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METRO VANCOUVER REGIONAL DISTRICT
CLIMATE ACTION COMMITTEE

REGULAR MEETING

Friday, May 15, 2020
1:00 p.m.
28th Floor Boardroom, 4730 Kingsway, Burnaby, British Columbia

REVISED AGENDA[1]

1. ADOPTION OF THE AGENDA

1.1 May 15, 2020 Regular Meeting Agenda
That the Climate Action Committee adopt the agenda for its regular meeting scheduled for May 15, 2020 as circulated.

2. ADOPTION OF THE MINUTES

2.1 March 13, 2020 Regular Meeting Minutes
That the Climate Action Committee adopt the minutes of its regular meeting held March 13, 2020 as circulated.

Revised **3. DELEGATIONS**

3.1 Isaac Beevor and Katelyn Maki
Subject: Yearly Measuring and Reporting on Greenhouse Gas Emissions

4. INVITED PRESENTATIONS

4.1 Brad Badelt, Assistant Director, Sustainability, City of Vancouver
Subject: Establishment of Metro Vancouver's Low Carbon Cities Canada (LC3) Centre

5. REPORTS FROM COMMITTEE OR STAFF

5.1 Adapting Air Quality and Climate Change Engagement During COVID-19
Designated Speakers:
Laura Taylor, Public Engagement Coordinator, Parks and Environment Department
Lucy Duso, Policy Coordinator/Engagement Lead, External Relations Department

[1] *Note: Recommendation is shown under each item, where applicable.*

That the Climate Action Committee receive for information the report dated April 30, 2020, titled "Adapting Air Quality and Climate Change Engagement During COVID-19".

5.2 Low Carbon Economic Stimulus Funding in Response to COVID-19

Designated Speakers:
Morgan Braglewicz, Policy Analyst
Conor Reynolds, Division Manager, Air Quality and Climate Change Policy
Parks and Environment Department

That the MVRD Board write letters to the provincial Minister of Environment and Climate Change Strategy, the federal Minister of Environment and Climate Change, and other appropriate government agencies to call for economic stimulus funding to be directed to low carbon initiatives.

5.3 Iona Island Wastewater Treatment Plant Project: Resiliency, Recovery and Restoration

Verbal Report

Designated Speakers:
Peter Navratil, General Manager, Liquid Waste Services Department
Robyn Worcester, Natural Resource Management Specialist, Parks and Environment Department

5.4 *Clean Air Plan* and *Climate 2050* Discussion Paper on Agriculture

Designated Speakers:
Theresa Duynstee, Regional Planner, Regional Planning and Housing Services Department
John Lindner, Air Quality Planner, Parks and Environment Department

That the Climate Action Committee receive for information the report dated April 17, 2020, titled "*Clean Air Plan* and *Climate 2050* Discussion Paper on Agriculture".

5.5 *Climate 2050* and *Clean Air Plan* Discussion Paper on Nature and Ecosystems

Designated Speakers:
Josephine Clark, Senior Park Planner, Parks and Environment Department
Edward Nichol, Senior Policy and Planning Analyst, Regional Planning and Housing Services Department
Jason Emmert, Senior Planner, Parks and Environment Department

That the Climate Action Committee receive for information the report dated April 17, 2020, titled "*Climate 2050* and *Clean Air Plan* Discussion Paper on Nature and Ecosystems".

5.6 Amendments to GVRD Air Quality Management Bylaw No. 1082, 2008

Designated Speaker:
Julie Saxton, Acting Division Manager, Bylaw and Regulation Development
Parks and Environment Department

That the MVRD Board:

a) give first, second and third reading to *Metro Vancouver Regional District Air Quality Management Amending Bylaw No. 1308, 2020*; and
b) pass and finally adopt *Metro Vancouver Regional District Air Quality Management Amending Bylaw No. 1308, 2020*.

5.7 Manager's Report
Designated Speaker:
Roger Quan, Director, Air Quality and Climate Change
Parks and Environment Department
That the Climate Action Committee receive for information the report dated April 16, 2020, titled "Manager's Report".

6. INFORMATION ITEMS

7. OTHER BUSINESS

8. BUSINESS ARISING FROM DELEGATIONS

9. RESOLUTION TO CLOSE MEETING

Note: The Committee must state by resolution the basis under section 90 of the Community Charter on which the meeting is being closed. If a member wishes to add an item, the basis must be included below.

10. ADJOURNMENT/CONCLUSION

That the Climate Action Committee adjourn/conclude its regular meeting of May 15, 2020.

Membership:

Carr, Adriane (C) - Vancouver
Dhaliwal, Sav (VC) - Burnaby
Arnason, Petrina - Langley Township
Baird, Ken - Tsawwassen First Nation
Dupont, Laura - Port Coquitlam
Hocking, David - Bowen Island
Kruger, Dylan - Delta
McCutcheon, Jen - Electoral Area A
McIlroy, Jessica - North Vancouver City
McLaughlin, Ron - Lions Bay
Patton, Allison - Surrey
Steves, Harold - Richmond
van den Broek, Val - Langley City
Yousef, Ahmed - Maple Ridge

METRO VANCOUVER REGIONAL DISTRICT
CLIMATE ACTION COMMITTEE

Minutes of the Regular Meeting of the Metro Vancouver Regional District (MVRD) Climate Action Committee held at 1:00 p.m. on Friday, March 13, 2020 in the 28th Floor Committee Room, 4730 Kingsway, Burnaby, British Columbia.

MEMBERS PRESENT:
Chair, Councillor Adriane Carr, Vancouver
Vice Chair, Councillor Sav Dhaliwal, Burnaby
Councillor Petrina Arnason, Langley Township
Councillor Laura Dupont, Port Coquitlam
Councillor David Hocking, Bowen Island
Councillor Dylan Kruger, Delta
Councillor Jessica McIlroy, North Vancouver City
Mayor Ron McLaughlin, Lions Bay
Councillor Allison Patton, Surrey (arrived at 2:02 p.m.)
Councillor Harold Steves, Richmond
Mayor Val van den Broek, Langley City
Councillor Ahmed Yousef, Maple Ridge (arrived at 1:02 p.m.)

MEMBERS ABSENT:
Chief Ken Baird, Tsawwassen
Director Jen McCutcheon, Electoral Area A

STAFF PRESENT:
Roger Quan, Director, Air Quality and Climate Change, Parks and Environment
Jerry W. Dobrovolny, Chief Administrative Officer
Genevieve Lanz, Legislative Services Coordinator, Board and Information Services

1. ADOPTION OF THE AGENDA

1.1 March 13, 2020 Regular Meeting Agenda

It was MOVED and SECONDED
That the Climate Action Committee adopt the agenda for its regular meeting scheduled for March 13, 2020 as circulated.

CARRIED

2. ADOPTION OF THE MINUTES

2.1 February 14, 2020 Regular Meeting Minutes

It was MOVED and SECONDED
That the Climate Action Committee adopt the minutes of its regular meeting held February 14, 2020 as circulated.

CARRIED

3. DELEGATIONS

No items presented.

1:02 p.m. Councillor Yousef arrived at the meeting.

4. INVITED PRESENTATIONS

4.1 Steve Litke, Senior Program Manager, Fraser Basin Council

Steve Litke, Senior Program Manager, Fraser Basin Council, provided members with a presentation on the Lower Mainland Flood Management Strategy highlighting regional flood risk, partners and participants, and risk reduction priorities, options and strategy.

Presentation material titled "Lower Mainland Flood Management Strategy" is retained with the March 13, 2020 Climate Action Committee agenda.

4.2 Dr. Michael Brauer, Professor, School of Population and Public Health, UBC

Dr. Michael Brauer, University of BC, provided members with a presentation on health impacts of residential wood smoke highlighting ambient air pollution exposure risks, impact of wood smoke on health and hospitalization, and reducing fine particulate matter.

Presentation material titled "Health Impacts of Residential Wood Smoke" is retained with the March 13, 2020 Climate Action Committee agenda.

5. REPORTS FROM COMMITTEE OR STAFF

5.1 MVRD Residential Indoor Wood Burning Emission Regulation Bylaw No. 1303, 2020

Report dated Roger Quan, Director, Air Quality and Climate Change, Parks and Environment, seeking MVRD Board adoption of *Metro Vancouver Regional District Residential Indoor Wood Burning Emission Regulation Bylaw No. 1303*, *2020*, concerning the phased introduction of regulatory requirements to reduce emissions from residential indoor wood burning.

2:02 p.m. Councillor Patton arrived at the meeting.

It was MOVED and SECONDED

That the MVRD Board:

a) give first, second and third reading to *Metro Vancouver Regional District Residential Indoor Wood Burning Emission Regulation Bylaw No. 1303, 2020*; and

b) pass and finally adopt *Metro Vancouver Regional District Residential Indoor Wood Burning Emission Regulation Bylaw No. 1303, 2020*.

CARRIED

5.2 Addressing the Greenhouse Gas Intensity of Buildings in the BC Building Code

Report dated February 26, 2020 from Erik Blair, Air Quality Planner, Parks and Environment, seeking direction to write a letter to the provincial Minister of Municipal Affairs and Housing advocating for greenhouse gas emission reduction requirements for new construction and retrofits to existing buildings.

Members were provided with a presentation on greenhouse gas building emissions and requirements for new construction and retrofitting of existing buildings within the BC *Building Code* and BC *Energy Step Code* to reduce emissions from natural gas use, utilize electric heating and hot water systems, and promote low and zero carbon construction.

Presentation material titled "Addressing GHG Intensity of Buildings" is retained with the March 13, 2020 Climate Action Committee agenda.

It was MOVED and SECONDED

That the MVRD Board write a letter to the provincial Minister of Municipal Affairs and Housing and other appropriate provincial government ministries requesting that the Province include:

a) opt-in greenhouse gas intensity performance requirements for new construction in the British Columbia Building Code;

b) an option to require zero emissions space heating and hot water; and

c) complementary requirements in the proposed provincial "Retrofit Code" for existing buildings.

CARRIED

5.3 Manager's Report

Report dated February 20, 2020 from Roger Quan, Director, Air Quality and Climate Change, Parks and Environment, updating the Climate Action Committee on the Committee's 2020 Work Plan, air quality monitoring on Musqueam Reserve Lands in Vancouver, *Clean Air Plan* and *Climate 2050* engagement, and energy improvements at Metro Vancouver head office.

It was MOVED and SECONDED

That the Climate Action Committee receive for information the report dated February 20, 2020, titled "Manager's Report".

CARRIED

6. INFORMATION ITEMS

It was MOVED and SECONDED

That the Climate Action Committee receive for information the following Information Items:

6.1 Correspondence dated February 28, 2020 to Sav Dhaliwal, Chair and Directors Metro Vancouver Board re Alignment of Federal, Provincial, and Local Government Greenhouse Gas Targets from Minister George Heyman, Ministry of Environment and Climate Change Strategy

6.2 Report from Edward Nichol, Senior Policy and Planning Analyst, Regional Planning and Housing Services re: Metro 2040 Climate and Natural Hazards Policy Review Scope of Work, dated January 15, 2020 to the Regional Planning Committee February 7, 2020 meeting.

6.3 Report from Laurie Bates-Frymel, Senior Planner, Regional Planning and Housing Services re: Metro 2040 Environment Policy Review – Update on Policy Option Development, dated January 20, 2020 to the Regional Planning Committee February 7, 2020 meeting

CARRIED

7. OTHER BUSINESS

No items presented.

8. BUSINESS ARISING FROM DELEGATIONS

No items presented.

9. RESOLUTION TO CLOSE MEETING

No items presented.

10. ADJOURNMENT/CONCLUSION

It was MOVED and SECONDED

That the Climate Action Committee conclude its regular meeting of March 13, 2020.

CARRIED

(Time: 2:57 p.m.)

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Genevieve Lanz,
Legislative Services Coordinator

_____

Adriane Carr, Chair

37709515 FINAL

Summary of presentation:

We are Katelyn and Isaac, local climate organizers who work to bring communities together across Metro Vancouver to tackle the climate crisis. In the past year we have campaigned for cities to implement the UN IPCC climate targets, which call for emissions to be reduced by 45% by 2030, 65% by 2040 and reach net-zero emissions by 2050. These are the targets that every level of society has to reach. So far there has been a huge appetite in the region; eight cities have officially adopted these targets and are incorporating them into new and existing plans, while four others have taken steps towards implementing the targets. But one of the biggest issues cities, particularly smaller cities, face is the lack of staff capacity and revenue to actually measure and report on their emissions to the community. Since Metro Vancouver has been one of the leaders for emission reductions, with the IPCC targets unanimously passed by the board back in June 2019, we know you can be the forerunners in supplying the needed capacity to measure and report on cities emissions.

We need Metro Vancouver to institute a regional yearly measuring and reporting system for greenhouse gas emissions, in line with the Greenhouse Gas Protocol for Cities, from 2020 onwards. This regional model would allow cities across Metro Vancouver to understand their greenhouse gas emissions, so they are able to drastically reduce them to meet their 2030 targets.

In 2014, the Greenhouse Gas Protocol was developed to provide a standard for how cities should report on their greenhouse gas emissions. The GPC recommends that cities update their inventory on an annual basis, as it provides frequent and timely progress on overall GHG emissions. Key highlights from the report are the differentiation in scope of emissions - broken down into Scope 1, Scope 2 and Scope 3 emissions.

- Scope 1: The minimum requirement that encompasses all sources of emissions within a city's boundary (e.g. emissions from fossil gas in buildings, transportation emissions, waste etc.)
- Scope 2: Requires encompassing a wider spectrum of emissions, including the emissions generated from the electrical grid or waste sites where waste from a city was sent but the site sat outside the city's boundary.
- Scope 3: A wider global approach including emissions from consumption of residents, embodied emissions in construction and out of boundary transportation such as emissions from aeroplanes and shipping.

At this moment Metro Vancouver has the data to be able to accurately report on emissions within scope 1 and 2 - see Metro Vancouver's 2015 report below. There are difficulties with transportation emissions data, mostly due to the inability to account for trips taken outside the region and the lack of odometer readings from ICBC. Answering these two problems, especially by having yearly odometer readings for all registered cars, would ensure a higher accuracy of data. However, this should not be a cause for delay. The current system to compile emissions from transportation uses regional fuel sales data, the number and type of registered vehicles

and an indication of odometer readings. This system provides a strong enough basis to publicly report on Scope 1 and 2 emissions from 2020 onwards.

But we are facing a global climate crisis and our reporting on emissions needs to reflect that. We know emissions are generated outside of the boundaries of Metro Vancouver because of activity within Metro Vancouver. If we only report on emissions that fall within Scope 1 and 2 we are providing a simplistic picture that will limit politicians and the public's perceptions on the actions we need to take to tackle this global climate crisis. Reporting on Scope 3 emissions would result in cities and industry working together to reduce embodied emissions in construction or vehicles, encourage cities to increase pressure on industry and the province to reduce emissions, while also highlighting the need to change consumption patterns on a personal and societal level. We need to have a reporting system that reports on Scope 3 emissions for 2021 that is released in 2022.

It's essential that as a regional governing body you collect the hard data on emissions and report it to other cities. If cities were to report on their own emissions data, a uniform reporting system for Metro Vancouver would become unlikely because the differing scopes give rise to the potential for different reporting systems. We need every city to be using the same reporting system so we, the residents of Metro Vancouver, can gain a clearer picture on which cities are meeting their emissions and which are not. Those hard conversations about what emissions are designated to what sector or what city need to be discussed by a regional board, and not individually by every city.

The reality is you can't cut what you don't measure. At the moment we don't even know if we will be hitting our emission reduction targets. In this time of such uncertainty, we need our political leaders to show us that we can stop runaway climate change, hit our targets and change society for the better. You have proven yourselves to be leaders in the fight to tackle the climate crisis. Our ask of you is to institute a regional yearly measuring and reporting system for greenhouse gas emissions, in line with the Greenhouse Gas Protocol for Cities, from 2020 onwards.

Katie Maki & Isaac Beevor

Resources:

GHG Protocol for Cities

CDP: Home (Carbon disclosure project)

Metro Vancouver:

Emission Inventories & Forecasts (outline of 2015 report)

Greenhouse Gas Emissions (2015 report)

Vancouver:

Greenest City goal: Climate and Renewables

Google Environmental Insights:

Victoria - Summary - Google Environmental Insights Explorer - Make Informed Decisions

Toronto:

City of Toronto's Greenhouse Gas Emissions Inventory (Feb 2019)

Summary Note: Low Carbon Cities Canada (LC3) – May, 2020

Background

Low Carbon Cities Canada (LC3) was initiated by The Atmospheric Fund, based in Toronto, and Natural Resources Canada, which sought to create non-profit hubs in major cities across the country to help scale up low-carbon solutions. The Atmospheric Fund (TAF) was created in 1991 by the City of Toronto with a $23M endowment. TAF has since worked with local government, the private sector and other community organizations to deliver grants, capacity-building programs, research and policy development, and innovative financial tools aimed at enabling and scaling up low-carbon solutions. In 2019, the federal government announced funding of $183M to create LC3 centres modelled on the TAF approach in Metro Vancouver, Edmonton, Calgary, Ottawa, Montreal Metropolitan and Halifax region (along with growing TAF, which serves the Greater Toronto and Hamilton Area). For the Metro Vancouver region, the federal funding includes a $20M endowment (to be maintained in perpetuity, with the interest to support the Centre's operations) and a ~$1.7M start-up grant.

How LC3 Can Advance Regional Climate Action

The objective of LC3 is to enable and accelerate urban carbon-reduction solutions. These solutions could encompass buildings, transportation or renewable energy supply—the focus will vary across the LC3 Centres, depending on the local needs and opportunities. The Metro Vancouver region LC3 Centre will use three tool to advance climate action: 1) impact investing (such as offering financing for building retrofits); 2) granting (to support other organizations and local governments advance priority projects); and 3) capacity building (such as knowledge sharing, training, and best practices resources to advance climate action). The LC3 Centre will focus on solutions that have the greatest opportunity of scaling up across the region, rather than "one-off" carbon reductions. In this way, the LC3 Centre can directly advance the goals of the Climate Action Committee and the priorities of local governments across the region.

Selecting the LC3 Host Organization

During the project development phase in 2018, the City of Vancouver indicated a willingness to act as the proxy host until such time as a suitable host organization could be secured. At the time, the City of Vancouver was also in the process of establishing the Zero Emissions Building Exchange, which serves a similar function within the City but which could be expanded to serve the region as part of, or under, an LC3 Centre. Following the federal funding announcement, the City of Vancouver hosted a stakeholder workshop and a provided a presentation to Metro Vancouver's REAC Climate Subcommittee. City staff also began collaborating with Metro Vancouver staff on a Request for Expressions of Interest (RFEOI) to secure a host organization. The LC3 funding will go directly to the non-profit organization selected to be the host; cities are not eligible to host an LC3 Centre but will be eligible to apply for grants and to provide input to the LC3 Centre to ensure that it is most impactful and not duplicating efforts.

The RFEOI closed on April 14, 2020. Multiple qualified vendors have submitted expressions of interest and the review team made up of City of Vancouver and Metro Vancouver staff are now evaluating those submissions. The Federation of Canadian Municipalities (FCM), which is overseeing the LC3 program and administering the federal funds, will be part of the evaluation process, to ensure that the preferred vendor is able to meet FCM's requirements to receive the funding. Staff are aiming to have a preferred organization identified by early June, after which the recommendation will be brought forward to the Climate Action Committee and MVRD Board for information. The recommendation will also be brought forward to the City of Vancouver's council. Following this evaluation process, the selected organization will then negotiate and enter into a funding agreement with FCM. FCM has a number of requirements that will need to be fulfilled, in terms of organizational capacity, governance, financial capacity, and reporting.

Governance

The selected host organization will be required by FCM (as a condition of the federal funding) to have local government representation on the decision-making body for the LC3 Centre. FCM's preference is that the

representative be an elected official (local councils will have the ability to delegate that role to staff if they wish). For the Metro Vancouver region LC3 Centre, the host organization will be expected to have two representatives (specified in the RFEOI) from local government: one identified through the Metro Vancouver Board, and a second position designated by the City of Vancouver council. Having two representatives will ensure that local government has a strong voice on the LC3 Centre governance body, and also enable a diversity of views are provided (i.e., a large urban centre and a smaller, less dense community).

Next steps

City of Vancouver and Metro Vancouver staff will be working with FCM to select a preferred organization to host the Metro Vancouver region LC3 Centre. Staff will report back to the Climate Action Committee with a recommendation at an upcoming meeting. Following that, the selected organization will begin negotiating the funding agreement with FCM and taking steps to satisfy the various conditions, including providing seats for local government representatives on their decision-making body.

LC3 site: http://lc3.ca/

To: Climate Action Committee

From: Laura Taylor, Public Engagement Coordinator, Parks and Environment Department
Lucy Duso, Policy Coordinator/Engagement Lead, External Relations Department

Date: April 30, 2020 Meeting Date: May 15, 2020

Subject: **Adapting Air Quality and Climate Change Engagement During COVID-19**

RECOMMENDATION
That the Climate Action Committee receive for information the report dated April 30, 2020, titled "Adapting Air Quality and Climate Change Engagement During COVID-19".

EXECUTIVE SUMMARY
Metro Vancouver continues to assess work plans on a case by case basis to determine if the COVID-19 pandemic response requires an adjustment to any work plans, including engagement components.

Staff continue to develop *Climate 2050 Roadmaps* and the draft *Clean Air Plan*, with the intention of meeting the timelines set out in the Climate Action Committee work plan for 2020. In the next few months, while public health protection measures (such as physical distancing requirements) remain in place, staff will implement alternate engagement methods, and tailor its approaches for specific audiences. Staff will assess the capacity of various audiences to respond, and where appropriate, shift to obtaining feedback through feedback forms, direct emails and online meetings.

A similar approach will be applied for regulations that are currently under development, such as a regulation on open-air burning, and for outreach programs including electric vehicle promotions.

It is critical that Metro Vancouver continue to pursue its ambitious climate targets, and continue with initiatives that protect human health and the environment.

PURPOSE
To provide the Climate Action Committee with information about the evolving approach to current and upcoming engagement activities for priority air quality and climate change projects during the COVID-19 pandemic response.

BACKGROUND
Based on discussion with the Committee Chair, staff have prepared a report that outlines Metro Vancouver's approach to engagement on air quality and climate change projects during the developing pandemic response. Since the previous Committee meeting, there have been increasing requirements for strict physical distancing, and recognition of a shift of community priorities towards health and safety, economic impacts and for many residents, disruption and anxiety.

All engagement plans follow Metro Vancouver's public engagement guidelines (Reference 1) and include activities that "*work directly with the public to ensure that public concerns and aspirations are*

consistently understood and considered". This report describes how engagement on key air quality and climate change projects will proceed, with adjustments to methods and timelines, and recognition of the varied circumstances for different audiences.

REVISING ENGAGEMENT PLANS

Metro Vancouver continues to assess work plans on a case by case basis to determine if the COVID-19 pandemic response requires adjustments to be made, including engagement components. Staff are revising engagement plans for key air quality and climate change initiatives.

As previously reported to the Committee, projects currently in consultation include the *Climate 2050 Roadmaps*, the *Clean Air Plan*, and a regulatory development initiative for *Managing Emissions from Open-Air Burning of Vegetative Debris*. A first phase of engagement on options for managing emissions from cannabis production and processing operations has completed, and staff are analyzing the feedback received and will report back to the Committee on the next phase of engagement. Air quality outreach programs such as Emotive - the electric vehicle experience, and in particular in-person events, are also affected. Revised engagement activities, by project, are outlined in Attachment 1.

Although the engagement plans are being revised, the work plans to develop policies and key milestones are currently unchanged. Air quality and climate change projects and programs focus on improving air quality and taking leadership on climate action to continue protecting public health and the environment, as identified in the Metro Vancouver *Board Strategic Plan*. Regional greenhouse gas targets in *Climate 2050*, and proposed air quality targets in the *Clean Air Plan*, have time horizons of less than ten years, so it is important that Metro Vancouver move forward with the initiatives and engagement described in this report. Actions that are taken now remain a priority and will help to avoid the worst impacts of climate change.

Climate 2050 sets out a dynamic, iterative approach to developing and implementing the issue area roadmaps. The roadmaps will be informed by measurement of progress towards targets, as well as evolving science and technology, and importantly, by ongoing stakeholder and public feedback *throughout* the process to achieve the climate targets established by the Board.

Metro Vancouver remains committed to seeking public, stakeholder and government feedback, and is revising processes to obtain this feedback, shifting to online opportunities where possible or postponing activities. Attachment 2 provides additional details on revised engagement methods.

ADAPTING ENGAGEMENT METHODS

The goals and objectives of the project engagement plans remain unchanged, although the methods and tools used to obtain feedback are being adjusted. Staff also anticipate reduced participation from some audiences, and will revisit engagement outcomes in the coming months.

Attachment 2 describes the established engagement methods used by Metro Vancouver, and identifies replacement methods under consideration, with comments on how well each replacement is expected to perform. In addition to adapting engagement methods, for all projects in consultation staff plan to do the following:

- For each project, email the existing contact database to ask how and if people would like to be engaged and their thoughts on Metro Vancouver engaging on each initiative in the near-term. The aim is for staff to show recognition that priorities and capacity to respond may have changed, and determine the most appropriate methods on how engagement should proceed.
- If this initial outreach indicates stakeholder support for proceeding with consultation, staff will use the engagement methods outlined in Attachment 2.
- Feedback received and any further revisions to the engagement plans will be reported to the Climate Action Committee.

It is recognized that some audience groups are more impacted in their ability to provide feedback during the pandemic response. Engagement plans and activities are being adjusted to focus on audience groups that may have more capacity in the short term including, for example, some government agencies. There are also indications that some members of the public, while self-isolating or experiencing a reduction in other activities, are indicating an interest in engagement with local government. Metro Vancouver is also connecting to youth, a key audience for *Climate 2050*, through an online workshop in May, and making plans for additional engagement activities with youth.

INCREASING RESILIENCY

The 100 Resilient Cities initiative describes *urban resilience* as an approach to meeting the growing range of challenges cities face in the 21st century, and notes the following: "*From the effects of climate change to growing migrant populations to inadequate infrastructure to pandemics to cyber-attacks. Resilience is what helps cities adapt and transform in the face of these challenges, helping them to prepare for both the expected and the unexpected*".

The COVID-19 pandemic response is an example of the need for resiliency in our communities. Among other outcomes, it emphasizes the need to remain connected and to continue to hold dialogue not only about the current challenges, but also to progress with critical work already underway. Adapting work plans, in this case the approach to engagement, provides an experience that will help organizations, including Metro Vancouver, prepare for the disruptions projected to occur as our climate changes.

Another example, as wildfire season nears, is Metro Vancouver's response to the potential for increased exposure to air pollution that could result from wildfires, and how this could impact on COVID-19 susceptibility. Metro Vancouver is continuing to work with health authorities to ensure that air quality advisory messaging is consistent and meaningful for the region. Similarly, publications and outreach activities like *Caring for the Air* and the *Climate 2050* website, air quality monitoring programs with Metro Vancouver's mobile air monitoring unit (MAMU), and electric vehicle campaigns contribute to resilient communities by helping residents see the benefits and impacts of air quality and climate change programs.

Metro Vancouver continues to develop new, and strengthen existing, channels of communication with other organizations and residents across the region.

ALTERNATIVES
This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS
The resources required to adapt engagement on *Climate 2050 Roadmaps*, the *Clean Air Plan*, *Managing Emissions to Open-Air Burning Regulation*, *Managing Emissions from Cannabis Production and Processing Operations*, and electric vehicle outreach programs are included in the existing program budgets for 2020. Adaptation of engagement activities will not result in additional costs.

CONCLUSION
Metro Vancouver continues to assess work plans on a case by case basis to determine if the COVID-19 pandemic response requires adjustments to any work plans, including engagement components. For air quality and climate change programs and initiatives, this means continuing with work plans that protect human health and the environment, but adjusting the approach to engagement.

Metro Vancouver is continuing to seek feedback on a series of *Clean Air Plan* and *Climate 2050* Discussion Papers. Goals and targets in Metro Vancouver's climate-related plans are science-based, and interim targets (such as a 45% reduction in greenhouse gas emissions below 2010 levels by 2030), have a time horizon of less than ten years, so taking action now to avoid the worst impacts of climate change remains a priority. Staff are committed to meeting the time lines set out in the Committee's work plan for *Climate 2050* roadmap development, but with revised engagement plans and methods, and recognition of the varied circumstances for different audiences. Metro Vancouver is also revising engagement plans for regulatory development and other initiatives to align with the COVID-19 pandemic response.

Revised engagement activities, by project, are outlined in Attachment 1. Attachment 2 provides details on revised engagement methods. Metro Vancouver staff continue to meet with member jurisdictions and other government agencies to discuss emerging and best practices for engagement during the COVID-19 pandemic response. Staff will continue to adjust these plans with the best available information.

Public feedback continues to be valued and the project teams will continue to create online feedback opportunities, review feedback and ensure it is reflected as policy development moves forward.

Attachments *(38895957)*
1. Air Quality and Climate Change Initiatives – Revised Engagement Activities by Project During COVID-19 Pandemic Response, May 15, 2020
2. Air Quality and Climate Change Initiatives – Revised Engagement Methods During COVID-19 Pandemic Response, May 15, 2020

Reference
Metro Vancouver's Community Engagement Guidelines

38350604

Air Quality and Climate Change Initiatives – Revised Engagement Activities by Project During COVID-19 Pandemic Response

This attachment provides a description of the three air quality and climate change-related projects currently in consultation and includes engagement objectives, audiences, and adapted timeline and approach. It also describes the approach to upcoming engagement programs and outreach initiatives.

Projects in Consultation

1. *Climate 2050 Roadmaps* and the *Clean Air Plan* - Metro Vancouver is currently seeking feedback on a series of Discussion Papers (Buildings, Transportation, Industry, etc.) that contribute to the development of the *Climate 2050 Roadmaps* and the *Clean Air Plan*.	
Engagement Objective	To increase understanding of the issues and trade-offs related to air quality and climate change from stakeholders and other governments, include diverse and historically under-represented voices, and earn buy-in from stakeholders and other governments.
Audience (Each Issue Area has a relevant audience. This table lists examples.)	• broad public with a focus on youth • First Nations • member jurisdictions • neighbouring regional districts • provincial and federal governments and agencies • health authorities • partner agencies • organizations with responsibilities in air quality • industry and business associations • energy utilities • professional associations and academic institutions • community and environmental groups
Adjustments to the engagement timeline	• The engagement period for all Discussion Papers is extended until July 31, 2020. This includes an extension for feedback on the Transportation, Industry and Buildings Discussion Papers, as well as the forthcoming Nature & Ecosystems and Agriculture Discussion Papers, which are also part of the May 2020 Climate Action Committee agenda package. • Staff is working towards roadmap completion timelines set out in the Climate Action Committee work plan for 2020. • Staff will use online tools to engage and will promote online feedback through the *Climate 2050* and *Clean Air Plan* websites and social media channels.

Anticipated Challenges and Responses	
Challenge: Many planned engagement activities required in-person methods.	Response: All engagement methods revised to online and direct telephone outreach.
Challenge: Shifting priorities of organizations (e.g. industry and business associations, Health Authorities, energy utilities), to health, safety and financial impacts.	Response: Focus on obtaining input from government agency partners, stakeholders and other departments within Metro Vancouver who may have more capacity. When the COVID-19 response allows, re-visit opportunities as capacity grows.
Challenge: Shifting priorities of broader public audience to health, safety and financial impacts.	Response: Reduce outreach to broader public audience, but maintain online presence and feedback options. When the COVID-19 response is past, revisit an emphasis on public engagement.
Challenge: Shifting priorities of typically underrepresented voices, including vulnerable communities, to health, safety and financial impacts.	Response: Staff will reach out to community leaders to determine a course of action that ensures feedback is heard from a range of voices in our communities.

2. *Managing Emissions from Open Air Burning and Vegetative Debris* - Metro Vancouver is currently seeking feedback on a potential emission regulation. In addition to consulting on options to reduce emissions from open-air burning, Metro Vancouver has restricted open-air burning in the region due to COVID-19 and the increased susceptibility to respiratory infections from exposure to air pollution.	
Engagement Objective	To obtain input from the public, stakeholders, and other governments on a potential Metro Vancouver open-air burning regulation and to provide information about the environmental and health impacts of smoke emissions.
Audience	• broad public • member jurisdictions • municipal fire departments • First Nations • agricultural producers • agricultural advisory committees • businesses involved in land clearing, land development, construction and landscaping • businesses providing services of collection, recycling, and processing of vegetative debris • consultants, manufacturers and distributors of equipment that provide services for open-air burning activities • manufacturers and distributors of equipment used to reduce the size of vegetative debris • provincial, federal and other government agencies • neighbouring jurisdictions

	• public health experts • other interested parties
Adjustments to the engagement timeline	• Engagement on the Discussion Paper will be extended from April 13 to July 31, 2020. • Staff plan to seek feedback on a draft emission regulation starting before the end of 2020 to align with open-air burning season and a less active growing period for the agricultural sector. • Staff will present the Climate Action Committee with an updated engagement plan later this year. • Staff will continue to promote online feedback opportunities through the project website and social media channels.
Anticipated Challenges and Responses	
Challenge: Many planned engagement activities required in-person methods.	Response: Upcoming engagement will move to online and telephone outreach. Staff have presented at municipal Agricultural Advisory Committees in the region and will engage with any other committees recommended by municipal staff when meetings resume.
Challenge: Shifting priorities of many stakeholders. (A key audience for this policy is the Agriculture sector, which is recognized as widely impacted by COVID-19.)	Response: Focus on the stakeholders most affected by a potential Open-Air Burning Regulation (e.g. cranberry farmers) and those holding open-air burning permits with member municipalities. When the draft regulation is prepared staff will present the Climate Action Committee an engagement plan that includes increased outreach to agricultural producers, to account for this disruption.
Challenge: Providing information to members of the public who rely on community resources such as city halls, libraries and community centres.	Response: Increase outreach through social media and Metro Vancouver publications.

Projects with upcoming consultation

3. Consultation on *Managing Emissions from Cannabis Production and Processing Operations*

Consultation on this initiative is a two-phase approach. A first round of engagement activities on a discussion paper has ended, and staff are analyzing the feedback from the public, stakeholders and other governments. A second phase of engagement on a draft emission regulation is likely to be delayed, as the intention is for staff to meet in person with stakeholders, and visit facilities and communities in which production and processing operations are active. Staff will present the Climate Action Committee an engagement plan for a draft emission regulation later this year.

Educational outreach programs

4. Managing Residential Wood Smoke Emissions

In March 2020, a bylaw was passed introducing phased measures to reduce emissions from residential indoor wood burning. The first phase, which would restrict residential indoor wood burning in the warm season between May 15 and September 15, comes into effect in 2021. This bylaw requires public outreach and education to ensure people are aware of the new requirements. An engagement strategy is being developed and may include outreach activities that have proven successful in other information campaigns, particularly in more rural communities where residential wood burning is more prevalent, such as distributing informational brochures to libraries and community centres. Other effective outreach activities include providing information about techniques to improve the efficiency of and reduce emissions from wood heat appliances at community wood heat workshops. Until these community facilities reopen, staff will increase digital outreach through Metro Vancouver social media channels both broadly and by geotargeting prioritized communities.

5. Caring for the Air

Metro Vancouver's Caring for the Air report is an easy-to-read annual publication that provides information about air quality and climate change issues in our region, as well as programs that protect public health and the environment, improve visual air quality, and reduce greenhouse gas emissions. Typically, new editions are available in late spring, and are promoted on social media and made available in hard copy through public facilities, such as libraries and municipal halls, and at community events. Until facilities reopen and community events resume, staff will increase outreach through Metro Vancouver social media channels.

6. Mobile Air Monitoring Unit (MAMU) – Current Deployment

On March 17, Metro Vancouver's MAMU began monitoring on Musqueam First Nation's Indian Reserve No. 2 in Vancouver. The monitoring will provide information on air quality in the community and support Metro Vancouver's Iona Island Wastewater Treatment Plant Biosolids Dewatering Facility project. In response to COVID-19, Musqueam First Nation are working to limit the number of visitors to their community. Metro Vancouver is requesting an arrangement with Musqueum First Nation to allow an air quality technician to enter the community in a manner that complies with requirements to protect the health of Musqueam First Nation members to provide the regular servicing necessary to operate MAMU.

7. Air Quality Advisories – Looking Ahead to Summer 2020

Metro Vancouver, local Health Authorities, the Fraser Valley Regional District, the BC Ministry of Environment and Climate Change Strategy, and Environment and Climate Change Canada work cooperatively in an existing, proven process to provide information about air quality and potential health impacts to residents when air quality degrades. Providing information about potential health impacts will continue to be a priority for the air quality advisory program in 2020, particularly during the summer and the wildfire season. In response to COVID-19, our health agency partners have advised there is strong evidence that exposure to air pollution increases susceptibility to respiratory viral infections by decreasing immune function, particularly as a result of vehicle emissions and biomass burning. Air quality advisories are being updated to include health messaging related to COVID-19. Improvements to overall air quality may help to protect the whole population from COVID-19 and its potentially severe effects.

Air Quality and Climate Change Initiatives – Revised Engagement Methods During COVID-19 Pandemic Response

The projects in consultation as of April 2020 are *Climate 2050*, the *Clean Air Plan* and *Consultation on an Alternative Approach for Regulating Emissions from Open-Air Burning of Vegetative Debris in Metro Vancouver*. Table 1 outlines the methods currently used in the engagement plans, and describes potential alternatives under physical distancing restrictions.

Table 1: Air Quality and Climate Change Engagement Methods During Physical Distancing Restrictions

Current method identified in engagement plans	Potential alternative method	Audience	Considerations
Open house	Webinar (Adobe Connect)	All stakeholders, general public (includes residents, businesses, community and environmental organizations, youth, media)	Access to tablet or computer – will include phone options. Time is at a premium for people with young children at home – will provide recorded videos to be viewed at leisure, where possible.
Print material: informational brochures, rack cards *(Note: Libraries and other public access points where these were distributed are currently closed)*	Project webpage, Metro Vancouver social media channels (Facebook, Twitter, Instagram)	All stakeholders, general public (includes residents, businesses, community and environmental organizations, youth, media)	Will continue to host on Metro Vancouver website with increased online promotion. Not all members of the public access social media channels.
Community event information booth	Informal subject matter expert conversations (e.g., webinar, Facebook Live)	General public (includes residents, businesses, community and environmental organizations, youth, media)	Replicate short, informal conversations with residents. Will need increased social media promotion.

Current method identified in engagement plans	Potential alternative method	Audience	Considerations
Stakeholder workshop	Webinar (Adobe Connect)	Affected stakeholders (example: affected industry and sector representatives, academics, NGOs, other orders of government), general public (includes residents, businesses, community and environmental organizations, youth, media)	Hold online breakout groups and webinar message board to enable stakeholder conversations with each other.
Government workshop	Webinar (Adobe Connect)	First Nations, member municipalities, provincial and federal government agencies	Increase interactivity of webinar (e.g., live-polling) to ensure sufficient feedback and two-way dialogue is achieved.
Public webinar	No change (Adobe Connect)	All stakeholders, general public (includes residents, businesses, community and environmental organizations, youth, media)	Increase interactivity and two-way conversations to account for lack of any supplementary in-person engagement.
Sustainability community breakfast	Postponed - no replacement currently identified	All stakeholders, other orders of government, and general public (includes residents, businesses, community and environmental organizations, youth, media)	Where appropriate, will increase number of offered sustainability breakfasts in later phases of engagement.
Online feedback form	No change	All stakeholders, other orders of government, and general public (includes residents, businesses, community and environmental organizations, youth, media)	Greater online promotional effort needed to account for lack of in-person promotion at events.
Project webpage	No change	All stakeholders, other orders of government, and general public (includes residents, businesses, community and environmental organizations, youth, media)	Will host all changes in timeline and event cancellations and replacements.

Current method identified in engagement plans	Potential alternative method	Audience	Considerations
Advertisements	Include radio ads, where needed, in addition to planned newspaper and newsletter ads.	All stakeholders, general public (includes residents, businesses, community and environmental organizations, youth, media)	Increased advertisement to account for lack of in-person project promotion. Varied outlets to reach greater audience (e.g., non-English language local newspapers).
Presentations and feedback sessions at municipal advisory meetings in the region	Continue online where applicable	Municipal Advisory Committee members (e.g., agricultural, environmental)	Some municipalities have indicated they will resume these meetings online, may not be the case with all.

Digital Outreach Considerations

Staff are sensitive to inequalities in access to affordable technology and digital literacy skills. Many of these inequalities are also present in non-pandemic engagement. Staff aim to counterbalance the increased focus on digital outreach with some targeted phone outreach, and look ahead to resuming in-person engagement, possibly with increased opportunities, when the social distancing restrictions are lifted. As always, engagement will be responsive to feedback and will be altered to better reach all audiences.

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Morgan Braglewicz, Policy Analyst
Parks and Environment Department

Date: April 16, 2020 Meeting Date: May 15, 2020

Subject: **Low Carbon Economic Stimulus Funding in Response to COVID-19**

RECOMMENDATION

That the MVRD Board write letters to the provincial Minister of Environment and Climate Change Strategy, the federal Minister of Environment and Climate Change, and other appropriate government agencies to call for economic stimulus funding to be directed to low carbon initiatives.

EXECUTIVE SUMMARY

The response to COVID-19 is currently focused on critical near-term decisions on key issues such as public health and high levels of unemployment. Once these issues begin to stabilize, the Provincial and Federal government will turn to decisions on how to stimulate economic recovery. Historically, government stimulus funding has focused on programs and public work projects. Despite support for "green stimulus" measures following the 2008 Great Recession, the potential to invest funding into low carbon initiatives went largely unrealized. Already, there have been public demands for post COVID-19 economic stimulus funding to go to the oil and gas sector. However, many organizations are advocating for low carbon initiatives to form the core of Canada's economic stimulus spending, rather than investment in oil and gas. Metro Vancouver has an opportunity to add its voice in calling for the development of stimulus spending that is equitable and accelerates the growth of a resilient, low carbon economy, to support achievement of the climate goals that have been established for the region.

PURPOSE

To provide the Climate Action Committee with an overview of the challenges and opportunities for climate action during and after the COVID-19 crisis, and the potential impact of a letter from the MVRD Board advocating for increased spending on low carbon economic stimulus to align with Metro Vancouver's climate action goals.

BACKGROUND

Through *Climate 2050,* Metro Vancouver is committed to achieving carbon neutrality by 2050 and ensuring the equitable implementation of actions to reduce greenhouse gas emissions. Achieving this goal will only be possible with strong alignment and collaboration between all levels of government. As the Provincial and Federal governments implement economic stimulus measures to support economic recovery following the impact of COVID-19, Metro Vancouver should ensure that Provincial and Federal spending align with the shared objectives of economic recovery for communities, the equitable distribution of benefits, and the creation of economic growth in low carbon sectors that are sustainable over the long term.

COVID-19 CHALLENGES AND LEARNINGS

The emergence of COVID-19 has led to drastic health, social, and economic shifts as our communities face the all-encompassing challenge of overcoming this virus. Policy makers at all orders of government have been focused on critical near-term decisions on public health and employment crises. In recent weeks, the Provincial and Federal governments have announced unprecedented levels of economic support for individuals and businesses impacted by COVID-19. Inevitably, in the near term the COVID-19 crisis will lower the priority placed on climate change action as public health and social security measures take precedence. However, as decisions on economic stimulus spending are made, these decisions will have an effect on climate action.

Supporting a Low Carbon Future

Now, more than ever before, Canada and BC have an opportunity to accelerate the development of an economy that is sustainable in a low carbon future. It will be tempting for BC and Canada to fall back on existing economic pillars, which include the fossil fuel industry, as decisions are made to stabilize and revitalize the economy. Low oil prices are an additional complicating factor, as they simultaneously illustrate the precariousness of the oil and gas sector while also undermining the business case for energy efficiency or fuel switching. Propping up the oil and gas sector through stimulus spending may support near-term economic recovery for some, but it is at odds with Canada and BC's climate commitments and the need to reduce greenhouse gas emissions. Low carbon programs and projects that support long-term economic stability and climate resiliency should be central to the composition of new economic stimulus funding.

Implications for Climate Action

There will be important lessons to be learned from governments' reactions to the COVID-19 crisis that can potentially be applied to a renewed approach to climate action in a post COVID-19 environment. The response to COVID-19 has demonstrated that institutions can be nimble in decision-making, and change their processes quickly under pressure. It has also demonstrated that individuals are capable of changing long-held behaviours, though it remains to be seen how persistent those behaviour changes will be. Finally, impacts of both COVID-19 and climate change will likely be felt disproportionately by the most vulnerable, so it will be critical to prioritize actions that build resiliency and reduce inequalities.

ECONOMIC STIMULUS FUNDING

Historically, governments have put money into programs and public works projects to stimulate the economy following significant economic downturns. Most notably, Franklin D. Roosevelt's New Deal following the Great Depression of the 1920s and 1930s focused on providing relief for unemployed workers, recovery of the economy, and reform of the financial system. More recently, widespread economic stimulus was needed after the Great Recession of 2008. The role of "green stimulus" measures was widely discussed at the time. Despite analysis on the potential for "green stimulus" measures following the recession, this potential went largely unrealized as stimulus spending did not prioritize low carbon initiatives. In Canada, under 10% of all economic stimulus spending in 2009 was spent on "green stimulus" measures, amounting to approximately $3.4 billion (Reference 1). Additionally, while the New Deal included a strong social component, significant amounts of stimulus spending after the 2008 Great Recession went to large financial institutions, leading to an inequitable distribution of the benefits from stimulus measures.

Low Carbon Stimulus Funding Mechanisms

There are numerous examples of mechanisms that can stimulate low carbon economic growth. Job creation and skills training can be focused on new low carbon sectors; investment can flow to low carbon infrastructure and renewable energy; industry investment can be tied to new environmental regulations; and tax instruments such as tax cuts, credits, exemptions, and subsidies can be introduced to direct spending in ways that decrease emissions and increase climate resilience. Many of these tools can be applied in a way that provides support and opportunities for more vulnerable individuals and communities.

Post COVID-19 Economic Stimulus Funding

The Federal and Provincial governments have already provided economic support for those impacted by COVID-19, and have indicated that they will announce economic recovery spending in the coming months. There will be a narrow window to determine how this money is spent, and how much of it goes to low carbon initiatives. Notably, the Federal government has already announced $1.7 billion dollars in funding to go to the cleanup of orphaned oil and gas wells in western provinces, including BC. Given the relatively limited focus on low carbon initiatives in 2009 Canadian economic stimulus spending, and the current call from some Provincial Governments to stimulate the oil and gas sector, advocacy on this issue is likely needed to push significant spending into low carbon initiatives with an equitable distribution of benefits.

Several organizations have already been advocating for low carbon initiatives to drive economic stimulus spending. The International Energy Agency has advocated for clean energy to be at the heart of economic stimulus (Reference 2). In Canada, 265 academics submitted a letter to Prime Minister Justin Trudeau opposing an oil and gas bailout as part of Canadian economic stimulus spending (Reference 3). Some organizations, including the Pembina Institute, Efficiency Canada, and the Canada Green Building Council, have already developed sector-specific recommendations and strategies to support low carbon stimulus spending. Additionally, a number of Metro Vancouver member jurisdictions have raised this issue. Metro Vancouver has an opportunity to add its voice to other organizations' in calling for the development of stimulus spending that is equitable and accelerates the growth of a resilient, low carbon economy.

ALTERNATIVES

1. That the MVRD Board write letters to the provincial Minister of Environment and Climate Change Strategy, the federal Minister of Environment and Climate Change, and other appropriate government agencies to call for economic stimulus funding to be directed to low carbon initiatives.

2. That the MVRD Board receive for information the report dated April 16, 2020, titled "Low Carbon Economic Stimulus Funding in Response to COVID-19" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

There are no financial implications associated with Alternative 1 in this report.

CONCLUSION

COVID-19 has already transformed our communities in profound ways. As critical near-term decisions help to stabilize public health and social support, the Provincial and Federal governments will begin to make decisions on economic stimulus spending to revitalize the economy. While economic recovery is the priority in these decisions, it is also important that they align with Metro Vancouver's *Climate 2050* commitments, as well as provincial and federal commitments to reduce greenhouse gas emissions and ensure the equitable distribution of benefits. Additionally, the economic transformations that are created through stimulus spending should support growth that is sustainable in the long term in a low carbon economy. However, some Provinces have already been calling for stimulus spending to go to the recovery of the oil and gas sector. Many other organizations are advocating for the implementation of low carbon economic stimulus measures.

Staff recommend Alternative 1, that the Board write letters to the provincial Minister of Environment and Climate Change Strategy, the federal Minister of Environment and Climate Change and other agencies as appropriate, to call for economic stimulus funding to be directed to low carbon initiatives.

References

1. Green Stimulus Measures
2. International Energy Agency Calls for Clean Energy Measures
3. Letter from 265 Academics on Economic Recovery Planning

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Theresa Duynstee, Regional Planner, Regional Planning and Housing Services Department
John Lindner, Air Quality Planner, Parks and Environment Department

Date: April 17, 2020 Meeting Date: May 15, 2020

Subject: ***Clean Air Plan* and *Climate 2050* Discussion Paper on Agriculture**

RECOMMENDATION
That the Climate Action Committee receive for information the report dated April 17, 2020, titled "*Clean Air Plan* and *Climate 2050* Discussion Paper on Agriculture".

EXECUTIVE SUMMARY
In October 2019, the MVRD Board directed staff to begin an integrated engagement process for *Climate 2050* and the *Clean Air Plan*, using a series of issue area discussion papers. Climate models predict that there will be consequences for agriculture, and protecting agricultural land and enhancing local food production are a priority for resilience in the region. Agricultural activities are also a source of greenhouse gas emissions. Staff have developed a draft discussion paper on agriculture's linkages to air quality and climate change, which will support public, stakeholder and government engagement on the *Clean Air Plan* and *Climate 2050*. The draft agriculture discussion paper is being presented to the Climate Action Committee for information, and feedback provided will be incorporated into the final discussion paper and associated engagement process.

PURPOSE
To provide the Climate Action Committee with information about the agriculture discussion paper to support development of the *Clean Air Plan* and the *Climate 2050 Roadmaps*.

BACKGROUND
Metro Vancouver has developed three previous air quality and greenhouse gas management plans, in 1994, 2005, and the *Integrated Air Quality and Greenhouse Gas Management Plan* in 2011. A new plan, the *Clean Air Plan*, will build on the 2011 plan and identify opportunities for accelerated emissions reductions, including greenhouse gas emission reduction actions. These actions will help protect human health and the environment and avoid dangerous levels of climate change.

Climate 2050 is an overarching long-term strategy that will guide our region's policies and collective actions to transition to a carbon neutral and resilient region over the next 30 years. Metro Vancouver is implementing *Climate 2050* through ten issue area *Roadmaps*, which will describe long-term goals, targets, strategies and actions to reduce regional greenhouse gas emissions and ensure that this region is resilient to climate change impacts. Implementation of the *Roadmaps* will be driven by Metro Vancouver's management plans and other policies, including the *Clean Air Plan*.

On October 4, 2019, the MVRD Board directed staff to begin an integrated engagement process for the *Clean Air Plan* and *Climate 2050*, using a series of issue area discussion papers. Discussion papers for buildings, industry and transportation were presented to the Climate Action Committee and MVRD Board in 2019. This report presents a draft discussion paper on the agriculture issue area (Attachment 1), which will support engagement on air quality issues, greenhouse gas reductions, and climate change adaptation related to this issue area.

AGRICULTURE DISCUSSION PAPER

The agriculture discussion paper includes long-term goals (i.e., with expected achievement in 2050 and beyond) for air quality and climate change, as shown below.

- Air quality and greenhouse gases:
    - The agricultural sector is carbon neutral and powered by clean, renewable energy.
    - The agricultural sector continues to employ best available management practices and technologies to minimize greenhouse gas and air contaminant emissions.
- Climate change adaptation:
    - Widespread adoption of climate resilient and regenerative farm practices that improves soil health, strengthens agricultural viability and sustains local food production for future generations.

The discussion paper reflects feedback provided by the Climate Action Committee at its meeting on June 14, 2019. The discussion paper also includes example actions from other jurisdictions and big ideas to support discussions to identify targets and actions for this region, including around carbon storage. The paper also outlines expected climate hazards for the agriculture issue area, as well as current and example adaptation actions. Feedback provided by the Committee on the attached draft discussion paper will be incorporated into the final version.

Agriculture Engagement Activities

Metro Vancouver is planning activities to engage the public, stakeholders and governments, including First Nations, about the agriculture issue area, including the following:

- Offer online presentations to the regional and municipal Agricultural Advisory Committees;
- Correspondence and potential workshops with agriculture associations, when feasible;
- Present to MVRD Regional Planning Committee;
- Present to Regional Planning Advisory Committee and its sub-committees;
- Public and stakeholder online questionnaire; and
- Public and stakeholder webinar.

Additional engagement activities will be considered where possible as Metro Vancouver continues to adapt to the challenges associated with COVID-19. The impact of COVID-19 on air quality and climate change engagement activities is the subject of Report 5.1 in the Committee's May 2020 agenda.

Engagement is intended to provide sufficient opportunity to interested parties to learn about the *Clean Air Plan* and *Climate 2050 Roadmaps*, and to provide feedback. Details on engagement will be available on the *Clean Air Plan* and *Climate 2050* websites (References 1 and 2, respectively), including any new or updated events. Feedback from the Committee is sought on the engagement activities presented.

Additional Discussion Papers to Support *Clean Air Plan* and *Climate 2050* Development
The draft nature and ecosystems discussion paper is the subject of Report 5.5 in the May 2020 Climate Action Committee agenda package. Discussion papers for the remaining two issue areas that will support the integrated engagement process (waste; and measurement, monitoring and regulation) are under development and will be provided to the Committee for information later in 2020. Additional issue area discussion papers may be written to support the development of the other *Climate 2050 Roadmaps* that are not within the scope of the *Clean Air Plan*; these would be presented as part of a separate process.

The discussion papers will also inform the development of *Metro 2050*, the comprehensive update to *Metro Vancouver 2040: Shaping our Future,* the regional growth strategy.

ALTERNATIVES
This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS
The overall resources required to develop and engage on the *Clean Air Plan* and *Climate 2050 Roadmaps* have been approved in program budgets for 2020, including consulting amounts of $219,000 and staff time, to support the engagement process and evaluation of the air quality and climate impacts of actions. Integration of engagement activities and deliverables for the *Clean Air Plan* with the development of the *Climate 2050 Roadmaps* is intended to make the best use of resources available, as well as minimize time commitments for interested parties providing feedback.

CONCLUSION
Metro Vancouver is developing the *Clean Air Plan* to identify actions to reduce emissions of air contaminants, including greenhouse gases, in our region over the next 10 years. Metro Vancouver is also implementing *Climate 2050*, a long-term strategy to achieve a carbon neutral and resilient region over the next 30 years. A series of issue area discussion papers are being developed to support an integrated engagement process for the *Clean Air Plan* and *Climate 2050*.

The draft discussion paper presented here on the agriculture issue area has been prepared and identifies goals and example actions for this source of air contaminants and greenhouse gases in our region, as well as hazards, metrics and example actions for climate adaptation.

Feedback from the public, stakeholders and other governments will support the development of the *Clean Air Plan* and the *Climate 2050 Roadmaps*.

Attachment
1. Agriculture Discussion Paper, draft dated April 2020 *(37512731)*

References
1. www.metrovancouver.org/services/air-quality/projects-initiatives/clean-air-plan/
2. www.metrovancouver.org/climate2050

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Agriculture

Discussion Paper to support *Climate 2050* and the *Clean Air Plan*

Reducing emissions, storing carbon and increasing climate resilience for agriculture in the Metro Vancouver region over the next 10 to 30 years

Draft May 2020

SERVICES AND SOLUTIONS FOR A LIVABLE REGION

Your feedback is valued:

This paper was drafted in Spring 2020, and introduced for public and stakeholder comment during the COVID-19 pandemic response. Metro Vancouver assesses work plans on a case by case basis to determine if the COVID-19 pandemic response requires an adjustment to any work plans, including engagement components. For air quality and climate change programs and initiatives, this means continuing with work plans that protect human health and the environment, but adjusting how we approach engagement.

Goals and targets in Metro Vancouver's climate-related plans are science-based and remain a priority. The interim targets of a 45% reduction in greenhouse gas emissions below 2010 levels by 2030 has a time horizon of less than ten years. Pursuing a carbon-neutral region by 2050 requires taking bold action now.

Across the globe, the pandemic response has had an unexpected benefit of significant environmental improvements. This provides a glimpse of what is possible and what we can achieve with coordinated efforts and common goals.

Public feedback is valued and project teams continue to seek input, create online feedback opportunities, and ensure feedback is reflected as policy development moves forward. Documents, feedback forms, direct email links to the project team are all posted to the Metro Vancouver website, metrovancouver.org, search 'Clean Air Plan' or 'Climate 2050'.

OVERVIEW

Agriculture can help shape our low-carbon future by using clean and renewable energy and using regenerative farming practices. We all need to protect agricultural land for future food production and carbon storage.

Agriculture contributes to the regional economy and provides fresh, healthy food for local use and exports. Protecting agricultural land enables food security and provides other benefits, called ecosystem services like helping to manage floods, capture carbon, and provide habitat for wildlife.

Agricultural activity is vulnerable to the impacts of climate change. Farmers are dealing with changes in temperature and rainfall, and extreme weather events, all of which affect local food production. To increase our resilience, we need to support farming practices that improve soil health, strengthen agricultural viability and sustain local food production for future generations.

We're creating a road map to help us reach a low-carbon, resilient future while also improving air quality. By 2050, we can make agriculture carbon neutral and power it with clean, renewable energy. Farmers can use regenerative farm practices to capture carbon and build the soil for long-term productivity. And we can protect and invest in agricultural land to enable food production and provide secure tenure to farmers and sustain the agricultural industry over the long term.

Please provide us with your feedback on these ideas by July 31, 2020.

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Introduction

Underlined words are key concepts and are defined in the Glossary on page 24.

Key questions for feedback are shown in boxes marked ?

Planning for the Future

Climate 2050 and the *Clean Air Plan* will be the key climate change and air quality planning documents for Metro Vancouver to support a transition to a carbon neutral and resilient region, while continuing to improve air quality to protect public health and the environment.

Climate 2050 is an overarching long-term strategy that will guide our region's policies and collective actions to transition to a carbon neutral and resilient region over the next 30 years. Metro Vancouver is implementing *Climate 2050* through 10 issue area *Roadmaps* (see Figure 1), which will describe how the region can reduce greenhouse gas emissions and adapt to climate change impacts. Implementation of the *Roadmaps* will be driven by Metro Vancouver's management plans and other policies, including the *Clean Air Plan*.

The *Clean Air Plan* is the near-term action plan that will set Metro Vancouver's direction for air quality and greenhouse gas management for the next 10 years. The Plan will outline actions to reduce emissions of air contaminants, including greenhouse gases, from all regional sources. The *Clean Air Plan* will primarily be organized around six issue areas (see Figure 1).

This discussion paper is about the **agriculture** sector, and is intended to promote discussion and enable feedback that will be used in the *Clean Air Plan* and the *Climate 2050 Agriculture Roadmap*. The feedback will also inform other planning documents such as the update of the regional growth strategy, *Metro Vancouver 2040: Shaping our Future* and Metro Vancouver's corporate operations. More information on the relationship between the *Clean Air Plan*, *Climate 2050* and the associated discussion papers is available in the Clean Air Plan Backgrounder.

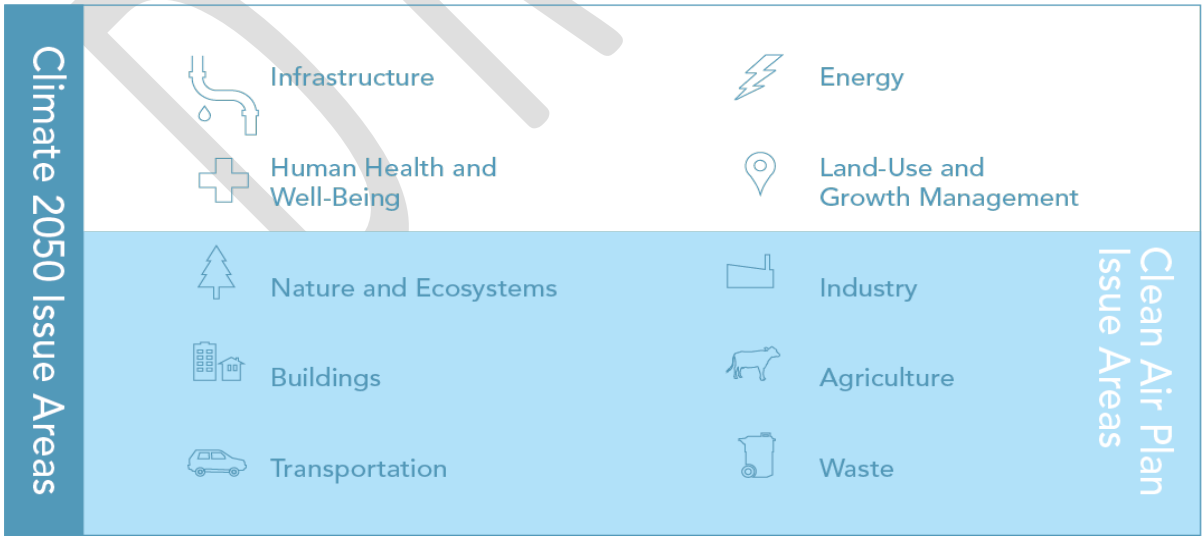

Figure 1: Issue areas for *Climate 2050* and *Clean Air Plan*; overlapping issue areas are highlighted in blue.

Meeting Long-term Targets for the Region

Metro Vancouver, together with its member jurisdictions, has been taking action on air quality and greenhouse gases for decades. But actions must be accelerated to reduce our impacts on global climate change, and to protect public health and the environment. The region also needs to adapt to the anticipated impacts from a changing climate.

There is significant overlap between the sources of greenhouse gases and common air contaminants, so actions that address emissions reductions to protect public health can often (but not always) reduce greenhouse gases, and vice versa. Metro Vancouver aims to maximize co-benefits by focusing on policies and programs that reduce both greenhouse gases and common air contaminants.

Climate Change Targets

Climate change is directly associated with greenhouse gases, primarily carbon dioxide. While emissions are global, we all have a shared responsibility to take local action. The major sources of greenhouse gases in this region are transportation, buildings and industry, with smaller contributions from waste and agriculture. Climate change projections for this region by the year 2050 include longer, hotter and drier summers, warmer and wetter fall and winter seasons with decreased snowpack, and more extreme weather.[1]

Metro Vancouver has adopted the following regional climate change targets:

1. reduce regional greenhouse gas emissions by 45% from 2010 levels by 2030;

2. become a carbon neutral region by 2050; and

3. ensure our infrastructure, ecosystems, and communities are resilient to the impacts of climate change.

Although the region has made progress over the past 15 to 20 years, we need to accelerate our climate actions to meet these targets and avoid dangerous impacts of climate change. More information on climate change in our region is available on the *Climate 2050* website.

We need to accelerate our climate actions to meet these targets and avoid dangerous impacts of climate change.

Air Quality Targets

Health researchers have found that there are no known safe levels for some common air contaminants, including fine particulate matter, ground-level ozone and nitrogen dioxide. Health Canada estimates that

[1] Metro Vancouver, 2016. Climate Projections for Metro Vancouver. www.metrovancouver.org/services/air-quality/AirQualityPublications/ClimateProjectionsForMetroVancouver.pdf

at least 1,600 British Columbians die prematurely every year due to common air contaminants and many more live with the associated health effects.[2]

As part of the *Clean Air Plan*, Metro Vancouver has proposed two new regional air quality targets for 2030:

1. ambient air quality in the region meets or is better than ambient air quality objectives and standards set by Metro Vancouver, the BC Government and the Government of Canada; and

2. increase the amount of time that visual air quality is classified as excellent.

Please consider if these are the right air quality targets for the region.

Residents in the region generally experience good air quality, but additional emission reduction actions are needed to continue protecting human health and the environment.

More information on the health and environmental impacts of air contaminants is listed in the *Glossary* on page 24 and on the Metro Vancouver website.

We Need Your Feedback

The purpose of this agriculture discussion paper is to solicit feedback on the key air quality and climate change issues facing agriculture in the region and the ways we can reduce emissions and adapt this region's agriculture sector to a changing climate. This discussion paper is intended for the public, agricultural producers, other stakeholders and other governments, including First Nations.

The goals, metrics, targets and actions identified herein are considered potential opportunities for the region's agriculture sector. We must take action to reduce agriculture emissions and ensure people and the agricultural industry are resilient to a changing climate. Local governments need to hear from agricultural producers and others to figure out the best way forward.

Climate change and degraded air quality impact some neighbourhoods, households and individuals more than others. Also, some households are better able to prepare for and protect themselves from climate change and air quality impacts. A priority of both the *Clean Air Plan* and *Climate 2050* is to incorporate the voices and needs of a full range of communities into program and policy design to ensure that fairness and equity are reflected in the actions that Metro Vancouver implements or advocates for. Policies and programs that reduce emissions should support an equitable distribution of benefits and costs, such as increased economic opportunities in a low emission and carbon neutral economy, affordable housing and access to healthy food. Issues of intergenerational equity will also be considered.

Specific opportunities to provide feedback are described under *Feedback and Engagement Process*, on page 22.

[2] Health Canada, 2019. Health Impacts of Air Pollution in Canada. http://publications.gc.ca/site/eng/9.874080/publication.html

Linkages to Other Issue Areas

There are several linkages between agriculture and other issue areas. Metro Vancouver is exploring which linkages must be considered when developing policies and actions. This discussion paper primarily addresses agriculture within our region, and impacts and actions related to climate change or air contaminants. The broader food system is out of scope, but is discussed in other regional documents. Some of the related issue areas for agriculture include:

- **Land-use and growth management** – Containing urban growth protects agricultural land for farming. Agriculture is vulnerable to impacts from adjacent land uses and new housing developments and transportation infrastructure.
- **Nature and Ecosystems** – Protecting and connecting natural areas, and enhancing ecosystem services on agricultural land support a climate resilient agriculture sector.
- **Human health and well-being** – Fresh local and imported food, especially fruits and vegetables, support healthy communities; food choices affect health as well as emissions and agriculture viability.
- **Transportation** – Transporting imported and exported foods, and food distribution within the region are sources of emissions.
- **Waste** – Food loss and food waste increase air contaminant emissions, including greenhouse gases.

As these discussion papers are developed, they will be made available on the Metro Vancouver website.

Regional Agriculture Emissions and Air Quality

Agriculture in the Metro Vancouver region contributes to the regional economy and provides fresh, healthy food for residents, visitors, businesses, and export markets. In addition, agricultural land provides an aesthetic landscape, habitat, and other public benefits called ecosystem services, such as wildlife habitat, carbon sequestration, water infiltration and flood management. At the same time, agricultural activities cause greenhouse gas and common air contaminant emissions. These come from livestock production, diesel farm equipment, excess fertilizer applications, burning of organic residues, and the heating of greenhouses with natural gas and other fuels.

Greenhouse Gas Emissions from Agriculture

Metro Vancouver's 2015 regional emissions inventory estimates that agricultural activities generate 3% of total greenhouse gas emissions in the region (Figure 2). The major sources of agriculture-related greenhouse gas emissions in this region are carbon dioxide from fuel combustion in greenhouses and farm equipment, methane from livestock and manure storage, and nitrous oxide from fertilized and manured soils. Carbon sequestration estimates from agricultural (or other) land are not included in the emissions inventory.

The Canadian total of greenhouse gas emissions from agriculture is 10% and there are similar estimates for agriculture globally.[3] These do not include upstream emissions from fertilizer and farm equipment manufacturing, and the downstream emissions from food transportation, refrigeration, processing and food waste disposal.[4]

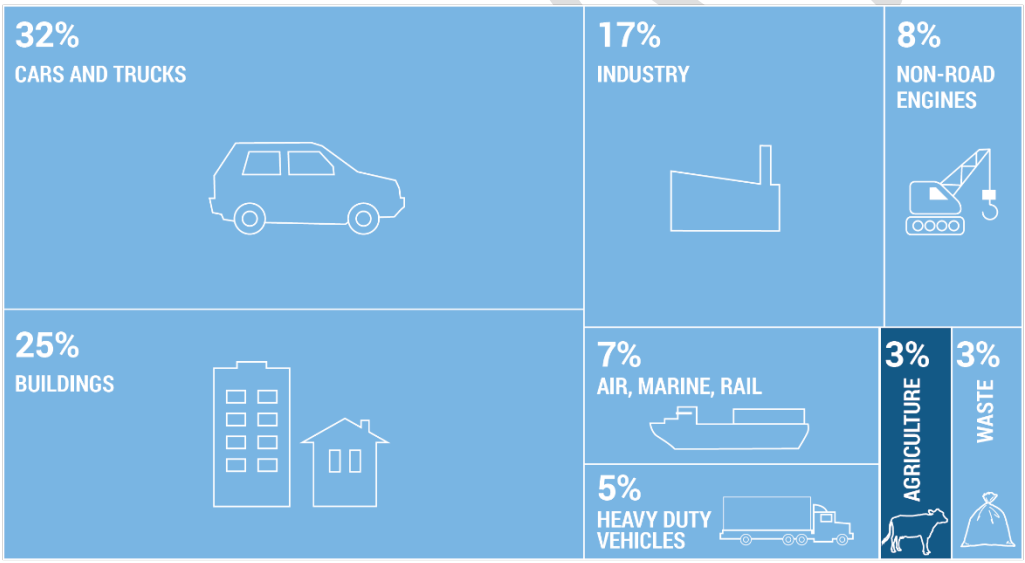

Figure 2: Contribution of different emission sources to total regional greenhouse gas emissions. The contribution from agriculture is highlighted in blue.

[3] The International Panel on Climate Change (IPCC) estimated that agricultural activities account for 12% of total global anthropogenic greenhouse gas emissions including: methane emissions from ruminant livestock and rice cultivation; nitrous oxide from fertilized soil and manure storage; and carbon dioxide from fossil fuels, biomass burning, cultivation of peat soils and other sources.

[4] Farm Folk City Folk, 2019. Climate Change Mitigation Opportunities in Canadian Agriculture and Food Systems. www.farmfolkcityfolk.ca/wp-content/uploads/2019/12/Climate-Mitigation-Opportunities.pdf

Opportunities to reduce greenhouse gas emissions from agriculture in Metro Vancouver include the use of cleaner, more renewable fuels, improving fertilizer and manure management, and altering livestock diets. Agriculture can also contribute to carbon sequestration by maintaining existing natural vegetation and woodlots, planting trees and hedgerows, and by using regenerative farm practices that add carbon to soil. Also, protecting agricultural land for farming prevents land conversion and development that generally emit more greenhouse gases.

Air Quality and Agriculture

Air contaminants emitted from agriculture that can impact public health and the environment include ammonia, fine particulate matter, volatile organic compounds and odorous air contaminants. Air contaminant emissions can also impact visual air quality.

Agricultural operations are the largest source of ammonia emissions in this region, contributing 38% of the total. The main sources from agriculture are poultry and cattle manure, and ammonia fertilizers. While there are no provincial, federal or Metro Vancouver ambient air quality objectives for ammonia, it remains an air contaminant of concern because it can react in the atmosphere to form fine particulate matter, which can have impacts on public health.

The major sources of fine particulate matter emissions in the region are residential wood burning, non-road equipment, light and heavy-duty vehicles, and industry. The main sources from agriculture are fuel use by greenhouses, erosion and fugitive dust. Open-air burning of agricultural debris is estimated to be a relatively small source of fine particulate matter emissions within the region. Diesel particulate matter is also emitted from tractors and other farm equipment powered by diesel.

Odour can come from normal farm practices, such as manure spreading or fertilizer application. Some agricultural practices can also generate odorous air contaminants, which may be more challenging to manage than nuisance odours.

Ground-level ozone is formed when nitrogen oxides and volatile organic compounds react in the air during hot and sunny days. Metro Vancouver assesses existing and emerging issues of concern as well as potential future sources of volatile organic compound emissions in the region to help reduce concentrations of ground-level ozone. In the 2015 inventory, volatile organic compound emissions from agricultural activities accounted for less than 1% of the regional total. Since that time, studies have indicated that regional volatile organic compound emissions could increase due to the development of cannabis production facilities, some of which are located on agricultural land.

Opportunities to reduce air contaminants include the adoption of cleaner fuels and engines, better vegetation burning practices, improved fertilizer management, and the adoption of emission control technologies.

Current Actions to Reduce Agriculture Emissions

All government agencies including Metro Vancouver and other organizations, are taking action to reduce emissions from agriculture. Some significant actions underway to support agricultural emission reductions in our region are outlined below.

(Additional information on the actions is listed in the web links shown.)

1. **Agriculture Greenhouse Gas Program** is leading research and helping farmers transition to farm practices that reduce greenhouse gas emissions (Government of Canada).
2. **Agricultural Ammonia indicator** estimates the ammonia emissions associated with Canadian agricultural activities from 1981 to 2011 (Government of Canada).
3. **Engine emission standards for non-road equipment**, including agricultural equipment, limits air contaminants from new non-road engines (Government of Canada).
4. **Environmental Farm Plan Program** provides guidance on manure handling and storage as well as energy use that helps farmers identify best management practices to reduce emissions (BC Agriculture Council).
5. **Anaerobic digestion** of manure and organic waste combined with a biogas upgrading process produces biomethane, a renewable natural gas (Seabreeze Dairy Farm).
6. **Investigating Greenhouse Gas Emissions from BC Farms** measures nitrous oxide, methane and carbon dioxide from agricultural crops year-round (University of British Columbia).
7. **Greenhouse Gas Mitigation in Organic Blueberries** is exploring how to improve the efficiency of nutrient use in organic blueberries and compare different mulch and organic fertilizer management strategies for their impact on blueberry yields, greenhouse gas emissions and soil carbon sequestration (University of British Columbia).
8. **Boilers and Process Heaters Emission Regulation Bylaw** sets emission limits and other requirements for agricultural boilers (Metro Vancouver).
9. **Code of Practice for Agricultural Environmental Management** prevents air contaminants from crossing property boundaries, ensures nitrogen application rates meet crop needs and requires record keeping (BC Government).
10. **New technologies in precision agriculture** supports efficient use of fertilizer and related farm inputs, which reduce air contaminant emissions, including greenhouse gases (BC Ministry of Agriculture).
11. Exploring options to manage **volatile organic compound emissions from cannabis production and processing operations** (Metro Vancouver).
12. **Authorization of emissions from open-air burning of agricultural debris** through approvals manages the impacts from smoke (Metro Vancouver).
13. Exploring options to reduce smoke emissions from **open-air burning of agricultural debris** (Metro Vancouver).
14. **Regional Ground-Level Ozone Strategy** aims to minimize chronic exposure to ground-level ozone including the frequency and severity of acute exposure, including to minimize impact on ecosystems, plant life and agricultural crops (Metro Vancouver and partners).

Roles and Responsibilities in Agriculture Emission Reductions

Under authority delegated by the BC Government in the *Environmental Management Act*, Metro Vancouver is responsible for managing and regulating air quality and greenhouse gases in the region, including air contaminants from agricultural sources. Metro Vancouver is also responsible for developing, implementing and stewarding *Metro Vancouver 2040: Shaping our Future* (*Metro 2040*), the regional

growth strategy. *Metro 2040* contains Metro Vancouver's greenhouse gas reduction targets, and includes strategies to protect agricultural land and promote agricultural viability through policies such as the Urban Containment Boundary.

Air quality management and climate action require close coordination among all governments, as well as private businesses, utilities, institutions and residents. The government and other agency roles in reducing agricultural emissions are outlined below.

- **BC Ministry of Agriculture** supports the production, marketing, processing and merchandising of agricultural products, provides guidance for agricultural operations and directs the preservation of agricultural land through the mandate of the Agricultural Land Commission.

- **Agricultural Land Commission** preserves agricultural land, encourages farming in British Columbia and encourages other governments to support agriculture.

- **BC Ministry of Environment and Climate Change Strategy** is responsible for the protection, management and conservation of BC's water, land, air and living resources, and leads climate action through various policies, legislation, regulation and programs.

- **Farm Industry Review Board** is an independent administrative tribunal that is responsible for hearing complaints from persons aggrieved by odour, noise, dust or other disturbances arising from agriculture and may also study and report on farm practices.

- **Government of Canada** establishes standards for agricultural operations and agricultural equipment as well as supports agricultural research.

- **Member jurisdictions** have authority over local land use decisions and support agriculture through zoning, environmental policies and engaging with residents. Some member jurisdictions can manage agriculture within their jurisdictions through Farm Bylaws.

- **Energy utilities** (e.g., BC Hydro, FortisBC) provides rebates, infrastructure and energy for agricultural operations, as well as access to market for energy sources such as renewable natural gas.

- **Academic institutions, non-profits and other organizations** provide education and training as well as advocate and inform others about ways to transition to a low carbon future.

- **Industry associations** support agricultural producers with the latest information on technologies, policies and regulations.

- **Local residents** make food choices that can support agriculture by buying local food.

Our Emissions Reduction Opportunity

A reduction in greenhouse gas and air contaminant emissions from agricultural activities can be achieved by switching to clean, renewable energy sources, improving manure management and maintaining natural areas on agricultural land to help sequester carbon. Continued support for an economically viable agricultural sector is the best avenue to protect agricultural land and prevents conversion to land uses with higher greenhouse gas emissions.

Discussion:
Reducing Agriculture Emissions

The following sections outline proposed goals, example targets, example actions, and potential Big Ideas to reduce agriculture emissions.

Proposed Long-Term Goals for Agriculture Emission Reductions

Long-term goals describe a desired future state for low emission and carbon neutral agriculture, with expected achievement in 2050 and beyond. Long-term goals will help identify and prioritize new actions to achieve the deep emission reductions needed from the agricultural sector.

Please consider the following long-term goals proposed for agriculture in our region. Will these goals help us reach our desired future state?

1. The agricultural sector is carbon neutral and powered by clean, renewable energy.
2. The agricultural sector continues to employ best available management practices and technologies to minimize greenhouse gas and air contaminant emissions.

Example Agriculture Emission Reduction Metrics

Near-term targets are milestones to support achievement of the long-term goals and will be included in the *Climate 2050 Agriculture Roadmap* and the *Clean Air Plan*. Additional work is needed to establish specific targets for the agriculture sector to ensure that they are feasible for this region's agriculture. Initial discussions instead focus on metrics, to measure progress towards a low emissions agricultural sector.

Please consider the following ways that emissions are currently measured by government agencies. Could any of these help us measure progress toward reaching our long-term goals? What targets should be considered?

1. Methane emissions from dairy and livestock (California)
2. Greenhouse gas emissions from agriculture sector (Germany)
3. Ammonia emissions from agriculture sector (European Union)
4. Carbon storage on agricultural land (France)

Example Agriculture Emission Reduction Actions

Actions are the policies and programs, including regulations, incentives and educational outreach campaigns, which will lead to emission reductions. Actions will be included in the *Clean Air Plan* and the *Climate 2050 Agriculture Roadmap*. In addition to the list of current actions previously mentioned on page 6, we need new actions to address the many opportunities we have to further reduce emissions and meet our long-term goals.

Please consider the following actions from other leading jurisdictions, which show a range of actions that could be implemented to reduce emissions. Could any of these help us further reduce emissions to reach our goals? What should new, additional actions look like?

(Additional information on the actions is listed in the web links shown.)

1. **Funding Agricultural Replacement Measures for Emission Reductions** (FARMER) Program provides funding through local air districts for agricultural harvesting equipment, heavy duty trucks, agricultural pump engines, tractors, and other equipment used in agricultural operations (California).
2. **Dairy Digester Research & Development Program** provides financial assistance for the installation of dairy digesters, which reduce greenhouse gas emissions (California).
3. **Alternative Manure Management Program** helps farmers transition from wet manure handling that produces methane, to dry manure handling strategies like composting, solids separation, or keeping livestock on pastures where their manure can decompose naturally (California).
4. **Wood chipping incentive program** to reduce burning of agricultural waste (Regional District of Okanagan-Similkameen)
5. **Best management practices for silage management** to reduce ammonia and nitrous oxide emissions (San Joaquin Valley, California).
6. **Improved animal feed formulations** by altering livestock diets or adding compounds such as seaweed to reduce methane production (Whatcom County, Washington).
7. **Healthy Soils Program** (HSP) funds farm management practices that include but are not limited to: cover cropping, no-till, reduced-till, mulching, compost application and conservation plantings. The HSP Incentives Program provides financial assistance for implementation of conservation management that improves soil health, sequesters carbon and reduces greenhouse gas emissions. The HSP Demonstration Projects showcases farmers' and ranchers' implementation of HSP practices (California).
8. **Maryland Healthy Soils Act** promotes healthy soil practices while meeting important goals set by the state's Climate Change Commission (Maryland).
9. **4 per 1000 Initiative** proposes a global effort to add carbon to soils at an annual rate of four parts per thousand. If implemented globally, this rate of carbon sequestration could offset the increase in carbon dioxide in the atmosphere related to human activities (France).

10. **Carbon Farm Plans** increase the capacity of farms or ranches to capture carbon dioxide and to store it beneficially as soil organic matter and above ground in permanent vegetation (California).

Potential Big Ideas for Agriculture Emission Reductions

To achieve a cleaner, healthier, more equitable future, we need to think big and act quickly. Metro Vancouver has identified several **Big Ideas** to accelerate emission reductions. The Big Ideas were selected for different reasons, including potential for significant reductions (or removals) of air contaminant emissions (including greenhouse gases), ease of implementation or their foundational nature (i.e., they are needed to support other actions).

Please consider the following Big Ideas. Could any of these help us drive significant emission reductions to reach our goals? What other Big Ideas should Metro Vancouver consider?

***Big Idea 1**: Accelerate the adoption of clean, renewable energy sources in agriculture*

Carbon dioxide emissions in the region come mainly from the combustion of fossil fuels (gas, diesel and natural gas). There are several opportunities for agriculture to reduce carbon emissions from fossil fuel use. Clean, renewable energy sources are primarily electricity from renewable sources but could include renewable natural gas and biofuels.

Farms can generate electricity through solar photovoltaic panels that convert sunlight (solar radiation) into electricity using semiconductors. Replacing fossil-fueled engines, furnaces, water heaters and other farm equipment with electric alternatives is an option for some agricultural operations[5]. Small- and medium-sized tractors and light trucks are starting to be electrified, although the technology for electric tractors is still in its infancy.

Agriculture can produce renewable natural gas from organic waste and manures through anaerobic digestion, as has been demonstrated by Seabreeze Farms in Delta. While this is an expensive endeavor for most farms, the economic viability could be improved with government financial support and incorporating commercial food waste as a fuel source.

Biofuels can be used to replace diesel fuel in farm equipment. Biofuels are not carbon neutral because the feedstocks for biofuels (e.g., oilseed) utilize fertilizers and fuels, but biofuels generally have a lower carbon intensity than diesel refined from fossil fuels. Biofuels could be a short term solution until new technologies are available to replace diesel trucks and equipment. Renewable natural gas and biofuels still produce emissions of common air contaminants, which have negative impacts for public health and the environment.

Big Idea 2: *Protect agricultural land for food production, to contain urban growth and preserve areas for carbon sequestration*

Local agriculture provides multiple benefits to the region – fresh and healthy food, economic activity, community connections and ecosystem services, including carbon sequestration. The best way to protect agricultural land in the region is by ensuring agricultural businesses are profitable.

Sustaining the viability of agricultural businesses can be challenging amongst competing interests for land, increasing input costs, lack of labour availability and increasing public expectations that agriculture should minimize the impacts of their operations. Additional pressures from land use developments and transportation infrastructure within, and adjacent to, agricultural areas can also create problems for producers.

Agriculture in a growing metropolitan region is particularly vulnerable to external impacts from new land and transportation developments. Environmental impact assessments are conducted, but do not always

[5] The National Farmers Union, 2019. Tackling the Farm Crisis and the Climate Crisis: A Transformative Strategy for Canadian Farmers and Food Systems.

consider, mitigate or prevent impacts on agriculture such as storm water flooding, loss of road access, increased traffic, recreational conflicts or other activities that add stress and additional costs to struggling farm operations.

Agriculture impact assessments can increase awareness and information about how land use decisions can impact the viability of agriculture. A simple assessment can be done using a checklist of potential sources of conflict. A systematic approach to identifying potential impacts of new developments can help avoid or minimize unintended consequences to agriculture. Greenhouse gas and air contaminant emissions can be part of an assessment as well as the cumulative impacts of multiple development activities.

Failure to address development impacts on agriculture is a serious threat to protecting agricultural land and to the long term viability of agricultural production in the Metro Vancouver region. The incremental losses of agricultural land and increasing costs of production could lead to widespread abandonment of farming in the region. The loss of farms could also reduce the carbon storage capacity on agricultural land in the region. Equally concerning are the land uses that replace agriculture, such as housing developments, commercial buildings, industry or transportation infrastructure that have much higher greenhouse gas emissions than agriculture, without the benefit of ecosystem services such as carbon storage.

Big Idea 3: *Preserve and enhance avenues to increase carbon storage on agricultural land.*

The most practical and cost effective way to remove excess carbon dioxide from the atmosphere is through living plants and soil through a process called carbon sequestration. The easiest ways to sequester carbon are to protect existing carbon sinks such as wetlands, and woodlands, and to advance afforestation, reforestation, land restoration and carbon farming.

Enhancing carbon storage links strongly with the previous Big Idea on protecting agricultural land. Although the potential to sequester large amounts of carbon on agricultural land in Metro Vancouver is limited, there are multiple co-benefits for both agriculture and society when carbon is stored on farmland. The building and preservation of soil carbon is critical for soil health and sustaining agricultural productivity because it increases soil fertility, improves soil structure and makes the land more resilient to extreme weather events. Establishing natural assets along stream corridors and in woodlots also provides pollinator and wildlife habitat that can lead to increases in biodiversity.

Farmers can add carbon to soil by reducing tillage, planting legumes and/or grasses in crop rotations, converting marginal crop land to perennial grass or trees, rotational grazing and high-intensity/short duration grazing, planting trees and shrubs as hedgerows and shelterbelts, cover cropping in the winter producing non-crop fast growing plants, and restoring wetlands.

Currently the only avenue to secure carbon storage on agricultural land is by purchasing the land itself. There are few incentives locally for farmers to retain natural areas or sequester carbon. One approach could be conservation reserve programs, which pay farmers to remove marginal lands from agricultural production for a set number of years, to improve environmental health and soil quality. There are also initiatives that fund beneficial farm management practices. These programs are experiencing widespread participation from farmers in the United States.

Regional Agriculture Adaptation to Climate Change

Agriculture has always adapted to changing and challenging conditions that arise with variable weather, markets, input prices and regulations. The ability of agricultural producers to cope and adjust to uncertainty is influenced by their adaptive capacity, including the availability of financial resources.[6]

Food production is fundamentally reliant on stable weather patterns, water availability and soil quality, and therefore is vulnerable to changes in the environment. Knowledge sharing, public support and collaboration with a broad range of partners are essential to support agriculture's ability to adapt to climate change in a manner that maintains agriculture economic viability and food production in Metro Vancouver. Equally important is to protect the agricultural land base for future agricultural production as part of a strategy for climate change adaptation.

Expected Climate Risks, Hazards and Impacts

The agricultural sector is one of the most vulnerable sectors to the impacts of climate change. Farmers will have to deal with changes in temperature and rainfall, shifting pests and diseases, and extreme weather events that will affect local food production. These impacts are not unique to the region, and will also affect agricultural areas in other parts of the world that supply food to this region.

Agriculture's historical dependence on a stable climate can no longer be relied upon. Climate change will lead to a steady increase in temperature, which may benefit agriculture by extending the growing season and enabling a wider variety of crops to be produced locally. However, there is also uncertainty and significant climate risks to agriculture such as the increased frequency and severity of extreme weather events - droughts, heat waves, heavy rainfall and flooding. Extreme conditions will have immediate impacts on food production in this region as well as other parts of North America and internationally that supply food in Metro Vancouver.

Table 1 describes the range of climate risks and hazards and their potential impacts on agriculture. Adverse impacts on agricultural crops are expected from higher temperatures, increased frequency and/or severity of droughts and storms, severe precipitation events, and salinization of soil and groundwater due to sea-level rise. The potential impacts to agriculture will increase costs of crop and livestock production and reduce economic viability.

[6] Climate Action Initiative, 2012. BC Agriculture Climate Change Adaptation Risk + Opportunity Assessment.

*Table 1: Climatic Changes and Hazards and their Potential Impacts to Agriculture**

Changing Temperatures	**Potential Impacts to Agriculture**
Warmer temperatures - an increase in daytime high and nighttime low temperatures	• A longer growing season leads to earlier harvests and a greater range of crop suitability. • Decreases heating costs for greenhouses in cooler months. • Increases demand for irrigation in the growing season. • Exasperates pest and disease problems that are controlled by cool temperatures.
Variations in temperature	• Increased variability in growing conditions impacts crop quality, pollination and the life cycle of pests and disease. • Creates challenges in aligning production with processing schedules.
Hotter summers and heat waves	• Decreases productivity and crop quality and increases crop losses (many plants stop growing above 35 degrees Celsius). • Heat stress may require more heat-tolerant plants. • Leads to water stress and an increased demand for irrigation. • Increases energy use for cooling and ventilation costs for greenhouses, crop storage and livestock facilities.
Changing Precipitation	
Longer dry spells in the summer	• Increases the demand for supplementary irrigation that would put pressure on local water supply.
Seasonal variability in precipitation	• Unreliable rainfall during the growing season increases irrigation requirements that didn't exist in the past
Increased precipitation in winter, spring and fall	• Waterlogged soils lead to delayed plantings, soil compaction and leaching of nutrients. • Increases the necessity for drainage infrastructure.
More intense extreme rainfall events, including hail	• Crop damage or crop loss. • May require the relocation of livestock. • Erosion on bare soils • Delays in planting or harvesting crops.
Sea Level Rise	
Salination of Fraser River water	• Limits the water supply for agriculture during the late summer and fall, which may increases the demand for water from other sources.
Rising water table and soil salinity	• Decreases in crop productivity. • Increases the demand for supplementary irrigation that would put pressure on other sources of the water.
Sea level rise, storm surges and ocean flooding	• Increases requirement for dyke upgrades and coastal flood protection. • Increases potential for soil salinization and reduced crop yields.
Severe weather events	
Storms and high winds	• Impacts infrastructure that protects crops (greenhouses) and prevents flooding (dykes). • Interruptions to regional infrastructure and supply and delivery lines.
Bad weather and crop failures in other agricultural regions	• Increases the demand for food produced in Metro Vancouver. • May lead to food price increases and possibly a supply shortage of some agricultural products.

* Adapted from Climate Projections in Metro Vancouver (2016) and reports by the BC Agriculture & Food Climate Action Initiative, Fraser Valley & Metro Vancouver Snapshot Report (2012) and the Delta Regional Adaptation Strategy

Current Actions to Adapt Agriculture to Climate Change

Metro Vancouver, together with its member jurisdictions and other agencies, has been taking action to adapt to the expected impacts of climate hazards on agriculture. Some proposed, planned or current actions for agriculture in our region are outlined below.

(Additional information on the actions is listed in the web links shown.)

1. **BC Agriculture & Food Climate Action Initiative** (CAI) delivers agricultural projects related to climate change mitigation and adaptation. Since 2015, CAI has focused on climate change adaptation through the delivery of two programs to strengthen collaborative relationships and build networks while improving knowledge and informational resources for the agriculture sector. The CAI Regional Adaptation Program addresses broad regional level issues while the Farm Adaptation Innovator Program funds applied research projects at the farm level (BC Agriculture Council and BC Agricultural Research and Development Corporation).

2. **Delta Agricultural Adaptation Strategy**, developed with CAI, identifies four priority impact areas on agriculture. The municipality followed up on the results by studying the economic impacts of a storm surge flood event, developing on-farm emergency planning and a Delta Agriculture and Climate Change Communications Strategy to promote farming in Delta (City of Delta).

3. **Climate Adaptation Strategies** will help the communities better adapt to climate changes well into the future (Surrey, Township of Langley).

4. **Environmental Farm Plan Program** provides guidance on crop management, soil amendments and biodiversity that helps farmers identify best management practices to enhance the environment, as well as funding to increase agricultural sustainability through the Beneficial Management Practices Program (BC Agriculture Council)

5. **Garden City Lands** is a significant public open space located in the Agricultural Land Reserve that includes an urban farm, a bog conservation area and trails. The farm demonstrates regenerative farm practices and includes a storm water retention pond that serves as an irrigation source (Richmond and Kwantlen Polytechnic University).

6. **Farmland Advantage** works with farmers to enhance the ecosystem services on their land which are not traded in the marketplace but have great public value. The project helps farmers identify the ecosystem services that can be protected and enhanced, and develop plans to preserve them including actions such as water or stream setbacks, strategic fencing, reforestation, or rangeland enhancement.

7. **BC Agricultural Climate Adaptation Research Network** is a network of researchers, industry specialists, policy makers, students, and producers from across the province that fosters a collaborative approach for enhancing climate change adaptation research, education, and knowledge sharing. Improving the accessibility of research outcomes is a critical step for establishing more climate resilient agriculture systems in BC.

8. The **Canadian Agricultural Partnership** provides funding to CAI and the Environmental Farm Plan's Beneficial Management Practices Program (Government of Canada and BC Government).

9. **Centre for Sustainable Food Systems at UBC Farm** offers a wide array of learning opportunities on sustainable agriculture practices for climate adaptation. The UBC farm also hosts an innovative BC Food Web website that provides food system research results and resources to improve farming practices (University of British Columbia).

10. **Delta Farmland and Wildlife Trust** promotes the preservation of farmland and wildlife habitat on the lower Fraser River delta through co-operative land stewardship with local farmers. Their cost sharing stewardship programs integrate research, education, and financial incentives to promote the sustainable use of agricultural land.

11. **Climate Preparedness and Adaptation Strategy** currently under development will help reduce risks and find opportunities resulting from BC's changing climate (BC Ministry of Environment and Climate Change Strategy).

12. **Urban agriculture initiatives** such as bee keeping, community gardens, backyard chickens and rooftop gardens increase local food security (most municipalities in Metro Vancouver, including Burnaby, Surrey, and New Westminster).

Roles and Responsibilities in Agriculture Adaptation to Climate Change

Across the region, many different organizations are taking early action to understand and act upon different areas of climate vulnerability, but everyone has a role to play in preparing for a changing climate. Regional adaptation initiatives will require the cooperation and support of all governments, as well as agriculture producers, the BC Agriculture Council, non-profit organizations, academic institutions (primarily UBC, KPU and UFV) and residents.

Metro Vancouver implements the regional growth strategy, *Metro Vancouver 2040: Shaping our Futur*e, and works in collaboration with member jurisdictions to contain urban growth, protect the supply of agricultural land and promote agricultural viability. The regional role also includes acting as a regional forum in facilitating collaboration with local municipalities and other organizations to create efficiencies and improve alignment of adaptation strategies and actions.

Our Adaptation Opportunity

Adaptation actions can reduce vulnerabilities and exposure to climate related hazards, prevent future harm, or plan for consequences that are unavoidable such as extreme weather events and changing climate conditions. Building resilience to climate change requires a continuous and iterative process that incorporates emerging best practices supported by current climate science. By supporting actions to help the agricultural sector adapt to climate change, we can significantly reduce risks to farms and ensure food security for residents over the long-term.

The most important adaptation opportunities for agriculture are integrated solutions that provide co-benefits that mitigate climate change, maintain agricultural viability, enhance ecosystem services and increase local food production. The adaptation opportunity is to identify innovative strategies that can mobilize multi-disciplinary knowledge and resources to protect agricultural land for food production and encourage environmentally beneficial practices while ensuring the economic viability of farming businesses.

Some adaptation opportunities are already underway. The effects of heat waves and changes in precipitation are managed in some cases by adopting crop varieties that can better handle these stresses, or by building infrastructure to protect crops from climate-related drought, heavy precipitation and flooding. Some agricultural producers are forced to shift to alternative crops better suited to changing weather patterns or use greenhouses.

Discussion:
Agriculture Adaptation

The following sections outline proposed goals, example targets, example actions, and potential Big Ideas to adapt agriculture to climate change.

Proposed Long-Term Goal for Agriculture Adaptation

Long-term goals describe a desired future state for a climate resilient agricultural sector, with expected achievement in 2050 and beyond. Long-term goals will help identify and prioritize new actions to achieve the adaptations required from the agricultural sector.

Please consider the following long-term adaptation goal proposed for our region's agricultural sector. Will this goal help us ensure the region is resilient to climate change?

1. Widespread adoption of climate resilient and regenerative farm practices that improves soil health, strengthens agricultural viability and sustains local food production for future generations.

Example Agriculture Adaptation Metrics

To support achievement of the long-term adaptation goal, it is important to measure progress towards a climate resilient agricultural sector. How climate resiliency is measured is an emerging field of research and our region will be learning alongside other local jurisdictions. Adaptation metrics will be included in the *Climate 2050 Agriculture Roadmap*.

Please consider the following ways that adaptation is currently measured by government agencies. Could any of these help us measure progress toward reaching our long-term goal? What should adaptation metrics look like for our region?

There are currently two sources of information on agricultural land use practices that are updated every five years.

1. **Census of Agriculture** provides data on methods of irrigation, land management and water conservation practices such as rotational grazing, infield winter grazing, winter cover crops, plowing down green crops, buffer zones around water, crop rotations and nutrient management planning (Statistics Canada).

2. **Agricultural Land Use Inventories (ALUI)** collect consistent, credible, and comprehensive data about land use and land cover on agricultural land includes details on crop type, irrigation, livestock, and land use and non-farm uses in the Agricultural Land Reserve. The ALUI provides baseline information that can be used to track trends in agricultural land use and measure changes over time (BC Ministry of Agriculture).

Example Agriculture Adaptation Actions

Actions are the policies and programs, including requirements, incentives and educational outreach campaigns, which will lead to a more climate resilient agricultural sector. Actions will be included in the *Climate 2050 Agriculture Roadmap*. In addition to current actions, we need new actions to address the many opportunities we have to increase resilience and meet our long-term goals.

Please consider the following actions from other leading jurisdictions. Could any of these help us increase resilience to reach our goal? What should new, additional actions look like?

(Additional information on the actions is listed in the web links shown.)

1. **Sustainable Agricultural Lands Conservation** was the first organization in the United States to invest in the preservation of farmland as a climate strategy. The program utilizes funds from cap and trade programs to protect agricultural lands at risk of conversion to other uses. Agricultural land produces less greenhouse gas emissions than urbanized land, and protecting agricultural land helps sequester carbon in the land base. The program promotes growth within existing urban jurisdictions, ensure open space remains available and supports a healthy agricultural economy through planning grants and agricultural conservation easement grants (California).

2. **Technical Assistance Providers** help farmers adopt new practices and manage applications and implementation of government programs that support climate adaptation related to manure management practices, and water efficiency and enhancement programs (California).

3. The **Perennial Farming Initiative** fosters a renewable food system rooted in healthy soil. One of their main programs is Restore California, where participating restaurants add a voluntary 1% charge that goes into California's healthy soil carbon fund, and pays farmers $10/US ton of carbon dioxide removed from the atmosphere to help them transition to renewable farming practices (California).

4. **Kiss the Ground** creates societal awareness about the potential of soil through media and advocacy. The Kiss the Ground Farmland Program funds training and soil testing that supports farmers and ranchers in transitioning lands and adopting management practices that support regenerative agriculture (Los Angeles).

5. **Foodland Ontario** helps the public choose fresh food from close to home, all while supporting local farmers and businesses (Ontario).

6. **Friends of the Greenbelt Foundation** supports food, farming and building climate resilience through an array of activities such as: enabling a community of practice for environmental

stewardship and soil health in agriculture; supporting rural economic development; and restoring and enhancing natural systems to improve their ability to withstand and recover from severe weather events (Ontario).

Potential Big Ideas for Agriculture Adaptation

To respond to the accelerating impacts of climate change, we need to think big and act quickly. Metro Vancouver has identified two **Big Ideas** to improve regional resilience. The Big Ideas were selected for different reasons, including potential to significantly advance climate resilience of the agriculture sector, ease of implementation or their foundational nature (i.e., they are needed to support other actions).

Please consider the following Big Ideas. Could this help us to significantly advance climate resilience for the agricultural sector? What other Big Ideas should Metro Vancouver consider?

Big Idea 1*: Provide incentives to enhance ecosystems services from agricultural land*

Agricultural land provides ecosystem services, or the benefits people obtain from ecosystems, beyond food production, farm income and jobs. Nutrient and organic matter recycling, wildlife habitat, climate regulation, water infiltration and flood management are just a few. Carbon sequestration through living plants and soil is another example of an ecosystem service and is the most practical and cost effective way to remove excess carbon dioxide from the atmosphere. Agriculture can sequester carbon in soil and perennial biomass by planting trees, enhancing natural areas and by adopting certain farm practices such as crop rotations with deep rooted perennial plants or cover crops to enhance root biomass.

There is evidence that several farm practices can deliver multiple ecosystem services, while maintaining or even increasing production.[7] Many of the public benefits from ecosystem services are not considered in land use decisions because they are often provided for free and are not captured in the marketplace or accounting systems. Having no monetary value means these public benefits are also at risk to degradation or loss.

Protecting the capacity of agricultural land to perform ecosystem services that can moderate or reduce negative impacts of climate change, produce food and provide a wide array of public benefits requires funding and a commitment that is not susceptible to short term conditions. The Delta Farmland and Wildlife Trust, established in 1993, is one example of how society supports regenerative farming practices over the long-term. Funds from the Trust support local stewardship programs such as planting cover crops and grass fields. More and similar programs that pay for ecosystem services throughout the region can help sustain local food production and food security as the climate changes and puts the agricultural sector at risk.

[7] J. Hardelin and J. Lankoski, 2018. Land use and ecosystem services. OECD Food, Agriculture and Fisheries Papers, No. 114, OECD Publishing, Paris.

Big Idea 2: *Enable long-term investments in agriculture lands by providing secure tenure for farmers*

Farmers make investments in infrastructure and healthy soil when they are confident they will gain the benefits from those investments. For agricultural producers that don't own land, they need secure tenure and long term leases to justify making the financial commitments necessary for a viable business and to sustain food production on agricultural land into the future.

Leasing agricultural land is good way to expand local food production when the cost of farmland is prohibitive for most farmers. However, in most cases, only short-term leases (1-2 years) are available, and this situation does not encourage regenerative farm practices or investments in infrastructure that are necessary for maintaining agricultural viability or increasing local food production. The situation is worst for new farmers who have difficultly securing access to agricultural land to start their farming business.

Estimates suggest that about a third of the agricultural land under production in Metro Vancouver is leased to farmers (approximately 10,000 hectares). Landowners with no intention of farming purchase agricultural land for speculative purposes or for other reasons not related to farming. These landowners benefit from low taxes because they are located in the Agricultural Land Reserve. In addition, the current assessment system for farm classification in British Columbia enables low farm tax rates to landowners by simply arranging a one-year lease with a farmer who makes $2,500 of gross income on parcels greater than two acres. This policy is a disincentive for landowners to offer long term land tenure. It also prevents agricultural producers from investing in agricultural production systems that can take years to improve yields and profitability.

More options are needed to secure land tenure and long term leases for farmers. Agricultural producers need long-term, secure land tenure to protect their investments in farm practices that maintain soil health, and irrigation and drainage infrastructure that improves crop yields and resilience to climate change.

There are several ways to enable secure land tenure for farmers:

- Provide long-term leases on public land for farming. The public can benefit from the regenerative farm practices and ecosystem services generated by agricultural land management.
- A regional land trust that specifically buys agricultural land for new farmers and offers long-term leases for farms that enhance ecosystem services that provide societal benefits.
- Update the BC Assessment for Farm Classification regulatory requirement for leasing agricultural land to a minimum of five or ten years.

Feedback and Engagement Process

Metro Vancouver invites feedback from diverse viewpoints to help shape *Climate 2050* and the *Clean Air Plan* and will carefully consider all input. Feedback is welcome by email at CleanAirPlan@metrovancouver.org or Climate2050@metrovancouver.org, or by telephone at 604-432-6200.

To ensure your comments are considered please provide feedback by July 31, 2020.

Participation Opportunities

Metro Vancouver will provide a variety of engagement opportunities to hear input on this discussion paper. The public, stakeholders, and other levels of government can participate via the following:

- online public survey;
- open comments to a dedicated email account;
- public dialogue or forum;
- public webinars; and
- direct feedback to Metro Vancouver staff.

Details about events will be posted on the *Clean Air Plan* and *Climate 2050* websites (see blue box on this page).

Feedback on any part of this discussion paper is welcome at any time through the engagement period. Events will focus on proposed goals and example targets, initial identification of potential actions, and consideration of the potential emissions pathways need to reach our regional climate change and air quality targets.

To ensure your comments are considered please provide feedback by July 31, 2020.

How Feedback Will Be Used

With revisions, content from this discussion paper will form the basis of the agriculture section of the *Clean Air Plan* and the *Climate 2050 Agriculture Roadmap*, both of which will be available for comment and feedback before they are finalized. Note that actions identified in the final *Clean Air Plan* and any of the *Climate 2050 Roadmaps* that could result in significant changes to existing air emission regulations or new regulations may require an independent public engagement process before any regulations or amendments are adopted.

Metro Vancouver staff will treat personal information with confidentiality; please note that comments you submit may be provided to a third party if a freedom of information request is made under the

Freedom of Information and *Protection of Privacy Act*. If you have any questions or comments regarding the consultation process, please call 604-432-6200.

Thank you for taking the time to provide your valuable feedback.

For more information, visit www.metrovancouver.org and search "Clean Air Plan" or "Climate 2050", or call 604-432-6200.

Glossary

Adaptive capacity means the ability of ecosystems, economies, infrastructure and communities to adjust to climate change (including climate variability and extremes) by moderating potential damages, taking advantage of potential opportunities, or coping with consequences.

Air contaminants are any substances emitted into the air that do or could a) harm public health (including material physical discomfort) and property, b) damage the environment, including the climate, c) impede normal business operations, or d) impair visual air quality.

Ambient air quality objectives and standards are health-based targets which define the acceptable outdoor concentration of key air contaminants. Metro Vancouver and the federal and provincial governments adopt objectives and standards that become more stringent over time, to drive continuous improvement in air quality.

Ammonia (NH_3) can negatively impact public health and the environment. In the agricultural sector, it is released mainly through naturally occurring processes, such as the breakdown of excreted urea (cattle and pigs) or uric acid (poultry). Ammonia emissions also come from nitrogen fertilizers containing ammonium or urea.

Carbon dioxide (CO_2) is the primary driver of climate change, and is produced primarily by burning fossil fuels. In agriculture, carbon dioxide is primarily generated by fuel combustion by greenhouses and agricultural equipment. Carbon dioxide is also released from farm fields during soil cultivation as organic materials undergo biological decomposition. Plants, trees and soils can sequester carbon in stable organic matter.

Carbon neutral region is a region that has achieved the deepest greenhouse gas emissions reductions possible across all economic sectors, and removes or captures sufficient carbon dioxide to balance any remaining regional greenhouse gas emissions.

Carbon sequestration is the removal of carbon dioxide from the air and the long-term storage of carbon to mitigate climate change. Carbon enriched soils are healthier, have better resilience to extreme weather, better water permeability, microbial diversity, higher yields and reduced input requirements.

Carbon sinks are natural systems that absorb more carbon dioxide than they release. The main natural carbon sinks are plants, the ocean and soil.

Clean, renewable energy is low or zero emissions energy that is replenished over days or years. In Metro Vancouver, clean, renewable energy is primarily electricity from renewable sources such as hydro or solar.

Climate change adaptation means anticipating, planning for and responding to the adverse effects of climate change and taking appropriate action to prevent or minimize the damage it can cause, or taking advantage of opportunities that may arise. It has been shown that well planned, early adaptation action saves money and lives later.

Common air contaminants are air contaminants that can harm public health and reduce residents' quality of life and life expectancy by causing heart and lung diseases, cancer, asthma, and other impacts. Some air contaminants have odorous characteristics. Common air contaminants include fine and coarse particulate matter, diesel particulate matter, ground-level ozone, nitrogen dioxide, sulphur dioxide and volatile organic compounds.

Diesel particulate matter is a form of particulate matter from diesel engines that is classified as carcinogenic.

Ecosystem services are the benefits people obtain from ecosystems. Ecosystem services provided by farmland include nutrient and organic matter recycling (from food waste), wildlife habitat, carbon sequestration, climate regulation, water infiltration and flood management.

Fine particulate matter ($PM_{2.5}$) is made up of tiny solid or liquid particles that float in the air and can penetrate deep into the lungs and even into the bloodstream. Particulate matter can damage your health by aggravating existing lung and heart diseases, increasing the risk of cancer and reducing life expectancy.

Greenhouse gases are air contaminants that trap heat and are the cause of climate change. Greenhouse gases include carbon dioxide and nitrous oxide, as well as short-lived climate forcers such as methane, halocarbons, black carbon and ozone. Limiting or preventing greenhouse gas emissions and removing these gases from the atmosphere is critical to avoiding catastrophic climate change (generally referred to as climate change mitigation).

Ground-level ozone (O_3) can have harmful impacts on everyone, especially children, seniors, and people with lung and heart conditions. It is primarily formed when nitrogen oxides and volatile organic compounds react in the air on hot and sunny days.

Hazard refers to a dangerous phenomenon, substance, human activity, or condition. In this context, hazards are caused or made worse by climate change. Examples include rainstorms, extreme weather, wildfires, storm surges, and landslides.

Impacts refers to the consequences of realized risks on ecosystems, economies, infrastructure and communities. Impacts may be referred to as consequences or outcomes, and can be adverse or beneficial.

Methane (CH_4) is a short-lived greenhouse gas and is 25 times more effective than carbon dioxide at trapping heat in the atmosphere. Methane emissions from agriculture are produced by ruminant animals such as cattle and sheep through a bacterial process called enteric fermentation, as well as being released from manure storage sites, especially when wet because of the lack of oxygen during decay. Natural gas is mostly composed of methane.

Natural assets are the stock of natural resources and ecosystems (including geology, soil, air, water and all living things) that provide benefits to people. Examples include forests, wetlands, and streams. It is from these natural assets that humans derive a wide range of services, often called ecosystem services, which make human life possible.

Nitrogen dioxide (NO_2) can damage your health by aggravating existing lung diseases like asthma and bronchitis, and reducing immunity to lung infections. It is formed during high-temperature fuel combustion, and can contribute to the formation of ground-level ozone and fine particulate matter.

Nitrous oxide (N_2O) is a long-lived greenhouse gas, and is 298 times more effective than carbon dioxide at trapping heat in the atmosphere. Nitrous oxide emissions from agriculture is primarily produced by microbes as they process nitrogen in soils from fertilizers, manures and other inputs.

Regenerative farm practices can rebuild soil organic matter, restore degraded land and improve the water cycle by utilizing natural nutrient cycles, restoring soils, raising carbon levels, protecting water, and enhancing biodiversity and ecosystem services.

Visual air quality is how clear the air looks to the average observer. Metro Vancouver and its partners measure visual air quality on a scale from "very poor" to "excellent" at five sites in the Lower Fraser Valley.

Volatile organic compounds (VOC) are compounds that easily become vapours or gases; they are emitted during fuel combustion and from many consumer products. VOC react with nitrogen oxides in the atmosphere to form ground-level ozone, a key constituent of smog that has both direct and indirect impacts on human health.

Vulnerability is the degree to which ecosystems, economies, infrastructure and communities are susceptible to, or unable to cope with, the adverse effects of climate change. Vulnerability varies based on exposure, sensitivity and adaptive capacity. Geographic location, socio-economic conditions, and other factors can impact susceptibility to harm and adaptive capacity of agriculture to climate change.

Metro Vancouver is a federation of 21 municipalities, one Electoral Area and one Treaty First Nation that collaboratively plans for and delivers regional-scale services. Its core services are drinking water, wastewater treatment and solid waste management. Metro Vancouver also regulates air quality, plans for urban growth, manages a regional parks system and provides affordable housing. The regional district is governed by a Board of Directors of elected officials from each local authority.

Member jurisdictions of Metro Vancouver include:

- Village of Anmore
- Village of Belcarra
- Bowen Island Municipality
- City of Burnaby
- City of Coquitlam
- City of Delta
- Electoral Area A
- City of Langley
- Township of Langley
- Village of Lions Bay
- City of Maple Ridge
- City of New Westminster
- City of North Vancouver
- District of North Vancouver
- City of Pitt Meadows
- City of Port Coquitlam
- City of Port Moody
- City of Richmond
- City of Surrey
- Tsawwassen First Nation
- City of Vancouver
- District of West Vancouver
- City of White Rock

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Josephine Clark, Senior Park Planner, Parks and Environment Department
Edward Nichol, Senior Policy and Planning Analyst, Regional Planning and Housing Services Department
Jason Emmert, Senior Planner, Parks and Environment Department

Date: April 17, 2020 Meeting Date: May 15, 2020

Subject: ***Climate 2050* and *Clean Air Plan* Discussion Paper on Nature and Ecosystems**

RECOMMENDATION

That the Climate Action Committee receive for information the report dated April 17, 2020, titled "*Climate 2050* and *Clean Air Plan* Discussion Paper on Nature and Ecosystems".

EXECUTIVE SUMMARY

In October 2019, the MVRD Board directed staff to begin an integrated engagement process for *Climate 2050* and the *Clean Air Plan*, using a series of issue area discussion papers. The region has a rich and diverse natural environment that provides important ecosystem services including clean air and water, pollination, flood control, cooling of urban areas, and contributes to the regulation of the global climate by removing and storing carbon dioxide from the atmosphere. Staff have developed a draft discussion paper on nature and ecosystems, and linkages to climate change and air quality, including how the health of our region's ecosystems are vulnerable to further degradation, especially with a changing climate. The discussion paper will support public, stakeholder and government engagement for *Climate 2050, Metro 2050* and the *Clean Air Plan* in 2020. The draft nature and ecosystems discussion paper is being presented to the Climate Action Committee for information, and feedback provided will be incorporated into the final paper and associated engagement process.

PURPOSE

To provide the Climate Action Committee with information about the nature and ecosystems discussion paper to support development of the *Climate 2050 Roadmaps, Metro 2050* and the *Clean Air Plan*.

BACKGROUND

Climate 2050 is an overarching long-term strategy that will guide our region's policies and collective actions to transition to a carbon neutral and resilient region over the next 30 years. Metro Vancouver is implementing *Climate 2050* through ten issue area *Roadmaps*, which will describe long-term goals, targets, strategies and actions to reduce regional greenhouse gases and ensure that this region is resilient to climate change impacts. Implementation of the *Roadmaps* will be driven by Metro Vancouver's management plans and other policies, including *Metro 2050* and the *Clean Air Plan*.

Metro 2050 is the comprehensive update to *Metro Vancouver 2040: Shaping our Future* (*Metro 2040*), the regional growth strategy. *Metro 2040* is the region's collective vision for how growth will be managed to support the creation of complete, connected and resilient communities, protect

important lands and support the efficient provision of urban infrastructure like transit and utilities. Climate change considerations underpin many of *Metro 2040*'s key goal areas, including Goal 3: Protect the Environment and Respond to Climate Change Impacts.

The *Clean Air Plan* builds on the 2011 *Integrated Air Quality and Greenhouse Gas Management Plan*, and will identify opportunities for accelerated emissions reductions, including greenhouse gas emission reduction actions. These actions will help protect human health and the environment and avoid dangerous levels of climate change.

On October 4, 2019, the MVRD Board directed staff to begin an integrated engagement process for *Climate 2050* and the *Clean Air Plan*, using a series of issue area discussion papers. Discussion papers for buildings, industry and transportation were presented to the Climate Action Committee and MVRD Board in 2019. Also on October 4, 2019, the MVRD Board approved the engagement plan for *Metro 2050*.

This report presents a draft discussion paper on the nature and ecosystems issue area (Attachment 1), which will support engagement on greenhouse gas reductions, climate adaptation and air quality issues related to this issue area.

NATURE AND ECOSYSTEMS DISCUSSION PAPER

The nature and ecosystems discussion paper includes long-term goals (i.e., with expected achievement in 2050 and beyond) for climate change mitigation and adaptation, as shown below.

- Nature and ecosystems are resilient, protected, maintained, restored and connected, to maximize ecosystem services across the region.
- Nature-based solutions that support biodiversity are prioritized in the region's response to climate change.

The discussion paper reflects feedback provided by the Climate Action Committee at its meeting on June 14, 2019. It also reflects feedback from ongoing engagement on *Metro 2050*, which covered some of the topics in the nature and ecosystems discussion paper. The discussion paper includes example metrics, targets, actions and big ideas from other jurisdictions, to support discussions to identify targets and actions for this region, including around carbon storage. The paper also outlines expected climate hazards for nature and ecosystems. Feedback provided by the Committee on the attached draft discussion paper will be incorporated into the final version.

Nature and Ecosystem Engagement Activities

Metro Vancouver is planning activities to engage the public, stakeholders and governments, including First Nations, about the nature and ecosystems issue area, including the following:

- Present to MVRD Regional Planning Committee and MVRD Regional Parks Committee;
- Present to Regional Planning Advisory Committee and its sub-committees;
- Public and stakeholder questionnaire and webinar; and
- Feedback opportunities promoted on social media.

Additional engagement activities will be considered where possible as Metro Vancouver continues to adapt to the challenges associated with COVID-19. The impact of COVID-19 on all air quality and

climate change engagement activities is the subject of Report 5.1 in the May 2020 Climate Action Committee agenda package.

Engagement is intended to provide sufficient opportunity to interested parties to learn about *Climate 2050 Roadmaps*, *Metro 2050* and the *Clean Air Plan*, and to provide feedback. Details on engagement will be available on the *Climate 2050*, *Metro 2050* and *Clean Air Plan* websites (References 1, 2 and 3, respectively), including any new or updated activities. Feedback from the Committee is sought on the engagement activities presented.

Additional Discussion Papers to Support *Clean Air Plan* and *Climate 2050* Development
The draft agriculture discussion paper is the subject of Report 5.4 in the May 2020 Climate Action Committee agenda package. Discussion papers for the remaining two issue areas that will support the integrated engagement process (waste; and measurement, monitoring and regulation) are under development and will be provided to the Committee for information later in 2020. Additional issue area discussion papers may be written to support the development of the other *Climate 2050 Roadmaps* that are not within the scope of the *Clean Air Plan*; these would be presented as part of a separate process. These discussion papers will also inform the development of *Metro 2050*.

ALTERNATIVES
This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS
The overall resources required to develop and engage on *Climate 2050 Roadmaps* and the *Clean Air Plan* have been approved in program budgets for 2020, including consulting amounts of $219,000 and staff time, to support the engagement process and evaluation of the climate and air quality impacts of actions. Alignment of engagement activities and deliverables for the *Clean Air Plan* and *Metro 2050* with the development of the *Climate 2050 Roadmaps* is intended to make the best use of resources available, as well as minimize time commitments for interested parties providing feedback.

CONCLUSION
Metro Vancouver is implementing *Climate 2050*, a long-term strategy to achieve a carbon neutral and resilient region over the next 30 years. *Metro 2050* is being developed to set out the region's collective vision for how growth will be managed. Metro Vancouver is also developing the *Clean Air Plan* to identify actions to reduce emissions of air contaminants, including greenhouse gases, in our region over the next 10 years. A series of issue area discussion papers are being developed, to support the engagement processes for *Climate 2050, Metro 2050* and the *Clean Air Plan*.

The draft discussion paper presented here on the nature and ecosystems issue area identifies goals, hazards and example targets and actions for climate change mitigation and adaptation.

Feedback from the public, stakeholders and other governments will support the development of the *Climate 2050 Roadmaps*, *Metro 2050* and the *Clean Air Plan*.

Attachment

1. Nature and Ecosystems Discussion Paper, draft dated April 2020 *(37716437)*

References

1. www.metrovancouver.org/climate2050
2. www.metrovancouver.org/metro2050
3. www.metrovancouver.org/services/air-quality/projects-initiatives/clean-air-plan/

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ATTACHMENT

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Nature and Ecosystems

Discussion Paper to support *Climate 2050, Metro 2050* and *Clean Air Plan*

Storing carbon and increasing climate resilience through nature and ecosystems in the Metro Vancouver region over the next 10 to 30 years

Draft May 2020

SERVICES AND SOLUTIONS FOR A LIVABLE REGION

Climate Action Committee

Your feedback is valued:

This paper was drafted in Spring 2020, and introduced for public and stakeholder comment during the COVID-19 pandemic response. Metro Vancouver assesses work plans on a case by case basis to determine if the COVID-19 pandemic response requires an adjustment to any work plans, including engagement components. For air quality and climate change programs and initiatives, this means continuing with work plans that protect human health and the environment, but adjusting how we approach engagement.

Goals and targets in Metro Vancouver's climate-related plans are science-based and remain a priority. The interim targets of a 45% reduction in greenhouse gas emissions below 2010 levels by 2030 has a time horizon of less than ten years. Pursuing a carbon-neutral region by 2050 requires taking bold action now.

Across the globe, the pandemic response has had an unexpected benefit of significant environmental improvements. This provides a glimpse of what is possible and what we can achieve with coordinated efforts and common goals.

Public feedback is valued and project teams continue to seek input, create online feedback opportunities, and ensure feedback is reflected as policy development moves forward. Documents, feedback forms, direct email links to the project team are all posted to the Metro Vancouver website, metrovancouver.org, search 'Clean Air Plan' or 'Climate 2050'.

OVERVIEW

Natural spaces provide ecosystem services that help the region respond to a changing climate—by capturing carbon, storing and cleaning stormwater, cooling our city streets, and protecting coastal communities. They also have tremendous cultural and spiritual importance, provide us with a sense of place, and enhance livability.

The region's natural spaces and ecosystems are at risk. Human activities, including development and climate change impacts, result in ecosystem change and loss. This reduces the critical ecosystem services we can receive, now and in the future. To increase our resilience, we need to accelerate our climate actions to protect, restore, and connect ecosystems.

We're creating a road map to help us reach a low-carbon, resilient future. By 2050, we can expand the restoration and protection of natural areas and connect a regional green infrastructure network. We can also recognize—in all of our work—the value of natural assets as critical to human and ecosystem health.

Please provide us with your feedback on these ideas by July 31, 2020

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Introduction

Underlined words are key concepts and are defined in the Glossary on page 26.

Key questions for feedback are shown in boxes marked ?

Planning for the Future

Climate 2050, Metro 2050, and the *Clean Air Plan* will be the key climate change and air quality planning documents for Metro Vancouver to support a transition to a carbon neutral and resilient region, while continuing to improve air quality to protect public health and the environment.

Climate 2050 is an overarching long-term strategy that will guide our region's policies and collective actions to transition to a carbon neutral and resilient region over the next 30 years. Metro Vancouver is implementing *Climate 2050* through 10 issue area *Roadmaps* (see Figure 1), which will describe how the region can reduce greenhouse gas emissions and adapt to climate change impacts. Implementation of the *Roadmaps* will be driven by Metro Vancouver's management plans and other policies, including *Metro 2050* and the *Clean Air Plan*.

Metro 2050 is the comprehensive update to *Metro Vancouver 2040: Shaping our Future (Metro 2040),* the regional growth strategy, which is the region's collective vision for how growth will be managed to support the creation of complete, connected and resilient communities, protect important lands, and support the efficient provision of urban infrastructure like transit and utilities. Climate change considerations underpin many of the regional growth strategy's key goal areas, including *Goal 3: Protect the Environment and Respond to Climate Change Impacts*.

The *Clean Air Plan* is the near-term action plan that will set Metro Vancouver's direction for air quality and greenhouse gas management for the next 10 years. The Plan will outline actions to reduce emissions of air contaminants, including greenhouse gases, from all regional sources and is closely linked with several of the *Climate 2050* issue areas in Figure 1.

Figure 1: Issue areas for *Climate 2050*

This discussion paper is about the **nature and ecosystems** issue area, and is intended to promote dialogue and enable feedback that will be used in the *Climate 2050 Nature and Ecosystems Roadmap, Metro 2050*, and the *Clean Air Plan*. The feedback will also inform current and future directions for other planning documents such as the *Ecological Health Framework*, as well as Metro Vancouver's corporate operations.

Nature & Ecosystems in the Metro Vancouver Region

Ecosystems

Ecosystems are all the plants and animals that live in a particular area together with the relationships between them and their environment.

The Metro Vancouver region's rich and diverse natural environment (including forests, fields, coastal and intertidal areas, wetlands, and watercourses) is vital to the people and wildlife who live here. These areas have tremendous cultural and spiritual importance, contribute to the region's livability, and provide a sense of place. Nature and ecosystems also provide essential ecosystem services (see Figure 2), including storing carbon, which is part of Metro Vancouver's strategy to becoming a carbon neutral region by 2050. They provide additional ecosystem services that are key to helping the region adapt to a changing climate and improve our health and wellbeing (e.g. store and clean floodwater, cool our city streets, and protect coastal communities).

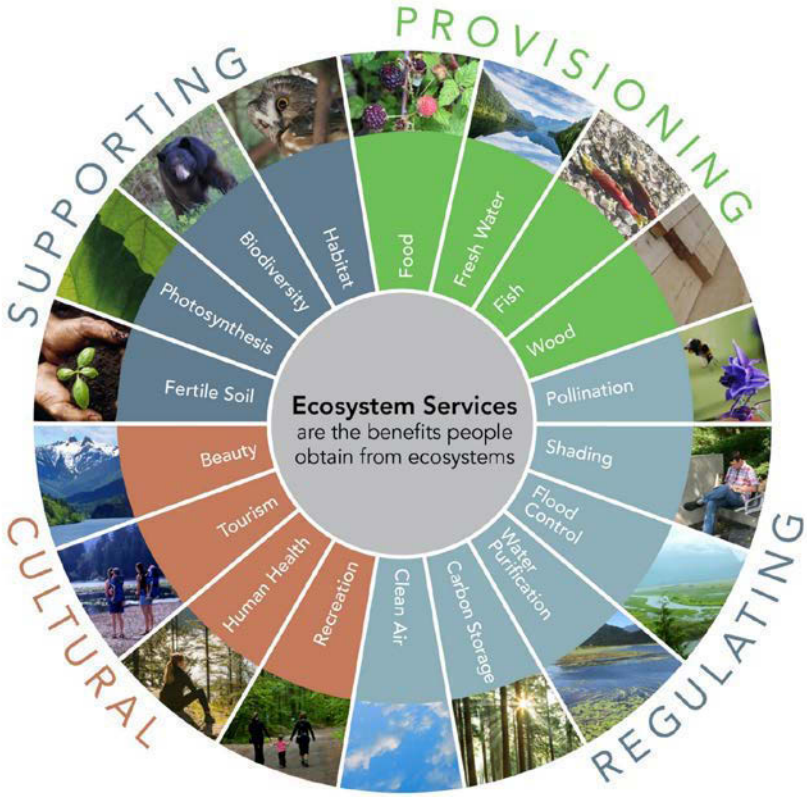

Figure 2: Ecosystem Services Wheel

The Nature and Ecosystems issue area is concerned with urban (e.g. street trees, backyards, green roofs) and natural (e.g. wetlands, forests, riparian) ecosystems. Collectively, these natural, enhanced and engineered systems – known as green infrastructure (see Figure 3) – store carbon, help us adapt to climate change, and provide society with a range of other ecosystem services.

Figure 3: Types of Green Infrastructure.

In order for nature and ecosystems to provide these ecosystem services, they must be resilient to the impacts of human activities, including climate change. Resilient ecosystems are those that are healthy and biodiverse – biodiversity is the variety of life. For example, a healthy forest that supports a wide variety of tree species, will recover faster from disturbances such as fire or pests, because not all species will be impacted to the same degree and some will be able to rebound more easily. Protecting and enhancing biodiversity in nature and ecosystems maximizes their ability to provide climate change benefits.

Nature-Based Solutions

Nature-based solutions are actions that protect, sustainably manage, and restore ecosystems but also address societal challenges such as climate change, thereby providing both human well-being and biodiversity benefits.

For example, seagrass meadows store carbon, reduce impacts of coastal storms on shorelines, and provide essential habitat for fish and other species. Protecting and restoring this ecosystem creates co-benefits for both humans and wildlife.

However, the region's ecosystems are at risk. Human activities including development and climate change, result in ecosystem change and loss which reduces the ability of nature and ecosystems to provide climate-related benefits, now and in the future.

Locally and internationally, there has been a growing understanding and recognition of the role ecosystems play as critical service-providing infrastructure, leading to the:

- emergence of nature-based solutions as a focus for climate action; and
- incorporation of ecosystem services into government decision-making to ensure our actions today do not compromise nature's ability to provide services for future generations.

These concepts are explored further in the Big Ideas section on page 2.

Ecosystem Loss in the Metro Vancouver Region

Metro Vancouver maintains an inventory of the region's most important ecological areas and monitors it for change. Between 2009 and 2014, 1,600 hectares of ecosystem loss was documented, including 1,000 hectares of forest, 120 hectares of wetland, and 100 hectares of riparian areas. Primary drivers of ecosystem loss were logging and urban development, occurring through land use plans and policies.

Tracking the tree canopy cover of urban forests by municipalities in the Metro Vancouver region has shown trees are being lost in urban areas. Currently, urban areas across the region have 32% tree canopy cover, and further declines are anticipated due to ongoing urban growth.

As we continue to lose these ecosystems, we lose the services they provide, including the ability to store carbon, and adapt to climate change.

Meeting Long-term Targets and Tracking Progress for the Region

Metro Vancouver, together with its member jurisdictions, has been taking action on greenhouse gases and air quality for decades. But actions must be accelerated to reduce our impacts on global climate change, and to protect human health and the environment we depend on. The region also needs to adapt to the anticipated impacts from a changing climate. Since ecosystems store carbon and help us adapt to climate change, tracking the health and extent of the region's urban and natural ecosystems helps us understand where we need to focus protection and restoration efforts.

Climate Change Targets

Climate change is directly associated with greenhouse gases, primarily carbon dioxide. While emissions are global, we all have a shared responsibility to take local action. The major sources of greenhouse gases in this region are transportation, buildings and industry, with smaller contributions from waste

and agriculture. Climate change projections for this region by the year 2050 include longer, hotter and drier summers, warmer and wetter fall and winter seasons with decreased snowpack, and more extreme weather.

Metro Vancouver has adopted the following regional climate change targets:

1. reduce regional greenhouse gas emissions by 45% from 2010 levels by 2030;
2. become a carbon neutral region by 2050; and
3. ensure our infrastructure, ecosystems, and communities are resilient to the impacts of climate change.

Although the region has made progress over the past 15 to 20 years, we need to significantly accelerate our climate actions to meet these targets and avoid dangerous impacts of climate change. Accelerated climate actions will also improve regional air quality, which protects public health and the environment. More information on climate change in our region is available on the *Climate 2050* website.

We need to accelerate our climate actions to meet these targets and avoid dangerous impacts of climate change.

Ecological Health Indicators

Metro Vancouver monitors and reports on the region's ecological health through a number of plans including the *Regional Growth Strategy (Metro 2040)*, the *Ecological Health Framework*, and Regional Parks' *Natural Resource Management Framework*. The ecological health indicators developed through these plans help us understand the health and resilience of the region's ecosystems – and their ability to support community resilience through the ecosystem services they provide. Metro Vancouver will continue to measure the following indicators at a range of scales, and use the information to inform climate action:

- Percent tree canopy cover;
- Percent impervious surfaces (e.g., paved roads, buildings);
- Hectares of Sensitive or Modified Ecosystems;
- Percent inventoried Sensitive and Modified Ecosystems rated high quality;
- Hectares of protected lands and waters;
- Hectares of ecological restoration areas in regional parks;
- Hectares of unprotected Sensitive or Modified Ecosystems;

- Green space connectivity index;
- Watershed and stream health index;
- Water quality index;
- Number of new invasive non-native species recorded and/or considered established; and
- Hectares of invasive non-native species treated, or kilograms or tonnes removed, from regional parks.

These indicators are not a complete picture of the region's ecological health. Metro Vancouver will continue to develop indicators as new information becomes available, and technological advances are made.

Action is needed to ensure our ecosystems, infrastructure, and communities are resilient to climate change.

We Need Your Feedback

The purpose of this discussion paper is to enable feedback on the key climate change and air quality issues facing nature and ecosystems in the region, and the ways in which we can store carbon, reduce emissions and adapt to climate change through nature-based approaches. This discussion paper is intended for the public, stakeholders and other governments, including First Nations.

The goals, metrics, targets and actions identified herein are considered potential opportunities for the region's natural environment. We must take action to store carbon, reduce emissions and ensure people and ecosystems are resilient to a changing climate, and we need your help to figure out the best way forward.

Climate change and degraded air quality impact some neighbourhoods, households and individuals more than others. Also, some households are better able to prepare for and protect themselves from climate change and air quality impacts. A priority of *Climate 2050, Metro 2050*, and the *Clean Air Plan* is to incorporate the voices and needs of a full range of communities into program and policy design to ensure that fairness and equity are reflected in the actions that Metro Vancouver implements or advocates for. Policies and programs that reduce emissions, promote carbon storage, and increase resilience should support an equitable distribution of benefits and costs, such as the distribution of heat-reducing green spaces, increased economic opportunities in a low emission and carbon neutral economy, as well as the provision of a range of affordable housing and diverse transportation options. Issues of intergenerational equity will also be considered.

Specific opportunities to provide feedback are described under *Feedback and Engagement Process*, on page 25.

Links to Other Issue Areas

There are many links between nature and ecosystems and other issue areas. Metro Vancouver is exploring which linkages must be considered when developing climate policies and actions.

- **Land-use and growth management** – policies that support more compact, complete communities, and protect ecologically important areas from development lead to increased resilience and carbon storage;
- **Infrastructure** – green infrastructure such as green roofs and rain gardens improve building energy efficiency, and absorb rainfall and stormwater, which reduces the strain on built infrastructure and restores urban biodiversity;
- **Energy** – nature and ecosystems cool urban areas, reducing the need for air conditioning and decreasing overall energy use;
- **Human health and well-being** – nature-based climate change solutions (such as planting trees in urban areas) improve mental and physical health;
- **Agriculture** – agricultural lands can be managed to protect natural areas, and enhance ecosystem services that build resilience to climate impacts and store carbon.

These issues will be explored in discussion papers of their own. As papers are developed, they will be made available on the Metro Vancouver website.

Nature and Ecosystems – Storing Carbon and Adapting to Climate Change

Carbon Storage and Sequestration

INSERT CARBON CYCLE DIAGRAM – Figure 4 will show nature-based solutions for storing carbon]

Carbon stored in nature and ecosystems, including forests, wetlands and intertidal areas, takes thousands of years to accumulate. A conservative estimate of the total carbon stored in the vegetation and soils of the region's nature and ecosystems is 65 million tonnes[1]. Every year, these areas sequester additional carbon, removing carbon dioxide from the atmosphere and storing it away. The ecosystems that Metro Vancouver protects in the watersheds that provide the region's drinking water, along with the regional parks system, store 22 million tonnes of carbon. Although carbon storage is not the primary

[1] Figures derived from Metro Vancouver's regional carbon storage dataset. The estimate provided applies to the full extents of the watersheds that supply the Metro Vancouver region's drinking water, along with estuarine and intertidal areas.

function of these areas, ongoing protection of these significant carbon stores is critical to climate action in the region.

To ensure the carbon stored into the region's ecosystems remains in place requires that ecosystems are healthy and relatively undisturbed. Carbon is released from ecosystems when we cut down trees, disturb soils, and alter water cycles (e.g. draining wetlands). Becoming a carbon neutral region by 2050 will require more than just emission reductions, it will require that we increase the carbon storage capacity of the region's ecosystems. This can be done by protecting functioning ecosystems, and restoring and enhancing the condition of others. When we lose ecosystems, we not only lose the carbon stored but also their ability to continue to remove carbon dioxide from the atmosphere, year after year.

Figure 5 explores key carbon stores in the region.

INFOGRAPHIC MAP (Figure 5) of the region conveying information about carbon storage and other services provided by nature and ecosystems in the Metro Vancouver region.

[to be developed]

Nature & Ecosystems, Wildfire and Air Quality Concerns

Residents in the region generally experience good air quality, but additional emission reduction actions are needed to continue protecting human health and the environment. Some air contaminants, such as ground-level ozone, can damage plants and reduce vegetation growth, adding to the stress on nature and ecosystems due to climate change.

As temperatures rise and droughts become more frequent, forests in the Pacific Northwest are at increased risk to wildfires. Wildfires create significant amounts of fine particulate matter, the air contaminant with the greatest health impact in our region. This topic area will be addressed in more detail in the *Human Health and Well-being Roadmap*.

Expected Climate Hazards and Impacts

While nature and ecosystems store carbon and help us adapt to climate change impacts, many natural areas are themselves at risk from a changing climate. Climate change impacts affect nature and ecosystems and the services that ecosystems provide. For example, trees reduce energy use and store carbon, cool our streets, and absorb floodwater. Trees are less able to provide these benefits if they are suffering from drought and extreme heat.

Many species and ecosystems in the region are at risk of being impacted or displaced entirely due to climate change because they cannot adapt fast enough – for instance, Pacific salmon will be affected by warming stream temperatures in the region (see the case study on page 15). Climate change adaptation must be considered when we manage urban and natural areas. This should include emerging best practices supported by current climate science.

We can contribute to the region's collective climate resilience by monitoring the extent and health of urban and natural ecosystems, providing space in our communities for nature to adapt and flourish, and considering the natural environment as a critical part of climate action.

The region's nature and ecosystems may be affected by climate hazards – these hazards could cause impacts in numerous ways. However, nature and ecosystems can also minimize the impacts of climate change. These relationships are outlined in Table 1 below.

***Table 1*: Climatic Changes and Hazards and their Potential Impacts to Nature and Ecosystems.**

Note: These climate hazards can cause cascading impacts – for example, flooding tends to be more severe following a wildfire, landslides tend to occur following heavy rainfall, and coastal storms may become more frequent and severe when combined with sea level rise. Non-climatic hazards can also exacerbate climatic ones; for instance, subsidence can increase overall sea level rise, and earthquakes can disrupt flood protection infrastructure. Climate change impacts will magnify existing stressors on ecosystems from other human activities. Our understanding of how ecosystems will be affected by cumulative impacts is incomplete, but we do know that large, healthy, connected, and biodiverse ecosystems are more resilient to climate change impacts.

Climatic Changes and Hazards	***Anticipated Impacts to Nature and Ecosystems***	***How Nature and Ecosystems Can Minimize Impacts***
Sea level rise and flooding (coastal and riverine)		
Rising water levels	• Shoreline ecosystems will be lost as they are caught between rising waters and hardened shoreline infrastructure (known as coastal squeeze). • Extreme flooding causes structural changes to rivers and shorelines, shifting ecosystems and impacting wildlife. • Flood waters deposit excess sediment over fish habitat, including spawning areas, impacting fish health. • During a flood, toxic substances from low-lying industrial areas, infrastructure or contaminated sites can be released, damaging ecosystems.	• Natural shorelines reduce the impacts of riverine and coastal flooding by absorbing water and wave energy. They also provide space for ecosystems to adapt and move as water levels rise.
Changing salinity	• Salt water will move further into rivers and coastal areas, which affects fish and ecosystems, and impacts drinking water and water supply for agricultural areas.	
Combined hazard of sea level rise, storm surge and coastal flooding	• The ecological impacts of coastal storms and flooding will be exacerbated by sea level rise.	• Coastal and intertidal ecosystems (such as mudflats and seagrass beds) protect at-risk communities by reducing the impacts of waves and extreme tides, absorbing excess water, and buffering the impacts of coastal storms.
Changing precipitation		
More extreme rainfall	• Increased pollutant run-off, turbidity, and erosion, leading to poor water quality and impacts to freshwater and marine ecosystems. • Increased risk of landslides, disrupting wildlife habitat and movement.	• Wetlands, riparian ecosystems and other vegetated areas reduce flooding, prevent erosion, and absorb and filter rainwater, reducing the strain on stormwater infrastructure.
Longer dry spells in the summer	• Drought reduce annual tree growth and increase mortality rates.	• Trees and other vegetation help to retain the little water

Climatic Changes and Hazards	*Anticipated Impacts to Nature and Ecosystems*	*How Nature and Ecosystems Can Minimize Impacts*
	• Warmer waters and less flow during the dry season, combined with an earlier freshet, will stress and limit migration of salmon and other aquatic species. • Stress to newly planted restoration areas, increased risk of fire and disease, and increased likelihood that trees are blown over during high winds. • Longer and more intense wildfire season, driven by both heat and drought, impacts ecosystems.	available during drought conditions by reducing the loss of water from the soil, which also cools the air. • Intact forests alongside streams and waterbodies provide shade, keeping waters cooler and reducing evaporation.
Increased precipitation in winter, spring and fall	• Soils and forests will be damaged by heavy rain storms, resulting in flooding, slope instability and tree failure.	• Healthy, intact forests are better able to stabilize slopes and resist change.
Changing temperatures		
Extreme heat	• Heat sensitive ecosystems (e.g. wetlands) and species (e.g. salmon, bats, western red cedar) will be stressed by increased temperatures and drought conditions. • Ecosystems and species are driven to move as conditions become less suitable; however, finding new locations that support their needs may not be possible. For example, cold climate, high-elevation ecosystems such as alpine tundra are restricted in their ability to move.	• Healthy trees and other vegetation help protect people from extreme heat, in part by reducing the urban heat island effect. When temperatures are cooler, there is less demand for air conditioning which reduces energy use and emissions. • Trees adjacent to riparian and wetland areas support fish and other wildlife by keeping water cool.
Warmer winters	• Increased spread of pathogens, pests and invasive species that were previously controlled by low winter temperatures.	• Healthy ecosystems are more resilient and better able to resist pathogens, pests and invasive species.
Seasonal shifts	• Shifts in seasonal temperatures (e.g. early spring/late fall) can cause disconnects between species and their habitats or food sources. For example, migratory pollinators may return to	• Resilient, large, and connected ecosystems across the landscape help native species adapt to changing conditions.

Climatic Changes and Hazards	*Anticipated Impacts to Nature and Ecosystems*	*How Nature and Ecosystems Can Minimize Impacts*
	their home habitat after flowers have already bloomed.	
Ocean warming and acidification	• Impacts to marine and intertidal ecosystems, stress on native species due to changing conditions, and new incidences of invasive aquatic species.	• By lessening human-caused stressors such as over-fishing and ocean pollution, marine and intertidal ecosystems are more resilient to the impacts of ocean warming and acidification
Wind storms		
High winds exacerbate other hazards	• Wind storms, in conjunction with sea level rise, lead to greater storm surge. • Trees blown down during wind storms increase the amount of fuel available during a wildfire and can accelerate the wildfire's spread. • Insect pest infestations are exacerbated by high winds.	• Natural breakwaters such as reefs can reduce wave action. • Contiguous forests are more resilient to wind damage. Buffer trees can also protect infrastructure and crops from wind.

Species Case Study: Pacific Salmon

In the Pacific Northwest, salmon are a keystone species, supporting people, ecosystems and wildlife. Salmon have cultural and spiritual and food source significance in our region, particularly to First Nation communities. The Fraser River, which weaves through the Metro Vancouver region, is one of the most important habitats for salmon in North America.

Eagles, bears, and orcas all rely on salmon as a food source. As migrating salmon return to rivers and are eaten by other species, essential nutrients from their carcasses are transferred to forests and other ecosystems.

Salmon, and the habitats they thrive in, are at risk from climate change impacts. In the Metro Vancouver region, we are projected to experience warmer and wetter winters, hotter and drier summers, reduced snowpack, and more precipitation falling as rain and less as snow. These impacts may decrease the amount of water available in streams during dry periods, raising stream temperatures. Salmon are sensitive to warming temperatures – they may not enter streams until the water has cooled to a specific temperature, and warmer temperatures can affect both survival and reproductive success. The Fraser River summer water temperature has warmed by, on average, 1.5°C since the 1950s, and this trend is projected to continue.

We can take action to help salmon adapt to climate change impacts. Restoring riparian corridors with native vegetation can cool stream temperatures. Considering fish passage in the design of flood control infrastructure will ensure salmon can continue to reach their spawning grounds. We can also identify and protect critical salmon spawning habitat – often this habitat provides other ecosystem services. For example, eelgrass serves as nursery habitat for salmon, but also reduces wave impacts from coastal storms, and stores carbon.

Current Actions to Store Carbon and Adapt to Climate Change

Metro Vancouver, together with its member jurisdictions and other agencies, has been taking action to reduce greenhouse gases and adapt to the expected impacts of climate change through nature and ecosystems. Some significant current actions in our region are outlined below. The list below is not an exhaustive list of actions occurring in the region; however, these examples have been chosen because they highlight the wide range of approaches currently being implemented related to nature and ecosystems.

(Additional information on the actions is listed in the web links shown.)

1. **Advance natural asset management** by inventorying natural assets, developing asset management strategies and plans, and incorporating the value of natural assets and the ecosystem services they provide into financial planning and reporting, asset management and capital budgeting processes. (West Vancouver, Metro Vancouver).

2. **Identify how current and future flood infrastructure may impact the natural environment** in the Lower Mainland region, which includes the Metro Vancouver region (Fraser Basin Council).

3. **Restore and enhance** natural shorelines and estuaries to buffer storm surge impacts, protect coastal infrastructure and minimize the habitat lost to coastal squeeze (Surrey/Delta, Stewardship Centre for British Columbia, UBC, BC Government, Metro Vancouver).

4. **Research the potential to store more carbon** in the forests, agricultural soils, and coastal areas of the Metro Vancouver region (West Coast Environmental Law/SFU, Parks Canada, Metro Vancouver).

5. **Commit to nature-based approaches** to support municipal climate change mitigation and adaptation goals (Vancouver, New Westminster, Surrey, District of North Vancouver).

6. **Incorporate ecosystem-based approaches** when developing or upgrading coastal infrastructure (Metro Vancouver, Surrey, West Vancouver).

7. **Ensure a healthy and climate resilient urban forest** to maximize climate adaptation benefits (Metro Vancouver, New Westminster, Vancouver, Surrey).

8. **Acquire and protect** significant areas of additional parkland (Metro Vancouver).

9. **Use green infrastructure** to support climate change mitigation and adaptation goals (SFU Adaptation to Climate Change Team, Vancouver, Surrey, SFU).

10. **Manage invasive species** by developing and implementing best practices for existing invasive species, and research those that may become more prevalent in the region under future climate conditions (Metro Vancouver, in collaboration with Invasive Species Council of Metro Vancouver and member jurisdictions).

11. **Reduce wildfire risk in managed natural areas** during periods of elevated fire danger and rapidly detect and suppress fires if they occur within the Metro Vancouver region (Metro Vancouver, provincial government and local authorities).

12. **Reduce methane emissions and improve carbon storage capacity** in bog ecosystems (Metro Vancouver with University of Victoria, Richmond).

13. **Implement new forest management practices** to adapt to climate change and enhance carbon storage (BC Government).

14. **Plant and restore seagrass in appropriate locations** to support biodiversity, protect shorelines, and store carbon (Port of Vancouver, Seagrass Conservation Working Group).

Roles and Responsibilities
relating to Storing Carbon and Adapting to Climate Change through Nature and Ecosystems

Metro Vancouver has a range of functions relating to nature and ecosystems and their role in storing carbon and adapting to climate change.

Metro Vancouver is responsible for developing, implementing and stewarding *Metro Vancouver 2040: Shaping our Future* (*Metro 2040*), the regional growth strategy. The strategy represents the regional federation's ongoing commitment to building a compact metropolitan region where approximately two-thirds of the land in the region are designated for agricultural, recreational, and conservation uses.

Metro Vancouver secures land for regional parks to protect the region's natural areas and to connect people with nature. Metro Vancouver is also responsible for developing long range plans for managing our region's drinking water sources, including 60,000 hectares of restricted access, protected water supply lands. These lands include the most intact old-growth forest ecosystems in south-western BC.

Under authority delegated by the BC Government in the *Environmental Management Act*, Metro Vancouver is also responsible for managing and regulating air quality and greenhouse gases in the region.

As the regional government, Metro Vancouver acts as a regional forum in facilitating collaboration with member jurisdictions and other organizations to create efficiencies and align climate change strategies and actions.

Nature and ecosystems do not adhere to administrative boundaries and their protection and management involves a wide range of groups including all governments, community groups, residents, and academic institutions. These roles are summarized below:

- **Government of Canada** is working with the provinces and territories to implement the Pan-Canadian Framework on Clean Growth and Climate Change which includes plans to build climate resilience, including investing in natural infrastructure. The Government of Canada is also responsible for protection and management of certain species and nationally significant wildlife areas. Responsibilities for environmental assessments are shared by the federal and provincial governments.

- **BC Government** manages forest and wildlife resources, as well as protected areas within the region. The province is developing a climate preparedness and adaptation strategy through its role in supporting residents and communities to adapt to climate change.

- **First Nations** operating under a Treaty or Land Code can set land use policies that may influence nature and ecosystems. First Nations play an integral role in caring for the natural environment. As

keepers of generational knowledge and stewards of nature, First Nations also have an intimate knowledge of how a changing climate has impacted local species and ecosystems.

- **Municipalities** have authority over local land use decisions, including those related to local parks and natural areas. Municipalities can protect ecosystems through various policy mechanisms, such as Official Community Plans, climate action strategies, biodiversity strategies, and urban forest management plans.
- **Environmental non-governmental organizations** map at-risk ecosystems, purchase land for conservation purposes, promote nature-based climate change solutions, monitor ecosystems through citizen science initiatives, restore and enhance ecosystem health, and lobby for more stringent ecosystem protection policies.
- **Health authorities** study the impacts of climate change on human health, and the role that green space can play in reducing these impacts and increasing resilience.
- **Academic institutions** in the region lead research on how ecosystems are both affected by, and a solution to, climate change.
- **Local businesses** develop and implement innovative solutions to environmental challenges, including green infrastructure in urban areas, certification programs (e.g. Salmon Safe), and other programs.
- **Local residents** can be environmental stewards – for example, a significant proportion of existing tree canopy and plantable areas for new trees in the region is on residential property, and the residents can also get involved in ecosystem restoration and environmental stewardship work through volunteer groups.

Discussion:

Storing Carbon and Adapting to Climate Change Through Nature and Ecosystems

The following sections outline proposed goals, example targets and metrics, example actions, and potential Big Ideas to store carbon and adapt to climate change through nature and ecosystems.

Proposed Long-Term Goals for Carbon Storage and Adaptation

Long-term goals describe a desired future state where the ability of nature and ecosystems to contribute to a carbon-neutral and resilient region has been maximized, by the year 2050 and beyond. Long-term goals will help identify and prioritize new actions to achieve increases in carbon storage and adaptation benefits from nature and ecosystems in the region.

Please consider the following long-term goals proposed for nature and ecosystems in our region. Will these goals help us reach our desired future state?

1. **Nature and ecosystems are resilient, protected, maintained, restored and connected, to maximize ecosystem services across the region.**

2. **Nature-based solutions that support biodiversity are prioritized in the region's response to climate change.**

Example Carbon Storage and Adaptation Targets and Metrics

Near-term targets are milestones to support achievement of the long-term goals and will be included in the *Climate 2050 Nature and Ecosystems Roadmap* and the *Clean Air Plan*. Measuring resilience is an emerging field of research and our region will be learning alongside other local jurisdictions. Adaptation metrics will be included in the *Climate 2050 Nature and Ecosystems Roadmap*. Many jurisdictions and agencies have established targets and metrics relating to nature and ecosystems, and the following list highlights a number of ambitious examples.

Please consider the following near-term targets and adaptation metrics. Are any of these the right milestones to help us reach our long-term goals? What should our near-term targets and adaptation metrics look like?

(Additional information on the targets is listed in the web links shown.)

1. The Nature Needs Half initiative aims to protect 50% of the planet by 2030 to address the dual challenge of climate change and biodiversity loss.

2. The Global Deal for Nature recognizes the role native ecosystems play in meeting our global greenhouse gas reduction targets. This science-driven plan calls for 30% of Earth to be formally protected and an additional 20% to be designated as climate stabilization areas, by 2030, to stay below 1.5°C of warming.

3. The United Nations announced a Decade of Ecosystem Restoration and has set a target to restore 350 million hectares (approximately the size of India) by 2030 to simultaneously address climate change and reduce biodiversity loss.

4. Melbourne's Urban Forest Strategy has a target to increase tree canopy cover from 22% to 40% on public lands by 2040, with the goal of cooling the city by 4°C.

5. The Capital Regional District aims to strategically acquire protected areas that contribute to climate change mitigation, and aims to acquire and connect 100% of a system of natural areas from Saanich Inlet to Juan de Fuca Strait.

6. Citing the co-benefits of vegetated roofs for climate change mitigation and adaptation – as well as human health and biodiversity – Portland has a recommended green roof target of 15% of total area for the city centre by 2035.

7. Singapore's City Biodiversity Index, used by 80 other cities across the world, contains an indicator for climate regulation. This indicator accounts for the carbon storage and cooling effect of vegetation.

8. Vancouver has adopted the target that by 2030, restoration work will be completed on enough forest and coastal ecosystems in Vancouver and the surrounding region to remove one million tonnes of carbon pollution annually by 2060.

9. Surrey's Climate Adaptation Strategy has proposed indicator measures for total area of protected riparian zones, as well as the proportion of the municipality's land base with vegetative coverage.

10. As part of a broader commitment to nature-based climate solutions, the Government of Canada has committed to plant two billion new trees over the next 10 years, and conserve 25% of Canada's land and 25% of Canada's oceans by 2025, working toward 30% of each by 2030.

11. To build resiliency to sea level rise, coastal storms, erosion, and flooding, California will work with partners to ensure an additional 10,000 acres (4,050 hectares) of coastal wetlands will be protected, restored or created by 2025, and increase the size of coastal wetlands in California by 20% by 2030 and 50% by 2040.

12. In order to protect biodiversity and bolster climate change resilience, California will work with partners to preserve the existing, known 15,000 acres (6,070 hectares) of seagrass beds and create an additional 1,000 acres (405 hectares) by 2025.

Example Carbon Storage and Adaptation Actions

Actions are the policies and programs, including regulations, incentives and educational outreach campaigns, which will lead to increased carbon storage and resilience. Actions will be included in the *Climate 2050 Nature and Ecosystems Roadmap* and the *Clean Air Plan*. In addition to existing actions (see page 15) we need new actions to address the many opportunities we have to store additional carbon and meet our near – and long-term climate targets, while also adapting to the expected impacts of climate change. Some proposed, planned or current actions for nature and ecosystems in our region are outlined below.

Please consider the following actions from other leading jurisdictions, which show a range of actions that could be implemented to increase carbon storage and resilience through nature and ecosystems. Could any of these actions help us reach our goals? What should new, additional actions look like?

(Additional information on the actions is listed in the web links shown.)

1. **Municipal stormwater charges** incentivize residents to install green infrastructure on private property (Halifax, Mississauga, Victoria).

2. **Expand and connect green spaces** by creating a network of greenways, urban parks and other green spaces to increase resilience to heat waves and flooding, while also supporting biodiversity (Bilbao, Berlin, New England and Eastern Canada).

3. **Restore coastal ecosystems and re-establish watershed connections** to provide habitat, protect important areas from flooding, and improve ecological health (San Francisco, Louisiana, Singapore, Nova Scotia).

4. **Establish innovative carbon credit and offset programs** to protect, restore and enhance ecosystems (Yokohama, Austin, New Zealand, Great Bear Rainforest).

5. **Include forests and trees** within greenhouse gas emissions accounting procedures (ICLEI USA).

6. **Encourage, incentivize, or mandate the installation of green roofs** on a large scale through policies and bylaws (Amsterdam, Denver, Toronto, San Francisco).

7. **Incorporate natural assets** into local government financial planning and asset management programs (Municipal Natural Assets Initiative and pilot communities).

8. **Implement large-scale tree planting initiatives** to meet climate change mitigation and adaptation goals (India, United Kingdom, Moscow, World Economic Forum).

9. **Protect and maximize ecosystem services on agricultural lands** through protection of natural features and innovative best practices (Farmland Advantage, Delta Farmland and Wildlife Trust).

10. **Incorporate climate change into protected area and wildlife corridor planning** and identify how species movements will shift due to climate change (Pacific Institute for Climate Solutions, Portland, Edmonton, Quebec, Yellowstone to Yukon Conservation Initiative).

11. **Invest in green infrastructure** to improve resilience to flooding at a large scale (China, Berlin, Copenhagen, New York City).

12. **Research the potential of nature based solutions** to meet greenhouse gas reduction targets and assess their viability on a large scale (The Nature Conservancy).

13. **Study the impacts of climate change** on park ecosystems and integrate adaptive management practices (East Bay Regional Park District).

14. **Research the air quality impacts** and benefits of urban trees (Sacramento, Louisville).

15. **Develop new and innovative strategies for wildfire and forest management** that minimize carbon emissions (Pacific Institute for Climate Solutions), bolster resilience, and incorporate Indigenous cultural values and traditional knowledge (First Nations' Emergency Services Society).

16. **Conserve, restore and monitor seagrasses in key locations** to benefit biodiversity, improve food security and address climate change (Project Seagrass).

Potential Big Ideas to Store Carbon and Adapt to Climate Change Through Nature and Ecosystems

To achieve a cleaner, healthier, more equitable future and respond to the accelerating impacts of climate change, we need to think big and act quickly. Metro Vancouver has identified three **Big Ideas** to increase carbon storage in nature and ecosystems, and accelerate adaptation efforts. The Big Ideas were selected for different reasons, including potential for increasing carbon storage and/or improving climate resilience, as well as ease of implementation or their foundational nature (i.e., they are needed to support other actions).

Please consider the following Big Ideas. Could any of these help us significantly increase carbon stored in nature and ecosystems, and advance climate resilience to reach our goals? What other Big Ideas should Metro Vancouver consider?

Big Idea 1*: Accelerate and expand the restoration and protection of natural areas.*

To become a carbon neutral and resilient region by 2050, we need to make substantial commitments that maximize carbon storage and adaptation through nature and ecosystems – at a larger scale than ever before. To realize this idea will require partnership and collaboration between Metro Vancouver and other governments and agencies.

These commitments should involve:

- requiring protection of remaining natural areas in the region;
- ambitious restoration of forests, wetlands, riparian ecosystems, and other natural areas; and
- minimizing and mitigating future losses of ecosystems due to human activities, such as urban development.

Some examples of jurisdictions committing to large scale protection or restoration efforts are outlined below.

- Toronto has committed to one of the largest urban re-naturalization projects in North America as a way to reduce flood impacts via The Don Mouth Naturalization Plan.
- Vancouver has adopted the target that by 2030, restoration work will be completed on enough forest and coastal ecosystems in Vancouver and the surrounding region to remove one million tonnes of carbon dioxide annually by 2060.
- Montreal, with financial assistance from the Government of Canada, expanded an existing park to create the largest urban park in Canada, “Grand parc de l’Ouest”. This 3,000-hectare park (8 times the size of Central Park in New York City) will provide access to nature and recreation for the community, as well as protection from flooding.

- King County, Washington, aims to preserve over 26,000 hectares of remaining high conservation value lands within 30 years, before the opportunity is lost to population growth and development pressure.

***Big Idea 2**: Connect a regional green infrastructure network*

Green infrastructure provides a range of climate change, biodiversity and health benefits. However, green infrastructure projects are not often planned as part of a cohesive network across jurisdictional boundaries. A regional green infrastructure network would see diverse urban and natural ecosystems connected together across the region, providing more substantial ecosystem services to people and wildlife than green infrastructure projects developed in isolation.

Developing a green infrastructure network would necessitate creating a collaborative and cross-jurisdictional process, building on existing local networks, and identifying opportunities to maximize associated climate adaptation, ecological connectivity, and human health benefits. Novel mechanisms to create partnerships and fund land acquisition to connect landscapes together are also needed.

Some examples of organizations that are connecting green infrastructure at broader scales include:

- Surrey has adopted a green infrastructure network as part of their overall Biodiversity Strategy.

- The Capital Regional District aims to acquire and connect 100% of a system of natural areas from Saanich Inlet to Juan de Fuca Strait.

- Ontario's conservation authority governance structure is focused at the watershed scale and creates opportunities for multi-jurisdictional collaboration on green infrastructure (e.g. Toronto and Region Conservation Authority).

***Big Idea 3**: Require integration of natural assets into conventional asset management and decision-making processes*

The Metro Vancouver region is rapidly growing. Ecosystems are being lost to planned land use change and development, and climate change will cause additional impacts. Commonly referred to in this context as natural assets, ecosystems provide humans with many services that local governments rely on, including stormwater management, recreation, and flood and shoreline protection. Typically, natural assets and the services they provide are not acknowledged or accounted for through traditional asset management approaches. This lack of recognition can contribute to natural assets being lost, under-valued, and under-resourced (e.g. for maintenance or restoration).

Local governments are increasingly recognizing the need to acknowledge, measure and account for natural assets and the services they provide, and to incorporate this information into decision-making and asset management systems. Valuing natural assets will ensure we prioritize forests, wetlands and other ecosystems for protection and restoration. It is important to note that nature and ecosystems also have inherent value and benefits that are impossible to quantify. Valuing the services provided by natural assets is simply a mechanism to account for the benefits nature provides that are often taken for granted.

Valuing natural assets and integrating the information into decision-making is an emerging practice. Some early adopters of this approach are listed below:

- The Municipal Natural Assets Initiative team provides scientific, economic and municipal expertise to support and guide local governments in **identifying, valuing and accounting for natural assets in their financial planning and asset management programs.**

- Gibsons, BC was North America's first community to experiment with strategies to **integrate natural assets into asset management and financial planning**. For example, Gibsons' Integrated Stormwater Management Plan leverages natural assets to provide stormwater services, as an alternative to building new infrastructure, and has resulted in millions of dollars saved in construction and maintenance costs.

- The Region of Peel and Credit Valley Conservation have inventoried and assessed stormwater services provided by wetlands, forests, and open green spaces for the whole region under current and future climates – valuing these services at over $20 billion. This information will be used to develop a business case for natural asset management, maintenance and restoration.

If implemented, these three Big Ideas above will help us collectively achieve the following benefits.

- **Store carbon** – natural assets such as forests and wetlands, and the carbon they store, are protected and restored, supports a path to a carbon neutral region. Integrating these assets into asset management and decision-making will help to ensure their long term health and well-being, and therefore carbon storage capacity. A focus on nature-based solutions will ensure co-benefits such as carbon storage are maximized, as we take action to adapt to climate change.

- **Bolster resilience** – actions taken to protect and maintain natural assets will reduce the vulnerability of our communities to climate change impacts by providing shading and cooling that reduces energy demand during hot summer days, mitigating flooding, and reducing pressure on stormwater infrastructure.

- **Enhance biodiversity** – support biodiversity by protecting and enhancing habitat for wildlife and ecological connectivity, and offering pathways for species to migrate under changing climate conditions.

- **Promote human health and well-being** – provide cooling and shading from the sun, and opportunities to access green space which improves mental and physical health. The critical role of nature and ecosystems to mental and physical health has been underscored during the COVID-19 pandemic.

- **Promote equity** – greening efforts can be directed to neighbourhoods more at risk from climate change impacts, and to ensure the benefits from nature are distributed equitably.

- **Deliver sustainable services** – natural assets provide a resilient and cost efficient alternative to traditional built infrastructure.

Feedback and Engagement Process

Metro Vancouver invites feedback from diverse viewpoints to help shape *Climate 2050, Metro 2050* and the *Clean Air Plan* and will carefully consider all input. Feedback is welcome by email at Climate2050@metrovancouver.org, RegionalPlanning@metrovancouver.org (for *Metro 2050*), or CleanAirPlan@metrovancouver.org, or by telephone at 604-432-6200.

To ensure your comments are considered please provide feedback by July 31, 2020.

Participation Opportunities

Metro Vancouver will provide a variety of engagement opportunities to hear input on this discussion paper. The public, stakeholders, and other levels of government can participate via the following:

- online public questionnaire;
- open comments to a dedicated email account;
- community events;
- public webinars; and
- direct feedback to Metro Vancouver staff.

Details about events will be posted on the *Climate 2050, Metro 2050* and *Clean Air Plan* websites (see blue box on the next page).

Feedback on any part of this discussion paper is welcome at any time through the engagement period. Events will consider goals, targets, metrics and potential actions, as well as the emission and carbon storage pathways need to reach our regional climate change targets.

To ensure your comments are considered please provide feedback by July 31, 2020.

How Feedback Will Be Used

With revisions, content from this discussion paper will form the basis of the nature and ecosystems section of the *Climate 2050 Nature and Ecosystems Roadmap* and the *Clean Air Plan*, both of which will be available for comment and feedback before they are finalized. (Note that actions identified in the final *Clean Air Plan* and any of the *Climate 2050 Roadmaps* that could result in significant changes to existing air emission regulations or new regulations may require an independent public engagement process before any regulations or amendments are adopted.)

Content from this discussion paper will also inform the development of *Metro 2050*, the update to the regional growth strategy. To provide feedback on this process directly, please fill out the Metro 2050 Feedback Form.

Comments and suggestions will be compiled into a summary report for consideration by the Metro Vancouver Board, and will be made publicly available in 2020.

Metro Vancouver staff will treat personal information with confidentiality; please note that comments you submit may be provided to a third party if a freedom of information request is made under the *Freedom of Information* and *Protection of Privacy Act*. If you have any questions or comments regarding the consultation process, please call 604-432-6200.

Thank you for taking the time to provide your valuable feedback.

For more information, visit www.metrovancouver.org and search "Climate 2050", "Metro 2050" or "Clean Air Plan", or call 604-432-6200.

Glossary

Air contaminants are any substances emitted into the air that do or could a) harm public health (including material physical discomfort) and property, b) damage the environment, including the climate, c) impede normal business operations, or d) impair visual air quality.

Biodiversity is the variety of species and ecosystems, and the ecological processes that they are part of.

Blue carbon refers to the carbon stored in coastal and marine ecosystems.

Carbon neutral region is a region that has achieved the deepest greenhouse gas emissions reductions possible across all economic sectors, and removes or captures sufficient carbon dioxide to balance any remaining regional greenhouse gas emissions.

Climate change adaptation means anticipating, planning for and responding to the adverse effects of climate change and taking appropriate action to prevent or minimize the damage it can cause, or taking advantage of opportunities that may arise. It has been shown that well planned, early adaptation action saves money and lives later.

Climate resilience describes the capacity of ecosystems, economies, infrastructure, and communities to absorb the impacts of climate change while maintaining essential services and functions needed to support health and well-being. In some cases, climate resilience involves changing services and functions so they are more sustainable.

Ecosystems describe all the plants and animals that live in a particular area together with the relationships between them and their environment.

Ecosystem services are the benefits people obtain from ecosystems. These services can be grouped into four main types:

- *Provisioning services* include material and energy outputs from ecosystems, including food, fresh water, and raw materials used for construction and energy like wood.
- *Regulating services* refer to the services provided by ecosystems in processing and assimilating pollution, stabilizing water flows and soil erosion, controlling local climates, and storing carbon.
- *Cultural services* are the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, recreation, and aesthetic enjoyment.
- *Supporting services* underpin all other ecosystem services. Ecosystems provide habitats for all plants and animals while depending on a diversity of species to maintain their own functions

Coastal squeeze occurs when rising sea levels push coastal habitats landward. Coastal habitats are often diminished in both size and function when caught between rising sea levels and fixed infrastructure (such as a sea wall) or high ground.

Fine particulate matter ($PM_{2.5}$) is made up of tiny solid or liquid particles that float in the air and can penetrate deep into the lungs and even into the bloodstream. Fine particulate matter can damage people's health by aggravating existing lung and heart diseases, increasing the risk of cancer and reducing life expectancy.

Greenhouse gases are air contaminants that trap heat and are the cause of climate change. Greenhouse gases include carbon dioxide and nitrous oxide, as well as short-lived climate forcers such as methane, halocarbons, black carbon and ozone. Limiting or preventing greenhouse gas emissions and removing these gases from the atmosphere is critical to avoiding catastrophic climate change (sometimes referred to as climate change mitigation).

Green infrastructure is a tool for providing biodiversity and climate benefits through nature-based solutions. It includes natural, enhanced, and engineered assets that collectively provide society with ecosystem services required for healthy living. Natural assets (e.g. forests, wetlands and soil) and enhanced or engineered systems (e.g. bioswales and green roofs) improve resilience and mitigate negative environmental impacts from urban development, benefiting both people and ecosystem function.

Ground-level ozone (O_3) can have harmful impacts on everyone, especially children, seniors, and people with lung and heart conditions. It is primarily formed when nitrogen oxides and volatile organic compounds react in the air on hot and sunny days.

Hazard refers to a dangerous phenomenon, substance, human activity, or condition. In this context, hazards are caused or made worse by climate change. Examples include rainstorms, extreme weather, wildfires, storm surges, and landslides.

Impacts refers to the consequences of realized risks on ecosystems, economies, infrastructure and communities. Impacts may be referred to as consequences or outcomes, and can be adverse or beneficial.

Keystone species have a disproportionately large effect on the ecosystems in which they occur. Keystone species help to maintain local biodiversity within a community either by controlling populations of other species that would otherwise dominate the community, or by providing critical resources for a wide range of species.

Natural assets are the stock of natural resources and ecosystems (including geology, soil, air, water and all living things) that provide benefits to people. Examples include forests, wetlands, and streams. It is from these natural assets that humans derive a wide range of services, often called ecosystem services, which make human life possible.

Nature-based solutions are actions that protect, sustainably manage, and restore natural or modified ecosystems but also address societal challenges (such as climate change), thereby providing both human well-being and biodiversity benefits.

Riparian refers to areas close to or on river banks.

Sensitive or Modified Ecosystems are ecosystems mapped by the Metro Vancouver Sensitive Ecosystem Inventory. Sensitive Ecosystems are ecologically significant and relatively unmodified, and include wetlands, older forests and riparian areas. Modified Ecosystems are younger and more human modified, but still have ecological value and importance to biodiversity (e.g. young forests).

Sequester is the removal of carbon dioxide from the air and the long-term storage of carbon to mitigate climate change.

Subsidence is the sudden sinking or gradual downward settling of the ground's surface. Subsidence is common in river deltas.

Tree canopy cover refers to the leaves and branches that form a visible layer if one is viewing the region from the air, and the extent to which they cover the ground.

Urban forests contain the trees within the public and private lands of a city, including the trees in parks, around buildings, along streets and in backyards.

Urban heat island effect refers to a phenomenon where built-up areas are hotter than nearby non-urban areas. The average air temperature of a city can be several degrees warmer than the surrounding landscape.

Vulnerability is the degree to which ecosystems, economies, infrastructure and communities are susceptible to, or unable to cope with, the adverse effects of climate change. Vulnerability varies based on exposure, sensitivity and adaptive capacity. Geographic location, socio-economic conditions, and other factors can impact susceptibility to harm and adaptive capacity.

Metro Vancouver is a federation of 21 municipalities, one Electoral Area and one Treaty First Nation that collaboratively plans for and delivers regional-scale services. Its core services are drinking water, wastewater treatment and solid waste management. Metro Vancouver also regulates air quality, plans for urban growth, manages a regional parks system and provides affordable housing. The regional district is governed by a Board of Directors of elected officials from each local authority.

Member jurisdictions of Metro Vancouver include:

- Village of Anmore
- Village of Belcarra
- Bowen Island Municipality
- City of Burnaby
- City of Coquitlam
- City of Delta
- Electoral Area A
- City of Langley
- Township of Langley
- Village of Lions Bay
- City of Maple Ridge
- City of New Westminster
- City of North Vancouver
- District of North Vancouver
- City of Pitt Meadows
- City of Port Coquitlam
- City of Port Moody
- City of Richmond
- City of Surrey
- Tsawwassen First Nation
- City of Vancouver
- District of West Vancouver
- City of White Rock

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Julie Saxton, Acting Division Manager, Bylaw and Regulation Development
Parks and Environment Department

Date: April 14, 2020 Meeting Date: May 15, 2020

Subject: **Amendments to GVRD Air Quality Management Bylaw No. 1082, 2008**

RECOMMENDATION

That the MVRD Board:

a) give first, second and third reading to *Metro Vancouver Regional District Air Quality Management Amending Bylaw No. 1308, 2020*; and
b) pass and finally adopt *Metro Vancouver Regional District Air Quality Management Amending Bylaw No. 1308, 2020*.

EXECUTIVE SUMMARY

This report brings forward housekeeping amendments to Metro Vancouver's main air quality management bylaw (Bylaw 1082), arising as a consequence of the Board's adoption of the *Residential Indoor Wood Burning Emission Regulation Bylaw* on March 27, 2020. The proposed amendments include three changes to definitions in Bylaw 1082, to reflect the definitions included in the new residential wood burning bylaw, and a change to reference the more detailed requirements of the new bylaw with respect to the control of emissions from residential indoor wood burning.

PURPOSE

To seek Board adoption of *Metro Vancouver Regional District Air Quality Management Amending Bylaw No. 1308, 2020* (Amending Bylaw 1308) (Attachment 1), a bylaw to amend *Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008* (Bylaw 1082), with respect to consequential amendments arising as a result of the adoption of *Metro Vancouver Regional District Residential Indoor Wood Burning Emission Regulation Bylaw No. 1303, 2020* (Bylaw 1303).

BACKGROUND

At its meeting on March 27, 2020, the Metro Vancouver Regional District (MVRD) Board adopted Bylaw 1303, a bylaw to regulate emissions from residential indoor wood burning appliances (Reference 1). Bylaw 1303 includes more stringent requirements to control emissions from residential indoor wood burning appliances than the provisions that currently exist in Bylaw 1082.

This report presents Amending Bylaw 1308 to amend Bylaw 1082. The proposed amendments would align the definitions in Bylaw 1082 related to residential indoor wood burning with the definitions in Bylaw 1303, and add a reference to Bylaw 1303 into Bylaw 1082 with respect to the additional conditions that must be met in order to discharge air contaminants from a residential indoor wood burning appliance.

Without the proposed amendments, there would be inconsistent regulatory requirements between Bylaw 1082 and the new Bylaw 1303, which could give rise to a risk of difficulties in achieving compliance with bylaw requirements concerning residential wood burning discharges to air, and a resulting risk of impacts on air quality in the region.

PROPOSED AMENDMENTS TO BYLAW 1082

Amending Bylaw 1308 is presented to amend Bylaw 1082. The proposed amendments include: three changes to definitions in Bylaw 1082, to reflect the definitions included in Bylaw 1303; and a change to existing provisions under Section 8 of Bylaw 1082 to control emissions from residential indoor wood burning in accordance with Bylaw 1303.

Interpretation: Section 3(2)

Amendments to definitions in Bylaw 1082 to align with definitions in Bylaw 1303 include:

- changing the definition "comfort heating device" to refer to a "residential indoor wood burning appliance" rather than a "residential fireplace or stove";
- deleting the definition "residential fireplace or stove"; and
- adding the definition "residential indoor wood burning appliance".

Application: Section 8

Section 8 of Bylaw 1082 currently outlines the fuels that may be used in residential fireplaces and stoves as well as requirements to follow manufacturer's operating procedures and use techniques to minimize emissions. An amendment has been proposed that deletes and replaces the current Section 8 requirements with a requirement that a discharge of an air contaminant from a residential indoor wood burning appliance must be conducted in accordance with Bylaw 1303, which sets out detailed requirements in respect of appliances, solid fuel, manufactured firelogs and best burning practices.

ALTERNATIVES

1. That the MVRD Board:
   a) give first, second and third reading to *Metro Vancouver Regional District Air Quality Management Amending Bylaw No. 1308, 2020*; and
   b) pass and finally adopt *Metro Vancouver Regional District Air Quality Management Amending Bylaw No. 1308, 2020*.

2. That the MVRD Board receive for information the report dated April 7, 2020, titled "Amendments to GVRD Air Quality Management Bylaw No. 1082, 2008" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

There are no new financial implications. The proposed amendments to Bylaw 1082 introduced by Amending Bylaw 1308 arise as a consequence of the adoption of Bylaw 1303. The financial implications of Bylaw 1303 were included in a previous report to the MVRD Board when the bylaw was adopted on March 27, 2020.

CONCLUSION

Amending Bylaw 1308 proposes amendments to Bylaw 1082 to ensure that provisions in Bylaw 1082 related to the control of emissions from residential indoor wood burning are consistent with the

requirements introduced by the adoption of Bylaw 1303 by the MVRD Board on March 27, 2020. Bylaw 1303 contains additional measures, including more stringent requirements, to control emissions from residential fireplaces and wood stoves. These requirements will be phased in over several years.

The proposed amendments to Bylaw 1082 included in Amending Bylaw 1308 replace the Bylaw 1082 definition "residential fireplace or stove" with the definition "residential indoor wood burning appliance" used in Bylaw 1303, and introduce a requirement that a discharge of an air contaminant from a residential indoor wood burning appliance must be conducted in accordance with Bylaw 1303. The proposed amendments are intended to provide clarity to the regulated community about requirements by ensuring there is consistency within Metro Vancouver's bylaws.

Attachment

1. Metro Vancouver Regional District Air Quality Management Amending Bylaw No. 1308, 2020 *(#34104644)*

References

1. Metro Vancouver Regional District Residential Indoor Wood Burning Emission Regulation Bylaw No. 1303, 2020

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METRO VANCOUVER REGIONAL DISTRICT
BYLAW NO. 1308, 2020
A Bylaw to amend Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008

WHEREAS:

A. The Board of the Metro Vancouver Regional District has enacted the "Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008";

B. That bylaw contemplates that the Board of the Metro Vancouver Regional District may establish emission regulations;

C. The Board of the Metro Vancouver Regional District has also enacted the "Metro Vancouver Regional District Residential Indoor Wood Burning Emission Regulation Bylaw No. 1303, 2020;

D. As a result of enacting that bylaw, the Board of the Metro Vancouver Regional District wishes to make corresponding amendments to the "Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008".

NOW THEREFORE the Board of the Metro Vancouver Regional District enacts as follows:

Citation

1. The official citation of this bylaw is "Metro Vancouver Regional District Air Quality Management Amending Bylaw No. 1308, 2020".

Amendment of Bylaw

2. The "Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008" is amended as follows:

   (a) In section 3(2), the definition "**comfort heating device**" is deleted and replaced as follows:

   "**comfort heating device**" means a boiler or furnace which discharges to the air and which is used as a space heating appliance in residential, commercial, institutional or industrial premises but does not include a residential indoor wood burning appliance;

   (b) In section 3(2), the definition "**residential fireplace or stove**" is deleted.

   (c) In section 3(2), the definition "**residential indoor wood burning appliance**" is added in alphabetic order as follows:

   "**residential indoor wood burning appliance**" has the same meaning as defined in the "Metro Vancouver Regional District Residential Indoor Wood Burning Emission Regulation Bylaw No. 1303, 2020";

(d) Section 8 is deleted in its entirety and replaced with the following:

8. No person may discharge, or cause, permit or allow the discharge of any air contaminant into the environment from a residential indoor wood burning appliance unless such discharge is conducted strictly in accordance with the Metro Vancouver Regional District Residential Indoor Wood Burning Emission Regulation Bylaw No. 1303, 2020.

Read a first, second and third time this _____ day of _____, _____.

Passed and finally adopted this _____ day of _____, _____.

_____
Sav Dhaliwal, Chair

_____
Chris Plagnol, Corporate Officer

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Roger Quan, Director, Air Quality and Climate Change
Parks and Environment Department

Date: April 16, 2020 Meeting Date: May 15, 2020

Subject: **Manager's Report**

RECOMMENDATION
That the Climate Action Committee receive for information the report dated April 16, 2020, titled "Manager's Report".

Climate Action Committee 2020 Work Plan
The attachment to this report sets out the Committee's Work Plan for 2020. The status of work program elements is indicated as pending, in progress, or complete. The listing is updated as needed to include new issues that arise, items requested by the Committee, and changes to the schedule.

Adaptation Canada 2020
The Adaptation Canada conference took place February 19-21, 2020 in Vancouver. Themed around "Raising our game on resilience" the conference, organized by the Fraser Basin Council, brought together expertise from different sectors and disciplines across the country to tackle the challenges we face in adapting to climate change. Director Christine Boyle provided opening remarks on behalf of the Metro Vancouver Board of Directors and the City of Vancouver.

The conference had eight tracks to address different aspects of adaptation, including financing resilience, showcasing solutions, ecological resilience, and addressing climate change inequities. The work of the Environment group within Regional Planning was showcased through panels on Regionalizing Green Infrastructure, Climate Change and Urban Greenspace, and Best Practices for Managing Invasive Species in the Metro Vancouver Region.

The learnings and connections made at this conference will inform and influence ongoing work including the development of the Climate 2050 Roadmaps and Metro Vancouver's corporate adaptation actions.

Metro Vancouver Participation in Environmental Assessment Reviews
At the March 13 meeting, the Climate Action Committee requested a listing of the environmental assessment review processes that Metro Vancouver staff are currently participating in. The following table lists several major projects across the region, where staff are providing technical input to ensure potential impacts to Metro Vancouver assets and operations are considered and mitigated. The table also shows the current status of each project in the environmental review process, including which agency is leading the process. Where available, the project name is linked to its website, which contains detailed information about the project.

Project	Current Status
Cascadia Rail Terminal Track Extension *Burnaby*	*Agency:* Port of Vancouver Permit issued in December 2019, subject to conditions
Coquitlam Rail Corridor Improvements Project *Coquitlam*	*Agency:* Port of Vancouver Design phase. A virtual design charrette was held with stakeholders on April 2, 2020.
Delta Grinding Facility *Tilbury Island, Delta*	*Agency:* BC Environmental Assessment Office Pre-application phase. As of April 2020, meetings and engagement has been postponed due to COVID-19.
Eagle Mountain Woodfibre Gas Pipeline (Amendment) *Northern portion of MVRD Electoral Area A and SLRD*	*Agency:* BC Environmental Assessment Office Environmental Assessment Certificate granted in August 2016. Amendment application to make design changes to the pipeline corridor and to the compressor stations submitted in March 2020, currently under review.
Holdom Overpass *Burnaby*	*Agency:* Port of Vancouver Design phase.
Pattullo Bridge Replacement *New Westminster and Surrey*	*Agency:* BC Environmental Assessment Office Certificate Issued May 2019; Pre-construction phase.
Roberts Bank Terminal 2 *Delta*	*Agency:* Impact Assessment Agency of Canada Independent Federal Review Panel report (summary) submitted to the Minister of Environment and Climate Change Canada on March 27, 2020. The Minister has extended the time limit for the decision by 90 days due to COVID-19.
Tilbury Phase 2 LNG Expansion *Tilbury Island, Delta*	*Agency:* BC Environmental Assessment Office Early engagement phase, extended to June 26, 2020 due to COVID-19.
WesPac Tilbury Marine Jetty *Tilbury Island, Delta*	*Agency:* BC Environmental Assessment Office Application review phase.
Westwood Street Rail Crossing *Coquitlam and Port Coquitlam*	*Agency:* Port of Vancouver Design phase.

The links below provide additional information on the environmental review processes:
Click here for an overview of the BC Environmental Assessment process
Click here for an overview of the Port of Vancouver's Project and Environmental Review Process
Click here for an overview of the federal Impact Assessment Process

Staff will continue to update the Climate Action Committee on any significant developments relating to these and new projects.

Attachment
Climate Action Committee 2020 Work Plan

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ATTACHMENT

Climate Action Committee 2020 Work Plan
Report Date: April 16, 2020

Priorities

1st Quarter	**Status**
Climate 2050 and Clean Air Plan Discussion Papers: Nature and Ecosystems, Agriculture, and Waste	In progress
Climate 2050 - managing Metro Vancouver's corporate energy and GHG emissions	In progress
Air Quality – proposed bylaw for residential wood burning	Complete
Air Quality - initiate consultation on expansion of Non-Road Diesel Engine bylaw	In progress
SIF (Sustainability Innovation Fund) – 2020 proposals	Complete
SIF – results of Air Aware citizen science air quality monitoring	In progress
SIF – results of electric vehicle fast charger demonstration at Metro Tower III	In progress
Ecological Health – invasive species – outreach materials	Complete
Participate in environmental assessment processes as required	Complete
2nd Quarter	
Climate 2050 – electric vehicle programs review and recommendations	In progress
Air Quality – 9th annual Caring for the Air report	In progress
Air Quality - monitoring network review and upgrades	In progress
Air Quality - initiate consultation on review of air quality regulatory fees	In progress
Air Quality – second phase of consultation on proposals for managing cannabis production emissions	In progress
SIF – status report on previously approved liquid waste projects	In progress
SIF – results of the Strata Energy Advisor pilot program and proposals for moving forward	In progress
SIF – design for public display of air quality monitoring data and outreach strategy	In progress
Ecological Health Framework – annual report	Pending
Ecological Health – invasive species – best management practices	In progress
Participate in environmental assessment processes as required	In progress
3rd Quarter	
Climate 2050 Annual report – Metro Vancouver's climate actions and carbon neutral progress	In progress
Climate 2050 and Clean Air Plan – Phase I engagement results	Pending
Climate 2050 and Clean Air Plan – modelling to support a carbon neutral region	In progress
Air Quality - outreach on reducing residential wood-burning emissions	In progress
Air Quality – second phase of consultation on open-air burning bylaw	Pending
SIF – status report on previously approved regional district and water projects	In progress
Participate in environmental assessment processes as required	Pending
4th Quarter	
Climate 2050 Roadmaps – Buildings, Industry, and Transportation	In progress
Climate 2050 – regional building emissions benchmarking program	In progress
Metro Vancouver's Draft Clean Air Plan	Pending

Air Quality - initiate consultation on regulatory measures to meet ambient air quality objectives for nitrogen dioxide	Pending
SIF – Metro Vancouver's Sustainable Infrastructure and Buildings Policy Design Guide	In progress
Annual budget and 5 year financial plan	Pending
Ecological Health – regional ecosystem connectivity	Pending
Participate in environmental assessment processes as required	Pending