What do you think is the most important for improving the cycling environment? Please rank these items from 1 through 5, with 1 being the most important to 5 being the least important.

	Most Important				Least Important
Bicycle lanes	1	2	3	4	5
Separated bicycle lanes	1	2	3	4	5
Trails and pathways	1	2	3	4	5
More bicycle parking	1	2	3	4	5



Provide cycling education	1	2	3	4	5
Better bicycle-transit integration	1	2	3	4	5
Other	1	2	3	4	5

Please specify other:

Part 3: Tell us about yourself

9. What is the main purpose for most of your walking and cycling trips? (Please check all that apply)

	Walking	Cycling
Commute to work	<input type="checkbox"/>	<input type="checkbox"/>
Go to school	<input type="checkbox"/>	<input type="checkbox"/>
Shopping and errands	<input type="checkbox"/>	<input type="checkbox"/>
Recreation and leisure	<input type="checkbox"/>	<input type="checkbox"/>
Exercise	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>

Please specify other:

10. If you do not currently walk or cycle, what improvements would you like to see in the community that would encourage you to walk or cycle more?

11. How old are you?

- 14 or under
 25 – 34
 45 – 54
 65 or over
 15 – 24
 35 – 44
 55 – 64

12. What is your gender

- Male
 Female



13. Do you have any other comments about walking or cycling in Port Alberni?

Thank you for completing this survey

Survey Results Summary

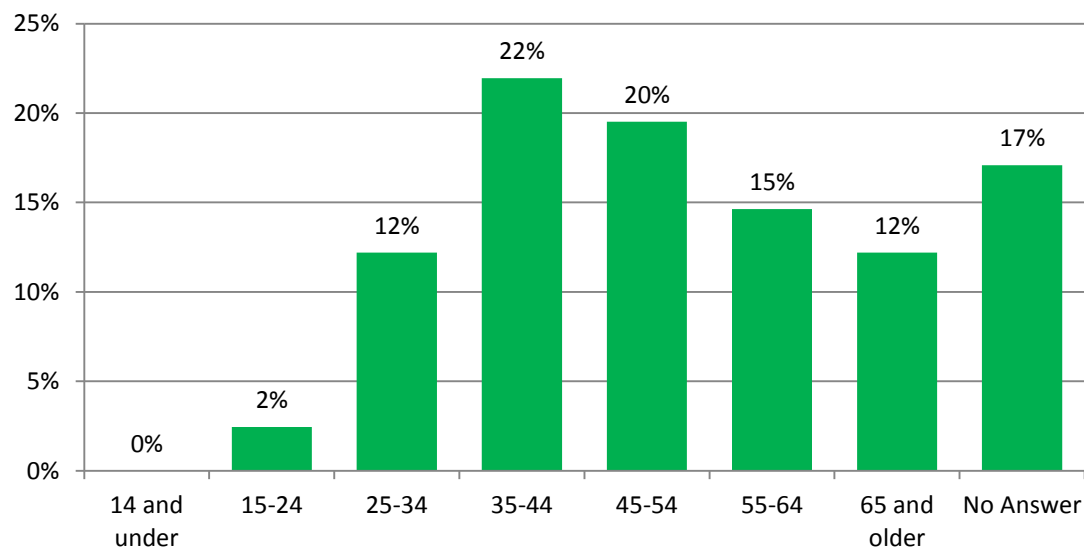
1. Survey Respondent Characteristics

This section summarizes characteristics of the survey respondents. In total, 42 survey responses were received. Out of all the respondents 37% were female, compared to approximately 46% male (the remaining 17% of survey respondents did not indicate gender).

1.1 Age of Respondents

As shown in **Figure 1**, the majority of survey respondents (22%) are between 35-44 years of age. This is followed by residents between the ages of 45-54 (20%). Respondents over the age of 65 years old made up 12% of the respondents. However, respondents 15-24 years of age make up only 2% of the respondents.

Figure 1: Survey Respondents by Age



2. Survey Respondent Issues and Opportunities

At the open house and through the online survey, respondents were asked to indicate which aspects of Port Alberni's cycling and pedestrian network they think should be considered the highest priority in the Active Transportation Plan. This section summarizes the opportunities with the pedestrian and cycling environments respondents.

3.1 Walking

3.1.1 Like the most about walking

Respondents were asked what aspects they liked the most walking in Port Alberni. Some of the overarching themes that emerged throughout the responses are summarized below:

- Good environment for pedestrians
 - Scenery and views of mountains and water
 - Great climate
 - Fresh air

- Low traffic volumes
 - There is not too much traffic
- Pedestrian facilities and network
 - Areas where there are new, wider sidewalks
- Location and proximity to destinations
 - Most destinations are conveniently located
 - Easily accessible
- Trails and off street facilities
 - Access natural areas and green spaces
 - Extensive walkways and trails
 - Off street facilities away from traffic

3.1.2 Like the least about walking

Respondents were asked what aspects they liked the least walking in Port Alberni. Some of the overarching themes that emerged throughout the responses are summarized below:

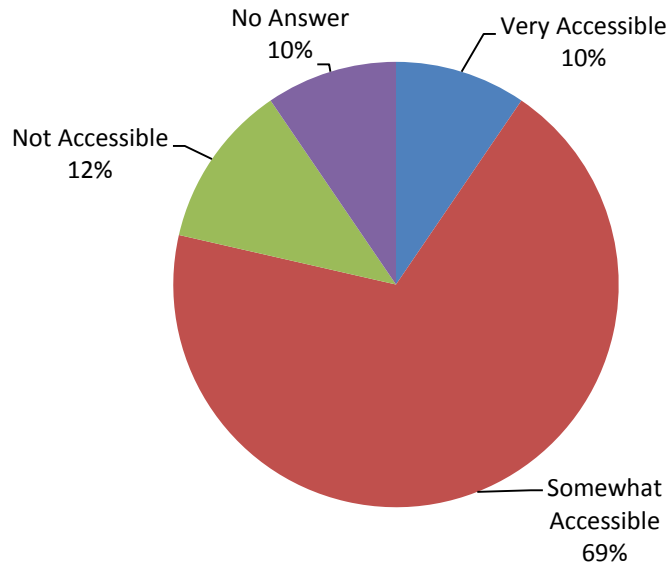
- Other vehicles
 - Dangerous intersections
 - Vehicle drivers not noticing pedestrians
 - Truck routes
- Poor pedestrian facilities
 - Maintenance
 - Lack of sidewalks
 - Uneven surfaces
 - Crosswalks and accessibility
- Connectivity
 - Access to the waterfront
 - Crossing at Rogers Creek
- Safety
 - Personal safety travelling through the City
 - Lighting
- Hills
 - Steep hills make walking in the City difficult

3.1.3 Accessibility

Survey respondents were also asked about the level of accessibility in their City. The question posed to survey respondents was ‘how would you describe the level of accessibility when travelling through Port Alberni? Particularly, if you are travelling by scooter, wheelchair or pushing a stroller. As seen in

Figure 2 results show that the majority (69%) of survey respondents find the neighbourhood *somewhat accessible*, 12% indicated it was *not accessible*, 10% of the respondents said the City was *very accessible* and provided *no answer* respectively.

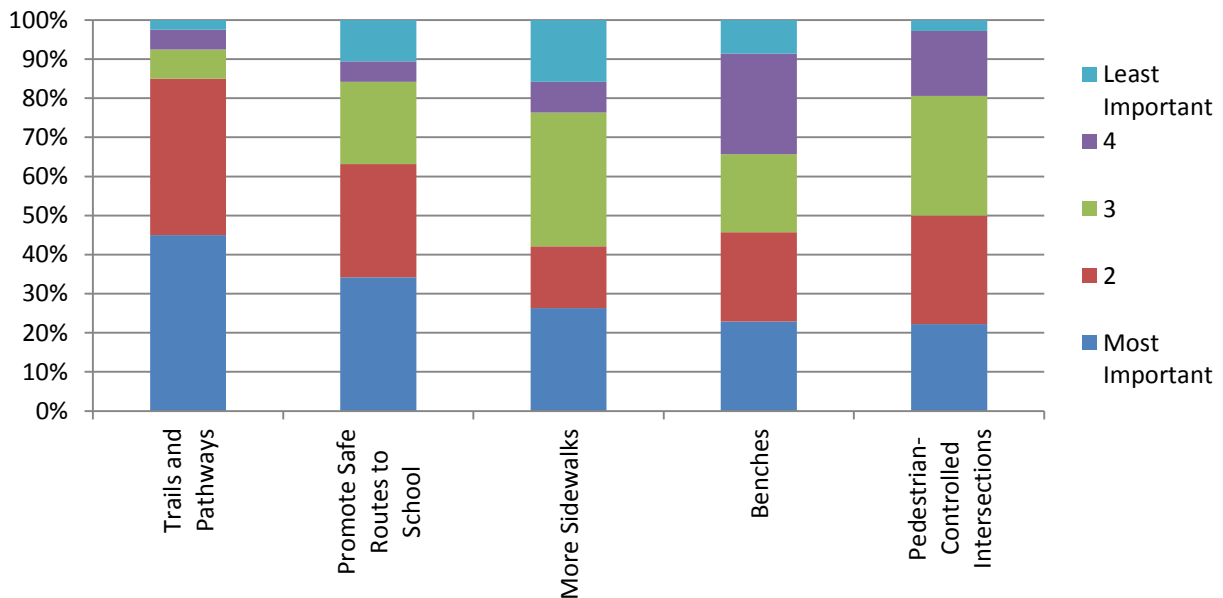
Figure 2: Community Accessibility



3.1.4 Most Important Improvement

Survey respondents were asked what they think is most important for improving the walking environment. Based on survey responses Trails and pathways and promoting safe routes to school were identified as the most important improvements to the walking environment. The least important were the implementation of benches and increasing the number of sidewalks.

Figure 3: Most Important Pedestrian Improvement



3.2 Cycling

3.2.1 Like the most about cycling

- Wide Roads
 - The wide streets make the commute feel safe
- Low Traffic Volumes
- Nice Cycling Environment
 - Good weather
 - Destinations are close
 - Scenery and views
- Off Street Facilities
 - Trails and paths away from traffic

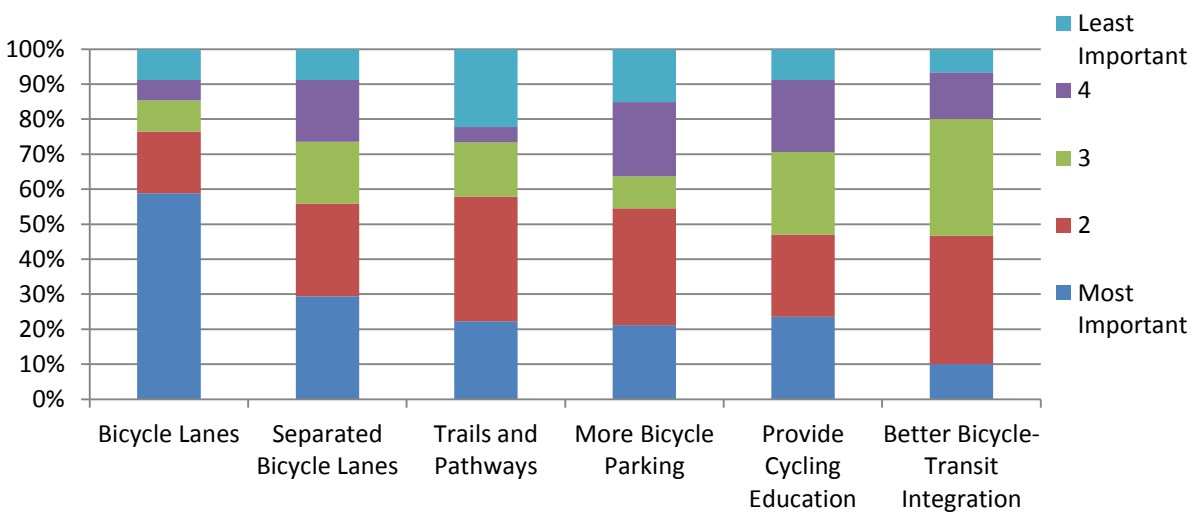
3.2.2 Like the least about cycling

- Traffic and other road users
 - Conflict and education between motorists and cyclists
 - Large trucks/truck routes
- Lack of cycling facilities
 - Bicycle lanes
 - Bicycle parking
- Hills

3.2.3 Most Important Improvement

Survey respondents were asked what is the most important for assisting in improving the cycling environment. Overwhelmingly bicycle lanes were seen as the most important improvement to survey respondents followed by separated bicycle lanes, and trails and pathways. However, all of the survey options were considered quite important by survey respondents.

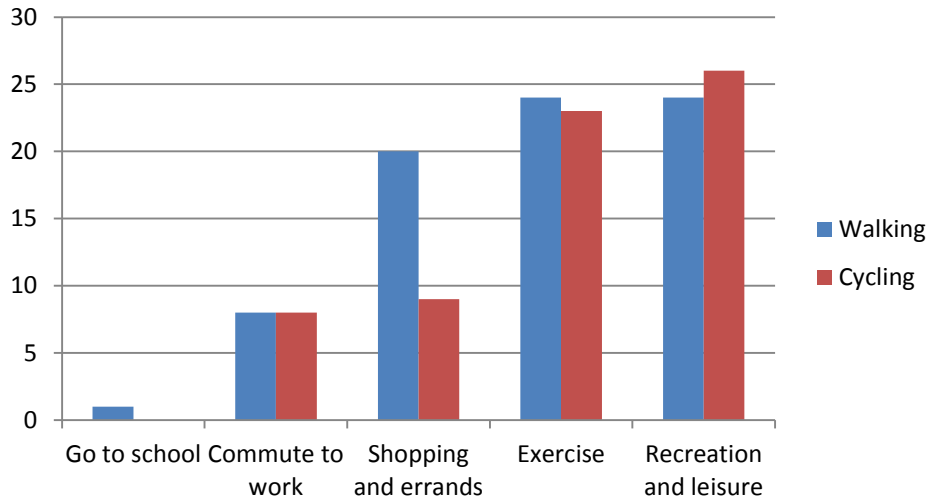
Figure 4: Most Important Cycling Improvement



4.0 Trip Purpose

The survey was used to gather information regarding trip purpose and mode choice. Survey respondents were asked what was the purpose of most their walking and cycling trips. Recreation, leisure, and exercise were the most common cycling and pedestrian trip purposes.

Figure 5: Trip Purpose by Travel Mode



Detailed Survey Results

The below summary is of the responses received from the online survey.

Walking

Survey respondents were asked about the current issues and opportunities within the walking network in Port Alberni. Survey respondents were asked what they liked the least and the most about walking in Port Alberni. Detailed responses are provided below. For the most part, comments are provided verbatim but have been grouped to identify themes.

1.1 Like the most about walking in Port Alberni

1.1.1 Nice Pedestrian Environment

- The sights
- Friendly people, scenery
- I like seeing residential gardens
- interesting neighbourhood
- Fresh air, social aspect of meeting other people out for a walk, seeing the sights
- Fresh air, nice scenery, gentle exercise
- Temperate climate, we get to enjoy the outdoor air and exercise
- Good exercise and fresh air
- I like the mostly friendly people that I see and that where I walk I feel safe
- Green surroundings, beautiful mountains, scenery.
- Proximity to the water and views of the mountain.
- Easy weather for walking year round.

1.1.2 Low Traffic volumes

- Not too much traffic
- You don't have to re-park or park your car
- Wide streets, quieter (relatively) traffic.
- The scenery
- Scenery

1.1.3 Pedestrian Facilities and Network

- Good sidewalks
- The sidewalks are good.
- Areas with wider new sidewalks
- Most of the sidewalks are clean and well maintained.
- Sidewalks are generally generous enough.

1.1.4 Location and Proximity to Destinations

- You can get most anywhere if you're on either side of north /south port
- Most things are close

- Close proximity to sights and services.
- Easy access to all parts of town, sidewalks and lights are pedestrian-friendly
- You can walk pretty much anywhere in the community
- Everything is close.
- Easy access

1.1.5 Trails and Off Street Facilities

- Lovely walkways and trails
- Connection to natural areas
- Greenspaces like the dyke.
- Lots of trails to get you to places without always having to walk on streets. Many of our streets are also lit by streetlamps which I like.
- Many great walking trails, varied terrain, many trees
- The well kept trails and easy access to nature.
- Excellent trails surrounding Port Alberni Township.
- There are some designated walking paths away from traffic.
- Well developed trails

1.1.6 Other

- I don't walk in town very much
- The hills are good exercise
- Limited in walking due to age/disability but get out with little dog at least once a day. Use the quay and the dike for ease with my walker since both are relatively smooth and level. Enjoy getting outside, so many people say "hello" or even stop and chat - especially other dog owners.
- I only walk a few blocks at a time. Due to chronic pain and fatigue, I cannot walk fast enough or long enough to get health benefits of walking. I ride my bike for exercise instead.

1.2 Like the least about walking in Port Alberni

1.2.1 Other Vehicles

- Peoples driving habits
- Harbour Quay vehicle traffic west of the railway tracks should be limited Thursday to Sunday evenings during the summer to enable pedestrians to enjoy the shops, restaurants and music.
- Stamp and Roger is dangerous as nobody stops turning right onto Stamp from Roger.
- Industrial traffic on all our roads
- Misinformed traffic
- In town, it is very dangerous. I have nearly been hit by vehicles many times.

1.2.2 Poor Pedestrian Facilities

- Need broken pavement on roadways and side walks

- It is near impossible to safely walk at Pacific Rim Center - a walk from WalMart to the Post Office is very difficult.
- Lack of sidewalks in certain neighbourhoods
- Too few seats for resting (I am 69), some traffic lights do not leave much time for pedestrian crossing
- Un-kept neighbourhoods
- The crappy sidewalks
- Rough ground areas, crossing streets
- Some sidewalks for the handicapped are in dire need of repair The doctor's offices and Clinic Pharmacy on 9yj Ave is dangerous! try walking with a walker in all the ruts and uneven sidewalk. Totally needs a complete redo before someone falls and breaks something they are recovering from. A lawsuit waiting to happen for sure. Pretty poor being by a doctor's office, pharmacy and a physiotherapist office.
- Crosswalks on busy streets (Johnston) that motorists don't stop for or don't wait for the pedestrians to clear the crosswalk.
- Worst thing is the terrible condition of many of our sidewalks and walkways. I am capable of walking right now but I fear for a future when I have to use our sidewalks with mobility aids etc. and have to negotiate all the uneven narrow cracked walkways and paths that are very difficult for people with disabilities.
- Dangerous positioning of crosswalks, lack of thru-ways between sides of town.
- Wide streets/traffic

1.2.3 Connectivity

- You need to go all away Round via highway or Johnson to get to south/north port
- No sidewalks next to river
- spread out nature of the city which has 3 or 4 'downtowns', lack of access to our waterfront
- No access to the beach or waterfront trails - all waterfront access is heavily built up
- Lack of waterfront walkways
- The town is to spread out to make walking a choice in many cases. Increase the density of the City to make walking easier.
- The lack of areas to walk around the various waterfronts.

1.2.4 Safety

- The downtown has too many sketchy looking people roaming around. It does not appear safe.
- The downtown neighborhoods are dirty, and there are too many sketchy people
- At night not many lights
- The short cut below the tracks by Roger creek has the "bums" there and it is scary.
- Some bad neighbourhoods, some areas are not suitable for walking
- Insidious characters

1.2.5 Hills

- Hills

- The hills
- Too many hills in uptown area makes it too difficult to walk very much.
- Well the hills are steep but you can't change the topography
- Lots of hills

1.2.6 Other

- There is nothing to walk to its just boring and there is nothing new to see
- All the rain in the winter.
- Nasty little dogs off-leash and lack of public washrooms
- Smoke from wood stoves
- Would prefer to walk/run on asphalt, not concrete. Easier on the body. Would prefer pathways through areas instead of having to walk on the sidewalk right beside the streets. Too much exhaust when you're trying to walk/run.
- Nothing (x2)
- Rain
- Big logging trucks
- Not much

2.0 Cycling

Survey participants were asked about the current issues and opportunities within the cycling network in Port Alberni. Survey respondents were asked what they liked the least and the most about cycling in Port Alberni. Detailed responses are provided below. For the most part, comments are provided verbatim but have been grouped to identify themes.

2.1 Like the most about cycling in Port Alberni

2.1.1 Wide Roads

- Wide roads, lots of routes to choose from
- wide roads
- The wide streets and most of the drivers are great!....and I commute by bike every work day, no matter what the weather for the last 9 years.
- Wide streets that feel reasonably safe.
- Wide streets
- Wide streets
- Roads are mostly wide enough to ride safely away from cars.
- We have wide streets
- The wide roads

2.1.2 Low Traffic Volumes

- Lack of traffic
- low volume of traffic

2.1.3 Nice Cycling Environment

- You can take back roads safely

- The variety of terrain in a relatively small area.
- Great views.
- Good exercise and good way to commute to work
- Weather makes cycling possible all year long, interesting hills and curved streets, connection to natural areas and trails
- Compact city, easy to get around, nice scenery
- Streets are generally quiet. wide streets, lots to see
- Fresh air and exercise
- Fantastic views and encounters with wild life in certain parts of the city
- Everything is close.

2.1.4 Off Street Facilities

- flat roads/trails
- There are a few areas where cyclists can be isolated from traffic.

2.1.5 None

- N/A
- N/a
- do not cycle
- Not much at all...there isn't really anywhere I feel safe to cycle but I guess the flat areas in Northport are the most inviting.
- I don't cycle in Port Alberni.
- I don't do it

2.1.6 Other

- Easy, environmentally-friendly means of commuting, fresh air and exercise, convenience of everything for running errands by bike
- The weather

2.2 Like least about cycling in Port Alberni

2.2.1 Traffic and Other Road Users

- Traffic
- Inattentive Drivers
- Traffic is dangerous. Cars do not respect cyclists. Especially the large truck traffic. Maersk trucks and logging trucks particularly.
- Sometimes the traffic is aggressive and won't share the road
- Attitudes of many drivers which feel cyclists should get out of their way
- Traffic is sometimes scary. Not paying attention.
- Bad drivers not paying attention or following the rules of the road, such as signaling before turning, make biking on the road not very safe. I have been nearly hit several times by bad drivers, so now I ride on sidewalks where ever the roads are not safe, such as Stamp Avenue.
- Motorists do not seem to understand or care about the right of cyclists to share a lane.

- Inconsiderate drivers squeezing you off the road, or yelling at you to get on the sidewalk
- Lack of awareness from drivers, lack of roads that run across town consistently.
- The crazy drivers who don't pay attention to cyclists/pedestrians.
- Traffic
- Logging trucks

2.2.2 Road Maintenance

- Pot holes

2.2.3 Lack of Cycling Facilities

- No bike lanes on Redford Street/ Johnston/ River Road to Sproat Lake
- The 4 dangerous spots in town--the bridge by the Barkley, the dip, Bedford connector (although you did a good job fixing it) and the turn at Roger and Stamp. You have also done a good job with the "share the road" signs but I feel that these areas could use them. Also some commercial drivers are pretty much the only drivers I have ever had a problem with in my 9 years of daily commuting. Very seldomly have I ever had a problem with the general public.
- lack of bike lanes on even our widest streets and no way to bike along the waterfront
- very few places to lock up a bike in key spots like uptown, athletic hall, bob daily stadium, some dangerous intersections, some key corridors have narrow lanes, bridges are narrow
- Lack of generally a long waterfront pathway to enjoy the sights. We would even transport bikes with a car carrier to a spot where we could get a nice 1/2 hour ride done.
- No safe, dedicated bike paths or lanes. No good bike paths along Alberni Inlet, harbour or River Road. Vancouver's sea wall is a world class biking and roller blading route that attracts tourists specifically for that purpose. Industry has hogged all the best water front land in Port Alberni, making the beautiful views off limits to citizens. We need some way to reclaim access to the entire water front for walkers, bikers, roller bladers, etc.
- Lack of bike racks throughout the city; many of the current bike racks are difficult to lock a bike to.
- Riding on streets and not feeling safe. Although we have wide streets a simple painted bike lane would increase my feeling of safety and security and would probably assist drivers with moving by bicycles and feeling safe while doing so. This town is also very spread out making distances sometimes challenging. Many people also see no value in investing in bike infrastructure but have no problem with the City spending money on public transportation. I see the two as being closely linked and think biking would be utilized more if people felt safe. Please invest a small amount of money to paint some bike lane lines.
- No bike paths. No bike lanes.
- One of the main roads across town has no provision for cycling (Stamp Ave) and you are forced to ride on the sidewalk for safety.
- dangerous, narrow roads when cycling in traffic, rules not enforced (i.e.: wearing helmets, cycling on the right side of the road, not cycling on sidewalks)
- There are some intersections where cycling access is problematic. There are times when it would be great to have "level" access between upper North and South Port.

- No bike routes.
- Some roads (Stamp Ave) have no bike paths

2.2.4 Hills

- I no longer cycle due to poor balance and the hilly terrain.
- Hills (x2)
- The hills are nasty!

2.2.5 Other Cyclists

- Not all bike riders obey traffic laws and/or ride irresponsibly
- Sometimes cyclists aren't paying attention. Both cyclists and motorists need education and awareness.

2.2.6 Other

- Do not cycle
- N/a
- Nothing

3.0 Walking and Cycling encouragement

Survey participants were asked about what could be done in Port Alberni to encourage and increase frequency of walking and cycling activity. Detailed responses are provided below. For the most part, comments are provided verbatim but have been grouped to identify themes.

3.0.1 More Facilities

- in the rural areas designated walk/cycle paths beside the main roads In the city the roads are wide enough and the traffic light enough that dedicated bike lanes are unnecessary, but maintenance of road ways and sidewalks is lacking, pot holes and cracked pavement can make both unpleasant, and icy sidewalks in winter will keep the less able bodied inside.
- More bike lanes and police enforcement of bike lanes to protect cyclists.
- Maybe with signs reminding drivers that cyclists have a right to be on the road too or at best, widen these areas.
- Bike lanes on all of our wide streets and a plan to address problem areas in the future
- Only reason I do not currently bike to work is there is no secure bike storage or facilities for changing/showering within the building. City could work with businesses/organizations to promote healthy commuting options.
- Bike lanes

3.0.2 Network Connectivity

- Link to south and north port

3.0.3 Accessibility

- Easier access for walkers and wheelchairs

3.0.5 Other

- I do so depending on physical capabilities
- It is fine the way it is
- NA

4.0 Additional Comments - Walking and cycling

Respondents were asked to provide any additional comments regarding walking and cycling in Port Alberni. Detailed responses are provided below. For the most part, comments are provided verbatim but have been grouped to identify themes.

4.0.1 Education

- I would like to see more driver education about people walking and cycling in town. Drivers are not always as aware as they should be.
- I think education for motorists is important about sharing the road with cyclists. Also need to educate pedestrians that wearing all black at night in the rain makes them invisible.
- Vehicles don't consider the safety of cyclists or pedestrians in this town. This needs to be dealt with asap via bike lanes & education before more deaths occur.

4.0.2 Enforcement

- Traffic laws need to be enforced... what happened to mandatory helmets?

4.0.3 Facilities

- Thanks for the survey...Bike lanes on Beaver Creek Road / River Road / Etc. would be a good idea. Publicizing the bike lanes could draw more people Uptown.
- This is a great city to cycle commute in as it has ridiculously wide streets, but there are some critical areas that I think stop people from doing it, although, it seems that more and more people are put there biking and walking and it is great to see!
- Please just paint some lines for bike lanes - I believe strongly it will assist with making cycling safer in this town and promote increased use by all ages.
- Make cycling access and safety priorities not just for residents but for visitors. If there was a safe bike path all along River Road that made connecting to other parts of the water front safe and easy there would be far more residents walking, strolling, biking, and roller blading in the city. It would also be a great tourist draw, encouraging visitors to spend more time in town by going on bike tours.
- Would like to see more places to park a bicycle securely and more places to sit down.
- The funneling of all pedestrian traffic through downtown Port Alberni seems to be a shame when there is beautiful waterways that could be strolled by if some sort of board walk could be developed that stretches from Harbour Quay to Victoria Quay.
- cycling lanes would be greatly appreciated for the safety of all cyclists, pedestrians and drivers

4.0.4 Support Programs

- it should be encouraged to support a healthy and active community, Port Alberni should catch up with what other Vancouver Island communities have done in relation to cycling
- Miss being able to do it more often. Glad to see encouragement.

4.0.5 Accessibility

- Handicapped accessible

4.0.6 Other

- Improvement of walking/cycling environments in the city should not be considered as a stand-alone problem; for example, spending money to create bike lanes won't make the city itself more accessible, because the most heavily trafficked and important areas of town are inherently dangerous for biking (ie. on steep hills, located along highways). Any effort put towards trying to improve the city's walking/cycling environment needs to be considered as part of a larger plan that includes improving recreation and tourism opportunities.
- It is easy to get around
- Cycling lanes are a waste of money, we have some of the widest roads around and maybe 20 commuters

Farmer's Market

The City and consultants hosted a booth at the Farmers Market at Harbour Quay on July 20, 2013. The booth was a successful public consultation event as over 60 people viewed the boards, asked questions and gave feedback on walking and cycling in Port Alberni.

The booth was made up of five display boards. These boards covered the topics of:

- Project overview;
- Profile of Port Alberni;
- Issues and opportunities for walking and cycling;
- Walking- sidewalk map and additional facilities; and
- Cycling- proposed network map and additional facilities.

Members of the public were encouraged to respond to the information by posting notes on the boards with their feedback on strategies, routes, intersections and facilities. After the event the boards were placed in City Hall to allow more people to view them and respond.

Overall, the feedback received at the booth was very positive. Many people noted how they appreciated that this study was being completed and that it was important step for the town. A number of questions were asked about implementation, including some skepticism that the study would produce results.

A summary of the issues raised include:

Strategies

Walking	Walking & Cycling	Cycling
<ul style="list-style-type: none"> • Washrooms • Walking tours <ul style="list-style-type: none"> ○ Map ○ History of Port Alberni • Skateboards • Scooters 	<ul style="list-style-type: none"> • Education of all road users • Printable, easy to read cycling and walking routes and trails • More bus service (x2) • Circle Routes 	<ul style="list-style-type: none"> • Bike education • Links to trails • Enjoy riding on the Dyke • Map of cycling routes

Walking- Routes and Facilities

- Access to trails
- Maintenance
- Accessibility for scooters
- Covered bus stops
- Education about correct use of road
- Speed too fast
- Benches on trails
- There needs to be a crosswalk near the Attic (next intersection from Buy-Low)
- Pacific Rim Shop – Centre Sidewalks – make it safe for pedestrians

- Bridge across Roger Creek to fairgrounds
- Scooter/bike lane
- Not an easy walk along the waterfront from Beaver Creek towards downtown Port Alberni
- A way to walk from Victoria Quay to Argyle Street
- Access to Papermill Dam Park
- River Road needs better facilities for pedestrians (promenade)
- Connect River Road and Stamp Avenue with path
- Walkway/sidewalk on both sides of Stamp Avenue
- Garbage Cans
- Pedestrian only around the Quay make people park further up Argyle
- Doggy bags on trails and walkways
- Signage and maps especially to trails

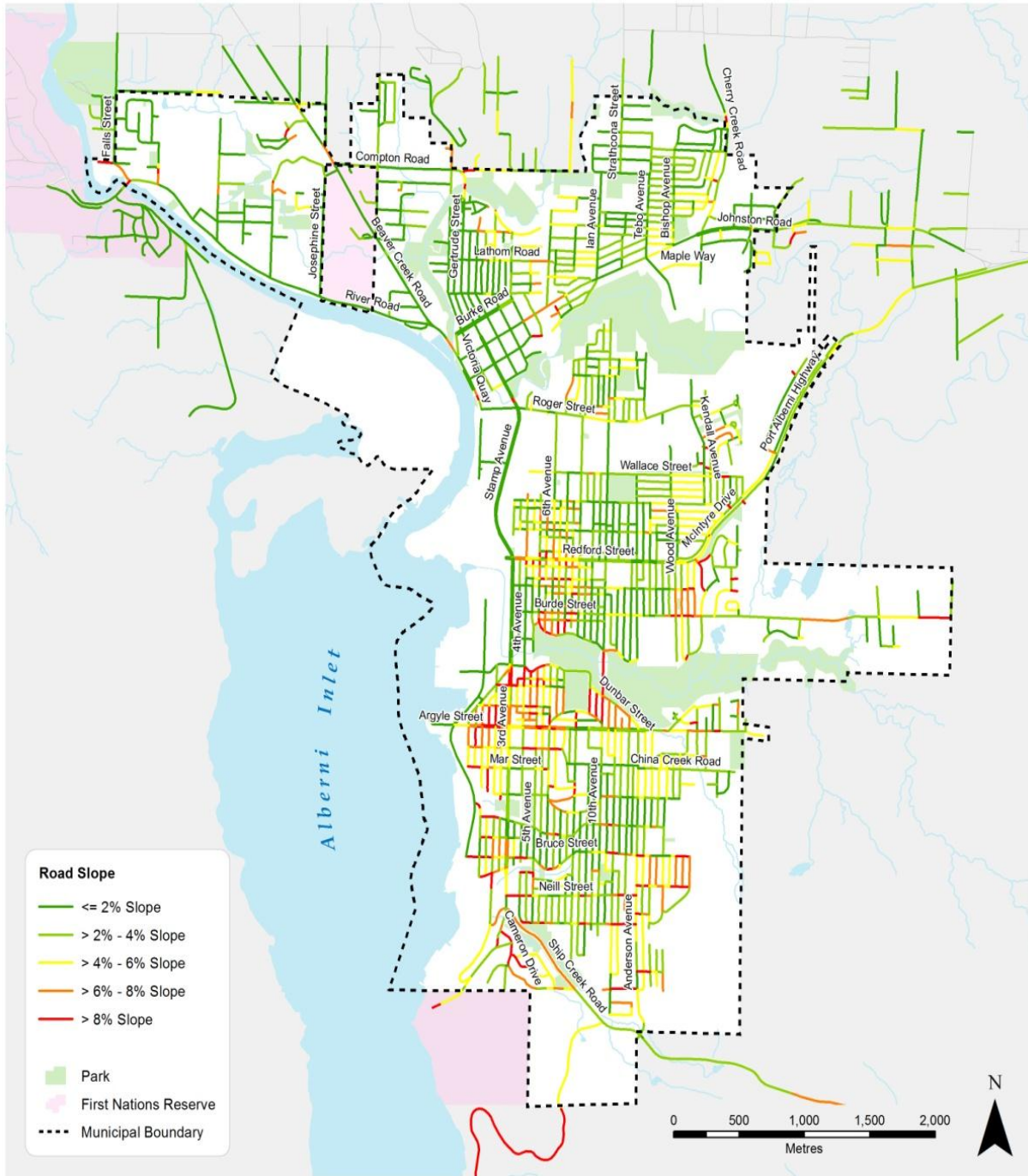
Cycling- Proposed Network and Facilities

- Access to Spout Lake – similar to Ucluelet
- Beaver Creek Road – Needs a bike lane (x2)
- Trucks on 3rd Avenue – noise, pollution and speed
- River Road bike path – tourist draw
- Washrooms at Bob Daly Stadium (x2)
- Enhanced pavement markings
- Bike racks (x4)
- 3rd Avenue parking – large cars parking far out into the road, forcing cyclists too far out into the street
- Stamp and Redford is dangerous
- Difficult to get people to go uphill to 6th Street – regarding our 6th Street crossing – more of a preference for a connection on Stamp Avenue
- Stamp Avenue – the flat connection, important but a challenge
- Dangerous: Stamp Avenue – 10th Avenue gully so I ride on sidewalks
- Industrial Traffic (3rd Avenue)
- Port Alberni Highway shoulder is narrow and feels unsafe
- 10th and Dunbar intersection – paint or caution signs
- Hills!
- Bike share
- Harbour Quay
 - Permanent special farm theme
 - Bike valet for farmers market
- Kevin's bicycle rack is great!
- Cyclists need to use a bell when passing pedestrians
- Signs on road to show where cyclists should be

Appendix B - Topography

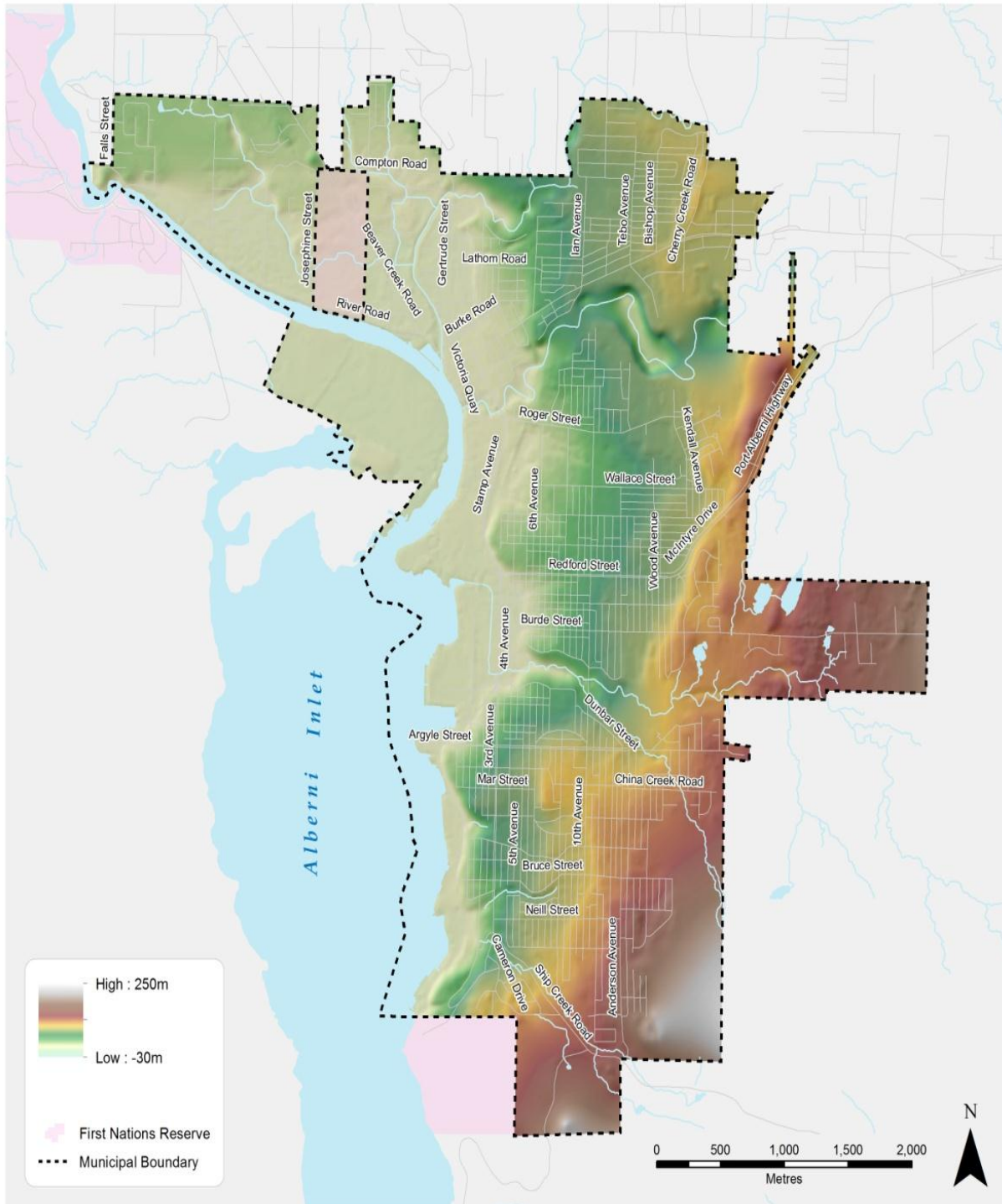
Topography can have a significant impact on the pedestrian and cycling experience and has been found to impact cycling and walking frequency particularly when discussing travel for transportation purposes. The slope of a street can have a dramatic affect on the visual appearance of the street and the neighbourhood as a whole. Streets with small or no hills are considered, by most, to be easier to walk and cycle than steeper hills. Gentle hills and slight changes in topography can create pleasant views and a visually interesting streetscape. However, hills which are too steep that make cycling and walking difficult or uncomfortable for major population groups would be considered too steep and create a difficult active transportation environment. The topography of Port Alberni, as represented in **Figures 1 and 2**, is quite steep and can have a significant impact on both walking and cycling. In a number of locations is greater than 8% which can make walking and cycling difficult, or at least act as an added barrier or deterrent to walking. Some of the steepest areas in the City include the Southport Commercial Area and the 10th Avenue crossing of Dry Creek.

Figure B1
Percent of Slope by Street Segment



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Figure B2
Topographic Elevations



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Appendix C- Greenhouse Gas Emissions

One of the key reasons to promote cycling and walking is because neither mode generates greenhouse gas (GHG) emissions. This is important because, similar to most communities in British Columbia and elsewhere, transportation is responsible for over half (58%) of the City's GHG emissions, as shown in **Figure 1**. As shown in **Figure 2**, this is lower than many other communities throughout central and south Island.

Figure C1
GHG Emissions by Sector (2010)

Source: 2013 Community Energy and Emissions Inventory

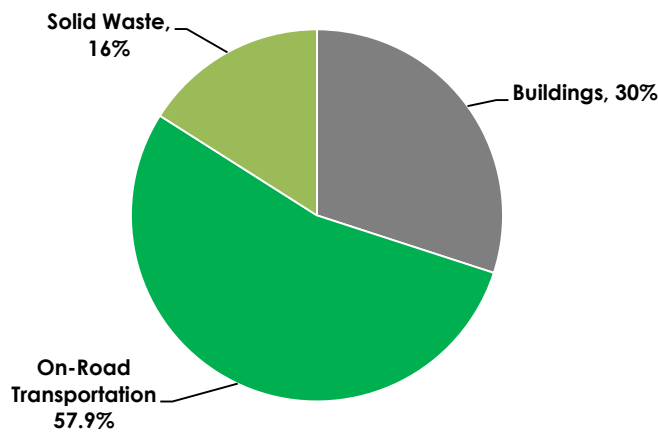
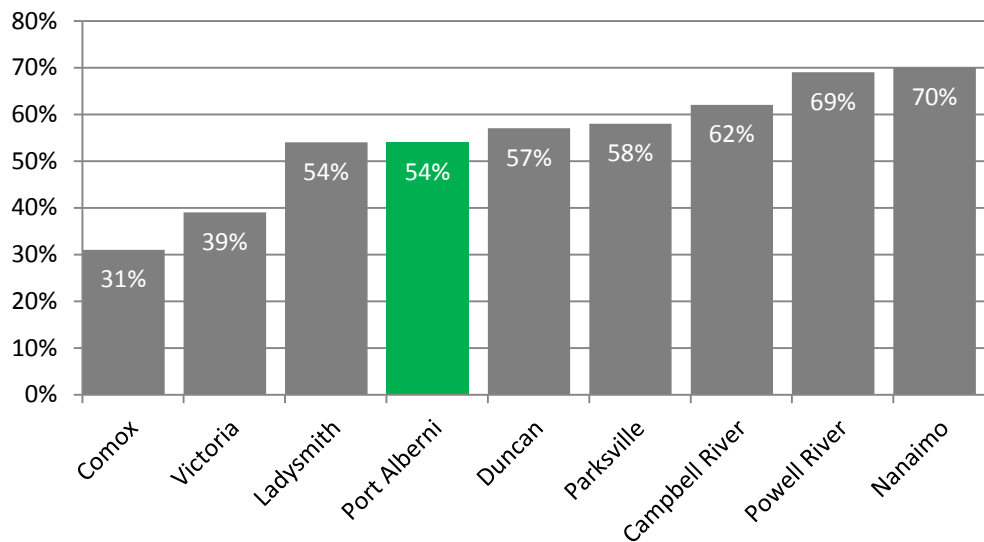


Figure C2
Proportion of On-Road Transportation GHG Emissions in Vancouver Island Communities (2010)

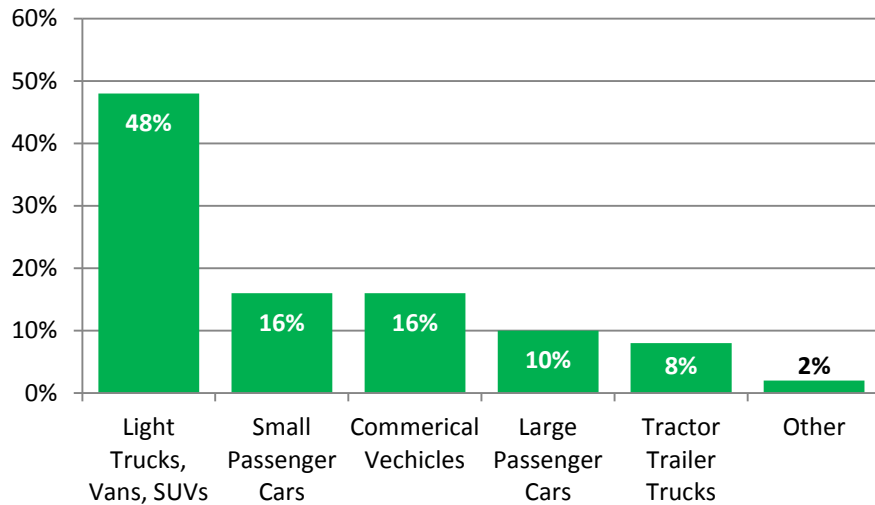
Source: 2013 Community Energy and Emissions Inventory



In addition, nearly three-quarters (74%) of transportation-related GHG emissions are emitted from passenger cars, light trucks, vans, and SUVs, as shown in **Figure 3**. As such, the Active Transportation Plan presents an important opportunity for the City of Port Alberni to encourage more people to walk and cycle as a means to reducing community-wide emissions.

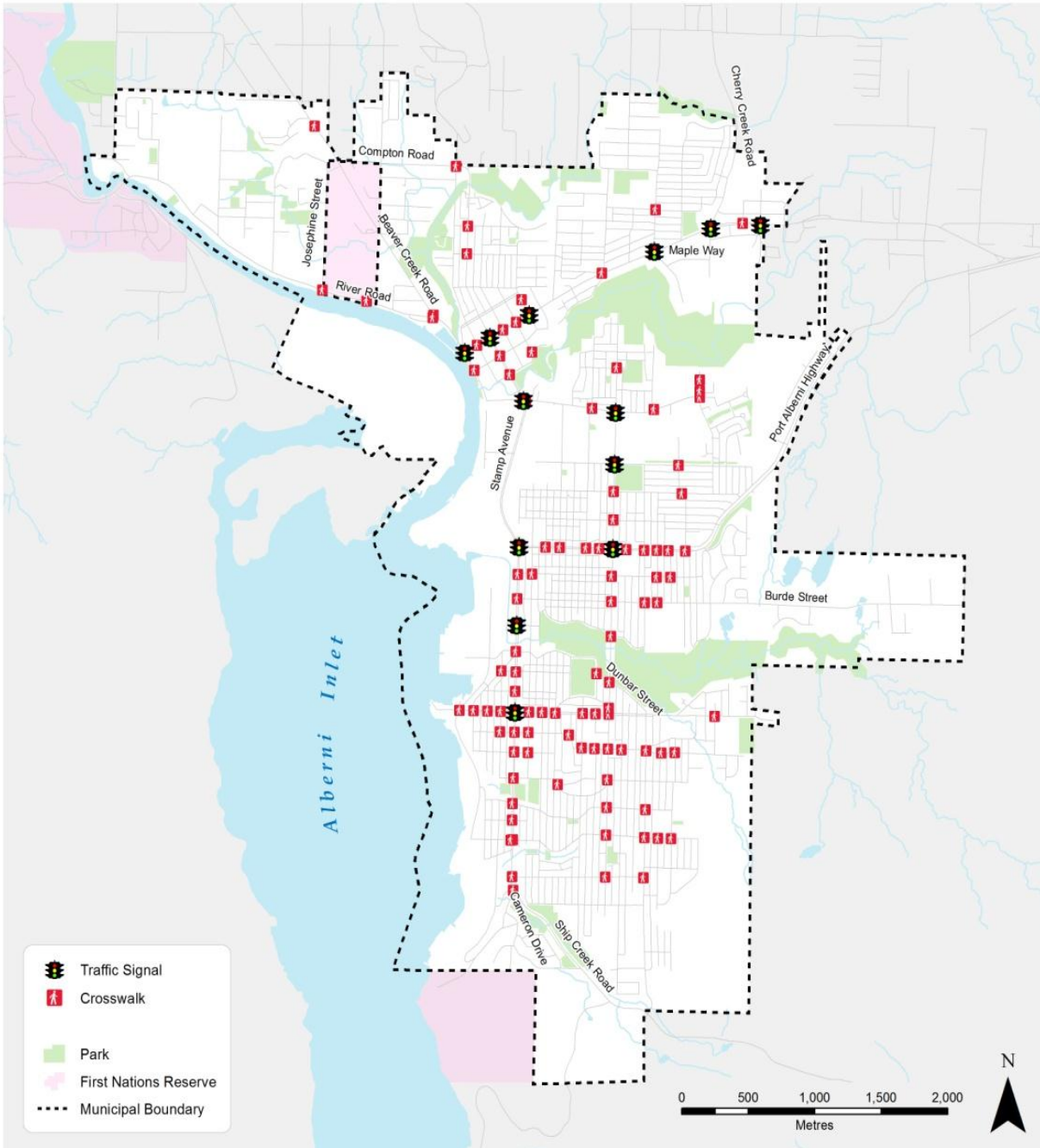
Figure C3
Transportation-Related GHG Emissions in Port Alberni (2010)

Source: 2012 Community Energy and Emissions Inventory



Appendix D- Pedestrian Crossings

Figure D1
Existing Pedestrian Infrastructure



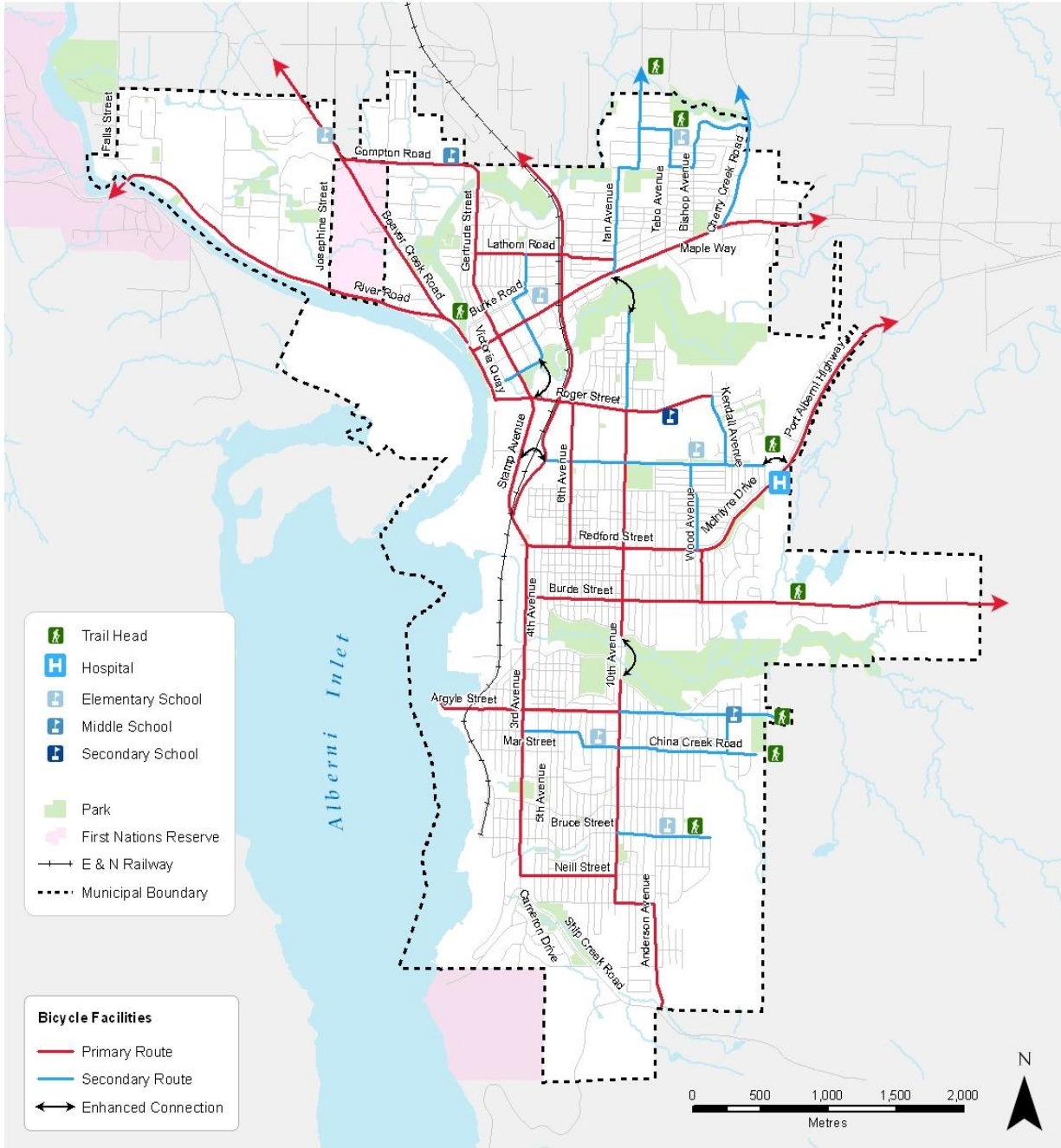
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Figure D2
City of Port Alberni Pedestrian Crossing Features

Intersection Location	Pedestrian Crossing Features			
	Pedestrian Push Button	Pedestrian Countdown Timers	Audible Pedestrian Signals	Any Other Features
1. Argyle St & 3 rd Ave	All directions	N/A	All crosswalks	Curb Extensions
2. Napier St & 3 rd Ave	All directions	N/A	N/A	Curb Extension
3. Redford St & Stamp Ave	All directions	N/A	All directions	N/A
4. 10th Avenue and Redford Street	All directions	Across Redford	Across Redford	N/A
5. 10th Avenue and Wallace Street	All directions	N/A	All directions	N/A
6. 10th Avenue and Roger Street	All directions	N/A	All directions	N/A
7. Stamp Avenue and Roger Street	2 way crossing only	N/A	All directions	N/A
8. Alberni Highway & River Road	All directions	N/A	N/A	N/A
9. Alberni Highway & Gertrude St	All directions	All directions	N/A	N/A
10. Alberni Highway & Helen St	Only across Alberni Hwy	Only across Alberni Hwy	N/A	N/A
11. Alberni Highway & Tebo Avenue	3 way crossing only	N/A	N/A	N/A
12. Alberni Highway & Cherry Creek Road	All directions	N/A	N/A	N/A
13. Alberni Highway & Broughton Street	All directions	N/A	N/A	N/A

Appendix E- On-Street Bicycle Network

Figure E1
Proposed On-Street Bicycle Network (Primary and Secondary Routes)



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Appendix F- Detailed Phasing of Infrastructure Improvements



Figure F1
Detailed Bicycle Improvements

Roadway	From	To	Facility Type	Improvement Type	Distance (km)	Priority
River Rd	Falls St	Burke Rd	Primary	Bicycle Lane (widening req)	2.97	Long-Term
Beaver Ck	River Rd	Pierce Rd	Primary	Bicycle Lane	1.86	Long-Term
Compton Rd	Beaver Ck Rd	Gertrude St	Primary	Bicycle Lane	1.02	Medium-Term
Gertrude St	Roger St	Compton Rd	Primary	Bicycle Lane	1.72	Medium-Term
Johnston Rd	Victoria Quay	John St	Primary	Bicycle Lane	2.60	Short-Term
Lathom Rd	Gertrude St	Ian Ave	Primary	Bicycle Lane	1.05	Medium-Term
Adelaide St	Pemberton Rd	Johnston Rd	Primary	Bicycle Lane	0.25	Long-Term
Victoria Quay	Roger St	Burke Rd	Primary	Bicycle Lane (widening req)	0.55	Long-Term
Roger St	Victoria Quay	Kendall Ave	Primary	Bicycle Lane	1.63	Short-Term
Stamp Ave (west side)	R.R. X-ING	Roger St	Primary	Bicycle Lane (widening req)	1.09	Long-Term
Redford St	(W) E.O.P.	San Mateo Dr	Primary	Bicycle Lane	1.47	Medium-Term
Port Alberni Hwy	San Mateo Dr	Easterly	Primary	Bicycle Lane	1.90	Medium-Term
3rd Ave	Cameron St	Redford St	Primary	Bicycle Lane	3.08	Short-Term
Neill St	3rd Ave	10th Ave	Primary	Bicycle Lane	0.71	Medium-Term
Scott St	10th Ave	Anderson Ave	Primary	Bicycle Lane	0.23	Long-Term
Anderson Ave	Ship Creek Rd	Scott St (E)	Primary	Bicycle Lane	0.86	Long-Term
E&N Rail Trail	Stamp Ave	City Boarder	Primary	Multi- Use Path	2.75	Long-Term
10th Ave	Roger St	Northrly	Secondary	Local Bikeway	0.70	Medium-Term
10th Ave	Scott St	Roger St	Primary	Bicycle Lane	3.50	Short-Term
Bruce St	10th Ave	17th Ave	Secondary	Local Bikeway	0.69	Medium-Term
Angus St	3rd Ave	7th Ave	Secondary	Local Bikeway	0.42	Long-Term
7th Ave	China Creek Rd	Angus St	Secondary	Local Bikeway	0.10	Long-Term
Argyle St	(W) E.O.P.	10th Ave	Primary	Bicycle Lane	1.28	Short-Term
Argyle St	11th Ave	Easterly	Secondary	Local Bikeway	1.44	Medium-Term
China Creek Rd	7th Ave	(E) E.O.P.	Secondary	Local Bikeway	1.29	Long-Term
18th Ave	China Creek Rd	Argyle St	Secondary	Local Bikeway	0.27	Long-Term
Burde St	3rd Ave	21st Ave	Secondary	Local Bikeway	1.78	Long-Term
17th Ave	Burde St	Redford St	Secondary	Local Bikeway	0.38	Long-Term
Wood Ave	Redford St	Maitland St	Secondary	Local Bikeway	0.41	Long-Term
6th Ave	Redford St	Roger St	Secondary	Local Bikeway	1.02	Medium-Term
Kendall Ave	Maitland St	Huff Dr	Secondary	Local Bikeway	0.54	Long-Term
Wallace St	(W) E.O.P.	21st Ave	Secondary	Local Bikeway	1.64	Long-Term
Ian Ave	Johnston Rd	Compton Rd	Secondary	Local Bikeway	0.76	Long-Term



Roadway	From	To	Facility Type	Improvement Type	Distance (km)	Priority
Compton Rd	Ian Ave	Strathcona St	Secondary	Local Bikeway	0.15	Long-Term
Strathcona St	Compton Rd	Shaughnessy St	Secondary	Local Bikeway	0.28	Long-Term
Shaughnessy St	Strathcona St	Tebo Ave	Secondary	Local Bikeway	0.24	Long-Term
Tebo Ave	Cedar St	Shaughnessy St	Secondary	Local Bikeway	0.18	Long-Term
Morgan Cres (N)	Tebo Ave	Bishop Ave	Secondary	Local Bikeway	0.17	Long-Term
Bishop Ave	Morgan Cr (N)	Cherry Cr Rd	Secondary	Local Bikeway	0.59	Long-Term
Cherry Creek Rd	Johnston Rd	Bishop Cr	Secondary	Local Bikeway	0.77	Medium-Term
Southgate Rd	Victoria Quay	Merrifield St	Secondary	Local Bikeway	0.95	Medium-Term
Helen St	Burke Rd	Lathom Rd	Secondary	Local Bikeway	0.27	Medium-Term
Burke Rd	Helen St	Adelaide St	Secondary	Local Bikeway	0.12	Medium-Term
Adelaide St	Pemberton Rd	Arrowsmith Rd	Secondary	Local Bikeway	0.52	Medium-Term
Pemberton Rd	Adelaide St	Cul-de-sac	Secondary	Local Bikeway	0.15	Medium-Term
Total					46.33	



Figure F2
Detailed Sidewalk Improvements

Roadway	From	To	1 or 2 Sides Needed	Distance (m)	Priority
River Rd	Falls St	Burke Rd	1	2968	Long-Term
Beaver Creek Rd	River Rd	Heaslip Rd	1	135	Short-Term
Beaver Creek Rd	Heaslip Rd	Pierce Rd	2	3456	Short-Term
Johnston Rd	Leslie Ave	Tebo Ave	1	836	Medium-Term
Victoria Quay	Roger St	Burke Rd	1	547	Medium-Term
Roger St	Victoria Quay	Stamp Ave	1	276	Medium-Term
Roger St	Anderson Ave	Kendall Ave	1	441	Medium-Term
Stamp Ave (east & west side)	Redford St	R.R.X-ING	1	1094	Long-Term
Redford St	15th Ave	San Mateo Dr	1	263	Medium-Term
Port Alberni Hwy	San Mateo Dr	Easterly	1	1904	Medium-Term
3rd Ave	Ship Creek Rd	South St	1	480	Medium-Term
Anderson Ave	Ship Creek Rd	Comox St	2	918	Short-Term
Anderson Ave	Comox St	Bruce St	1	679	Short-Term
Ship Creek Rd	3rd Ave	Anderson Ave	2	2834	Long-Term
Cherry Creek Road	Michigan Rd	Bishop Cr	1	521	Long-Term
Compton Rd	Beaver Creek Rd	Gertrude St	2	2038	Medium-Term
Lathom Rd	Gertrude St	Ian Ave	1	1045	Long-Term
Argyle St	Anderson Ave	17th Ave	1	383	Medium-Term
Argyle St	17th Ave	Easterly	2	1214	Medium-Term
McIntyre Dr	Wood Ave	Morton Ave	2	630	Medium-Term
3rd Ave	Cameron Ave	Ship Creek Rd	1	118	Long-Term
Cameron Dr	3rd Ave	Mallory Dr	1	45	Long-Term
Cameron Dr	Hamilton Dr	Ship Creek Rd	2	308	Long-Term
Bruce St	4th Ave	9th Ave	1	565	Long-Term
5th Ave	Bruce St	Montrose St	1	449	Medium-Term
18th Ave	China Creek Rd	Argyle st	1	270	Medium-Term
10th Ave	Bruce St	Melrose St	1	194	Short-Term
10th Ave	Dogwood St	Rosewood St	1	216	Short-Term
Burde St	17th Ave	Bracken Ln	2	1236	Long-Term
Burde St	Bracken Ln	Ilkeston Rd	1	651	Long-Term
Wood Ave	Redford St	Exton St	1	520	Long-Term
Kendall Ave	King St	Huff Dr	1	332	Medium-Term
Wallace St	(W) E.O.P.	10TH AVE	1	598	Medium-Term
Wallace St	Anderson Ave	Kendall Ave	1	521	Medium-Term
Josephine St	River Rd	Beaver Creek Rd	2	1878	Long-Term



Roadway	From	To	1 or 2 Sides Needed	Distance (m)	Priority
Indian Ave	Beaver Creek Rd	Compton Rd	2	994	Long-Term
Leslie Ave	Johnston Rd	Lathom Rd	2	616	Long-Term
Compton Rd	Ian Ave	Tebo Ave	1	370	Medium-Term
Strathcona St	Compton Rd	Marpole St	1	191	Long-Term
Strathcona St	Marpole St	Shaughnessy St	2	184	Long-Term
Bishop Ave	Johnston Rd	Craig Rd	2	456	Medium-Term
Bishop Cres	Haslam Dr	Cherry Cr Rd	2	200	Medium-Term
Southgate Rd	Margaret St	Elizabeth St	1	221	Medium-Term
Southgate Rd	Elizabeth St	Helen St	2	452	Medium-Term
Adelaide St	Southgate Rd	Johnston Rd	1	151	Medium-Term
Kingsway Ave	Strathern St	3rd Ave	1	164	Medium-Term
Maple Way	Tebo Ave	Cherry Cr Rd	1	319	Long-Term
Tebo Ave	Maple Way	Johnston Rd	2	133	Long-Term
Arrowsmith Rd	HELEN ST	E & N RAILWAY	2	234	Medium-Term
Vimy	Roger St	(N) E.O.P.	2	256	Long-Term
Maitland St	10th Ave	Anderson Ave	1	227	Long-Term
7th Ave	Strathern St	Dunbar St	1	114	Long-Term
North Crescent	7th Ave	9th Ave	1	202	Long-Term
McNaughton Ave	Argyle St	Frank St	2	368	Long-Term
China Creek Rd	8th Ave	10th Ave	1	204	Long-Term
Bruce St	Anderson Ave	15th Ave	1	200	Long-Term
BRUCE ST	15th Ave	17TH AVE	2	400	Long-Term
15th Ave	Bruce St	Melrose St	1	200	Long-Term
			Total	37419	



Figure F3
Detailed Pedestrian Improvements

Intersection	Improvement
1. Argyle St & 3 rd Avenue	Pedestrian Countdown Timers (all)
2. Napier St & 3 rd Avenue	Pedestrian Countdown Timers (all)
	Audible Pedestrian Signals
3. Stamp Avenue and Roger Street	Pedestrian Countdown Timers (all)
4. Redford St & Stamp Avenue	Pedestrian Countdown Timers (all)
5. 10th Avenue and Redford Street	Pedestrian Countdown Timers (E/W 10th Avenue)
6. 10th Avenue and Wallace Street	Pedestrian Countdown Timers (all)
7. 10th Avenue and Roger Street	Pedestrian Countdown Timers (all)
8. Johnston Road & River Road	Pedestrian Countdown Timers (all)
	Audible Pedestrian Signals
9. Johnston Road & Gertrude Street	Audible Pedestrian Signals
10. Johnston Road & Helen Street	Pedestrian Countdown Timers (all)
	Audible Pedestrian Signals
	Pedestrian Pushbutton
11. Johnston Road & Tebo Avenue	Pedestrian Countdown Timers (all)
	Audible Pedestrian Signals
12. Johnston Road & Cherry Creek Road	Pedestrian Countdown Timers (all)
	Audible Pedestrian Signals
13. Johnston Road & Broughton Street	Pedestrian Countdown Timers (all)
	Audible Pedestrian Signals

APPENDIX 16

The Alberni Valley Gleaning Project

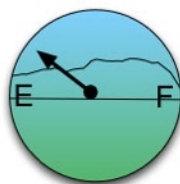
A Local Community Service and Food Security Initiative



Project report prepared by

Heather Shobe
for Alberni Valley Transition Towns Society.

June 12, 2015



Alberni Valley
Transition Town Society

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Executive Summary

The Alberni Valley Gleaning Project is a community project where volunteers harvest unwanted fruit from trees throughout the Alberni Valley. The harvest is shared, with 1/3 going to the homeowner (where they desire it), 1/3 to the pickers and 1/3 to charity. 'Gleaning' was a term used originally to describe the act of collecting leftover crops from farmers' fields after they had been commercially harvested. While the term is used somewhat differently in this case, it still refers to the act of harvesting what is unwanted by a property owner.

The benefits of the project are many. Inherently, its base function is to increase local food security in the region by increasing the amount of local food available and in use. The project also significantly reduces bear/human conflict and supports marginalized community members-both homeowners who can not manage their fruit trees and the recipients of charitable donations. Finally, the project offers a forum for community collaboration, education and the celebration of our local resources.

The project has grown steadily since its inception in 2012. Physical assets have been procured and concrete working procedures established and documented. A stable base of volunteers exists to assist and outreach and media attention within the community has brought only support and commendations for the project.

A thriving, professional, well known, and beneficial program has been built by dedicated volunteers within the Alberni Valley. While volunteerism will remain a significant and integral component to the project, increased financial capacity is required to meet the increasing demand for the project and its administrative, equipment and coordination needs. This report attempts to identify and specify some of those needs, paving the way forward towards an integrated and permanently established food security and community service program.

Project History

In the early spring of 2012, Alberni Valley Bear Smart (a local committee) and Heather Shobe, of Eden Tree Farm and Gardening (a small farm, educational and consulting business) were both considering, and working towards, the start-up of a community fruit gleaning project. AVBS had identified that fruit trees were the second highest bear attractant in the community. Their brochures recommended the destruction of fruit producing trees and movement away from edible landscapes. Heather had identified the ongoing waste of a local food resource as both a problem and a potential agricultural yield.

Both agencies had begun to establish some ground work for the project. Alberni Valley Bear Smart had initiated the creation of community partnerships and collated a binder of project related information. Eden Tree had developed procedural plans, recruited

volunteer interest and accessed needed physical assets. AVBS had just drafted a request for proposals for a volunteer coordinator when one of their members saw Heather's online posting about a new gleaning project initiative. A connection was made between the agencies and a collaborative project established.

Originally, Heather was to slated to coordinate the harvest and the Port Alberni Friendship Centre was to coordinate distribution. While PA Friendship Center did pick up fruit for the first two years for their own use, they never did coordinate the distribution on a broader scale. Alberni Valley Bear Smart set up an online sign up form for homeowners and offered moral support for the program but in the fall of 2012, Dawn Boyce, who had been Heather's main contact, left AVBS and their participation in the project declined. Heather, who was also a member of Alberni Valley Transition Town Society, began reporting on the project at monthly meetings of their 'Food Group'. That group quickly became the project's biggest sponsor and supporter.

Over three seasons, between 2012 and 2014, over 4300 lbs of fruit was donated to local charities and over 3000 lbs of spoiled fruit waste was cleaned up from under trees around the Alberni Valley.

Historical Annual Breakdown of Activities

A year by year breakdown of main program activities and yields is as follows;

2012

- Project initiated
- 27 harvesting events
- 3876 pounds of fruit harvested
- 20% of yield was spoiled waste from underneath the trees
- 20 lbs sold (volunteers' personal share and yield)
- Grant application for \$10,750 through Epicure Foundation (in collaboration with the Salvation Army) at year's end was denied
- Equipment used was the personal property of the coordinator, picking was done using ice cream buckets and boxes
- Port Alberni Friendship Center and Salvation army were the recipients of the donated portion of fruit.

2013

- 22 harvesting events. General community feedback was of a poor fruit set regionally.
- 2080 pounds of produce harvested
- 10% of yield was spoiled waste from beneath trees.
- One volunteer preserved, via canning, a number of jars of lower grade fruit which was subsequently donated for Salvation Army Christmas hampers.
- Coordinator initiated and organized a fundraiser through West Coast Seeds which yielded \$408
- Alberni Valley Transition Towns Society donated \$500 to the project
- Alberni Valley Coop donated \$100 gas card

- 2 ladders and proper fruit harvesting bags were purchased
- Coordinator took at \$91 stipend
- Friendship Center and the Salvation Army were the donation recipients.
- Port Alberni Parks and Recreation bought a very small amount of fruit from a volunteer for their playground programs.

2014

- 44 harvesting events with 40 volunteers participating
- 9117 pounds of fruit harvested
- 22% waste (2006 pounds) of spoiled fruit cleaned up from under trees. One pick was entirely waste fruit, and on 4 other picks more than half of the fruit was spoiled.
- Project Coordinator attended 32 of the picks, as there was a lack of volunteers with trucks capable of transporting ladders, equipment and fruit.
- Transition Towns contributed \$1893.75
- AVBS contributed \$161.18 for advertising
- Alberni Valley Coop donated \$100 gas card
- Project Coordinator received stipend of \$1582.15
- One ladder broken beyond repair during a pick after a volunteer (who was uninjured) fell off of it.
- Arrowvale Farm brought a fruit pressing truck into the region for the first annual 'Apple Festival' and donations were given to the Bread of Life in the form of fruit juice
- Recipients of fruit donations were the Salvation Army, Bread of Life and Alberni Community and Women's' Services (ACAWS)

Spring 2015

- An application of \$12,279 to the Alberni-Clayoquot Regional District Grant-In-Aid Program was denied
- Alberni Valley Transition Towns Society commissioned this report for the purpose of documenting project information and supporting further grant requests.

Project Benefits

There are numerous recognized benefits to a community gleaning program. These include an increase in food security, reduction in human/bear conflict and the fostering of a sense of community and agricultural education.

Increased Food Security

The program secures a local food resource, which would otherwise go to waste, for consumption by community members. One third of the yield goes directly to charitable organizations for use in food box and/or similar programs for low income people. The rest is kept by homeowners and volunteers. Waste fruit, which has been in contact with the ground or over ripe, is either used to feed livestock or properly composted to create a valuable product. In future, it is recommended that the project use the homeowners' share (which is seldom claimed) and make it available for sale to the public as well.

Protecting, using and making local food sources available to the public reduces ‘food miles’ and carbon emissions of the food consumed locally and reduces the risk of non-supply and/or higher food prices due to environmental changes or shortages in other regions. It is well known that Vancouver Island has only a 3 day food supply in the case of emergency. Protecting and enhancing local food systems, such as this community fruit gleaning project, ensures that a system of harvest and distribution is in place to mitigate distress.

Reduction in Human/Bear Conflict

Of equal importance to the community is the reduction in human-bear conflict due to the removal of ripe fruit. If this fruit wasn’t harvested from the trees, it would typically rot under the tree, be brought to the landfill or eaten by bears. About 90% of homeowners who donate their trees to the program site bear problems as the main reason. Often, when volunteers arrive to harvest, there are up to one hundred pounds of fruit under the tree which need to be cleared before fruit can be picked from the tree. Alberni Valley Bear Smart has stated that generations of bears come to the very same fruit trees in our neighborhoods each season, knowing exactly when the fruit ripens. They have repeatedly expressed concern that a human-bear conflict may result in the death of a citizen. Every year Conservation Officers need to kill bears that have become habituated from eating fruit. In the fall of 2013, The City of Port Alberni was designated the 5th ‘Bear Smart Community’ in the province of BC, in part because of the work the Alberni Valley Gleaning Project has done to reduce their second highest attractant.

Service to Community

The Alberni Valley Gleaning project provides important services to the community. The assistance to property owners in managing the yields of their fruit trees is an important program benefit. The Alberni Valley boasts a very high number of fruit trees and climatically, the territory is very favorable for fruit production. Colonization brought an agriculturally minded population to the region who planted many fruit trees in order to increase their self-sufficiency. It continues to be part of our cultural mindset to plant fruit trees in our backyards. However, many of the tree owners are now elderly or disabled and unable to care for their fruit trees or harvest the fruit. People and families in general are very busy, and stretched for time. A community harvesting program offers an alternative to cutting down the fruit trees altogether.

Many citizens rely on food donations from local charitable organizations. In BC, 7.8% of families suffer from food insecurity (Statistics Canada, 2007/2008). The 2012 ‘Alberni Community Food Assessment’ report notes that the Alberni Valley rates in the fourth worst percentile for both unemployment assistance and income assistance. Charitable organizations stress the importance of distributing fresh produce and their difficulty in procuring it as, generally, community donations are in the form of lower quality, processed foods. The Alberni Valley Gleaning project donates the freshest of produce, harvested regionally and delivered directly.

Community Education and Collaboration

Finally, the Alberni Valley Gleaning Project fosters community by bringing people together for a common cause. In 2014, 40 community members volunteered to assist with harvesting, and while they worked, often in groups of 5-6 people, they shared valuable perspectives with each other and cemented a sense a community spirit. The groups also created a spontaneous and accessible method of education about food and agricultural skills. Each contributed in some way to the collective's knowledge of fruit tree cultivation and management. They learned other valuable food and agricultural related skills, including methods of preservation and cooking, cultivation of plants and management of wildlife.

The Alberni Valley Gleaning Project is a comprehensive project dealing with the culture, harvest and distribution of a local food resource. Without it, precious resources would be going to waste. With it, a community comes together to benefit each other, including the lowest income earners and marginalized members, and creates a community and educational framework to promote further expansion of local food production.

How it Works!

The project has developed a number of protocols and work procedures in order to function in a smooth and professional manner. Specific procedures are included in the appendix of this report.

At the most basic level, each harvesting event has four stages. Firstly, a tree owner with fruit available for harvest contacts, usually via phone or email, the project coordinator and requests a harvesting team. The coordinator then recruits a team to complete the pick and confirms the time and place. The harvesting team arrives with the needed equipment for the on-site work, the produce is harvested and divided into thirds and finally the donated portion is brought back to 'headquarters' for distribution to charity.

Outreach

Both tree owners and volunteers have been recruited to the program in a variety of ways. Social Media has been used in addition to more conventional advertising channels. Posters and brochures are available, with particular effort to distribute them at venues such as the Alberni Valley Fall Fair and regional Farmers' Markets. The project has been featured a number of times in newspaper articles and has twice been featured for a Shaw TV video clip. Thank you letters are sent, at least annually, to past volunteers and donors as a reminder for the project and to solicit continued support. A proper safety and project orientation is required for volunteers and this is normally conducted at the beginning of the season after recruiting interest through publicity channels.

Coordination of Volunteers

Coordination of volunteers for the harvesting events has been attempted in a number of different ways. This included scheduling days for various pick leaders in advance of the season, a method which generally failed due to inherent fluidity of summer schedules and the difficulty for volunteers to follow through with commitments so far ahead of time. Sometimes, where pick leaders were very committed, they could be counted on to assist where necessary, and recruit their own team members. This was, however, the exception as opposed to the norm, particularly as the seasons wore on and they were called on many times. In addition, they generally only called upon their closest friends and acquaintances, leaving out some of the other volunteers in the pool who were available. Volunteers have fluctuating schedules and many other commitments. What has worked best for coordinating a harvesting team is to send out the request for pickers, via a group email list, once a harvesting opportunity has been identified. Those who have availability in their schedule and a desire to help respond to the coordinator and a team is mobilized. This seems to create the most satisfaction and continued engagement for the volunteers as they always had a choice of whether to respond or not.

Pick Leaders

The term 'Pick Leader' refers to the leader of the harvesting event. This person generally has participated in a number of prior events. He/she is skilled in the art of harvesting, mindful and responsible for on-site safety and communication with the home owner while on site. This person is also responsible for the delivery of equipment to the site, the division of the produce and the delivery of fruit and equipment back to the project base. They are required to have the use of a suitable vehicle, usually a truck. In 2014, a significant problem with the program operation was the lack of volunteers with a suitable vehicle. As such, in addition to the other roles, the project coordinator participated physically in 33 out of the 42 harvesting events, greatly increasing her work load.

On Site

On site, this first activity is cleaning up the ground fall under the trees. A very important food safety aspect of the program is in keeping this fruit separate from the 'edible' fruit. Any fruit that has touched the ground carries with it an inherent risk of being contaminated by e-coli through the droppings of deer, mice, or other animals. It is always separated and used for compost or livestock feed (pigs in particular). At times there is a significant amount of ground fall. This is a very unrewarding task as it is often rotten and smelly (which is exactly what attracts the bears!)

Harvesting of the tree/s continues until it is picked clean of all the accessible fruit. In very tall trees the highest fruit can not be reached, even using picking poles and ladders. The crew will then rake up any remaining debris from under the tree and collect equipment. The fruit is sorted into thirds, with one third set aside for donation. The homeowner is always offered a third (though they rarely take any or very much)

and the remainder is split between the volunteers. In the future, it is recommended that the homeowners portion is sold to generate income.

Distribution

Equipment and the donated portion of fruit is brought back to the project base and weighed. Fruit tallies and event info is recorded. Eden Tree Farm and Gardening has donated the use of their commercial cooler and market stand as a depot and provides storage for equipment. It is commercially insured for public access and this component of the Alberni Valley Gleaning Project.

Finally, the project coordinator contacts a charitable organization and makes arrangements to have the fruit picked up. Thankfully, the charitable organizations have all been able to contribute to the project by picking up the produce themselves. This has eliminated the need for an additional delivery component to the project.

The Coordinator's Role

The coordinator role is essential to the success of a professional and stable project. This person is ultimately responsible for all aspects of the project - from marketing to training volunteers, from assisting physically at events to budgeting and policy development. Where roles are delegated, there remains a need for someone to ensure that they are followed through with and assess results.

Since the inception of the project, this role has been played by a volunteer, with a very small stipend in 2013 (\$91) and 2014 (\$1582). There is not a volunteer prepared to take on this role for the 2015 season, nor is it advisable to continue to develop such a strong and valuable program through volunteer effort. As this report will show, opportunities exist to further develop the program capacity and network strategically with other groups, but to engage in this sort of collaboration without a stable and committed financial platform would be reckless and detrimental to that collaborative strategy itself.

Specific Coordinator Duties

Following is a list of the main duties required for the proper management of the program;

- Develop policies, orientation guides, spreadsheets, waivers
- Source and purchase equipment
- Solicite donations from business (gas, equipment discounts, media coverage)
- Respond to mail/phone inquiries from public
- Investigate and manage complaints
- Solicit tree donors and volunteers
- Write thank you letters to previous tree donors and volunteers
- Organize and lead volunteer orientation/s and safety briefings

- Manage and coordinate volunteers (40 volunteers in 2014)
- Respond to requests for and schedule harvest events
- Attend and managing harvesting events where volunteer pick leaders are unavailable
- Maintain harvesting and food safety standards
- Work with distribution agencies and donor agencies
- General fruit sorting and distribution to charity
- Manage sales of fruit and coordination with other agencies
- Solicit funding from and report to stakeholders
- Investigate fundraising initiatives and apply for grants
- Create and distribute marketing info, brochures, posters
- Promotion at Fall Fair and other community events
- Maintain media and social media presence
- Organize year end celebration
- Year end summary and financial statement
- Maintain budget and records

Project Sponsors, Current and Potential

Alberni Valley Transition Towns Society

Alberni Valley Transition Towns Society is a non-profit organization with a mandate which includes supporting local food security initiatives and the transition to a more resilient society. The group has been involved with the Alberni Valley Gleaning Project since its inception in 2012 and is its primary financial donor. Alberni Valley Transition Towns Society is essentially the umbrella organization for the administration of the project and the agency under which the project operates and applies for grants. The society is, however, a very limited organization, with no paid staff itself and a very limited budget. The main funding source for Alberni Valley Transition Towns Society currently is through the Vancouver Island Health Authority's 'Community Food Action Initiative' and is designated for the purpose of building food security networks and capacity in the region by working with other groups and developing a Food Action Plan. The Initiative does not have the ability to fund the gleaning project itself. AVTTS is, however, building its own capacity through the CFAI project and is currently experiencing a good deal of growth. In addition, the collaborative work of the CFAI initiative with other food security related organizations in the region assists with promoting the project and making collaborative community connections.

AVTTS has undertaken specific fund raising efforts for the Alberni Valley Gleaning Project including a Christmas gift drive to raise money for Gleaning Project equipment. Project information is included at AVTTS tables at special events throughout the year and is noted in its organizational chart as a key program. The society membership and newsletters provide an excellent pool for recruiting volunteers and general project support.

Alberni Valley Credit Union

Staff at the Alberni Valley Credit Union learned of the Alberni Valley Gleaning Project through promotional activity of Alberni Valley Transition Town Society. The Credit Union has since donated \$500 to the project for the 2015 season, with the only caveat that they will receive enough apples to make a few pies!

Alberni Valley Bear Smart

Alberni Valley Bear Smart remains a key proponent of the project. The gleaning project assists the AVBS committee to fulfill its mandate of supporting communities by reducing bear attractants and minimizing human/bear interactions. Though highly invested in the project's success, it is not able to contribute financially to a significant degree. AVBS has however, offered some support for advertisements and a limited amount of in-kind time for support of grant applications and administrative expertise.

Regional Food Insecurity and Community Support Agencies

Local charitable organizations are the recipients of 1/3 of the harvested fruit. These organizations distribute it to their clients through a variety of programs. Agencies who have participated with the project thus far include the Port Alberni Friendship Centre, Salvation Army, Bread of Life and Alberni Community and Women's Services (ACAWS). Fruit has been purchased by Port Alberni Parks and Recreation for children's playground programs and other such collaborative initiatives are likely in the future. 'Port Alberni Better at Home' is a new support project for Senior Citizens funded by United Way and aimed at helping them stay at home. The Alberni Valley Gleaning Project provides a service which is an excellent fit with their mandate.

Alberni District Co-operative Association

The Alberni District Co-op has donated gas vouchers totaling \$100 annually in 2013 and 2014. This money assists with transportation costs for fruit and equipment.

Huu-ay-aht First Nation

The Huu-ay-aht First Nation is implementing a 'Good Food Box' program starting in June of 2015. This program will see the delivery of a free food box, via refrigerated truck to an estimated 50-100 Huu-ay-aht members who desire it. The program will offer once per month delivery to Nanaimo, Vancouver, Anacortes and Port Alberni. It is interested in purchasing approximately 250 pounds of fruit monthly from the Alberni Valley Gleaning Project at a cost of about \$1.50/lb. While managing this type of sales initiative and sorting and separating the best quality fruit from the unclaimed homeowners' share will involve time, it will also provide a specific benefit to peoples of the Huu-ay-aht First Nation and increase the visibility of the program. A pamphlet about the project will be put into each recipient's food box and members recruited to volunteer with the project. Huu-ay-aht staff report that there may be further funding potential in the future.

Sproat Lake Landing Restaurant

Sprout Lake Landing is a new restaurant operating along the busy highway 4 at Sprout Lake. Management and chefs are actively seeking out local products to include on their menu. The restaurant has confirmed the intent to purchase fruit from the Alberni Valley Gleaning Project whenever it is available in the 2015 season. They will accept both table quality fruit for fresh eating and the much less desirable 'ugly' fruits for preserving. This is another excellent opportunity to increase the availability of local food in the community and increase food security through the reduction of what would have been food waste without the services of the program.

Eden Tree Farm and Gardening

The owner of Eden Tree Farm and Gardening, Heather Shobe, was one of the primary founders of the project and has acted as the project developer and coordinator since it's inception, in a largely volunteer capacity. Her business donations have included a facility for equipment storage, cooler space, a venue as a depot and for volunteer training, use of harvesting equipment and vehicle, office space, printing, marketing platforms and very limited liability protection, particularly for the use of the physical space of the farm property. While Heather is able to continue to offer the use of some of her assets and space for storage, events, refrigeration and other needs, she is, herself, unable to continue the role as general project coordinator in a volunteer capacity.

Alberni District Secondary School Students

Time and time again, high school students have been identified as a target group for recruitment of volunteers. Students are required to complete a certain number of volunteer hours and the gleaning project offers a project suitable for physically fit young people and the opportunity to learn about fruit tree cultivation and create a connection with the food supply. It also offers them an opportunity to assist disadvantaged and low income citizens. The use of teenage volunteers may bring a need for additional mentoring and monitoring however it would create an additional benefit within the broader community.

Land Owners and Farmers

All land owners with fruit trees are potential contributors to the project. Experience has demonstrated that a very high portion of land owners who use the program repeat their donation the following year. In addition, repeat donors contact the project sooner, before their fruit is already starting to fall, which results in less waste and higher quality yields. Realtors value the program either as a means of helping to maintain vacant property or as a selling feature. Farmers are a potential resource as well. The Alberni Valley Gleaning Project is a valuable asset for farmers experiencing health issues, or other issues which render them less able to harvest their fruit in a given year. They still retain the ability to keep and sell a full 1/3 of their fruit but without the need to pay for labour or spend the time themselves. As the project reputation grows, this could be a significant source of fruit yield.

Media Outlets

Media outlets have been important supporters throughout the history of the project. It has been featured in many articles and two Shaw TV videos. Reporters have offered continuing support and produce very positive reports which garner additional community support and interest.

Physical Assets

The physical assets of the project include the following.

- 12' ladder
- 4 fruit harvesting bags
- Fruit picking pole
- Dehydrator cabinet
- Stainless steel fruit press

Identified Needs

Despite the success of the Alberni Valley Gleaning Project there remain, as follow, certain clear requirements to secure it's continued operation and growth.

- Ladders; minimum of 1 x 8' orchard ladder, 1 x 10' orchard ladder, and a step stool
- Agricultural Grade and Food Safe harvesting bins; 20 bins of a 50 lbs capacity
- Tools; 2 rakes, 2 picking poles, scales, gloves
- Display sign to erect while on harvesting sites
- Dedicated project vehicle capable of transporting ladders and fruit
- Insurance
- Financial support for project coordinator/s
- Consideration of honorarium's for Pick Leaders
- Marketing and public outreach assistance

Ladders

The project has relied on three orchard ladders of 8', 10' and 12' in height. The 8' ladder was broken beyond repair in the 2014 season and the 10' one is the personal property of a volunteer. At minimum, the project requires a new 8' ladder and 10' ladder for successful operation in 2015. In addition, a least one short step stool is required. As the project grows it is foreseeable that two such sets of ladders will be required. While an even taller ladder would be ideal in certain circumstances, it could pose a problem for transportation and handling and is not recommended at this time.

Harvesting Containers

In the past volunteers have relied on using reused cardboard boxes which are scavenged from grocery stores and business'. This creates an additional workload and in the summer season they are quite difficult to secure. Additionally, the re-use of cardboard boxes poses issues about contamination. Stackable, lightweight, dedicated, and easy to clean bins are essential for safe and efficient operation.

Tools

Two rakes are required for cleaning up debris from under the trees after harvesting. Fruit picking poles allow volunteers to harvest fruit from higher in a tree's canopy and disposable and two scales are required to weigh fruit. Finally, washable or disposable gloves are required for those times where volunteers are picking up fruit that is rotten, mushy, or in contact with dog waste (an unfortunate occurrence!)

Display Sign

While on picking events, a display sign such as a sandwich board, could advertise the project and solicit interest. Information such as a contact number, email and website link would be posted. Public interest peaks when a vehicle with professional fruit harvesting equipment shows up in the neighborhood!

Dedicated Project Truck

Access to a reliable vehicle has been the biggest stumbling block in the solicitation of pick leaders and has significantly increased the demands on the project coordinator. Back in 2012, Bear Smart identified the use of a government vehicle as an integral need for the program. This remains one of the greatest requirements of the program. A vehicle is essential to transport ladders, equipment and fruit to and from harvesting sites. Many volunteers have the skill and experience to lead harvesting events but without a vehicle, the coordinator has also been required to participate in order to meet the needs of the project, using her own vehicle and at her own cost.

There are solutions to this through collaboration with other regional organizations. Ideally, a vehicle will be offered for use by an organization with applicable insurance. Alberni Valley Transition Towns Society does not have the facility to hold vehicle ownership and insurance without significant additional funding and infrastructure. Harvesting events are generally organized for first thing in the morning or in the evening (outside of the heat of the day). Ideally, the City of Port Alberni or Alberni-Clayoquot Regional District would willing and able to set aside a minimum of 2-3 times per week, in season, where a truck was available for the use of project volunteers. Alternately, there may be such a vehicle which is being decommissioned and available for donation and/or use. At times, a committed pick leader will have access to a suitable vehicle but this has been the exception rather than the norm. While they have been actively recruited, relying on such volunteers is not a sustainable and long term solution for this integral project requirement.

Insurance

In 2012, Alberni Valley Bear Smart investigated the risk to homeowners when volunteers harvested fruit on their properties. The feedback from MacDermott's Insurance agency in Port Alberni was that generally, 'a homeowner's insurance policy would cover bodily injury to the Volunteer Fruit Harvester(s) caused by negligence of the homeowner because the volunteers are being invited onto the Homeowner's property and are not seeking monetary compensation', however it was up to the courts to determine if there was negligence involved.

Liability coverage for the program remains a need, however. Is the project coordinator a volunteer when picking on site, or is he/she being paid? Who is responsible if a volunteer claims that he/she was not given a proper safety briefing or that equipment was faulty? While donations of food to charitable organizations are exempt from liability via the 'BC Food Donor Encouragement Act', there remains a risk where a portion of the food is sold. This liability insurance requirement is by no means a stumbling block, rather a key piece of the responsible management and fiscal responsibility of the program. Liability coverage must be secured for the project, likely through either the umbrella of Alberni Valley Transition Towns Society or a regional/municipal government.

Financial Support for a Project Coordinator

Given the demands of this role, it will not be easy to recruit another volunteer coordinator. Though aspects of the role can be delegated to volunteers, there remains a need for general oversight and accountability. In addition, the coordinator must provide their own office space and supplies unless a sponsor offers a facility for the work to take place. As stated previously in this report, this is a significant role, requiring a great deal of skill and management expertise.

Consideration of Honorariums for Pick Leaders

In the event that a vehicle is not secured for Alberni Valley Gleaning Project use, an honorarium for Pick Leaders who transport equipment must be considered. Firstly, there are the actual costs for the pick leader; gas, insurance, wear and tear including possible dings/dents from equipment. Secondly, financial motivation will assist in recruiting and retaining reliable helpers. It is quite easy to volunteer once, twice, or a few times, with the additional work and time involved with being a pick leader. However, once a volunteer has secured their own supply of fruit, processed many jars and yet continues to be inundated with more, their motivation, understandably, diminishes. In the height of the season, requests for volunteers are consistent and the volume of fruit is staggering. Where the project is limited in accessing a vehicle, financial reward of those who contribute towards it must be compensated. The actual harvesting event, between picking up ladders and dropping them and the fruit back off at the depot, generally takes about 3-4 hours, depending on the size/number of trees, number/skill of volunteers, and physical distance to travel. A stipend of approximately \$20 would cover vehicle costs, and while it would not fully compensate the Pick Leader for their time, it would offer something for their effort.

Marketing and Public Outreach Support

Advertising is costly, in both time and money. Where social media is a very successful means of recruiting interest, it does not eliminate the usefulness of newspaper advertisements and print documents. If a sponsoring agency were able to offer an in-kind donation of printing services, the actual cost would be less than paying for the service through a business agency. In addition, links to the project on government and other websites assist in generating trust in the program and increasing public donations of fruit trees and the help of volunteers.

Community Capacity Survey

In it's third year, operating mainly through volunteers, the Alberni Valley Gleaning Project harvested over 9000 pounds of fruit. Generally, when pickers would look over into the neighbors' yard from the tree canopy they would see another tree (or 2 or 3) that was dropping fruit and in need of harvest.

A community Capacity Survey is an important tool in calculating the potential of this project. It is estimated that yields could easily reach 30,000 pounds of fruit annually, and likely much more. A quick survey could be undertaken to collect information from homeowners about the number of fruit trees in the region and the potential harvest. This survey could take a number of forms. Very simply, it could be part of an Alberni Valley Transition Towns Society booth at the 2015 Alberni Fall Fair. Landowners could complete a very short questionnaire about their fruit tree assets and interest in contributing to the gleaning project in return for a chance to win a prize. A more widespread survey could be completed if the City of Port Alberni and/or Alberni-Clayoquot Regional District sent out a survey via mail or newsletter. Either way, a community capacity survey would be an excellent means of more accurately identifying where and how much fruit is potentially available for harvest.

Budget

The following budget is the minimum financing required for a fully functional, professional and stable project at it's present scale.

Alberni Valley Gleaning Project - Budget Projection, 2015	
Marketing; Brochures, Advertisements, Print Material, Signage	\$700
Salary; Project, Harvest and Distribution Coordinator (450 hours)	\$9000
Materials/Equipment; Rakes, Fruit picking pole, Ladders, Plastic storage bins, Scales	\$750

Equipment Storage/Refrigeration	\$500
Travel; Honorarium paid to Pick Leaders for personal use of vehicles to carry ladders/fruit \$20/event x 50	\$1000
Volunteer Orientation and Year End Celebration Food and niceties	\$100
Other; Insurance, accounting, administration	\$1600
Total Projected Expense	\$13,650

Projected Revenue for 2015

Following is revenue projected for 2015. * denotes unconfirmed and estimated funds

Alberni Valley Gleaning Project - Revenue Projection, 2015	
Alberni Valley Transition Towns Society	\$2196
Credit Union	\$500
Alberni Valley Coop	\$100*
Alberni Valley Bear Smart	\$100*
Eden Tree Farm and Gardening	\$500 (in kind facility use)
Huu-ay-aht Sales	\$1000*
Sproat Lake Landing Sales	\$500*
Total Projected Revenue	\$3196 or \$4796*

Funding Shortfall

Expenses - Revenue	\$10,454 or \$8854*
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Specific Funding Requests

Funding requests exceed the funding shortfall however not all requests can be assumed to be honored. If donations exceed funds needed for 2015 operations, they will be held over for use in 2016.

Alberni Valley Gleaning Project - Funding Requests, 2015	
City of Port Alberni; Financial Support and Use of Truck for harvesting events - Either 2-3 scheduled half-days (mornings or evenings) per week during July, August, September, October; or on as-needed basis	\$3000 + In Kind
Rotary Club/Other Community Groups; Financial Support	\$3000
Alberni-Clayoquot Regional District; Financial Support, Website Link and Print Materials Use of Truck if unavailable through the City of Port Alberni	\$3000 + In Kind
Alberni Valley Transition Town Society; Administrative Umbrella, Financial Support, Marketing and Community Outreach	\$2196 + In Kind
Eden Tree Farm and Gardening; Equipment Storage, Physical Site for Depot and Volunteer Orientation, Refrigeration	In Kind
Alberni Valley Bear Smart; Project support and advertising	\$100 + In Kind
Alberni District Co-operative Association; Gas Card	\$100
Coastal Community Credit Union; Financial Support	\$500
Total Support Requested	\$13,396

Other Funding Options

The following funding options are also available and being considered;

Homeowner Pays for Service

In a business environment, the service of fruit harvesting and waste clean up could be a fee for service initiative. The homeowner would essentially hire the Alberni Valley Gleaning Project to harvest their fruit. Charitable donations would continue, as would a volunteer harvesting crew but the project would have a greater self-funding capacity. Even if the fee was minimal, tree donations would likely decline. As many of the clients are elderly, disabled, or low income it would become more difficult to contribute. This options also goes against the general spirit of service of the program and would likely deter clients who are accustomed to simply shoveling their waste fruit over the embankments, into green spaces, or into the landfill.

Volunteer Membership Fee

Some communities have a membership fee for volunteers in their gleaning projects. Volunteers pay a modest annual fee (about \$20) for the opportunity to access the fruit and receive the harvesting training. While this may work where there is an extremely high pool of volunteers and a higher general population, the history of the Alberni Valley project demonstrates that, while volunteers are available, they still require a significant amount of recruitment. Those who do participate generally offer more time than they might otherwise, due to a belief in the program. Their willingness to help may be diminished if they had to pay to do so!

Pick for Sale

Many harvesting events yield poor quality fruit, and some have been made up of entirely waste clean up. As tree donors are generally repeat their donation in following years, a more discriminating system could be established, where the coordinator is either familiar with the property, or scouts the trees prior to confirming harvesting potential. In this way, only properties that are known to have potential for fruit sales will harvested. While this is a possibility, the sale of fruit requires additional time and resources, potentially making it a net zero benefit. Additionally, this options greatly decreases the potential for bear/human conflict reduction and the total potential yield.

Sorting Harvest and Increasing Sales of Fruit

The sorting of fruit would improve the program and sale of fruit to the public could yield an important revenue stream. Sorting the fruit could render some of it 'higher value' for fresh eating sales and leave another, lower price quantity for preserving. Sorting would have the benefit of increasing the quality that is received by the charitable organizations as well, and likely increase the percent which is actually consumed. While potential exists, this has not been actively pursued due to the increase in volunteer hours required. There is also an increased time requirement to pursue sales and, typically, a flush of similar fruits on the market at the same time which calls for a comprehensive

marketing strategy. Some buyers have signed up for purchases in 2015 if the project continues.

Crowd-funding

Crowd-funding is a popular and useful tool for soliciting funding. In such a campaign, a host website will feature a page promoting a fundraising campaign and offer a platform for the public to donate online to the project or initiative. Generally, 'rewards' are offered to those who contribute. In the case of the Alberni Valley Gleaning Project, rewards could be a five pound bag of apples, a case of pears, a thank you note, logo or advertisement on project brochures, and so forth.

Residents of the Alberni Valley have shown wide support for the Alberni Valley Gleaning Project and media attention has been positive and easy to generate. Prior tree donors, who have expressed satisfaction for the program may offer a donation as well as other citizens in search of worthy local projects to contribute to.

A successful crowd-funding campaign is not as simple as it may appear, however. Experts point out that a successful campaign can take months of work prior to launch and then very focused and full time attention throughout the campaign itself. In addition, at the end of the campaign, rewards need to be delivered. The host website takes a percentage of funds raised (the amount depending on the platform) and typically someone is hired to run the campaign itself.

If a crowd-funding campaign were launched for the Alberni Valley Gleaning project, certain strategies could increase the yield. This would include showcasing a well-liked sponsor who stands out in support of the project (the 'fame' potential), and the offer of matching funds by another agency, which entices people to contribute as their contribution is therefore doubled.

A crowd-funding campaign could be viable for the Alberni Valley Gleaning Project however it would take a significant amount of work and a good strategic plan. Yield is uncertain and the timeline is one of months for the best results.

Models and Comparables

Many other communities, in British Columbia and around the world, support projects to harvest unwanted fruit. Most of these programs are funded largely by the community's respective governments and/or other local agencies. Generally, someone is paid in the role of project coordinator, either specifically for the project or through the umbrella organization 'from the side of their desk'.

Other projects run similarly to the Alberni Valley Gleaning Project but each region is nevertheless unique. They have a different population to draw from, business and

processing assets, and a unique community culture. It is important when designing a program for the Alberni Valley to consider it's own unique needs and resources. Other groups do however, offer models and a point of reflection.

Lifecycles Fruit Tree Project

The Lifecycles Fruit Tree Project in Victoria, BC reported a harvest of 30,000 lbs in 2014. They have two paid staff working for the program, one a project coordinator and one a harvesting coordinator. Lifecycles is funded largely by the Victoria Foundation and they are also a registered charity, able to issue tax receipts.

Lifecycles is unique in that 1/4 of their fruit is set aside for sale in order to generate income for the project. Because homeowners often do not take their share, the program ends up with about 35% of the harvest (mostly seconds and inedible fruit) being available for sale. Over the past 7 years, Lifecycles has managed to establish a value-added business component to their project by making connections with local processors and restaurants who create feature products, via preserving, with second quality fruit. Regardless, Lifecycles reports that they have no long term funding and that they have nearly shut down on more than one occasion.

'LUSH Valley Food Action Society' Fruit Tree Program

The LUSH Valley 'Fruit Tree Project' is based in Comox, BC. LUSH Valley also manages the 'Comox Valley Food Round Table' - the Comox chapter of Vancouver Island Health Authority's CFAI program. In this respect, the organization is very similar to Alberni Valley Transition Towns Society.

LUSH Valley reports picking 12,000 pounds of fruit in 2013. They hire a project coordinator at the rate of \$4-5000/year and in addition, the organization maintains other staff members who assist with the program, including marketing and administrative details at a central office. The coordinator has a volunteer Pick Leader in each of five local regions who organizes and attends the specific harvest events within those regions.

Future Potential

In 2014, the Gleaning Project was called on to assist a farmer who reported to have composted thousands of pounds of fruit every year for a number of years, as he had been unable to harvest his yields. He had been previously reluctant to allow strangers on his property to harvest for him, but felt comfortable with the formal and professional program being offered.

An increase in harvest is only a fraction of the possible benefits as this reputable project builds. Following are other ways in which the Alberni Valley Gleaning Project can grow.

Community Orchards

As with Community Gardens, Community Orchards are growing in popularity around the world. The Parks and Recreation Department of the City of Port Alberni is considering planting produce in garden plots around the city. Planting fruit trees instead of ornamental ones is also an option, and the Alberni Valley Gleaning Project is an existing and proven group who could be recruited to harvest this produce.

At present, the city is considering options for the use of a five acre property near the top of Burde Street as a park and community orchard. This property boasts over 100 mature fruit trees, grapes, berries, currants and other food producing plants. While in early stages of investigation, there is a serious interest in securing the property for community use. It could become the 'home base' for the Alberni Valley Gleaning Project, where equipment is stored, educational events are held and public events occur which entice the public into the satisfying realm of fresh fruit and food production.

Fruit Tree Pruning Service

Many of the gleaning project tree donors are unable to properly maintain their fruit trees. Proper pruning and training techniques increase the yield and quality of the fruit and the attractiveness of the trees themselves. It also makes it easier to harvest the fruit. In the future, the Alberni Valley Gleaning Project could operate a tree pruning and maintenance service, essentially maintaining it's tree assets throughout the year. As a social enterprise, this could yield an additional income stream to the project.

Processing and Preserving Educational Workshops

Much of the fruit accessed by the gleaning project is of lower perceived quality than the 'blemish free' product available at local grocery stores. It still has a significant nutritional value though, and can be made into stable products that feed the community over the winter and spring months. Many health organizations such as the Vancouver Island Health Authority and Literacy Alberni promote education around food preservation and preparation techniques in order to improve the health of local citizens. The Alberni Valley Gleaning Project could easily provide the fruit and assist with the coordination and facilitation of these preserving workshops.

Product Branding and Marketing Initiative

As Lifestyles Fruit Tree Project has done in Victoria, BC, the Alberni Valley Gleaning Project will work to develop business relationships with restaurants, processors and distributors to create a value-added and profitable side line. In time, local fruits can be preserved into specific products which are marketed as a 'local and community benefiting' brand and available for sale through local business', Farmers' Markets, and community events.

Increased Community Capacity and Collaboration

Many organizations within the region are involved with food security projects and initiatives. Alberni Valley Transition Towns is developing a Food Security Round Table

initiatives which will bring these groups into discussion and regular collaboration. The Alberni Valley Gleaning Project is an existing and established project where various groups could involve themselves, benefit from and contribute to. A stable and well managed project is an excellent venue for bringing together groups who have historically worked independently, and often with redundancy, despite their similar goals.

Summary

The Alberni Valley Gleaning Project is a public service program with a value far beyond it's financial cost. Project benefits include; an increase in regional food security and the safety of citizens through a reduction in human/bear conflict, the availability of nutritious food for lower income community members, a useful service for fruit tree owners and an accessible platform for food and agricultural education for residents. Because the program is largely based on the involvement of volunteers, it's actual financial cost is very low.

The Alberni Valley Gleaning Project benefits and engages multiple stakeholders within the region. In this respect, it is an ideal platform for modeling a collaborative community project with a widespread benefit. Such collaborative initiatives are growing in number all over the globe, and are an important part of 'from the ground up' solutions for community resiliency, safety and food security. This project is at a critical juncture and it's success will be determined, in part, by the contributions of community groups and governmental organizations.

With increased community support, the project can continue as a model community service enterprise which brings together a number of community organizations and achieves it's the goal of increasing local access to healthy food, the agricultural yield of the region, and collaborative projects.

The project has run successfully for three years. It has established protocols, dedicated volunteers, a database of returning fruit tree owners, physical equipment and a good reputation within the community. With dedicated funding, it's positive impact will expand even further into other community benefits. As one tree donor wrote,

"I would like to thank you and your volunteers for doing such a wonderful job of picking our apples! The group arrived with all their equipment, picked apples until they ran out, and raked up all the debris, including the previously fallen apples. The children were well-behaved and polite, and quite happily played with the dogs. My husband allowed them to swim in the pool, and they were no problem at all.

Thank you for taking care of our bumper crop--I can now relax and enjoy the rest of the summer. You can be sure I will recommend you and your services to anyone else who has a surplus crop!"

APPENDIX

Average Fruit Harvesting Dates for Alberni Valley Gleaning Project

July 1-14

- Sour Cherries

July 14-31

- Sour Cherries
- Sweet Cherries
- Transparent Apples
- Plums

Aug 1-14 (High Volume)

- Plums (red/yellow/green)
- Transparent apples
- Some other apple varieties

Aug 14-31 (High Volume)

- Apples
- Plums (red/yellow/green)
- Bartlett Pears
- Prune Plums
- Grapes

Sept 1-30 (High Volume)

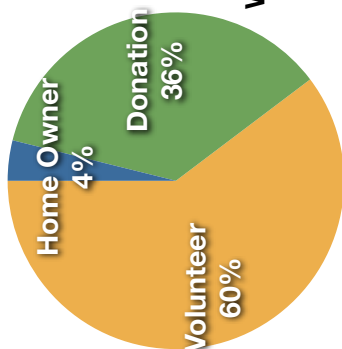
- Pears, variety
- Apples
- Grapes

Oct 1-30

- Pears, winter
- Apples
- Grapes
- Quince

Alberni Valley Gleaning Project, Harvest and Distribution - 2014

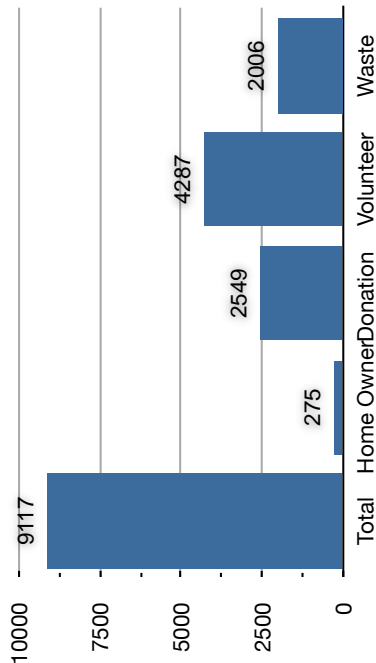
Distribution of Edible Fruit



Waste to Edible Fruit



Total Distribution, Lbs of Fruit



Project Notes

- A total of 44 gleaning 'events' took place; 40 volunteers participated in fruit picking; 2549 lbs of fruit was donated to local charities.
- Home owners kept a very low portion of fruit
- Most of previous years homeowners returned to the program
- 2006 lbs of waste fruit was cleaned up from under trees
- 'Waste' fruit was used for compost and livestock, instead of feeding bears.
- Agencies donated to were the Friendship Center, Salvation Army, Bread of Life and ACAWS
- One ladder was broken beyond repair during an event
- Capital requirements are ladders, stackable storage and transport bins, pole pickers and a dedicated project truck

Budget 2014	Revenue	Expenses
Alberni Valley Transition Towns	1893.75	
AV Bear Smart	161.18	
Alberni Coop Gas Card	100	
Ad, National Volunteer Week		225.75
Ad, Volunteer Orientation		161.18
Brochure Printing		168
Juice pressing for donated juice		17.85
Project Coordinator		1582.15
Total	\$2,154.93	\$2,154.93

Eden Tree Farm and Gardening

6220 Karen Place, Port Alberni, BC

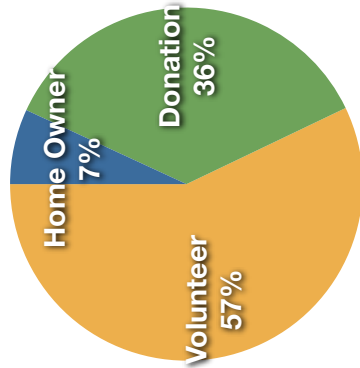
V9Y 8K9

250-724-2175

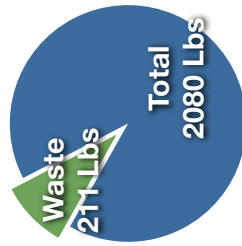
heather@edenreefarm.ca

Alberni Valley Gleaning Project, Harvest and Distribution - 2013

Distribution of Edible Fruit



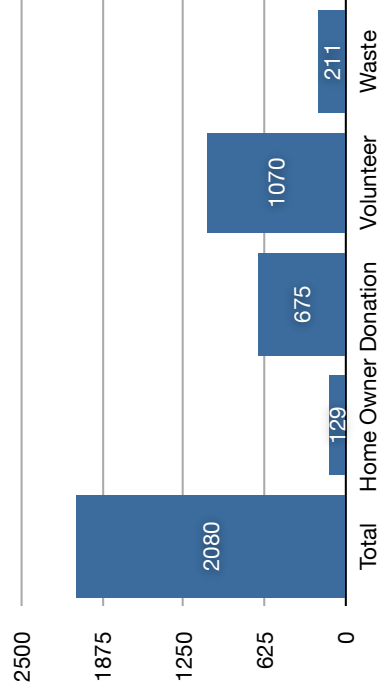
Waste to Edible Fruit



Project Notes

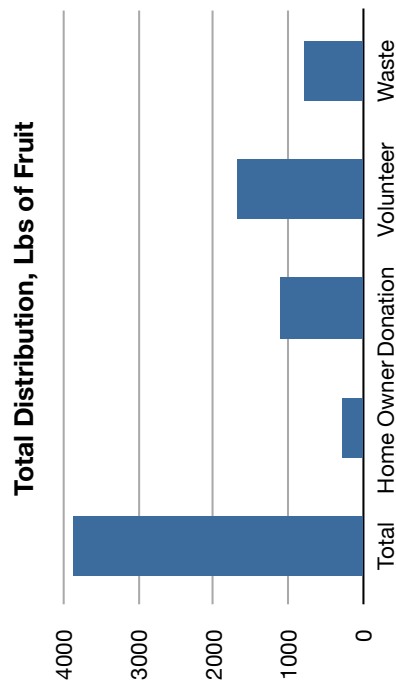
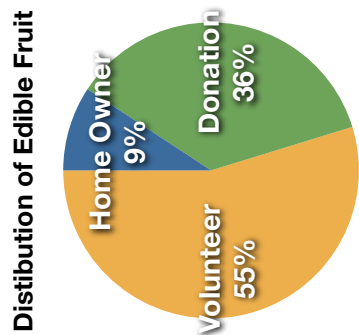
- A total of 22 gleaning 'events' took place; 16 volunteers participated in fruit picking. 675 lbs of fruit was donated to local charities.
- Harvest was down significantly from 2012 (3876 lbs). General reports were of lower quantity of fruit on trees throughout the region.
- 'Waste' fruit was used for compost and livestock.
- Agencies donated to were the Friendship Center and Salvation Army.
- Donations to the Salvation Army included 102 jars of jelly and applesauce that were canned by an independent volunteer with a retail value of about \$430.

Total Distribution, Lbs of Fruit

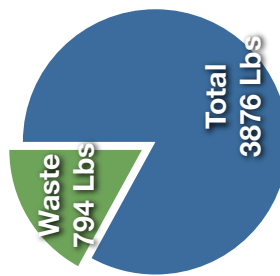


Budget 2013	Revenue	Expenses
West Coast Seeds Fundraising Project	408.67	
Alberni Valley Transition Towns	500	
Alberni Valley Coop Gas Bucks	100	
Professional Harvesting Bags		267.62
Orchard Ladders (2)		229.60
Fruit Press		125
Gas stipend for ladder transport		99
Brochures		196
Project Coordinator		91.45
Total	\$1,008.67	\$1,008.67

Alberni Valley Gleaning Project, Harvest and Distribution - 2012



Waste to Edible Fruit



Project Notes

- A total of 27 gleaning 'events' took place; over 20 volunteers participated in fruit picking.
- Some events included the collection of large amounts of fallen/waste fruit.
- 'Waste' fruit was used for compost and livestock.
- Agencies donated to were the Friendship Center and Salvation Army. Both agencies were able to pick up the fruit after notification.
- Some fruit was sold and we hope to increase the market next year in order to generate capital.
- Capital items still required include boxes, baskets, ladders and tools for harvesting.

Volunteer Orientation

Alberni Valley Gleaning Project, Notes and Orientation 2014

Roles and Definitions

Pick Leader - Trained and experienced volunteer, in charge of the picking team. Preferably with own vehicle for transporting ladders.

Picking Team - Volunteers working together to harvest fruit at designated site/sites.

Event - Any single event where produce is harvested from a single location. One harvesting time slot may have multiple events.

Coordinator - Responsible for responding to offers of trees for harvesting and coordinating the organization of teams to perform the harvest. Also responsible for the final sorting and donation of produce.

General Procedures

- Fruit tree owners contact program coordinator, Heather Shobe, at Eden Tree Farm via email, phone or internet survey when trees are ripe.
- Coordinator notifies scheduled Pick Leader of details of harvesting event. If no-one scheduled the coordinator will send out emails and/or phone calls to other volunteers.
- Pick Leader picks up ladders and tools at Eden Tree Farm before picking.
- Pick Leader sorts fruit after picking, giving home owner up to 1/3 if desired. 1/3 is distributed amongst pickers.
- Fruit is not sorted in accordance to quality, only quantity. All recipients will likely receive a mix of perfect and imperfect fruit.
- Pick Leader returns ladders and tools to Eden Tree farm along with 1/3 of fruit to be donated.

Picking instructions

- Ensure all equipment is in good condition.
- Ensure ladders are safely erected - with the legs secure/level and the tripod open wide enough to make a stable base. Never climb on top rungs, do not reach far from ladder. Don't place tools and buckets on ladder where they may fall onto people below.
- Identify and mitigate site hazards including animals, sink holes, tripping hazards, power lines, bees and wasp nests, broken or weak tree limbs.
- Pick ripe fruit without breaking branches, shaking trees or climbing trees. Put fruit into bins carefully to reduce bruising. Ripe fruit generally falls from tree with a slight lift and turning action.
- Clean up fruit from ground after picking. All fallen fruit must be kept separate and identified when dropped off-it will not be donated but will be used for livestock or compost.
- Rake up ground under trees and put debris where homeowner wants it.

Pick Leaders

- Must be willing to commit to regular picks.
- Must be willing to transport ladders and fruit to and from Eden Tree Farm.
- Must be willing to work with others in a leading role.
- Always notify homeowners of your presence on the property. Ask about hazards and other pertinent info, including dogs, determine how much fruit the homeowner would like and where to put yard waste. If bringing children make sure homeowner is aware and ensure children are respectful.
- Must weigh fruit and record data when dropping off donations and equipment.
- Communicate needs, issues, incidents and concerns to coordinator.

Volunteer Waiver and Sign Up Sheet

Alberni Valley Gleaning Project, Volunteer Sign-up and Release, 2013

By signing I agree that...

- Neither Eden Tree Farm & Gardening or any other Gleaning Project Affiliates nor any related workers, volunteers, tree owners, residents or pretty much anyone else is responsible or can be held liable for any incident or injury sustained while participating in gleaning activities. I can take responsibility for myself!
- I understand the both the general procedures and the safety procedures for the AV Gleaning Project
- I will ask if I have questions and report any safety concerns to the pick leaders immediately.

Name	Signature	Email	Phone and Address	Availability	Notes (kids, truck, ladders, tools, disabilities/skills, preferred picking partners?)

Thank You Letter to Volunteers



Heather Shobe,
Eden Tree Farm and Gardening

6220 Karen Place
Port Alberni, BC V9Y 8K9

250-724-2175
heather@edentreefarm.ca

May 27th, 2013

The Alberni Valley Gleaning Project aims to put unwanted fruit to use in the valley. You are receiving this letter because you either helped pick fruit or expressed interest in helping in 2012.

We had a great first year, harvesting over 3800 pounds of fruit. 1/3 of all fruit harvested was donated to worthy organizations including the Friendship Center and Salvation Army. The program was run entirely by volunteers, with no external funding.

We hope to increase the harvest in 2013. This spring we ran a successful fundraising program and raised about \$400 towards the purchase of better harvesting equipment. There should be no need to harvest with ice cream buckets this year!

Please consider volunteering this year, and help spread the word to others. As in the past year, 1/3 of fruit harvested will go to the homeowner (if desired), 1/3 to volunteer pickers and 1/3 to donations.

There will be a [volunteer orientation on June 12th at 7pm](#) at Eden Tree Farm for fruit pickers. It is strongly recommended that you attend, in order to meet other volunteers you may work with, review safety and harvesting guidelines and offer suggestions for the program. We are looking at ways for volunteers to sell and process some of their fruit, thus earning income if they would like.

As the project grows, we aim to offer pruning workshops or discounts to tree owners. Our vision also includes a community storage and processing facility, gas bucks for volunteer pickers, and a thriving social enterprise.

Please RSVP for the orientation session or let me know if you can't make it but would like to volunteer anyway.

Thank you!

Heather Shobe Alberni Valley Gleaning Project, Eden Tree Farm and Gardening

***AVGP is also sponsored by Alberni Valley Bear Smart and Alberni Valley Transition Towns Society

Thank You Letter to Homeowners



Heather Shobe,
Eden Tree Farm and Gardening

6220 Karen Place
Port Alberni, BC V9Y 8K9

250-724-2175
heather@edentreefarm.ca

May 27th, 2013

The Alberni Valley Gleaning Project aims to put unwanted fruit to use in the valley. Thank you for making your fruit tree(s) available to the program in 2012!

We had a great first year, harvesting over 3800 pounds of fruit. 1/3 of all fruit harvested was donated to worthy organizations including the Friendship Center and Salvation Army. The program was run entirely by volunteers, with no external funding.

We are hoping to increase the harvest in 2013. This spring we ran a successful fundraising program and raised about \$400 towards the purchase of better harvesting equipment.

We hope that you consider donating your trees to the program again this year, and that you help by spreading the word to others. As in the past year, 1/3 of fruit harvested will go to the homeowner (if desired), 1/3 to volunteer pickers and 1/3 to donations.

To participate, simply give us a call at 250-724-2175 when your fruit is getting ripe and we will arrange a time to come and pick it for you, and clean up under the trees.

As the project grows, we aim to offer pruning workshops or discounts to tree owners. Our vision also includes a community storage and processing facility.

If you, or someone you know would like to help harvest fruit, please contact me for more information. We will be having a volunteer orientation on June 12th at 7pm.

Please feel free to send any comments, concerns or questions to my attention as well.

Thank you!

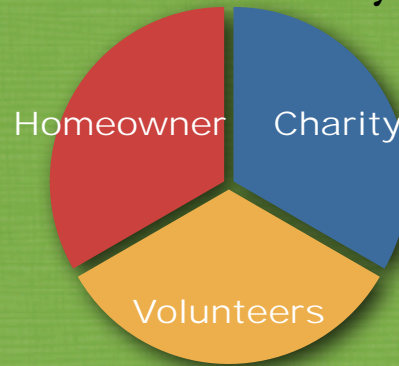
Heather Shobe
Alberni Valley Gleaning Project, Eden Tree Farm and Gardening

***AVGP is also sponsored by Alberni Valley Bear Smart and Alberni Valley Transition Towns Society

Alberni Valley Gleaning Project



**Getting local fruit out
into the community!**



Do you have an organization worthy of and in need of fresh fruit?

Do you have fruit trees that need picking?

Would you like to volunteer to pick fruit in exchange for a share?

Here's what one tree donor had to say...

"I would like to thank you and your volunteers for doing such a wonderful job of picking our apples! The group arrived with all their equipment, picked apples until they ran out, and raked up all the debris, including the previously fallen apples. The children were well-behaved and polite, and quite happily played with the dogs. My husband allowed them to swim in the pool, and they were no problem at all.

Thank you for taking care of our bumper crop--I can now relax and enjoy the rest of the summer. You can be sure I will recommend you and your services to anyone else who has a surplus crop!"

Please email heather@edentreefarm.ca or
call us at 250-724-2175 for more info or to participate

Thank you to all of our sponsors! - AV Bear Smart, AV Transition Towns, AV Coop, Buckerfields, West Coast Seeds/SD 70 parents, tree donors, volunteers and everyone else who has supported this project!