

Our Kelowna as We Take Action

Kelowna's Community Climate Action Plan

June 2018

Letter from the Future

May, 2040

I'm writing this to you as I watch the spring rains that have been pouring out of the sky for the last three days. This is pretty normal for this time of year, but I find myself thinking about how, 22 years ago when I was a kid, this kind of weather seemed so unusual.

I remember waking up one May day in 2017 to find our house surrounded by water while my parents were trying to keep it out of our basement. The news that night said the flooding was a "once in a 200-year event." These days, though, it seems like we're getting these kinds of major weather events every few years. Our winters are shorter with less snow, and followed by incredibly wet springs with hotter, drier summers and more wildfires and pest problems than before.

But thankfully, a lot of improvements have been made over the last 20 years and we're better able to cope with them.

One of the noticeable shifts is how we use our land. Much of Kelowna's growth over the last 20 years has been concentrated in our five urban centres. This has created compact neighbourhoods with great mixes of residential, commercial and recreation space. People don't have to travel long distances to go between the places where they live, work, shop and play so it's a lot easier to get around by walking, biking or transit than it was when I was a kid. We've managed to accommodate the addition of almost 50,000 people while preserving natural areas that may have otherwise been used for houses. And that means those areas are still absorbing carbon, providing critical habitat for at-risk wildlife and contributing to the natural splendor that Kelowna is known for.

While many of the changes Kelowna has made are mitigating the effects of climate change, change is still happening. The changes that have come along with this growth happened over time, but as I stand here today I know that Kelowna is more vibrant, more diverse and has more opportunities than ever before. I am grateful that back in 2018, the community committed to a Climate Action Plan that set us on this course to be resilient and responsive to a changing climate with a goal to preserve our quality of life, now and for future generations.

*Sincerely yours,
Bria Goodneighbour*

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- Public who participated in community conversations through *Imagine Kelowna* and/or provided feedback on getinvolved.kelowna.ca at the end of the project.

Finally, special thanks to FortisBC for co-funding the Plan and providing input on the recommended actions. Images used in this document are used with permission from the authors, unless otherwise indicated. Not for duplication or distribution. All rights reserved.

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Executive Summary

The world is changing. Weather patterns are becoming less predictable, new technologies are emerging and ways of doing things are shifting. Individual and community behaviour must also change to be resilient and thrive.

There is global consensus among climate scientists that climate change is happening, and human activity is the cause.¹ Kelowna must be flexible in in order to cope with the challenges it will present.

Moving towards a low carbon future is a monumental challenge, but also an opportunity to plan for a healthy and resilient environment. With intention, Kelowna can be a dynamic community that embraces diverse transportation options; shifts away from a car-centric culture; grows vibrant urban centres; moves away from sprawl; and protects land, water and air. This will in turn attract jobs in the new global economy, be healthier for citizens, and be resilient in the face of a changing world.

Updating Kelowna's Community Climate Action Plan (the Plan) examines *mitigation* options, those actions that will reduce emissions, that the City can influence and lead to achieve GHG reductions through land use planning, transportation options, building requirements and waste services. The Plan update does not take into account what the City needs to do to *adapt*, or prepare for anticipated climate change impacts.

Between 2007 and 2012², Kelowna's greenhouse gas (GHG) emissions declined 3.5 per cent to approximately 642,000 tonnes (5.4 tonnes per capita). Despite this initial reduction, preliminary data indicates that since 2012 emissions are rising, particularly since fuel consumption has increased.

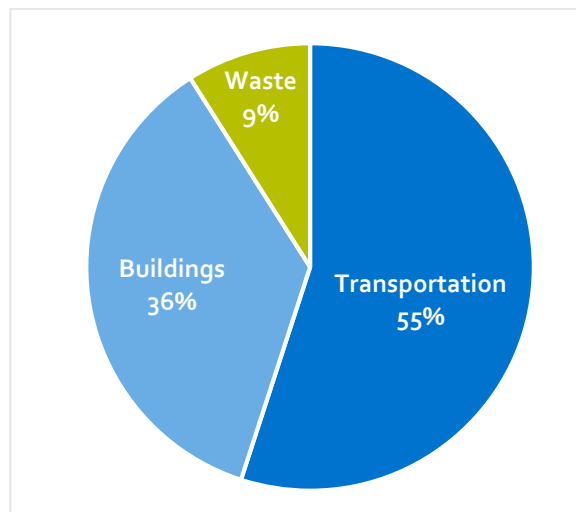


Figure 1: Kelowna's 2012 GHG Emissions
(642,000 tonnes CO₂e)

Converting this information to energy expenditures, in 2012 about \$341 million was spent in the community, about \$3,000 per person per year. Most of this money leaves the community. This Plan will help to keep more of this money local providing direct economic benefits, as well as reducing the community's risk to fluctuating energy prices.

Based on input from the *Imagine Kelowna* process, stakeholder engagement, staff and best practices, 48 actions and 3 ambitious actions have been identified that will help reduce community GHG emissions. While some of the actions are regulatory in nature, others rely on community behavioral shifts as the City provides more opportunities for residents to lead a low carbon lifestyle. The actions are based on the following six themes:

1. *The Way We Get Around* – providing options to reduce vehicle trips and accelerate transition to low carbon transportation options.

¹ Scientific American, 2014. Climate Risks as Conclusive as Link between Smoking and Lung Cancer.
<https://www.scientificamerican.com/article/climate-risks-as-conclusive-as-link-between-smoking-and-lung-cancer/>

² 2012 is the most recent complete set of data available on GHG emissions.

2. *The Energy We Use in Our Buildings* – improving energy performance and reducing GHG emissions in new and existing buildings.
3. *The Waste We Create* – increasing the diversion of waste from the landfill.
4. *Encouraging Renewable Energy* – encouraging the use of renewable energy alternatives.
5. *Planning Our Community* – managing energy and emissions by focusing growth in urban areas so residents and workers are located closer to transit and services.
6. *Other* – other actions that support Kelowna moving towards a low carbon future.

Implementing the recommended actions over the next five years is estimated to achieve an absolute GHG reduction of 4 per cent below 2007 levels by 2023 (equivalent to a 27 per cent per capita reduction).

A short-term target based on what can be achieved in the near future reflects the City's efforts to define an assertive and **pragmatic** path that will slow emissions growth. Further, by including a 2050 target, this ensures **bold leadership** that moves the City towards the long-term provincial target of eighty per cent reduction so that the monumental responsibility is not passed to future generations. Aligned with this direction, three targets are recommended:

Year	Absolute GHG Target	Target as Per Capita Estimate
	Below 2007 levels	
2023	4%	27%
2033	25%	50%
2050	80%	90%

The City of Kelowna will work towards these targets in partnership with: senior governments; local residents and businesses; NGOs; external agencies; and utility providers.

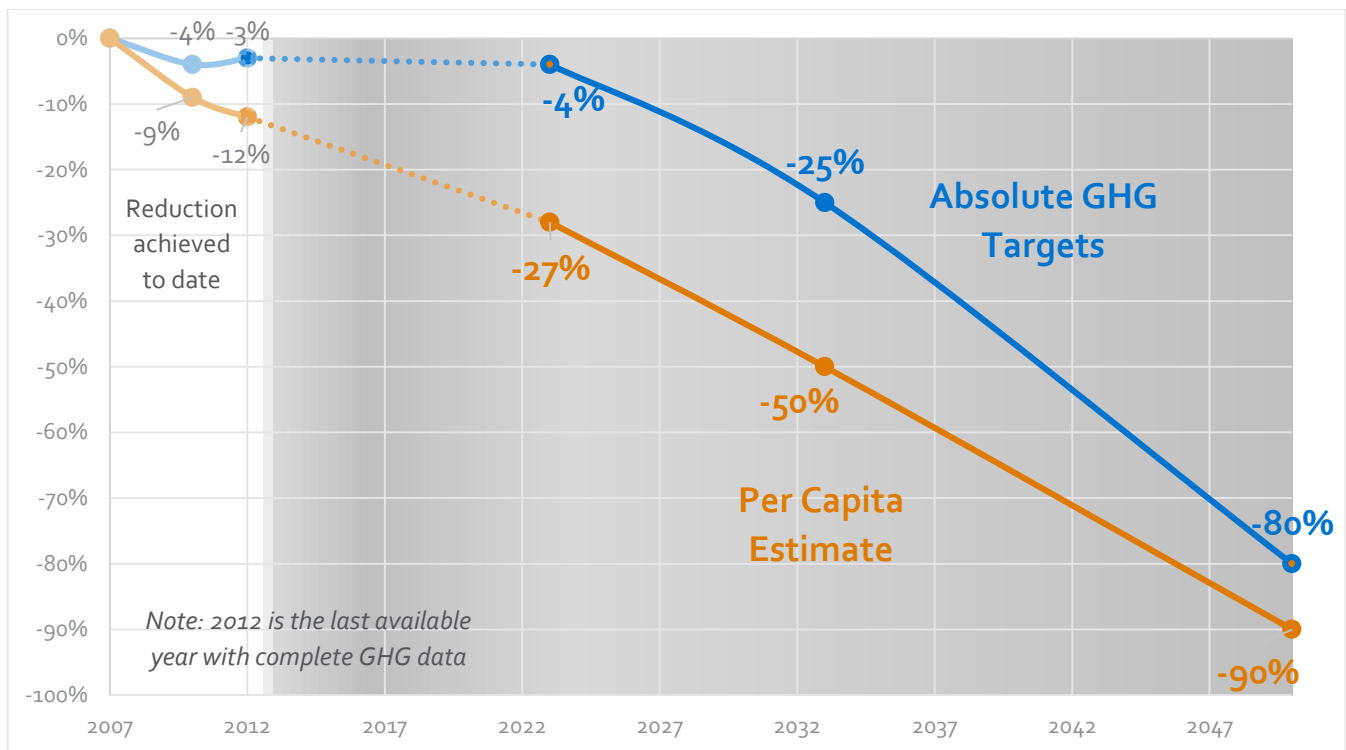


Figure 2: Kelowna's GHG Reduction Targets



The biggest opportunity for emissions reduction are the actions related to transportation, as transportation is the biggest component of Kelowna's community GHG footprint. While benefits related to the other categories may not be as large, they also will have influential impacts in Kelowna.

Table 1: Possible reductions from each category to 2023

Category	Reduction (tonnes)	Percentage of Total Reduction
The Way We Get Around	37,793	72%
The Energy We Use (Buildings)	5,019	10%
The Waste We Create	2,512	5%
Planning Our Community	5,399	10%
Encouraging Renewable Energy	1,808	3%
Other Actions	248	0%
TOTAL	52,779	100%

In addition to GHG savings, the Plan's recommended actions will also reduce energy costs. If no additional action is taken, by 2023 it is anticipated that energy expenditures in Kelowna will reach approximately \$445 million (accounting for population growth and assigning assumptions about future energy prices). However, by implementing the Plan's recommendations, it is

projected that by 2023, energy expenditures will be approximately eight per cent less (\$412 million, a savings of approximately \$34 million annually, or about \$240 per capita per year).

Research demonstrates³ that in order to successfully implement the Plan, Kelowna needs to focus on several key factors including:

1. Establish broad support for implementation.
2. Establish staff and financial capacity for follow through.
3. Institutionalize the Plan by incorporating its direction and objectives into other City plans and monitoring. Key Performance Indicators (KPIs) are important to ensure long-term accountability during the cycles of turnover of personnel that occur in a local government.

Although mitigation measures are essential, it is also essential that the City prepares to join others to respond to the impacts of climate change (climate adaptation). Climate change is no longer a future trend, but requires a community response today. The extreme weather events the community experienced in 2017 emphasize the importance of implementing the Plan's recommendation to "investigate developing a Climate Adaptation Plan for Kelowna."

Although the City can provide leadership on climate action, it is up to everyone, citizens, businesses and senior governments in particular, to do their part to rethink, re-evaluate, and re-imagine the way they lead their lives to making the community and planet a better place for future generations.

Climate change affects everyone, and everyone must do their part. Kelowna has the capacity and community desire to invite change that will benefit the environment, the economy, quality of life, and importantly, the City's resiliency.

³Community Energy Implementation Framework, 2016
[http://gettingtoimplementation.ca/wp-](http://gettingtoimplementation.ca/wp-content/uploads/2016/12/Final-Framework-December72016_online.pdf)

[content/uploads/2016/12/Final-Framework-December72016_online.pdf](http://gettingtoimplementation.ca/wp-content/uploads/2016/12/Final-Framework-December72016_online.pdf)

We've proven Kelowna can do this



Average household natural gas use declined 8% between 2011 & 2015



Average household electricity use declined 10% between 2011 & 2015



20% of sensitive ecosystem land is permanently protected



3,000 trees planted have been planted on private property through Neighbourwoods since 2010.

3.5% decrease in GHG emissions between 2007 & 2012



In 2017, 40% of new residential units were built in the Urban Core.



In 2016, 14% of residents walked, cycled or took transit to work.



In the Central Okanagan, there are over five million transit trips annually!

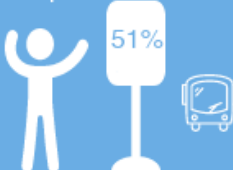
Providing transportation options

280 kilometres of bike lanes



412 kilometres of sidewalks

51% of residents live within 400 metres of a transit stop



*All stats refer to Kelowna unless otherwise specified

Introduction

The world is changing

The world is changing. Weather patterns are changing, new technologies are emerging and ways of doing things are shifting. Behaviour of individuals and communities must change to be current, survive, and succeed.

Despite the challenges, globally the tide is turning. Recently, the US saw three times more employees working in renewable energy than those in fossil fuels.⁴ China's solar and wind capacity continue to grow beyond expected targets⁵ and the Netherlands made a commitment for all new cars to be emission-free by 2030⁶.

Cities play an important role in reducing greenhouse gas (GHG) emissions. Canadian communities influence approximately 60 per cent of energy use and 50 per cent of GHG emissions nationally.⁷ Municipalities can influence and lead emission reductions through land-use planning, transportation options, education, building requirements and waste services.

Locally, Kelowna has seen the impact of a changing climate. In 2017, Kelowna experienced one of its most extreme weather years on record. Record levels of spring precipitation led to historic flooding impacting approximately 3,200 residents in the community. This was followed by one of the hottest and driest July and August periods on record,⁸ factors contributing to a devastating wildfire season and the community blanketed in smoke. As the impacts of climate change continue to grow, these types of extreme weather events are expected to occur more regularly.



Kelowna must be flexible in order to cope with the challenges it will be faced with. Taking action on climate and moving towards a low carbon future will provide benefits such as creating a healthier and more liveable community for people of all ages as well as leveraging external sources of funding to drive local economic development. Challenges include an increase in severe weather events and associated risks of flooding, droughts and forest fires.

It is time to accelerate efforts. Moving towards a low carbon future is an opportunity that will result in a community that residents desire as heard in *Imagine Kelowna*. Implementing the Plan will help the community shift away from a car-centric culture; grow vibrant urban centres; protect land, water and air; and be resilient in the face of a changing climate. While the City can provide leadership, it is up to everyone - residents, businesses, and all levels of government - to do their part. This is a call to action to rethink, re-evaluate, and re-imagine their ways of doing things to make a commitment to build a safe, healthy future for citizens and the planet.

⁴ The Guardian, 25 May 2016. [Global clean energy employment rose 5% in 2015](#).

⁵ Yan, J and Myllyvirta, L, Aug. 24, 2017. Unearthed, [China has already surpassed its 2020 solar target](#). [Unearthed.greenpeace.org/2017/08/25](#)

⁶ Electrek, 10 October 2017. The Dutch government confirms plan to ban new petrol and diesel cars by 2030.

⁷ CEA, QUEST. Community Energy Implementation Framework. http://gettingtoimplementation.ca/wp-content/uploads/2016/12/Final-Framework-December72016_online.pdf

⁸ Castanet. Sep 1, 2017. Hottest, driest on record. <https://www.castanet.net/news/Kelowna/205602/Hottest-driest-on-record>

Community climate action planning

The intent of a Community Climate Action Plan (the Plan) is to:

- Establish and confirm Kelowna's current energy and emissions for transportation, energy and waste;
- Establish short and long-term GHG reduction targets; and
- Develop an action plan with a corresponding implementation strategy.

The Plan examines *mitigation* options, those actions that can be taken to reduce emissions. The Plan does not take into account what the City needs to do to *adapt*, or prepare for climate change impacts that are anticipated regardless of local efforts to reduce GHG emissions.

As a community each year, the buildings, vehicles, and infrastructure within city limits use at least \$34.1 million of energy and emit over 640,000 tonnes of GHGs.⁹ The City of Kelowna is interested in reducing energy dollars exported from the community, in order to enhance local economic development and resilience. In addition, the actions have multiple benefits, ultimately building a forward thinking and vibrant city. The City is also required by the Province to have a community GHG emission reduction target in its Official Community Plan (OCP), with associated actions to work towards that target.

The City of Kelowna adopted its first Community Climate Action Plan in May 2012. It has provided direction to initiatives such as energy efficiency in buildings and transportation options in the community. The 2012 plan needed to be updated in order to:

- Update GHG reduction targets beyond 2020;
- Include *Imagine Kelowna* direction, where residents expressed desire for a community that takes action and is resilient in the face of climate change;
- Update the community's energy & emissions profile; and
- Identify actions for continual incremental progress on GHG reduction.

This is a made-for-Kelowna Plan that considers climate action in its local context and includes realistic actions. Its focus is for specific actions that the City can lead to help the community reduce its GHG footprint and achieve other benefits including economic development, community health and livability, and enhanced resilience. In addition to its actions, the Plan will inform the OCP update and other plans, policies, and decisions made by the City.

One challenge is the rapid pace of change in the field of climate action. Technological advancements, best practices, funding sources, and legislation are all changing and accelerating. It is impossible to predict what will be feasible in five years.

Although commissioned by the City of Kelowna, the Plan acknowledges that the participation of senior levels of government, FortisBC, the Community Energy Association, as well as businesses, stakeholders, organizations, and the public, are essential to realize the benefits that the Plan can bring.

⁹ Data sourced from the Province of BC's Community Energy & Emissions Inventory for Kelowna (<https://www2.gov.bc.ca/assets/gov/environment/climate-change/data/ceei/2012-ceedi->

[reports/ceei_2012_kelowna_city.xls](#)), and transportation fuel sales data from Kent Marketing. Calculations conducted by CEA.

The role of governments

Nationally, the 2016 Pan-Canadian Framework on Clean Growth and Climate Change set the stage for the Federal government, demonstrating that it will support climate action across Canada through a wide number of ways.¹⁰ The Federal government has committed to reducing Canada’s GHG emissions by 30% below 2005 levels by 2030.¹¹ Actions that can be taken at the federal level include vehicle fuel efficiency standards, model national building codes, energy ratings and national carbon price.

Provincially, BC’s 2016 Climate Leadership Plan establishes a GHG reduction target of 80 percent below 2007 levels by 2050 and requires rapid implementation of various actions. These include sourcing clean and renewable electricity, incremental steps in the BC Building Code to make buildings net zero energy ready by 2032, tailpipe emission standards and continuing use of a carbon tax.¹²

At the local level, over 120 communities in BC have community climate action plans outlining actions to influence GHG emission reductions. Local governments have varying degrees of influence

over different sources of GHG emissions in their boundaries, as shown in Figure 3. To be successful, actions will require leadership and/or support from higher levels of government as well as shifts in behaviour from residents and businesses.

The role of agencies and businesses

Agencies and businesses also have significant influence over GHGs through their plans and operations. In addition, many groups have demonstrated leadership and innovation with GHG reductions, such as educational institutions providing training in new technologies, health associations divesting from fossil fuels, and businesses using innovative techniques to save on energy consumption.

The role of citizens

The behaviours that cause GHG emissions are often many small impacts that occur regularly over time, by many people. It is incumbent on all of us to do what we can do, and recognize that small behaviour changes, undertaken over time by many people, will have significant and important changes towards the goals of emission reductions and ultimately climate change. This plan requires a community effort to be successful.

Direct Control	Direct Influence	Indirect Influence	Little Influence
Municipal infrastructure, buildings & fleet	Transportation network Land use patterns Solid waste Building efficiency standards	Transportation mode share Residential & business energy efficiency Food security	Air travel Industrial energy efficiency Vehicle standards Energy utilities

Figure 3: How local governments can influence GHG emissions

¹⁰ Government of Canada. Pan-Canadian Framework on Clean Growth and Climate Change.
<https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/climate-change-plan.html>

¹¹ Government of Canada. [Progress towards Canada’s greenhouse gas emissions reduction target](https://www.canada.ca/en/services/environment/weather/climatechange/progress-towards-canada-greenhouse-gas-emissions-reduction-target).

¹² Province of BC. Climate Leadership Plan.
https://climate.gov.bc.ca/app/uploads/sites/13/2016/10/4030-CLP_Booklet_web.pdf

Developing the Plan

In order to complete the Plan, a five stage approach was developed as described below and outlined in Figure 4:

- Phase 1:
 - Public engagement, (through *Imagine Kelowna*);
- Phase 2:
 - Community energy and emissions inventory;
 - Business as Usual (BAU) projections;
 - Council direction;
- Phase 3:
 - Drafting potential actions;
 - Modelling draft action impacts;
 - Creating draft targets;
 - Review with staff and Council;
- Phase 4:
 - Refining the actions and targets with input from staff, stakeholders, and the public; and
- Phase 5:
 - Drafting and presentation of the Plan.

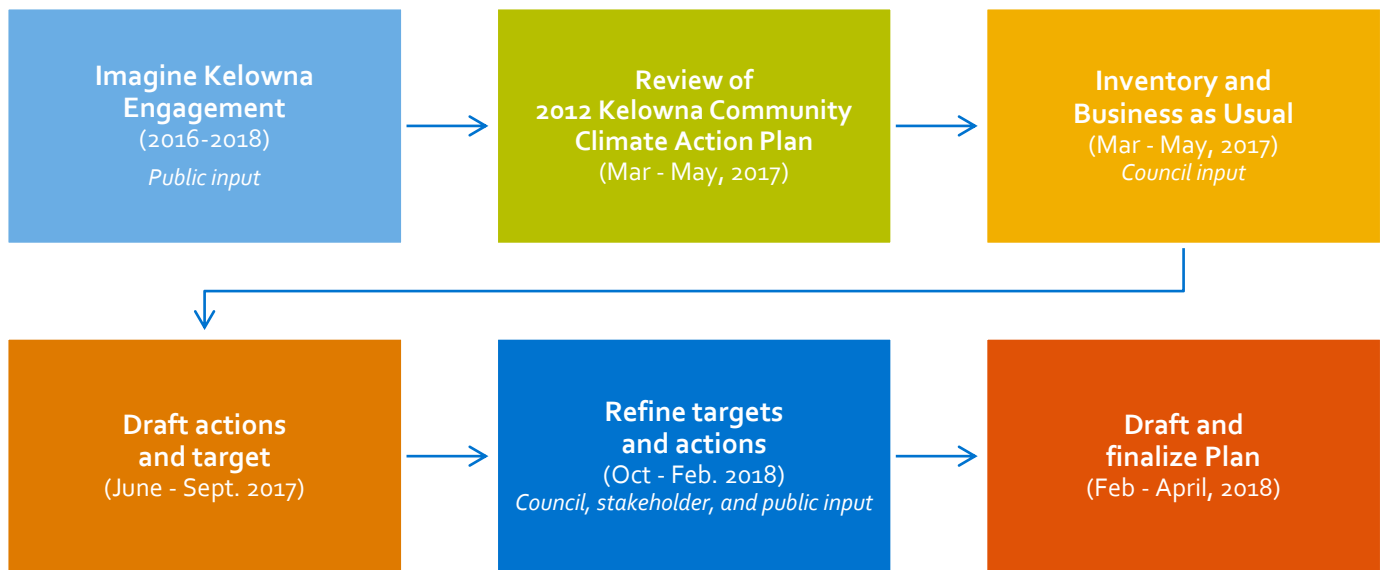


Figure 4: Community Climate Action Plan Development Process

Engagement

To ensure the Community Climate Action Plan was well-informed and shaped both by members of the public and key stakeholders, the City offered a variety of opportunities throughout the project to engage residents and gather feedback. Appendix 5 provides more details of engagement activities that took place during the development of the Plan.

Consultation was supported through the *Imagine Kelowna* process; the most comprehensive community dialogue the City has ever done. One of the goals identified during this process was “Take action and be resilient in the face of climate change.” This exercise also identified other goals aligned with emission reductions including:

- “Embrace diverse transportation options to shift away from our car-centric culture”; and
- “Concentrate on growing vibrant urban centres and stop facilitating urban sprawl.”

Two of the “On Point” discussion sessions hosted through the *Imagine Kelowna* process provided additional direction for the Plan.

- Climate Change “On Point”, 136 attendees discussed what behaviors they could change and what the City could do to support that change. The overall sentiment was: *“We can individually make incremental adjustments, but we need our City to take the lead to initiate*

large-scale action on climate change.”

Attendees provided action ideas on energy, transportation, policy and lifestyle.

- Transportation “On Point”, 110 people attended and the overall sentiment was: *“Let’s design our future with the pedestrian, cyclist, and transit-goer in mind.”* Attendees identified actions to help meet this objective.

Stakeholders were consulted during a half-day workshop on Nov. 30, 2017 to gather input on the draft targets and actions. Sixteen stakeholders representing fourteen organizations reviewed the draft targets and actions, provided input, and identified additional actions. Additionally, FortisBC was consulted through the Plan’s development.

The public had a final opportunity to review the draft actions and targets through an online discussion. There were nearly 440 unique visits to getinvolved.kelowna.ca between February 6 and 22, 2018 with 38 engaged visitors, 137 informed visitors and 359 aware visitors.

Further, twice during the development of the Plan process, workshops were hosted to gather input from Council on the Plan’s direction.

Overall, the input, in conjunction with best practices, helped inform the actions and policy direction identified in the Plan.



The Case for Community Climate Action Planning

Community climate action planning has numerous benefits, in addition to the reduction of GHG emissions. A plan can meet legislative requirements, help drive economic development, create a healthy and livable city, reduce energy consumption, provide social benefits, manage risks and leverage external sources of funding. This is why over 200 communities in Canada, representing over 50 per cent of the population, have a community climate action plan.¹³

Legislative Requirements

Through the *Green Communities* legislation, the Province of BC amended the *Local Government Act* and *Community Charter* to require municipalities to have GHG reduction targets, and actions and policies for achieving those targets in their OCPs.¹⁴

For the City of Kelowna, updating the Community Climate Action Plan is essential to properly comply as the current target only goes until 2020.

Further, in 2007 the Province also established a voluntary Climate Action Charter. By signing this, local governments acknowledge that they and the Province each have an important role in addressing climate change, and make a commitment to create complete, compact, and energy efficient communities. Kelowna is one of 182 local governments that have signed it to date.¹⁵

"It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change."

– Charles Darwin

¹³ CEA, QUEST, Smart Prosperity. Getting To Implementation in Canada. <http://gettingtoimplementation.ca>

¹⁴ West Coast Environmental Law. Bill 27: opportunities and strategies for green action by BC local governments. www.toolkit.bc.ca/sites/default/files/WCEL_Bill27_Opports_and_Strategies_for_Green_Action.pdf

¹⁵ Ministry of Municipal Affairs and Housing. BC Climate Action Charter.

Driving economic development

Driving economic development is the primary interest for most communities in developing a community climate action plan. Communities see opportunities to reduce the number of energy dollars exported from the community. Each person in Canada spends about \$2,000-4,000 per year on energy,¹⁶ (estimated at \$3,000 per year in Kelowna) most of which leaves the community. Conservation helps residents and businesses reduce costs, and increases money available to spend on local goods and services. Local energy generation creates local jobs.

Further, through leadership, Kelowna can be promoted as an environmentally-conscious community which will help attract green businesses, innovation and people, building on momentum and opportunity. For example, the Rack Force GigaCenter located itself in Kelowna in 2009 partly due to the Province of BC securing a low-GHG supply of electricity.¹⁷

Healthy and livable community

Actions to reduce GHG emissions also support the creation of a healthy and livable city including:

- Good air quality through reduced air pollutants;
- Sustainable transportation options;
- Quality housing by building more energy efficient homes;
- Access to healthy food through protecting local agriculture; and
- Increasing the urban tree canopy.

http://www.cscd.gov.bc.ca/lgd/greencommunities/climate_action_charter.htm

¹⁶ CEA, QUEST, Smart Prosperity. [The Value Proposition / Environmental, Health and Economic Benefits](http://www.valueproposition.ca/).

¹⁷ Newswire. RackForce's New GigaCenter(TM). <https://www.newswire.ca/news-releases/canadas-first-large-scale-green-data-center-opens-its-doors-538095071.html>

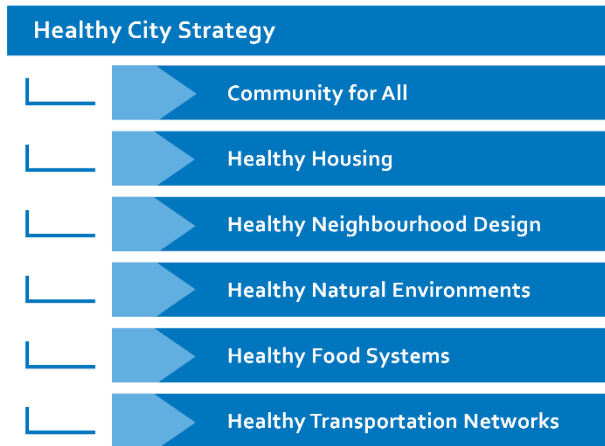


Figure 5: Taking action on climate contributes to all aspects of a healthy City

Taking action on climate can contribute to all aspects of a healthy city. The City of Kelowna and Interior Health Authority have partnered to develop a Healthy City Strategy, a long term, integrative plan that focuses on healthy places and spaces, community health, and quality of life for all Kelowna residents.

Health benefits

Strategies that address climate change can also improve physical and mental health and reduce demand on the healthcare system. For example, active transportation can reduce obesity while at the same time improving mental health. Adding insulation to a home to reduce energy demand can also decrease respiratory and cardiovascular disease.

Reducing energy consumption

Apart from immediately saving costs for residents, reducing energy consumption also benefits energy customers in the long-run. When utility companies can defer investments in new infrastructure, it helps to keep rates lower.

Social benefits

In Kelowna, the cost of housing is increasing and income isn't keeping pace. In both rental and ownership categories, many Kelowna residents are

spending over 30% of their annual income on housing costs.

Transportation and housing choices represent the two largest expenditures for most working households. Encouraging affordable housing that factors in transportation costs is key to creating affordability for residents. Creating compact and complete communities in the City's urban core can increase proximity to work and amenities and reduce the need for vehicle ownership.

Additionally, with increasing energy prices, utility costs can be a significant portion of shelter costs. Improving energy efficiency can reduce these costs.

Managing risks

In a changing world, communities need to be flexible in order to be resilient, survive and succeed. Reducing energy consumption reduces exposure to financial risk from fluctuating energy prices which are caused by external factors outside of the City's control, such as commodity price fluctuations, geopolitical events, and legislation including carbon price increases. Further, by anticipating changing weather patterns and severe weather events, it reduces exposure to physical risks.

A small outlay in community resources will lead to significant risk reduction and the realization of significant co-benefits to the community.

Leveraging external sources of funding

Finally, an increasing number of funding sources are available for climate action initiatives. Communities with a community climate action plan and corresponding targets can leverage these sources of funding and realize multiple benefits for Kelowna, its residents and businesses.

Where We Are Now

Creating the inventory

The project team collected data for Kelowna’s energy and emissions inventory from a variety of sources as outlined in Appendix 2.

The main source was the Province of BC’s Community Energy & Emissions Inventory (CEEI) for Kelowna for 2007, 2010, and 2012 (the most up to date data available). Fuel sales data to 2016 supplemented the CEEI inventories to provide Kelowna’s emission inventory.

Due to challenges in data collection, it is important to note that commercial vehicle fleet emissions are greatly underestimated,¹⁸ and emissions from large industrial facilities have not been made public by the Province for privacy reasons¹⁹.

Kelowna’s current GHG emissions

As shown in Figure 6, Kelowna’s 2012 community GHG emissions were over 642,000 tonnes (5.4 tonnes per capita). The bulk of emissions are due to vehicles, followed by buildings and waste.

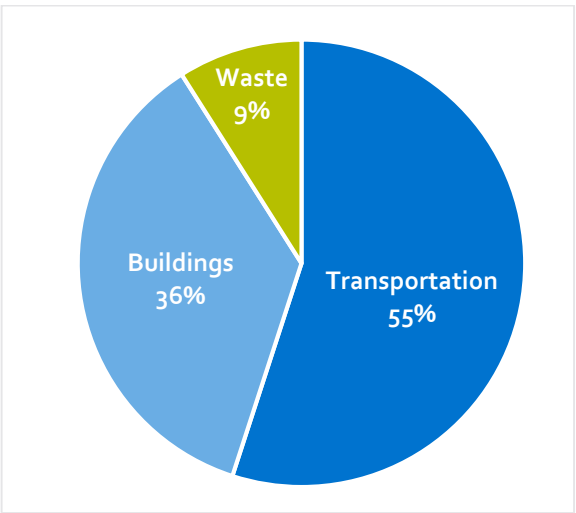


Figure 6: Kelowna's 2012 community GHG emissions 642,000 tonnes, CO₂e

As shown in Appendix 2, emissions in 2012 represent a 3.5 per cent decrease from the 2007 baseline (equivalent to a 12 per cent per capita reduction).

This overall decrease is due to lower consumption of gasoline for transportation. Overall emissions from electricity also decreased due to lower emissions per kilowatt hour, which more than compensated for an increase in electricity volume.

Included in this inventory are the City of Kelowna’s corporate GHG emissions. These are the emissions that are a product of the buildings, vehicle fleet, and infrastructure owned and managed by the City. At 8,083 tonnes in 2012, these emissions comprise about 1 per cent of the community GHG footprint.

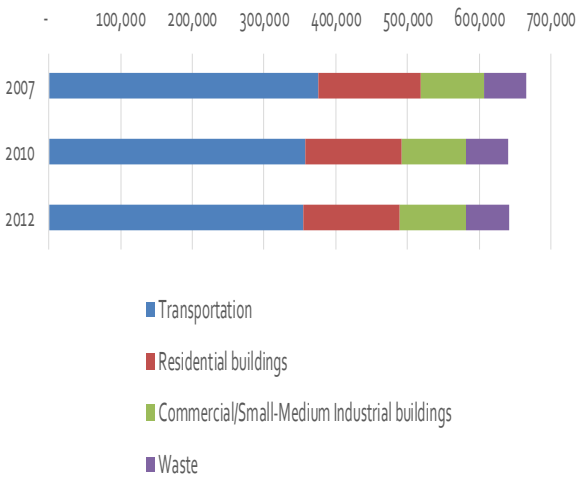


Figure 7: Comparison of Kelowna's GHG Emissions, 2007, 2010 and 2012

¹⁸ Based on a previous release of the CEEI data, and making assumptions based on population growth, these may have been about 120,000 tonnes in 2012.

¹⁹ These emissions are unknown.

Kelowna’s current energy expenditures

As shown in Figure 8, in 2012, Kelowna’s community energy expenditures were \$341 million, or about \$3,000 per person per year, most of which leaves the community. The bulk of expenditures are due to transportation fuels, followed by electricity, natural gas, with the remainder split between wood, propane, and heating oil.

Despite the decrease in GHG emissions, dollar expenditures in 2012 increased by 18 per cent compared to 2007 as illustrated in Figure 8. When adjusted for inflation, this is an 8 per cent increase compared to 2007 (equivalent to 3 per cent per capita increase). This is due to higher prices of all forms of energy except for natural gas which decreased. While overall gasoline consumption decreased, this was outweighed by the increase in its price.

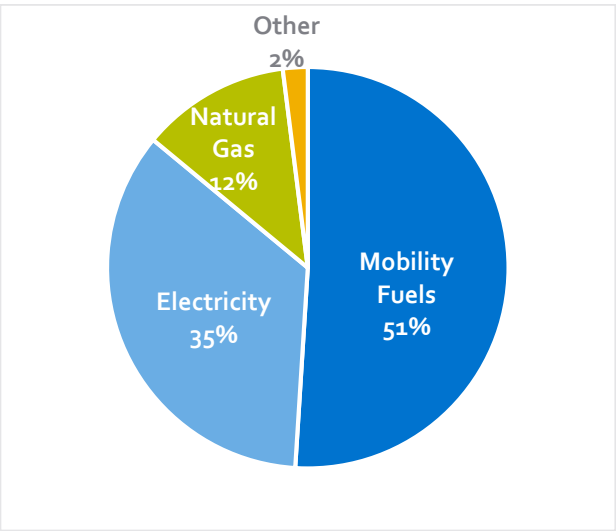


Figure 9: Kelowna's 2012 community energy expenditures \$341 million

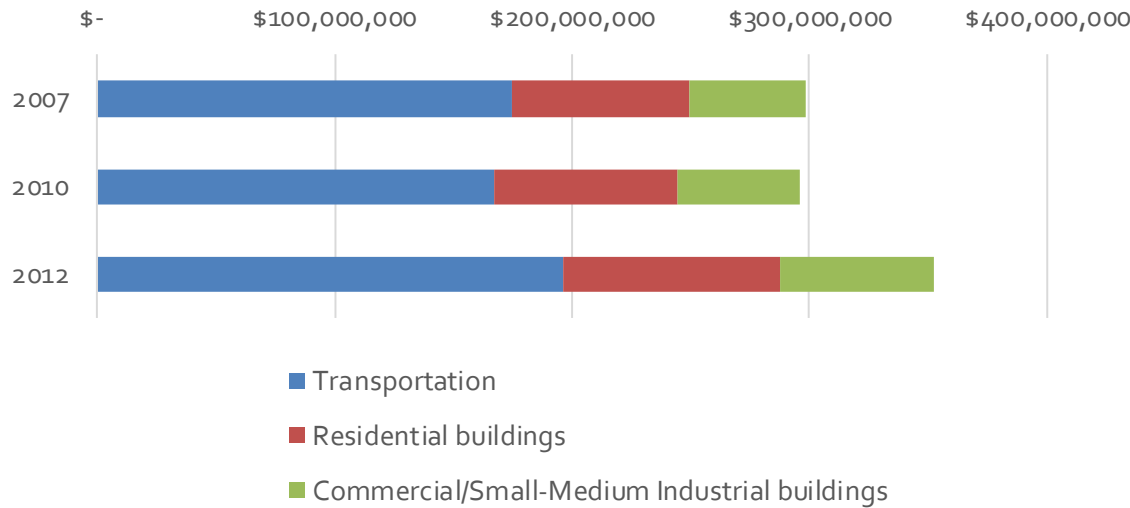


Figure 8: Comparison of Kelowna’s community energy expenditures 2007, 2010, 2012

Business as usual scenario

As illustrated in Figure 10, the business as usual scenario shows that if no action is taken and all other things remain equal, it will be increasingly difficult to reduce absolute GHG emissions. (Appendix 3 provides information on how the business as usual scenario was calculated).

Despite decrease in emissions between 2007 and 2012, preliminary data indicates that emissions are rising. This is illustrated in the business as usual scenario as data shows that fuel consumption has increased between 2012 and 2017.

Therefore, it is imperative to take action to reduce GHG emissions.

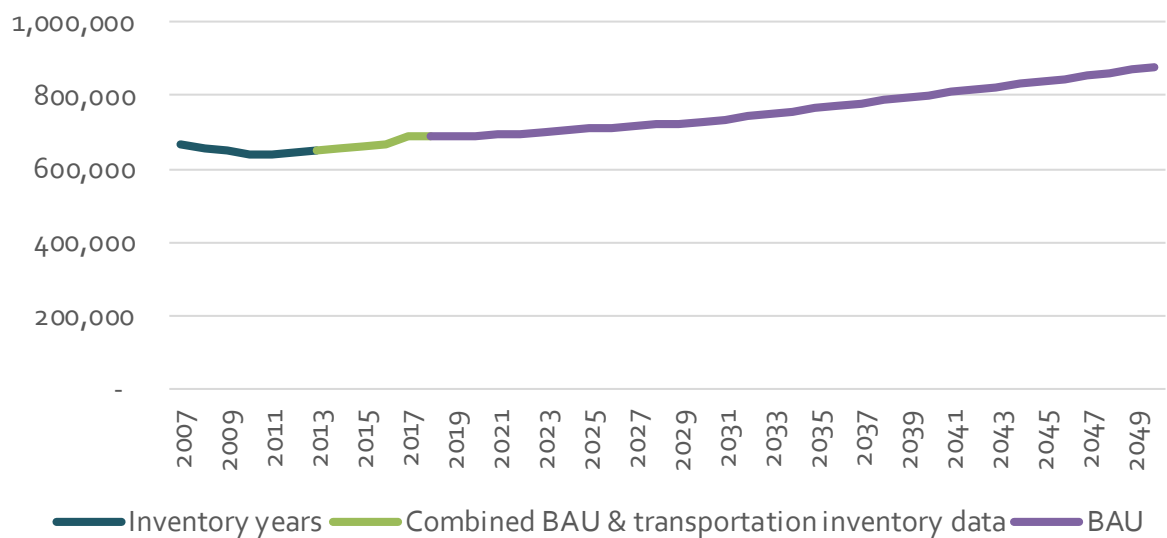


Figure 10: Inventory and modelled business as usual projection

Recommended Actions

Based on input from the *Imagine Kelowna* process, stakeholder engagement, staff and best practices, 48 actions and 3 ambitious actions have been identified that will help reduce community GHG emissions. The actions presented in this Plan focus on where the City can show leadership from a jurisdictional perspective and provide opportunities for the community to take action.

Not all opportunities to influence energy and emissions across a community are equal. As a general rule it makes sense to reduce demand as much as possible first, since the best business cases are usually through improving efficiency.

The actions are based on the following themes:

1. *The Way We Get Around* – providing options to reduce vehicle trips and accelerate transition to low carbon transportation options.
2. *The Energy We Use in Our Buildings* – improving energy performance and reducing GHG emissions in new and existing buildings.
3. *The Waste We Create* – increasing the diversion of waste from the landfill.
4. *Planning Our Community* – managing energy and emissions by focusing growth in urban areas so residents and workers are located closer to transit and services.
5. *Encouraging Renewable Energy* – encouraging the use of renewable energy alternatives.
6. *Other* – other actions that support Kelowna moving towards a low carbon future.



Actions in each category are classed as:

1. *Actions in progress* – these actions have been initiated and will continue over the span of the Plan.
2. *Actions to implement* – these actions are recommended to be executed as part of the Plan implementation and staff and/or resources are available to support implementation.
3. *Actions to investigate* – these actions require further investigation to fully assess implications before implementation.
4. *Actions to support* – these are led by external organizations and the City would support.

The Way We Get Around

Embracing diverse transportation options

Providing options to reduce reliance on single occupant vehicles and accelerate the transition to low carbon transportation options is essential as Kelowna is one of the most car dependent cities in Canada²⁰. Transportation forms 55 per cent of Kelowna's GHG emissions, and 51 per cent of its community energy expenditures.

Figure 11 demonstrates a hierarchy for opportunities to reduce emissions from the on-road transportation sector. Good community planning principles can help further decrease emissions by reducing reliance on automobiles (see Planning Our Community actions).

The actions recommended to reduce transportation emissions reflect the community's draft goal *"to embrace diverse transportation options to shift away from our car-centric culture"* as heard during *Imagine Kelowna* engagement.²¹ Further, the actions build on participants' suggestions heard during the *Imagine Kelowna* On Point discussions on climate and transportation:

- "Increase parking costs / reduce parking
- Build more bike paths and bike lanes
- Increase dedicated bike / multi-use paths by allocating more resources in the annual budget and making active transportation a priority
- Improve transit systems by establishing consistent schedules and affordable rates
- Embrace autonomous vehicles
- Support car share and car pooling²²."

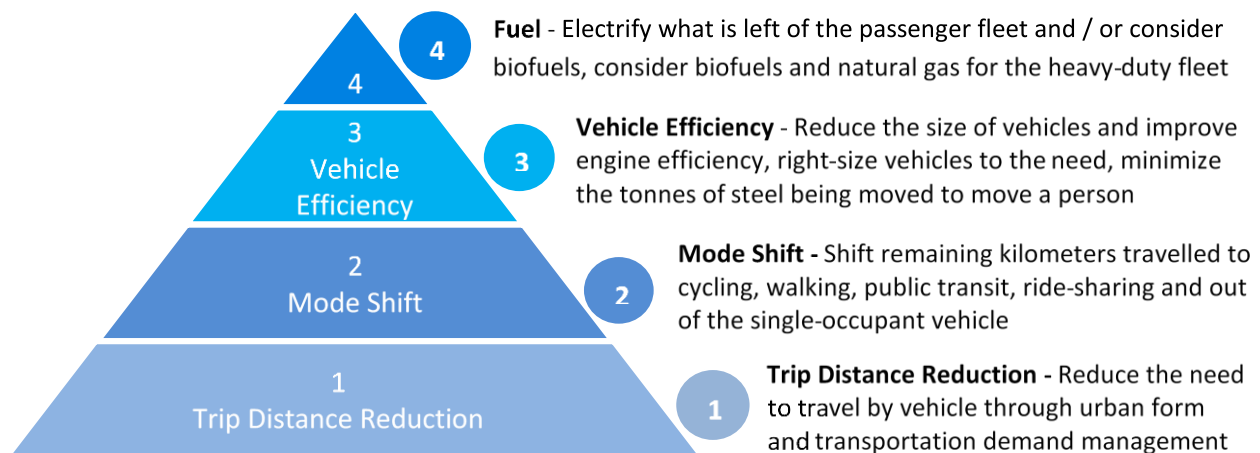


Figure 11: Suggested steps in energy planning for transportation (Source: CEA)

²⁰ Imagine Kelowna. Draft Vision.
<https://kelownapublishing.escrimemeetings.com/filestore/am.ashx?DocumentId=11131> Page 8

²¹ Imagine Kelowna. Draft Vision, Values and Principles.
<https://imagine.kelowna.ca/document/imagine-kelowna-draft-vision-values-and-principles>

²² Imagine Kelowna. On Point Event Summaries.
<https://imagine.kelowna.ca/document/point-event-summaries>



Citizens also identified traffic flow management as a top priority in the recent 2017 Citizen Survey, however traffic congestion cannot be solved just by building more roads. In fact, history has shown new roads give people more incentive to drive and quickly fill up²³, adding even more emissions. Further, with Kelowna's population expected to increase by 50,000²⁴ by 2040, there isn't sufficient land or money available to build enough roads to ensure all vehicles can move freely and parking is always available.²⁵

The recommended actions focus on making public transit and active transportation convenient transportation choices for all ages and abilities. These types of actions are excellent ways to reduce emissions, enhance livability, and reduce costs. It is anticipated that rapid changes with car-sharing, ride-sharing, and new technologies like electric and autonomous vehicles will bring additional opportunities in the near future, and may present new challenges. As heard in the stakeholder workshop, while electric vehicles may appear to be a silver bullet in solving transportation emissions, they would still have the same issues of congestion and the need for expensive road construction and parking.

The Cost of Roads

Roads are much more expensive to maintain than active transportation pathways. In Kelowna, the approximate cost of maintaining 1 km of roadway is \$2,700 per lane km and \$1,074 for 1 lane km of multi-use pathway.

(Source: City of Kelowna, Road improvements enroute News Release – May 16, 2017)

Table 2: Recommended transportation actions

Action #	Action
<i>Actions ongoing or in progress</i>	
T1	Implement policy actions from the Pedestrian and Bicycle Master Plan.
T2	Implement capital projects from the Pedestrian and Bicycle Master Plan.
T3	Through the development of BC Transit's Transit Future Action Plan and its implementation, continue improving public transit service delivery.
T4	Develop a disruptive mobility strategy that aims to identify, analyze and plan for the impact of technological advances and trends in transportation (e.g. self-driving electric vehicles) on the future of the Central Okanagan and ensure that GHG reduction potential is maximised.
<i>Actions to implement</i>	
T5	If successful, expand the pilot community bike share program.

²³ Ewing, R. & Proffitt, D., 2016. Improving decision making for transportation capacity expansion. Transportation Research Record, 2568, page 1.

²⁴ City of Kelowna, OCP 2040 Population and Housing Facts in Focus

²⁵ Imagine Kelowna. Draft Vision, Values and Principles. <https://imagine.kelowna.ca/document/imagine-kelowna-draft-vision-values-and-principles>

Action #	Action
T6	Develop a community wide electric vehicle (EV) strategy. The strategy should include standards for City capital (i.e. parkades, parks, facilities), policies for development projects to include EV technology and infrastructure, and opportunities for other electric transport (e.g. e-bike and e-scooters) to charge.
T7	Update the Zoning Bylaw to restrict drive-through uses in all applicable zones (include food, financial institutions, pharmacy, liquor) as they restrict walkability and encourage idling.
T8	Through the Travel Demand Management Review project, identify opportunities to improve upon and enhance the effectiveness of Kelowna's current TDM program. Implement the project recommendations once complete.
T9	Implement an anti-idling bylaw as outlined in the Clean Air Strategy.
T10	Investigate regulations and incentives for improvements to the City parking system to prioritize the use of alternative transportation modes.
Actions to investigate years	
T11	Investigate options to integrate alternative fuels into fleets such as: <ul style="list-style-type: none"> • City fleet • City contracted services and/or • BC Transit
T12	Investigate options for a regional fuel tax to support the expansion and improvement of the regional transit system and/or alternative forms of transportation as part of the Sustainable Transportation Partnership of the Central Okanagan (STPCO) and/or the Regional Transportation Plan.
Actions to Support	
T13	Support ride-hailing and ride-sharing services to increase the travel options available and encourage overall reductions in vehicle kilometers traveled (VKT).

The Energy We Use in Buildings

Increasing energy efficiency

Buildings and the energy they use are responsible for 36 per cent of Kelowna’s GHG emissions, and 49 per cent of the community energy expenditures.

Similar to transportation, there is a hierarchy of opportunities to reduce emissions from buildings, as illustrated in Figure 12.

The first and best way to reduce building energy consumption is through efficiency. As 72 per cent of the homes in Kelowna were constructed prior to 2000,²⁶ this represents an excellent opportunity for energy savings through retrofits.

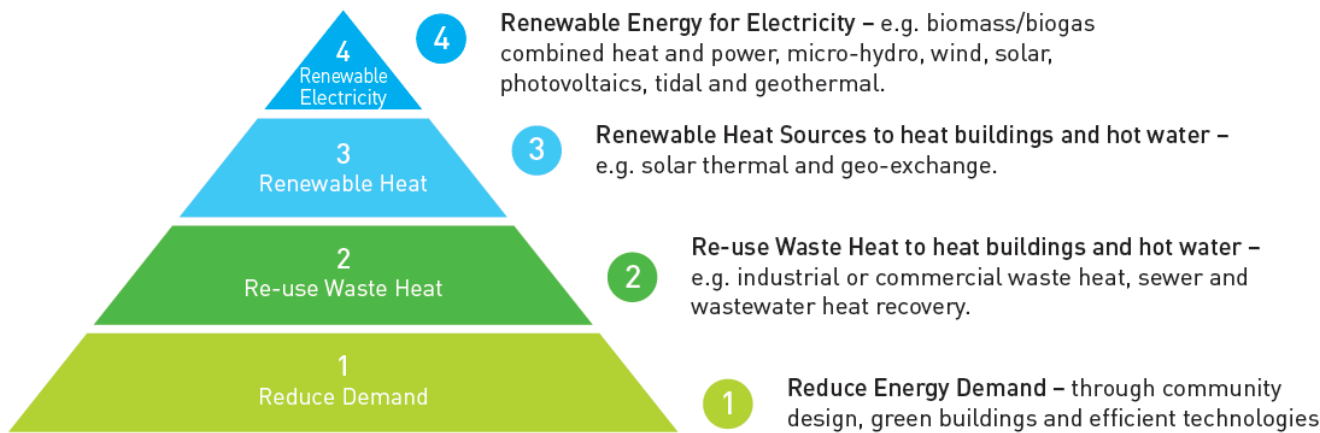


Figure 12: Suggested steps in energy planning for building and energy supply (Source: BC Hydro)

²⁶ Statistics Canada, 2016 Census.

Further, Kelowna sees substantial construction of new buildings to accommodate its growing population, with over 2500 permits issued for residential units in 2017 alone.²⁷ It is far more economical to build efficiently than to retrofit a building later, and once built, a building lasts for decades. Fortunately, in collaboration with organizations including the Canadian Home Builders' Association of BC and the Urban Development Institute, the Province of BC has developed an Energy Step Code that communities can sign-on to in order to encourage or require more efficient new construction.²⁸

The recommended actions build on the input provided during the *Imagine Kelowna* "On Point" session on climate including suggestions to:²⁹

- "Provide incentives for businesses, residences, developers to improve energy efficiency

- *Provide rebates for sustainable purchases like high efficiency appliances and solar*
- *Look at building codes with green initiatives*
- *Require developers to do more on alternative energy."*

The BC Energy Step Code

The Province of BC has committed to taking steps to make all new buildings net zero ready by 2032. To help communities prepare and to allow them to encourage or require new construction to be more energy efficient than the BC Building Code in a consistent way, it has developed the BC Energy Step Code. Communities can use the Step Code to encourage or require new buildings to be built to energy efficiency steps that are beyond the base code, and gives builders great flexibility in how they can do this.

Table 3: Recommended building actions

Action #	Action
Actions ongoing or in progress	
B1	Partner with FortisBC on delivery and promotion of conservation and energy management programs, including New Home, Energy Conservation Assistance Program, Rental Apartment Efficiency Program, Commercial Custom Design Program and other residential and commercial rebates and offers.
B2	Engage the building community on the regional Energy Step Code implementation strategy.
B3	Develop educational offerings to support a smooth transition to Energy Step Code implementation.
Actions to implement	
B4	Develop a community energy retrofit strategy including regulation and incentives to encourage existing building stock to become more energy efficient.
B5	Update Kelowna's Building Bylaw to reference the Energy Step Code as a city-wide requirement for Part 9 buildings with an adoption timeline of Step 1 by April 2019, graduating to Step 3 by October 2020 (carriage houses would require Step 2 compliance at this time).

²⁷ City of Kelowna, Building Permit Issuances Quarterly Report 2017

²⁸ Province of BC. BC Energy Step Code.

<https://www2.gov.bc.ca/gov/content/industry/construction-industry/building-codes-standards/energy-efficiency/energy-step-code>

²⁹ Imagine Kelowna. On Point Event Summaries.

<https://imagine.kelowna.ca/document/point-event-summaries>

Action #	Action
B6	Relax the setback requirements in Kelowna's Zoning Bylaw to ensure thicker walls to accommodate more insulation (common to buildings constructed to Steps 4 and 5 of the Energy Step Code).
B7	Create a building permit fee rebate program for part 9 buildings to incentivize projects achieving Steps 4 and 5 of the Energy Step Code.
<i>Actions to investigate</i>	
B8	Investigate updating the OCP Development Permit Guidelines to be more inclusive of building energy efficiency.
B9	Investigate options for implementing the Energy Step Code for Part 3 buildings once the Province makes it available for referencing in local policies and regulations.
B10	Investigate adopting the higher steps (4 and 5) of the Energy Step Code once the Province makes it available for referencing in local policies and regulations, and after the lower steps (1 to 3) have been adopted.
B11	Investigate financing models and other funding sources that would support city-wide deep energy retrofits.

The Waste We Create

Managing solid waste

Although waste is only 9 per cent of Kelowna's GHG footprint, actions to reduce emissions from this source provide other benefits including prolonging the lifespan of landfills, and the creation of useful by-products such as compost.

During the *Imagine Kelowna* On Point discussion on climate, attendees suggested they wanted the City to:

- "Provide a home compost pickup / drop off"³⁰

This suggestion is also addressed as an action to investigate as part of the 2017 Solid Waste Management Plan.

GlenGrow and OgoGrow

The City of Kelowna creates two compost products at the Glenmore Landfill, GlenGrow and OgoGrow, which are available for purchase in the community. GlenGrow is made by composting plant materials like lawn trimmings and prunings. OgoGrow is made by combining biosolids from the wastewater treatment facility with waste wood and wood ash.

Table 4: Recommended waste actions

Action #	Action
Actions ongoing or in progress	
W1	Implement the 2017 Solid Waste Management Plan (upon Ministry approval) to achieve its targets of 50 per cent waste diversion rate by 2022 and the Regional District of Central Okanagan (RDCO) to achieve an average municipal solid waste disposal rate of 600 kilograms per capita by 2022 (down from 680 kg in 2014).

³⁰ Imagine Kelowna. On Point Event Summaries.
<https://imagine.kelowna.ca/document/point-event-summaries>

Planning Our Community

Focusing growth in urban areas

Kelowna grew up during the golden age of the automobile. The low-density, car-dependent development spread outward into natural and agricultural areas. In addition to contributing to transportation emissions, these sprawling developments require expensive infrastructure and services that end up being subsidized by residents in other parts of the city.³¹ Other consequences associated with urban sprawl include increased pollution, expensive and space-consuming parking³², higher taxes, increased traffic congestion, loss of open spaces and natural habitats, increased social isolation, and risk of chronic diseases.³³

To counter sprawl, Kelowna's OCP establishes a Permanent Growth Boundary and five urban centres (Downtown, Rutland, Capri-Landmark, Midtown and South Pandosy) and includes policy to not support new urban development outside the boundary.



Energy and emissions can be reduced over the long term by focusing growth in urban areas so residents and workers are located closer to transit and services. Compared to low density single-use development, compact smart growth patterns can reduce the amount people drive by 20-40 per cent, reducing GHG emissions by 18-36 per cent.³⁴

The Cost of Parking

For many people, free or subsidized parking may seem like an entitlement, but parking comes at a great cost to a community both financially and in terms of space requirements. The car requires roughly 350 square feet at its origination and 350 square feet at its destination. Across North America it is estimated that there are 6 parking spaces for each car.

In Canada, there is a trend of people, particularly the younger generation, who increasingly want to live downtown and don't require as much parking.

Parking comes at a significant cost, and even though it may be "free" (or subsidized), people still pay for it, as taxpayers, residents, or shoppers.

In Kelowna, a report by the City estimated that to break even on City owned parkades, parking revenue would need to be at least \$121 per stall per month, excluding enforcement, land acquisition, major maintenance, future replacement reserve contribution costs, or profit. By comparison, in 2017, blended parkade revenues were approximately \$104 per stall per month. Parkades are partially subsidized by other parking.

³¹ E.g. Ministry of Municipal Affairs and Housing. Canada Mortgage and Housing Corporation's Lifecycle Costing Tool for Community Infrastructure Planning Tool: Pilot Findings. http://www.cscd.gov.bc.ca/lgd/library/Costing_Tool_Case_Studies.pdf

³² CBC News. The slow death of urban parking: Don Pittis. <http://www.cbc.ca/beta/news/business/parking-real-estate-urban-planning-1.4221365>

³³ Smart Prosperity Institute. Suburban Sprawl. <http://thecostofsprawl.com/>

³⁴ BC Climate Action Toolkit. Planning Smart: Local Government's Key to Cutting Emissions. <https://www.toolkit.bc.ca/solution/actions-land-use>

Residents desire our community to “concentrate on growing vibrant urban centres” as heard through *Imagine Kelowna*.³⁵ Further, the actions align with those suggested during the “On Point” sessions on transportation and climate:

- “Localize work; continue to build on the concept of 5 town centres
- Promote shopping in high density areas
- Encourage walkable communities.”³⁶

Attendees at the stakeholder session also supported actions that addressed parking, infrastructure lifecycle costing, transit-oriented development and the need for greater housing diversity and affordability.

Table 5: Recommended land use actions

Action #	Action
Actions ongoing or in progress	
LU1	Update the Zoning and Traffic Bylaws to incentivize car sharing based on “Car Sharing Policy Review Report” as reported to Council on September 18, 2017.
Actions to implement	
LU2	Amend the Zoning Bylaw to establish updated parking minimums and maximums to discourage more parking than is required.
LU3	Apply an infrastructure cost analysis (such as the Community Lifecycle Infrastructure Costing (CLIC) tool) to major OCP amendments and Area Sector Plan (ASP) applications, assessing both upfront capital costs and ongoing operational costs to the City of Kelowna.
LU4	Coordinate land use and transportation planning through the OCP, Transportation Master Plan and the Regional Strategic Transportation Plan updates to ensure policy and actions make it easier for people to choose sustainable travel modes.
LU5	As part of the OCP Update, reinforce the Permanent Growth Boundary.
LU6	For the 2040 OCP update, re-evaluate a more compact growth strategy that prioritizes development in the urban core and dis-incentivizes development in the fringe.
Actions to investigate	
LU7	Investigate options to amend OCP policy and Zoning regulations for shared parking facilities in new and existing developments to maximize development potential and land use optimization in urban areas.
LU8	Investigate amendments to Bylaw 7900 Subdivision, Development and Servicing Bylaw to include pedestrian circulation and connectivity requirements to implement OCP Policy 7.8.4 “Promote mid-block pedestrian linkages between buildings in Urban Centres.”
LU9	Investigate incorporating a policy into the Official Community Plan to design neighbourhoods such that the site design, construction of buildings and corresponding infrastructure achieves more efficient energy and water use through a systems approach.

³⁵ Imagine Kelowna. Draft Vision, Values and Principles. <https://imagine.kelowna.ca/document/imagine-kelowna-draft-vision-values-and-principles>

³⁶ Imagine Kelowna. On Point Event Summaries. <https://imagine.kelowna.ca/document/point-event-summaries>

The Energy We Generate

Encouraging renewable energy

Because BC’s electricity is already sourced almost entirely from renewable energy sources like hydro and wind power, actions to generate electricity locally (such as using solar panels) would have almost no noticeable impact on Kelowna’s GHG footprint. However, as costs come down for technology, personal renewable energy systems could provide energy cost savings for residents and businesses. To maximize GHG reductions, renewable energy actions focus on substituting natural gas with heat pumps or renewable natural gas. Although this action will contribute to reducing emissions from buildings, it will not have as great an impact or as good a business case as actions on efficiency.

During the *Imagine Kelowna* process, attendees said that they wanted the City to invest in alternative energy.³⁷

Renewable Natural Gas

Renewable natural gas is a renewable replacement for natural gas that can be derived from a number of sources, usually from bacteria digesting organic matter in the absence of oxygen. It is created in landfills, and can be created in wastewater treatment plants and facilities to manage organic waste such as animal manure or food scraps. The City of Kelowna has an agreement with FortisBC to supply it with renewable natural gas from the Glenmore Landfill. In the first full year of operation it provided enough gas to heat 500 homes. Over the project life, this is expected to double.

Table 6: Recommended renewable energy actions

Action #	Action
Actions to investigate	
RE1	Investigate opportunities to increase both supply and demand of Renewable Natural Gas

³⁷ Imagine Kelowna. On Point Event Summaries.
<https://imagine.kelowna.ca/document/point-event-summaries>

Other Actions

Supporting Kelowna's transition

Many other actions will support Kelowna moving towards a low carbon future.

The actions in this section align with the direction heard during the *Imagine Kelowna* On Point climate discussion:

- "Provide more education and awareness
- Provide rebates for sustainable purchases
- Require developers include more green space and community gardens
- Protect farm land
- Create more green space"³⁸

Some of the actions in this section will have immediate tangible benefits. Actions such as preserving and expanding the urban tree canopy, encouraging local food, or implementing the clean air strategy, are all important to both reduce emissions and to adapt to a changing climate.

While less tangible, other actions such as education and engagement and sourcing funding for climate initiatives, will provide benefits and support overall implementation.



Finally, other actions in this section support the transition to a low carbon community. Actions such as a Green Economy Study will help to attract more clean technology and business to the region's growing tech-industry.

Table 7: Other recommended actions

Action #	Action
Actions in progress	
O1	Implement the Urban Forestry Strategy to achieve the target of 20% tree canopy cover.
O2	Implement the actions of the 2017 Agriculture Plan to increase and encourage local food production.
O3	Continue to implement the actions of the Clean Air Strategy.
Actions to implement	
O4	Amend the landscape regulations in both Zoning and Subdivision Bylaws to include tree protection replacement requirements.

³⁸ Imagine Kelowna. On Point Event Summaries.
<https://imagine.kelowna.ca/document/point-event-summaries>

Action #	Action
Actions to investigate	
O5	Investigate options to fund climate mitigation and adaptation initiatives.
O6	a) Investigate developing a Climate Adaptation Plan to proactively prepare for anticipated changes in local climate. b) Develop a Climate Adaptation Plan contingent on outcomes of O6a
O7	Investigate doing a Green Economy Study on how Kelowna could attract and develop more clean tech jobs and businesses. Look for opportunities to partner with the Central Okanagan Economic Development Commission or others on the study.
O8	Investigate adopting both a private and heritage tree protection bylaw.
O9	Investigate process improvements to ensure that tree planting requirements (on public and private lands) are executed through on site construction.
O10	Investigate the opportunity to use treated effluent from the Waste Water Treatment Facility (WWTF) for irrigation.
O11	Investigate implementing or expanding education and engagement campaigns on climate action, including but not limited to: <ul style="list-style-type: none"> • Eco-Driving • Promoting the City's corporate energy reduction initiatives to inspire other organizations. • Residential solar system building options. • Water conservation for the City's water utility.
O12	Update the cultural grant funding evaluation criteria to include the City's sustainability goals and targets as well as raising public awareness on key sustainability issues.
O13	Investigate opportunities in the Cultural Plan update to incorporate climate change messaging through artistic work.

Ambitious Actions

Actions that will push the envelope

These actions are ambitious in nature and they will only be adopted after further discussion, therefore their impacts have not been incorporated into the model. Adopting these actions will provide long-term benefits, but the shift from current practice may be too great for implementation at this point of time. If the community wishes to achieve deep GHG reductions, then these actions require careful consideration.

During the *Imagine Kelowna* On Point discussion on climate, attendees suggested that a “*high carbon tax*” be introduced as one way to reduce emissions.³⁹

Many of the attendees at the stakeholder session, were interested in seeing bold actions. Several attendees highlighted the benefits of early endorsement of the Energy Step Code and transportation pricing strategies.

Transportation pricing strategies

Transportation pricing strategies focus on the costs associated with the use of the transportation system in terms of vehicle kilometers traveled and/or fuel consumption. Examples include: a vehicle-kilometer traveled fee, pay-as-you-drive insurance, a motor fuel tax or carbon price, tolls, or congestion pricing.

Congestion pricing refers to dynamic tolls that change in real-time (e.g. tolls that are more expensive during peak-periods and less during off-peak periods) to help manage travel demand.

Research suggests that these types of pricing strategies have the largest potential to reduce GHG emissions within the transportation sector.

Table 8: Recommended ambitious actions

Action #	Action
AA1	Advance early endorsement of the Energy Step Code so that the thousands of buildings constructed between now and 2032 (when the Province fully implements the Energy Step Code) incorporate efficiency measures which will have lasting impacts to building performance.
AA2	Invest more into alternative transportation, prioritizing alternative modes through proximity, connectivity and urban design.
AA3	Conduct a regional study to determine local feasibility, effectiveness and legislative authority for transportation pricing strategies for vehicle kilometers traveled and/or fuel consumption.

³⁹ Imagine Kelowna. On Point Event Summaries.
<https://imagine.kelowna.ca/document/point-event-summaries>

Climate Targets

Modelling

Incorporating action impacts

Based on the actions, the Community Energy Association's (CEA) QuickStart model was used to estimate the potential GHG reductions that could be achieved (see Appendix 3 for more information). Developed in 2010 on behalf of BC Hydro and used by approximately 60 communities to date, the model builds on existing information including population data, community energy and emissions inventory data and uses formulas to estimate the impact of each action.

Over the next five years, the community should be able to achieve an absolute GHG reduction of four per cent below 2007 levels by 2023. While some of the actions are regulatory in nature, others rely on community behavioral shifts as the City provides more opportunities for residents to lead a low carbon lifestyle.

There are many initiatives on the horizon that could be major game changers in reducing GHG emissions in the next few decades. These are not included in the model because of the considerable uncertainty involved. If they occur, and depending on the manner in which they occur, then achieving community GHG targets may become much easier. Game changers include:

- A significant increase in the number of electric vehicles;
- Introduction and growth of driverless shared vehicles^{40 41}; and
- Densification of Kelowna's five Urban Centres.

⁴⁰ New York Times. G.M. Says Its Driverless Car Could be in Fleets by Next Year.
<https://www.nytimes.com/2018/01/12/business/gm-driverless-car.html>

New Targets

From pragmatic to aspirational

To demonstrate leadership for Kelowna and to meet provincial requirements, Council directed staff to move forward with two underlying themes for a GHG reduction target. First, develop a short-term target that is **realistic and pragmatic**, to ensure the community can achieve it and incremental progress and success can be demonstrated. Secondly, ensure **bold leadership** is still present in the Plan to position the City as a leader and not passing the monumental responsibility to future generations.

Aligned with this direction three targets are recommended.

The City of Kelowna will in partnership with senior governments; local residents and businesses; NGOs; external agencies; and utility providers, work towards reducing community greenhouse gas emissions by:

1. ***4 per cent below 2007 levels by 2023 (equivalent to 27 per cent per capita reduction)*** - based on the model's results of emission reductions that can be achieved by implementing the actions over the next five years.
2. ***25 per cent below 2007 levels by 2033 (equivalent to 50 per cent per capita reduction)*** – based on incremental steps to achieve the long-term target as it is anticipated significant technological advances will accelerate progress.
3. ***80 per cent below 2007 levels by 2050 (equivalent to 90 per cent per capita reduction)*** – aligned with the Provincial Climate Leadership Plan target, which

⁴¹ University of Toronto Faculty of Applied Science and Engineering, 2015. Driving Changes: Automated Vehicles in Toronto, page 20.

recognizes that “the pathway to that goal is not always clear.”⁴²

While the 2023 target had a mixed reception by stakeholders, some felt that the target was realistic, while others felt that it was “kicking the can down the road.” It will still be a challenge to achieve in light of Kelowna’s anticipated population growth. A four per cent reduction may not look ambitious, however, when it is translated into a per-capita estimate, a 27 per cent reduction is a notable achievement.

Beyond 2023 more work will need to be done to maintain the downward trajectory in emissions, particularly in the face of ongoing population growth. For the 2023 and the 2050 targets the City

does not have all of the answers at the present time. It is anticipated that the plan will be revisited every five years to reflect and stay current with the rapid pace of change and new actions will be identified to help reach the targets. As strategies and technologies continue to evolve and new possibilities and partnerships emerge, the Community Climate Action Plan will be a guiding document.

Of critical importance is the change of the trajectory. That is, every action multiplies in benefits over time. This is why changing this direction is important early, and every change will have compounding and ongoing benefits.

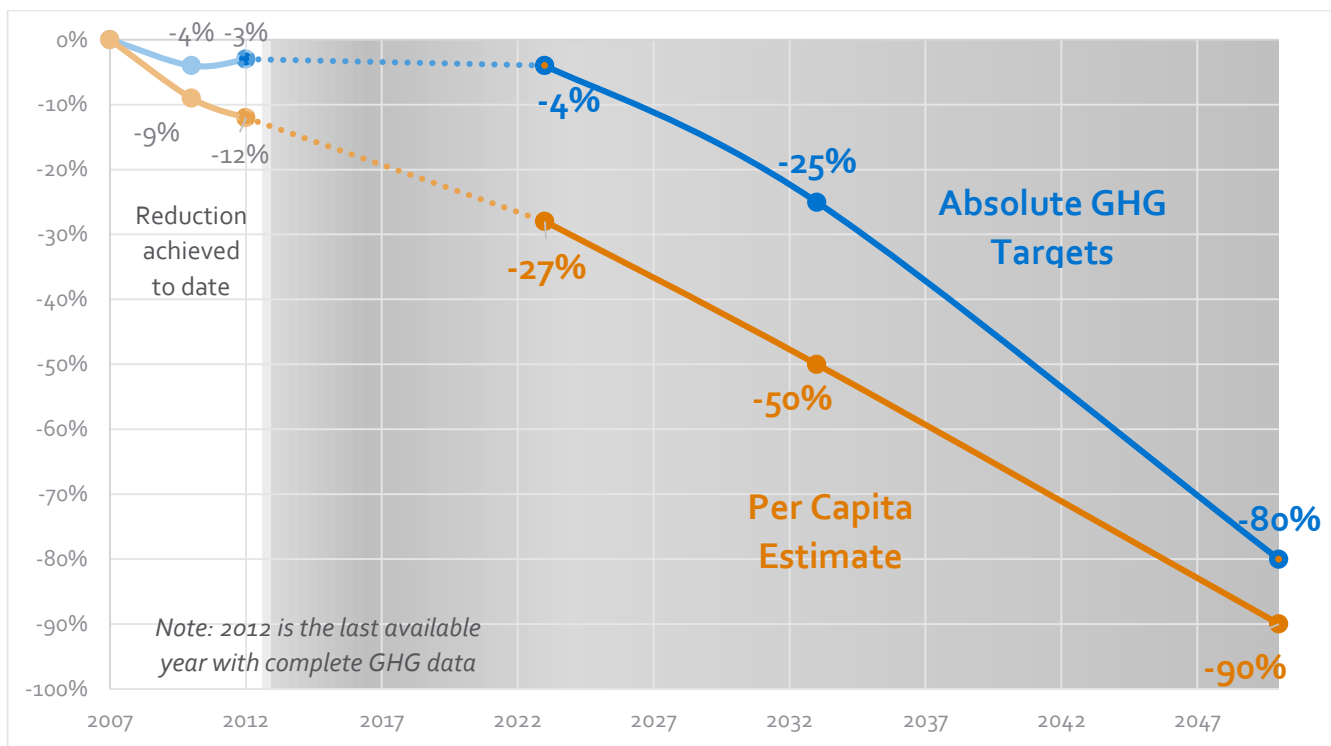


Figure 13: GHG emission reduction targets and per capita estimates below 2007 levels

⁴² Province of BC. Climate Leadership Plan.
https://climate.gov.bc.ca/app/uploads/sites/13/2016/10/4030_CLP_Booklet_web.pdf

Meeting the Targets

Impact of actions

The City has levers to reduce community energy and emissions and can help move the community closer towards its target. However, many things remain outside of the City's control including federal and provincial actions, technological changes, and community behavioral change. These may provide significant assistance towards meeting the targets. Further, the downward trajectory of emissions over the next five years mainly reflects actions that the City can do with some help from other sources. Additional actions conducted by senior levels of government or other stakeholders that are outside of the City's control are not included in the target.

The estimated impact that each action category can have towards meeting the 2023 target is shown in Table 9 and Figure 14. The biggest opportunity for emissions reduction are the actions related to transportation, due to transportation being the biggest component of Kelowna's community GHG footprint. The two most impactful actions will be improving public transit and an electric vehicle strategy. While benefits related to the other categories may not be as large, they will have lasting impacts in Kelowna.

Table 9: Possible reduction from each category to 2023

Category	Reduction (tonnes)	Percentage of Total Reduction
The Way We Get Around	37,793	72%
The Energy We Use (Buildings)	5,019	10%
The Waste We Create	2,512	5%
Planning Our Community	5,399	10%
Encouraging Renewable Energy	1,808	3%
Other Actions	248	0%
TOTAL	51,628	100%

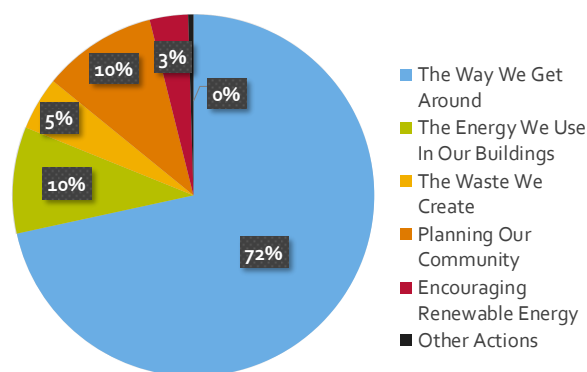


Figure 14: GHG reductions from each category to 2023

Getting to 25 and 80 per cent reductions

Getting to deeper community carbon reductions will take longer than the next 5 years, and will involve technologies, methods and partnerships that are not yet widely used. However, it is possible to have a sense of what types of measures will be necessary for the community to achieve 25 and 80 per cent reductions.

A 25 per cent reduction by 2033 (i.e. an estimated 50 per cent per capita reduction) would require, for example, approximately a 50 per cent conversion to electric vehicles, a reduction in conventional natural gas usage by 60 per cent in residential and commercial facilities, and a 50 per cent capture of methane from the landfill compared to business as usual.

An 80 per cent reduction by 2050 (i.e. an estimated 90 per cent per capita reduction) would require, for example, a 90 per cent conversion to electric vehicles, a 70 per cent reduction in conventional natural gas usage in residential and commercial facilities, and a 100 per cent capture of methane from the landfill for energy usage.

These are just examples of what could be required to reach the targets, a variety of other actions could also be taken. As new technologies emerge, Kelowna continues to densify and senior government takes further action, these will all play a role in how the targets are reached.

Saving Money

Impact on energy dollars spent

Perhaps the greatest co-benefit to implementing the Plan is the fact that it will save residents and businesses in Kelowna money by reducing energy bills.

Figure 15 shows estimates for Kelowna's community energy expenditures in 2012 versus 2023, if the Plan is implemented or not. Community energy expenditures were approximately \$341 million in 2012. In 2023, taking into account population growth and some assumptions regarding future energy prices, if the City does nothing, energy expenditures are estimated to be about \$445 million. If the Plan is implemented, however, an eight per cent reduction can be achieved saving the community approximately \$34 million annually (about \$240 per capita per year).

As with GHG savings, the top actions for energy dollar savings are improving public transit and an electric vehicle strategy. Actions that save electricity and that are related to buildings can have a greater impact with saving money compared to GHGs, because of the high cost but low GHG intensity of electricity. More detail on which actions will save the most money is in Appendix 3.

There is considerable uncertainty regarding the economic impacts that the Plan may have, including with respect to future energy prices. However, there is no doubt that finding ways for Kelowna's economy to run more efficiently will be beneficial for the community, as well as help it to adjust to fluctuating energy prices.

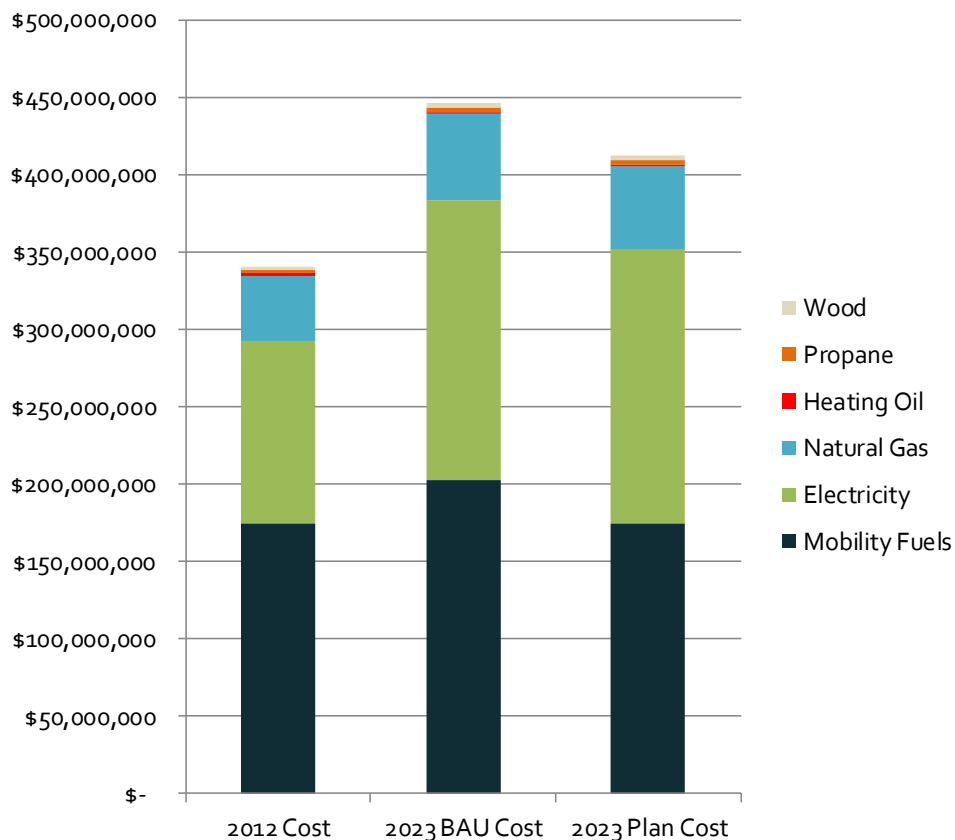


Figure 15: Community energy costs 2012 versus 2023, with and without plan implementation

Adapting to a Changing Climate

Global climate change is occurring, and Kelowna residents will feel its effects locally in a wide variety of ways. Climate change is no longer a future trend, but instead requires the community to respond today. Kelowna's infrastructure, economy and residents will need to consider how best to adapt to the coming changes.

While this Plan focuses on mitigation, adaptation should also be considered. Measures to mitigate climate change should not be conducted without also considering adaptation, because the climate will continue to change. Measures to adapt should not be conducted without considering mitigation, because as the climate becomes more severe, adaptation becomes more expensive and may ultimately become impossible in some circumstances.

Action O6 recommends the development of a Climate Adaptation Plan. It will likely include measures to manage extreme heat, drought, flooding, severe weather events, as well as address infrastructure and other climate impacts.

Expected future impacts

As the climate system continues to adjust to the emissions that have been emitted over the last few decades, and as GHG emissions continue to grow, changes in weather patterns are predicted to become more severe.

The Pacific Climate Impacts Consortium (PCIC) has used climate change modeling to determine implications for British Columbia.⁴³ Based on their projections a 1.9 Celsius increase in global temperature is expected by 2050. The increase in average temperature increases the likelihood of major weather events and will also result in hotter and drier summers in Kelowna. At first glance a two-degree increase may seem harmless, but a

2050 Climate Projections



**1.9 CELSIUS
INCREASE**



**7% ANNUAL
INCREASE**



**14% ANNUAL
DECREASE**

closer look reveals that this increase will mean significant heatwaves and periods of unseasonably warm temperatures to boost the annual average temperature.

By 2050, PCIC also projects shorter winters with up to 14 per cent less snowfall, impacting the region's snowpack. Despite warmer, drier temperatures and less snow, the model actually predicts a 7 per cent increase in overall annual precipitation with major rain events occurring more frequently. Kelowna is expected to see much wetter winters and springs (where precipitation will fall as rain instead of snow). These projections paint the picture of a changing climate where increased spring precipitation will contribute to increased risk of flooding and hotter drier summers will increase the risk of droughts and wildfires.

Adapting in Kelowna

A community and its infrastructure are usually built only to withstand the climate that has been known as a community has grown, with the implicit expectation that this climate will never change. Only relatively recently have communities around the world started to consider how their

⁴³ Pacific Climate Impacts Consortium. Summary of Climate Change for Central Okanagan in the 2050s.

<http://www.plan2adapt.ca/tools/planners?pr=7&ts=8&toy=16>

local climate may change, and the wide implications this may have. Using good quality data on expected local climate changes will facilitate the City with evidence-based decision-making.

The implications of adapting to Kelowna's changing climate can take many forms:

- Increased severity of rainfall events may require that stormwater infrastructure be enhanced in order to reduce flooding risk. Recommended measures may include expansion of infrastructure or retention through natural assets like wetlands.
- Increased risk of wildfire events and severity due to drought and extreme temperatures may mean reducing wood fuel in the urban-wildland interface. The wildfire season has extended by 2.5 months over the past 30 years, a trend that will likely continue.⁴⁴ The increased maximum temperatures, low humidity and strong gusting winds can also make it harder to contain the spread of fires in some instances. As average temperatures increase over time the number of wildfires could increase by 5 or 6 times.⁴⁵
- Increased drought will also increase stress of Kelowna's water supply. More water management measures may need to be taken. While Kelowna's per-capita water use has been steadily declining over the past decade, summertime water consumption is still well above the national average, largely due to

outdoor irrigation.⁴⁶ It will be necessary to work with stakeholders, such as the Okanagan Basin Water Board, who have already been researching how to manage the region's water resource now and in the future.

- Increased impacts on health due to a myriad of climate change factors. Stress and anxiety are caused by flooding and extreme weather events. Decreased air quality are caused by rising temperatures increasing ground level ozone and wildfires. Increased exposure to diseases are caused by flooding and rising temperatures. Obesity can be caused by reduced food security. And injury and death can be caused by rising temperatures, extreme weather, and wildfires.^{47, 48}

Even if humankind stops emitting GHGs tomorrow, the climate will continue to change due to the inherent lag in the climate system, mainly due to the time taken for the oceans to warm. The impacts seen so far are due to emissions from about 40 years ago.⁴⁹ Therefore, even if there are strenuous worldwide efforts to reduce emissions in the near future, it will still be necessary for Kelowna to take measures to adapt as property and municipal assets are potentially at risk. Costs for repair can often greatly exceed the cost of adaptation.

⁴⁴ Swiss Re Institute. 2016. Natural catastrophes and man-made disasters in 2016: a year of widespread damages. Page 6. Retrieved from: http://media.swissre.com/documents/sigma2_2017_en.pdf

⁴⁵ Globe and Mail. October 2016. Climate change found to double impact of forest fires. Retrieved from: <https://beta.theglobeandmail.com/news/national/climate-change-found-to-double-impact-of-forest-fires/article32314179/?ref=http://www.theglobeandmail.com&>

⁴⁶ Imagine Kelowna. Draft Vision, Values and Principles. <https://imagine.kelowna.ca/document/imagine-kelowna-draft-vision-values-and-principles>

⁴⁷ Interior Health. Climate Change and Your Health. <https://www.interiorhealth.ca/YourEnvironment/ClimateChange/Pages/default.aspx>

⁴⁸ Province of BC. Climate Change Health Risks. https://www2.gov.bc.ca/assets/gov/environment/climate-change/adaptation/health/final_climate_change_and_health_backgrounder_overview.pdf

⁴⁹ SkepticalScience.com. Climate Change: The 40 Year Delay Between Cause and Effect. <https://skepticalscience.com/Climate-Change-The-40-Year-Delay-Between-Cause-and-Effect.html>

2017 – a year of climate extremes for Kelowna

As outlined in the City of Kelowna's 2017 Community Trends Report Special Edition, *A Changing Climate*, in 2017 Kelowna experienced one of its most extreme weather years on record. The May 2017 inflow to Okanagan Lake was 229 per cent above average, and this led to historic flooding of Okanagan Lake, Mission Creek and Mill Creek, impacting approximately 3,200 residents in the community and causing tens of millions of dollars in damage to public and private property and infrastructure. Despite attempts to reduce the damage, including the deployment of 2 million sandbags, City staff estimate that 500 parcels of land were impacted and 1,250 docks needed to be repaired or replaced. City infrastructure was also pushed to breaking point with many systems operating at full capacity, including the installation of pumps at six different locations along the lakefront to guard against a full backup of the City stormwater system at a substantial cost to the City.

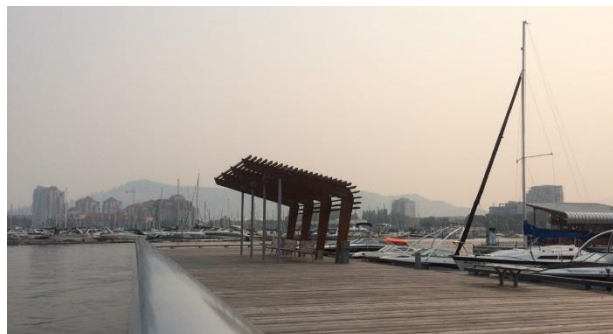
This was followed by one of the hottest and driest July and August periods on record, factors contributing to a level 3 drought, a devastating wildfire season and the community blanketed in smoke with 25 days when air quality posed a health risk.

By the end of the extreme weather, the Central Okanagan Emergency Operations Centre was active for 131 days. Further, BC Wildfire Service reported that in 2017, there were over 1.2 million hectares of wildfires costing the provincial government roughly \$500 million to contain.

These impacts were felt beyond personal and public property. The flooding event also had an impact on the City's tourism sector and general economic activity. For the early part of the summer, lake access was limited with boat launches shutdown and parks and beaches closed, impacting Kelowna's most important recreation and tourism asset - Lake Okanagan. Canada Day fireworks, which usually attract upwards of 60,000 residents and tourists, were rescheduled due to the flooding of parks and beaches. Tourism Kelowna reported a decrease of 7 per cent in hotel occupancy for July 2017 compared to summer 2016.

As a community that relies heavily on Lake Okanagan for recreation and tourism, the flooding and fire in 2017 had considerable impacts on the local economy.

Interior Health also noted major impacts in 2017 in its service area due to the wildfires, including the displacement of 700+ staff, 880 patients/clients evacuated, 32,013 staff hours reported on wildfire, and an estimated cost to Interior Health of \$2.7 million.



Implementation for Success

Key Factors for Successful Implementation

Research completed for the *Community Energy Implementation Framework*, by CEA, QUEST, and Smart Prosperity⁵⁰ identified several key factors for successful implementation of climate action plans including:

1. Establish broad support for implementation.
2. Establish staff and financial capacity for follow through.
3. Institutionalize the Plan to ensure long-term accountability during the cycles of turnover of personnel that occur in a local government.

Building support

Fostering widespread political, staff and stakeholder support is important to get started on

a plan or on individual actions. Strategies that can help with this revolve around identifying co-benefits, collaboration and engagement.

Building capacity

Without dedicated staff time, climate action takes place off the side of someone's desk, and initiatives and opportunities are not prioritized.

Without some ability to access funds internally, many opportunities to act will depend on the availability of external funding. In addition, as external funds often require matching funds, many of these opportunities will be difficult to access. Table 10 has some examples of how BC communities fund climate action initiatives.

Table 10: Examples of how some BC communities fund climate initiatives

Funding Mechanism	Local Government	Description
Climate Action Revenue Incentive Program (CARIP)	Many	Many communities use CARIP rebate to fund corporate and/or community emissions reductions.
Forgone building permit revenue to provide incentives	Penticton	Provides incentives for their sustainability checklist which encourages brownfield redevelopment and sustainable new construction
	Kimberly	Encourages more energy efficient new homes.
Sustainability / climate / carbon funds	Dawson Creek	Charges a per tonne price for their corporate carbon emissions that is reinvested into other corporate emission reduction projects.
	Sparwood	Uses the savings created by an energy efficiency retrofit to their recreation centre, to fund energy saving projects and incentives for efficient new homes.
General revenue	North Cowichan	Established through a referendum, a 0.5% property tax levy funds grants for community and municipal projects, including rebates and municipal loans.
Recycling fee	Invermere	Charges a \$5/month per resident recycling fee to fund a permit fee rebate program for energy efficient new homes and other GHG reduction initiatives.
Building permit fee increases	Langley Township	Charges a Sustainable Construction Fee at building permit issuance to fund a permit fee rebate program for energy efficient new construction.
Surplus from building inspection services	Nanaimo Regional District	Uses their \$20,000/year surplus from building inspection services to incent energy efficient new construction and renewable energy systems

⁵⁰ http://gettingtoimplementation.ca/wp-content/uploads/2016/12/Final-Framework-December72016_online.pdf

Institutionalization

Embedding climate action planning into the plans, policies and processes of the local government, i.e. institutionalization, is important to weather the inevitable changes that occur.

One example of this is how all municipalities in BC are required to have community GHG targets in their OCPs, and actions and policies to try to meet those targets. Another example is how the City currently includes numerous relevant indicators in its annual OCP indicators report, such as on urban growth patterns, availability of transportation options, and household energy efficiency. Indicators are explored more in the Implementation Strategy section.

Table 11 provides further examples of how the City could institutionalize climate action planning into its processes.

Table 11: Institutionalizing climate action

Incorporate	Embed climate action into other planning documents such as the OCP, Zoning Bylaw, and Transportation plans. Also incorporate climate action into City staff job descriptions.
Budget	Embed climate action into the budgeting process.
Monitor	Monitor indicators as outlined in the Monitoring and Evaluation section.
Convene	Host regular meetings to discuss implementation with internal and/or external stakeholders.
Report	Report regularly to Council on progress and accomplishments.
Renew	Prepare for plan renewal approximately every 5 years.

Implementation Strategy

The implementation strategy is key for successful implementation. It scopes the anticipated timeline and resources required to successfully complete the actions and policies prescribed in the Plan. The majority of the actions and recommendations put forth in this Plan will be implemented through existing staff and financial resources provided by the City of Kelowna. However, additional support (both financial and staff) will be required to execute all the identified actions.

A proposed work plan is provided for the 47 action that the City of Kelowna can lead in the following two tables. Actions in each table are organized according to a proposed implementation timeline:

- **Actions in progress or ongoing:** These include actions that are already in progress or are required to be addressed throughout the life of the plan.
- **Actions to implement (0-2 years):** These actions will be undertaken within two years (2020) of the Plan's endorsement.
- **Actions to implement (3-5 years):** The goal is to implement these actions 3-5 years (2021 – 2023) after the Plan is endorsed.

It should be noted that those actions where the City plays a supporting role are not included in the implementation strategy, as those timelines would be determined by another stakeholder. Further, ambitious actions are also not included.

Table 12 lists those actions that can be undertaken using existing staff and budget resources. Table 13 identifies those actions that require additional staff and/or budget resources. For those actions requiring additional resources, funding options will be investigated and/or budget requests will be made as part of the annual budget cycle.

Table 12: Implementation actions to be undertaken with existing resources

Action IDs	Description	Policy & Planning	Community Planning	Strategic Investments	Development Services	Integrated Transportation	Infrastructure Engineering	Infrastructure Delivery	Parks & Buildings Planning	Building Services	Parks Services	other operations	Utility Services	Communications	Active Living and Culture	Grants and Special Projects	Financial Services	Supporting Organizations	Funding addressed in another plan
Actions in Progress or Ongoing																			
T1	Implement policy actions from the Pedestrian and Bicycle Master Plan	x			x	x													x
T2	Implement capital projects from the Pedestrian and Bicycle Master Plan					x	x												x
T3	Continue improving public transit service delivery.					x												BC Transit	x
T4	Develop a disruptive mobility strategy					x													
B1	Partner with FortisBC on delivery of programs	x											x					FortisBC	
B2	Engage building community on regional Energy Step Code implementation strategy	x			x														
B3	Develop educational offerings to support transition to Energy Step Code	x			x														
W1	Implement the 2017 Solid Waste Management Plan												x					Regional Waste	x
LU1	Update the Zoning and Traffic Bylaws to incentivize car sharing	x	x	x		x													
O1	Implement the Urban Forestry Strategy										x								x
O2	Implement the 2017 Agriculture Plan	x																	x
O3	Continue to implement the Clean Air Strategy					x													x

Action IDs	Description	Policy & Planning	Community Planning	Strategic Investments	Development Services	Integrated Transportation	Infrastructure Engineering	Infrastructure Delivery	Parks & Buildings Planning	Building Services	Parks Services	other operations	Utility Services	Communications	Active Living and Culture	Grants and Special Projects	Financial Services	Supporting Organizations	Funding addressed in another plan
O5	Investigate options to fund climate mitigation and adaptation initiatives	x						x								x			
O6a	Investigate developing a Climate Adaptation Plan	x					x												
Actions to be implemented - Years 0 - 2																			
T5	If successful, expand the pilot community bike share program.					x												Drop Bike	
T7	Update the Zoning Bylaw to restrict drive-through uses		x																
T9	Implement an anti-idling bylaw					x													
T10	Investigate regulations and incentives for City parking to prioritize the use of alternative transportation modes			x															
T12	Investigate options for a regional fuel tax					x											x		
B5	Update Building Bylaw for part 9 buildings requiring Step Code 1 (April, 2019) and Step Code 3 (Oct, 2020)	x			x														
B6	Relax Zoning Bylaw setback requirements to allow thicker walls for Step 4 and 5 buildings	x			x														
B7	Create a building permit fee rebate program for part 9 buildings for those achieving Steps 4 or 5	x			x														

Action IDs	Description	Policy & Planning	Community Planning	Strategic Investments	Development Services	Integrated Transportation	Infrastructure Engineering	Infrastructure Delivery	Parks & Buildings Planning	Building Services	Parks Services	other operations	Utility Services	Communications	Active Living and Culture	Grants and Special Projects	Financial Services	Supporting Organizations	Funding addressed in another plan
B8	Investigate updating the OCP Development Permit Guidelines to include building energy efficiencies	x			x														
LU2	Amend the Zoning Bylaw to establish updated parking minimums and maximums		x																
LU4	Coordinate land use and transportation planning through OCP and transportation plans	x				x													
LU5	As part of the OCP update, reinforce the Permanent Growth Boundary	x																	
LU6	As part of the OCP update, evaluate a more compact growth strategy	x																	
LU8	Investigate amendments to Bylaw 7900 to include pedestrian connectivity				x	x	x												
LU9	Incorporate a policy into the Official Community Plan to design neighbourhoods through a systems approach.	x					x												
O4	Amend the landscape regulations in both Zoning and Subdivision Bylaws to include tree protection and replacement requirements.		x		x		x				x								
O10	Investigate the opportunity to use treated effluent from the WWTF for irrigation												x						
O13	Investigate opportunities in the Cultural Plan update to incorporate climate change messaging through artistic work.														x				

Action IDs	Description	Policy & Planning	Community Planning	Strategic Investments	Development Services	Integrated Transportation	Infrastructure Engineering	Infrastructure Delivery	Parks & Buildings Planning	Building Services	Parks Services	other operations	Utility Services	Communications	Active Living and Culture	Grants and Special Projects	Financial Services	Supporting Organizations	Funding addressed in another plan
Actions to be implemented- Years 3 - 5																			
LU7	Investigate options to amend OCP policy and Zoning regulations for shared parking facilities in new and existing developments		x	x															
O8	Investigate adopting both a private and heritage tree protection bylaw	x									x								
O12	Update the cultural grant funding evaluation criteria to include the City's sustainability goals and targets														x				

Table 13: Implementation actions: Additional resources required

Action IDs	Description	Policy & Planning	Community Planning	Strategic Investments	Development Services	Integrated Transportation	Infrastructure Engineering	Infrastructure Delivery	Parks & Buildings Planning	Building Services	Parks Services	other operations	Utility Services	Communications	Active Living and Culture	Grants and Special Projects	Financial Services	Supporting Organizations	Funding addressed in another plan
Actions in Progress or Ongoing																			
T8	Through the TDM review project, enhance Kelowna's TDM program					x													
O11	Investigate implementing or expanding education and engagement campaigns	x			x	x				x			x	x					
Actions to be implemented - Years 0 - 2																			
T6	Develop an electric vehicle strategy	x		x		x												Fortis	
B4	Develop a community energy retrofit strategy	x			x														
B9	Investigate options to implement Energy Step Code for Part 3 buildings once available.	x			x														
B10	Investigate adopting Steps 4 and 5 for part 9 buildings once Province makes it available	x			x														
B11	Investigate financing models to support city-wide deep energy retrofits	x			x														
Actions to be implemented – Years 3 - 5 years																			
T11	Investigate options to integrate alternative fuels into fleets such as transit.					x						x							
LU3	Apply an infrastructure cost analysis to major OCP amendments and ASP applications	x					x												
RE1	Investigate opportunities to increase both supply and demand of Renewable Natural Gas												x					Fortis	
O6b	Develop a Climate Adaptation Plan	x					x												

Action IDs	Description	Policy & Planning	Community Planning	Strategic Investments	Development Services	Integrated Transportation	Infrastructure Engineering	Infrastructure Delivery	Parks & Buildings Planning	Building Services	Parks Services	other operations	Utility Services	Communications	Active Living and Culture	Grants and Special Projects	Financial Services	Supporting Organizations	Funding addressed in another plan
O7	Investigate doing a Green Economy Study			x														COEDC	
O9	Investigate process improvements to ensure that tree planting requirements are executed through site construction		x		x			x											

Monitoring and Evaluation

Monitoring and evaluating the implementation of the Plan is critical for its success. Key Performance Indicators (KPIs) enable communities to measure the outcomes of a plan’s implementation. When KPIs are monitored on a regular basis, communities can determine how to best allocate resources to support implementation, and what success different actions are having.

Two types of indicators are recommended for Kelowna’s Community Climate Action Plan. The primary indicators measure energy consumption and GHG emissions and are central for assessing

overall progress on implementation. Secondary indicators, can quantify indirect success of different actions related to energy consumption and GHG emissions such as containing urban growth and transportation.

The following table provides descriptions of 7 indicators along with the measures of success (what is being measured), evaluation mechanisms (how it is being measured), and data sources for each. Progress should be reported bi-annually, although data may not be available on all KPIs.



TABLE 14: COMMUNITY CLIMATE ACTION PLAN PERFORMANCE INDICATORS

Indicator		Measures of Success	Data Sources	Frequency of Reporting
1	Number of Plan actions completed	<ul style="list-style-type: none"> 60% of actions are initiated or completed 2 years after Plan endorsement. 90% of actions are initiated or completed 4 years after Plan endorsement. 	Updates and amendments to policies, regulations, operations or budgets. New projects emerging from the Community Climate Action Plan.	Bi-annually
2	Community GHG Emissions	A target of 4% reduction in community greenhouse gas emissions below 2007 levels by 2023.	Provincial Community Energy and Emissions Inventory (note: transportation data needs to be supplemented)	Bi-annually or as data becomes available
3	Household energy consumption	Average household energy use (natural gas and electricity) decreases over time.	OCP Indicators Report tracks average household gas consumption (GJ) and average household electricity consumption (kWh)	Collect data annually but report bi-annually
4	Fuel consumption	Annual fuel sales (gasoline and diesel) decrease overtime	Kent Marketing fuel sales data (note: this is currently the only feasible way to estimate transportation emissions)	Collect data annually but report bi-annually
5	Containing urban growth	Increase in the percentage of: <ul style="list-style-type: none"> new residential units located in the Urban Core new commercial square footage located in the Urban Centres Changes to the Permanent Growth Boundary	OCP Indicators report	Collect data annually but report bi-annually
6	Balanced transportation networks	<ul style="list-style-type: none"> Increase in length of new cycling and pedestrian network compared to new roads Increase in population proximity to transit 	OCP Indicators report	Collect data annually but report bi-annually
7	Use of alternative transportation	Increase in use of sustainable transportation modes	Regional Household Travel Survey and the Journey to Work from Census	Every five years as data becomes available

Conclusion

Climate change is one of the most critical issues humanity faces today.⁵¹ Cities are critical leaders to modify the trajectory of climate change by influencing and leading emission reductions through land-use planning, transportation options, education and engagement, building requirements and waste services. As Kelowna grows, strong action to address climate change through planning, partnerships, shared accountability and encouraging community behavioural change will make significant gains now and in the future.

Kelowna has already made important headway in policies and actions that address climate change through expansion of alternative transportation networks, establishment of a Permanent Growth Boundary and growth of the urban forest. The Community Climate Action Plan defines additional actions and policies that the City can take to provide opportunities for the community to continue to reduce GHG emissions.

There is a compelling case for mitigating climate change. Implementing the 47 actions in the Plan will reduce GHG emissions through encouraging energy conservation and efficiency, by providing opportunities to shift transportation modes, and by focussing growth in urban areas. Moving towards this low carbon future is a monumental challenge, but planning for a healthy and resilient environment is also an enormous opportunity. Community benefits are broad reaching. A dynamic community that embraces transportation options, grows vibrant urban centres, and protects land, water and air will attract jobs in the new global economy, is healthier for citizens and is resilient in the face of climate change.



Implementing the pragmatic actions in the Plan puts Kelowna on the path to reduce emissions four per cent below 2007 levels over the next five years. Beyond that, the Plan provides the foundation to shift how the community lives, works and moves, so that continual incremental progress can be achieved to reach an eighty percent GHG reduction by 2050. Achieving these targets requires both City leadership and community commitment to ensure Kelowna works towards becoming an energy efficient, liveable, responsible and sustainable community.

Climate change affects everyone, and everyone must do their part. Innovation and new technology will have an effect, but all segments of the community - residents, business and government - must do their part to make a difference. It is time to accelerate efforts, work as a community instead of as individuals and act now to make a difference for the long term. Kelowna CAN do this.

Our generation has inherited an incredibly beautiful world from our parents and they from their parents. It is in our hands whether our children and their children inherit the same world.

-Richard Branson

⁵¹ Province of BC, 2018. BC Climate Leadership Plan
https://climate.gov.bc.ca/app/uploads/sites/13/2016/10/4030_CLP_Booklet_web.pdf

Appendix 1: Acronyms

ASP	Area Sector Plan
BAU	Business as Usual
CARIP	Climate Action Revenue Incentive Program
CEA	Community Energy Association
CEEI	Community Energy and Emissions Inventory (inventories created by the Province for each local government)
CLIC	Community Lifecycle Infrastructure Costing
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide equivalent (i.e. converting GHG emissions of different gases into tonnes of carbon dioxide equivalent)
EV	Electric Vehicle
GHG	Greenhouse Gas (there are several different anthropogenic GHGs and they have different relative impacts. When tonnes of GHGs are stated in the document the standard practice of stating this in equivalent of tonnes of carbon dioxide is followed. Carbon dioxide is the most important anthropogenic GHG.)
GJ	Gigajoules (one of the standard measures of energy)
HDV	Heavy Duty Vehicle
KPI	Key Performance Indicator
kWh	kilowatt hours (standard measure of energy, typically used with electricity)
LDV	Light Duty Vehicle
OCP	Official Community Plan
PCIC	Pacific Climate Impacts Consortium
QUEST	Quality Urban Energy Systems of Tomorrow
RDCO	Regional District of Central Okanagan
TDM	Travel Demand Management
UBC-O	University of British Columbia, Okanagan Campus

Appendix 2: Community Energy and Emissions Inventory Details

Creating the inventory

The project team collected data for Kelowna's energy and emissions inventory from the Province of BC's Community Energy & Emissions Inventory (CEEI) for Kelowna supplemented with fuel sales data from Kent Marketing for Kelowna gas stations.

The most recent full energy and emissions inventory year for Kelowna is 2012 for several reasons.

First, provincial CEEI data is available for 2007, 2010, and 2012, but only covers energy consumption and emissions related to buildings and solid waste. CEEI data used to include transportation, but with the 2012 release the Province removed it because of concerns that the data did not meet its quality standards. Therefore, the project team sourced Kelowna gasoline station fuel sales data from Kent Marketing for 2007, 2010, 2012 to supplement the provincial data. Fuel sales data was converted into energy consumption, GHGs, and energy dollars.⁵² In addition, fuel sales data was obtained for 2014, 2016 and 2017 to assist with GHG projections.

Second, while it is possible to obtain more recent building energy consumption data from FortisBC and from the Province, it has not received the same quality assurance as the CEEI. There may be some issues with the data categories, and with community boundaries. A review of this data showed that it is not directly comparable with CEEI. Therefore, this data was not used.

⁵² An advantage of using the Kent Marketing fuel sales data is that it is easily accessible for any year.

⁵³ The fuel sales approach to estimating transportation energy consumption and emissions is different to the one that the Province has taken with CEEI before. It will include tourism and through-traffic, while the Province's approach would have only included vehicles

Data gaps and issues

In addition to some methodological challenges to using fuel sales data⁵³, a major drawback is fuel sales through card lock stations are not included with the data. This means that many commercial diesel vehicles are excluded. Based on a previous release of the CEEI data, and making assumptions based on population growth, commercial vehicles may have accounted for 120,000 tonnes in 2012. If that is approximately accurate, then that would constitute a considerable omission as Kelowna's 2012 GHG emissions are estimated at 642,000 tonnes of CO₂e excluding most commercial vehicles.

The CEEI also does not include the energy consumption and emissions from large industrial sources for privacy reasons, so these are excluded.

Despite a data request to ICBC, it was not possible to obtain data on the number of vehicles of different types that are registered within City limits. This data would have been useful to compare with the gasoline and diesel vehicle fuel sales, and also to identify trends (e.g. vehicle ownership per capita, and types of vehicles including growth in electric or hybrid vehicles).

Inventory details

Details of the inventory are shown Table 15.

registered in the community. For a discussion on the pros and cons of the different approaches see 'Assessing vehicular GHG emissions, a comparison of theoretical measures and technical approaches' by Pacific Analytics.

<https://www2.gov.bc.ca/assets/gov/environment/climate-change/z-orphaned/ceei/ceei-comparison-study.pdf>

Table 15: Kelowna Community Energy and Emissions Inventory Data

Kelowna Community Energy and Emissions Inventory Data							
Sector	Subsector Description	Measurement Description	Connections	Consumption	Units	Energy (GJ)	CO ₂ E (t)
2017							
On-Road Transportation	Light duty vehicles, mainly	Gasoline		155,258,416	L	5,434,045	344,037
On-Road Transportation	Heavy duty vehicles, mainly	Diesel Fuel		16,391,434	L	627,792	41,065
2016							
On-Road Transportation	Light duty vehicles, mainly	Gasoline		149,474,450	L	5,231,606	334,275
On-Road Transportation	Heavy duty vehicles, mainly	Diesel Fuel		14,208,061	L	544,169	35,924
2014							
On-Road Transportation	Light duty vehicles, mainly	Gasoline		145,822,981	L	5,103,804	332,153
On-Road Transportation	Heavy duty vehicles, mainly	Diesel Fuel		13,165,869	L	504,253	33,906
2012							
On-Road Transportation	LDVs, mainly	Gasoline		138,614,166	L	4,851,496	321,585
On-Road Transportation	HDVs, mainly	Diesel Fuel		12,473,660	L	477,741	32,718
Solid Waste	Community Solid Waste	Solid Waste		73,073	T	0	59,989
Buildings	Residential	Electricity	52,323	616,084,767	kWh	2,217,903	2,647
Buildings	Residential	Natural Gas	32,458	2,403,305	GJ	2,403,305	119,567
Buildings	Residential	Propane		66,749	GJ	66,749	4,061
Buildings	Residential	Heating Oil		37,765	GJ	37,765	2,556
Buildings	Residential	Wood		278,649	GJ	278,649	6,543
Buildings	Commercial/Small-Medium Industrial	Electricity	6,467	559,860,173	kWh	2,015,495	2,448
Buildings	Commercial/Small-Medium Industrial	Natural Gas	3,977	1,811,978	GJ	1,811,978	90,148
Total Emissions 2012							642,262
2010							
On-Road Transportation	Light duty vehicles, mainly	Gasoline		141,038,935	L	4,936,363	327,210
On-Road Transportation	Heavy duty vehicles, mainly	Diesel Fuel		11,219,691	L	429,714	29,957
Solid Waste	Community Solid Waste	Solid Waste		85,050	T	0	58,745
Buildings	Residential	Electricity	51,465	610,070,174	kWh	2,196,251	4,867
Buildings	Residential	Natural Gas	32,225	2,367,361	GJ	2,367,361	117,779
Buildings	Residential	Propane		60,010	GJ	60,010	3,651
Buildings	Residential	Heating Oil		33,952	GJ	33,952	2,298
Buildings	Residential	Wood		250,518	GJ	250,518	5,883
Buildings	Commercial/Small-Medium Industrial	Electricity	6,388	540,204,555	kWh	1,944,735	4,391

Kelowna Community Energy and Emissions Inventory Data							
Sector	Subsector Description	Measurement Description	Connections	Consumption	Units	Energy (GJ)	CO ₂ E (t)
Buildings	Commercial/Small-Medium Industrial	Natural Gas	3,840	1,733,257	GJ	1,733,257	86,231
Total Emissions 2010							641,012
2007							
On-Road Transportation	Light duty vehicles, mainly	Gasoline		148,808,168	L	5,208,286	348,211
On-Road Transportation	Heavy duty vehicles, mainly	Diesel Fuel		10,211,429	L	391,098	27,877
Solid Waste	Community Solid Waste	Solid Waste		96,892	T	0	58,996
Buildings	Residential	Electricity	52,304	576,821,576	kWh	2,076,556	4,707
Buildings	Residential	Natural Gas	31,160	2,517,233	GJ	2,517,233	125,235
Buildings	Residential	Propane		62,346	GJ	62,346	3,793
Buildings	Residential	Heating Oil		35,274	GJ	35,274	2,387
Buildings	Residential	Wood		260,269	GJ	260,269	6,112
Buildings	Commercial/Small-Medium Industrial	Electricity	6,172	528,280,886	kWh	1,901,810	4,397
Buildings	Commercial/Small-Medium Industrial	Natural Gas	3,735	1,678,748	GJ	1,678,748	83,519
Total Emissions 2007							665,234

Appendix 3: Modelling Details

The QuickStart modelling tool

CEA's QuickStart model was used both to calculate the BAU trajectory, and to estimate the potential GHG reductions that could be achieved.

Developed in 2010, on behalf of BC Hydro, and used by approximately 60 communities to date, the model builds on information including population and community energy and emissions inventory data.

The model uses formulas both to calculate the BAU trajectory, and to estimate the impacts of each action.

Business As Usual (BAU) trajectory

The BAU trajectory was calculated by using available inventory data, and then projecting forwards.

As described in Appendix 2, from 2007-2012 comprehensive inventory data is available through a combination of CEEI and Kent Marketing fuel sales data. From 2013-2017 only transportation data from Kent Marketing was available, and energy consumption and emissions from electricity, natural gas, and solid waste were estimated. From 2018 onwards, all of the data is an estimate as a BAU projection.

For the BAU projection modelling, the assumption is that energy consumption and emissions will increase proportionally with increases to Kelowna's population, although the impact of policies from higher levels of government are also incorporated. Only policies that have already been adopted and that will have quantifiable impacts are incorporated. These are:

- the Province's incremental steps to net zero energy ready buildings by 2032;
- tailpipe emissions standards;

- renewable & low carbon transportation fuel standards; and
- An average annual decrease of 1.2 per cent in natural gas consumption per residential connection, as FortisBC does in its planning.⁵⁴

Action impacts

To take into account the impact of implementing a climate action plan, the modelling tool estimates the impacts of actions compared to the BAU trajectory. It calculates the individual and combined impact of actions.

The impacts of individual actions can vary greatly between communities, and depend on the assumptions made. CEA has conducted research on the impacts that different actions can have. Estimated impacts for the Kelowna actions were refined through discussions with City staff.

A summary of the impacts of the plan is shown in the Climate Targets section. Details on the impacts of individual actions on GHGs and energy dollars are shown in Figures 16 and 17.

⁵⁴ FortisBC. 2014 Long term resource plan.

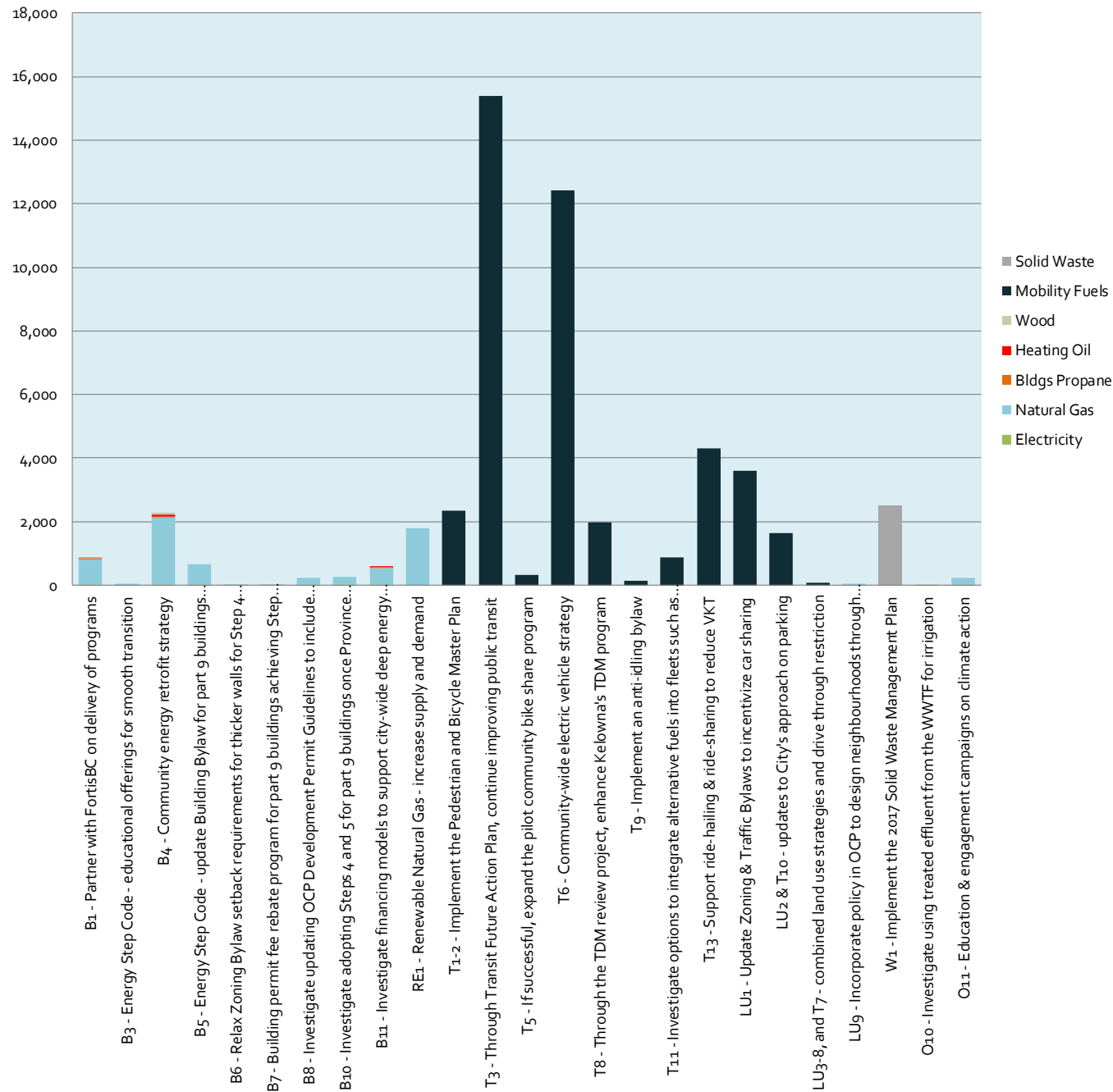


Figure 16: Estimated GHG impact for each action

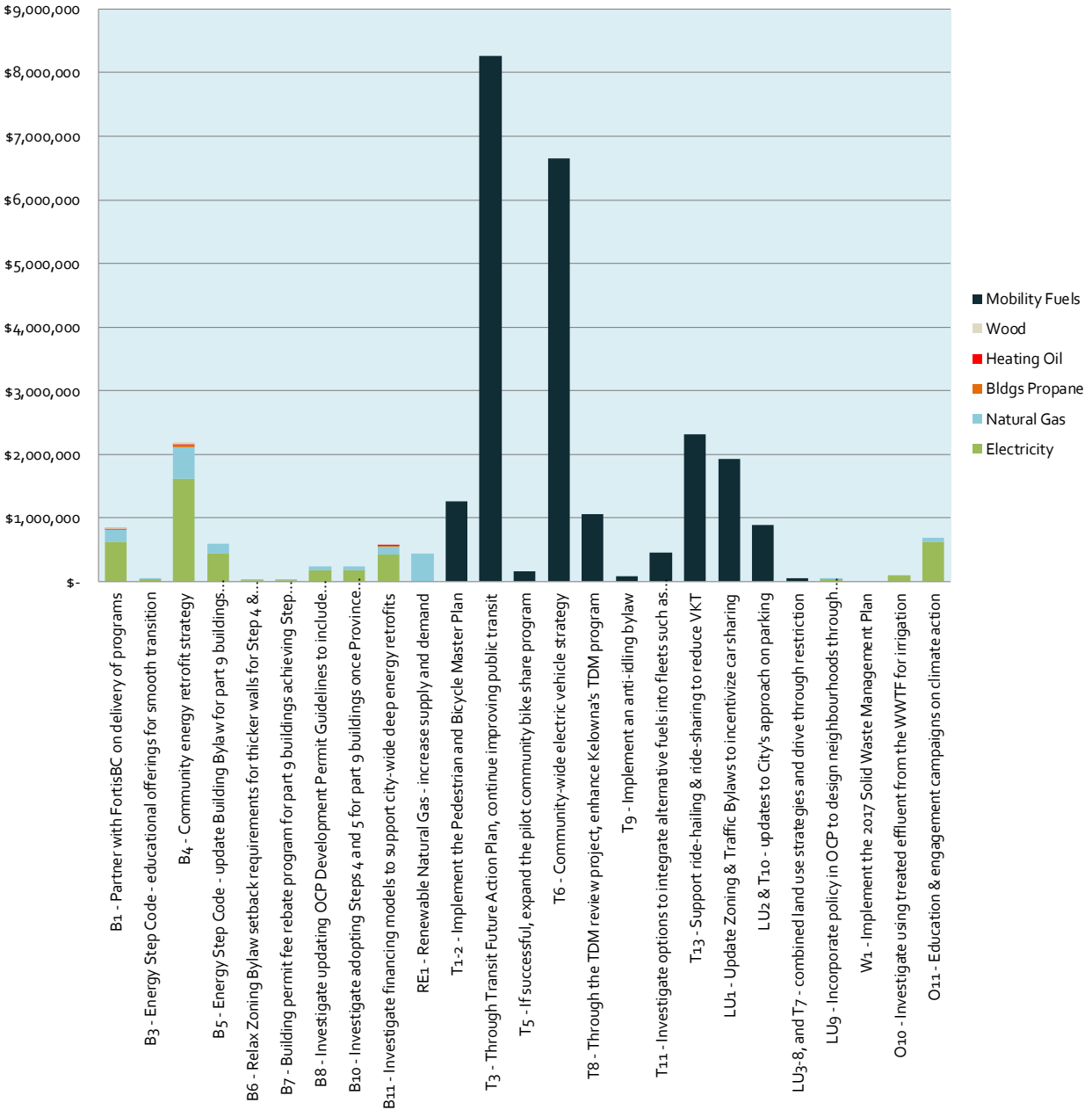


Figure 17: Estimated energy dollar savings for each action

Appendix 4: Our Community's Success Stories

Below are a few snapshots of some of Kelowna's success stories since the 2012 Community Climate Action Plan was endorsed.

- **City of Kelowna Operations.** The City has made great progress in reducing emissions in its own buildings, fleet, and infrastructure, reducing GHG emissions 7 per cent from 2007 to 2016. Despite Kelowna's rapid population growth, it is providing services to more people at a reduced carbon footprint, and saving taxpayers money by controlling energy costs. A variety of retrofit and fleet changes have been implemented to achieve this reduction. An LED streetlight retrofit project is currently underway and will help continue to reduce energy costs. This project is estimated to reduce streetlight electricity consumption by 62 per cent, or the electricity used by 410 homes per year.⁵⁵ The cost savings will pay for the project in under 4 years, with the LED's expected to last for up to 15 years.⁵⁶
- **City of Kelowna Processes.** The City has made it easier for residents to generate their own renewable energy. Building permit fees and requirements have been removed for residential solar photovoltaic systems provided panels mount flush to the roof, and the installation is completed according to the manufacturer's instructions.⁵⁷ In other BC communities, these costs can add up to \$2,000 on top of a system that may only be around \$6,000, and add significant delays to a project.

"I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait till oil and coal run out before we tackle that."

-Thomas Edison

- **Construction Partnerships.** The construction industry has been leading with a number of innovative projects, including the Wilden Living Lab, a partnership between the Wilden, UBC, Okanagan College, FortisBC, and AuthenTech Homes. Two essentially identical homes were built side-by-side, one to current code requirements, and the other to a higher energy efficiency standard. Monitoring will take place over a few years as families live in them, to verify the expected energy savings.⁵⁸ In addition, a 700 square foot laneway house being built on Walrod Street by Stonebridge Contemporary Originals is anticipated to reach Step 4 or 5 of the Step Code for as estimated \$214 per square foot. Research has suggested that it should be expensive for small homes to achieve higher steps of the Step Code, and yet this project proves that it can be cost effective.⁵⁹
- **Royal Ann Hotel.** The Royal Ann Hotel installed 54 ductless split heat pumps to reduce energy consumption and provide a quieter experience for guests than conventional alternatives.⁶⁰
- **Okanagan Car Share.** The Okanagan Car Share Co-op launched in August 2013 with just 35 members and 2 vehicles. It has since grown

⁵⁵ Electricity savings will be over 4,400,000 kWh per year.

⁵⁶ City of Kelowna. 2017 Corporate Energy and GHG Emissions Plan. https://www.kelowna.ca/sites/files/1/docs/2012-06-12_climate_action_plan_final_public_version_reduced.pdf

⁵⁷ Communications with Development Services.

⁵⁸ Wilden Living Lab. <http://wildenlivinglab.com/>

⁵⁹ Communications with Stonebridge Contemporary Originals and the homeowner.

⁶⁰ Canadian Aerothermal. Projects. <http://canadianaerothermal.ca/projects.html>

to over 450 members and 13 vehicles.⁶¹ Car sharing significantly reduces GHG emissions through reduced travel in single occupant vehicles. They also reduce need for parking, helping to lead to more complete, compact communities.

- **Kelowna Taxi Services.** Kelowna Cabs operates a fleet of mostly hybrid vehicles. Current Taxi opened in Kelowna in early 2017 as BC's first all-electric taxi fleet and has since expanded rapidly.
- **Electric Vehicle Network.** The electric vehicle charging network has steadily expanded in Kelowna in recent years. A number of businesses have seen an opportunity to attract customers by installing electric vehicle chargers, such as the Best Western Hotel, Delta Grand, Hotel Eldorado, Four Points, Bottega Farm Inn, Urban Distilleries, Towne Centre Mall, and Summerhill Winery. The City of Kelowna has also installed electric vehicle chargers in the downtown in partnership with FortisBC.



⁶¹ Okanagan Car Share Co-op. About OGO.

<https://www.ogocarshare.ca/about/>

Appendix 5: Engagement Summary

Introduction

The City offered a variety of opportunities prior to and during the project to engage the public and stakeholders to gather their feedback. This feedback was used in conjunction with best practices to inform and update the Community Climate Action Plan to recommend actions and initiatives that can be undertaken to reduce community energy and greenhouse gas (GHG) emissions in Kelowna.

This summary provides highlights of engagement activities that informed the development of the Community Climate Action Plan.

Feedback for the Plan was obtained through the following:

- *Imagine Kelowna* – 2016 to 2018 input
- *Imagine Kelowna* On Point Discussions:
 - Climate Change On Point Session, November 16, 2016
 - Transportation On Point Session, December 8, 2016
- Stakeholder Discussion on Energy Step Code – September 2017
- Stakeholder Workshop – November 30, 2017
- Online Engagement.kelowna.ca online engagement – February 6 – 22.

Methodology

Engagement for the Community Climate Action Plan was based on an engagement strategy that was developed at the start of the project to effectively gather input from the community and key stakeholders in development of the Plan.

The purpose of engaging on the Community Climate Action Plan is to create understanding, awareness and support for an updated greenhouse gas reduction target as well as actions that will work towards the target. Additionally, it is hoped that engaging with stakeholders will help build

future partnerships to implement the actions of the Plan.

As the City was in the midst of the most of extensive public engagement process in its history, *Imagine Kelowna*, the information gathered during that process was used to help inform the Community Climate Action Plan. Discussions during the process specifically on climate and transportation (the On Point Discussions) provided helped inform the actions. Further, through the Imagine Process identified draft key directions that the Community Climate Action Plan aligned with.

The provincial Energy Step Code was introduced early in the process, and as the direction of Step Code would help inform the actions regarding new buildings, stakeholders were invited to respond to a high level email discussion on the topic.

After the development of draft targets and actions, informed by best practices and the above input, stakeholders were invited to a stakeholder engagement in late fall to provide feedback and identify if any actions were missing.

The final engagement with the community was hosted online to provide feedback on the target as well as the actions related to energy use in buildings, transportation and other actions.

It should be noted, that in addition to gathering input from the public, extensive engagement was done with a variety of City departments to develop and build support for the Plan's actions.

Engagement Results

Imagine Kelowna 2016 to 2018

The City and community partners recently undertook the most extensive public engagement process to date to create a new community vision for the future. *Imagine Kelowna* is a vision for building a prosperous and sustainable city in the face of an uncertain future. The City will use *Imagine Kelowna* to help shape its short and long-term planning priorities and provide the foundation for future strategies, plans and projects.

Almost 4,000 residents provided input to the *Imagine Kelowna* process, and many of the goals that have been drafted from this input help achieve a low carbon community. The key draft directions from *Imagine Kelowna* that provided direction for the Community Climate Action Plan include:

- Principle: Connected
 - Goal: Embrace diverse transportation options to shift away from our car-centric culture
 - Goal: Create great public spaces that bring people together
- Principle: Smarter
 - Goal: Take action and be resilient in the face of climate change
 - Goal: Build healthy neighbourhoods that support a variety of households, income levels and life stages
- Principle: Responsible
 - Goal: Concentrate on growing vibrant urban centres
 - Goal: Strengthen the protection of our land, water and air resources
 - Goal: Protect agricultural land and promote sustainable farming
 - Goal: Preserve Okanagan Lake as a shared resource

For more information on the *Imagine Kelowna* process, visit imagine.kelowna.ca.

Imagine Kelowna On Point Discussions – November 16 and December 8, 2016

Two On Point Upside Down Town Halls were hosted as part of the *Imagine Kelowna* engagement specifically related to the Climate Action Plan input one on climate and one on transportation. A snap shot of the discussion of these two events are provided below. For more information on the On Point events visit imagine.kelowna.ca.

ON POINT ON CLIMATE CHANGE

136 participants gathered on November 16, 2016 to talk about the many ways the community can address the threat of a changing climate to life in the Okanagan.

Overall the sentiment from the evening was:
"We can individually make incremental adjustments, but we need our City to take the lead to initiate large-scale action on climate change."

At the event community members participated in an engagement activity that included a roundtable discussion. In addition to discussion how individuals could make behavior change to reduce greenhouse gas emissions, the discussion also focused on what the City could do to help the community reduce its emissions. Actions suggested were from five categories and included:

1. Energy
 - invest in alternative energy
 - building codes with green initiatives
 - incentives for businesses, residences, developers to improve energy efficiency
2. Transportation
 - increase parking costs / reduce parking
 - more bike paths / better bike lanes
 - improve transit (within city and the valley – public train?)
 - make Bernard a walk only street
3. Lifestyle
 - ban leaf blowers
 - rebates for sustainable purchases like rain barrels, solar, high efficiency appliances
 - home compost pickup / drop off

- encourage walkable communities
- 4. Policy
 - ban bottled water / plastic bags
 - protect farm land / create more green space
- 5. Other
 - more education and awareness
 - push developers to do more, i.e. more green space, alternative energy, community garden, implement car sharing at new developments.

ON POINT ON TRANSPORTATION

110 engaged community members gathered on December 8, 2016 to talk about transportation in the Okanagan, and focused on how to shift thinking 'beyond transportation', to how it can enable a vibrant city.

The overall theme heard during the evening was: *"Let's design our future with the pedestrian, cyclist, and transit-goer in mind."*

At the session participants discussed actions that the City or themselves could take to turn the theme of the evening into reality. Actions suggested were from four categories and included:

1. Biking and walking
 - increase dedicated bike / multi-use paths by allocating more resources in the annual budget and making active transportation a priority
2. Transit
 - improve transit systems by establishing consistent schedules and affordable rates
 - build an electric, fast train running up and down the valley along the old rail routes
3. City development
 - promote shopping for everyday needs in areas of high density so residents don't have to drive to shop
 - localizing work; continue to build on the concept of 5 town centres
 - introduce a car-free Bernard
 - increase traffic circles

4. Other
 - companies promote remote working opportunities
 - embrace autonomous vehicles
 - support carshare and car pool -- don't let companies charge OGO for the spots; incentives to encourage use
 - introduce a HIGH carbon tax
 - find better ways to connect UBCO/OUC students with local industry throughout their degree

Stakeholder Energy Step Code Discussion, September 2017

One of the main actions that can be taken to reduce emissions from new buildings is for a municipality to adopt the provincial Energy Step Code into its building bylaws. Several stakeholders were emailed a series of questions to gather their input on the new provincial energy step code. Responses were received from 5 organizations including the Canadian Housing and Mortgage Corporation (CMHC), Urban Development Institute (UDI), Canadian Home Builders Association (CHBA), BC Housing, and Nido Design.

Participants commented on a variety of questions related to building more efficiently including:

1. *Projects that organizations have been involved in built above the energy efficiency requirements of the current BC Building Code:*
 - Several builders in the community have already been building beyond the base BC Building Code.
 - Almost all affordable housing projects that have received funding from both CMHC and BC Housing are built above BC Building Code
 - CMHC's Affordable Rental Innovation Fund program requires eligible BC projects demonstrate a minimum 10% energy performance improvement on the BC Building Code
 - CMHC's Rental Construction Financing Initiative requires eligible projects must

achieve a minimum 15% decrease in energy use and GHG emissions relative to the 2015 National Energy Code for Buildings

2. *Challenges to building more efficiently:*

- Taking the time and money to design projects well early in the process.
- Designers and builders unfamiliar with a building envelope first approach.
- Convincing municipalities to allow for features that help achieve high performance designs (e.g. thicker walls, buildings without balconies, lower window to wall ratio).
- How to convince home builders and developers to build more energy efficiently.
- Perceived assumptions that green must cost more
- Many consumers wish to have higher aesthetic standards as opposed to spending the same dollars on improved sustainability
- Energy efficiency is often examined in isolation without considering other benefits it brings, such as trade-off opportunities (e.g. smaller and less expensive HVAC systems) and better indoor environmental quality.

3. *Anticipated challenges for Energy Step Code:*

- Finding qualified contractors especially in more remote regions.
- Some builders and designers are ideologically opposed to the idea of more compact forms or different ways of putting together building envelope.
- All purchasers get higher cost of ownership – more expensive for new homes due to energy efficiency, therefore older home prices go up.
- Recent building code updates have already increased costs by \$15,000 to \$20,000.
- The additional benefit with each improvement in the code gets smaller for every dollar.

- More opportunity for community energy efficiency for less money in the existing home market.
- Not enough research to see what the cost effects will be to both builders and home buyers.

4. *Anticipated opportunities for Energy Step Code:*

- Designers and builders consider the building envelope first, improve quality control
- It allows Kelowna to build towards Net Zero Housing, making our City more sustainable!
- The tiers provide municipalities with the flexibility to require or incentivize the steps that make most sense to its regional context and goals.
- For builders, the learning curve to adapt to the Step Code will be less steep than other programs (LEED, Built Green, etc.).
- Opportunities for builders who do wish to adopt early to achieve a competitive advantage over those who wait for legislation to require such.
- Given that its being promoted as a voluntary, flexibility in creating best practices to achieve the varying levels of the step code, without any impractical methods being mandated.

5. *Suggested actions City could take to encourage/require more efficient building*

- Train staff so that they recognize more novel solutions to energy savings.
- Work with other organizations to sponsor industry training opportunities in your municipality.
- Require at least the lower levels of the step code for all buildings and upper levels for incentives and rezoning.
- Build some city-owned projects to the new standards.
- Engage the general public to raise awareness of energy efficiency, improve their understanding of the total cost of

owning and operating a home and achieve market acceptance.

- Identify projects to research on the additional tangible benefits of energy efficiency.
- Require energy labeling on new builds and major renovations if they can be supplied locally at a reasonable cost. This could be offset, initially, with reduced permitting fees to get uptake to a point of critical mass.
- Add density bonus provisions to promote higher efficiencies. There needs to be an offset to the perceived cost of these measures.

6. *Training and education needed to prepare for Step Code implementation:*

- Building envelope design for designers
- Hands-on building envelope detailing classes for builders and trades.
- House-as-a-system training to improve the knowledge that energy efficiency also provides greater comfort, better indoor environmental quality and long-term cost-savings.
- Training for Energy Advisors to improve access to CEAs.
- Built Green equivalent for builders and a Developer Specific one for Developers.

7. *Additional Comments:*

- Focus on readily available technology and materials to help reduce the incremental costs
- Promoting waste reducing methodologies such as prefabricated panelization of construction, and/or PPVC
<https://www.bca.gov.sg/BuildableDesign/pvc.html>

**Stakeholder Workshop,
November 30, 2017**

Fourteen people representing 13 organizations attended a stakeholder workshop on November 30, 2017 to discuss the draft target and actions. Fourteen people representing thirteen organizations attended including:

- Canadian Mortgage and Housing Corporation
- Canadian Home Builders Association
- Urban Development Institute
- Canadian Mortgage and Housing Corporation (CMHC)
- Total Home Solutions
- UBC Okanagan
- Interior Health
- Okanagan College
- Nido Design
- Flip Side Sustainability
- Okanagan Basin Water Board
- Ogo Car share
- Urban Systems

Feedback was provided on each of the actions categories (the way we get around, the energy we use in buildings, planning our community, other actions). Participants had the opportunity to provide feedback on the existing draft actions as well as to provide suggestions for new actions. For those new actions, the comments were then either linked to existing actions or summarized as a new suggestion. Participating organizations also provided feedback where they felt their organization could help support an action.

Input on the Way We Get Around

1. Action concerns

Action #	Comment
General	Actions don't address population growth of the community
T2	<p>Pedestrian and Bicycle Master Plan Capital Projects - if they need to put in bike lanes as part of the development, then their costs increase which increase the costs to the consumers.</p> <ul style="list-style-type: none"> • Need more bike lanes. Every road that is built should have a bike lane. • Instead of sidewalks have wider multi-use pathways. (This also helps with aging in place.) • Integrated bike lanes, sidewalks and multi-use pathways
T3	<p>Kelowna Transit:</p> <ul style="list-style-type: none"> • shoe string system on a budget due to constraints. How can we help make the business case for transit? • Regional Transit Strategy to reduce traffic problems between Kelowna and West Kelowna • Transit rider growth targets • Business case for BC Transit. Strategic marketing. Marketing analysis of public transit. Responsibility to be fiscally smart. • City working with BC Transit to build business plan for transit expansion (new customers for transit, strategic marketing, etc.)
T4	<p>Electric Vehicle Strategy:</p> <ul style="list-style-type: none"> • Electrical vehicles are an end of the pipe solution. They don't promote modal shift, and the resulting problems are the same, e.g. congestion, need for road construction, and parking structures which are expensive. • Instead of electric vehicles, the transportation budget should align with the goals of the plan.... E.g. if there is a desire for active transportation and transit options, then the budget should reflect these priorities proportionally. • Planning for E plug in stations, e.g. in parking structures, multifamily and commercial structural parkades.
T5	Banning drive through is easier to gate keep and more effective than anti-idling bylaw.
T6	<p>Enhance TDM – several comments that the action is too vague. This action could include:</p> <ul style="list-style-type: none"> • Not subsidising parking by employers • Require key infrastructure in work places like showers (e.g. as the Province mandates all of their buildings to have). • Encourage carpooling (Carpool.ca not effective). Hamilton has a carpooling program for suburbs, very successful. Run through Facebook. City could replicate. • Encourage telecommuting or shared satellite work spaces. • Neighbourhood level surveys and direct engagement, e.g. as per the Smart Trips program that Green Step did for South Pandosy several years ago. With mode split targets for each neighbourhood. Surveys can help to understand what it would take for people to look at options. Neighbourhood level mode split targets plus Action Plan and direct engagement
T7	Anti-idling will be tough to enforce. Insignificant action, other measures will make more impact.
T10	Regional fuel tax - assess if it is effective to changing behavior. Demonstrate accountability and transparency with program (e.g. communicate out what projects are being supported, e.g. transit or active transportation), and the modal shift.
T10	Example of the carbon tax – revenue neutral – make a system that goes to tax credits for desired behavior and investments so it improves the business case (e.g. transit)
T11	Move bike share to actions to implement

2. Suggestions for new actions

Comment
Protect for an Okanagan alternative transportation corridor (e.g. LRT or maybe autonomous car share) vehicles that operate like mini buses between municipalities. Plan for Light Rail Transit (or alternative intercity corridor)
Autonomous vehicles: <ul style="list-style-type: none"> Plan and support emerging technologies - autonomous vehicles Support emerging technologies – driverless cars Combine driverless vehicle strategy with electric vehicle strategy (also look into rooftop solar to charge electric vehicles)
Active transportation infrastructure: <ul style="list-style-type: none"> Bike racks: secure places to lock bikes, more bike racks on buses, insufficient bike parking on Bernard, guidelines on bike racks, including on visibility (making sure there is a window that looks out on to them) and on quality snow clearing for bike lanes Ensuring sidewalks are not obstructed so that kids can cycle Electric bike and electric scooter charging stations (one person at the table had an issue with this).
Pilot project. Park & ride, or park & cycle, from Capital News car park into town.
Consult with stakeholders with perceived barriers so you can implement these actions.

3. Supporting the actions

Comment
UBCO: <ul style="list-style-type: none"> Can share the business case for green / rain garden stormwater management that was used as rationale for their onsite stormwater transit exchange plan. Have TDM planning in 2018-19 fiscal year as a proposal
Ogo Car Share Co-op (ongoing)
Urban Systems - driverless vehicle infrastructure design
CMHC – part of CHMC's affordable housing grants they have to be close to transit. Additionally, they must also have 10% reduction in GHG emissions compared to current building code. https://www.cmhc-schl.gc.ca/en/inpr/afhoce/afhoce/affordable-rental-innovation-fund.cfm
Urban Matters - conduit relationships between organization and City
Team Construction is practicing "Lean Construction" – resulting in less trips for materials and site visits, which maximizes fuel consumptions and emissions.
Electric bikes – Wilden are currently selling electric bikes to residents at a low cost and might consider an electric bike co-op in the future.

Input on the Energy We Use in Buildings

1. Action concerns

Action #	Comment
General	Actions are 'tame' not bold. Need to be bolder.
B2	Retrofit strategy: <ul style="list-style-type: none"> very important but need incentives (e.g. FortisBC) or City tax incentive, or Micro-loans from City / bank partnership, or add to property taxes, Property transfer tax – energy assessment on existing homes Energy retrofit with low interest loan CMHC, savings on utility costs and increased value of home, payback of loan from savings on utility costs. Need to include thermal imaging with this for pre-2000 buildings Potentially, fire inspectors could do thermal imaging as part of their inspections?

	<ul style="list-style-type: none"> • Provide a guide for homeowners on retrofits (note: there can be issues in providing advice that is too general, as homes can be specific). (Note: FortisBC has an insulation and draft proofing guide on their website) • Could be a good opportunity for neighbourhood by neighbourhood approach on energy literacy. Perhaps include incentives like, free blower door tests, & invite the neighbours over too (Note: this has been shown to be effective in other communities / circumstances.) Could also include transportation. • Engaging community in DSM (Demand Side Management) measure awareness, energy efficiency for retrofit technology
B3	<p>Step Code Strategy:</p> <ul style="list-style-type: none"> • Challenge with net zero / efficient buildings is sourcing the materials (e.g. windows cannot be sourced locally) and qualified trades. • City needs to provide a clear timeline. A 1-year lead time for Step 1 to be made mandatory across the community to prepare EnerGuide assessors. A phased approach would make it easier. • City could offer reduced DCCs for green buildings / passive projects (e.g. Penticton OK College daycare received 50% off DCCs and now it is in their bylaw for passive projects, e.g. Lake Country has Building Permit rebates on higher performances) • Engaging community in DSM (Demand Side Management) measure awareness, energy efficiency in new builds (e.g. UBCO), as well as DSM retrofit technology

2. Suggestions for new actions

Comment
Need to also look at the GHG impact of material choices, e.g. Concrete holds the most GHG load typically in a building and there are ways to reduce it (e.g. recycled concrete or using ash products to lighten concrete without reducing its strength). Look also at other aspects of materials and their impacts e.g. VOCs in paint or carpets.
Report Card for Housing: <ul style="list-style-type: none"> • Energuide assessment required at sale of home (resale or new home) (note: not allowed under current legislation). Require real estate 'Energy Score' in listings and lenders to also require this for mortgage qualification.
Support post-secondary: <ul style="list-style-type: none"> • Support the Okanagan College's Passive House Program, through education and policy development • Support UBCO's Life Cycle Management Lab
Mortgage lenders should be required to include the energy costs per month in the spreadsheet for qualifying for a mortgage for all properties.
Guide to Home Retrofit with Fortis and City (mechanical and envelope with utility)

3. Supporting the actions

Comment
<p>Opportunities with Okanagan College and University of British Columbia:</p> <ul style="list-style-type: none"> • The Okanagan has an opportunity to be able to train trades (and engineers) who are specifically qualified to design and construct green buildings (so far not enough demand). We could have the vision to be the centre of this industry in the interior, but need the policy to go first to create the demand, the demand will follow and the college and university are ready to provide the appropriate classes and programs. • Partner with UBCO and Okanagan College for a Capstone project to prepare a business case for passive house standards, and how to better educate and integrate the Step Code and green building requirements into policy and normal practice • UBC-O could engage builders, developers', trades on their short term, 2-5 year DSM plan which looks at new technologies like wireless occupancy sensors to shut off HVAC in UBC-O buildings. Also, engaging students so they have education on these topics while in school including energy efficiency courses.

Comment
OBWB – OK Mainline Real Estate Board has Industry Funding that is often undersubscribed. OBWB could help facilitate a partnership for the real estate industry and the City to do a business case for the implementation of the Step Code / green buildings.
Urban Systems – help communicate actions to the public
CHBA – promote energy efficiency and green building to builders
UDI – communicate to members
CMHC: <ul style="list-style-type: none"> moving from net zero energy to net zero carbon and is promoting conservation measures first. Green home rebate - CMHC Green Home offers a premium refund of up to 25% to borrowers who either buy, build or renovate for energy efficiency using CMHC-insured financing

Input on Planning Our Community

1. Action concerns

Action #	Comment
LU1	Amend parking requirement: <ul style="list-style-type: none"> Parking requirement is key. Incentive programs for large employers Plan for the changes autonomous vehicles will bring, including the reduced need for parking. This trend should be reflected in reduced parking requirements through bylaw. There should be no parking requirements for development within a certain distance of transit (e.g. Oregon) Balance minimum and maximum parking requirements. Modernize parking regulations (and requirements for parking in new buildings) to align with fewer, smaller and autonomous car future Reduce parking minimums for rentals in town centres and transit corridors
LU2	Lifecycle costing in DCCs (i.e. Lakeshore bridge – end of life cycle paid for by DCCs) Developers are paying for City infrastructure through DCC program (note: there is an asset management program for maintenance).
LU4	Land planning with respect to urban densification should be integrated with transportation planning (note: this is the intent of this action)
LU5	City or neighbourhood get involved in building neighbourhood structured parkades, for car share and electric vehicles sharing between projects.

2. Suggestions for new actions

Comment
Increase density: <ul style="list-style-type: none"> Look at other planning options to increase density without radically changing character of neighbourhoods (e.g. RU7 an example of small scale multi-family developments on a single lot without consolidation). Relax height restrictions to encourage density, walkability, transit oriented growth. There is a “missing middle” with density. Not just high rise, or low density, but mid-density. If suburbs are going to have commercial, then they need to increase the density to multiple unit projects in order to make the commercial viable. Amenities to reduce driving trips in communities as economic development (e.g. no supermarket closer to Upper Mission than South Pandosy) Growth concentration around rail corridor and town centres to meet transit service goals Urban centre increase density verses village centres Innovate urban (non-suburban) options for family housing e.g. shared economy (Healthy Housing Strategy)
Work with neighbouring municipalities.

Comment
Planning for people aged 8-80.
Encouraging local amenities to reduce driving trips.

3. Supporting the actions

Comment
Interior Health can provide comments on actions.
CHBA - can promote healthy growth with all the Land Use Planning actions among its members.
OGO is decreasing parking demand

Input on Other Actions

1. Action concerns

Action #	Comment
O1	<p>Urban Forestry Strategy:</p> <ul style="list-style-type: none"> Weedy tree management needs to be part of an Urban Forestry Strategy (e.g. no Siberian elms or Tree of Heaven) Rather than require replacement trees on the exact same parcel as development, consider an Urban Tree Bank for the neighbourhood, for parks and public areas Use boulevards for the fullest possible tree and green area and remove barriers for putting trees in boulevards Use boulevards for tree canopy and flood mitigation to achieve targets
O4	Amend landscape regulations – need to also enforce landscape regulation
O5	Funding climate initiatives – clarify if public versus private. Can a community group participate for startup funding?
O11	<p>Education / outreach (a key action):</p> <ul style="list-style-type: none"> Could be posed as a challenge (e.g. Frances GHG's/capita is 30% of ours) required to educate citizens about the relative costs of various choices and impacts homeowner education on how to operate new technology, like heat pumps, can be necessary. Partner with OC and UBC on housing as a system to educate trades On point as example – community organization hosted instead of City results in shared accountability City should also link CCAP actions with climate change, e.g. through a blog on these issues. Regular communications may help people become more solution oriented. & make it personal. People can feel differently through shared opportunities. & there are huge opportunities with the tech sector. Educate cyclists & motorists so that we all take care of each other. more branding for Kelowna may help, for marketing and advertising. Table decided on: "Healthiest City in Canada." Branding – piggy back off of Healthy City Strategy people need to be able to see with growth in population, what could the City look like? What future would they like? If people can visualize what it can look like, it might help. E.g. compare smoky sprawling city with one with excellent public transit Using shared stories and experiences to bring people to a common place Cyclist and motorist education so we all take care of each other, understand rules of the road Cyclist training There should be regular columns in local papers on this subject. City can be thought leaders on this. (e.g. City used to have a regular Living Greener story) Education of the local media. Getting these reporters into the room.

	<ul style="list-style-type: none"> Failure in communication is that we are thinking macro scale. Often it comes back to communicating community values. Gives example of using Community Energy Explorer with Delta to help folks imagine what the future can look like. Paint a vivid picture of what things will look like. How can we manage growth & maintain quality of life? (note: UBC Climate Futures Lab – shows Delta) in 2005 some people made videos on “the two tomorrows”. Perhaps by Okanagan Partnership. On You Tube (https://www.youtube.com/watch?v=qcKoQeCWs38)
W1	<p>Waste reduction:</p> <ul style="list-style-type: none"> Green compost pickup regionally. (e.g. Chilliwack has a composting program) (note: draft Regional Waste Reduction Plan already refers to investigating options for this). Waste reduction (in absolute terms. Not just diversion)

2. Suggestions for new actions

Comment
Combine climate mitigation and adaptation plans. Integrate mitigation and adaption actions – synergy with combined plans. Further Ensure Adaptation Plan is integrated across departments
<p>Local Food:</p> <ul style="list-style-type: none"> Need Community greenhouses and more community gardens. Promotion and more incentives for community gardens in multifamily projects and parks. More opportunities to have food production on public land Promote edible landscaping and community gardens.
<p>Renewable energy:</p> <ul style="list-style-type: none"> Push Fortis to partner for district energy Promote District Energy solutions, e.g. around the WWTF and the college / KSS. (College uses some now). Solar and district energy partnerships Solar incentives Establish better incentives for self-generating power (e.g. solar, home biogas (\$1,000 for a mini-biogas digester for compost can provide enough gas to power fireplace, stoves or BBQ). And work with Fortis to remove barriers to sell self-generated power back to the grid. Fortis needs to promote net metering for solar and encourage and make it easy for residents Incentivize more local, municipal and homeowner renewable energy production (e.g. Nelson Solar Garden) Investigate a community solar farm. Promote choosing Renewable Natural Gas as a choice for users in order to increase the demand for it.
Integrate natural capital into the plan. Natural Capital considerations (e.g. Gibsons)
Paradigm shift required – generational shifts
APEGBC – Engineers and Geoscientists Climate Change Mitigation Paper and Information Portal
Incentivize rainwater capture barrels for homes and businesses

3. Supporting the actions

Comment
UBCO – Capstone project for the business case to Green Your Infrastructure Bylaw, including stormwater standards, e.g. boulevards as rain gardens and stormwater sinks instead of curb and gutter to storm drain. Use the flooding specter of the cost of pumping out multiple stormwater systems each time the lake gets too high to accommodate the flow in the spring as an example.
<p>Action O11 – Education support:</p> <ul style="list-style-type: none"> UBC-O could help by engaging with students, e.g. through Capstone. Accelerate Okanagan could engage the tech sector (although they were not present, this was mentioned)

Comment
<ul style="list-style-type: none"> • CHBA could help with education • Interior Health Could help with education • CMHC has some indicators that could help.

GHG Target Input

1. Thoughts on 2023 target

Comment
<p>General:</p> <ul style="list-style-type: none"> • Shy away from trying to change individual behaviour • take some risks to help encourage behaviour shifts (need infrastructure in place). Chicken versus egg question – behaviour change and infrastructure investments. Need to encourage and incentivize behaviour change <p>4% reduction seems tame, not bold. Some think it is realistic. Other's think it is "kicking the can down the road". Per capita targets are impressive. Some are unsure on what target should be while others think bolder moves needed.</p> <p>Communicate:</p> <ul style="list-style-type: none"> • Need for frame conversation in the positive, package the message positively to be the vision of a green City, sustainable and focus on that people don't have to give up their vision for quality of life, but that it can improve / will improve their quality of life. Focus on the gains, e.g. savings in time, money, and overall quality of life. (e.g. Vancouver closed a lane on Burrard Bridge for bikes, framed it as a positive for the City). • Empower people, educate, let them know it IS manageable, possible. Compare to other countries that are doing things already. Address a basic lack of understanding of what is required and involved • – Leaders need to keep the conversation on the agenda, normalize it as the 'Way we do Business', as a foundation of our OCP, not a part of it

2. Thoughts on 2033 target

Comment
Participants can send public engagement open house info out to their networks.

3. Thoughts on 2050 target

Comment
Be bold
Work on longer actions, even if unpopular

Input on Ambitious Actions

1. Action concerns

Action #	Comment
AA1	<p>Endorse Step Code early:</p> <ul style="list-style-type: none"> • City to set dates for Step Code implementation • Pilot project with a developer to help prove business case for Step Code (local examples) and work with UBC researchers • CHBA has hired an evaluator to show cost for different levels of Step Code locally (3 home types for each step) • Require high levels of Step Code for rezoning and variances (e.g. height, setbacks etc.)
AA4	Transportation pricing strategies:

	<ul style="list-style-type: none"> • Mobility Pricing needed – e.g. parking costs, bridge toll, congestion charges. The example used can be when the provincial government removed the bridge toll and auto trips went up 20+% in a month. • Toll the bridge
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2. Suggestions for new actions

Comment
Resiliency – community platform (i.e. sustainability committee)
Need to make the plan resilient enough to withstand political cycles. E.g. an ongoing climate action committee.
Need to leverage the local climate events. Recent, real, & significant impacts (UBCO used this to help them). And to ensure that actions reflect what community members are telling you. Lots of work to gather this input. & don't focus too much on the naysayers, but look at the critical mass.

3. Supporting the actions

Comment
A ₁ (Step Code) <ul style="list-style-type: none"> • UBC could do a pilot with a more energy efficient development to prove out the business case for higher steps and/or UBC-O could provide a Step Code test case with some of its development. • CHBA have hired a building estimator to look at costs. Using local data. Should be done in a few weeks, and they will make it available. Case study examples can help with Step Code too.
A ₄ (Transportation Pricing Strategies) could do a UBCO/College / City – Capstone project and focus on how it will improve Quality of Life, not so scientific.

Next Steps

Comment
Public engagement: <ul style="list-style-type: none"> • invite people to go to community engagement for positive reinforcement and use networks • Host a focus group with the “nay sayers” to find out their main issue and their core values • Include <i>Imagine Kelowna</i> input for public engagement • People at the meeting to come out to the public engagement session to provide positive feedback.

**Online Engagement,
getinvolved.kelowna.ca
February 6 – 22, 2018**

The online discussion through Get Involved was made available from February 6 to February 22, 2018. Citizen opinions were gathered relating to some of the new actions for transportation, buildings and the proposed GHG targets.

The Get Involved project page was promoted through many channels including: City of Kelowna Website, Facebook and Twitter. There were a total 440 unique visits to the project page, 38 engaged visitors, 137 informed visitors and 359 aware visitors.

Survey respondents were asked the following four open ended questions:

1. Have you completed any retrofits on your home? Did you receive any rebates or incentives to help encourage you to do them? What barriers have you encountered to making your home more energy efficient?
2. What are your thoughts on the above proposed ideas to reduce emissions from vehicles?

3. What are your thoughts on the proposed targets?
 - "Reduce GHG emissions four per cent below 2007 levels by 2023 (equivalent to 27 per cent per capita reduction)"
 - "Reduce GHG emissions 80 per cent below 2007 levels by 2050 (equivalent to 90 per cent per capita reduction)"
4. Is there anything else on the list of proposed actions that you would like to discuss? Do you have any other action ideas that you would like us to consider?

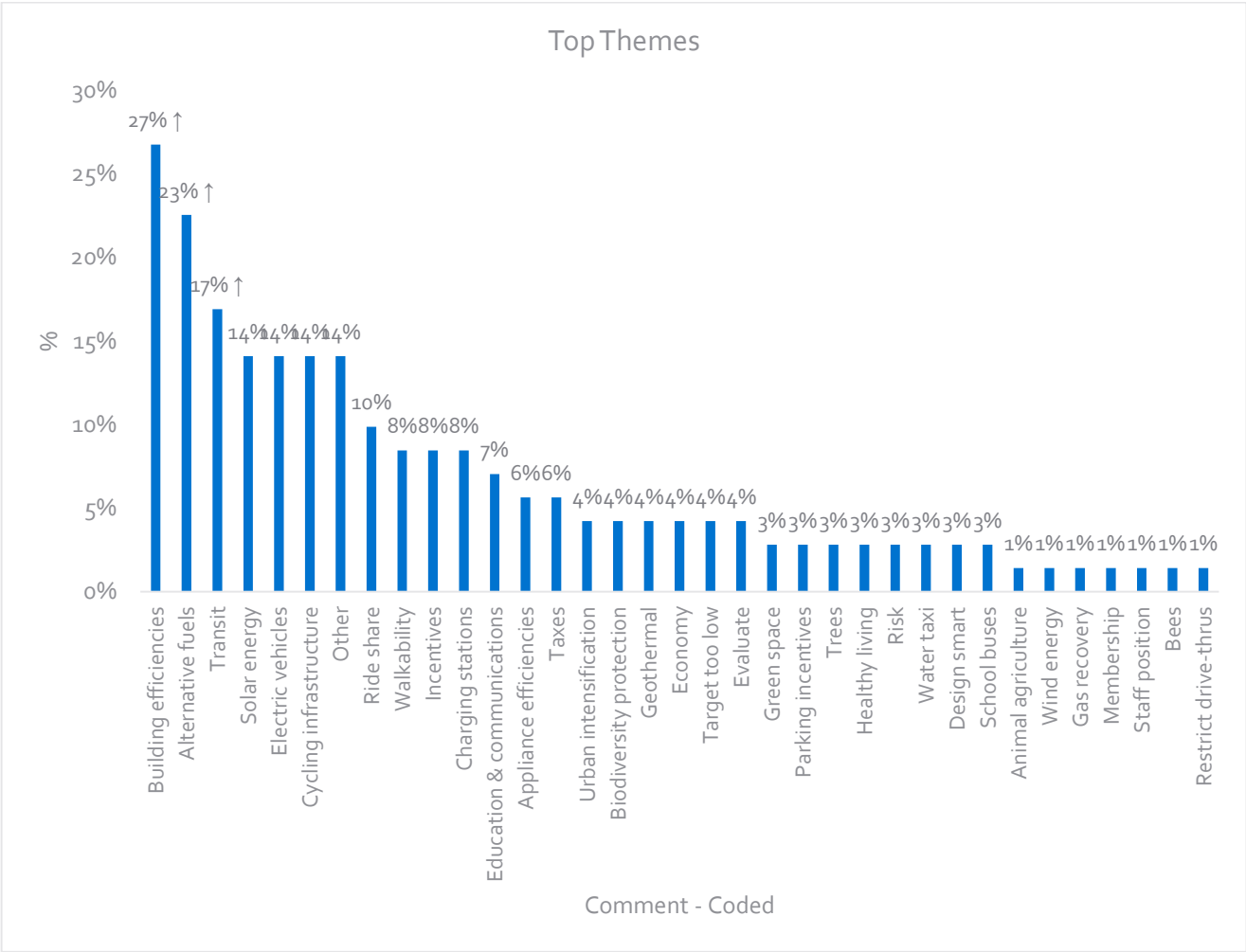
The 71 comments were analyzed through the survey tool word cloud and the top tags were created as categories. The three themes are listed in order of the frequency they were mentioned:

1. Building efficiencies
2. Alternative fuels
3. Transit



Many respondents commented about building efficiencies, and the upgrades citizens had made to make their home more energy efficient. The second most common theme was regarding using alternative fuels to reduce emissions. The third common theme suggested ideas around transit

and how this mode of transportation can be improved for the future.



Appendix 6: Implementation Best Practices

A summary of some of the best practice examples of climate action implementation from around the province are outlined in table below.

Table 16: Climate action implementation best practice examples

Climate action category	Details
Buildings – new	City & District of North Vancouver, and District of West Vancouver – were among the first communities in BC to pass measures to require steps of the BC Energy Step Code. The 3 municipalities require Step 3 for Part 9 homes, Step 2 for Part 3 residential, and Step 1 for Part 3 commercial. The City of North Vancouver and District of West Vancouver allow small Part 9 homes to only meet Step 1.
	City of North Vancouver – created zones and guidelines for the Moodyville neighbourhood to reduce GHG emissions and energy consumption. Policies include requiring new buildings to achieve either the Passive House standard, 10 per cent better than NECB 2011 or 15 per cent better than ASHRAE 90.1-2010 standards, EnerGuide 86 or the most stringent step of the BC Energy Step Code. Part of the neighbourhood will be a pilot area for Passive House construction and renewable energy technologies.
	City of Campbell River and Comox Valley Regional District – have passed incentives to encourage steps of the BC Energy Step Code for low density residential buildings. Campbell River has incentives for Steps 2-5, and Comox Valley for Steps 3-5. The highest rebate they both provide is a 100 per cent building permit fee rebate for Step 5.
Buildings – existing	City of Vancouver – has a policy in place to require EnerGuide assessments as a condition for receiving a building permit for renovations of certain types, in order to encourage home energy retrofits. The City of Victoria has received a legal opinion stating that communities governed by the Community Charter can also do this if they wish.
	City of Richmond – has a Building Energy Challenge which is a friendly competition for property managers in Richmond of commercial, institutional and multi-family buildings that aims to reduce energy use over a one-year period. In the first year, 12 organizations representing 75 buildings and nearly 5.6 million square feet participated. Site energy use decreased by 12% over the last baseline year and GHG emissions declined by 16%.
	City of Nelson – has helped hundreds of homes receive energy assessments and then pursue retrofits since the Nelson's EcoSave program was introduced in April 2012. Estimated savings are several thousand GJs of electricity, and a few hundred tonnes of GHGs per year.
Transportation	City of Vancouver – introduced requirements in 2009 for specific percentages of parking stalls in new residential and commercial buildings to be equipped with electric vehicle charging infrastructure. The percentages were as follows: 100 per cent for single family and attached, 20 per cent for multi unit residential buildings, and 10 per cent for commercial buildings. It is currently considering upgrading its requirements.
	City of Richmond – amended its Zoning Bylaw to require that all residential parking spaces in new buildings, excluding visitor parking, feature an adjacent electrical outlet capable of providing Level 2 electric vehicle charging.

Climate action category	Details
Transportation con't	City of Port Coquitlam – amended its Zoning Bylaw to require roughed-in electric vehicle charging infrastructure in the parking areas of all new buildings with residential dwellings. This means a 240V or 208V circuit breaker on an energized electrical panel connected by raceway to an outlet within 3 metres of the unit's required parking area. There are slightly different requirements for buildings with common parking areas.
	City of North Vancouver –launched the Safe and Active School Travel Program in 2013, in partnership with the North Vancouver School District with the goal of shifting to more sustainable modes of transportation when children travel to and from school. These efforts have resulted in significant increases in walking and cycling rates, and an average decrease in driving rates to school of 25%. One school showed an 80% increase in students walking to school.
Renewable energy	City of Vancouver, City of Victoria, District of Saanich – have all endorsed targets to source 100 per cent of the energy for their communities from renewables by 2050.
	District of Hudson's Hope – has recently installed 9 solar photovoltaic installations on its buildings, totalling over 500 kW, and supplying 50-100 per cent of the electrical needs of the buildings. These high profile installations have also encouraged the installation of other solar photovoltaic systems in the community, and other municipalities in the region are interested in following the District's lead.
	Village of Alert Bay – has recently installed 5 solar photovoltaic systems on its buildings, totalling 71 kW.
Water efficiency	City of Richmond - offers free high-efficiency replacements for existing water fixtures through its Efficient Water Fixtures Program. To date, the program has identified 472 additional energy saving opportunities, which in addition to water savings are projected to reduce GHG emissions by over 500 tonnes.
	Abbotsford, Mission, Richmond, City of Nanaimo, Township of Langley, New Westminster, Coquitlam, Vancouver, West Vancouver, and the City and District of North Vancouver - have all offered a water appliance rebate to encourage the purchase of water and energy efficient appliances. BC Hydro also provides an incentive and manages the administration of the program.
Other	City of Richmond – has had 31 businesses join the Climate Smart Program to date, 16 of which have completed emissions inventories and committed to annual progress, leading to a collective annual reduction of 800+ tonnes of GHG emissions reductions.