# Development of graphics to visualize climate action and inaction in Vancouver: What does our future look like?


**Prepared By:**

Taylor Legere | Sustainability Scholar 2023

**Prepared For:**

Paige Bennett | Planning Analyst, Sustainability group | City of Vancouver

Sarah Labahn | Policy analyst, Sustainability group | City of Vancouver



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This report was produced as part of the UBC Sustainability Scholars Program, a partnership between the University of British Columbia and various local governments and organisations in support of providing graduate students with opportunities to do applied research on projects that advance sustainability and climate action across the region.

This project was conducted under the mentorship of City of Vancouver staff. The opinions and recommendations in this report and any errors are those of the author and do not necessarily reflect the views of City of Vancouver or the University of British Columbia.

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# Acknowledgments


## Land Acknowledgment

This report was written on the unceded ancestral lands of the xwməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), Stó:lō and Səl̓ílwətaʔ/Selilwitulh (Tsleil- Waututh) Nations.

This place is the unceded and ancestral territory of the hən̓q̓əmin̓əm̓ and Sḵwx̱wú7mesh speaking peoples, the xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish), and səlilwətaɬ (Tsleil-Waututh) Nations, and has been stewarded by them since time immemorial.

Vancouver is located on territory that was never ceded, or given up to the Crown by the Musqueam, Squamish, or Tsleil-Waututh peoples. The term unceded acknowledges the dispossession of the land and the inherent rights that Musqueam, Squamish and Tsleil-Waututh hold to the territory. The term serves as a reminder that Musqueam, Squamish and Tsleil-Waututh have never left their territories and will always retain their jurisdiction and relationships with the territory.

As a settler on these lands, I recognize the perspective I am taking to visualize elements of the land, climate impacts, and climate actions is through a colonial lens and is therefore limited, as this report was created without consultation of the Host First Nations. While the graphics presented in this report are intended to visualize a possible climate future, a just climate future is not possible without centering equity and reconciliation. It is therefore critical that Musqueam, Squamish, or Tsleil-Waututh Nations are central in decision making on this lands climate actions and future.

I am grateful for the opportunity to work, learn, and live on these lands, as well as the lands I grew up on which are in the Treaty Lands and Territory of the Mississaugas of the Credit, and the Haldimand Tract, land that was granted to the Haudenosaunee of the Six Nations of the Grand River and is within the territory of the Neutral, Anishinaabe, and Haudenosaunee peoples. I hope to continue learning more about the history of the places I have had the privilege to live in and visit, and how I can contribute to reconciliation and a just climate future.

## Thank you

I would like to thank Sarah Labahn and Paige Bennett for their mentorship on this project, as well as Tina Barisky and Karen Taylor for managing the Sustainability Scholar program. I would also like to thank Brady Faught, Jennifer Bailey, Rachel Telling, Sarah Hunn, and Yette Gram for their guidance and support to create the visuals included in this report.

This project builds on the work of Joaquin Diaz, Rachel Habermehl, Yeslie Lizarraga Leyva, Kōlea Praywell and Nicholas Samuelson in the UBC Climate Action Labs, as well as Samantha Bowen's Sustainability Scholar report, *Best Practices for Community Mobilization Towards Meaningful Climate Action* (2022). Thank you to everyone who's mentorship and scholarship contributed to these findings and graphics.

# Executive Summary

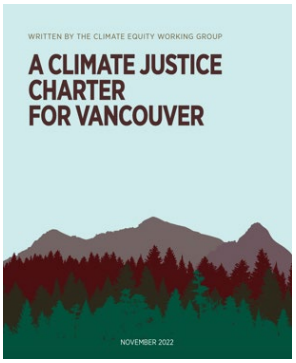
## Challenge

Climate change is already impacting communities across Canada, and the City of Vancouver is no exception. By 2050, Vancouver is expected to experience more frequent and intense extreme weather events, including hotter, drier summers and wetter winters.[1] Canada is also one of the highest per capita carbon emitters globally, and is therefore well positioned to make a substantial impact to reducing global warming and set an example for other high emitting countries should rapid action be taken to reduce emissions. Since cities produce over 60 percent of global emissions[2], Vancouver is faced with the dual challenge of preparing for the more extreme weather that is already coming, and the need to dramatically reduce the cities carbon emissions to avoid further warming and associated impacts. Reducing emissions is especially important to prevent worsening impacts for communities that are particularly vulnerable to climate change, such as seniors, youth, Indigenous Peoples, racialized populations, people with disabilities, people who are pregnant, frontline emergency responders, residents of northern and remote communities, individuals who are socially and economically disadvantaged, and people who are immunocompromised and those living with pre-existing illness.[3]

Growing awareness of the risks associated with climate change has prompted anxiety from residents, with 94 percent of polled Vancouver residents expressing concern about climate change.[4] The City of Vancouver has already made progress on responding to the climate emergency through the implementation of climate actions within the Climate Emergency Action Plan (CEAP), Climate Change Adaptation Strategy (CCAS) and the Climate Justice Charter (CJC). These strategies jointly work to reduce the cities carbon emissions to avoid future warming and prepare the city for shocks and stresses that cannot be avoided. However, many residents are not aware of the progress the city has already made to respond to climate change, or the planned actions to further reduce risks and carbon pollution. Only 23 percent of polled residents are aware of CCAS, and only 38 percent were aware of CEAP.[5] This is also reflected at the national level, where 45 percent of Canadians acknowledge that climate change is a problem, but they aren't engaged in taking action or informed on the risks.[6]


Climate Change Adaptation Strategy (Adopted in 2012, Updated 2018)

Climate Emergency Action Plan (Adopted in 2020)




Climate Justice Charter (2022)

1 "City of Vancouver Climate Change Adaptation Strategy." *City of Vancouver.*

2 "Climate Emergency Action Plan." *City of Vancouver.*

3 "Who is most impacted by climate change." *Health Canada*.

4 Sentis, "City of Vancouver 2023 Public Opinion Poll" (Virtual Presentation, June 7, 2023).

5 Sentis, "City of Vancouver 2023 Public Opinion Poll" (Virtual Presentation, June 7, 2023).

6 Bennett et al., "Climate Messaging that Works", 4.

Given the high level of concern about climate change, there is an opportunity to build greater awareness and support for the existing climate actions the city is taking, and to increase momentum for future actions. Concerned residents who are unsure of what can be done to respond to climate change are known as the 'moveable middle', and determining ways to engage this group in climate action is the primary focus of this project. The visuals developed for this project will help Vancouver residents imagine what Vancouver could look like in a future where climate action is or is not taken.

## Key Definitions [7]

### Climate Adaptation

Understanding what climate we are likely to experience in the future, and creating proactive plans that take advantage of opportunities and prepare for impacts.

### Climate Mitigation

Efforts to limit climate change by reducing greenhouse gases.

7 "City of Vancouver Climate Change Adaptation Strategy." *City of Vancouver.*

## Benefits and Pathways to Action

This project builds on the recommendations of Samantha Bowen's Sustainability Scholar report, *Best Practices for Community Mobilization Towards Meaningful Climate Action* (2022). After interviewing eight cities on their approaches to public outreach and climate change education, as well as conducting a literature review on climate communication, Bowen made several key recommendations to improve the City of Vancouver's approaches.

This project seeks to address one of Bowen's recommendations to create visuals of climate action and the effects of climate change specific to Vancouver by conducting additional research on key considerations for effective climate communication and developing two graphics that put these considerations into practice.[8]

Three of the key components of engaging climate change visuals include: focusing on local and human level design, promoting understanding through simplicity, and utilizing clear action-oriented narratives. These components were incorporated into two graphics: the first illustrates how the city can adopt a more integrated approach to water management, and the second illustrates how communities can prepare for extreme heat. The graphics feature street-level, human-scale scenes that allow the viewer to visualize these climate solutions in their own community.

By showing residents visually what a more positive climate future could look like for the City, we hope to drive momentum for the 'moveable middle' to become more informed and engaged with the City's climate change policies and actions. The graphics produced for this project can be used as examples for ways in which the City of Vancouver can communicate ways take climate action, and create a safer, healthier, and more equitable city. By illustrating climate adaptation and mitigation actions together, the City can communicate the creation of livable and walkable neighbourhoods, cleaner air and water, healthier ecosystems, safe and efficient transportation routes, communities, and more comfortable homes.

This report presents an overview of climate change communication best practices, examples of how other cities are using visuals to communicate about climate change, descriptions of the two City of Vancouver climate action graphics created, and recommendations for use of the graphics and further research. For the visuals to be most impactful, it is important that they are distributed by trusted sources such as scientists and peers, that they are provided in multiple languages, and that additional research is conducted on which communication platforms and visual styles resonate most with the 'moveable middle'.

8 Bowen, "Best Practices for Community Mobilization Towards Meaningful Climate Action", 52.

# Climate Change Communication Best Practices

A brief literature review on climate communication best practices revealed several key criteria for creating engaging visuals, and barriers to engaging with audiences on this topic. Key components of engaging climate change visuals include: focusing on local and human level design, promoting understanding through simplicity, and utilizing clear action-oriented narratives.

## Local and Human Level Design

One of the recurring themes in literature on climate communication is the importance of framing information at the human scale, and in a local context. Focusing on local impacts may help overcome the misconception a third of Canadians hold that climate change isn't something that is a risk to them personally.[9] A focus on the local level impacts of climate change can be perceived as more urgent than global impacts and drive more action.[10] Linking images to viewers day to day emotions, experiences, and concerns, has also been found to be more relatable and easier for audiences to understand.[11] Using images of real people that viewers can relate to has also been found to be more effective than images perceived as staged.[12] Examples of linking imagery to audiences everyday experiences could include the health benefits of spending time outside in environments with cleaner air, or showing the impact of a flood event in a well-known local park. This type of imagery may also help build viewers understanding and appeal to their emotions, which is another strategy to boost engagement.[13]

## Promoting Understanding Through Simplicity

A current barrier to effective communication about climate change is a general lack of climate literacy, with many unsure of the causes of climate change and unaware of potential avenues to mitigate risks.[14] Therefore it is critical that information is presented in a way that is as easy to understand as possible for the target audience. There are several strategies that can be taken to make complicated information easier to understand, including the use of metaphors, using plain language, avoiding technical terms and jargon, focusing on facts over the unknown, using visual formats familiar to the audience, and connecting with widely shared public views.[15] Another avenue to make information more relatable is to relate it back to economic contexts, by highlighting the potential economic impact of climate action including job creation, and the cost savings of preventing disasters compared to responding to disasters.[16]

9 Bennett et al., *Climate Messaging that Works*, 2.

10 Altinay, Z., *Visual Communication of Climate Change*, 293; Corner et al., *Climate Visuals*; Sheppard, *Visualizing Climate Change,* 47-49.

11 Altinay, Z., *Visual Communication of Climate Change*, 295; Corner et al., *Principles for effective communication*, 8.

12 Bennett et al., *Climate Messaging that Works*, 6; Corner et al., *Climate Visuals*.

13 Altinay, Z., *Visual Communication of Climate Change*, 294.

14 Bennett et al., *Climate Messaging that Works*, 2.

15 Bennett et al., *Climate Messaging that Works*, 2-3; Corner et al., *Principles for effective communication*, 10, 11, 17-18; Harold et al., *Enhancing the accessibility of climate change data visuals*.

16 Bennett et al., *Climate Messaging that Works,* 4.

## Clear Action-Oriented Narratives

Another way to overcome the lack of climate literacy on responses to climate change is to create climate education materials that are both action-oriented and hopeful. This addresses another key barrier to climate communication which is that feelings of hopelessness and ambivalence can prevent action.[17]

While fear-based messaging can draw residents attention in the short-term, positive and hopeful images are more engaging for driving long-term attention and action.[18] One challenge with using solely hopeful images may be a lack of perceived urgency to take the short-term actions that are needed to address climate change. Framing the image as a decision point that emphasizes the risks and the opportunities available to adapt and mitigate risks right now can help create a sense of urgency while still empowering viewers.[19]

This framing can help create a clear narrative as well through the application of the message triangle approach which highlights the challenge ahead, pathways to action, and the benefits of taking action to help remove barriers to public engagement.[20] For example, highlighting that while flood risk may increase due to more intense rainfall events, we can reduce this risk by incorporating more green infrastructure to manage additional water, which has the added benefits for aesthetics, recreation, and biodiversity.

17 Bennett et al., Climate Messaging that Works, 3.

18 Bennett et al., Climate Messaging that Works, 4; Schroth et al., Visual Climate Change Communication, 417.

19 Bennett et al., Climate Messaging that Works, 3; Schroth et al., Visual Climate Change Communication, 417.

20 Bennett et al., Climate Messaging that Works, 2.

# Project Summary | Extreme Heat

## Challenge

By 2050, Vancouver is expected to have hotter and drier summers, with twice as many days over 25°C and 20 percent less rain. This will result in increased health risks for vulnerable people, and increased water use restrictions, drought risk, increased impacts of urban heat island effect, more poor air quality days, and impacts to outdoor work and tourism.[21]

More extreme heat events are already occurring across the country, with significant impacts in British Columbia. The 2021 western heat dome was the deadliest weather event in Canada, with 619 heat-related deaths reported by the BC Coroners Service when western Canada experienced temperatures up to 20°C above normal.[22] Many of those who passed away were older adults living alone with pre-existing health challenges, and 98 percent of deaths occurred indoors.[23]

Given the recent heat dome and the projections for future summers in Vancouver, it is understandable that a recent public opinion poll identified 62 percent of Vancouver residents are concerned about extreme heat.[24] With hotter days ahead, there is a growing need to support vulnerable populations to reduce health risks.

## Opportunity

Building greater connections within communities through the expanding the number and distribution of cooling rooms and centres, integrating neighbourhood buddy systems, creating more green space, retrofitting buildings with heat pumps that provide effective cooling, and improving insulation are just a few examples of how we can become more resilient to extreme heat. These actions can be further supported by the City's land use and building policies that prioritize the expansion of tree canopy and naturalized areas, active transportation and transit, and building codes that regulate both heating and cooling. Through the implementation of the Climate Change Adaptation Strategy (CCAS) and the Climate Emergency Action Plan (CEAP), the City of Vancouver is already progressing on several of these strategies to support neighbourhoods to become more resilient. For example, the city is working to expand public access to drinking water, increasing urban tree canopy cover, and improving access to green space for residents across the city.[25]

21 "Climate Change Adaptation Strategy." City of Vancouver. 2018.

22 "Surviving Heat Impacts 2021 Western Heat Dome Canada." Government of Canada Science and Innovations. 2022.

23 "Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021." BC Coroners Service. 2022.

24 Sentis, "City of Vancouver 2023 Public Opinion Poll" (Virtual Presentation, June 7, 2023).

25 "Climate Change Adaptation Strategy." City of Vancouver. 2018; "Climate Emergency Action Plan." City of Vancouver. 2020.

The challenge of increased extreme heat events offers an opportunity to increase community resilience. For example, the integration of cooling centres in residences and increased green spaces to mitigate the effects of extreme heat also create opportunities to get to know your neighbours and enjoy the many benefits that come from spending more time in nature. Multi-unit residential buildings are at particular risk and residents may have varying capacity to adapt, especially for renters. There are several opportunities though for renters and landlords to be empowered to increase preparedness thought implementing retrofits and behavioural shifts.

## Precedents

Since 2012, the City of Vancouver has been a member of the C40 Cities Initiative, which is a global network of mayors from around the world committed to taking action on the climate crisis.[26] As part of Vancouver's participation with C40, the city is also a member of the Cool Cities Network, in which cities share policies and strategies related to heat and vulnerability mapping, heat wave emergency management, integrating heat into long-term planning, making the case for heat action, and heat mitigation solutions.[27]

To get a sense of how other cities are communicating about extreme heat graphics from other Cool Cities Network were reviewed to identify which types of visual communication are already being used, and where gaps may exist. Graphics were reviewed from heat reports and websites for Austen, Boston, Los Angeles, Montreal, New York City, Phoenix, Sydney, Toronto, and Washington. Most city resources reviewed primarily featured photos, heat maps, and graphs to communicate about the impact of extreme heat. Notably, Boston and Austen incorporated more illustrative and narrative approaches to their extreme heat communications that may be more engaging for a resident audience based on the previously discussed criteria for effective climate communication.

26 "Vancouver, Canada." C40 Cities. 2012.

27 "Cool Cities Network." C40 Cities. 2023.

## City of Boston

The [2022 Heat Resilience Solutions for Boston Report] includes several engaging graphics that meet several criteria for effective climate communication.

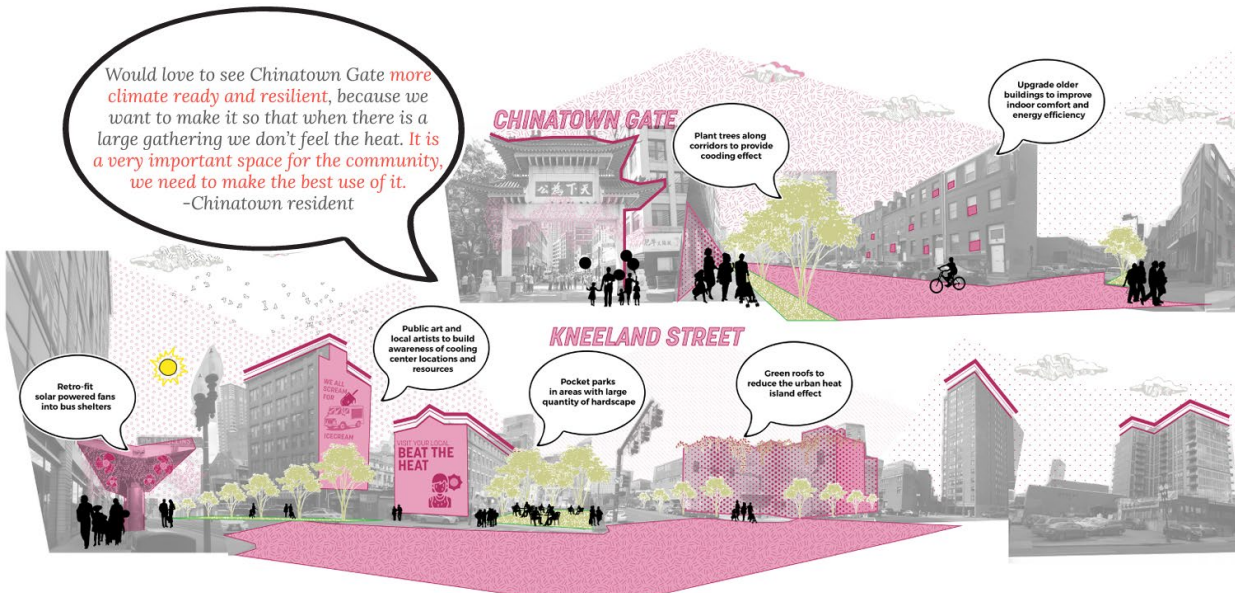
Of note is a series of graphics produced based on five Boston neighbourhoods, Chinatown, Dorchester, East Boston, Mattapan, and Roxbury. The graphic for each neighbourhood depicts adaptations that could be made to increase heat resilience based on a series of neighbourhood ideas sessions and youth engagement sessions.

Another stand out graphic from the Boston heat resilience report is the customizable Heat Resilience Comics which invited residents to tell their personal experiences of extreme heat with customizable avatars experiencing place-based variations in temperature.


Heat Resilience Comic (Image Source: City of Boston)

By focusing on recognizable Boston neighbourhoods and showcasing individual experiences of heat, Boston helps residents understand their personal connection to extreme heat and climate change. The use of bold colours and simple written annotation also increases the legibility of the graphics, and helps viewers understand the action-oriented narratives, such as building understanding of the cooling impact of tree shade.

To build on the success of Boston's heat resilience graphics, the use of speech bubbles to add narratives to the drawings has also been applied in the City of Vancouver extreme heat graphic.




Boston Neighbourhood-level Heat Resilience (Image Source: City of Boston)

## City of Austin

Austin's 2015 Grow Green Earth-wise Guide to Cool Spaces also features engaging and hopeful imagery of heat adapted spaces at the residential level.

Strengths of Austin's approach include the focus on human-level, residential images that viewers can image themselves in. Using clear images with complementary annotation to describe additional details also aids comprehension of the images. Finally, the Guide to Cool Spaces has several clear calls to action, as zoomed in views of the larger image are coupled with links where viewers can learn more about implementing the heat mitigation measures pictured.

One of the successful elements from Austin's guide that has been incorporated into the Vancouver heat graphic is the use of zoomed in views of the larger image to provide more detailed information and further emphasis the human scale impacts of extreme heat.


Residential-level Heat Adaptation Cooling Strategies (Image Source: City of Austin)

## Design Process and Iterations

The following design iterations were created after consulting with City of Vancouver staff from the Sustainability Team and the Vancouver Emergency Management Agency (VEMA) on priorities for responding to extreme heat for the City of Vancouver. The key priority for the design identified through this consultation was to show cooling techniques and infrastructure changes that can help mitigate high indoor temperatures. There was particular interest in showing actions that could be taken at the scale of a multi-level residential building, and showcasing actions being completed by residents, landlords, and the City of Vancouver.

Upon review of the three initial design iterations, idea 3 was selected to proceed with as it sent the message that moving isn't required to respond to extreme heat and showed the intersection between building level and street level actions such as active transportation and increasing tree canopy.

Extreme Heat Idea 1

Extreme Heat Idea 2

Extreme Heat Idea 3

## Final Design

The final design builds on feedback from the initial iterations and strives to incorporate the three best practices of climate change communication, local and human level design, promoting understanding through simplicity, and incorporating clear action-oriented narratives.

**Local and human level design**

The building-level scale of the final drawing aims to showcase the human level impacts of extreme heat, and recognizable Vancouver features such as the mountains, sky train, and building style center the graphic as being local to Vancouver. The sketched style of the people in the image is intended to help viewers imagine themselves in the image, as an alternative to using stock photography which can be perceived as staged.

**Promoting understanding through simplicity**

This graphic aims to increase climate literacy and build understanding of mitigative actions that can be taken at various scales to respond to extreme heat. Using limited text annotation aids comprehension of the image by quickly communicating the key points graphically. The use of customizable speech bubbles on zoomed in versions of the graphic also allow the graphics to be modified to resonate more with viewers depending on the context of the graphic use.

**Clear action-oriented narratives**

Showing a variety of changes that can be taken to decrease building temperatures aims to drive action amongst viewers, many of which will be able to take at least one action presented regardless of financial position (with actions ranging from seeking shade from public street trees and cooling from publicly available misting stations to more expensive options such as installing AC and heat pumps). Presenting the challenge of extreme heat on the left side of the graphic coupled with a more hopeful community centered response to extreme heat emphasizes the urgency of the situation as well as a hopeful path forward to drive action.

## Suggested use of Graphic

This graphic was created to be used in publicly available heat survey reports, presentations to council, as a tool for education sessions, and as a social media or website feature for emergency preparedness campaigns and extreme heat response campaigns.

Another possible use of the graphics to engage residents that aren't already engaged in extreme heat could be to run an interactive campaign inviting residents to fill in their own experiences of extreme heat into the speech bubbles. These graphics could be distributed digitally in a similar manner to Boston's online Heat Stories Comic Builder, printed on postcards, or an accordion comic strip and distributed in places where people seek cooling during periods of heat such as cooling centers in community centers and neighbourhood houses.

Additional digital uses could include the creation of an informative video to follow-up on the indoor temperature survey. The video could include additional information on what the City of Vancouver is doing to prepare for extreme heat and tips for short term actions residents can take to protect themselves during heat events.

The graphics could also be used in public displays such as posters in public places such as bus shelters, posters in transit hubs or community centres, or as part of educational hand-outs to raise awareness of ways to stay safe and cool during periods of hot weather. Other uses could include displays that show how the city is increasing building resilience with regulations and policy, as well as information on how residents can make home upgrades such as installing heat pumps. Information on heat pumps could be distributed in partnership with Clean BC Better Homes to couple educational opportunities with information on rebates to reduce financial barriers for heat pump installation.

## Extreme Heat Visualization

# Project Summary | One Water

## Challenge

Increasing population density, as well as greater fluctuations in water availability with more frequent and intense rainfall in winter, and hotter, drier summers, will place additional pressure on all components of Vancouver's water infrastructure.

By 2050, the City of Vancouver anticipates 20 percent less rain in summer months, which will place increased drought stress on vegetation and result in increased water restrictions. Conversely, winter months will see increased risks for coastal flooding due to more intense storms and king tide events. Sea levels may also rise as much as half a meter by 2050, presenting further challenges for coastal areas to address flood risks.[28]

Anxiety about drought and flood risks is also present on the minds of Vancouver residents, with over 90 percent of surveyed residents concerned about drought, damage to coastal areas from storms and sea level rise, and increasing flood risks for low-lying areas.

## Opportunity

To address these challenges, Vancouver has joined several other cities from around the world to take a One Water approach to integrated water management. One Water is a collaborative approach between departments to consider the full water cycle including drinking water, wastewater, rainwater, surface water, and ground water. The collaborative nature of this management strategy creates benefits for communities, the economy, and the environment.[29] The One Water approach seeks to shift the view of water as a resource to a view of water as part of the landscape and broader ecosystem. This approach plays a role in the creation of a more livable, healthy and resilient city for generations to come.

The City of Vancouver is addressing the water related challenges associated with climate change through the Climate Adaptation Strategy, the Rain City Strategy, and the Healthy Waters Plan. Examples of actions already underway include increasing investments in sewer and drainage systems, increasing nature-based solutions to absorb and clean rainwater, and integrating more permeable pavers to minimize impervious surfaces in the city.[30]

Taking an integrated approach to water management offers benefits to biodiversity and carbon sequestration through increasing the urban tree canopy and integrating green infrastructure solutions, and reducing the costs of water management. This approach also improves access to recreational opportunities, contributes to the restoration of wild aquatic food sources, reduces the urban heat island effect, and helps to adapt to climate change.

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28 City of Vancouver, Climate Change Adaptation Strategy.

29 "One Water." *City of Vancouver*.

30 "Healthy Waters Plan," *City of Vancouver*, 2023.; "Climate Change Adaptation Strategy", *City of Vancouver*, 2018; "Rain City Strategy," *City of Vancouver*, 2019.

## Precedents

To understand how the One Water approach is currently being communicated to the public, graphics were reviewed from several other regions with resources on integrated water management including, York Region, Okanagan Valley, Milwaukee, Los Angeles, Charlotte, Lancaster, and Colorado. Most cities reviewed had very technical "textbook" like graphics targeted towards a more technical audience. Okanagan Valley was the only region reviewed that had more stylized graphics targeted to the general public and educators.

## Okanagan Valley

Okanagan Basin Water Board has produced several graphics and educational tools illustrating the regions approach to water management. One of which is the Waterwise Tips to Protect Okanagan Drinking Water, which illustrates the interconnectedness of water systems in the Okanagan Valley.

The Okanagan Basin Water Board also produced a graphic on Climate Change and Water in the Okanagan, which is a tool for educators to share how climate change is impacting the community.

The graphics include features such as mountains and regionally specific ecosystems and animals to connect viewers to the local context. The graphics also utilize clear descriptions without technical jargon to further explain the visual elements. Finally, the text elements include clear calls to action to keep water clean and learn more about how to create a secure water future.

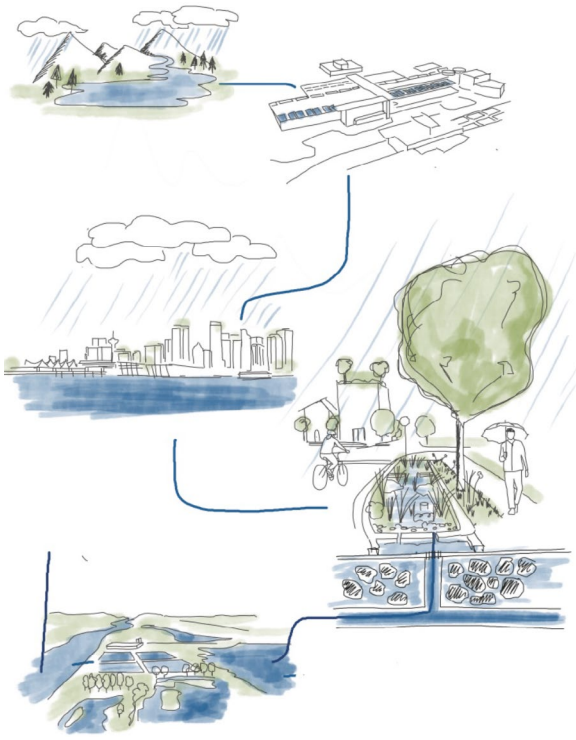
Lessons learned from reviewing the Okanagan Basin Water Board's graphics that have been applied to the City of Vancouver One Water Illustration include using regionally specific ecosystems, mountains and recognizable skyline features to create a local connection to the risks and actions portrayed.


Waterwise Tips to Protect Okanagan Drinking Water (Image Source: Okanagan Basin Water Board)

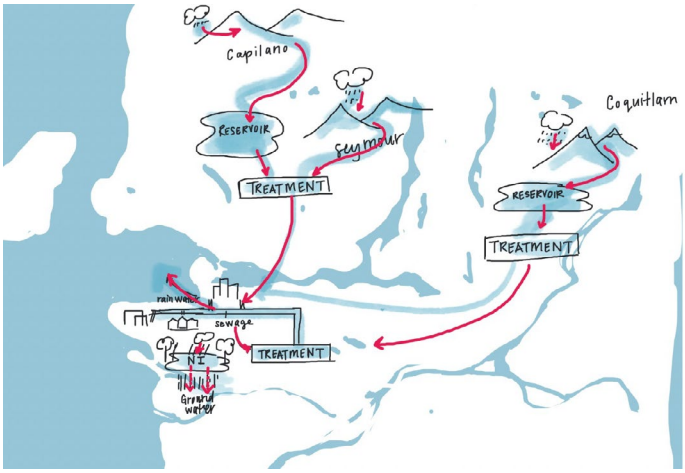
## Design Process

The following design iterations were created after consulting with City of Vancouver staff from the Sustainability Team and the One Water Team on priorities for integrated water management in the City of Vancouver. The key priority for the design identified through this process was to build understanding of what integrated water management is and to help residents understand the benefits of such an approach. There was particular interest in illustrations that showcased the non-linear process of water management at a range of scales.

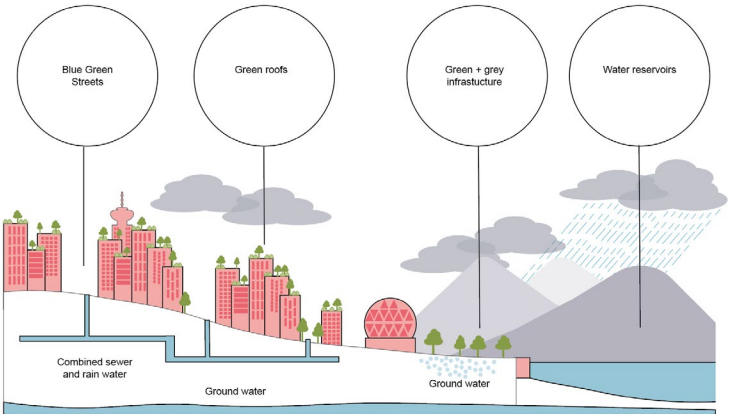
Upon review of the three initial design iterations, idea three was selected to proceed with because it offered the clearest explanation of the various components of water management, while still maintaining a scale that was relatable for viewers.



One Water Design Idea 1




One Water Design Idea 2




One Water Design Idea 3

## Final Design

The final design builds on feedback from the initial iterations and strives to incorporate the three best practices of climate change communication, local and human level design, promoting understanding through simplicity, and incorporating clear action-oriented narratives.

**Local and human level design**

The neighbourhood-level scale of the final drawing aims to showcase the human level experience of water management, with recognizable Vancouver features such as the mountains, city skyline, and seawall indicating the viewer that graphic is local to Vancouver. This is done in balance with pull-out circles to place the local context of water management within the broader geographic context of the regions water reservoirs and treatment facilities. The sketched drawing style of the image is intended to help viewers imagine themselves in the image, and to create the impression of an aspirational and evolving approach.

**Promoting understanding through simplicity**

More saturated circular highlights are used to direct viewers' attention to the key elements of the graphic to increase understanding. Simple and limited annotation is also added to further explain how residents interact with water management in their everyday life moving around the city.

**Clear action-oriented narratives**

Illustrating a broad range of water management mechanisms around the city, including both green and grey infrastructure aims to build hope that while climate projections for the city may have significant impacts, the city is taking proactive actions to reduce risks through investments in improving water infrastructure.

## Suggested use of Graphics

### City of Vancouver Internal Uses

These graphics were designed for internal use in the One Water communications and engagement toolkit, presentations, and reports. Specifically, the graphic will be used to articulate what adapted water infrastructure could look like.

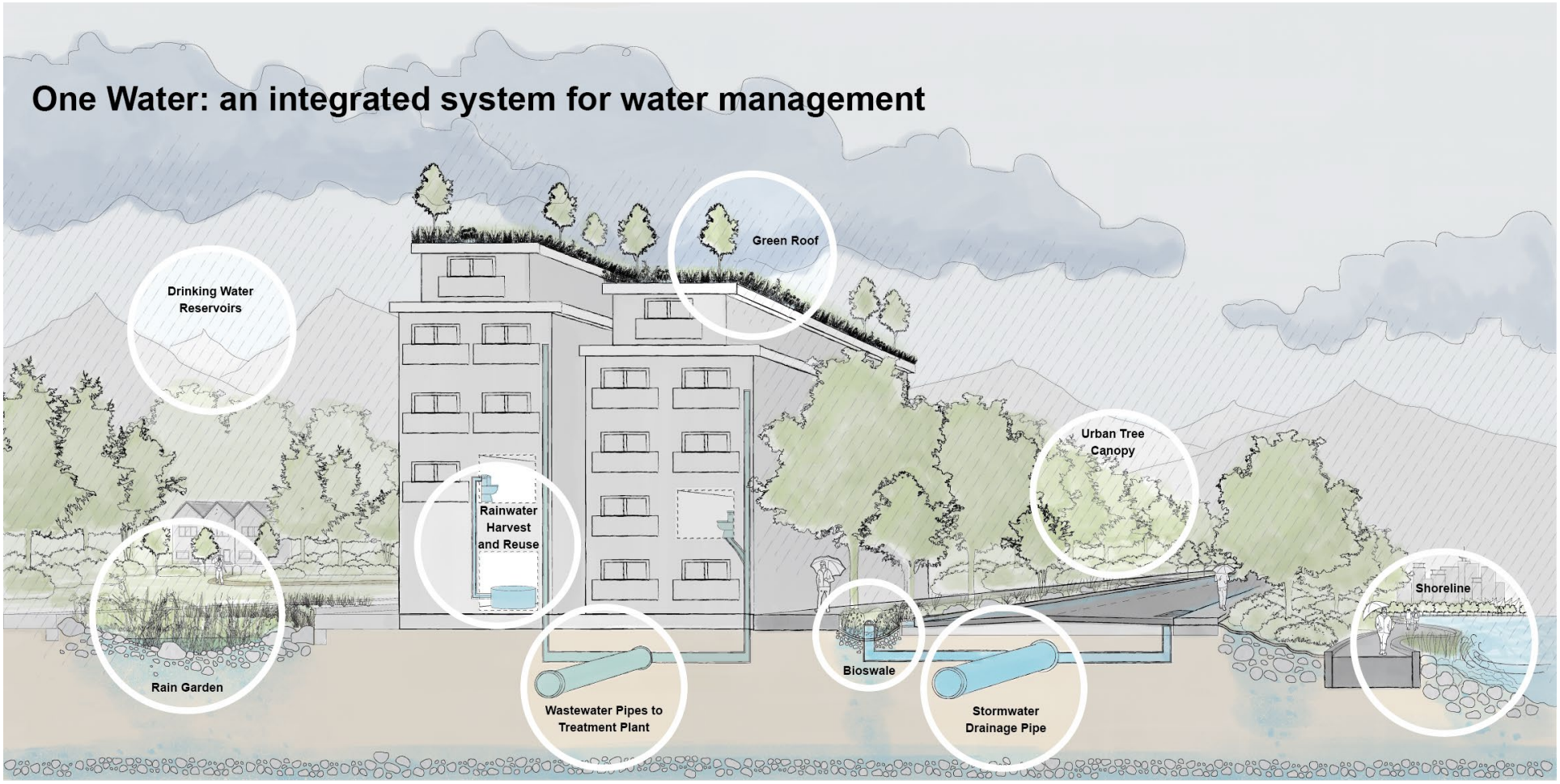
### External Engagement

The graphic could also be used for public engagement through social media posts and education programs. Examples of using the graphic to engage with residents could include use in public displays such as posters in public places such as bus shelters, posters in transit hubs or community centres, or as part of educational hand-outs. Public displays could be used to draw viewers attention to season variation in water availability through placement of placards and signs next to water bodies, storm drains, or green infrastructure. Placement of signs with the graphic next to components of water management may also help situate the components within the larger One Water system.

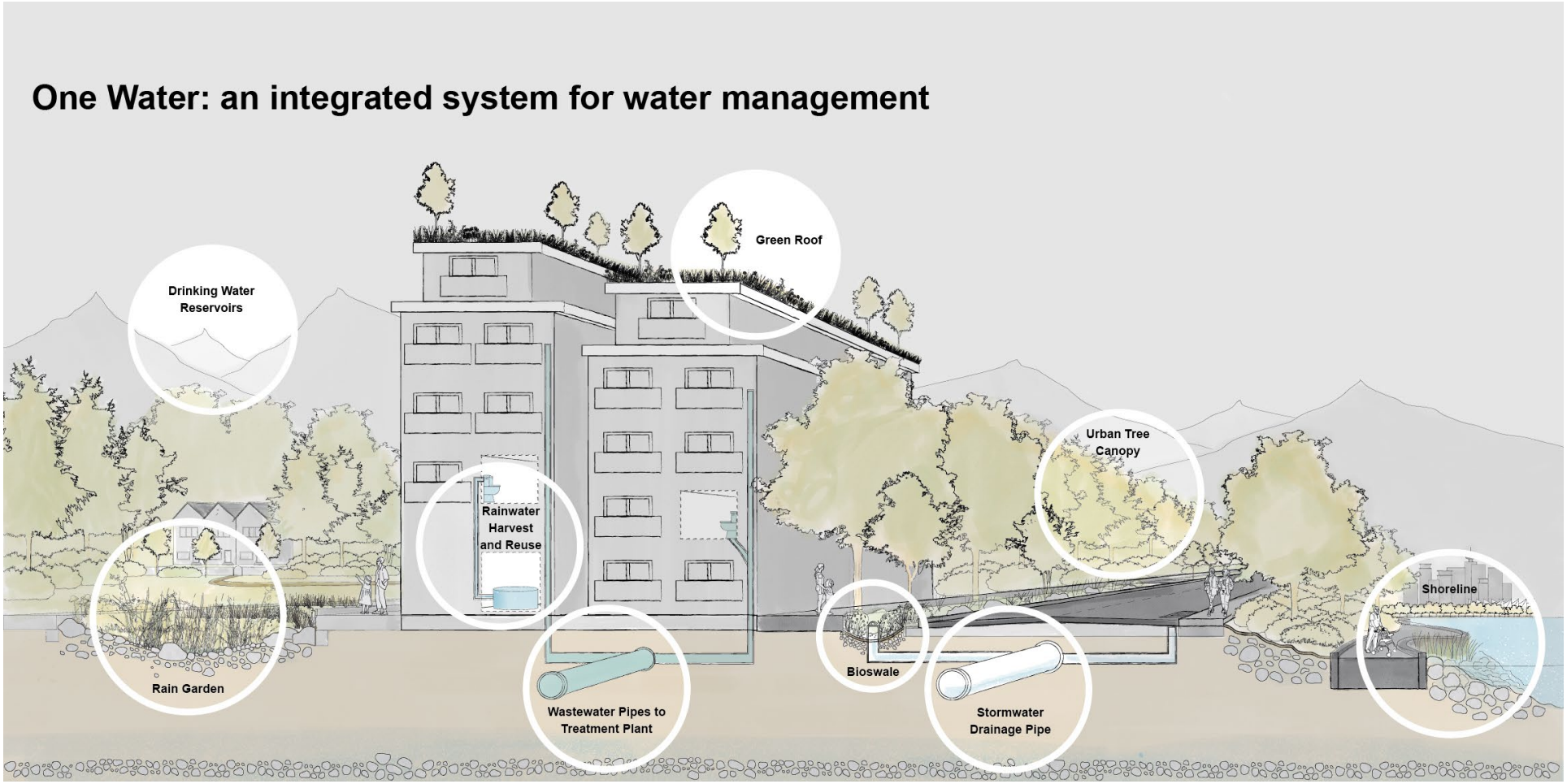
Online uses of the graphic could include the development of an interactive Arc GIS Story Map to explain how water is managed in Vancouver. For this tool different layers and segments of the graphic could be highlighted as more in depth explanations of the different components are explored. Alternatively the graphic could be used as part of a video to explain how water use needs to change to be more restricted in the summer months. A partnership with Metro Vancouver to further connect to the regional jurisdiction of water management could also be beneficial to send consistent messaging through multiple stakeholders and channels.

The graphic could also be used to reinforce existing engagement between the city and residents on water management. For example, when residents adopt a catch basin or volunteer for the green streets programs the graphic could be sent as a postcard, fridge magnet or thank you card with a note about how they are contributing to our water management goals. The graphics could be similarly distributed to recipients and applicants of the Green Grants program for projects specific to climate action and/or water use.

## One Water Visualization | Rainy Season



## One Water Visualization | Dry Season



# Conclusion and Recommendations

This project builds upon the existing library of visuals that the City of Vancouver utilizes to communicate about climate action with residents. The new graphics are intended to be customized to be used in a variety of contexts to communicate the importance of urgent climate action to create a safer, healthier, and more equitable future for those that call Vancouver home.

There are several opportunities to further develop these graphics and future visuals the City of Vancouver may use to communicate about climate change and climate action. One opportunity is to translate any written components of the visuals to languages frequently spoken in Vancouver to make them more accessible for wider audience. The visuals could also be used as a component of a targeted campaign on climate literacy at the city to build understanding of the local impacts of climate change. Community groups and spaces such as libraries, community centres, sports organizations, faith groups, and community gardens could also be given copies of the graphics with links to learn more from the City of Vancouvers website.

Finally, there is evidence to suggest that information related to climate change is best received when it is disseminated though trusted sources such as scientists and peers (friends, family, neighbours).[31] As such a dissemination methods that can leverage sharing amongst trusted sources is likely to be more successful.

**Recommendations for Future Work**

It may be beneficial to collect data on how different visual communication tools drive engagement on different outreach platforms. For example, the same content could be posted in the form of a graph, photo, and illustration on social media channels to see which type of visual gets the highest engagement. Data on which types of visuals resonate most with the City of Vancouver's target audience can then set the direction for future visualizations. Follow-up surveys could also be sent to those engaging with the graphics to better understand their effectiveness to communicate about climate action and inform future initiatives.

There are also findings to suggest that three-dimensional imagery and interactive visuals, such as video games, can increase drive to act on mitigation and adaptation policies.[32] While the scope of this project did not allow capacity for an initiative of this scale, the City of Vancouver might consider visuals of this nature for future projects, particularly as an educational tool. Interactive climate literacy tools such as the previously mentioned Boston Heat Resilience Story Comic Builder may also be a key component of improving community engagement on climate action.

31 Bennett et al., *Climate Messaging that Works*, 1-2; Corner et al., *Principles for effective communication*; Sheppard, *Visualizing Climate Change*, 49

32 Schroth et al., *Visual Climate Change Communication*, 429

# Appendix: Report Follow-up

As of November 2023, the findings of this report and graphics have been featured by local news outlets and shared more broadly through speaking engagements.

## Local News Features

**Vancouver Sun Local News | September 5, 2023**

The article was also featured by the Global News, Vancouver Sun Roundup of Climate News, UBC in the News, The Province, O Canada, and The Prince George Post.

## Speaking Engagements

**City of Vancouver City Leadership Team | November 3, 2023**

Presented key report findings to City Leadership Team alongside fellow Sustainability Scholars.

**Urbanarium Studio Climate Response | September 26, 2023**

Provided key note introduction on best practices for climate communication as described in this report, and facilitated a smaller group discussion on community driven climate response planning and action.

**UBC Sustainability Scholars Conference | September 25, 2023**

Findings from the report and visuals were shared at the UBC Sustainability Scholars conference on urban sustainability research.

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