

METRO VANCOUVER REGIONAL DISTRICT REGIONAL PLANNING COMMITTEE

REGULAR MEETING

May 19, 2022 9:15 am

Meeting conducted electronically/in person pursuant to the Procedure Bylaw 28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia Webstream available at http://www.metrovancouver.org

AGENDA1

1. ADOPTION OF THE AGENDA

1.1 May 19, 2022 Regular Meeting Agenda

That the Regional Planning Committee adopt the agenda for its regular meeting scheduled for May 19, 2022 as circulated.

2. ADOPTION OF THE MINUTES

2.1 March 4, 2022 Regular Meeting Minutes

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That the Regional Planning Committee adopt the minutes of its regular meeting held March 4, 2022 as circulated.

- 3. **DELEGATIONS**
- 4. INVITED PRESENTATIONS
- 5. REPORTS FROM COMMITTEE OR STAFF

5.1 Process to Consider Stronger Climate Action Language and Policy for *Metro 2050*That the MVRD Board receive for information the report dated April 22, 2022, titled "Process to Consider Stronger Climate Action Language and Policy for *Metro 2050*".

5.2 Impacts of Immigration on Projections and Growth Throughout the Region

Verbal Update

Designated Speaker:

Sinisa Vukicevic, Program Manager, Regional Planning Analytics, Regional Planning and Housing Services

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

5.3 Regional Parking Strategy – Scope of Work

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That the MVRD Board receive for information the report dated April 11, 2022, titled "Regional Parking Strategy – Scope of Work".

5.4 Social Equity in Regional Growth Management Phase 3 Study – Project Scope That the MVRD Board receive for information the report dated April 11, 2022, titled

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"Social Equity in Regional Growth Management Phase 3 Study – Project Scope".

5.5 2022 Agriculture Awareness Grant Recommendations

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That the MVRD Board award the annual Agriculture Awareness Grants to the following fourteen non-profit organizations as described in the report dated April 8, 2022, titled "2022 Agriculture Awareness Grant Recommendations":

- a) Fraser North Farmers Market Society, for the "Nibble Network" project in the amount of \$2,500;
- b) Hives for Humanity Society, for "Stories and Sounds of Connection around Beekeeping and Gardening" in the amount of \$2,000;
- c) Immigrant Link Centre Society, for the "From Pollution to Solution' Educational Cartoon" project in the amount of \$5,500;
- d) See-emia Cultural Studies Society, for the "Sovereign Seedlings" project in the amount of \$4,750;
- e) Urban Bounty/Richmond Food Security Society, for "From Field to Fork" in the amount of \$5,000;
- f) Delta Farmland & Wildlife Trust, for "Day at the Farm" in the amount of \$4,500;
- g) BC Agriculture in the Classroom, for "Take a Bite of BC" in the amount of \$3,000;
- h) Earthwise Society, for the "Tomato Festival" in the amount of \$2,500;
- i) Public Health Association of BC (PHABC), for "Farm to School BC" in the amount of \$3,500;
- j) The Sharing Farm Society, for the "12th Annual Garlic Festival" in the amount of \$2,000;
- k) BC Association of Farmers Markets, for the "PechaKucha: Local Food and Agriculture" project in the amount of \$3,000;
- I) FarmFolk/CityFolk, for the "Visioning a Sustainable Food System in BC" project in the amount of \$4,250;
- m) Pacific Immigrant Resources Society (PIRS), for the "Local Food Literacy for Immigrant and Refugee Women in Metro Vancouver" project in the amount of \$5,500; and
- n) Growing Chefs Society, for "Edible Education Programming" in the amount of \$2,000.

5.6 Request for Sanitary Service Connection at 13179 224 Street, Maple Ridge That the MVRD Board:

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- a) resolve that the extension of GVS&DD sewerage services to an existing restaurant and three additional existing businesses at 13179 224 Street in the City of Maple Ridge is consistent with the provisions of Metro Vancouver 2040: Shaping our Future, and
- b) forward the requested Fraser Sewerage Area extension application to the GVS&DD Board for consideration.

5.7 Manager's Report

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That the Regional Planning Committee receive for information the report dated April 28, 2022, titled "Manager's Report".

6. INFORMATION ITEMS

6.1 Draft Climate 2050 Nature and Ecosystems Roadmap

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6.2 Draft Climate 2050 Agriculture Roadmap

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6.3 HNC Symposium Living Together - Connecting Housing, Social Well-being and Resilience

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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 Regional Planning Committee adjourn/conclude its regular meeting of May 19, 2022.

Membership:

Coté, Jonathan (C) – New Westminster Froese, Jack (VC) – Langley Township Copeland, Dan – Delta Dueck, Judy – Maple Ridge Gambioli, Nora – West Vancouver Guerra, Laurie – Surrey Hurley, Mike – Burnaby Kirby–Yung, Sarah – Vancouver McEwen, John – Anmore Muri, Lisa – North Vancouver District Steves, Harold – Richmond Vagramov, Rob – Port Moody van den Broek, Val – Langley City West, Brad – Port Coquitlam

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METRO VANCOUVER REGIONAL DISTRICT REGIONAL PLANNING COMMITTEE

Minutes of the Regular Meeting of the Metro Vancouver Regional District (MVRD) Regional Planning Committee held at 9:01 a.m. on Friday, March 4, 2022 in the 28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia.

MEMBERS PRESENT:

Chair, Mayor Jonathan Coté*, New Westminster

Vice Chair, Mayor Jack Froese*, Langley Township

Councillor Dan Copeland*, Delta (arrived at 9:16 a.m.)

Councillor Nora Gambioli*, West Vancouver (arrived at 9:03 a.m.)

Councillor Laurie Guerra*, Surrey

Mayor Mike Hurley*, Burnaby

Councillor Sarah Kirby-Yung*, Vancouver (arrived at 9:03 a.m.)

Mayor John McEwen*, Anmore

Councillor Lisa Muri*, North Vancouver District

Councillor Harold Steves*, Richmond

Mayor Rob Vagramov*, Port Moody (arrived at 9:05 a.m.)

Mayor Val van den Broek*, Langley City

Mayor Brad West*, Port Coquitlam (arrived at 9:42 a.m.)

MEMBERS ABSENT:

Councillor Judy Dueck, Maple Ridge

STAFF PRESENT:

Jerry W. Dobrovolny, Chief Administrative Officer Heather McNell, General Manager, Regional Planning and Housing Services Amelia White, Legislative Services Supervisor, Board and Information Services

1. ADOPTION OF THE AGENDA

1.1 March 4, 2022 Regular Meeting Agenda

It was MOVED and SECONDED

That the Regional Planning Committee:

- a) amend the agenda for its regular meeting scheduled for March 4, 2022 by adding Item 3.1 Late Delegation Alex Boston; and
- b) adopt the agenda as amended.

CARRIED

^{*}denotes electronic meeting participation as authorized by Section 3.6.2 of the *Procedure Bylaw*

2. ADOPTION OF THE MINUTES

2.1 February 10, 2022 Regular Meeting Minutes

It was MOVED and SECONDED

That the Regional Planning Committee adopt the minutes of its regular meeting held February 10, 2022, as circulated.

CARRIED

3. DELEGATIONS

3.1 Alex Boston, Executive Director, Renewable Cities and Fellow MJ Wosk Centre for Dialogue, Simon Fraser University

Alex Boston, Executive Director, Renewable Cities and Fellow MJ Wosk Centre for Dialogue, Simon Fraser University, spoke to members regarding Item #5.1, "Consideration of Metro Vancouver Regional District Regional Growth Strategy Bylaw No. 1339, 2022, a bylaw to adopt *Metro 2050*", highlighting the need to increase climate and sustainability principles in *Metro 2050*.

9:03 a.m. Councillor Gambioli and Kirby-Yung arrived at the meeting.

9:05 a.m. Mayor Vagramov arrived at the meeting.

Presentation material titled "Metro 2050 Vision-Strategy Alignment Course Correction" is retained with the March 4, 2022 Regional Planning Committee agenda.

4. INVITED PRESENTATIONS

4.1 Caitlin Cooper, Project Manager, TransLink

Caitlin Cooper, Project Manager, TransLink, provided the Regional Planning Committee with an overview of *Transport 2050*, highlighting the key components of the strategy, maps of the network options, the 2022 implementation priorities and the intentional integration with *Metro 2050* and *Climate 2050*.

9:16 a.m. Councillor Copeland arrived at the meeting.

Presentation material titled "Transport 2050: Regional Transportation Strategy" is retained with the March 4, 2022 Climate Action Committee agenda.

5. REPORTS FROM COMMITTEE OR STAFF

5.1 Consideration of Metro Vancouver Regional District Regional Growth Strategy Bylaw No. 1339, 2022, a bylaw to adopt Metro 2050

Report dated February 18, 2022, from Sean Galloway, Director, Regional Planning and Electoral Area Services and James Stiver, Division Manager, Regional Land Use Policy, Regional Planning and Housing Services, providing the Regional Planning

Committee with the *Metro Vancouver Regional District Regional Growth Strategy Bylaw No. 1339, 2022* for consideration of first and second readings and referring the bylaw to a Public Hearing in April 2022.

Discussion ensued regarding various elements of the *Metro 2050* strategy and the possibility of whether additional amendments could be incorporated.

Agenda Order Varied

The order of the agenda was varied to consider Item 5.4 at this point.

5.4 Metro 2050 – Providing Clarity on Key Concepts

Heather McNell, General Manager, Regional Planning and Housing Services providing the Regional Planning Committee with a verbal update on the scope of *Metro 2050*, the history of the urban containment boundary and directing growth to transit-oriented and urban locations.

9:42 a.m. Mayor West arrived at the meeting.

Presentation material titled "Metro 2050: Clarifying Concepts and Policy Intent" is retained with the March 4, 2022 Regional Planning Committee agenda.

It was MOVED and SECONDED

That the Regional Planning Committee receive for information the March 4, 2022 verbal report from Heather McNell, General Manager, Regional Planning and Housing Services regarding Providing Clarity on Key Concepts.

CARRIED

Agenda Order Resumed

The order of the agenda resumed with Item 5.1 being before the Committee.

5.1 Consideration of Metro Vancouver Regional District Regional Growth Strategy Bylaw No. 1339, 2022, a bylaw to adopt Metro 2050 (Continued)

It was MOVED and SECONDED

That the MVRD Board:

- a) give first and second readings to *Metro Vancouver Regional District Regional Growth Strategy Bylaw No. 1339, 2022*, a bylaw that would adopt *Metro 2050* as the regional growth strategy for Metro Vancouver;
- b) refer *Metro Vancouver Regional District Regional Growth Strategy Bylaw No.* 1339, 2022, to a Public Hearing to be held in April , 2022; and
- c) given the urgent need to respond to climate change and prepare for extreme weather events, direct staff to undertake work and engagement with an aim to proposing an early amendment to *Metro 2050* post-adoption to strengthen climate action language and policy including the intent to improve integration of climate action into other *Metro 2050* priorities.

CARRIED

Councillor Steves voted in the negative.

5.2 Metro 2050 Phase 2 Engagement Including Activities in Q4 2021

Report dated February 8, 2022, from Lucy Duso, Policy Coordinator, External Relations and Erin Rennie, Senior Planner, Regional Planning and Housing Services, providing the Regional Planning Committee with a synthesis of the Metro 2050 Phase 2 engagement program as well as a detailed report on engagement during Q4 of 2021.

It was MOVED and SECONDED

That the Regional Planning Committee receive for information the report dated February 8, 2022, titled "Metro 2050 Phase 2 Engagement Including Activities in Q4 2021".

CARRIED

5.3 2021 Census – Highlights of Population and Dwelling Count Data

Sean Galloway, Director, Regional Planning and Electoral Area Services and Sinisa Vukicevic, Program Manager, Planning Analytics providing the Regional Planning Committee with a verbal presentation on 2021 census data highlighting population growth, dwelling units and the upcoming releases in 2022.

Presentation material titled "2021 Census: Highlights from Population and dwelling Count Data" is retained with the March 4, 2022 Regional Planning Committee agenda.

It was MOVED and SECONDED

That the Regional Planning Committee receive for information the March 4, 2022 verbal report from Sean Galloway, Director, Regional Planning and Electoral Area Services regarding the 2021 Census – Highlights of Population and Dwelling Count Data.

CARRIED

5.5 Climate 2050 – Links to Land Use and Transportation

Roger Quan, Director, Air Quality and Climate Change, providing the Regional Planning Committee with a verbal presentation on the *Climate 2050* issue areas and roadmaps, and the intentional alignment between *Climate 2050* and *Metro 2050*.

Presentation material titled "Climate 2050 Overview: A Pathway to a Resilient and Carbon Neutral Region" is retained with the March 4, 2022 Regional Planning Committee agenda.

It was MOVED and SECONDED

That the Regional Planning Committee receive for information the March 4, 2022 verbal report from Roger Quan, Director, Air Quality and Climate Change regarding the Climate 2050 – Links to Land Use and Transportation.

CARRIED

5.6 Manager's Report

Report dated February 22, 2022 from Heather McNell, General Manager, Regional Planning and Housing Services, providing the Regional Planning Committee with a summary of the CMHC rental market report findings.

It was MOVED and SECONDED

That the Regional Planning Committee receive for information the report dated February 22, 2022, titled "Manager's Report".

CARRIED

6. INFORMATION ITEMS

No items presented.

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 Regional Planning Committee co	nclude its regular meeting of March 4, 2022.
	CARRIED
	(Time: 10:27 a.m.)
Amelia White,	Jonathan Coté, Chair
Legislative Services Supervisor	



To: Regional Planning Committee

From: Heather McNell, General Manager, Regional Planning and Housing Services

Date: April 22, 2022 Meeting Date: May 19, 2022

Subject: Process to Consider Stronger Climate Action Language and Policy for Metro 2050

RECOMMENDATION

That the MVRD Board receive for information the report dated April 22, 2022, titled "Process to Consider Stronger Climate Action Language and Policy for Metro 2050".

EXECUTIVE SUMMARY

The MVRD Board recently directed staff to explore stronger policy directions in *Metro 2050* with regards to GHG emission reductions and regional resilience, driven in part by the unprecedented climate change-related impacts the region and surrounding areas suffered in 2021 including the heat dome, wildfires, landslides, and flooding. Consistent with the recently released IPCC report, scientific experts recognize that further and faster action is needed to assist in reducing climate change impacts. This report presents a proposed scope of work and engagement plan to explore opportunities for stronger climate action language and policy for *Metro 2050*.

The schedule to adopt *Metro 2050* will proceed as directed by the MVRD Board, with possible consideration of bylaw adoption in July 2022. Given that land use intersects with many issue areas and the actions of other Metro Vancouver management plans, staff will concurrently be preparing the draft *Climate 2050 Land Use and Growth Management Roadmap*.

Over the latter half of 2022, staff will engage with the Regional Planning Advisory Committee, Regional Planning, Climate Action, and other standing committees, as well as with stakeholders and subject matter experts on the policy directions and the *Roadmap*, and will prepare recommendations for enhanced policies to be considered by the Board in 2023.

PURPOSE

This report is to provide the Regional Planning Committee and MVRD Board with a proposed scope of work and engagement plan to explore opportunities for stronger climate action language and policy for *Metro 2050* and the development of the *Climate 2050 Land Use and Growth Management Roadmap*.

BACKGROUND

The MVRD Board recently directed staff to explore stronger climate action language and policy for *Metro 2050* with regards to GHG emission reductions and regional resilience. This was driven in part by the unprecedented climate change-related impacts the region and surrounding areas suffered in 2021 including the heat dome, wildfires, landslides, and flooding. At its meeting on March 25, 2022, while considering first and second readings and scheduling a public hearing on the *Metro 2050* bylaw (Reference 1), the MRVD Board passed the following resolution:

Given the urgent need to respond to climate change and prepare for extreme weather events, direct staff to undertake work and engagement with an aim to proposing an early amendment to Metro 2050 post-adoption to strengthen climate action language and policy including the intent to improve integration of climate action into other Metro 2050 priorities.

This report responds to that direction with a proposed scope of work and engagement plan and link to the development of the *Climate 2050 Land Use and Growth Management Roadmap*.

CLIMATE ACTION-RELATED POLICIES IN METRO 2050

In April 2019, the MVRD Board directed staff to update *Metro 2040*, the regional growth strategy, through a series of "*Metro 2040* Policy Reviews" intended to "take stock of *Metro 2040*'s policy framework, develop an understanding of best practices, and help shape a significant update to the regional growth strategy" (Reference 2). The *Metro 2040* Climate Change and Natural Hazards Policy Review was scoped to review the greenhouse gas (GHG) emission reduction and resilience policies in the regional growth strategy, and to identify opportunities to enhance them in *Metro 2050* through close collaboration with the *Climate 2050* process, engagement with internal and external stakeholders, and a comprehensive review of best practices (Reference 3).

The Climate Change and Natural Hazards Policy Review identified three key issues pertaining to climate change content in *Metro 2040*:

- climate change considerations are not well-integrated throughout all goal areas of the regional growth strategy;
- the regional growth strategy is underutilized as a tool to meet the region's MVRD Boardadopted GHG emissions reduction target (i.e. a carbon neutral region by 2050); and
- the regional role related to climate change adaptation and natural hazards is not well-defined in the regional growth strategy.

The Policy Review resulted in seven broad policy recommendations to help address these key issues in *Metro 2050*. The recommendations were endorsed by the Metro Vancouver Board at its meeting on January 29, 2021, and Goal 3 policy content was developed from these recommendations and was reviewed by the Regional Planning Committee and MVRD Board in April 9, 2021 (Reference 4). A 'climate lens' was applied the content in all five of the strategy's goal areas and integrated *Climate 2050* content where appropriate.

Metro 2050 reflects a balance of GHG emission reduction and resilience-focused policies that support the regional federation's stated climate action objectives, while respecting the unique needs and ambitions of individual signatories. When the draft Metro 2050 was released for comment (July-November 2021), the comments received from member jurisdictions, regional agencies, local First Nations and the public included both requests to soften and requests to strengthen the proposed climate action policies (Reference 5). A report summarizing the new language in Metro 2050 that strengthens the policy areas pertaining to GHG emission reductions and climate resilience, including actions for Metro Vancouver, member jurisdictions and TransLink, was presented to the Regional Planning Committee at its meeting on February 10, 2022, and to the Climate Action Committee at its

meeting on March 11, 2022 (Reference 6). A detailed summary of the new and amended climate change policies in *Metro 2050* can be reviewed in the Attachment.

CLIMATE 2050 AND METRO 2050 ARE MUTUALLY-SUPPORTIVE BUT DISTINCT PLANS

Metro 2050 and Climate 2050, while mutually-supportive and interconnected, are distinct plans with their own scopes and objectives. Over the past three years, Metro Vancouver staff have been working closely to coordinate research and policy directions in Metro 2050 and Climate 2050, and with TransLink staff as they developed Transport 2050. Early in the development process, Metro Vancouver and TransLink staff identified policy areas appropriate for each strategy based on respective mandates. As such, Metro 2050 leads on land use and growth management elements, Climate 2050 leads on GHG emissions reduction and resilience from all sectors within the region, and Transport 2050 leads on the long-term transportation and access needs of the region. Each strategy contains policies and actions that are complementary, supportive, and reflective of the other strategies and should be considered together.

Climate 2050 is the region's climate action plan, that is scoped to be ambitious, aspirational, and comprehensive, and intended to guide climate change policy and action for Metro Vancouver over the next 30 years (Reference 7). It is made up of a series of ten "Roadmaps" by issue area which are currently being developed and implemented, each of which reflects different emission sources and include goals, targets, actions, and performance measures for reducing emissions in the region. They are also meant to reflect both current policies and new directions to set a path toward a resilient, low carbon region, and outline regional (to be led by Metro Vancouver or other governments / organizations, and sometimes in partnership) and corporate actions (led by Metro Vancouver) based on the best ideas, approaches, and available technologies. Each of the Climate 2050 Roadmaps will ultimately each be considered by the MVRD Board and endorsed by resolution. Implementation of the Roadmaps will be driven by the Clean Air Plan, Metro 2050, and other management plans and policies such as those for liquid waste, solid waste, drinking water, and regional parks. For actions that are primarily the responsibility of others, Metro Vancouver can play a supporting, advocacy, and / or convening role.

If adopted, *Metro 2050* will be the regional growth strategy, a plan that is defined and prescribed by the *Local Government Act* and enacted by bylaw, which requires acceptance from all member jurisdictions. In many cases, actions included in the *Climate 2050 Roadmaps* are also included in *Metro 2050*. At the time of writing this report there are still four *Roadmaps* to be initiated. Following the adoption of *Metro 2050*, as the *Roadmaps* are finalized and endorsed, there will likely be additional opportunities to amend *Metro 2050* in the future with policy language that is mutually supportive of the two strategies.

CLIMATE 2050 LAND USE AND GROWTH MANAGEMENT ROADMAP

In support of *Climate 2050*, Regional Planning staff will be preparing a draft *Land Use and Growth Management Roadmap*. Land use and growth management overlaps with many issue areas and often intersects with the policies and actions of other plans and strategies. This *Roadmap* will be informed and based on the principles and goals of *Metro 2050*, and focused on the associated strategies and actions that will be required to reduce GHG emissions and build climate resilience in the region. It may also include climate action content that goes beyond the existing endorsed Metro Vancouver

policy actions of other *Roadmaps*, strategies, or current management plans (e.g. 'big moves', 'best practices', 'innovative ideas' or 'stretch goals'). It is anticipated that the *Roadmap* will inform future policy work and different policy areas / topics of *Metro 2050* and other Metro Vancouver management plans.

Staff are currently in the process of collecting and organizing ideas that will be considered for the draft Land Use and Growth Management Roadmap, including a thorough review of materials that were generated through all of the Metro 2040 policy reviews and the Climate 2050 discussion papers / Roadmaps. Metro Vancouver staff are working closely together to coordinate this work program with other related projects and initiatives both internally and externally to ensure efficiencies and mutually-supportive policy directions. Once the work on the draft Roadmap has been further advanced, it will be presented to the Climate Action and Regional Planning Committees for consideration, as well as others through a targeted engagement program with member jurisdictions.

CLIMATE ACTION POLICY AREAS TO EXPLORE FOR METRO 2050

In consideration of the Board's direction to explore strengthening climate action language and policy in *Metro 2050*, staff are proposing to first undertake policy analysis activities and engagement work to assess where improvements could be made, the integration with work being undertaken by member jurisdictions, and the likelihood of support for amendments. This review is intended to focus on climate change topic areas with strong connections to the content and goals of the regional growth strategy, including the identification of GHG emission reduction actions and resilience actions under the following areas:

- 1. Land Use, Communities, and Growth Low Carbon Resilient Growth Framework
 - Including consideration of implementation actions to enhance transit-oriented, growth structuring targets and urban containment and to minimize opportunities for 'sprawl' within the Urban Containment Boundary;
- 2. Industry, Business, and Agriculture Low Carbon Resilient Economy;
- Environment and Energy Thriving Ecosystems and Low Carbon Resilient Energy
- 4. Buildings and Housing Low Carbon Resilient Structures and Spaces;
- 5. Transportation and Goods Movement Low Carbon Resilient Mobility and Movement; and
- 6. Strengthening the language in existing policies (for example from 'consider' to 'undertake')
- 7. Other areas that may arise through review and engagement.

Scope and Engagement

The review will be prepared through the following phases, including some joint and overlapping work with the development of the draft *Climate 2050 Land Use and Growth Management Roadmap*.

Phase 1: Background Review and Early Engagement (Q2/3 of 2022)

Staff will consider all recent work on climate policy related to *Metro 2050*, *Climate 2050*, and other aligned projects. This will include background research and reviewing the recommendations of the *Metro 2040* Climate and Natural Hazards Policy Review (to determine where they can be strengthened, e.g. from "consider" to "require"), the content of the completed *Climate 2050 Roadmaps*, and the suggestions provided by Committee members during recent Regional Planning and Climate Action Committee meetings, including those from delegations. In addition, engagement

will be conducted with stakeholders, including with the Regional Planning Advisory Committee (RPAC). The work will be led by the Regional Planning Committee as per their terms of reference, however, other standing committees including the Climate Action Committee, Parks Committee and Liquid Waste Committee will be provided opportunity to provide input and feedback. This will take place in Q2 and Q3 of 2022.

Phase 2 Develop, Refine, and Organize Ideas (Q4 2022)

Policy ideas identified through the review and early engagement will be compiled. These policy ideas will then be organized into those that could be appropriate for *Metro 2050*, policies that could be appropriate for the Climate 2050 *Land Use and Growth Management Roadmap*, and policies that could be appropriate for both or other plans or strategies.

Phase 3 Engage with Stakeholders and Subject Matter Experts (Q1/2 2023)

A critical part of this work is building consensus around any proposed language or policy in considering a proposed amendment to *Metro 2050*. As the implementers of the regional growth strategy, member jurisdictions, TransLink, adjacent regional districts and Metro Vancouver departments must be willing to undertake, and therefore support the policy actions identified. When *Metro 2050* was developed, the level of commitment was tested with the Intergovernmental Advisory Committee and member jurisdictions Councils, and the resulting language was understood to be the limit of acceptance. If stronger language and policy is put forward, engagement will be key.

This phase will include considering support for strengthening the language of current policies in *Metro 2050* (e.g. using "support", "encourage", "require") as well as new policy generated through Phases 1 and 2. Engagement in early 2023 will be undertaken with RPAC, external subject matter experts, and interested standing committees of the Board. As climate action is a crucial part of Metro Vancouver's commitments and Board Strategic Plan, there may be opportunities to seed the policy ideas generated into other management plans, ensuring compatibility and consistency.

Phase 4: Prepare Recommendations (Q2 2023)

Review engagement data and prepare recommendations for the Regional Planning Committee and MVRD Board on possible amendments to *Metro 2050* and seek support and direction.

NEXT STEPS

Staff anticipate that the *Metro 2050* adoption schedule will continue to proceed as directed by the MVRD Board, with possible consideration of bylaw adoption in July 2022. The commitment to undertake this review is intended to signal to the new Board post local elections, the desire to explore stronger climate action language and policy in Metro 2050. The findings of the review and engagement results will be reported out to the Regional Planning Committee and Board as available, together with the draft *Climate 2050 Land Use and Growth Management Roadmap*.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

There are no financial implications to this report.

CONCLUSION

The MVRD Board recently directed staff to explore stronger language and policy for *Metro 2050* with regards to GHG emission reductions and regional resilience, driven in part by the unprecedented climate change-related impacts the region and surrounding areas suffered in 2021 including the heat dome, wildfires, landslides, and flooding. Regional Planning staff have prepared a proposed scope of work and engagement plan to explore opportunities for stronger climate change policy language and possible amendments to *Metro 2050*, as well as preparing the *Climate 2050 Land Use and Growth Management Roadmap*. The *Metro 2050* adoption schedule will continue to proceed as directed by the MVRD Board, with consideration of bylaw adoption in July 2022.

Over the latter half of 2022, staff will engage with stakeholders and subject matter experts on stronger climate action language and policy for Metro 2050 as well as on the *Climate 2050 Land Use and Growth Management Roadmap*, and will prepare recommendations on enhanced policies for the Regional Planning Committee and Board's consideration early in 2023.

Attachment

Comparison of Climate Actions in *Metro 2040* and Draft *Metro 2050*

References

- 1. <u>Consideration of Metro Vancouver Regional District Regional Growth Strategy Bylaw No. 1339, 2022</u>, a bylaw to adopt Metro 2050, Staff Report, March 9, 2022
- 2. Report dated March 28, 2019, titled "Towards Metro 2050: Updating Metro Vancouver 2040: Shaping our Future" presented to the MVRD Board at its regular meeting of April 26, 2019.
- 3. Report dated January 6, 2021, titled "Metro 2040 Climate Change and Natural Hazards Policy Review Recommendations" presented to the Regional Planning Committee at its regular meeting of January 14, 2021.
- 4. Report dated March 26, 2021, titled "Metro 2050 Draft Policy Language Goal 3: Protect the Environment and Respond to Climate Change Impacts and the Implementation Section" presented to the Regional Planning Committee at its regular meeting of April 9, 2021.
- 5. Report dated January 7, 2022, titled "Comments on the Draft of *Metro 2050* and Proposed Next Steps" presented to the Regional Planning Committee at its regular meeting of January 14, 2022.
- 6. Report dated February 4, 2022, titled "Metro 2050 Next Steps: Addressing Member Jurisdiction Comments and Climate Policy" presented to the Regional Planning Committee at its regular meeting of February 10, 2022.
- 7. http://www.metrovancouver.org/climate2050

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Comparison of Climate Actions in Metro 2040 and Draft Metro 2050

Each Goal **preamble** and **strategy rationale** describes the relevance of greenhouse gas emission reductions and climate change resilience for the Goal area.

Metro 2040 Climate Actions	Metro 2050 Climate Actions			
Goal 1: Create a Compact Urban Area				
No specific climate actions for UCs or FTDAs	Strategy 1.2 Focus growth in Urban Centres and Frequent Transit Development Areas Metro Vancouver will: 1.2.15 Work with First Nations and other appropriate agencies to ensure that new development and infrastructure investment is directed to areas that are transit-oriented and resilient to climate change impacts and natural hazards.			
	1.2.19 Advocate to the Province that any future or expanded rail-based rapid transit service: a) avoid locations that are exposed to unmitigated natural hazards and climate change risk;			
	Member Jurisdictions will: 1.2.26 Collaborate with member jurisdictions and other stakeholders on the expansion of the Frequent Transit Network, Major Transit Network, and new transit stations, and avoid expansion of permanent transit infrastructure into hazardous areas. Where risk is unavoidable, such as in existing settlements, use risk-mitigation or climate change adaptation strategies in the expansion of transit infrastructure.			
No specific climate actions for complete communities	Strategy 1.3 Develop resilient, healthy, connected, and complete communities with a range of services and amenities Metro Vancouver will: 1.3.1 Support member jurisdictions and work with First Nations in developing resilient, healthy, connected, and complete communities through regional strategies, research, and best practices that: b) reduce greenhouse gas emissions, bolster resilience to climate change impacts and natural hazards, and improve social equity, universal accessibility, and inclusive engagement; and 1.3.2 Provide technical advice, assistance, research, and data to member jurisdictions and other agencies to improve air quality, reduce greenhouse gases, increase access to community services, and to better understand the health and social equity aspects of land use and infrastructure decisions.			
No specific climate actions	1.3.3 Collaborate with health authorities, academic institutions, First Nations, and other researchers to share best practices, research, data, and tools that can advance land use policies to: c) reduce community exposure to climate change and air quality impacts, especially communities that are disproportionally impacted; and Member Jurisdictions will: 1.3.7 Adopt Regional Context Statements that: d) respond to health and climate change-related risks by providing equitable access to: i) recreation facilities; ii) green spaces and public spaces (e.g. parks, trails, urban forests, public squares, etc.); and iii) safe and inviting walking, cycling, and rolling environments, including resting spaces with tree canopy coverage, for all ages and abilities; Strategy 1.4 Protect Rural lands from urban development			
for Rural lands	Member Jurisdictions will: 1.4.3 Adopt Regional Context Statements that: e) support the protection, enhancement, restoration, and expansion of ecosystems identified on Map 11 to maintain ecological integrity, enable ecosystem connectivity, increase natural carbon sinks and enable adaptation to the impacts of climate change.			

Metro 2040 Climate	Metro 2050 Climate Actions			
Actions	Wetro 2000 chillate Actions			
Goal 2: Support a Sustainable Economy				
No specific climate actions Strategy 2.1 Promote land development patterns that support a dive				
for Industrial lands	regional economy and employment opportunities close to where people live			
	Metro Vancouver will:			
	2.1.6 Advocate that airport authorities:			
	c) develop strategies to adapt to climate change impacts and natural hazard risks.			
	2.1.7 Advocate that the Port of Vancouver: c) develop strategies to adapt to climate change impacts and natural hazard risks.			
	Strategy 2.2 Protect the supply, and enhance the efficient use of, industrial land			
	Member jurisdictions will:			
	2.2.9 Adopt Regional Context Statements that:			
	c) include policies for Industrial lands that:			
	ix) consider the preparation of urban design guidelines for Industrial land edge planning, such as interface designs, buffering standards, or tree planting, to minimize potential land use conflicts between industrial and			
	sensitive land uses, and to improve resilience to the impacts of climate change; and			
	e) include policies to assist existing and new businesses in reducing their greenhouse gas emissions , maximizing energy efficiency, and mitigating impacts on ecosystems.			
	f) include policies that assist existing and new businesses to adapt to the impacts of climate change and reduce their exposure to natural hazards risks, such as those identified within the regional growth strategy (Table 5).			
No specific climate actions for Agricultural lands	Strategy 2.3 Protect the supply of agricultural land and strengthen agricultural viability Metro Vancouver will:			
	2.3.9 Advocate to the Province to increase agricultural producers' knowledge and adoption of innovative practices for advancing agriculture economic development, and resilience to climate change and natural hazard impacts, such as those identified in the regional growth strategy (Table 5).			
	2.3.10 Advocate to the Province to provide incentives to encourage land management practices that reduce greenhouse gas emissions , improve soil health, protect natural assets, and maintain ecosystem services from agricultural land.			
	Member Jurisdictions will: 2.3.12 Adopt Regional Context Statements that: c) include policies that protect the supply of agricultural land and strengthen agriculture viability including those that: iii) support climate change adaptation including: • monitor storm water, flooding, and sea level rise impacts on agricultural land, • implement flood construction requirements for residential uses, • and maintain and improve drainage and irrigation infrastructure			
	 and maintain and improve drainage and irrigation infrastructure that supports agricultural production, where appropriate and in collaboration with other governments and agencies; 			

Metro 2040 Climate Actions	Metro 2050 Climate Actions	
Goal 3: Protect the Environment	Goal 3: Protect the Environment and	
and Respond to Climate Change	Respond to Climate Change and Natural	
Impacts	Hazards	
Strategy 3.1 Protect Conservation and	Strategy 3.1 Protect and enhance Conservation and	
Recreation lands	Recreation lands	
No specific climate actions for Conservation	Member jurisdictions will:	
and Recreation lands	3.1.9 Adopt Regional Context Statements that:	
	b) include policies that support the protection and	
	enhancement of lands with a Conservation and	
	Recreation land use designation, which may include the following uses:	
	vii) ecosystems not covered above that may be	
	vulnerable to climate change and natural hazard	
	impacts, or that provide buffers to climate change	
	impacts or natural hazard impacts for communities; and	
	viii) uses within those lands that are appropriately	
	located, scaled, and consistent with the intent of the designation, including:	
	land management activities needed to minimize	
	vulnerability / risk to climate change impacts.	
Strategy 3.2 Protect and enhance natural	Strategy 3.2 Protect, enhance, restore, and connect	
features and their connectivity	ecosystems	
No specific climate actions for ecosystems	Metro Vancouver will:	
	3.2.2 Implement the Metro Vancouver Ecological Health Framework, including relevant actions to:	
	a) collect and maintain data, including the Sensitive	
	Ecosystem Inventory, tree canopy cover, imperviousness,	
	and carbon storage datasets; report on gains and losses	
	and climate change impacts on ecosystems; and share	
	these datasets with member jurisdictions; and	
	b) incorporate natural assets and ecosystem services into Metro Vancouver's corporate planning, asset	
	management systems and investments, and provide	
	regionally appropriate guidance on methodologies, tools	
	and decision-making frameworks.	
	3.2.3 Manage Metro Vancouver assets and collaborate	
	with member jurisdictions, First Nations, and other	
	agencies to:	
	b) identify ecosystems that may be vulnerable to climate	
	change and natural hazard impacts as part of regional	
	multi-hazard mapping in Action 3.4.2 a); c) identify a regional green infrastructure network that	
	connects ecosystems and builds on existing local	
	networks, while maximizing resilience , biodiversity, and	
	human health benefits; and	
	3.2.6 Advocate to the Federal Government and the	
	Province to:	
	b) support the uptake of nature-based climate change	
	solutions, including those that protect or restore	
	foreshore ecosystems;	
	Member jurisdictions will:	
	3.2.7 Adopt Regional Context Statements that: c) include policies that:	
	i) support the consideration of natural assets and	
	ecosystem services in land use decision-making and land	
	management practices;	
	ii) enable the retention and expansion of urban forests	
	using various tools, such as local tree canopy cover	
	targets, urban forest management strategies, tree regulations, development permit requirements, land	
	regulations, development permit requirements, land	

Metro 2040 Climate Actions Metro 2050 Climate Actions acquisition, street tree planting, and reforestation or restoration policies, with consideration of resilience; Strategy 3.3 Encourage land use and Strategy 3.3 Encourage land use, infrastructure, and transportation infrastructure that reduce human settlement patterns that reduce energy energy consumption and greenhouse gas consumption and greenhouse gas emissions, create emissions, and improve air quality carbon storage opportunities, and improve air quality Metro Vancouver will: Metro Vancouver's role is to: 3.3.1 Implement the: 3.3.1 Implement the strategies and actions of a) strategies and actions of the regional growth strategy the Regional Growth Strategy that contribute that contribute to regional targets to reduce greenhouse to regional targets to reduce greenhouse gas gas emissions by 45% below 2010 levels by the year emissions by 45 percent below 2010 levels by 2030 and to achieve a carbon neutral region by the year 2030 and to achieve a carbon neutral region by 2050. Figure 3 identifies examples of b) Metro Vancouver Clean Air Plan, Climate 2050, and other associated actions to help achieve the regional strategies and actions contained in the greenhouse gas emissions reduction targets in Action Regional Growth Strategy to address climate Metro Vancouver's role is to: Metro Vancouver will: 3.3.2 Work with the federal government and 3.3.2 Work with the Federal Government, the Province,

- 3.3.2 Work with the federal government and the province, TransLink, municipalities, non-governmental organizations, and the private sector to:
- a) support the ongoing monitoring of energy consumption, greenhouse gas emissions, and air quality related to land use and transportation infrastructure;
- b) promote best practices and develop guidelines to support local government actions to reduce energy consumption and greenhouse gases, and improve air quality related to land use and transportation infrastructure (e.g. district heating systems and renewable energy opportunities).
- 3.3.2 Work with the Federal Government, the Province, TransLink, member jurisdictions, First Nations, non-governmental organizations, energy utilities, the private sector, and other stakeholders, as appropriate, to:
 a) monitor energy consumption, greenhouse gas emissions, and air quality related to land use, buildings, industry, agriculture, waste, transportation, and other emission sources, and consider lifecycle energy and emissions;
- b) monitor and pursue opportunities to increase carbon storage in natural areas; and
- c) promote best practices and develop guidelines to support local government actions that reduce energy consumption and greenhouse gas emissions, **support a transition to clean, renewable energy (including electricity), create carbon storage opportunities**, and improve air quality.
- 3.3.4 Work with the Federal Government, the Province, and other stakeholders when conducting environmental assessments to reduce the environmental and health impacts related to regional air quality and **greenhouse** gas emissions.

Metro Vancouver's role is to:

3.3.3 Accept Regional Context Statements that encourage land use and transportation infrastructure that reduce energy consumption and greenhouse gas emissions, and improve air quality, and that meet or work towards Action 3.3.4.

Metro Vancouver will:

3.3.5 Accept Regional Context Statements that encourage land use, infrastructure, and settlement patterns that reduce energy consumption and greenhouse gas emissions, improve air quality, **create carbon storage opportunities**, and that meet or work towards Action 3.3.7.

Metro 2040 Climate Actions

Actions Requested of Other Governments and Agencies

- 3.3.8 That the federal government and the province and their agencies establish further legislative and fiscal actions to help the public and private sectors to maximize reductions in energy consumption and greenhouse gas emissions, and improve air quality, such as:
 a) in the building sector,
- accelerate the modernization of the BC Building Code
- increase incentives for residential and commercial building retrofits
- support, where feasible and appropriate, energy recovery, renewable energy generation and district energy systems and related transmission needs

- b) in the transportation sector,
- enable the implementation of regional transportation demand management measures such as transportation user-based pricing
- increase funding for sustainable transportation infrastructure
- continue to advance stringent standards for on road vehicle emissions and fuel carbon content

The role of municipalities is to:

- 3.3.4 Adopt Regional Context Statements
- a) identify how municipalities will use their land development and transportation strategies to meet their greenhouse gas reduction targets and consider how these targets will contribute to the regional targets; b) identify policies and/or programs that reduce energy consumption and greenhouse gas emissions, and improve air quality from land use and transportation infrastructure, such as:
 - existing building retrofits and construction of new buildings to green performance guidelines or standards, district energy systems, and energy recovery and renewable energy generation technologies, such

Metro 2050 Climate Actions

Metro Vancouver will:

- 3.3.6 Advocate to the Federal Government and the Province to establish and support legislative and fiscal actions, that help the public and private sector maximize reductions in energy consumption and greenhouse gas emissions, and improve air quality, such as:
- a) in the building sector,
- accelerating the transition of energy efficiency requirements in the BC Building Code to net zero energy ready levels by 2032;
- setting greenhouse gas and energy performance requirements for new and existing buildings;
- iii) increasing incentives and financing tools for new low-carbon, zero-emissions, and resilient buildings;
- iv) supporting large-scale building electrification;
- v) requiring **benchmarking and energy labels** for new and existing buildings;
- vi) supporting reductions in embodied emissions of buildings, and the increased use of low-carbon circular building products and processes;
- vii) supporting programs, services and incentives for **low-carbon** upgrade options in rental buildings that benefit building owners and tenants;
- viii) incenting equitable **transit-oriented development** through policy and funding programs; and
- ix) supporting, where feasible and appropriate, energy recovery, renewable energy generation and **zero-carbon** district energy systems, and related transmission needs.
- b) in the transportation sector,
- revising enabling legislation to allow regional road usage charging for the purposes of managing congestion and greenhouse gases;
- supporting electric vehicle charging in new and existing buildings through requirements and programs;
- continuing to increase the amount of reliable and sustainable funding available for sustainable transportation infrastructure and low emission travel modes, such as active transportation and public transit; and
- iv) continuing to advance stringent standards for onroad vehicle emissions and fuel carbon content.

Member jurisdictions will:

- 3.3.7 Adopt Regional Context Statements that:
- a) identify how local land use and transportation policies will contribute to meeting the regional greenhouse gas reduction target of 45% below 2010 levels by the year 2030 and achieving a carbon neutral region by the year 2050.
- b) identify policies, actions, incentives, and / or strategies that reduce energy consumption and greenhouse gas emissions, **create carbon storage opportunities**, and improve air quality from land use, infrastructure, and settlement patterns, such as:
- i) existing building retrofits and construction of new buildings to meet energy and greenhouse gas performance guidelines or standards (e.g. BC Energy Step Code, passive design), the electrification of building heating systems, green demolition requirements, embodied emissions policies, zerocarbon district energy systems, and energy recovery and

Metro 2040 Climate Actions

- as solar panels and geoexchange systems, and electric vehicle charging infrastructure;
- community design and facility provision that encourages transit, cycling and walking (e.g. direct and safe pedestrian and cycling linkages to the transit system);
- c) focus infrastructure and amenity investments in Urban Centres and Frequent Transit Development Areas, and at appropriate locations along TransLink's Frequent Transit Network;
 d) implement land use policies and development control strategies which support integrated storm water management and water conservation objectives.*

Metro 2050 Climate Actions

renewable energy generation technologies, such as solar panels and geoexchange systems, and **zero emission** vehicle charging infrastructure; and

- ii) community design, infrastructure, and programs that encourage transit, cycling, rolling and walking; and c) focus infrastructure and amenity investments in Urban Centres and Frequent Transit Development Areas, and at appropriate locations along Major Transit Growth Corridors.
- *d) moved to 3.2.7 c) iv)

Actions Requested of Other Governments and Agencies

- 3.3.6 That TransLink pursue reductions of common air contaminants and greenhouse gas emissions from on-road transportation sources in support of regional air quality objectives and greenhouse gas reduction targets.
- 3.3.7 That TransLink manage its transit fleet and operations with the goal of increasing fuel efficiency and reducing common air contaminants and greenhouse gas emissions over time, in support of the Regional Growth Strategy and Air Quality Management Plan.

TransLink will:

3.3.8 Support regional air quality objectives and greenhouse gas emission reduction targets by advancing policy and infrastructure to support the aggressive transition of the ground-based vehicle fleet to zero-emissions, and by transitioning the entire transit fleet to one that utilizes low-carbon fuels.

Actions Requested of Other Governments and Agencies

3.3.5 That TransLink, in collaboration with Metro Vancouver and municipalities, establish criteria for defining major development proposals, which are referenced in the South Coast British Columbia Transportation Authority Act, in order to help meet the objective of concentrating major trip-generating uses in areas well served by transit.

TransLink will:

3.3.9 In collaboration with Metro Vancouver and member jurisdictions, establish a definition of major development proposals, which are referenced in the *South Coast British Columbia Transportation Authority Act*, to support the objective of concentrating Major Trip-Generating uses in areas well served by transit.

Strategy 3.4 Encourage land use and transportation infrastructure that improve the ability to withstand climate change impacts and natural hazard risks

Strategy 3.4 Encourage land use, infrastructure, and human settlement patterns that improve resilience to climate change impacts and natural hazards

Metro Vancouver's role is to:

3.4.1 Incorporate climate change and natural hazard risk assessments into the planning and location of Metro Vancouver utilities, assets and operations.

Metro Vancouver will:

3.4.1 Incorporate climate change and natural hazard risk assessments into the planning and location of existing and future Metro Vancouver utilities, assets, operations, and other critical infrastructure.

Metro 2040 Climate Actions

Metro Vancouver's role is to:

- 3.4.2 Work with the federal government and the province, TransLink and municipalities to: a) consider climate change impacts (e.g. sea level rise) and natural hazard risks (e.g. earthquake, flooding, erosion, subsidence, mudslides, interface fires) when extending utilities and transportation infrastructure that encourages land use development; b) research and promote best practices in adaptation to climate change as it relates to land use planning.
- 3.4.6 That the Integrated Partnership for Regional Emergency Management, in collaboration with the federal government and the province, and other agencies:
 a) identify areas that are vulnerable from climate change and natural hazard risks, such as those listed in Actions 3.4.2 and 3.4.4; b) coordinate priority actions to address the vulnerabilities identified, including implementation and funding strategies.
- 3.4.7 That the federal government and the province, in collaboration with the Integrated Partnership for Regional Emergency Management and other agencies:
 a) provide financial assistance and timely data and information, such as flood hazard mapping, shoreline mapping, hydrological and hydraulic studies, to better enable local governments to fulfill their flood hazard management roles and responsibilities; b) provide a coordination role to address flood hazard issues and management decisions:
- c) implement appropriate preparatory actions to address the implications of long-term sea level rise on infrastructure planning, construction, and operations;
- d) review and improve the effectiveness of existing provincial legislation and guidelines regarding flood hazard management by municipalities.

Metro Vancouver's role is to:

3.4.3 Accept Regional Context Statements that encourage land use, transportation and utility infrastructure which improve the ability to withstand climate change impacts and natural hazard risks and that meet or work towards Actions 3.4.4 and 3.4.5.

Metro 2050 Climate Actions

Metro Vancouver will:

- 3.4.2 Work with the Integrated Partnership for Regional Emergency Management, the Federal Government, the Province, First Nations, TransLink, member jurisdictions, adjacent regional districts, and other stakeholders, as appropriate, to:
- a) collaboratively develop and share information and data related to hazards, risks, and vulnerabilities in the Metro Vancouver region, which may include preparing a regional multi-hazard map, and identifying and coordinating priority actions, implementation strategies, and funding mechanisms;
- b) plan for climate change impacts and natural hazard risks when extending utilities and transportation infrastructure that support development;
- c) support the integration of emergency management, utility planning, and climate change adaptation principles in land use plans, transportation plans, and growth management policies;
- d) research and promote best practices and develop guidelines to support resilience to the impacts of climate change and natural hazards as it relates to planning and development;
- e) **support regional flood management approaches**, such as the implementation of the Lower Mainland Flood Management Strategy; and
- f) research and share information related to the impacts of climate change and natural hazards on vulnerable populations, and focus resilience actions on equitable outcomes.
- 3.4.4 Advocate to the Federal Government and the Province that they:
- a) review and improve existing provincial legislation and guidelines regarding flood hazard management at the local level, encourage the adoption of local flood hazard policies and bylaws, and implement appropriate preparatory actions to address the long-term implications of sea level rise on infrastructure planning, construction, and operations;
- b) incorporate resilience considerations into building codes and standards;
- c) modernize the provincial *Emergency Program Act* and associated regulations with requirements for land use planning, and consider land use implications in the development of climate change adaptation strategies; and
- d) provide guidelines, programs, funding, and timely data and information to support regional and local planning for climate change impacts and natural hazards.

Metro Vancouver will:

3.4.3 Accept Regional Context Statements that encourage land use, settlement patterns,

transportation and utility infrastructure which improve the ability to withstand climate change impacts and minimize natural hazard risks, and that meet or work towards Actions 3.4.5, 3.4.6, 3.4.7, and 3.4.8.

Metro 2040 Climate Actions	Metro 2050 Climate Actions	
The role of municipalities is to:	Member jurisdictions will:	
3.4.4 Adopt Regional Context Statements	3.4.5 Adopt Regional Context Statements that:	
that include policies to encourage settlement	a) include policies that minimize risks associated with	
patterns that minimize risks associated with	climate change and natural hazards in existing	
climate change and natural hazards (e.g.	communities through tools such as heat and air quality	
earthquake, flooding, erosion, subsidence,	response plans, seismic retrofit policies, and flood-	
mudslides, interface fires).	proofing policies; and	
	b) include policies that discourage new development in	
	current and future hazardous areas to the extent	
	possible through tools such as land use plans, hazard- specific Development Permit Areas, and managed	
	retreat policies, and where development in hazardous	
	areas is unavoidable, mitigate risks.	
3.4.5 Consider incorporating climate change	3.4.6 Incorporate climate change and natural hazard risk	
and natural hazard risk assessments into the	assessments into planning and location decisions for new	
planning and location of municipal utilities,	municipal utilities, assets, operations, and community	
assets and operations.	services.	
	3.4.7 Integrate emergency management, utility	
	planning, and climate change adaptation principles	
	when preparing land use plans, transportation plans, and growth management policies.	
	and growth management policies.	
	3.4.8 Adopt appropriate planning standards, guidelines,	
	and best practices related to climate change and natural	
	hazards, such as flood hazard management guidelines	
	and wildland urban interface fire risk reduction	
	principles.	
Goal 4: Develop Complete	Goal 4: Provide Diverse and Affordable	
dour 4. Develop complete	Godi 4. I Tovide Diverse dia Ariordable	
Communities	Housing Choices	
Communities No specific climate actions for housing	Housing Choices Strategy 4.1 Expand the supply and diversity of housing	
Communities No specific climate actions for housing	Housing Choices Strategy 4.1 Expand the supply and diversity of housing to meet a variety of needs	
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	Strategy 4.1 Expand the supply and diversity of housing to meet a variety of needs Member jurisdictions will: 4.1.8 Adopt Regional Context Statements that: c) identify policies and actions that contribute to the	
	Strategy 4.1 Expand the supply and diversity of housing to meet a variety of needs Member jurisdictions will: 4.1.8 Adopt Regional Context Statements that: c) identify policies and actions that contribute to the following outcomes:	
	Strategy 4.1 Expand the supply and diversity of housing to meet a variety of needs Member jurisdictions will: 4.1.8 Adopt Regional Context Statements that: c) identify policies and actions that contribute to the following outcomes: viii) existing and future housing stock that is low carbon	
	Strategy 4.1 Expand the supply and diversity of housing to meet a variety of needs Member jurisdictions will: 4.1.8 Adopt Regional Context Statements that: c) identify policies and actions that contribute to the following outcomes: viii) existing and future housing stock that is low carbon and resilient to climate change impacts and natural	
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Metro 2040 Climate Content	Metro 2050 Climate Content	
Goal 5: Support Sustainable Transportation Choices		
Metro Vancouver's role is to:	Strategy 5.1 Coordinate land use and transportation to	
5.1.2 Communicate to TransLink that	encourage transit, multiple-occupancy vehicles, cycling and	
Metro Vancouver's objectives for the	walking	
regional transportation system are:	Metro Vancouver will:	
b) to support energy consumption ,	5.1.2 Establish the following objectives for the regional	
greenhouse gas emission, and air	transportation system:	
quality objectives (as described in	b) reduce energy consumption and greenhouse gas emissions	
Strategy 3.3).	while improving air quality, as set out in Strategy 3.3; and	
	TransLink will:	
	5.1.15 In support of coordinated land use and transportation to	
	encourage transit, multiple occupancy vehicles, cycling, walking,	
	and rolling:	
	f) work with the Province, the Integrated Partnership for	
	Regional Emergency Management, and member jurisdictions to	
	evaluate the potential impacts of climate change and known	
	unmitigated natural hazards on rapid transit alignments, station	
	locations, and associated transportation infrastructure;	
No specific climate actions for land	Strategy 5.2 Coordinate land use and transportation to support	
use and transportation coordination	the safe and efficient movement of vehicles for passengers,	
	goods, and services	
	Metro Vancouver will:	
	5.2.4 Advocate to the Province, TransLink, and neighbouring	
	regional districts to request that the following elements are	
	considered when contemplating future expansion of private	
	vehicle capacity on major roads, highways, and crossings:	
	b) the negative impacts on the achievement of regional	
	greenhouse gas emission reduction targets and air quality	
	objectives;	
	f) the ability of the transportation system to withstand known	
	and unmitigated climate change impacts and natural hazards.	



To: Regional Planning Committee

From: Mark Seinen, Senior Planner, Regional Planning and Housing Services

Date: April 11, 2022 Meeting Date: May 19, 2022

Subject: Regional Parking Strategy – Scope of Work

RECOMMENDATION

That the MVRD Board receive for information the report dated April 11, 2022, titled "Regional Parking Strategy – Scope of Work".

EXECUTIVE SUMMARY

Regional Planning is initiating a Regional Parking Strategy that builds on the Apartment Parking Studies completed in 2012 and 2018. The Regional Parking Strategy will develop policy guidance aimed at reducing the amount of under-utilized parking and, as a result, the construction cost of new housing. The Strategy will provide best practices and guidance on:

- developing new and amended parking policies and regulations;
- reducing the supply of both parking spaces and vehicles; and
- how best to pursue greater land efficiency and housing affordability through reduced construction costs.

Member jurisdictions have requested that the project scope emphasize strategic planning and the provision of guidance, rather than simply data collection. The Strategy will feature a demand-side (pricing-based) element and be steered by a Technical Working Group. The project will be completed by the end of 2023.

PURPOSE

The purpose of this report is to advise the Regional Planning Committee and MVRD Board of the Regional Parking Strategy's scope of work and timeline.

BACKGROUND

Metro 2050 includes a commitment by Metro Vancouver to collaboratively develop a Regional Parking Strategy to provide guidance and best practice research to member jurisdictions to inform efforts to right-size the supply of parking in the region, reduce the number of vehicles, make more efficient use of the limited land supply, and improve housing and transportation affordability. This report presents the scope of work for the project.

REGIONAL PARKING STRATEGY

Metro 2050's policy action 5.1.6 sets out the need to undertake the Regional Parking Strategy. Specifically, it states that:

Metro Vancouver will collaborate with member jurisdictions and TransLink to jointly develop a regional parking strategy that:

- a) provides guidance to inform municipal parking requirements;
- b) considers local needs through customized guidance for different land use and transportation contexts; and
- c) seeks to right-size the supply of parking in the region, reduce the number of vehicles, make more efficient use of the limited land supply, and improve housing and transportation affordability.

Previous Regional Parking Initiatives

Metro Vancouver's role in developing regional parking strategies dates back to 1996, when A Comprehensive Parking Management Strategy for Greater Vancouver was published. That plan contained a number of progressive policy recommendations that were not implemented.¹

Metro Vancouver completed a regional Apartment Parking Study in 2012 and updated it in 2018 (Reference). For the studies, Metro Vancouver and TransLink collected parking utilization data across a sample of apartment sites and on nearby streets around the region (80 in the Fall of 2011, supplemented by 73 in the Fall of 2017). The key findings from the 2018 Study were as follows:

- 1. For both the surveyed rental and strata tenure buildings, apartment parking supply exceeded use across the region.
- 2. Apartment parking supply and use was lower for buildings closer to frequent transit.
- 3. Transit use was generally higher where apartment parking use was lower, especially for rental buildings.
- 4. Street parking is complex in mixed-use neighbourhoods.
- 5. The design and capacity of bicycle parking facilities in apartment buildings appeared to discourage use by many residents.

Objectives and Scope of Work

The intent of the regional parking strategy project is to build upon the findings of the 2012 and 2018 Apartment Parking Studies by preparing parking policy guidance that may be used by member jurisdictions, Metro Vancouver, and other agencies.

Through early discussions with member jurisdiction and TransLink staff, the minimum scope of the project is intended to provide best practices and guidance on:

- developing new and amended parking policies and regulations;
- reducing the supply of both parking spaces and vehicles; and
- how best to pursue greater land efficiency and housing affordability through reduced construction costs.

The full scope of work for the Regional Parking Strategy is still being developed. Finalizing the scope will be the first project task, which is to be completed with the assistance of a staff technical working

¹ For example: parking maximums and employer parking cash-out.

group. This will include exploring potential policy options such as: parking maximums, secure bicycle parking, and parking for non-residential land uses (industrial, commercial, office, institutional, etc.). Importantly, this task will also identify the items not to be included in the project scope (e.g. other aspects of Transportation Demand Management, such as pricing).

The project will consist of primarily research tasks, which could include the:

- review of existing municipal policies and bylaws;
- review of recent local parking strategies;
- best practice review of peer communities;
- assessment of the latest Census and TransLink Trip Diary data, leveraging concurrent work on the Housing and Transportation Cost Burden Study Update; and
- economic analysis of reducing or removing parking minimums (or implementing maximums) for development finance, housing, and transportation.

Project completion is expected by the end of 2023.

Technical Working Group

A Technical Working group will be struck to finalize the project scope, advise on project decisions, and engage in close review of deliverables, including any draft recommendations. This technical working group will include representatives from: Metro Vancouver, TransLink, and any interested member jurisdiction staff. The technical working group would meet on a regular schedule (e.g. once per month) which may increase as the core project work begins.

Staff engaged the Regional Planning Advisory Committee (RPAC) at its meeting on April 8, 2022 and confirmed interest from several member jurisdictions in the project and in participating on the Technical Working Group.

Potential Demand-Side Stream and TransLink Involvement

The minimum project scope, informed by *Metro 2050*'s policy action 5.1.6, does not necessarily include demand-side (pricing-based) elements of parking policy such as: rate regulation, parking taxes, permit zones, and employer cash-out programs.

One possible project approach, which is to be confirmed through further discussion, is to supplement Metro Vancouver's regional parking strategy work with a parallel project, led by TransLink staff, that could consider demand-side (pricing-based) parking strategies. This would allow procurement processes to proceed separately, while coordinating efforts between the agencies and allowing for a discussion of parking demand and supply issues at the same time. Metro Vancouver and TransLink have used similar project management approaches on recent projects such as the *Regional Resilience Framework* and *Long-Range Growth and Transportation Scenarios*. If this approach is acceptable to TransLink and member jurisdictions, details would be outlined in a project Terms of Reference and presented to the Regional Planning Committee at a future meeting.

To date, Metro Vancouver and TransLink staff have engaged in a series of discussions about the possible scope of work for the Regional Parking Strategy. These discussions have confirmed a mutual

interest in parking policy and suggested the potential for the broader TransLink involvement described in this section.

At its April 8, 2022 meeting, RPAC discussed and confirmed its support for a comprehensive approach to the project that would include a demand-side (pricing) component.

Potential Survey

The 2012 and 2018 Apartment Parking Studies were largely survey exercises, involving parking utilization field surveys at 153 apartment sites. Undertaking parking utilization field surveys were considered, but will not be included in the scope of work for the Regional Parking Strategy for the following reasons:

- Cost field surveys have a significant labour cost and must occur in the evening; gaining access to buildings is a substantial coordination effort.
- Reliability the COVID-19 pandemic has disrupted commuting and parking patterns, so while
 an update could be useful, the survey data collected may not be reliable until we enter the
 post-pandemic period.
- Need the 2018 study broadly corroborated the findings of the 2012 study. The estimate of excess (unused) parking for strata apartments was 18 to 35 percent in the 2012 study and 42 percent in the 2018 study. These numbers are also consistent with findings from similar studies in other cities and not expected to vary significantly if surveyed again.²
- Usefulness the regional parking strategy's guidance will likely be generalized and expressed in ranges. Additional local study would be required prior to implementing any of its recommendations. For these reasons, the guidance may not benefit from the additional precision that would be gained through greater survey samples.
- Timeliness it has been almost five years since the 2017 surveys, which occurred six years after the 2011 surveys.

RPAC expressed support for a project scope that emphasizes strategic planning and the provision of guidance, rather than simply data collection. Several member jurisdictions noted the benefits of leveraging recently compiled local parking utilization data as a means to enhance the 2012 and 2018 study datasets.

Communications and Reporting Out

The principal audiences for the project include the Regional Planning Committee and MVRD Board, TransLink, member jurisdiction planning staff, senior levels of government, the real estate development industry, and the public.

On completion of the projection, Regional Planning staff will work closely with Metro Vancouver's External Relations staff to manage the release of the Regional Parking Strategy findings and recommendations, and develop supplemental materials (e.g. web content). Prior to releasing any public-facing findings or recommendations, staff will engage with member jurisdiction staff via the technical working group and RPAC to review and comment on any policy recommendations or new

² King County, WA estimates an <u>oversupply of 40 percent</u> for multi-family buildings. Metro Boston, MA estimates an <u>oversupply of 30 percent</u>.

directions, and collaborate on communication. Coordination will also be needed with TransLink's Communications team, especially if joint work products are developed.

Staff will provide status updates to RPAC, the Regional Planning Committee and the MVRD Board at significant project milestones through 2022 and 2023.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Funding to support hiring a consultant(s) in the amount of \$50,000 is part of the Board-approved 2022 Regional Planning budget.

CONCLUSION

Metro Vancouver is initiating a regional parking strategy that builds upon the Apartment Parking Studies completed in 2012 and 2018. The regional parking strategy project will undertake research of best practices and develop parking policy guidance aimed at reducing the amount of under-utilized parking and improving housing affordability through reduced construction costs. The project will be completed by the end of 2023.

Reference

Metro Vancouver Regional Parking Studies

48514946



To: Regional Planning Committee

From: Erin Rennie, Senior Planner, and Laurie Bates-Frymel, Senior Planner,

Regional Planning and Housing Services

Date: April 11, 2022 Meeting Date: May 19, 2022

Subject: Social Equity in Regional Growth Management Phase 3 Study – Project Scope

RECOMMENDATION

That the MVRD Board receive for information the report dated April 11, 2022, titled "Social Equity in Regional Growth Management Phase 3 Study – Project Scope".

EXECUTIVE SUMMARY

This report provides the Regional Planning Committee and MVRD Board with an overview of the scope and timeline for Phase 3 of the Social Equity in Growth Management project. Regional Planning staff will pilot the use of the social equity baseline indicator mapping analyses from the 2020 Phase 2 report in a series of case study "mini projects" to help support local planning efforts. This project will include a review of the draft policies of *Metro 2050* to identify ways to enhance social equity outcomes through potential future amendments of the regional growth strategy and / or the accompanying Implementation Guidelines.

This phase of work will also involve promoting the indicator data and other resources associated with the project among local planning practitioners. Finally, this project will involve updating the social equity indicator maps with 2021 Census data in early 2023 after the required data becomes available.

PURPOSE

To present the Regional Planning Committee and MVRD Board with the proposed project scope of the Social Equity in Regional Growth Management Phase 3 Study.

BACKGROUND

The Social Equity in Regional Growth Management study was initiated in 2019 and, to date comprises two phases of work (References 1 and 2). The study's objectives have been to establish a baseline of information about social equity in the region, and to inform the new and amended policy actions of *Metro 2050* and their implementation. This next phase of the project will study opportunities for applying social equity analysis to regional and local planning work such as plans, programs, and policies.

PHASE 3 STUDY – PROJECT GOALS AND OBJECTIVES

The Social Equity in Regional Growth Management Phase 3 Study will focus on piloting the use of social equity analysis by applying the findings and recommended practices coming out of the Phase 1 and 2 studies to a selection of planning case studies and to the policy actions of *Metro 2050*.

This project will include a minimum of 2 case study mapping "minimum projects" utilizing the social equity.

This project will include a minimum of 3 case study mapping "mini projects" utilizing the social equity data indicators to help inform planning efforts in the region; e.g. one case study will be focused on

the relationship between the urban heat island effect and tree canopy cover (References 3, 4 and 5). This project will include a review of the policy actions of *Metro 2050* from a social equity perspective, with the objective of identifying ways to enhance the policies and outcomes in the future. This project will also involve sharing and promoting the indicator datasets and other resources currently available among local planning practitioners. Finally, this project will update the equity indicator maps from the Phase 2 work with data from the 2021 Census and other sources; this latter component will likely take place in early 2023 when the necessary data becomes available.

In summary, the purpose of the project is to:

- 1. Pilot the use of social equity indicator spatial analysis in urban planning through case studies;
- 2. Raise awareness among local practitioners about social equity analysis methods and available data:
- 3. Identify how to achieve the goals and targets and implement the policy actions in *Metro 2050* in a more equitable way; and
- 4. Identify lessons learned to advance local knowledge on the use of social equity planning analysis.

The objectives will be to:

- 1. Identify three case studies and pilot the use of social equity mapping analysis;
- 2. Share and promote the use of the social equity indicator data and maps among member jurisdictions and local practitioners through outreach activities including a possible webinar;
- 3. Apply a social equity analysis to the policy actions of *Metro 2050* and identify opportunities to enhance social equity policies and outcomes;
- 4. Share the lessons learned from the social equity case study analysis by convening and information sharing with member jurisdiction staff and other practitioners and by reporting out to the Regional Planning Committee and MVRD Board; and
- 5. Update a selection of the equity indicator maps from Phase 2 with the 2021 Census data.

Project Deliverables

The expected deliverables of the project are:

- 1. A minimum of three case studies that will involve the creation of maps that could be used to answer planning questions or guide planning efforts.
 - The case studies will be identified in consultation with member jurisdictions and the selected consultant.
 - The case study maps would layer at least one social equity indicator with other planning layers to understand relationships between the data, to identify areas of higher or lower priority or risk, etc.
 - One of the case studies will answer the question "what locations could be prioritized for heat island mitigation interventions that could enhance equity outcomes?" by layering heat island and tree canopy cover data, with a selection of social equity indicator maps.
- 2. A minimum of one outreach event (webinar, sustainability breakfast, etc.) to share and promote the results of the Phase 2 Study and to encourage planners and other practitioners in the region to use the equity indicator maps and data to inform local planning efforts.

- 3. A review of the policy actions of *Metro 2050* from a social equity perspective, to determine any potential social equity risks and opportunities. The identified risks and opportunities will be accompanied by mitigation recommendations that could support:
 - a) potential future revisions to the text of Metro 2050; and / or
 - b) a component of a new *Metro 2050* Implementation Guideline.
- 4. An updated selection of Phase 2 equity indicator maps using 2021 Census data.

Project Scope and Timeline

Workstream 1: Social Equity Analysis Case Study maps (Q1-Q3 2022)

Project Deliverable 1

Workstream 2: Knowledge Sharing and Outreach (Q3/Q4 2022)

Project Deliverable 2

Workstream 3: Social Equity Review of Metro 2050 (Q3-Q4 2022)

Project Deliverable 3

Workstream 4: Updating Indicator Maps with 2021 Census Data (Q4 2022 – Q1 2023)

Project Deliverable 4

NEXT STEPS

The next steps for the first quarter of 2022 will include hiring of a consultant to support the case study mapping efforts and circulating an online survey for member jurisdiction staff. Regional Planning staff will provide the Regional Planning Committee with an interim report mid-year 2022 and a final report in early 2023.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The Board-approved Regional Planning budget for 2022 includes a total of \$40,000 for this study. \$5,000 of this budget will be allocated to support the ongoing work of the Hey Neighbour Research Collective due to the important connections to Metro Vancouver's equity research and opportunities to cross-promote and leverage the work by that group. The remaining \$35,000 will support hiring a consultant to prepare the case study maps as well as to update a selection of the equity indicator maps using 2021 Census data as it becomes available.

CONCLUSION

The Social Equity in Regional Growth Management Phase 3 Study will focus on piloting social equity analysis methods by applying the findings and recommended practices coming out of Phases 1 and 2 of the work to a selection of planning case studies as well as to the policy actions of *Metro 2050*. There are four workstreams proposed as part of this phase comprising: 1) case study maps; 2) knowledge sharing and outreach; 3) social equity review of the policy actions of *Metro 2050*; and 4) updating selected equity indicator maps prepared in Phase 2 with the 2021 Census Data. The work will take place over the course of 2022 and into early 2023. Currently, Regional Planning staff are

soliciting equity mapping analysis case study ideas from Regional Planning Advisory Committee members and other organizations and agencies with an aim to supporting member jurisdictions by applying an equity lens to local planning work.

References

- 1. A Review of Social Equity in Regional Growth Management Phase 1 Report (2019)
- 2. Metro Vancouver Social Equity and Regional Growth Phase 2 Report (2021)
- 3. Social Equity in Regional Growth Management Key Findings, Staff Report, November 9, 2019
- 4. Social Equity and Regional Growth Study, Staff Report, March 5, 2021
- 5. <u>Metro Vancouver Social Equity and Regional Growth Inequity Baseline Data Indicator Maps</u> Phase 2 Report Attachment (2021)

48519169



To: Regional Planning Committee

From: Carla Stewart, Senior Planner, Regional Planning and Housing Services

Date: April 8, 2022 Meeting Date: May 19, 2022

Subject: 2022 Agriculture Awareness Grant Recommendations

RECOMMENDATION

That the MVRD Board award the annual Agriculture Awareness Grants to the following fourteen non-profit organizations as described in the report dated April 8, 2022, titled "2022 Agriculture Awareness Grant Recommendations":

- a) Fraser North Farmers Market Society, for the "Nibble Network" project in the amount of \$2,500;
- b) Hives for Humanity Society, for "Stories and Sounds of Connection around Beekeeping and Gardening" in the amount of \$2,000;
- c) Immigrant Link Centre Society, for the "From Pollution to Solution' Educational Cartoon" project in the amount of \$5,500;
- d) See-emia Cultural Studies Society, for the "Sovereign Seedlings" project in the amount of \$4,750;
- e) Urban Bounty/Richmond Food Security Society, for "From Field to Fork" in the amount of \$5,000;
- f) Delta Farmland & Wildlife Trust, for "Day at the Farm" in the amount of \$4,500;
- g) BC Agriculture in the Classroom, for "Take a Bite of BC" in the amount of \$3,000;
- h) Earthwise Society, for the "Tomato Festival" in the amount of \$2,500;
- i) Public Health Association of BC (PHABC), for "Farm to School BC" in the amount of \$3,500;
- j) The Sharing Farm Society, for the "12th Annual Garlic Festival" in the amount of \$2,000;
- k) BC Association of Farmers Markets, for the "PechaKucha: Local Food and Agriculture" project in the amount of \$3,000;
- FarmFolk/CityFolk, for the "Visioning a Sustainable Food System in BC" project in the amount of \$4,250;
- m) Pacific Immigrant Resources Society (PIRS), for the "Local Food Literacy for Immigrant and Refugee Women in Metro Vancouver" project in the amount of \$5,500; and
- n) Growing Chefs Society, for "Edible Education Programming" in the amount of \$2,000.

EXECUTIVE SUMMARY

Programs and outreach that support local sustainable food production are important contributions toward increasing awareness across the region. The funding provided through the Agriculture Awareness Grants is particularly valuable now for those community organizations doing public outreach on the value of producing or buying food close to home. This report supports those efforts by providing recommendations to the Regional Planning Committee and MVRD Board to award a total of \$50,000 in Agricultural Awareness Grants to fourteen non-profit organizations in 2022. Metro Vancouver has awarded grants for agriculture awareness since 2008, as recommended by the Agricultural Advisory Committee (AAC).

PURPOSE

The purpose of this report is to recommend that the MVRD Board award funding grants to non-profit organizations from around the region that are leading public awareness activities about the importance of local agriculture and food production and about educating residents on how to grow and cook food produced in the region.

BACKGROUND

The MVRD Board has supported agriculture awareness since 1994 in part to raise public understanding about the importance of local food and agriculture production in the region. The grant program started in 2008 and continues to provide annual funding to non-profit organizations that undertake such things as hosting events, workshops and educational programs in schools and communities. This report provides the recommended awards for 2022.

AGRICULTURE AWARENESS GRANTS

The number of applications and grants awarded over the past fourteen years is listed by year in Table 1. A description of previous grant recipients is available on the Metro Vancouver website (Reference).

Table 1: Metro Vancouver Agricultural Awareness Grant Program 2008 – 2021

Year	Number of Applications	Number of Grants Awarded	Funding Awarded
2008	11	3	\$25,000
2009	14	5	\$25,000
2010	14	7	\$30,000
2011	12	9	\$35,000
2012	27	8	\$35,000
2013	13	9	\$40,000
2014	15	11	\$40,000
2015	14	11	\$40,000
2016	12	11	\$40,000
2017	21	13	\$40,000
2018	24	12	\$40,000
2019	15	13	\$45,000
2020	21	12	\$45,000
2021	14	11	\$50,000
TOTAL	203	123	\$530,000

In 2021, a total of \$50,000 in Agricultural Awareness Grants was awarded to eleven non-profit organizations. Although there were participation impacts due to the COVID-19 pandemic, all projects were able to proceed, some with slight modifications, and complete their work programs. In some cases, project deadlines were extended slightly to accommodate the on-going COVID-19 restrictions.

GRANT APPLICATION EVALUATION CRITERIA

The mandatory requirements for agricultural awareness projects receiving a grant are:

- a) have a regional scope (i.e. impacting more than one municipality);
- b) be located in Metro Vancouver;
- c) be administered by a non-profit organization in good standing; and

d) have matching funding (dollars or in-kind) from another organization.

The six evaluation criteria and basis for scoring are the following:

- 1. The agriculture awareness activity is unique. A high score will be given to awareness activities that are one of a kind in the region and are currently not being done by another organization in Metro Vancouver.
- 2. The geographic scope of the grants awarded reaches out to municipalities across the region. A high score will be awarded to projects that provide a broad reach in Metro Vancouver or are targeting areas that are currently not well served by agriculture awareness activities.
- 3. The activity reaches out to culturally diverse audiences, urban residents, youth or K-12 school aged children. A high score will be awarded when these audiences are targeted in the awareness activity.
- 4. The activity contributes to the following desirable outcomes that support regional policy objectives, where a high score is awarded when the agriculture awareness activity aligns with two or more of the regional policy objectives:
 - Educates residents about local food production;
 - Enhances food literacy and skills in schools;
 - Communicates how food choices support the local economy;
 - Supports the next generation of food producers; and
 - Involves community gatherings that educate residential about local food.
- 5. The grant request is in the range of \$500 to \$6,000. A higher score will be awarded if the Metro Vancouver cash contribution is greater than 20% of the total cash budget, so that projects that may have a greater financial need are prioritized.
- 6. The extent to which grant applicants have received previous Agriculture Awareness Grant funding, and the completion of the imposed conditions listed on the application form. Groups that have not previously received a grant would automatically score high, while the previous grant recipients would be scored based on past compliance with the five conditions.

2022 AGRICULTURE AWARENESS GRANTS

On February 2, 2022, agricultural-related organizations, community groups and municipal staff liaisons were notified about the opening of Metro Vancouver's 2022 Agriculture Awareness Grants with an invitation to submit an application which was made available on the Metro Vancouver website. Sixteen applications were received by the March 1, 2022 deadline. The grant applications were evaluated by two AAC members and staff using the mandatory requirements and evaluation criterial listed above. Table 2, shown below, highlights the 2022 Agriculture Awareness Grant applications submitted by non-profit organizations, and the recommended grants. Each funding request was reviewed based on the amount of additional funding available to that organization and the overall amount the organization was relying on the funding coming from the grant. All but two of the qualifying applications had funding from other sources or had substantial budgets that marginally or somewhat relied on these grants as a funding source. The proposed grants being recommended were deemed the fairest based on the information received in each application.

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A summary description of all the applications is provided in the attachment and a list of all the recommended Agriculture Awareness Grants is provided in Table 2.

Table 2: List of 2022 Agriculture Awareness Applications and Recommended Grant Amounts

#	NON-PROFIT GROUP	PROJECT TITLE	GRANT REQUEST	RECOMMENDED GRANT
1	Fraser North Farmers	Nibble Network	\$2,500	\$2,500
2	Market Society Hives for Humanity Society	Stories and Sounds of Connection Around Beekeeping and Gardening	\$4,434	\$2,000
3	Immigrant Link Centre Society	"From Pollution To Solution" Educational Cartoon	\$6,000	\$5,500
4	See-emia Cultural Studies Society	Sovereign Seedlings	\$6,000	\$4,750
5	Urban Bounty/Richmond Food Security Society	From Field to Fork	\$5,950	\$5,000
6	Delta Farmland & Wildlife Trust	Day at the Farm	\$6,000	\$4,500
7	BC Agriculture in the Classroom	Take a Bite of BC	\$6,000	\$3,000
8	Earthwise Society	Tomato Festival	\$2,500	\$2,500
9	Public Health Association of BC (PHABC)	Farm to School BC	\$6,000	\$3,500
10	The Sharing Farm	12th Annual Garlic Festival	\$3,000	\$2,000
11	BC Association of Farmers Markets	PechaKucha: Local Food and Agriculture	\$3,450	\$3,000
12	FarmFolk/CityFolk	Visioning a Sustainable Food System in BC	\$6,000	\$4,250
13	Pacific Immigrant Resources Society (PIRS)	Local Food Literacy for Immigrant and Refugee Women in Metro Vancouver	\$6,000	\$5,500
14	Growing Chefs Society	Edible Education Programming	\$6,000	\$2,000
Total			\$69,834	\$50,000

ALTERNATIVES

- That the MVRD Board award the annual Agriculture Awareness Grant to the following fourteen non-profit organizations as described in the report dated April 8, 2022, titled "2022 Agriculture Awareness Grant Recommendations":
 - a) Fraser North Farmers Market Society, for the "Nibble Network" project in the amount of \$2,500;
 - b) Hives for Humanity Society, for "Stories and Sounds of Connection around Beekeeping and Gardening" in the amount of \$2,000;

- c) Immigrant Link Centre Society, for the "From Pollution to Solution' Educational Cartoon" project in the amount of \$5,500;
- d) See-emia Cultural Studies Society, for the "Sovereign Seedlings" project in the amount of \$4,750;
- e) Urban Bounty/Richmond Food Security Society, for "From Field to Fork" in the amount of \$5,000;
- f) Delta Farmland & Wildlife Trust, for "Day at the Farm" in the amount of \$4,500;
- g) BC Agriculture in the Classroom, for "Take a Bite of BC" in the amount of \$3,000;
- h) Earthwise Society, for the "Tomato Festival" in the amount of \$2,500;
- i) Public Health Association of BC (PHABC), for "Farm to School BC" in the amount of \$3,500;
- j) The Sharing Farm Society, for the "12th Annual Garlic Festival" in the amount of \$2,000;
- k) BC Association of Farmers Markets, for the "PechaKucha: Local Food and Agriculture" project in the amount of \$3,000;
- I) FarmFolk/CityFolk, for the "Visioning a Sustainable Food System in BC" project in the amount of \$4,250;
- m) Pacific Immigrant Resources Society (PIRS), for the "Local Food Literacy for Immigrant and Refugee Women in Metro Vancouver" project in the amount of \$5,500; and
- n) Growing Chefs Society, for "Edible Education Programming" in the amount of \$2,000.
- 2. That the Regional Planning Committee receive for information the report dated April 8, 2022 titled "2022 Agriculture Awareness Grant Recommendations" and provide alternative direction to staff.

FINANCIAL IMPLICATIONS

The total funds available for the Agriculture Awareness Grants in 2022 is \$50,000. This amount is included in the Board-approved Regional Planning budget for 2022. If the Board chooses Alternative 1, successful grant recipients will be notified.

CONCLUSION

Based on the evaluation conducted by AAC members and by staff, fourteen non-profit organizations are recommended to receive grant, for a total amount of \$50,000. The recommendations enable the continuation of successful educational programs and community agriculture-related events in 2022. Staff recommend Alternative 1.

Attachment

Description of the 2022 Agriculture Awareness Grant Applications

Reference

Previous Agriculture Awareness Grant Recipients

48784817

Summary List of 2022 Agriculture Awareness Applications

#	NON-PROFIT GROUP	PROJECT TITLE	BRIEF PROJECT DESCRIPTION	GRANT REQUEST	TOTAL BUDGET
1	Vancouver Urban Food Forest Foundation (VUFFF)	Vancouver Urban Food Forest (VUFF)	Develop a communal garden and food forest.	\$6,000	\$87,000
2	Fraser North Farmers Market Society	Nibble Network	Educate children and their parents about the value of local food production.	\$2,500	\$4,000
3	Association of Neighbourhood Houses of BC	Youth Environmental and Agriculture Hub (YEAH!)	Strengthen youth (13-18) knowledge, education and connection to food systems, upcycling and sustainable cooking.	\$6,000	\$28,914
4	Hives for Humanity Society	Stories and Sounds of Connection Around Beekeeping and Gardening	Create a Digital Sound Map to share stories of connection to land and food, community and culture.	\$4,434	\$22,434
5	Immigrant Link Centre Society	"From Pollution To Solution" Educational Cartoon	Create an educational cartoon about food waste by K12 students.	\$6,000	\$6,000
6	See-emia Cultural Studies Society	Sovereign Seedlings	Grow Indigenous seedlings and promote propagation of Indigenous plant species.	\$6,000	\$25,800
7	Urban Bounty/Richmond Food Security Society	From Field to Fork	Showcase urban small production growers and enhance food literacy through cooking demonstrations and workshops.	\$5,950	\$10,450
8	Delta Farmland & Wildlife Trust	Day at the Farm	Annual outreach event to directly connect to local farmers and learn about diversity of agriculture in our communities.	\$6,000	\$42,910
9	BC Agriculture in the Classroom	Take a Bite of BC	Provides fresh BC grown products to BC Culinary Arts Secondary students.	\$6,000	\$172,370
10	Earthwise Society	Tomato Festival	Family-friendly community gathering and celebration of history and diversity of BC agriculture with a focus on heirloom tomatoes.	\$2,500	\$6,000
11	Public Health Association of BC (PHABC)	Farm to School BC	Video series profiling diversity of food producers and land stewards in Metro Vancouver.	\$6,000	\$20,825
12	The Sharing Farm	12th Annual Garlic Festival	Support food-dignity to grow fresh local organic produce for low-income families through the Garlic Festival.	\$3,000	\$31,600
13	BC Association of Farmers Markets	PechaKucha: Local Food and Agriculture	Increase awareness about local agriculture and food initiatives through a PechaKucha storytelling.	\$3,450	\$5,950
14	FarmFolk/CityFolk	Visioning a Sustainable Food System in BC	Public engagement project to involve residents in exploring and questioning what a thriving, sustainable food system in BC can look like.	\$6,000	\$19,500
15	Pacific Immigrant Resources Society (PIRS)	Local Food Literacy for Immigrant and Refugee Women in Metro Vancouver	Expand on recent survey results and respond to community need by increasing local food literacy and participation through a food skill program and farm tours.	\$6,000	\$6,000
16	Growing Chefs Society	Edible Education Programming	Children grow their own food, connect to local farmers and chefs and learn where/how food is grown.	\$6,000	\$220,381
			TOTALS	\$81,834	\$710,134



To: Regional Planning Committee

From: James Stiver, Division Manager, Regional Land Use Policy,

Regional Planning and Housing Services

Date: April 14, 2022 Meeting Date: May 19, 2022

Subject: Request for Sanitary Service Connection at 13179 224 Street, Maple Ridge

RECOMMENDATION

That the MVRD Board:

- a) resolve that the extension of GVS&DD sewerage services to an existing restaurant and three additional existing businesses at 13179 224 Street in the City of Maple Ridge is consistent with the provisions of Metro Vancouver 2040: Shaping our Future, and
- b) forward the requested Fraser Sewerage Area extension application to the GVS&DD Board for consideration.

EXECUTIVE SUMMARY

The City of Maple Ridge submitted an application to the Greater Vancouver Sewerage and Drainage District to extend sewer service to a parcel to provide servicing to allow for the expansion of an existing restaurant at 13179 224 Street. The property is outside of the Fraser Sewerage Area, on land with a *Metro 2040* Agricultural land use designation, and outside of the Urban Containment Boundary. In accordance with the requirements in *Metro 2040*, the request is being presented to the MVRD Board for consideration of consistency with the regional growth strategy.

This report asserts that the application is generally consistent with Metro 2040 given that:

- the Agricultural Land Commission has confirmed that the *Agricultural Land Commission Act* does not apply to the parcel given its size;
- an on-site septic system is not feasible for the proposed use;
- the connection will not result in the expansion of the existing uses on the site;
- the proposal will not impact the surrounding agricultural uses; and
- sewerage infrastructure is located under 224 Street, across the frontage of the property.

PURPOSE

This report seeks MVRD Board concurrence that the City of Maple Ridge's request for a sanitary service connection to allow for the expansion of an existing restaurant at 13179 224 Street is consistent with *Metro Vancouver 2040: Shaping our Future (Metro 2040)*.

BACKGROUND

On November 4, 2019, the City of Maple Ridge submitted an application to the Greater Vancouver Sewerage and Drainage District (GVS&DD) to service the property at 13179 224 Street (Attachment 1). An expansion to the existing restaurant on the site is proposed, which is permitted by the City's current zoning. The site is also home to an existing auto repair shop, a dog grooming business, and a convenience store. All of these uses are intended to be serviced with the proposed sewer connection. The size of the connection is proposed to only accommodate the existing uses and the expanded restaurant.

51736908

The property is currently serviced by an on-site septic system. The property owner is unable to construct an upgraded system due to the size of the parcel, and the susceptibility of the site to seasonal flooding poses a potential health risk from the septic field and its proximity to the restaurant. The site is located outside of the GVS&DD Fraser Sewerage Area (FSA) on land with a *Metro 2040* Agricultural land use designation and outside of the Urban Containment Boundary (Figure 1).



Figure 1 - Map of 13179 224 Street, Regional Land Use Designations and FSA Boundary

In accordance with the requirements in the *Local Government Act* and *Metro 2040*, the request is being presented to the MVRD Board for consideration of consistency with the regional growth strategy.

METRO 2040 AND SEWERAGE AREA EXTENSION REQUESTS

Section 6.8 of *Metro 2040* includes provisions for coordination amongst the Metro Vancouver Boards to ensure alignment between the policies of the regional growth strategy, as governed by the MVRD Board, and the works and services governed by the GVS&DD and Greater Vancouver Water District Boards. The intention of limiting the extension of sewerage services from a regional growth management perspective is to support: urban containment; the protection of Agricultural, Rural and Conservation and Recreation designated lands; and the efficient provision of regional infrastructure services, which are all key tenets of *Metro 2040*. Furthermore, in accordance with subsection 445(1) of the *Local Government Act, Metro 2040* requires that all services undertaken by the GVS&DD be consistent with *Metro 2040*.

Specifically, Section 6.8.1 of *Metro 2040* states that:

The Greater Vancouver Sewerage and Drainage District and the Greater Vancouver Water District will not directly or indirectly supply, agree to supply, or authorize connections that enable the supply of services to a site that is developed or proposed to be developed after the date of adoption of the Regional Growth Strategy where the nature of that development is, in the sole judgment of the Greater Vancouver Regional District, inconsistent with the provisions of the Regional Growth Strategy.

While *Metro 2040* establishes the extent of urban development within the region, the provision of regional sewerage services is administered by the GVS&DD. Any requests from member jurisdictions to amend the GVS&DD sewerage area or to provide sewer services onto lands designated Agricultural, Rural or Conservation and Recreation in *Metro 2040* must be presented to the MVRD Board for consideration prior to be considered by the GVS&DD Board. These same provisions have been carried forward into the draft *Metro 2050*, the update to the regional growth strategy.

The GVS&DD regional sewerage area boundaries were drawn prior to the adoption of *Metro 2040*. As a result, there are some locations where the sewerage area and regional land use designations do not align. For properties designated Agricultural, Rural or Conservation and Recreation located outside of the sewerage area (as is the case with the subject property), the MVRD Board must first determine whether servicing is appropriate and consistent with the policies of *Metro 2040*, after which the final decision to amend the sewerage area boundary rests with the GVS&DD Board. Alternatively, for properties within the sewerage area that are designated Agricultural, Rural or Conservation and Recreation, only MVRD Board approval is required. In both cases, where the MVRD Board determines the sewerage area boundary amendment is not consistent with *Metro 2040*, the GVS&DD is obligated to deny the application.

REGIONAL PLANNING ANALYSIS

The subject property is a developed parcel designated Agricultural in *Metro 2040* and outside of both the FSA and the Urban Containment Boundary, with an existing sanitary sewer located under 224 Street across the frontage of the property. The Agricultural Land Commission has indicated that the site is not subject to the restrictions on the use of agricultural land contained in the *Agricultural Land Commission Act* (Attachment 3). Therefore, the Agricultural land use designation does not need to change to accommodate the proposed use.

Section 2.3.1 of *Metro 2040* (and *Metro 2050*) states that the GVS&DD Board will not allow connections to regional sewerage services to lands with an Agricultural regional land use designation

except where the MVRD Board determines that the new development is consistent with the provisions of that designation and where it has been determined that:

- a) that the connection to regional sewerage services [is] the only reasonable means of preventing or alleviating a public health or environmental contamination risk; or
- b) that the connection to regional sewerage services would have no significant impact on the strategy to protect the supply of agricultural land and promoting agricultural viability with an emphasis on food production.

In this case, the extension of sewer services pursuant to *Metro 2040* section 2.3.1(b) is supportable based on the following rationale:

- The Agricultural Land Commission has confirmed that the site is not subject to the *Agricultural Land Commission Act*;
- It has been determined that an on-site septic system is not feasible for the proposed restaurant expansion;
- The proposed use will not impact the surrounding agricultural uses nor impact urban containment objectives;
- Existing sewerage infrastructure is located under 224 Street, across the frontage of the property; and
- The proposed connection will only be sized to accommodate the existing businesses on the site and the proposed restaurant expansion such that the required connection will have limited potential for prompting additional regional sewerage connection requests in the surrounding area.

In preparing the above rationale, staff considered the criteria identified in *Metro 2040 Implementation Guideline #7: Extension of Regional Sewerage Services*, which outlines the application process and review criteria for member jurisdictions requesting a connection to regional sewerage services (Reference). The Implementation Guideline also indicates a requirement that applications for connection to regional sewerage services must be initiated by a resolution of the respective municipal council. Maple Ridge Council passed a resolution at its meeting on October 22, 2019 and forwarded it by letter to Metro Vancouver Liquid Waste Services staff (Attachment 1).

While it is recognized and anticipated that other owners of Rural or Agriculturally-designated properties outside the FSA may continue to make similar requests for servicing extension over time, any future applications will be considered on a case-by-case basis based on the provisions of the regional growth strategy. As such, should this servicing extension request be supported by the MVRD Board, staff do not anticipate a significant impact to the *Metro 2040* (or *Metro 2050*) objectives for urban containment or related regional land use designations, goals and strategies.

ALTERNATIVES

- 1. That the MVRD Board:
 - a) resolve that the extension of GVS&DD sewerage services to an existing restaurant and three additional existing businesses at 13179 224 Street in the City of Maple Ridge is consistent with the provisions of Metro Vancouver 2040: Shaping our Future, and
 - b) forward the requested Fraser Sewerage Area extension application to the GVS&DD Board for consideration.

2. That the MVRD Board resolve that the extension of GVS&DD sewerage services to an existing restaurant and three additional existing businesses at 13179 224 Street in the City of Maple Ridge is not consistent with the provisions of *Metro Vancouver 2040: Shaping our Future* and direct staff to notify both the City of Maple Ridge and the GVS&DD Board.

FINANCIAL IMPLICATIONS

There are no financial implications to this report from a Regional Planning perspective. Any financial implications related to the proposed servicing connection will be considered within the GVS&DD's application review process. If the MVRD Board chooses Alternative 1, as the property is located outside of the FSA, GVS&DD Board approval is still needed. The MVRD Board decision would be forwarded to Metro Vancouver's Liquid Waste Services staff who would then undertake the technical considerations of the sewerage connection application and report to the GVS&DD Board for consideration. If the MVRD Board chooses Alternative 2, the decision would be forwarded to Liquid Waste Services staff and the GVS&DD Board, and the City of Maple Ridge would be notified. The GVS&DD would be required to decline the application.

CONCLUSION

The GVS&DD has received an application from the City of Maple Ridge to extend a sanitary service connection to a property at 13179 224 Street to allow for an expansion to an existing restaurant. The parcel is proposed to be located within an adjusted FSA boundary. However, since the subject property is designated Agricultural in *Metro 2040* the MVRD Board must first determine if the proposed extension is consistent with the provisions of *Metro 2040* and will not impact urban containment objectives nor the protection of agricultural land.

Given that there is an existing sewer service across the frontage of the property, the Agricultural Land Commission has indicated that it is not subject to the Agricultural Land Commission Act, the construction of an expanded on site septic system is not feasible, the site is currently home to an existing auto repair shop, a dog grooming business, and a convenience store, and the proposed connection will be sized to only service the existing businesses and proposed to be expanded restaurant on the site, the extension of sewer service can be considered consistent with the provisions of Metro 2040. Staff therefore recommend Alternative 1.

Attachments

- 1. Letter from the City of Maple Ridge dated November 4, 2019 to Metro Vancouver Liquid Waste Services staff requesting a sanitary sewer service connection for 13179 224 Street.
- 2. Letter from the Agricultural Land Commission dated December 14, 2021.

Reference

Implementation Guideline #7: Extension of Regional Sewerage Services

51736908



November 4, 2019

Fred Nenninger Director, Policy Planning and Analysis Metro Vancouver 4330 Kingsway Burnaby BC V5H 4G8

Dear Mr. Nenninger:

Re:

Urban Containment Boundary - Request for Sanitary Service Connection

13179 224 Street, Maple Ridge

Our File: 11-5340-01

On October 29, 2019, City of Maple Ridge staff presented a report to Council for the request to provide a sanitary service connection to 13179 224 Street. The identified area is defined and described in the attached Council report and map.

Maple Ridge Council adopted the following resolution:

Resolution 1112 - October 29, 2019

THAT the request to provide a sanitary service connection to 13179 224 Street be supported and forwarded to the Greater Vancouver Sewerage and Drainage District Board for consideration.

As such, this letter is our formal request to allow the subject property connection to the sanitary sewer system.

We would appreciate if you could acknowledge receipt of this request. Should you have any questions or require further information, please contact the undersigned at mcanning@mapleridge.ca or 604-467-7465.

Yours truly,

Michael Canning, PEng.

Manager of Infrastructure Development

/mi

Att.



CITY OF MAPLE RIDGE

Agenda Item: Council Meeting of:

1112

October 29, 2019

That the request to provide a sanitary service connection to 13179 224 Street be supported and forwarded to the Greater Vancouver Sewerage and Drainage District Board for consideration.

CARRIED	DEFEATED	DEFERRED	"Mike !	Morden"	MAYOR
	Chief Administrative Office Dir – Corporate Adminis Chief Financial Officer Dir – Human Resources Dir – Economic Dev & C Corporate Controller Chief Information Office Mgr – Communications RCMP Fire Chief Gen Mgr – Planning & De Dir - Planning Mgr - Bylaws & Licences Ken Mgr – Engineering Se	stration sivic Properties er velopment	S		
	Municipal Engineer Dir - Engineering Opera Gen Mgr - Parks, Rec & C Dir - Parks & Facilities Dir - Recreation & Com.	tions ulture			
	Clerk's Section Corporate Officer Deputy Corporate Officer Risk & Insurance Front Desk Reception Legislative Clerk Committee Clerk Confidential Secretary Conveyancing Clerk	er			
for notat			he City Council held on the ired by your Department.		is sent to you



City of Maple Ridge

TO:

His Worship Mayor Michael Morden

MEETING DATE:

October 22, 2019

and Members of Council

FILE NO:

11-5340-01

FROM:

Chief Administrative Officer

MEETING:

COW

SUBJECT:

13179 224 Street - Request for Sanitary Service Connection Outside Urban

Containment Boundary

EXECUTIVE SUMMARY:

The owners at 13179 224 Street are in the preliminary stages of a building permit application to expand the existing restaurant on the property as permitted by the current zoning. The subject property is located outside the Urban Containment Boundary (UCB) and the existing structure is serviced via an onsite septic system.

Under current Metro Vancouver regulations, any extension or amendment of sanitary servicing (including on-site changes in use or capacity) to properties outside of the UCB requires approval of the Greater Vancouver Sewerage and Drainage District (GVS&DD) Board. Applications require a municipal Council resolution prior to consideration by the Board, as identified in the Metro-Vancouver Implementation Guideline #7.

The additional connection to the sanitary system does not represent a significant change in the sanitary capacity requirement and does not increase the pressure to provide sanitary services for development properties outside of the UCB, as such the application can be supported under Section 2.3.2 of Implementation Guideline #7.

It is recommended that Council support the request to seek approval from Metro Vancouver to provide a sanitary service connection to the property.

RECOMMENDATION:

That the request to provide a sanitary service connection to 13179 224 Street be supported and forwarded to the Greater Vancouver Sewerage and Drainage District Board for consideration.

DISCUSSION:

a) Background Context:

The owners at 13179 224 Street are in the preliminary stages of a building permit application to expand the existing restaurant on the property as permitted by the current zoning. The proposed sanitary service connection would provide service for the entire site, not just the restaurant. Other uses on the site include an auto repair shop, a dog grooming business, and a corner store. The property is outside the Urban Containment Boundary (UCB) and the existing structures are serviced with an onsite septic system.

1112

Under the current Metro Vancouver regulations any extension or amendment of sanitary servicing (including on-site changes in use or capacity) to properties outside of the UCB requires approval of the Metro Vancouver GVS&DD Board. Applications require a municipal Council resolution prior to consideration by the Board, as identified in the Metro Vancouver Implementation Guideline #7.

The addition of these structures to the sewer system does not represent a significant change in the sanitary capacity requirement and does not increase the pressure to provide sanitary services for development properties outside of the UCB and as such the application can be supported under Section 2.3.2 of Implementation Guideline #7.

The sanitary sewer in 224 Street fronting this property is a pressurized sanitary forcemain that provides sanitary service for the Blaney Hamlet area of Silver Valley. This forcemain conveys sanitary wastewater from the 136 Avenue / Foreman Drive Pump Station along 224 Street to the North Slope Sanitary Interceptor Trunk Main at 127 Avenue. Service connections to pressurized forcemains are much more complex than a typical gravity service connection and require multiple shut off valves and backflow check valves to reduce the chance of a failure of the service connection. Additionally the consequences of a failure of a pressurized connection are much higher than for a typical gravity connection as the pressurized wastewater would discharge on the site.

As this proposed service connection would utilize a pressurized sanitary forcemain a restrictive covenant will be registered on title indemnifying the City from liability as a result of the service connection operation.

b) Desired Outcome:

That Metro Vancouver approve the property owner's request for a sanitary service connection to the regional collection system. The service connection shall be sized to accommodate a capacity no greater then necessary to service the proposed building.

c) Alternatives:

Not supporting the request would prevent the applicant from connecting to the regional collection system and require an upgrade of the existing on-site septic system. There are logistical issues of upgrading the existing septic system as this would require a larger septic tank and septic field and land space is already limited. Also, the area is susceptible to flooding and having a large septic field nearby the restaurant poses a potential health risk.

Page 2 of 3

CONCLUSION:

The application to seek Metro Vancouver approval to connect to the regional sewer system is consistent with Section 2.3.2 of Metro Vancouver's Implementation Guideline #7, represents a minimal increase to the sanitary flows and does not result in any decrease in the service levels of the existing sanitary sewer system. As such it is recommended that Council support the request and that the application be forwarded to Metro Vancouver for consideration and approval.

Submitted by: Amrit Kang, EIT

Engineering Technologist

Reviewed by:

Mike Canning, PEng.

Acting Municipal Engineer

Approved by:

David Pollock, PEng.

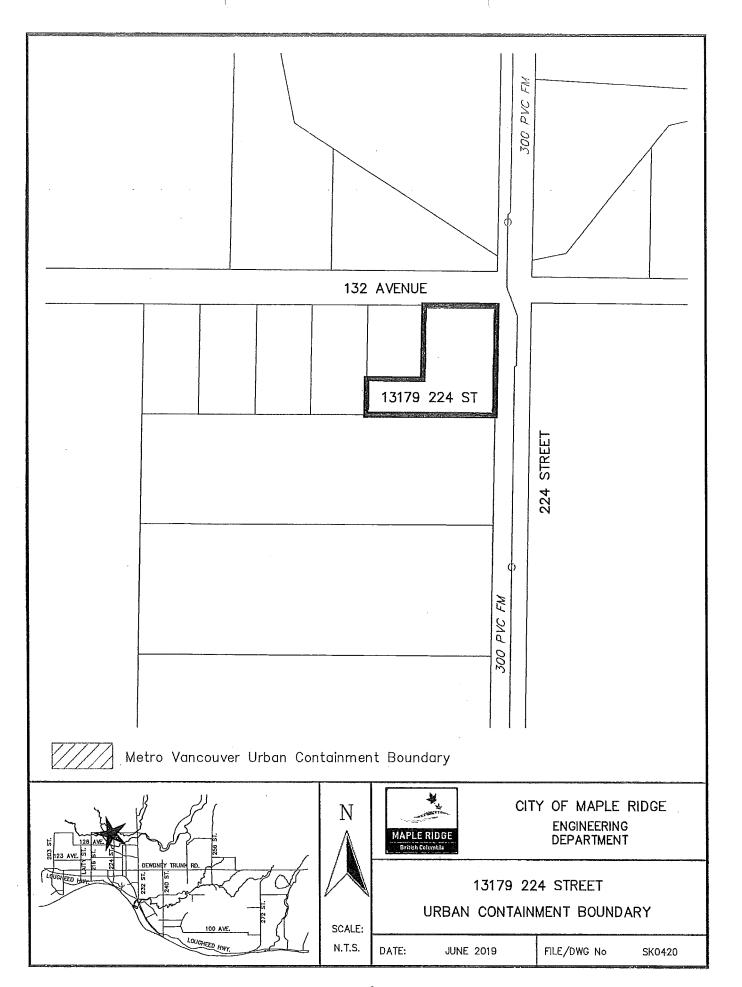
General Manager Engineering Services

Concurrence: Kelly Swift, MBA

Acting Chief Administrative Officer

Attachments:

(A) Map



5.6 ATTACHMENT 2



Agricultural Land Commission

201 – 4940 Canada Way Burnaby, British Columbia V5G 4K6

Tel: 604 660-7000 Fax: 604 660-7033 www.alc.gov.bc.ca

December 14, 2021

ALC Inquiry: 52452

Jai and Sharda Singh 12196 Dunbar St Maple Ridge V2X 5T6

Ronald Singh 22378 132nd St Maple Ridge V4R 2P6

Sent electronically to: rollenberger@mapleridge.ca

Dear Sirs/Madam:

RE: PID 006-784-801

Lot 6 Section 30 Township 12 New Westminster District Plan 10983

This letter is further to e-mail correspondence received December 13, 2021. The purpose of the correspondence was to confirm whether the above referenced property is subject to either the *Agricultural Land Commission Act* or BC Regulation 30/2019 (Agricultural Land Reserve Use Regulation) as per s.23(1) of the *Agricultural Land Commission Act* which reads:

Exceptions

23(1) Restrictions on the use of agricultural land do not apply to land that, on December 21, 1972, was, by separate certificate of title issued under the *Land Registry Act*, R.S.B.C. 1960, c. 208, less than 2 acres in area.

Based on the information provided, the Agricultural Land Commission (the "ALC") has ascertained the following facts:

1. The property is legally described as:

PID 006-784-801

Lot 6 Section 30 Township 12 New Westminster District Plan 10983

2. Lot 6 Plan 10983 was subdivided in June 1949 and was shown as 0.777 acres on the registered subdivision plan.

3. The Certificate of Title in effect for Lot 6 Plan 10983 as of December 21, 1972 was 581580E (registered July 25, 1966) and Lot 6 was the only parcel listed on the title.

This letter is to confirm that Lot 6 Plan 10983 is not subject to the restrictions on the use of agricultural land contained in the *Agricultural Land Commission Act* and BC Regulation 30/2019 (Agricultural Land Reserve Use Regulation).

Please be advised that this does not relieve the owner or occupier of the responsibility to comply with applicable Acts, regulations, bylaws of the local government, and decisions and orders of any person or body having jurisdiction over the land under an enactment.

Also, please note that this confirmation of "exception" from the restrictions of the ALC Act does not suggest that a local government is compelled to re-designate or re-zone the property for non-agricultural uses or to permit subdivision. The ALC recommends that the local government exercise its authority to refuse to authorize incompatible uses on excepted parcels, or to minimize their impact on adjoining farmland as per advice provided in Ministry of Agriculture's Guide to Edge Planning. Any future advice provided to the local government by the ALC as part of bylaw referral process, further described in the ALC Bylaw Reviews: A Guide for Local Governments, will confirm the ALC's mandate to preserve farmland and maintain the integrity of the ALR.

Please direct further correspondence with respect to this letter to ALC.LUPRT@gov.bc.ca.

Yours truly,

PROVINCIAL AGRICULTURAL LAND COMMISSION

Martin Collins, Director of Policy and Planning

Martin Collins



To: Regional Planning Committee

From: Heather McNell, General Manager, Regional Planning and Housing Services

Date: April 28, 2022 Meeting Date: May 19, 2022

Subject: Manager's Report

RECOMMENDATION

That the Regional Planning Committee receive for information the report dated April 28, 2022, titled "Manager's Report".

REGIONAL PLANNING COMMITTEE 2022 WORK PLAN

The Regional Planning Committee's Work Plan for 2022 is attached to this report (Attachment). The status of work program elements is indicated as pending, in progress, ongoing or complete. The listing is updated as needed to include new issues that arise, items requested by the Committee, and changes to the schedule.

REGIONAL GROWTH STRATEGY IMPLEMENTATION GUIDELINES UPDATE

The regional growth strategy, *Metro Vancouver 2040: Shaping our Future (Metro 2040)*, was adopted in 2011 and is currently being updated in the form of *Metro 2050.* Since 2011, a series of eight Implementation Guidelines were prepared to support the implementation and administration of the regional growth strategy. The Implementation Guidelines provide guidance to member jurisdictions on developing Regional Context Statements and other efforts that link regional goals and strategies with local objectives and actions, and should be read in conjunction with, and not replace or supersede the content or requirements of, the regional growth strategy and the *Local Government Act*.

With the *Metro 2050* bylaw now in its final stage of consideration, (*Metro Vancouver Regional District Regional Growth Strategy Bylaw No. 1339, 2022*), a review of the existing Implementation Guidelines is also being undertaken. The updated guidelines will reflect the latest content in the regional growth strategy as well as experience with implementing it over the past 11 years.

The preliminary review identified three Implementation Guidelines to prioritize for update:

- Regional Context Statements (2012)
- Amendments to the Regional Growth Strategy (2012, updated in 2014)
- Extension of Regional Sewerage Services (2017)

These initial three guidelines were prioritized because they will be needed to support local governments with preparing new Regional Context Statements, as required within two years of adoption of *Metro 2050* and to assist with any amendment requests. The other *Metro 2040* Implementation Guidelines will also be reviewed for update, identifying opportunities to enhance or replace them, along with creating new ones, to best support member jurisdictions.

As part of the engagement process, Metro Vancouver will provide the Regional Planning Advisory Committee and other key stakeholders opportunities to review and comment on the draft Implementation Guidelines. The finalized Implementation Guidelines will be advanced to the Regional Planning Committee and MVRD Board for consideration of approval after *Metro 2050* has been adopted.

CLIMATE 2050 DRAFT AGRICULTURE AND DRAFT NATURE AND ECOSYSTEMS ROADMAPS

The recently completed *Climate 2050* draft *Agriculture Roadmap* and draft *Nature and Ecosystems Roadmap* are available for review and feedback and are provided as information items in this agenda package.

The draft *Climate 2050 Nature and Ecosystems Roadmap* lays out strategies and actions to maintain healthy and resilient ecosystems that store carbon, moderate the impacts of a changing climate, and provide a range of other co-benefits. Action items in the draft Nature and Ecosystems Roadmap include protecting, restoring and connecting ecosystems, and advancing nature-based solutions to climate change. The draft is out for comment and engagement, with the intent of bringing an updated *Climate 2050 Nature and Ecosystems Roadmap* for consideration of endorsement by the MVRD Board later in 2022.

The draft *Climate 2050 Agriculture Roadmap* lays out strategies and actions that will accelerate the transition to a net-zero agriculture sector by 2050, and that support agriculture becoming resilient to the ever-changing effects of climate change that have a direct impact on the health and longevity of farming in the region. Action items in the *Roadmap* include protecting agricultural land and expanding the use of ecosystem services and regenerative agriculture within farming, to support creating an overall adaptive and resilient food system. The draft is out for comment and will inform ongoing engagement with the agriculture sector, Metro Vancouver's Agricultural Advisory Committee, and with member jurisdictions, with the intent of bringing an updated *Climate 2050 Agriculture Roadmap* for consideration of endorsement by the MVRD Board later in 2022.

Attachment

Regional Planning Committee 2022 Work Plan

Reference

Metro Vancouver Regional Growth Strategy Implementation Guidelines Webpage

51076321

Regional Planning Committee 2022 Work Plan

Report Date: April 28, 2022

Priorities

1st Quarter	Status
Regional Land Use Assessment – Scope	Complete
Behavioural Model Phase 1 – Report Out	Complete
Equity in Regional Planning Project – Scope	Complete
Sensitive Ecosystem Inventory – Scope	Complete
RILS Implementation E-commerce impacts – Scope	Complete
Housing and Transportation Cost Burden Study – Scope	Complete
Update Urban Centre and FTDA Targets – Scope	In Progress
Behavioural Model Phase 2 – Scope	Complete
Census Data Bulletin – Report Out	In Progress
2 nd Quarter	
Ecosystem Services on Agricultural Lands – Update	In Progress
Regional Parking Strategy – Scope	Complete
Metro 2050 1 st and 2 nd reading and public hearing	Complete
Metro 2050 Draft Implementation Guidelines – Scope	Complete
Census Data Bulletin – Report Out	In Progress
Regional Data Book/Annual Performance Monitoring Report – Report Out	Pending
3 rd Quarter	
Metro 2050 Signatory Acceptance and Final By-law	Pending
RILS Implementation Employment Lands Protection – Update	Pending
Housing and Transportation Cost Burden Study – Update	Pending
Regional Hazards, Risk and Vulnerability Inventory - Scope	Pending
Census Data Bulletin – Report Out	Complete
4 th Quarter	
Regional Land Use Assessment - Update	Pending
Housing and Transportation Cost Burden Study – Update	Pending
Equity in Regional Planning Project – Update	Pending
Sensitive Ecosystem Inventory – Update	Pending
RILS Implementation Employment Lands Protection – Report Out	Pending
Behavioural Model Phase 2 – Update	Pending
Regional Hazards, Risk and Vulnerability Inventory – Report Out	Pending
Ecosystem Services on Agricultural Lands – Report Out	Pending
Where Matters II – Update	Pending
Metro 2050 Draft Implementation Guidelines – Report Out	Pending
Regional Parking Strategy – Update	Pending



To: Climate Action Committee

From: Edward Nichol, Regional Planner, Regional Planning and Housing Services

Josephine Clark, Natural Resource Management Planner, Parks and Environment

Jason Emmert, Program Manager, Climate Policy, Parks and Environment

Date: March 9, 2022 Meeting Date: April 8, 2022

Subject: Draft Climate 2050 Nature and Ecosystems Roadmap

RECOMMENDATION

That the MVRD Board direct staff to proceed with engagement on the draft *Climate 2050 Nature and Ecosystems Roadmap*, as presented in the report dated March 9, 2022, titled "Draft *Climate 2050 Nature and Ecosystems Roadmap*".

EXECUTIVE SUMMARY

This report presents the draft *Climate 2050 Nature and Ecosystems Roadmap*, one of the series of ten *Climate 2050* Roadmaps that will guide our region's policies and collective actions to transition to a carbon neutral, resilient region by 2050. The draft *Climate 2050 Nature and Ecosystems Roadmap* lays out strategies and actions to maintain healthy and resilient ecosystems that store carbon, moderate the impacts of a changing climate, and provide a range of other co-benefits. Action items in the draft *Nature and Ecosystems Roadmap* include protecting, restoring and connecting ecosystems, and advancing nature-based solutions to climate change.

Like the other *Climate 2050 Roadmaps*, the *Nature and Ecosystems Roadmap* is intended to be dynamic, and over time, more work will be necessary to identify and undertake additional actions to reach the 2030 and 2050 climate targets established for the region. The draft will inform an engagement process, with the intent of bringing an updated *Climate 2050 Nature and Ecosystems Roadmap* for endorsement by the MVRD Board in 2022.

PURPOSE

To seek MVRD Board direction to proceed with engagement on the draft *Climate 2050 Nature and Ecosystems Roadmap*.

BACKGROUND

In September 2018, the MVRD Board adopted the *Climate 2050 Strategic Framework* and directed staff to initiate development of the *Climate 2050 Roadmaps*. The Board subsequently authorized staff to begin an integrated engagement process for *Climate 2050* and the *Clean Air Plan*, using a series of issue area discussion papers related to the ten Roadmaps. The Climate Action Committee received the *Climate 2050* Discussion Paper on Nature and Ecosystems at its May 2020 meeting (see Reference).

This report presents the draft *Climate 2050 Nature and Ecosystems Roadmap* (see Attachment), and provides information on associated engagement activities planned with the public, stakeholders and other governments, including First Nations.

CLIMATE 2050

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. Climate 2050 is being implemented 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 the Clean Air Plan, as well as forthcoming updates to the regional growth strategy (draft Metro 2050) and the Regional Parks Plan.

DRAFT CLIMATE 2050 NATURE AND ECOSYSTEMS ROADMAP

The *Climate 2050 Nature and Ecosystems Roadmap* supports the vision to achieve a carbon neutral and resilient region through healthy and biodiverse ecosystems. In addition to outlining challenges and benefits, the draft *Climate 2050 Nature and Ecosystems Roadmap* lays out 30 actions for storing carbon and building resilience, organized under the following five strategic areas:

- 1. Protect, Restore, and Enhance the Region's Ecosystems
- 2. Connect Green Infrastructure
- 3. Integrate Natural Assets into Conventional Asset Management and Decision-Making Processes
- 4. Support a Resilient, Robust, and Healthy Urban Forest
- 5. Advance Nature-based Solutions to Climate Change

The draft *Climate 2050 Nature and Ecosystems Roadmap* proposes an implementation timeline to encourage swift early action on key issues. Given the timelines and ambitious targets and goals, staff have continued to advance relevant work plan items across departments and collaborate with other governments and partners while planning and developing the draft *Climate 2050 Nature and Ecosystems Roadmap*.

Potential Impact on Greenhouse Gas Emissions

A conservative estimate of the carbon stored in the vegetation and soils of the region's ecosystems (such as wetlands, forests, and riparian areas) is 65 million tonnes. Every year, an estimated one million tonnes of additional carbon is sequestered from the atmosphere and added to the carbon stores held by the region's ecosystems. Protection of ecosystems helps ensure stored carbon remains locked away and ongoing sequestration of carbon continues. Restoration and enhancement of ecosystems improves the region's long-term carbon storage potential.

Carbon sequestration and storage is one of the many benefits achieved through ecosystem protection and restoration. However, significantly increasing the amount of carbon taken out of the atmosphere and stored in ecosystems requires large areas and long timeframes. The contribution of nature and ecosystems to reducing the region's greenhouse gas emissions is therefore a supplemental solution to the actions outlined in other *Climate 2050 Roadmaps*.

Potential Impact on Regional Resiliency

Nature and ecosystems are integrated climate solutions in that they both store carbon and increase resiliency. Resiliency is increased through a broad range of 'ecosystem services' including cooling and

shading urban areas, capturing and cleaning stormwater, moderating floods, and reducing impacts of coastal storms. To provide these services, ecosystems must be healthy, biodiverse, and able to withstand the impacts of climate change. Protecting, restoring and enhancing nature and ecosystems maximizes their ability to provide climate resiliency benefits to the region.

Climate 2050 Nature and Ecosystems Roadmap, Regional Parks Plan and Metro 2050

There are important connections between the draft *Climate 2050 Nature and Ecosystems Roadmap* and the regional growth strategy (draft *Metro 2050*), which is currently in the approvals phase. Metro Vancouver, in partnership with its member jurisdictions, will collectively manage growth coming to the region, and the protection of important lands for conservation through the regional growth strategy (draft *Metro 2050*). The draft *Climate 2050 Nature and Ecosystems Roadmap* builds on the regional growth strategy (draft *Metro 2050*) with further actions to protect natural stores of carbon and build resiliency with nature and ecosystems.

In addition to incorporating actions from the regional growth strategy (draft *Metro 2050*), important connections also exist between the draft *Climate 2050 Nature and Ecosystems Roadmap* and the *Regional Parks Plan*, which is currently being updated. Metro Vancouver manages regional parks to protect important natural areas across the region and provide opportunities for people to connect with nature. The *Regional Parks Plan* is being updated to more fully address climate change and incorporates many actions from the draft *Climate 2050 Nature and Ecosystems Roadmap*.

NEXT STEPS

Each of the Climate 2050 Roadmaps, including the Climate 2050 Nature and Ecosystems Roadmap, is intended to serve as a "living, breathing" document that charts the path to achieving the region's climate action goals and targets. It is expected that the strategic areas and actions will be updated dynamically, responding to changes in policy, technology, science, opportunities and innovations, and performance measures and indicators. In coming years, staff will continue to work with the public, stakeholders, and other governments including First Nations, to amplify these actions and add new ones to store carbon and build resiliency with nature and ecosystems. Of note, the staff project team are working to expand local and Indigenous perspective in the Nature and Ecosystems Roadmap and associated actions. This will, as an example, help to meet the statement in the draft vision that 'Indigenous ways of knowing about the natural world are showcased and more widely understood and embraced by all'. The draft Roadmap acknowledges local and Indigenous perspective as a historical and future priority.

ENGAGEMENT PROCESS

Staff will seek feedback and recommendations for revisions on this draft *Roadmap* from those most likely to comment, be impacted, or have a role in implementation. This includes but is not limited to member jurisdictions and other governments, including First Nations. Information and opportunities to provide feedback will also be shared to the broader public. Feedback might include for example; support, concerns about implementation or impacts, and ideas for innovation and collaboration.

The proposed engagement process will align with the Board Policy on Public Engagement. The goals, strategies, and actions in the draft *Climate 2050 Nature and Ecosystems Roadmap* incorporate public and stakeholder feedback received during development of the *Climate 2050 Strategic Framework* (previously summarized in a report on engagement for *Climate 2050* received by the Climate Action

Committee on September 19, 2018), as well as feedback from the *Nature and Ecosystems Discussion Paper*. Given the strong connections to the regional growth strategy (draft *Metro 2050*) and the draft *Regional Parks Plan*, feedback received through each engagement process has informed development of the draft *Climate 2050 Nature and Ecosystems Roadmap*.

Feedback on the draft *Climate 2050 Nature and Ecosystems Roadmap* will inform the final Roadmap, which will be presented to the Committee and Board for consideration later in 2022.

ALTERNATIVES

- 1. That the MVRD Board direct staff to proceed with engagement on the draft *Climate 2050 Nature and Ecosystems Roadmap*, as presented in the report dated March 9, 2022, titled "Draft *Climate 2050 Nature and Ecosystems Roadmap*".
- 2. That the MVRD Board receive for information, the report dated March 9, 2022, titled "Draft *Climate 2050 Nature and Ecosystems Roadmap*" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

Under Alternative 1, the overall resources required to develop and engage on *Climate 2050 Roadmaps* have been approved in program budgets for 2021, including staff time and consulting expenditures. Funding for enhanced engagement on *Climate 2050* from the Sustainability Innovation Fund has been approved by the MVRD Board and will be used to support engagement activities on the development and implementation of the *Climate 2050 Roadmaps*. Continued alignment between *Climate 2050 Roadmaps* and regional management plans is intended to make the best use of resources available, as well as minimize time commitments for interested parties providing feedback.

CONCLUSION

Metro Vancouver's draft *Climate 2050 Nature and Ecosystems Roadmap* lays out strategies and actions to maintain healthy and resilient ecosystems that store carbon, moderate the impacts of a changing climate, and provide a range of other co-benefits. If authorized by the Board, Metro Vancouver intends to seek feedback on the draft roadmap from the public, stakeholders and other governments, including First Nations.

Staff recommend Alternative 1, that the Board direct staff to proceed with engagement on the draft *Climate 2050 Nature and Ecosystems Roadmap*. Engagement is intended to provide sufficient opportunity to interested parties to learn about the draft strategies and actions in the *Nature and Ecosystems Roadmap* and provide feedback. Feedback from engagement will inform the development of a final *Nature and Ecosystems Roadmap* for Committee and Board consideration, planned for 2022.

Attachment

Climate 2050 Nature and Ecosystems Roadmap, draft dated April 2022 (50888637)

Reference

<u>Climate 2050 and Clean Air Plan Discussion Paper on Nature and Ecosystems</u>, report dated April 17, 2020

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CLIMATE 2050 ROADMAP

Nature and Ecosystems

A pathway to storing carbon and building a resilient future with Nature and Ecosystems

April 2022

Metro Vancouver acknowledges that the region's residents live, work and learn on the shared territories of many Indigenous peoples, including 10 local First Nations: Katzie, Kwantlen, Kwikwetlem, Matsqui, Musqueam, Qayqayt, Semiahmoo, Squamish, Tsawwassen, and Tsleil-Waututh.

Metro Vancouver respects the diverse and distinct histories, languages, and cultures of First Nations, Métis, and Inuit, which collectively enrich our lives and the region.

Your input is valued.

This Roadmap was drafted in the winter of 2021-2022 based on feedback received from a broad range of individuals, organizations and stakeholder groups between 2020-2021. Engagement was centred around the Metro Vancouver *Nature and Ecosystems Discussion Paper* to support *Climate 2050*, introduced for public and stakeholder comment in May 2020.

Public feedback is valued and project teams will continue to seek input on this draft Roadmap through the spring and summer of 2022. We will create online feedback opportunities, and will continue to ensure feedback is reflected as we move forward with implementing these actions. Documents, feedback forms, and direct email links to the project team are all posted to the Metro Vancouver website, metrovancouver.org, search "Climate 2050 Nature and Ecosystems Roadmap".

COVID-19 has had an impact on our traditional engagement methods. 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 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 target 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 in terms of greenhouse gas emissions. This provides a glimpse of what is possible and what we can achieve with coordinated efforts and common goals in a time of crisis.

Metro Vancouver

Metro Vancouver is a federation of 21 municipalities, one Electoral Area, and one Treaty First Nation, working collaboratively in planning and providing vital utility and local government services to 2.75 million people. Essential services include drinking water, sewage treatment, and solid waste disposal, along with regional services like regional parks, housing, land use planning and air quality management that help keep the region one of the most livable in the world. Metro Vancouver's mission is framed around three broad roles.

- **1. Serve as a Regional Federation** Serve as the main political forum for discussion of significant community issues at the regional level, and facilitate the collaboration of members in delivering the services best provided at the regional level.
- **2. Deliver Core Services** Provide regional utility services related to drinking water, liquid waste and solid waste to members. Provide regional services, including parks and affordable housing, directly to residents and act as the local government for Electoral Area A.
- **3. Plan for the Region** Carry out planning and regulatory responsibilities related to the three utility services as well as air quality, regional planning, regional parks, Electoral Area A, affordable housing, labour relations, regional economic prosperity, and regional emergency management.

BUILDING A RESILIENT REGION

Building the resilience of the region is at the heart of Metro Vancouver's work. Each of Metro Vancouver's regional plans and strategies adopts a vision, guiding principles, goals, strategies, actions and key performance measures that will support a more resilient, low carbon and equitable future. Metro Vancouver's interconnected plans and strategies are guided by the Board Strategic Plan, which provides strategic direction for each of Metro Vancouver's legislated areas of responsibility and the Long-Term Financial Plan which projects total expenditures for capital projects and operations that sustain important regional services and infrastructure. Together these documents outline Metro Vancouver's policy commitments and specific contributions to achieving a resilient region.



Adopted by the Metro Vancouver Board in 2018, the <u>Ecological Health Framework</u> encapsulates Metro Vancouver's collective efforts around ecological health and provides guiding principles, goals, and strategies to help achieve the vision of "a beautiful, healthy, and resilient environment for current and future generations". To help guide corporate actions, the *Framework* set three high-level goals: 1) build ecological resilience and minimize impacts; 2) protect natural areas and conserve ecosystem services; 3) and nurture nature within communities. The *Climate 2050 Nature and Ecosystems Roadmap* complements and builds on the *Ecological Health Framework* by identifying additional corporate and regional actions to maximize carbon storage, resilience, and other critical ecosystem services provided by nature and ecosytems.

Metro Vancouver's Roles and Responsibilities for Climate Action

The actions to achieve carbon neutrality and building a more resilient region will depend on the collaborative efforts of many players in the region as well as the federal and provincial government. However, Metro Vancouver has some unique and important roles and responsibilities for advancing climate action.

- Under the Environmental Management Act, Metro Vancouver has the delegated authority to provide the service of air pollution control and air quality management and may, by bylaw, prohibit, regulate and otherwise control and prevent the discharge of air contaminants, including greenhouse gases.
- Through the regional growth strategy, Metro Vancouver, with its members, plans for compact, complete communities that are foundational to enabling a carbon neutral, resilient region.
- As part of delivering its core services, Metro Vancouver also generates and uses clean, renewable energy
 from its facilities and is working to ensure core regional services and infrastructure are prepared for and
 resilient to climate change.
- Invest Vancouver is Metro Vancouver's economic development leadership service with the vision of a
 dynamic and resilient regional economy that delivers prosperity for all. It aims to foster greater regional
 collaboration on economic development issues, to advise leaders on sound economic policy and strategy,
 and to brand the region and its key industries to a global audience with the intention of attracting strategic

- investment. Invest Vancouver focuses on key export oriented industries in which the region has a productive advantage. This includes many aspects of the green economy, including clean technology, renewable energy and clean transportation.
- In its role as a regional forum, Metro Vancouver builds and facilitates collaborative processes which engage the public and build partnerships to address significant regional issues like climate change. As part of this role, Metro Vancouver coordinates with and advocates on behalf of its member jurisdictions to other governments and partners on greenhouse gas management and climate change adaptation initiatives.

These roles are necessary but not sufficient to achieve our goals of a climate neutral, resilient region. Metro Vancouver will be looking to other orders of government, First Nations and other regional partners to lead and collaborate in the implementation of a number of key actions in the Climate 2050 Roadmaps.

The Roadmap At a Glance

Metro Vancouver's ecosystems are vital to the people and wildlife who live here. In both urban and natural areas, these ecosystems have tremendous cultural and spiritual importance, contribute to the region's livability, provide a sense of place, and foster biodiversity. Nature and ecosystems help us address climate change by sequestering carbon annually and storing it over the long-term, while also bolstering our resilience to climate change impacts such as extreme heat and flooding. Nature and ecosystems are themselves at risk of a changing climate, exacerbated by other stressors such as land development and invasive species.

Despite the challenges faced, the region is well-positioned to take action and maintain a healthy environment. By protecting, restoring, and enhancing ecosystems, and connecting them together across the region through a robust green infrastructure network, we can support productive and resilient ecosystems that help us address climate change. Natural asset management — a concept that involves accounting for the benefits nature provides — continues to gain traction across the region. Improving the health and extent of the region's urban forest is another opportunity to take climate action close to where people live and work. Lastly, our collective efforts to address climate change can include nature-based solutions that help address multiple problems, such as biodiversity loss and climate change, simultaneously.

The Nature and Ecosystems Roadmap lays out 30 actions for storing carbon and increasing resiliency, organized under the following five strategic areas:

- 1) Protect, Restore, and Enhance the Region's Ecosystems
- 2) Connect Green Infrastructure
- 3) Integrate Natural Assets into Conventional Asset Management and Decision-Making Processes
- 4) Support a Resilient, Robust, and Healthy Urban Forest
- 5) Advance Nature-based Solutions to Climate Change

Although there is much work to be done, there are some important actions that can be implemented now to supplement the efforts in other sectors to reach a carbon neutral and resilient region by 2050. It is critical that the actions identified in this Roadmap are implemented rapidly to prevent future ecosystem loss and degradation, and to maximize long term carbon storage, resilience, and other co-benefits. We are not alone in this challenge. The actions in this Roadmap demonstrate the importance of working collectively to reach climate objectives, and will complement other regional plans that support healthy and biodiverse ecosystems. Working closely with First Nations, the federal and BC governments, member jurisdictions, and other key partners will be critical to effectively implement the actions in this Roadmap. Together, we can ensure that nature and ecosystems are an integral part of creating a carbon neutral and resilient region.

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Visioning Healthy and Resilient Nature and Ecosystems in 2050

Our vision is that in 2050, Metro Vancouver is a place where the natural environment provides benefits to humans and other species alike, and the relationship between people and nature is more intrinsically known and understood by residents across the region. Indigenous ways of knowing about the natural world are showcased and more widely understood and embraced by all. Nature and ecosystems are recognized for their inherent value as irreplaceable systems, but also for their ability to foster biodiversity, store carbon, and moderate the impacts of climate change. The way we "do business" has undergone a paradigm shift, such that these benefits are recognized and accounted for in decision-making processes. Ecosystems are healthy in undisturbed, natural areas, but also within the communities where people live, work and play. Our region is known globally as a leader in fostering relationships and partnerships - working together to enable the protection, enhancement, restoration, and connection of ecosystems, and implementing nature-based solutions to support biodiversity, moderate the impacts of climate change, and store carbon over the long-term.

Climate 2050 Nature and Ecosystems Roadmap

A pathway to storing carbon and building a resilient future with Nature and Ecosystems in Metro Vancouver

The Challenge

This Roadmap is about ambitious and necessary protection, enhancement and restoration of our natural environment. It presents a robust plan for this region to maintain a healthy environment that is supported by productive and resilient ecosystems. Nature and ecosystems have the capacity to store carbon and help moderate the impacts of a changing climate, and they provide numerous other benefits; however, these natural systems are themselves at risk due to a changing climate, land development, invasive species, pollution, and other factors. Decisions we make now to protect, restore, enhance, and connect nature and ecosystems across the region will have a lasting impact on the state of the natural environment in the future.

A carbon neutral and resilient region, supported by healthy ecosystems, is the best option for future generations to maintain a good quality of life, beyond 2050. We have to make some significant decisions and investments today or pass them on to future generations at higher cost and consequence. Metro Vancouver and many of its member jurisdictions have committed to ambitious targets and bold leadership to respond to the climate crisis. This plan responds to the global challenge to come together, think big, and act now in this region.

The Connection between Climate and Air Quality

The Clean Air Plan is Metro Vancouver's air quality and greenhouse gas management plan. Actions in the Plan will reduce air contaminant emissions and impacts in our region, including greenhouse gases, over the next 10 years. These actions will support the interim target of a 45% reduction in greenhouse gas emissions by 2030, and establish the foundation for the 30-year goal of a carbon neutral region by 2050. The Clean Air Plan also addresses 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. Some air contaminants, such as ground-level ozone, can damage plants and reduce vegetation growth, adding to the stress on nature and ecosystems imposed by 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 air quality-related health impacts in our region. While this topic area is touched on in the *Nature and Ecosystems Roadmap*, response to the air quality impacts of wildfires will be addressed in more detail in the *Human Health and Well-being Roadmap*, as well as the *Clean Air Plan*.

Climate Change Impacts on Nature and Ecosystems

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

Many species and ecosystems in the region are being impacted by climate change because they cannot adapt fast enough – for instance, Pacific salmon are affected by warming stream temperatures, stressing fish and increasing vulnerability to disease (see Species Case Study on page 17). Climate change adaptation must be considered when managing ecosystems in urban and natural areas, including the development of best practices supported by current climate science. While specifics are likely to change when new climate change projections are completed and more data becomes available, high-level trends are likely to remain consistent over time.

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 are, and will continue to be, affected by climate change and associated 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 on Nature and Ecosystems.

Climatic Changes and Hazards	Anticipated Impacts to Nature and Ecosystems	How Nature and Ecosystems Can Minimize Impacts
Sea level rise and flood	ling (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 fish and wildlife. Flood waters deposit excess sediment over fish habitat, including spawning areas, impacting fish health and populations. During a flood, toxic substances from low-lying areas (e.g. urban and industrial 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 in rivers	Salt water will move further upstream during lower river flows, affecting freshwater aquatic ecosystems	
Combined impact of sea level rise, storm surge and coastal flooding	The ecological impacts of coastal storms and flooding are exacerbated by sea level rise.	Coastal and intertidal ecosystems (such as mudflats and seagrass beds) protect atrisk communities by reducing the impacts of waves and extreme tides, absorbing excess water, and buffering the impacts of coastal storms.
Changing precipitation	on patterns	
More intense rainfall events	 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 the impacts of flooding, prevent erosion, and absorb and filter rainwater, reducing the strain on stormwater infrastructure – but in extreme events, natural systems can be overwhelmed.
Longer dry spells in the summer	 Drought conditions, combined with higher temperatures, reduce annual tree growth and increase mortality rates. 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. Drought can stress newly planted restoration areas, increase the risk of fire and disease, and increase the likelihood that trees are blown over during high winds. Longer and more intense wildfire season, driven by both heat and drought. Long periods of drought will dry out wetlands by lowering watertables 	 Trees and other vegetation help to retain the little water available during drought conditions by reducing the loss of water from the soil, which also cools the air. Intact forest and riparian vegetation alongside streams and waterbodies provide shade, keeping waters cooler and reducing evaporation.

Increased precipitation in winter, spring and fall	Forests can be damaged and soils lost by heavy rain storms, resulting in flooding, slope instability and tree failure.	 Healthy, intact forests are better able to stabilize slopes and resist change. Vegetated areas capture and regulate rainwater, reducing the strain on stormwater infrastructure.
Changing temperature	S	
Extreme heat	 Heat sensitive ecosystems (e.g. wetlands) and species (e.g. salmon, bats, western red cedar) become stressed at higher temperatures. Impacts are compounded by drought conditions. Ecosystems and species can be 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 alpine ecosystems are restricted in their ability to move. Higher outdoor temperatures increase the formation of ground-level ozone, which can damage plants 	 Healthy trees and other vegetation help protect people from extreme heat, by reducing the urban heat island effect. 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 are controlled by low winter temperatures. 	Healthy, biodiverse 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 their home habitat after flowers have already bloomed.	Resilient, large, and connected ecosystems across the landscape help native species adapt to changing conditions.
Ocean warming and acidification	Impacts to marine and intertidal ecosystems (e.g. die-offs during heatwaves), stress on native species due	Impacts can be reduced by lessening human-caused stressors such as over-fishing

	to changing conditions, and new incidences of invasive aquatic species.	 and pollution, and ensuring healthy biodiverse coastal ecosystems. Seagrasses may help to reduce salinity and buffer the impacts of ocean acidification
Wind storms		
High winds exacerbate other hazards	Wind storms, in conjunction with sea level rise, can lead to greater storm surge.	 Natural breakwaters such as reefs can reduce wave action. Contiguous areas of forest are more resilient to wind damage. Buffer trees can also protect infrastructure and crops from wind.

Note: These climatic hazards can cause cascading impacts – for example, flooding tends to be more severe following a wildfire, landslides tend to occur following heavy rainfall, and severe storms may cause more damage in coastal areas as the sea level rises. Cascading events were experienced in British Columbia during November 2021 when intense precipitation (an "atmospheric river") resulted in severe flooding and landslides. Non-climatic hazards can also exacerbate climatic ones; for instance, subsidence can increase the risk of coastal flooding and exacerbate 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.



Western Red Cedar in a State of Decline in West Vancouver (District of West Vancouver)

Carbon Storage and Sequestration from Nature and Ecosystems in Metro Vancouver

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 tonnes¹. Every year, these areas sequester additional carbon, removing carbon dioxide from the atmosphere and storing it away long-term. The ecosystems that Metro Vancouver protects in the drinking water supply areas, along with the regional parks system, store 22 million tonnes of carbon. Although carbon storage is not the primary function of these areas, ongoing protection of these significant carbon stores is critical to the region's efforts to reduce greenhouse gas emissions. Figure 2 shows the key natural carbon stores in the region.

Carbon Sequestration and Storage

<u>Carbon sequestration</u> is the removal of carbon dioxide from the air on an annual basis. The measure of annual sequestration would be considered as part of the region's efforts to measure carbon neutrality by 2050.

<u>Carbon storage</u> refers to the total amount of carbon stored in the vegetation and soils of ecosystems such as forests, wetlands and intertidal areas, which often takes thousands of years to accumulate.

Carbon is released from ecosystems when trees are cut down, soils are disturbed, and water cycles are altered (e.g., draining wetlands). Becoming a carbon neutral region by 2050 will require protection of regional ecosystems to ensure the carbon they store remains in place and they are able to continue to remove carbon from the atmosphere, year after year. Restoring, connecting and enhancing these ecosystems in locations that can sustain them can also improve the region's long-term carbon storage potential.

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

Carbon sequestration and storage is one of many benefits achieved through ecosystem protection and restoration, but it is not a silver bullet solution – it is a supplemental solution to directly reducing our greenhouse gas emissions through actions explored in other *Climate 2050* Roadmaps. Tangible increases in carbon storage levels in natural systems requires ample space for ecosystems to grow and shift, and long timeframes.

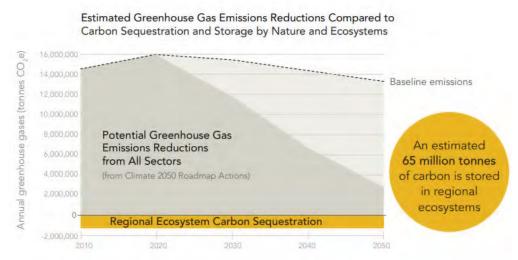


Figure 1: Estimated Greenhouse Gas Emissions Reductions Compared to Carbon Sequestration and Storage by Nature and Ecosystems

in vegetation and soil in the Metro Vancouver region metro vancouver Extensive forests in the north of the Trees in the region's urban forests Ø region store over 40 million tonnes store about 8 million tonnes of of carbon. These forests provide carbon. These trees also capture clean water and wildlife habitat. stormwater, cool our streets, and improve human health and well-being. Agricultural land stores carbon in vegetation and soils; Delta's agricultural soils alone store Coastal ecosystems store carbonclose to 1 million tonnes of (often referred to as "Blue carbon. In addition, Carbon"), protect shorelines agricultural land provides food from coastal storms, and provide security, economic benefits, habitat for fish and wildlife. and wildlife habitat. Burns Bog and other **wetlands** store large amounts of carbon. They also control floodwaters, improve water quality, and provide essential wildlife habitat.

Millions of tonnes of carbon are stored

Figure 2: Key Natural Carbon Stores in the Region and their Impacts on Regional Climate Resilience

Storing Carbon and Building Resilience Through Nature and Ecosystems

The following section outlines several key concepts that underpin the strategies and actions in this Roadmap. These key concepts are foundational for understanding how nature and ecosystems can become incorporated into the region's climate action strategy.

For nature and ecosystems to be effective as part of climate action planning, **biodiversity** must be considered and prioritized throughout all actions to ensure ecosystem health, and to avoid unintended consequences (e.g. planting of vegetation that maximizes carbon storage, but negatively affects wildlife and habitat for species). Ecosystems that are biodiverse are able to provide more **ecosystem services**, or co-benefits. Many ecosystem services are climate change related; for instance, trees and forests can store carbon but also provide shading, cooling, and other benefits associated with climate change adaptation. **Green infrastructure** refers to the types of natural, enhanced and engineered assets that provide ecosystem services. Linking different types of green infrastructure together into a functional network is best practice to maximize ecosystem services. **Nature-based solutions** are a type of green infrastructure that helps address both biodiversity loss and climate change simultaneously. Nature-based solutions are increasingly being integrated into climate action plans to supplement other technological and engineered solutions, such as those identified in other *Climate 2050* Roadmaps.

Biodiversity

The Metro Vancouver region's rich and diverse natural environment is vital to the people and wildlife who live here. The region's natural areas have tremendous cultural and spiritual importance, contribute to the region's livability, provide a sense of place, and foster biodiversity, which can be broadly defined as the variety of life. The region is home to the Fraser River Estuary, an important and productive marine ecosystem that forms the mouth of one of the largest salmon-bearing rivers in the world, and supports one of the highest concentrations of migratory birds in Canada. The Fraser River Estuary is one of four Important Bird Areas (IBA) being assessed as Key Biodiversity Areas – internationally recognized sites defined by a global standard – within Metro Vancouver. Large, contiguous ecosystems such as these have benefits for biodiversity, but the smaller, "stepping stone" habitats are important as well. For example, while the north shore mountains contain some of the highest quality habitat in the region, habitats at lower elevations are used by birds migrating back to the region in early spring while habitats in the north shore forests are still frozen. Collectively, the region's ecosystems - from the forests, wetlands, and watercourses to the urban trees and parks - form a mosaic of habitats that support biodiversity.

"Biodiversity enables Nature to be productive, resilient and adaptable. Just as diversity within a portfolio of financial assets reduces risk and uncertainty, so diversity within a portfolio of natural assets increases Nature's resilience to shocks, reducing the risks to Nature's services."

The Economics of Biodiversity: The Dasgupta Review

Climate change and biodiversity loss are two interlinked challenges occurring simultaneously, both globally and locally. Metro Vancouver's ecosystems are affected by a changing climate (see Table 1), and the lower mainland of southwestern British Columbia where they are situated has been identified as an ecoregion at significant risk to biodiversity loss. As climate change places stress on ecosystems, they become less resilient and less capable of storing carbon. In order for nature and ecosystems to provide benefits and ecosystem services, they must be resilient to the impacts of human activities, including climate change. Resilient ecosystems are both healthy and biodiverse. For example, a healthy forest that supports a wide variety of tree species will store more carbon and recover faster from disturbances, such as fire or pests, because not all species will be impacted to the same degree

and some will rebound more easily. Protecting and enhancing biodiversity in nature and ecosystems maximizes their ability to provide climate change benefits.

Species Case Study: Pacific Salmon

In the Pacific Northwest, salmon are a keystone species, supporting people, ecosystems and wildlife. Salmon have cultural, spiritual and food source significance in our region, particularly to First Nation communities. The Fraser River is one of North America's greatest salmon-producing rivers. The river and its main tributaries within Metro Vancouver – Kanaka Creek, Pitt River (Alouette River, Widgeon Creek), Coquitlam River and Brunette River – weave through the region, providing important habitats for salmon and other species.

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. Integrating fish passage into 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.



Ecosystem Services

The importance of nature and ecosystems in the Metro Vancouver region is intrinsic, invaluable and unmeasurable, and these environments have significant cultural and spiritual importance for all communities. The concept of 'ecosystem services' (see Figure 3) has emerged as a tool to allow us to more fully understand the breadth of benefits that nature provides, including cultural ones. Many of these benefits also relate to climate change – for instance, nature and ecosystems store carbon, cool city streets, clean stormwater, and moderate floods. The concept of ecosystem services can help underscore the fact that we live in reciprocity with nature; while ecosystems provide benefits to humans, we also co-exist in concert with the natural world.

Ecosystem services are not typically accounted for in decision-making, and this lack of understanding results in a devaluation of nature, contributing to its ongoing loss and degradation. As technology and methods that allow for measurement of ecosystem services improve, it will become easier to incorporate ecosystem services into broader decision-making, resulting in better outcomes for both people and nature.

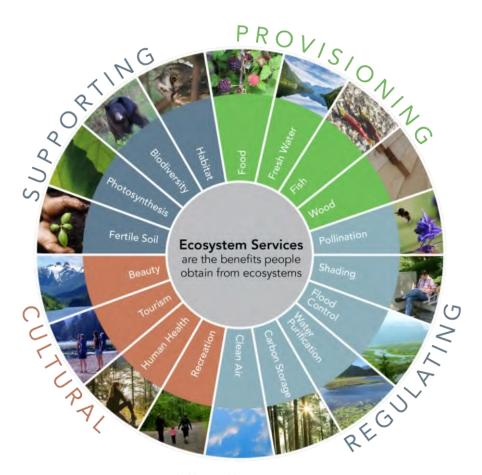


Figure 3: Ecosystem Services Provided by Healthy Ecosystems

Green Infrastructure

The term Green Infrastructure refers to the natural, enhanced and engineered systems (shown in Figure 4) that collectively store carbon, help communities adapt to climate change, and provide society with a range of other ecosystem services. This Roadmap considers green infrastructure across all landscapes and land use types, from urban street trees and green roofs to natural ecosystems such as wetlands, forests, and watercourses.



Figure 4: Types of Green Infrastructure

Stormwater management is a key driver for the implementation of enhanced and engineered green infrastructure solutions, and demand for this ecosystem service is likely to increase due to climate change. However, a major benefit of green infrastructure is that it provides a wide range of ecosystem services beyond stormwater management, including support for biodiversity and human health and well-being. In order to maximize benefits, green infrastructure needs to be planned and implemented with multiple ecosystem services in mind.

Metro Vancouver member jurisdictions have considerable experience planning and implementing green infrastructure projects; however, there is a need to move beyond individual projects and pilots to broad implementation across the region, with consideration given to 'networking' the individual elements of green infrastructure into a functioning system.

Green Infrastructure – a Cross-Cutting Climate Action

Green infrastructure will need to be integrated across different land uses and involve a range of sectors. This Roadmap focuses on the importance of creating a network of green infrastructure and planning for cobenefits, including support for biodiversity. Connections between other *Climate 2050* issue areas and green infrastructure are outlined below:

Land Use and Growth Management – the land use planning framework supports green infrastructure planning and implementation through the protection of lands important for conservation, recreation, and agriculture, as well as the integration of green infrastructure into the design of new or redeveloped urban areas, reducing the loss of trees and greenspace, and creating better places for people and nature.

Agriculture – agricultural land, including remnant natural vegetation such as wetlands and riparian areas, and other permanent vegetation (e.g. hedgerows), provide opportunities for wildlife, pollinator and bird habitat and connectivity across the landscape. Supporting long-term farm health and resiliency through the expansion of regenerative agriculture practices (e.g. cover cropping) also enhances biodiversity and ecosystems services.

Transportation – opportunities exist to reduce climate change impacts on the transportation network by integrating green infrastructure into transportation networks (e.g. through planting trees and other vegetation along road and railway verges and recreational greenways). Siting of infrastructure to avoid fragmentation of green infrastructure networks also supports a regional green infrastructure network.

Water and Wastewater Infrastructure – green infrastructure in urban areas tends to be heavily focused on stormwater management benefits. Green infrastructure can supplement grey infrastructure by filtering stormwater and reducing the amount of stormwater overflow during smaller rain events. Considering other benefits from green infrastructure (such as support for biodiversity and human health) increases the range of potential benefits achieved in urban areas.

Buildings – buildings dominate the urban landscape, so there is significant potential to leverage the climate-related benefits of green infrastructure (e.g. providing shade and capturing rainwater) by incorporating green infrastructure elements onto and around built structures.

Energy - trees can reduce the amount of energy needed to cool buildings and people by providing shade and reducing air temperatures.

Human health - green infrastructure provides a range of health benefits to people through connection to nature, as well as by providing services that support adaptation, including providing shade and capturing flood waters.

Nature-Based Solutions

Green infrastructure, if designed and implemented with biodiversity outcomes as a priority (e.g. a green roof that creates habitat for pollinators), is an example of a nature-based solution to climate change.

Locally and internationally, there has been a growing understanding and recognition of the climate change and biodiversity co-benefits that ecosystems provide, and this has led to the emergence of nature-based solutions as a focus for climate action. Nature-based solutions are holistic actions that protect, sustainably manage, and restore ecosystems, while simultaneously addressing societal challenges such as climate change. These solutions provide benefits for humans and wildlife alike, and ideally, these solutions recognize that humans and nature are interconnected and mutually dependent. For example, seagrass meadows store carbon, reduce impacts of coastal storms on shorelines, and provide essential habitat for fish and other species.

While climate change actions have historically been focused on technological and engineered solutions — which continue to be important — nature-based solutions can supplement these actions and become an integral part of climate action planning. Nature-based solutions are relatively new in terms of research, policy, and practice; however, awareness, protocols and standards for these types of interventions continue to be developed and improved.

Nature-based Solutions for Addressing Climate Change



Figure 5: Nature-based Solutions for Addressing Climate Change

Barriers and Opportunities

The Metro Vancouver region is growing by approximately 35,000 people per year, and the impacts from human activities, including urban development, logging, and climate change have resulted in ecosystem change and loss. Nature and ecosystems offer important benefits, but if they are lost, it will require substantial time and available space for them to regenerate into mature, functioning systems. Additional barriers, and opportunities to overcome them, are included in Table 2 below:

Table 2: Barriers and opportunities associated with storing carbon and building resilience with nature and ecosystems

Barrier	Opportunity
The region is facing a dual challenge of climate change	Taking action on both biodiversity loss and climate
and biodiversity loss, the impacts of which are	change together is the key to success. There is an
interrelated.	opportunity to implement nature-based solutions that
	help to address both challenges. Healthy, resilient, and
	biodiverse ecosystems are needed to support
	biodiversity and climate action.
Species and ecosystems are experiencing increasingly	It is important to consider future climate conditions in
challenging environments that will continue to change	planning processes; for instance, considering how
in the future.	future climate conditions might impact the urban
	forest, invasive species, natural resource
	management, and restoration work.
This region has a constrained land base, high costs and	Space for nature must be considered and integrated
competition for land, and a steadily increasing	throughout different land uses. This prioritization
population – all of which present challenges when	requires innovation and collaboration; for instance,
trying to conserve space for nature and ecosystems.	collaboration between multiple departments to
To achieve substantial gains in carbon storage, for	maximize both housing density and tree canopy in
instance, would require significant space for tree	urban areas. Multi-functional ecosystems across land
planting and ecosystem restoration.	uses support more habitats, which improves overall
	biodiversity.
Informed decision-making requires regionally-specifc	Some regional datasets have been developed to
data (e.g. vulnerability of ecosystems to climate	inform decision-making. These datasets were
change, susceptibility to new invasive species), and	generated, and will be updated, using a consistent
this data is not always available or current.	methodology across the region, and trend reporting
	can occur at regular intervals. As technology improves
	and costs decrease, some data will become
	increasingly more accessible. Partnerships with
	agencies and organizations that produce relevant data
	can also help overcome this barrier.
There is a lack of knowledge and training on newer	There is an opportunity to develop knowledge in a
approaches, such as the implementation of green	range of sectors through professional training.
infrastructure and nature-based solutions. Uncertainty	Providing a regional forum to share technical
and lack of knowledge leads to perceived risks around	knowledge, as well as the development of standards
the performance, cost and maintenance of using new	and guidelines, can help to dispel some of the
and innovative solutions. In addition, the results from	uncertainties and instill confidence in new practices.
case studies and pilot studies in other locations are	Embedding new approaches as shared objectives
not always transferable to this region.	across organizations avoids the risk of siloed initiatives
The table and table of action 1911 1 1911	within one department or discipline.
The inherent value of nature and the benefits it	Integrating natural assets and the ecosystem services
provides society are not fully recognized, leading to a	they provide into decision-making will improve overall
lack of priority given to protection and restoration	understanding and support efforts to prioritize
efforts.	protection and restoration.

The coastal and marine environment in the Metro Vancouver region is uniquely impacted by climate change. Ecosystems in these environments are affected by coastal squeeze, warmer temperatures, changing hydrology, and ocean acidification. These environments are governed by multiple agencies with differing levels of legislative authority, making it difficult to collaborate on solutions to these challenges.

There is an opportunity to monitor and share information related to the coastal marine environment among regional partners, and to connect with governments, agencies and organizations that have more direct influence in coastal and marine environments, including member jurisdictions, and the federal and BC governments.

Equity Considerations

The impacts of climate change will affect everyone, but they pose a greater threat to people who are already vulnerable due to overlapping factors such as income and health. For example, vulnerable populations with lower incomes have fewer resources and less adaptive capacity to respond to climate change impacts; these challenges can be magnified by poor health. Typically, those who are the most at-risk to climate change impacts have contributed the least to greenhouse gas emissions. Given the interlinkage between vulnerable populations and climate change impacts, incorporating equity considerations into climate change policy is imperative.

As climate action is planned and implemented, it will be important to consider how different groups are affected by climate impacts, and who may be at a greater risk. Including these considerations throughout the process may mean targeting or timing action to assist those who are most vulnerable. A relevant example would be identifying vulnerable communities living in areas with low levels of tree canopy, parks and other green space.

Green infrastructure enhancements can have unintended social consequences; for instance, researchers are investigating whether 'green gentrification' is contributing to the displacement of marginalized communities. If green infrastructure is to provide benefits to those most in need, it is essential to consider the potential for these kinds of unintended consequences and involve the community early in the planning process.

The Journey - Storing Carbon and Building Resilience through Nature and Ecosystems

Climate 2050 Roadmap Connections

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 loading on built infrastructure during smaller rain events and restores urban biodiversity. Separation of combined sewers into separate sanitary and storm systems allows for partial restoration of original drainage courses (e.g. daylighting streams).

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.

Buildings – nature and ecosystems can help reduce greenhouse gas emissions from buildings and increase resilience by protecting from flooding and heat.

Waste – biosolids and compost are soil amendments that improve soil health, improve water retention, promote vegetation growth, and restore disturbed ecosystems.

Climate Goals and Targets for Nature and Ecosystems

Metro Vancouver's *Climate 2050 Strategic Framework* has set the following regional vision to guide the region's response to climate change:

- Metro Vancouver is a carbon neutral region by 2050
- Infrastructure, ecosystems, and communities are resilient to the impacts of climate change

Metro Vancouver has also set an interim target of 45% reduction in greenhouse gas emissions from 2010 levels, by 2030.

What is a Carbon Neutral Region?

A carbon neutral region means that we have achieved the deepest greenhouse gas emission reductions possible across all economic sectors, and any emissions left are balanced out by the carbon dioxide removed from the atmosphere by the plants, trees, and soil in the region, as well as by potential carbon capture technologies that are under development.

Achieving this vision means setting goals in each of the *Climate 2050* Roadmaps, in order to ensure that each sector in the region plays as strong a role as possible in getting to a carbon neutral, resilient region.

Metro Vancouver has set the following goals for nature and ecosystems in this region:

GOAL: Nature and ecosystems are resilient, protected, maintained, enhanced, restored and connected, to maximize ecosystem services across the region.	Targets By 2050: Protect 50% of the region for nature Achieve 40% tree canopy cover within the Urban Containment Boundary
GOAL : Nature-based solutions that support biodiversity are included in the region's response to climate change.	MEASURABLE OUTCOMES: Measurable outcomes for nature-based solutions are still to be determined based on additional review and discussion.

Many of the actions identified in this Roadmap will need to be participated in or led by other governments (e.g., national, provincial, local, and First Nations) as well as other regional partners. Metro Vancouver has a long history of working with other governments towards common goals. Fortunately, many of the organizations needed to make this transition are already actively working toward similar goals, including: the Provincial Government and its CleanBC Plan, CleanBC Roadmap to 2030, and draft Climate Preparedness and Adaptation Strategy; the Federal Government's recently strengthened climate plan called A Healthy Environment and a Healthy Economy; and First Nations climate-related goals and initiatives. Metro Vancouver's member jurisdiction's own community and corporate climate plans; utilities; and, increasingly, industry associations.

Best Practices to Guide Success

The next section outlines 5 strategies and 30 actions; these measures set a pathway forward for nature and ecosystems to support the vision of a carbon neutral and resilient region by 2050. The following principles should be considered as best practices when implementing the actions throughout this Roadmap:

- 1. Prioritize biodiversity, equity, and conservation objectives when implementing nature-based climate solutions.
- 2. Prioritize planting native species in natural areas. Prioritize planting native species in urban areas where possible, but use non-native species to augment in challenging sites where native species will not thrive.
- 3. Choose solutions that support multiple ecosystem services, rather than focusing on only one ecosystem service.
- 4. Prioritize protection of mature trees and ecosystems.
- 5. Integrate environmental objectives so they are shared priorities across whole organizations and everyone is working to achieve them.
- 6. Offsetting the loss of ecosystems (e.g. through habitat compensation) should be done on a net-gain basis, but only considered after options for avoiding and reducing impacts have been explored.
- 7. Ensure long term maintenance and ecosystem health is considered and prioritized after planting.

Strategy 1: Protect, Restore, and Enhance the Region's Ecosystems

To become a carbon neutral and resilient region by 2050, we need to make substantial commitments to protect, restore, and enhance nature and ecosystems, and at a larger scale than ever before. Currently, about 40% of the region's land base is protected by government and other organizations in the form of parks and other publically-owned lands, for the purposes of conservation or recreation. Large, healthy, connected, and biodiverse ecosystems are more resilient to climate change impacts and therefore better able to store carbon and support climate change adaptation. Scientific reviews of how much of the Earth should be protected vary, but 50% - also know as 'Nature Needs Half' - is considered a mid-point of estimates and is supported by a range of scientific studies (see callout box - Why Protect 50% of the region?). Increasing the amount of parkland in the region also provides additional space for the region's growing population to access nature and recreate, contributing to community and individual health and well-being. Given that this region faces significant land use constraints, meeting this target will involve making trade-offs between competing priorities, reducing the amount of land available for urban development and other uses.

Why Protect 50% of the region?

There have been growing efforts globally to set ambitious area-based targets for protection. For example, the High Ambition Coalition for Nature and People, an intergovernmental group of 70 countries including Canada, committed to protecting 30% of land and seas by 2030 (known as 30 x 30). This is intended as an interim goal, with another 20% needed as 'climate stabilization areas' to keep climate change below 1.5 degrees.

Studies estimating the percentage of the Earth that should be protected provide values from 30% to 70%, or even higher. The call for 50% - known as Nature Needs Half - is a mid-point of these values and is supported by a range of scientific studies.

Ecosystem Loss in the Metro Vancouver Region

Metro Vancouver maintains the Sensitive Ecosystem Inventory (SEI) of the region's most important ecological areas and monitors it for change. Between 2009 and 2014, 1,600 hectares of sensitive 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 urban development (as planned within local official community plans) and logging (as permitted by the BC government).

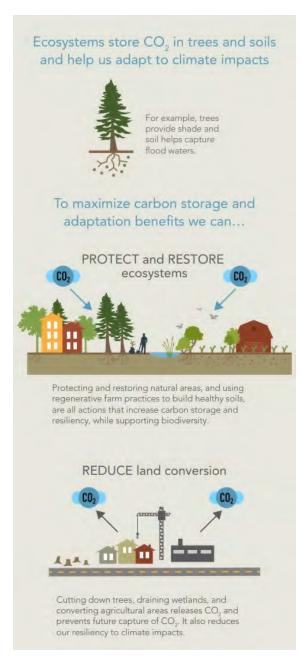


Figure 6: The Climate Change Benefits of Protecting and Restorating Ecosystems

Prioritizing the protection of the region's remaining mature ecosystems will focus effort on the highest functioning, most biodiverse areas. Once mature ecosystems are degraded or lost, it will take many years (and potentially extensive effort and resources) to return them to a similar well-functioning state.

Indigenous Peoples have lived on these lands since time immemorial, and continue to steward the land and species as part of a reciprocal relationship with nature. The protection of lands in this region needs to take place with the full participation and leadership of Indigenous Peoples, while respecting their land and resource rights.

Restoration provides us an opportunity to gain back ecosystems and the services they provide. Examples of how restoration efforts could support climate action include:

- increasing ecosystem connectivity between major protected areas to allow species to move in response to climate change;
- improving the health of ecosystems to keep large carbon stores locked away;
- replacing hard shoreline infrastructure with gently sloped vegetated shorelines to reduce the impacts of sea level rise and wave action; and
- restoring or enhancing wetlands to protect against flooding and daylighting streams to improve hydrological function.

Restoration planning will need to take into account the impacts of climate change in selecting plant species and choosing native species that can cope with the new and changing conditions.

By protecting and restoring a range of ecosystem types in different situations across the landscape (e.g. both high and low elevation forests), we provide for a diversity of ecosystems, species, and conditions. Diverse ecosystems are more resilient and have a greater capacity to recover from disturbances.

	Potential Impacts of Strategy	Key Partners
Strategy 1	 Sets a collective regional vision for ecosystem protection Expands the amount of land protected for nature Increases collaboration and knowledge-sharing on ecosystem protection, restoration, and enhancement in the region 	 Member jurisdictions First Nations BC government Federal government NGOs

BIG MOVE 1.1 Protect an Additional 10% of the Region for Nature.

All member jurisdictions, through implementation of the regional growth strategy, will identify local ecosystem protection targets and demonstrate how these targets will contribute to the regional target of protecting 50% of the region for nature. In addition to directly contributing to protection efforts (action 1.2), Metro Vancouver will support this process by providing data, information resources, and a forum for discussion.

1.2 Protect, Restore, and Enhance Natural Areas at the Regional Scale.

Continue to implement the *Regional Parks Land Acquisition 2050* strategy to increase the amount of important natural areas protected in the Regional Parks system. In regional parks and the drinking water supply areas, continue to restore and enhance degraded sites, enhance biodiversity, and promote ecosystem resilience. Advocate to the federal and BC governments, and other partners to protect, or fund the protection of, additional natural areas in the region, taking into consideration the importance of connecting existing protected areas.

1.3 Protect, Restore, and Enhance Nature at the Local Scale.

All member jurisdictions, through implementation of the regional growth strategy, support the protection, enhancement and restoration of ecosystems through measures such as land acquisition, density bonusing, development permit requirements, subdivision design, conservation covenants, land trusts, and tax exemptions.

1.4 Incorporate Climate Change Planning into Protected Area Management.

Develop a Regional Parks Climate Action Strategy. Continue work to improve understanding of climate impacts on the ecosystems and infrastructure in regional parks and the drinking water supply areas. Work with knowledge holders including First Nations, and other agencies with a role in protected area management, to improve understanding of climate impacts on the region's protected areas and develop best practice approaches to managing these areas in the context of a changing climate.

1.5 Prioritize the Conservation of Ecosystem Health and Biodiversity in BC Forest Management.

Advocate to the BC Government to make ecosystem health and biodiversity conservation the overarching priority of forest management and implement the recommendations of the strategic review of old forest management².

1.6 Support Ecosystem Protection, Restoration, and Enhancement.

Provide data, guidance materials and best practices to inform the protection, restoration, and enhancement of ecosystems in the region. Convene a forum to provide opportunities for cross-regional collaboration.

1.7: Reverse the Loss of the Region's Ecosystems.

Advocate to the federal government, the BC government, member jurisdictions and other agencies to commit to ecosystem restoration and enhancement at a significant scale. Collaborate with others and identify opportunities to make significant gains through restoration and look for partnerships and funding opportunities to magnify efforts.

² <u>A New Future For Old Forests: A Strategic Review of How British Columbia Manages for Old Forests Within its Ancient Ecosystems</u>

1.8 Manage Invasive Species.

Support regional invasive species management by developing and promoting best practices, and work with researchers to improve our understanding of the potential spread of invasive species as our climate continues to change. Employ best practices to prevent the introduction and spread of invasive species on lands managed by Metro Vancouver.

Old Growth Forests

Old growth forests of coastal BC are those with dominant trees older than 250 years, although they will have a diversity of aged trees present as the oldest trees die, creating space for younger trees to grow. The diversity of tree sizes and ages creates a wide variety of habitats, which supports many different species. As well as having high biodiversity values, old growth forests store large amounts of carbon, approximately 1,000 tonnes of carbon per hectare. Mature and young forests are also critical for carbon sequestration (ongoing uptake of carbon as trees continue to grow) and they provide ecosystem connectivity so wildlife species can move across the landscape. Protecting mature and young forests, in addition to old growth, will increase the total amount of old growth in this region over the long term.

Old Growth Forests in Metro Vancouver

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. Metro Vancouver tracks old growth and other rare, fragile, or at-risk ecosystems using the Sensitive Ecosystem Inventory. Within the region, including the full extent of Metro Vancouver's drinking water supply areas that extend north of the MVRD boundary, there are 49,853 ha of old growth. Of this amount, 34,805 (70%) is on Metro Vancouver owned or managed lands: 33,011 ha (66%) within watersheds and 1,794 ha (4%) in Regional Parks.

Metro Vancouver Corporate Leadership in Ecosystem Protection and Restoration

The regional parks system currently includes over 13,800 hectares of land which protectnatural areas and provide opportunities for people to connect with nature. Metro Vancouver is also responsible for protecting the region's drinking water supply areas from development, pollution, and human-caused disturbances. By protecting these watersheds for drinking water we are also protecting about 60,000 hectares of mostly forested land.

Ecological Health Framework – Adopted by the Board in 2018, this framework encapsulates Metro Vancouver's collective efforts around ecological health and provides guiding principles, goals, and strategies to help achieve the vision of a beautiful, healthy, and resilient environment for current and future generations. Specifically, the *Ecological Health Framework*:

- Identifies Metro Vancouver's role in protecting and enhancing ecological health as it relates to its services and functions;
- Provides a foundation for integrating ecological health into Metro Vancouver's corporate decision making;
- Identifies how Metro Vancouver will report on ecological health-related initiatives across the organization; and
- Supports regional efforts to protect and enhance ecological health.

Regional Parks Land Acquisition 2050 Strategy – Regional Parks Land Acquisition 2050 took a systematic, evidence-based approach to identifying land suitable for protection as a regional park. The result identifies the most regionally important unprotected natural areas that could be acquired for future new and expanded parks. It envisions growing the regional parks system into a connected network of resilient regional parks and greenways that protect regionally important natural areas and connects people to them.

<u>Invasive Species Resources</u> – Metro Vancouver provides a suite of resources to support invasive species management, including an online course, locally-tested best management guidance for practitioners, and fact sheets for residents.

Ecosystem Restoration in Regional Parks - Guided by the Natural Resource Management Framework, Regional Parks has an ongoing program to restore degraded sites, enhance biodiversity, and promote ecosystem resilience in the Regional Parks System. Every year through this program, thousands of trees and other native vegetation are planted, thousands of kilograms of invasive plants are removed, ecosystem health is monitored, and habitat improvements are made to support native biodiversity.

<u>Ecohydrological Restoration of Burns Bog</u> - Metro Vancouver works with other stakeholders to restore the bog and prevent the drying out of peat, which releases greenhouse gases.

Strategy 2: Connect Green Infrastructure

Green infrastructure includes both natural and urban elements (see Figures 4 and 7). From street trees, hedgerows and green roofs to forests, wetlands, and rivers, they provide a range of climate change, biodiversity, and health benefits. These benefits are magnified when individual green infrastructure elements are connected together into a network across jurisdictional boundaries, increasing resilience to climate impacts and supporting the movement of species across the landscape. A regional green infrastructure network would maximize ecosystem services by linking together natural and urban ecosystems.

Developing a regional green infrastructure network would necessitate creating a collaborative and cross-jurisdictional process, building on existing local networks, and identifying opportunities to maximize associated climate change adaptation, ecosystem connectivity, and human health benefits.

	Potential Impacts of Strategy	Key Partners
Strategy 2	 Creates a process to work together to connect a cross-regional network Integrates ecosystem connectivity into green infrastructure planning and implementation 	 Member jurisdictions First Nations BC government Federal government NGOs Academic institutions Agricultural land owners

BIG MOVE 2.1 Develop a Regional Green Infrastructure Network.

Through implementation of the regional growth strategy, collaborate with member jurisdictions, First Nations, and other agencies to identify a Regional Green Infrastructure Network that connects ecosystems and builds on existing local ecological networks, while maximizing resilience, biodiversity, and human health benefits.

Collaboratively prepare Implementation Guidelines to support a Regional Green Infrastructure Network.

2.2 Green Urban Areas.

Support the greening of urban areas by developing best practices and guidelines to incorporate green infrastructure into new developments and redeveloped areas. Work collaboratively with member jurisdictions and other partners to identify barriers and opportunities to integrating green infrastructure in urban areas.

2.3 Green the Regional Greenways Network.

Increase natural vegetation alongside the Regional Greenways Network through restoration, including tree planting and widening vegetated trail buffers to enhance ecosystem connectivity and provide shading and other benefits to trail users. Advocate to other agencies who own or manage parts of the Regional Greenways Network to do the same.

2.4 Minimize Ecosystem Fragmentation.

Avoid ecosystem loss and fragmentation when developing and operating infrastructure within the regional growth strategy Conservation and Recreation regional land use designation, but where unavoidable, mitigate the impacts, and advocate to other agencies to do the same. All member jurisdictions, through the implementation of the regional growth strategy, will discourage or minimize the fragmentation of ecosystems through low impact development practices that enable ecosystem connectivity.

2.5 Develop Data and Resources to Support Ecosystem Connectivity.

Continue to work with others to develop and share data and resources related to ecosystem connectivity, including resources that identify the impacts of climate change on connectivity.

Green Infrastructure Network

Yards and gardens Street trees Riparian Corridor Corridor Recreational Greenway and blueway Natural coastline Habitat hub Habitat hub Habitat hub Hedgerows

Components of a Regional Green Infrastructure Network



Figure 7: Components of a Green Infrastructure Network

Strategy 3: Integrate Natural Assets into Conventional Asset Management and Decision-Making Processes

While ecosystems should not be considered solely as "assets" from which humans derive value, the concept of "natural assets" has emerged as a mechanism to highlight that ecosystems (e.g. a wetland) can be formally acknowledged as a fundamental asset that benefits the community - in the same way that engineered assets (e.g. a wastewater treatment plant) are recognized.

Natural assets provide an extensive range of ecosystem services which are not officially recognized in traditional asset management, financial planning, or decision-making processes. Integrating natural assets into asset management processes supports improved understanding of the services they provide, and this information supports efforts to maintain and manage natural assets for their long term health and resiliency. Ensuring these natural assets are protected and monitored over the long term is crucial in the context of a changing climate, since many of the services ecosystems provide help communities respond to climate change.

While the concept of natural asset management is gaining considerable traction at the local level, Metro Vancouver can also play a key role in managing regional assets, supporting regional partners, convening key groups, providing a discussion forum, and developing and sharing data. Collectively, the region can elevate natural asset management from an optional process to an integral one. While there is no way to place a true economic valuation on nature itself (nor should nature be valued this way), a more robust understanding of the location of natural assets and the level of services they provide helps to demonstrate their critical importance to our communities, and an additional tool to help protect, restore, and enhance them.

	Po	tential Impacts of Strategy	Ke	y Partners
	•	Elevates natural asset management as standard practice rather	•	Member jurisdictions
		than the exception	•	First Nations
	•	Provides an additional mechanism to help protect nature and	•	NGOs
3		ecosystems long-term	•	BC government
eg)	•	Enables consistent funding opportunities	•	Public Sector Accounting
Strategy				Board
st			•	Agricultural land owners

3.1 BIG MOVE: Incorporate Natural Assets into Asset Management and Financial Planning.

Through implementation of the regional growth strategy, incorporate natural assets and ecosystem services into Metro Vancouver's corporate planning, asset management systems and investments, and provide regionally appropriate guidance on methodologies, tools and decision-making frameworks. This Big Move will require multiple departments at Metro Vancouver to shift their standard practice, and collaborate across silos.

BIG MOVE 3.2: Integrate Ecosystems and their Services into the Design of Major Infrastructure.

Demonstrate leadership and innovation by integrating nature-based solutions into the siting and design of major infrastructure where appropriate (or "where it makes sense"), and consider nature-based complements to hard (or "grey") infrastructure. Also require full carbon cost accounting and ecosystem service valuation during construction and operation of Metro Vancouver's water and wastewater infrastructure.

3.3 Consider Ecosystems and their Services in Major Development Decisions.

Work with member jurisdictions to understand and consider ecosystems and their services, including carbon storage and flood protection, in major development decisions, such as regional growth strategy amendment decisions. Using appropriate data, consider how potential new developments may inhibit the capacity for nature to provide ecosystem services and explore alternatives.

3.4 Support Natural Asset Management at the Local Level.

Develop guidance materials to support natural asset management at the local level, and provide a forum to share and advance best practices. Regional datasets can be used to inform local natural asset inventories including transboundary areas. Forums are a vital space to connect and empower local champions of natural asset management, build a regional network, and develop internal natural asset knowledge within organizations.

Municipal Natural Assets Initiative (MNAI)

The Municipal Natural Assets Initiative 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, and in developing leading-edge, sustainable and climate resilient infrastructure. Local communities in the Metro Vancouver region have taken the lead in working with the MNAI to understand and advance natural asset management.

District of West Vancouver's Natural Asset Inventory

The District of West Vancouver is one of the first Canadian municipalities to estimate the value of their natural assets in terms of the services they provide annually and into the future – a first step toward integrating natural assets into the District's financial and asset management plans. Metro Vancouver provided its Sensitive Ecosystem Inventory data to support this process.

3.5: Explore Opportunities to Overcome Barriers to Natural Asset Management.

Explore the legal landscape and other barriers that may inhibit natural asset management in the Metro Vancouver region. Results from this research may reveal opportunities to further reduce barriers or enable strategic frameworks and norms that support natural asset management in the region and across BC.

Strategy 4: Support a Resilient, Robust, and Healthy Urban Forest

The urban forest includes all of the trees in the public and privately owned lands of the built environment – including the trees in backyards, streets, and parks. A healthy and resilient urban forest provides essential ecosystem services such as habitat for local wildlife, shading and cooling hotter areas, capturing rainfall and stormwater, and storing carbon (the region's urban forest currently stores approximately 8 million tonnes of carbon³). To implement this strategy, Metro Vancouver can establish a regional urban tree canopy cover target, improve tree canopy cover in Metro Vancouver-owned lands such as Regional Parks and Watersheds, and support member jurisdictions, stewardship groups, and other regional partners by developing and sharing relevant data and resources.

Po	tential Impacts of Strategy	Key Partners
Strategy 4	Increases tree canopy cover to improve ecosystem services, including those that are climate change-related Improves the health and resiliency of the urban forest Provides a forum for knowledge sharing and partnerships	 Member jurisdictions Academic institutions Health authorities Urban forestry practitioners First Nations BC government Federal government Professional associations Local residents

³ Figure obtained from Metro Vancouver's Carbon Storage Dataset (metrovancouver.org/data).

4.1 BIG MOVE: Achieve 40% Tree Canopy Cover Within the Region's Urban Areas.

All member jurisdictions, through implementation of the regional growth strategy, will identify local tree canopy cover targets, and demonstrate how these targets will contribute to the regional target of 40% canopy cover within the region's Urban Containment Boundary. Metro Vancouver will contribute to this target by increasing tree canopy on Metro Vancouver-owned lands (where applicable), measuring and reporting on regional tree canopy cover trends, and advocating to the federal and BC governments to provide suitable funding opportunities for tree planting in urban areas. Meeting the 40% target will require collaboration and commitment throughout the region, and a major shift in the way tree protection and planting efforts are prioritized.



Figure 8: Tree Canopy Cover in Metro Vancouver

Tree Canopy Cover and the 40% Target

Tree canopy cover refers to the leaves and branches that form a visible layer, and the extent to which they cover the ground if one is viewing from the air. Given the ecosystem services that trees provide, we often use canopy cover as a proxy for these services. The region's canopy cover within the Urban Containment Boundary is currently 32%, and this number is expected to fall to 28% in the next 20-30 years based on projected development patterns. A canopy cover target of 40% is commonly adopted at the local level in cities around the world, and this number represents both an aspirational and achievable goal for the Metro Vancouver region. Local variation in geography, environmental conditions and historical development patterns will need to be considered, given that a 40% target is a regional average that will not be feasible for every individual member jurisdiction to meet at the local level.

4.2: Provide Data and Resources to Support Urban Forest Management.

Continue to develop materials that support member jurisdictions and other partners in achieving a healthy and resilient urban forest. These materials can help support local and regional urban forestry objectives.

4.3: Improve Local Regulations and Management Practices.

All member jurisdictions, through implementation of the regional growth strategy, will enable the retention and expansion of urban forests using various tools, such as local tree canopy cover targets, urban forest management strategies, tree regulations, development permit requirements, land acquisition, street tree planting, and reforestation or restoration policies, with consideration of climate resiliency. Through best practices and new or updated regulations, member jurisdictions have an opportunity to support a healthy urban forest by protecting and retaining existing trees, and supplementing those actions with the planting of new trees.

Metro Vancouver Corporate Leadership in Urban Forestry

<u>Urban Forest Climate Adaptation Initiative</u> - Metro Vancouver developed the Urban Forest Adaptation Initiative to assess the risks and predicted changes to the region's urban forest. The initiative provides guidance to help practitioners manage urban forests in a changing climate today and to prepare for the future.

<u>Regional Tree Canopy Cover and Impervious Surfaces Report</u> - This report contains an analysis of tree canopy cover and impervious surfaces in Metro Vancouver, and is accompanied by two publically-available GIS datasets.

Metro Vancouver Tree Regulations Toolkit - The Metro Vancouver Tree Regulations Toolkit identifies the available approaches to regulate trees in British Columbia, highlights considerations for selecting appropriate tools based on the local community context, and details the higher-level plans and local-scale regulatory tools that can help to preserve trees and increase tree canopy cover.

4.4: Convene Partners on Urban Forestry Issues.

Continue to provide a forum for a diverse range of urban forestry practitioners to discuss and collaborate on issues of regional concern. These forums allow regional partners to learn from each other, share relevant information and updates, overcome barriers, and build a community of practice.

4.5: Consider Equity and Human Health Considerations.

Work with health authorities, academic institutions, member jurisdictions, and other partners to further understand the connections between urban trees, human health, and equity, and consider these factors in urban forestry planning. These connections are particularly important to understand in the context of a changing climate.

Encouraging Tree Planting and Green Infrastructure on Residential Properties

Metro Vancouver's 2019 Regional Tree Canopy Cover and Impervious Surfaces Report identified that approximately 37% of potential planting area within the Urban Containment Boundary – land that could *theoretically* be used to increase tree canopy cover – is located in residential areas. This means that local residents can play a significant role in improving residential tree canopy cover within communities. Local governments can encourage environmental stewardship, partnership, and tree planting and protection on private properties through programs and initiatives, and communicate the benefits of trees.

While trees provide significant levels of ecosystem services, other types of green infrastructure provide benefits close to where people live as well. Metro Vancouver's <u>Grow Green</u> platform is a helpful guide to creating and maintaining a sustainable garden or lawn space on private property - utilizing non-invasive, waterwise plants that are readily available in Metro Vancouver.

Strategy 5: Advance Nature-based Solutions to Climate Change

Nature-based solutions are actions that protect, sustainably manage, and restore ecosystems, as well as address societal challenges such as climate change, providing both human well-being and biodiversity benefits. These solutions can be an important part of climate action planning since the co-benefits extend beyond storing carbon and adapting to climate change impacts. Metro Vancouver can help advance nature-based solutions by integrating them into regional projects and plans, encouraging and supporting their uptake at the local level, and exploring new and innovative opportunities for this emerging area of practice.

	Potential Impacts of Strategy	Key Partners
Strategy 5	 Supports the research, uptake, and mainstreaming of nature-based solutions in climate action planning Provides human health and biodiversity co-benefits 	 Member jurisdictions First Nations Academic institutions BC government Federal government NGOs Agricultural land owners

5.1 BIG MOVE: Explore Innovative Funding and Incentive Programs.

Explore the viability of regional-scale, innovative financial and incentive mechanisms (such as nature-based carbon offsets and credits, conservation levies, green bonds, and payment for ecosystem services) to advance and support nature-based solutions. This Big Move could also include advocating that the federal and BC governments enable and incentivize (e.g. through reliable and sustainable funding sources) nature-based solutions at the regional and local scales, including offset programs for multiple ecosystem types and services.

5.2 BIG MOVE: Plan for Climate Change Impacts on Ecosystems.

Work with other partners to conduct a vulnerability assessment of the region's ecosystems and update the Metro Vancouver Sensitive Ecosystem Inventory with climate change vulnerability information. This Big Move would create information that can be used across the region to inform planning efforts. It could also involve understanding how climate change impacts may affect carbon sequestration potential in the region's ecosystems.

5.3: Include Nature-Based Solutions in Climate Action Plans.

Advocate that member jurisdictions include nature-based solutions in climate action plans. Work with the federal and BC governments to identify opportunities to fund and implement nature-based solutions for climate change adaptation and carbon storage at the local level. Metro Vancouver will also provide data and a forum to share experiences and best practices.

Nature-based Carbon Offsets and Credits

A carbon offset is a reduction in carbon (or an increase in carbon storage, e.g. through tree planting) that is used to compensate for greenhouse gas emissions that occur elsewhere. A carbon offset credit is a transferrable instrument certified by governments or other entities. These offsets and credits are transferred through markets – these markets exist under both **mandatory** (compliance) and **voluntary** programs, both of which require some form of verification.

- Mandatory markets are created and regulated by mandatory national, regional, or international carbon reduction programs.
- Voluntary markets function outside of compliance markets and enable the purchase of offsets on a voluntary basis.

Key Considerations for Carbon Offsets

- **Framing and Use:** Offsetting should be framed as an additional action to supplement deep reductions in greenhouse gases, rather than a compensating action that enables greenhouse gas emitting activities to continue business as usual.
- Additionality: Ecosystem protection/restoration to create the carbon offset must be an activity that would not have occurred without the offset for instance, a forest that is already legally protected should not be counted in the offset process.
- **Permanence:** Ecosystems protected through offsets should be protected permanently. This can be difficult to ensure for some ecosystem types (e.g. salt marshes affected by sea level rise, and forests disturbed by pests and wildfire).
- Leakage: Preventing a harmful activity in one location may simply transfer that same activity to a new location i.e. protecting a forest from logging may simply shift the activity to a new area, resulting in no net climate benefit.
- Verification and quantification: Given the complexity of carbon fluxes in natural systems, a project's greenhouse gas reductions
 must be quantified accurately and then verified by an accredited third party. Guidelines for quantification, verification,
 monitoring, and reporting are needed to ensure projects deliver the estimated carbon reductions. Verification methods for forest
 ecosystems are the most well-developed to date.

Future Work

Metro Vancouver will continue to monitor and explore the role and validity of nature-based carbon credits and offsets in the region, in addition to other innovative financial and incentive mechanisms that support nature-based solutions. Future work could also explore the role of alternative ecosystems (e.g. salt marshes) and ecosystem services (e.g. habitat, flood protection) in offset mechanisms, through mandatory, voluntary and regional scale markets.

5.4 Support the Implementation of Nature-based Solutions.

Work with academic institutions and other regional partners to explore and promote best practices for advancing innovative nature-based solutions, while ensuring risks are minimized. This action could also involve testing newer technologies that measure ecological function to assess the effectiveness of nature-based solutions in a variety of land-use situations across the region. Providing a forum for collaboration and knowledge-sharing will contribute to overcoming barriers and advancing nature-based solutions in the region.

5.5: Manage Forests in the Context of a Changing Climate.

Advocate to the BC government to continue implementing measures that adapt forests to a changing climate (e.g. assisted migration research), enhance carbon storage (e.g. reforestation), and reduce greenhouse gas emissions associated with forest management (e.g. reduce slash pile burning). Continue to work with the BC government and local authorities in early detection and suppression of wildfire in the region's drinking water supply areas and adjacent forested areas, as well as fuel management practices in areas with high ignition risk.

Forest Fires and the Wildland Urban Interface (WUI)

Interventions to protect communities from wildfire risks will be explored further in the Land Use and Growth Management Roadmap.

5.6: Advance Nature-Based Solutions to Address Flood Hazards.

Work with partner organizations to advance nature-based options for flood management, through processes such as the Lower Mainland Flood Management Strategy and the BC government's Flood Strategy.

5.7: Develop our Understanding of Coastal Ecosystems and Blue Carbon Potential.

Work with academic institutions and other regional partners to better understand the long-term health and carbon storage potential in the region's coastal and marine ecosystems. Researchers in the region are studying these ecosystems and filling data gaps, and Metro Vancouver will collaborate on next steps.

Climate Change and Marine and Coastal Ecosystems

Our rich marine and coastal areas provide important habitat for fish and wildlife including endangered killer whales, salmon, and hundreds of species of resident and migratory shorebirds. The ocean has spiritual, cultural and ceremonial value for local First Nations, and it provides traditional foods. Salt marshes and seagrasses can store carbon and mitigate flooding in coastal communities. However, these complex intertidal and marine ecosystems are particularly vulnerable to climate change. With rising seas and storm surge, intertidal wetlands will be lost as they are unable to move higher due to sea walls and other man-made structures. In marine environments, warmer temperatures, increased runoff from more extreme rainfall events, and changes in ocean chemistry will alter ecological processes. Federal, provincial, and local governments, First Nations, researchers and conservation groups will need to work together to improve understanding and better protect marine and coastal environments from a changing climate. For instance, the BC government has committed to developing an Ocean Acidification Plan and Coastal Strategy, which could provide new collaboration opportunities across governments.

Setting the Path Ahead

The "Setting the Path Ahead" section will eventually be found on Metro Vancouver's Climate 2050 webpages under "Nature and Ecosystems", and will serve as a companion to the Nature and Ecosystems Roadmap. This will allow Metro Vancouver to track progress towards targets, and add and adjust strategies and actions in response to performance measurement.

Nature and ecosystems are already providing critical ecosystem services that support climate action; locking away millions of tonnes of carbon in vegetation and soils, and moderating the impacts of a changing climate by reducing flooding, protecting shorelines, and cooling temperatures. However, natural systems are themselves at risk from climate change, land development, pollution, invasive species and other factors; these impacts reduce the ability of nature to provide important climate-related services.

In order to maintain the existing services provided by nature and prevent further losses, actions to protect nature and ecosystems need to be implemented without delay. This involves protecting the region's ecosystems,

including the urban forest, and ecosystem connectivity across the region. These measures are supported by actions that seek to change how we do business by integrating nature into decision-making and managing natural assets for their long term health and resiliency. Actions to advance the understanding and mainstreaming of nature-based solutions are important to ensuring the region's responses to climate change leverage the benefits provided by nature, while also supporting biodiversity and human health and well-being. Actions that support restoration and enhancement of ecosystems offer an opportunity to gain back lost ground in terms of ecosystem function and climate-related benefits.

The timeline below contains all of the actions included in this Roadmap. Although there is much work to be done, there are some critical actions that, if started over the next two years, will support the regional vision of a carbon neutral and resilient region by 2050. Many actions contained in the Nature and Ecosystems Roadmap will be initiated in the short-term, but benefits and outcomes will be accrued slowly over time as ecosystems mature.

Strategy	2021-2023	2024-2029	2030-Beyond
	BIG MOVE 1.1 Protect an Additional 10% of the Region for Nature		
	1.2 Protect, Restore, and Enhan	ce Natural Areas at the Regi	onal Scale
	1.3 Protect, Restore, and Enhan	ce Nature at the Local Scale	
Protect, Restore, and Enhance the Region's	1.4 Incorporate Climate Change Planning into Protected Area Management		•
Ecosystems	1.5 Prioritize the Conservation of Ecosystem Health and Biodiversity in BC Forest Management		
	1.6 Support Ecosystem Protection, Enhancement, and Restoration		
	1.7: Reverse the Loss of the Region's Ecosystems through Restoration.		
	1.8 Manage invasive species		
	BIG MOVE 2.1 Develop a Regional Green Infrastructure Network		legional Green
	2.2 Green Urban Areas		
Connect Green Infrastructure	2.3 Green the Regional Greenways Network		
	2.4 Minimize Ecosystem Fragmentation		
		2.5 Develop Data and Resources to Support Ecosystem Connectivity	
Integrate Natural Assets into Conventional Asset	3.1 BIG MOVE: Incorporate Natural Assets into Asset Management and Financial Planning		

Management and Decision- Making Processes	BIG MOVE 3.2: Integrate Ecosystems and their Services into the Design of Major Infrastructure		
	3.3 Consider Ecosystems and their Services in Major Development Decisions		
	3.4 Support Natural Asset Management at the Local Level		
	3.5: Explore Opportunities to Overcome Barriers to natural asset management		
	4.1 BIG MOVE: Achieve 40% Tre	ee Canopy Cover Within the Region's Urban Areas	
	4.2: Provide Data and Resource	s to Support Urban Forest Management	
Support a Resilient, Robust,	4.3: Improve Local Regulations and Management Practices		
and Healthy Urban Forest	4.4: Convene Partners on Urbar	Forestry Issues	
		4.5 Consider Equity and Human Health Considerations	
		5.1 BIG MOVE: Explore Innovative Funding and Incentive Programs	
		5.2 BIG MOVE: Plan for Climate Change Impacts on Ecosystems	
Advance Nature-based	5.3: Include Nature-Based Solut	ions in Climate Action Plans	
Solutions to Climate Change	5.4 Support the Implementation of Nature-based Solutions		
	5.5: Manage Forests in the Con	text of a Changing Climate	
	5.6: Advance Nature-Based Solu	utions to Address Flood Hazards	
	5.7: Develop our Understanding of Coastal Ecosystems and Blue Carbon Potential		

Measuring our Progress

The table below lists examples of some of the performance indicators that could be used to help Metro Vancouver measure regional progress towards meeting the objectives of this Roadmap. Indicators in the table below may apply to more than one strategy, even if not listed. The performance indicators used will depend, to some extent, on the availability of this information from other organizations and agencies. Because this Roadmap allocates some actions to other partners, data sharing will be critical for measuring the pace of our collective progress towards common goals.

Roadmap Element	Key Performance Indicator	Data Source	Data is Currently Collected
	Hectares of unprotected Sensitive or Modified Ecosystems	Metro Vancouver	Yes
	Hectares of protected lands and waters	Metro Vancouver	Yes
	Hectares of Sensitive or Modified Ecosystems	Metro Vancouver	Yes
Protect, Restore, and Enhance the	Percent of inventoried Sensitive or Modified Ecosystems rated high quality	Metro Vancouver	Yes
Region's Ecosystems	Hectares of ecological restoration areas	Metro Vancouver Member jurisdictions NGOs BC government Other agencies	Yes – regional parks No – rest of region
	Number of new invasive non- native species recorded and/or considered established	BC government Federal government	Yes
	Watershed and stream health index	Metro Vancouver	No
Connect Green	Ecosystem connectivity index	Metro Vancouver	No
Infrastructure	Percent impervious surfaces (e.g. paved roads, buildings)	Metro Vancouver	Yes
Integrate Natural Assets into	Carbon stored in vegetation and soils	Metro Vancouver	Yes
Conventional Asset Management and	Measurement of ecosystem services (T.B.D.)	T.B.D.	No
Decision-making Processes	Number of member jurisdictions with natural asset inventories	Member jurisdictions	No
	Percent tree canopy cover (for the region and the urban containment boundary)	Metro Vancouver	Yes
Support a Resilient,	Urban forest health assessment	T.B.D.	No
Robust, and Healthy Urban Forest	Number of member jurisdictions with current (<=5yrs) tree bylaws and/or urban forest management strategies	Member jurisdictions	Yes

	Number of member jurisdictions with tree canopy cover targets	Member jurisdictions	Yes
Advance Nature-	Number of member jurisdictions' climate plans that incorporate nature-based solutions	Member jurisdictions	No
based Solutions to Climate Change	Extent of coastal ecosystems	BC government NGOs Academic institutions	No
	Ecosystem vulnerability indicators (T.B.D.)	T.B.D.	No

Metro Vancouver will continue to develop indicators as new information becomes available, and technological advances are made.

Feedback and Engagement Process

This *Roadmap* was generated with input from many organizations, including other governments, and residents across the region. The project team is continuously assessing that input, and many of the recommendations are reflected in the structure and content of this *Roadmap*.

This *Roadmap* reflects current policies and the best ideas, approaches and technologies available at time of writing. As with all climate planning, it must be viewed as an iterative, dynamic path forward. The goals remain clear, and new policies, ideas, approaches and technologies must be anticipated and reflected in the *Roadmap*.

The project team continues to be open to feedback, at any time, in this Nature and Ecosystems Roadmap and any other aspect of the climate action initiatives led or coordinated through Metro Vancouver. Send any comments direct to the Project Team through Climate2050@metrovancouver.org or phone 604-432-6200.

Glossary

Air contaminants refer to any substance that is emitted into the air and that (a) injures or is capable of injuring the health or safety of a person; (b) injures or is capable of injuring property or any life form; (c) interferes or is capable of interfering with visibility; (d) interferes or is capable of interfering with the normal conduct of business; (e) causes or is capable of causing material physical discomfort to a person; or (f) damages or is capable of damaging the environment.

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.

Blueway refers to a network of water bodies (such as rivers, creeks and lakes), often used for recreation.

Carbon neutral region is a region that has achieved the deepest greenhouse gas emission 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 on an annual basis.

Carbon storage refers to the total amount of carbon stored in the vegetation and soils of ecosystems such as forests, wetlands and intertidal areas, which often takes thousands of years to accumulate.

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.

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.

Ecological health captures the connection among healthy functioning ecosystems, the valuable services they provide, and human well-being.

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

Ecosystem connectivity is the physical and functional links between ecosystems that support biodiversity by allowing movement of species across the region.

Ecosystem services are the benefits people obtain from ecosystems, including food, fresh water, shading, and human health and well-being. These services can be grouped into four main types: supporting, provisioning, cultural, and regulating.

Equity is the promotion of fairness, justice, and the removal of systemic barriers that may cause or aggravate disparities experienced by different groups of people.

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.

Green gentrification occurs when improvements to urban green space trigger a flow of wealth into an area, increasing the cost of living and forcing economically marginalized residents to relocate.

Green infrastructure is the natural, enhanced, and engineered assets that collectively provide society with ecosystem services required for healthy living.

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).

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.

Recreational Greenway refers to a linear corridor often used for recreation.

Regional Greenways Network is the region's network of recreational greenways which support recreational walking, cycling, and, where appropriate, horseback riding.

Riparian refers to areas close to or on river banks.

Sensitive Ecosystem 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. Some younger and more human modified ecosystems still have ecological value and importance to biodiversity (e.g., young forests), and are also included in the Sensitive Ecosystem Inventory.

Stormwater is the water from rain or melting snow that is not absorbed into the ground. In urban areas, stormwater goes into storm sewers (the grated drains found on streets), which empty directly into rivers, creeks or the ocean. Managing stormwater and drainage is key to preserving the health of urban streams and rivers.

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 forest refers to 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.



To: Climate Action Committee

From: Carla Stewart, Senior Planner, Regional Planning and Housing Department

Jason Emmert, Program Manager, Climate Policy, Parks and Environment Department

Date: October 13, 2021 Meeting Date: November 5, 2021

Subject: **Draft Climate 2050 Agriculture Roadmap**

RECOMMENDATION

That the MVRD Board authorize staff to proceed with engagement on the draft *Climate 2050 Agriculture Roadmap*, as presented in the report dated October 13, 2021, titled "Draft *Climate 2050 Agriculture Roadmap*".

EXECUTIVE SUMMARY

This report presents the draft *Climate 2050 Agriculture Roadmap*, the next in a series of ten *Climate 2050* roadmaps that will guide our region's policies and collective actions to transition to a carbon neutral, resilient region by 2050. The draft *Climate 2050 Agriculture Roadmap* lays out strategies and actions that will accelerate the transition to a net-zero agriculture sector by 2050 and that support agriculture becoming resilient to the ever-changing effects of climate change that have a direct impact on the health and longevity of farming in this region. Action items in the *Agriculture Roadmap*, include protecting agricultural land and expanding the use of ecosystem services and regenerative agriculture within farming, to support creating an overall adaptive and resilient food system.

Like the other Climate 2050 roadmaps, the Agriculture Roadmap is intended to be dynamic, and over time, more work will be necessary to identify and undertake additional research and actions to reach our 2030 and 2050 climate targets. To assess resilience of the agriculture industry, further work and research is needed to establish measurable outcomes to quantify and qualify the impact of resiliency and adaptation actions in the Climate 2050 Agriculture Roadmap. The draft will inform on-going engagement with the agriculture sector, Metro Vancouver's Agricultural Advisory Committee and with member jurisdictions, with the intent of bringing an updated Climate 2050 Agriculture Roadmap for endorsement by the MVRD Board in 2022.

PURPOSE

To seek MVRD Board authorization to proceed with engagement on the draft *Climate 2050 Agriculture Roadmap*.

BACKGROUND

In September 2018, the MVRD Board adopted the *Climate 2050 Strategic Framework* and directed staff to initiate the development process of the *Climate 2050 Roadmaps*. The Board subsequently authorized staff to begin an integrated engagement process for *Climate 2050* and the *Clean Air Plan*, using a series of issue area discussion papers related to the roadmaps. The Climate Action Committee received a report on the *Climate 2050* Discussion Paper on Agriculture at its May 2020 meeting.

This report presents the draft *Climate 2050 Agriculture Roadmap* (attached), and provides information on how it will be the subject of engagement activities planned with the agriculture community, the public, stakeholders and other governments, including First Nations, on greenhouse gas (GHG) emission reductions from, and climate resiliency for, regional agriculture.

CLIMATE 2050 STRATEGIC FRAMEWORK

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. Climate 2050 is being implemented 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 the Clean Air Plan, as well as forthcoming updates to the Regional Growth Strategy (Metro 2050).

DRAFT CLIMATE 2050 AGRICULTURE ROADMAP

The *Climate 2050 Agriculture Roadmap* presents a robust plan for this region to have a carbon neutral and resilient agricultural industry by 2050. In laying out the pathway, the *Agricultural Roadmap* identifies the following issues:

- challenges to reaching net-zero emissions and a resilient agricultural sector, including targets
 for GHG emission reductions and goals and measurable outcomes that illustrate effective
 adaptation by 2050;
- **key sources** of GHG emissions and the expected impacts to farming operations as a direct result of a changing climate;
- **barriers and opportunities** to reduce emissions and increase resiliency that shape the strategies and actions in the Roadmap; and
- **benefits** of net zero agricultural operations and the communal benefits achieved from farms that support and use ecosystem services near or on their property.

The draft *Climate 2050 Agriculture Roadmap* lays out 26 actions for reducing emissions and increasing resiliency, organized under the following four strategic areas:

- 1. Protect Agricultural Land
- 2. Support Farmers and Climate Action Leaders
- 3. Support Long-Term Farm Health and Resiliency
- 4. Leverage Economic Opportunities, Innovation and Leadership

The Climate 2050 Agriculture Roadmap proposes an implementation timeline to encourage swift early action on key GHG issues and on obtaining additional data and research to further understand the path to resiliency. Given the timelines and ambitious targets and goals, staff have continued to work with all levels of government and other partners, including the agriculture industry, to take action while planning and developing the Climate 2050 Agriculture Roadmap.

The goals, strategies and actions in the draft *Climate 2050 Agriculture Roadmap* incorporate public and stakeholder feedback, previously summarized in a report on engagement for the *Clean Air Plan* and the *Climate 2050 Agriculture Discussion Paper* received by the Climate Action Committee on November 13, 2020. Additional GHG reduction actions not accounted for in the *Clean Air Plan* but

included in the *Climate 2050 Agriculture Roadmap* involve examining the use of soil to sequester and store carbon. Additional research and data collection is required for this action item to thoroughly understand how it may contribute to a carbon neutral agriculture industry by 2050.

Potential Impact on Greenhouse Gas Emissions

Initial modelling of carbon neutral scenarios, including key actions for agriculture, were presented to the Committee in November 2020. The overall 2030 agriculture target was initially set at a 35% GHG reduction below the 2010 regional total but reaching this target is dependent on additional policy creation and new technologies being developed. Additional review and modelling will be required to fully determine what GHG emission reductions are possible for the agricultural sector as a whole.

Each of the *Climate 2050* roadmaps, including the *Climate 2050 Agriculture Roadmap*, is intended to serve as a "living, breathing" document that charts the path to achieving the region's climate action goals and targets. It is expected that the strategic areas and actions will be updated dynamically, responding to changes in policy, technology, science, opportunities and innovations, and performance measures and indicators. In coming years, staff will continue to work with the agricultural sector, residents, businesses and governments to amplify these actions and add new ones to accelerate the transition to resilient, carbon neutral agriculture.

Relationship between the Climate 2050 Agriculture Roadmap, Clean Air Plan and Metro 2050

Approved on September 24, 2021 by the MVRD Board, the *Clean Air Plan* is Metro Vancouver's fourth air quality and greenhouse gas management plan, building on the 2011 *Integrated Air Quality and Greenhouse Gas Management Plan*. The *Clean Air Plan* supports *Metro 2050*'s vision of a carbon neutral region by identifying the initial actions needed to meet the region's 2030 greenhouse gas target - a 45% reduction in greenhouse gas emissions from 2010 levels by 2030. The 2030 greenhouse gas reduction target in the *Climate 2050 Agriculture Roadmap* initiated from the *Clean Air Plan*.

In addition to incorporating actions from the *Clean Air Plan*, there are important connections between the *Climate 2050 Agriculture Roadmap* and *Metro 2050*, which is currently in the comment and review phase. Metro Vancouver, in partnership with its member jurisdictions, will manage regional land use and agricultural land protection through *Metro 2050*. The *Climate 2050 Agriculture Roadmap* will outline the actions necessary to achieve regional carbon neutrality and *Metro 2050* will shape the future of how we move and live. Together, these strategies will ensure that agricultural land protection, regional growth, food security and climate strategies are mutually supportive.

ENGAGEMENT PROCESS

Metro Vancouver is committed to engaging with the agricultural community, the public, stakeholders and other governments, including First Nations, that could be impacted by the *Climate 2050 Agriculture Roadmap*, and will incorporate feedback into the final document. The engagement will be conducted in accordance with the Board Policy on Public Engagement and will build on the work completed to date to develop the draft *Agriculture Roadmap*. Most of the GHG reduction actions in the *Climate 2050 Agriculture Roadmap* originated from the *Clean Air Plan* and were brought forward through the *Clean Air Plan* engagement and adoption processes.

Engagement for the roadmaps has been designed to reach a broad audience to convey the importance of zero emissions, low carbon and resilient agriculture. Engagement for the *Climate 2050 Agriculture Roadmap* will also require connecting to the local agricultural community including farmers and agricultural producers through the Metro Vancouver Agricultural Advisory Committee; the Ministry of Agriculture, Food and Fisheries; the Agricultural Land Commission; agri-tech focused businesses; and educational institutions and non-government organizations involved in agricultural-focused research. Feedback sought from these specific sectors and organizations might include: support or concerns about implementation or impacts, and ideas for innovation and collaboration. Due to public health regulations, engagement is expected to be conducted through virtual means and staff are planning creative and engaging materials to encourage feedback. This feedback will be reported to the Committee, highlighting how it informed a finalized *Climate 2050 Agriculture Roadmap*, which will be presented to the Committee and Board for consideration in 2022.

ALTERNATIVES

- 1) That the MVRD Board authorize staff to proceed with engagement on the draft *Climate 2050 Agriculture Roadmap*, as presented in the report dated October 13, 2021, titled "Draft *Climate 2050 Agriculture Roadmap*".
- 2) That the MVRD Board receive for information, the report dated October 13, 2021, titled "Draft *Climate 2050 Agriculture Roadmap*" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

Under Alternative 1, the overall resources required to develop and engage on *Climate 2050 Roadmaps* have been approved in program budgets for 2021, including staff time and consulting expenditures. Funding for enhanced engagement on *Climate 2050* from the Sustainability Innovation Fund has been approved by the MVRD Board and will be used to support engagement activities on the development and implementation of the *Climate 2050 Roadmaps*. Continued alignment of engagement activities and deliverables for the *Climate 2050 Roadmaps*, with the implementation of the *Clean Air Plan* and development of other management plans, is intended to make the best use of resources available, as well as minimize time commitments for interested parties providing feedback.

CONCLUSION

Metro Vancouver's draft *Climate 2050 Agriculture Roadmap* lays out strategies and actions to transition regional agriculture to be resilient and adaptive to climate change and to reach carbon neutrality by 2050. If authorized by the Board, Metro Vancouver intends to seek feedback on the draft roadmap from the farming community, the public, stakeholders and other governments.

Staff recommend Alternative 1: for the Board to authorize staff to proceed with public engagement on the draft *Climate 2050 Agriculture Roadmap*. Engagement is intended to provide sufficient opportunity to interested parties to learn about the draft strategies and actions in the *Agriculture Roadmap* and provide feedback. Feedback from engagement will inform the development of a final *Agriculture Roadmap* for Committee and Board consideration, planned for 2022.

Attachment

Climate 2050 Agriculture Roadmap, draft dated October 13, 2021

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AGRICULTURE ROADMAP



Climate 2050 Roadmap Draft: Agriculture
Metro Vancouver acknowledges that the region's residents live, work and learn on the shared territories of many Indigenous peoples, including 10 local First Nations: Katzie, Kwantlen, Kwikwetlem, Matsqui, Musqueam, Qayqayt, Semiahmoo, Squamish, Tsawwassen, and Tsleil-Waututh.
Metro Vancouver respects the diverse and distinct histories, languages, and cultures of First Nations, Métis, and Inuit, which collectively enrich our lives and the region.
FRONT COVER: FARMING IN METRO VANCOUVER
4730 Kingsway, Burnaby, BC, V5H 0C6 www.metrovancouver.org
October 13, 2021

Your Input is Valued.

We heard you loud and clear.

This Roadmap was drafted in Summer/Fall 2021 based on feedback received from the farming community as well as a broad range of individuals, organizations and stakeholder groups between Spring 2020 and Spring 2021. Engagement was centred around the Metro Vancouver *Agriculture Discussion Paper* to support *Climate 2050*, introduced for public and stakeholder comment in Spring 2020.



Public feedback is valued and project teams will continue to seek input on this draft Roadmap through the Fall/Winter 2021. We will create online feedback opportunities, and will continue to ensure feedback is reflected as we move forward with implementing these actions. Documents, feedback forms, and direct email links to the project team are all posted to the Metro Vancouver website, metrovancouver.org, search "Climate 2050 Agriculture Roadmap".

COVID-19 has had an impact on our traditional engagement methods. 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 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 target 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 in terms of greenhouse gas emissions. This provides a glimpse of what is possible and what we can achieve with coordinated efforts and common goals in a time of crisis.

Metro Vancouver

Metro Vancouver is a federation of 21 municipalities, one Electoral Area and one Treaty First Nation that collaboratively plan for and deliver 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.

Mission

Metro Vancouver's mission is framed around three broad roles.

1. Serve as a Regional Federation

Serve as the main political forum for discussion of significant community issues at the regional level, and facilitate the collaboration of members in delivering the services best provided at the regional level.

2. Deliver Core Services

Provide regional utility services related to drinking water, liquid waste and solid waste to members. Provide regional services, including parks and affordable housing, directly to residents and act as the local government for Electoral Area A.

3. Plan for the Region

Carry out planning and regulatory responsibilities related to the three utility services as well as air quality, regional planning, regional parks, Electoral Area A, affordable housing, labour relations, regional economic prosperity, and regional emergency management.



Building a Resilient Region

Building the resilience of the region is at the heart of Metro Vancouver's work. Each of Metro Vancouver's regional plans and strategies adopts a vision, guiding principles, goals, strategies, actions and key performance measures that will support a more resilient, low carbon and equitable future. Metro Vancouver's interconnected plans and strategies are guided by the Board Strategic Plan, which provides strategic direction for each of Metro Vancouver's legislated areas of responsibility and the Long-Term Financial Plan which projects total expenditures for capital projects and operations that sustain important regional services and infrastructure. Together these documents outline Metro Vancouver's policy commitments and specific contributions to achieving a resilient region.



REGIONAL MANAGEMENT PLANS/STRATEGIES

Metro Vancouver's Roles and Responsibilities for Climate Action

The three broad roles outlined in Metro Vancouver's mission, each demonstrate responsibilities related to climate change. More specifically, under the *Environmental Management Act*, Metro Vancouver has the delegated authority to provide the service of air pollution control and air quality management and may, by bylaw, prohibit, regulate and otherwise control and prevent the discharge of air contaminants, including greenhouse gas emissions. Through the regional growth strategy, Metro Vancouver, with its members, plans for compact, complete communities that are foundational to enabling a carbon neutral, resilient region. As part of delivering its core services, Metro Vancouver also generates and uses clean, renewable energy from its facilities and is working to ensure core regional services and infrastructure are prepared for and resilient to climate change.

In its role as a regional forum, Metro Vancouver builds and facilitates collaborative processes which engage the public and build partnerships to address significant regional issues like climate change. As part of this role, Metro Vancouver coordinates with and advocates on behalf of its member jurisdictions to other governments and regional partners on greenhouse gas management and climate change adaptation initiatives. We will be looking to many other regional partners to lead the implementation of key actions in the *Climate 2050 Roadmaps*, highlighting the importance of ongoing collaboration with other governments and partners.



The Roadmap at a Glance

Humans rely on agriculture to provide healthy, delicious food. Agriculture relies on healthy ecosystems, balanced soils and predictable growing conditions to produce crops for our enjoyment and consumption. Increasingly however, agricultural producers have been facing difficult challenges in managing their operations due to the effects of climate change and have been identified as also needing to adjust their business practices to reduce their contribution to that changing climate.

Like many industries, agriculture will be affected by higher temperatures, shifting precipitation patterns, severe weather events and sea level rise. In response to these complicated and challenging climate change impacts, this Roadmap focuses on supporting new technologies, using renewable energy sources, supporting and conserving ecosystem services and healthy soils relied upon by farms, and using adaptation as a method to support a resilient agricultural community that will survive, thrive and help to reduce the effects of climate change.

The *Climate 2050 Agricultural Roadmap* is about taking the necessary steps to ensure the agricultural sector is supported in the journey to resiliency and ensuring the long-term production of the food humans rely on. This Roadmap lays out four key strategies and 26 actions that will reduce the region's greenhouse gas emissions and create a strong, adaptive agricultural community in Metro Vancouver by 2050.



The Agricultural Roadmap lays out 26 actions for reducing emissions and increasing resiliency, organized under the following 4 strategic areas:

Strategy 1: Protect Agricultural Land

Strategy 2: Support Farmers as Climate Action Leaders Strategy 3: Support Long-Term Farm Health and Resiliency

Strategy 4: Leverage Economic Opportunities, Innovation and Leadership

To achieve a carbon neutral agricultural community in this region, we are going to have to support farmers - financially and through information sharing - to transition their operations to using new sustainable technologies (e.g., solar power) and to incorporating regenerative agriculture and nature-based solutions into their daily operations. Farmers cannot be left alone in this transition and the food available to this region, both today and well into the future, relies on making these adjustments as a collective whole, with each stakeholder playing a vital and unique part:

- → For Farmers it means using climate smart, ecological and regenerative agriculture and investing in new available technologies to take advantage of digital systems and processes;
- → For Industry it means funding new research and embracing digital innovations or information sharing to create new low-carbon options (e.g., electric farm equipment);
- → For Consumers it means increasing their awareness (e.g., the connection between agriculture and our resilience to climate change), adjusting their personal choices (e.g., eating more local food and reducing food waste), and becoming stronger advocates (e.g., supporting structural and regulatory change that protects agricultural land and the longevity of farming in the region); and
- → For Government it means establishing policies, creating programs and providing financial assistance to bring all these elements together to support the changes needed in the agricultural sector in order for it to become fully adaptive and resilient to the climate challenges ahead.



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Visioning Net-Zero Carbon, Resilient Agriculture in 2050

In 2050....agriculture is a key contributor to a low-carbon future having embraced clean and renewable energy sources, switched to regenerative farming practices, and transitioned farm land for both carbon capture and local food production.

Agriculture continues to significantly contribute to the Metro Vancouver regional economy, provides fresh, healthy food for local use and export markets, and operates in a sustainable and resilient capacity. Agricultural land is protected for future farming needs, and it helps to manage floods, captures carbon and provides habitat for pollinators and other wildlife while also benefitting from these ecosystem services.

Agricultural production practices have evolved and continue to adapt to the vulnerabilities of climate change. Farmers are able to pivot operations to manage changes in temperature and rainfall and are able to adjust farming practices and adapt to extreme weather events by using technological innovations and by taking advantage of new or expanded capacity and financial support systems. The agricultural community has seen noticeable improvement and maintenance of soil health and overall has increased and expanded its agricultural viability ensuring a long-term succession of farming and sustainable local food production for future generations.

Climate 2050 Agriculture Roadmap

A pathway to net-zero carbon, resilient Agriculture in Metro Vancouver

The Challenge

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, and other public benefits called ecosystem services, including 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, farm equipment, excess fertilizer applications, burning of organic residues, and the heating of greenhouses with natural gas and other fuels.

Compared to the biggest contributors of greenhouse gas emissions in the region, agriculture contributes approximately 4% to the total mostly from three main sources: 1. carbon dioxide produced from fuel combustion to heat greenhouses and to run farm equipment; 2. methane from livestock and manure storage; and 3. nitrous oxide from fertilizer and manure soil treatments. While the agricultural community is not a large contributor overall, all sectors will need to lower their emissions contributions in order for Metro Vancouver to hit its Net Zero GHG Target by 2050.

Agricultural activity is also 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 are creating a roadmap 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 community over the long term.

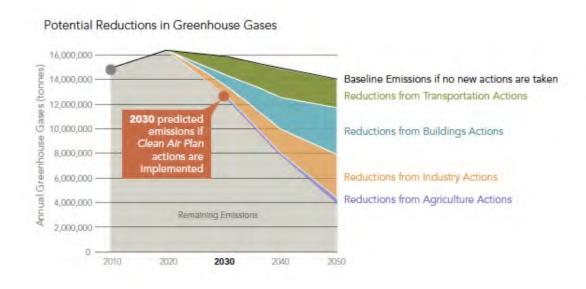
Call Out Box: What is a Carbon Neutral Region?

A carbon neutral region generates no net greenhouse gas emissions. This is achieved through the deepest greenhouse gas emission reductions possible across all economic sectors, and any remaining emissions are balanced out by the carbon dioxide that the plants, trees, and soil in the region remove from the atmosphere, or potentially through technological means.

A carbon neutral region is the best option for future generations to maintain a good quality of life, beyond 2050. We have to make some difficult decisions and investments today or pass them onto our children and grandchildren at higher costs and consequences. Metro Vancouver and many of its member municipalities have committed to ambitious targets and bold leadership to respond to the climate crisis. This plan responds to the global challenge to come together, think big, and act now.

Goals

GOALS	TARGETS AND MEASURABLE OUTCOMES
GOAL: The Agriculture Sector has lowered its emissions	TARGET: 35% reduction in greenhouse gas emissions from
by using renewable energy and new technology	greenhouses, relative to 2010 levels.
GOALS: The Agriculture community consistently applies its knowledge of the benefits of ecosystem services to support the resiliency of local farming operations. GOAL: Metro Vancouver complete food system is	MEASURABLE OUTCOMES: To Be Determined: measurable climate-resilient outcomes are currently unknown for the agricultural community. Additional review and consultation
adaptable and resilient. GOAL: Long-term investment in the Agriculture	will be required to determine what outcomes are attainable and available to measure on how well the region's agricultural
community is coordinated and successful.	producers are adapting to climate change impacts.

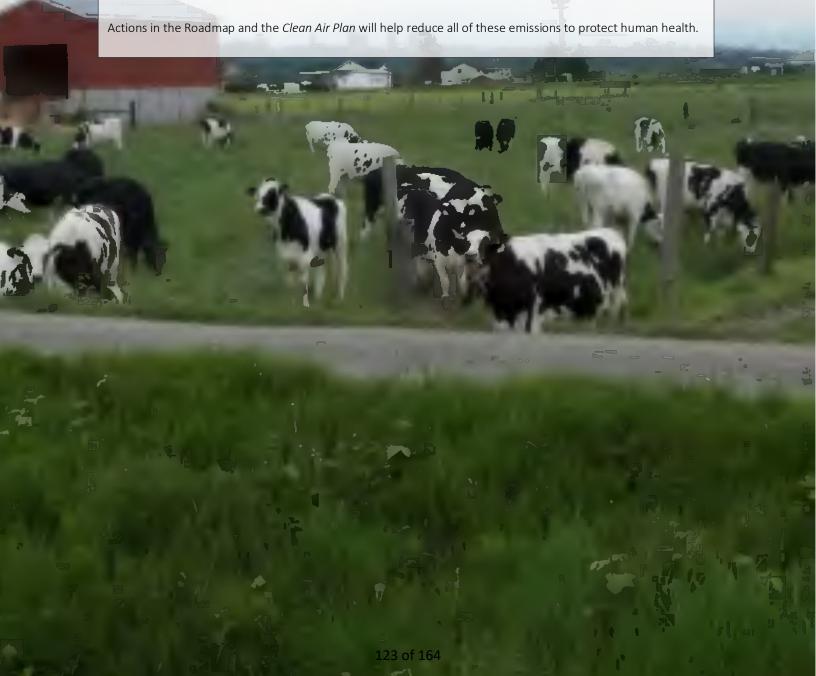


The Connection Between Climate and Air Quality

The Clean Air Plan is Metro Vancouver's air quality and greenhouse gas management plan. Actions in the Plan will reduce air contaminant emissions and impacts, including greenhouse gases, in our region over the next 10 years, and in doing so, support the 2030 target of reducing regional greenhouse gas emissions by 45% compared to 2010 levels, and establish the foundation for the 30-year commitment of a carbon neutral region by 2050. This management plan also addresses air quality targets for the region.

Agricultural activities including fuel combustion in greenhouses and farm equipment, manure management, livestock and fertilizer use, generate both greenhouse gases and air contaminants with direct health impacts, such as fine particulate matter, ammonia and nitrogen oxides. Residents in the region generally experience good air quality; however, health researchers have demonstrated that there are no known safe levels for some health-harming air contaminants.

Actions in the *Roadmap* and the *Clean Air Plan* will help reduce all of these emissions to protect human health and the environment.



Climate Impacts on Agriculture

The agricultural sector is one of the most vulnerable sectors to the impacts of climate change. Farmers will continue to deal with changes in temperature and rainfall, shifting pests and diseases, and extreme weather events that significantly affect local food production. These impacts are not unique to the region, and have been and will continue to affect those agricultural areas in other parts of the world that supply food to this region. Climate change will lead to an overall increase in temperature, which may benefit agriculture by expanding the growing season, enabling a wider variety of crops that can 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 the Metro Vancouver area as well as other parts of North America and internationally that supply food in this region.

Adverse impacts on agricultural crops are expected from higher temperatures, increased frequency and/or severity of droughts and storm, 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.



Based on climate projections to the 2050s, we can expect the following changes and impacts:

Climate Changes



Higher Temperatures overall, with higher daytime and nighttime temperatures, and more hot summer days. This will lead to increased frequency and severity of heatwaves, wildfires and droughts.



Shifting Precipitation Patterns, including more rainfall in every season except the summer, and less precipitation falling as snow.



Severe Storms and Extreme Weather Events, including high winds and heavy rainfall.



Sea Level Rise, with 0.5 m expected by 2050, which will impact coastal communities in our region. While sea level rise is an important aspect of climate change with significant regional impacts, it is not directly addressed in this report because it is being addressed through other Metro Vancouver initiatives.

Impacts Felt



Adjustments in temperature disrupt expected seasonal temperature changes affecting fisheries, livestock and crop mortality and the increase in the prevalence of new parasites and diseases. A longer growing season does lead to earlier harvests, a greater range of crop suitability and a decrease in heating costs for greenhouses in cooler months; however, warmer temperatures lead to an increase in demand for water for irrigation during the growing season and exacerbates pest and disease problems that are controlled by cooler temperatures.



Variations in temperature increase the variability in growing conditions which can impact crop quality, pollination and the life-cycle of pests and disease. These changes create challenges in aligning production with processing schedules. Hotter summers and heat waves also decrease productivity and crop quality and increase crop losses. Heat stress may require more heat-tolerant plants which may not currently be in use and may increase stress on limited water resources placing additional demands for irrigation. Energy use increases for the cooling and ventilation of greenhouses, crop storage and livestock.



Changes in precipitation increases the demand for supplementary irrigation that could put pressure on local water supplies and on adjacent ecosystems and riparian areas. Unreliable rainfall during the growing season increases irrigation requirements that didn't previously exist and waterlogged soils lead to delayed planting, soil compaction and nutrient leaching. Crop damage, crop loss, livestock relocation and soil erosion are all additional challenges agricultural producers are faced with due to the experienced changes in precipitation experienced within this region.



Riverine and field flooding from periods of extreme rainfall and increased runoff from adjacent urban development reduces ground permeability and causes long-term inundation of water into agricultural lands. This water intrusion reduces and limits land-use potential and causes root rot damage to year-round crop varieties.



More incidences of coastal flooding from higher tides and more severe storm surges causes immediate and long-term damage to agricultural land and operations including increased salinization of soils from brackish water, increased coastal erosion, loss of livestock and crops, reduced fish passage and a decrease in water quality used for irrigation and ecosystems. Coastal flooding also places additional pressures on ensuring flood prevention mechanisms, such as dykes, spillways and pumps, are all adequately maintained.



Food loss from climate change impacts affects the availability and pricing of local food producers, as well international food markets, to produce enough food for human consumption. Local food systems impacted by climate change also experience disruptions to regional infrastructure, supply and delivery lines, a skilled agricultural labour force, and trade markets. This may lead to food price increases, food shortages of some agricultural products, distribution disruptions and an overall increase in food insecurity for an area.

Emissions from Agriculture in Metro Vancouver

Metro Vancouver's 2015 regional emissions inventory estimates that agricultural activities generate 4% of total greenhouse gas emissions in the region. 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.

Agriculture emits 10% of the total greenhouse gases in Canada, with similar estimates for agriculture globally. This figure only measures emissions from agriculture production (including for food and non-food products) and does not reflect the full spectrum agricultural system emissions caused by upstream fertilizer and farm equipment manufacturing nor downstream from food transportation, refrigeration, processing and food waste disposal.

Opportunities to reduce greenhouse gas emissions from agriculture in Metro Vancouver include using 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 using regenerative farm practices that add carbon to soil. Protecting agricultural land for farming also prevents land conversion and development that generally emit more greenhouse gases.



Net-Zero Emissions, Resilient Agriculture

Reaching net-zero emissions and resilience in the agriculture sector involves considering and balancing, wherever possible, necessary elements of climate change action:

- Reducing Greenhouse Gas Emissions that accelerate climate change.
- Increasing resilience and the agriculture sector's ability to prepare, respond and recover from the effects of climate change that cannot be avoided.

A "net-zero emissions and resilient" agricultural sector is one that emits almost no greenhouse gas emissions and is able to withstand the negative effects of a changing climate, ensuring farm yield and business livelihoods are maintained. Looking to 2050, the Roadmap seeks to support the continued transition of agriculture toward a net-zero emissions future where alternative energy systems, innovative farm practices, and grazing and crop techniques support a sustainable and thriving future. By aiming for all of these desired outcomes simultaneously, we can identify ways to reduce emissions and vulnerability to climate change impacts at the same time.

In order for meaningful change to take place within the agriculture community, it is helpful to examine how it is connected to the three pillars of sustainability: economic, environmental and socio-cultural. These three pillars can also be used to structure and support necessary solutions and actions for change.

1. ECONOMIC - agricultural operations are businesses that need to make profits in order to survive and continue to function; these businesses can be difficult to adjust and may rely on expensive innovations and new technologies that still need to be developed in other sectors. For example, farmers cannot stop using diesel tractors until alternative fuel source (e.g., electric) tractors have been invented. When appropriate funding, incentives and technologies are offered to the agricultural sector, farmers can begin to implement these new innovations while still maintaining a profitable business.

What is the difference between "Zero Carbon", "Zero Emissions", "Net-Zero" and "Carbon Neutral" and what is "Carbon Sequestration"?

"Zero Carbon" also known as Zero Carbon Emissions, is reached when no greenhouse gas emissions exist at the point of use. A zero carbon fuel source either produces no greenhouse gas emissions, or the greenhouse gas emissions that are produced are offset by renewable energy (either generated onsite or purchased).

"Zero Emissions" are reached when no greenhouse gases or other air contaminants are generated at the point of use. Zero emissions include zero carbon and the elimination of or non-existence of health-harming air contaminants (e.g., fine particulate matter and nitrogen oxides).

"Net-Zero" is reached when there is a balance between the whole amount of greenhouse gases that are released into the atmosphere and the amount that is taken out.

"Carbon Neutral" is reached when a company achieves a balance between the carbon dioxide it releases into the atmosphere and the amount it takes out.

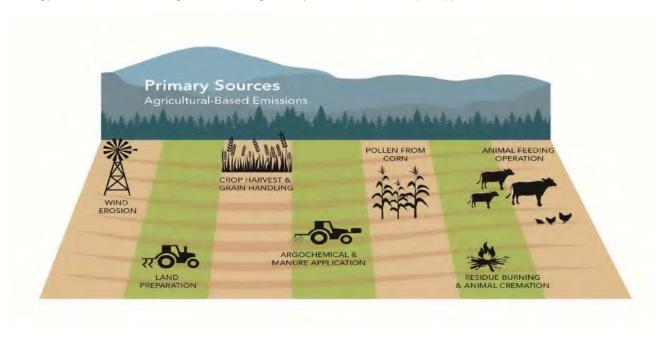
"Carbon Sequestration" is a process of capturing and storing atmospheric carbon dioxide. In the agricultural context, carbon sequestration includes carbon storage in soils in conjunction with sound land management practices, and is one component in creating a resilient agricultural sector.

- 2. ENVIRONMENTAL farming relies on and is affected by the environment. Affecting change, including using new fertilizer types and application methods, incorporating new irrigation systems and adjusting soil quality to increase carbon sequestration are all adjustments to farming practices that may take multiple growing seasons to determine if they were successful or not. Using nature-based solutions to solve problems is likely the best case scenario; however, outcomes are hard to determine in the short term.
- **3. SOCIO-CULTURAL** many farms are family-run businesses with generational ties to farming practices and many farms operate within a region where most residents have limited experience with the challenges and realities of running a farm. While these can both be challenging to overcome as farming is faced with the necessity to adjust its practices, generational knowledge and the desire for residents to have a closer connection to their food can also be used as positives for change.

Lowering Emissions Through Renewable Energy and New Technology

Agricultural operations emit air contaminants that can impact human health and the environment. These contaminants are sourced from a variety of farming practices including: the use of poultry and cattle manure; by-products from heating greenhouses; feed types provided to livestock; fertilizer application; and pesticide application.

Each of these contributors to air contaminants can be mitigated and addressed using a combination of renewable energy sources, new technologies, new management practices, and new input application methods.



1. Renewable Energy Sources

Renewable energy sources such as biogas and wind and solar have been around for decades and, when applied as alternative energy sources, their use helps to significantly reduce greenhouse gas emissions. Trucks, tractors and other non-road equipment, as well as greenhouses and agricultural buildings, all represent opportunities for the agricultural sector to transition to the use of clean, renewable energy sources. Most agricultural vehicles and equipment are extremely expensive (each range from \$15,000 - \$700,000 when purchased new) and are built to be durable and used for decades. Farmers need help to turn these vehicles over and take them out of production and they need technologies to advance making the option to purchase, for example an electric tractor with the same operating costs and life span as the current diesel version, actually possible.

2. New Technologies

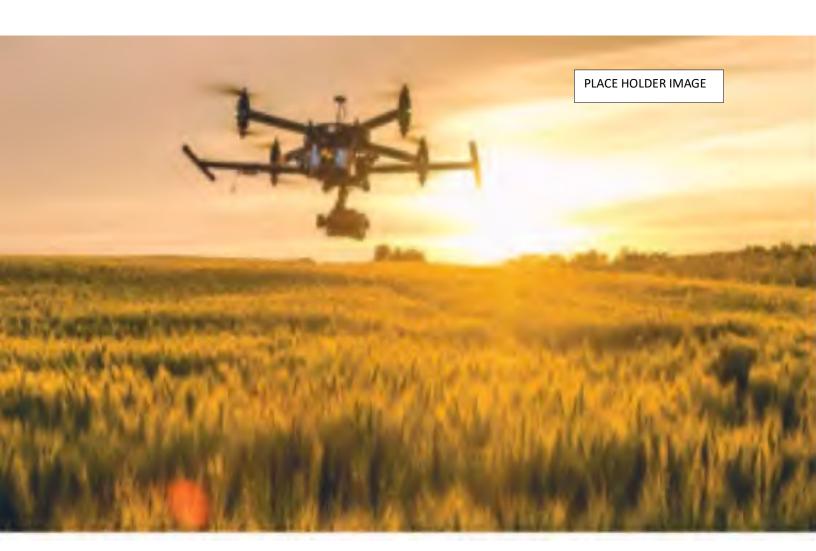
New technologies across all industries are being invented, tested and applied to mainstream uses on a regular basis. Within the agricultural sector, new energy sources such as renewable natural gas (RNG) hydrogen energy, re-using captured carbon dioxide and fusion power are all options that have potential to transform farming operations into carbon neutral producers. Greenhouses have the most to gain from these new technologies; however, more research is required to fully understand how fuel is used and released and how different technologies and fuel types can be applied to existing buildings and production systems. These new technologies can be used in conjunction with improving the energy efficiency of greenhouses (for example, making them more air tight and improving thermal performance) to increase the overall sustainability of the agriculture sector. Businesses involved in the Agritech Grant Program in British Columbia are providing insight into how farming can evolve.

3. New Management Practices

Adjusting production management practices at the farm level is an area where the agricultural community has more individual control. Enhancing grazing practices and optimizing grass and forage quality has shown to reduce methane emissions from cattle and retaining, expanding and adding freshwater wetlands and riparian zones directly onto farms can increase a farm's resiliency, and using regenerative agricultural practices within production fields can increase the ability for soils to store carbon, thereby releasing less carbon emissions into the atmosphere. Additional data collection in this area is vital to understanding the degree to which the agricultural community can, contribute to a reduction in greenhouse gas emissions in the region, and determine how these management practices can contribute to the long-term resiliency of agricultural producers.

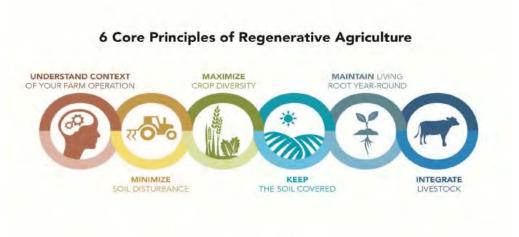
4. New Input Application Methods

In farming, field crops use nutrients, or inputs, (e.g., potassium, phosphorous and nitrogen) to grow. These nutrients are replaced back into the soil for each growing cycle through the use of mineral fertilizers. As these fertilizers are applied to crops, ammonia and greenhouse gas emissions, such as nitrous oxide, are released into the atmosphere. A convenient and standardized approach to fertilizer use involves an even application across entire fields regardless of plant need. Research has been conducted that shows that slow-release fertilizers and precision applications (for example, using field mapping to determine which specific parts of the crop need the fertilizer) can reduce emissions produced from using this input.



Understanding and Benefitting from Ecosystem Services

The agriculture sector within Metro Vancouver, British Columbia, Canada and across the globe is at a turning point of needing to adapt to the increasingly extreme effects of climate change. Every season, floods, rainfall events, heat waves, and droughts last longer or are more severe. Crop losses are more extensive, pest management is more difficult, and production costs are more expensive. Through all of this, farmers are relied upon to continue to produce the same quality and higher quantities of food even while it becomes harder and more challenging to do so. In order to continue to fill this economic and social need, farms must become as healthy and resilient as possible. This is achieved by understanding and benefitting from the ecosystem services provided by nature and working with those systems to ensure the long-term viability of agricultural producers.



1. Support Regenerative Agriculture

The agricultural sector is affected by and relies upon the natural environment. As the negative effects of climate change continue to increase and take their toll on farming operations, the natural environment increasingly is being identified as something farmers can turn to, not only to help them adjust to the changing conditions, but to also work to actually counteract climate change. Regenerative agriculture focuses on building high-quality soil, increasing biodiversity, and retaining rainwater with a focus on working in sync with nature. Land management practices such as agroecology and agroforestry are increasingly being applied by farmers globally and show promising signs of success.

2. Support and Expand Ecosystem Services

Regenerative agriculture and maximizing ecosystem services on farmland will help farmers manage against the uncertainty of the timing, extent and frequency of extreme weather conditions. Programs such as Farmland Advantage, work directly with farmers, helping to not only conserve critical riparian streams and habitats but making farms more resilient to climate concerns. Farmland Advantage targets high risk and high opportunity (e.g., where support by a farmer already exists) areas throughout British Columbia and focuses on providing assessments and working collaboratively with farmers. Identifying the best ways to enhance ecosystem services on farmland largely depends on understanding the regional specialization and differences in landscapes, for example, rain, wind and sun microclimates, ocean and riverine environments, species at risk locations, soil composition, etc. One way to identify these differences is to conduct natural asset mapping, an evaluative process that compiles an inventory of a community's existing natural assets (e.g., aquifers, forests and wetlands), within Metro Vancouver's agricultural areas, to determine how these areas can currently work to collectively create a resilient agricultural sector.

3. Payment and Programs for Ecosystem Services

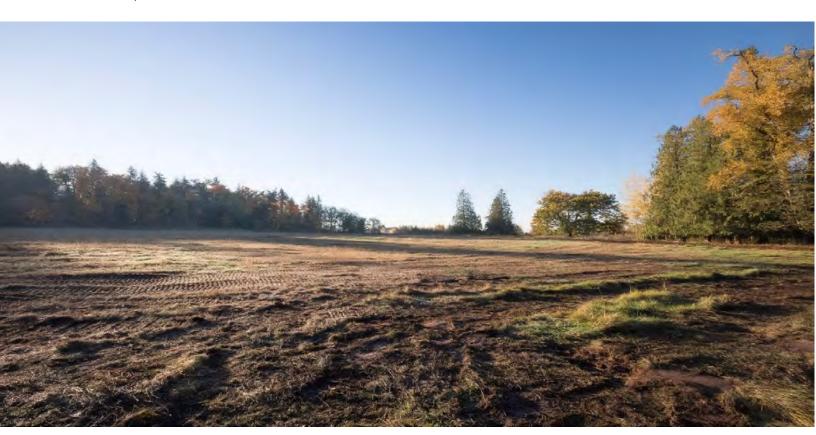
In order for the agricultural sector to be resilient in the wake of a significantly changing climate, adaptation will need to take place at the farm level. This requires that individual farmers take their land out of production; and although this results in the farmer losing the ability to expand their business, these set-aside areas also provide benefits to the farmer in the form of ecosystem services that provide habitat for pollinators and well as natural

flood and erosion control. In order to make establishing set-asides financially viable for the farming community, they need appropriate compensation, directly or indirectly, for these set-asides. Delta Farmland and Wildlife Trust and Farmland Advantage provide programs that specifically support ecosystem services in farmland in Metro Vancouver but there are other indirect tools (e.g., land acquisition programs) that can be used to share the burden throughout the entire population of Metro Vancouver as all residents, businesses and visitors benefit from supporting measures that help farmers maintain a sustainable business and that help farms adapt and increase their resiliency.

Other programs and policies that have been used throughout British Columbia and Canada to support the expansion of ecosystem services in agricultural areas include: Land Acquisition Fund Property Levy (Capital Regional District); Natural Asset Reserve Fund (Edmonton); reverse auctions (Ducks Unlimited); Species at Risk Farm Incentive Program (Ontario); Land Stewardship and Habitat Restoration Program (Ontario); Natural Area Protection Tax Exemption Program (Vancouver Island); Riparian Tax Credit (Manitoba); Stewardship Portal (Ontario). Funding sources for the lower mainland would need to be examined and reviewed to determine the most appropriate and effective option for supporting ecosystem services within Metro Vancouver's agricultural areas.

4. Focus on Soil Health

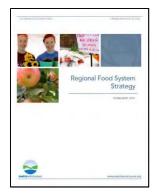
Good soil health is the backbone to a sustainable, resilient farm operation. Healthy soils help with water infiltration, help reduce the effects of drought and the need to use fertilizers, help improve soil nutrients and can help roots grow deeper and sustain cover crops which helps sequester carbon and reduce carbon release into the atmosphere. Beneficial Management Practices (BMP) for maintaining soil health, as used in regenerative agriculture, include reducing or eliminating tillage, reducing and minimizing soil disturbance and keeping plants growing year-round through the use of cover crops during the off-season. Work and research is currently on-going in Metro Vancouver to determine the benefits of healthy soils, which is imperative to help farmers understand how they can adjust their business practices to get the inherent benefit of the soil they depend on so much.



Developing Adaptable and Resilient Food Systems

The Metro Vancouver region is one of the most important food producing areas in British Columbia. The system that supports food production in the Lower Mainland is comprised of a myriad of players engaged in farming, processing, transporting, distributing, celebrating and food waste recovery. These players function as individual units yet are simultaneously part of a larger natural, social, economic and political system that is incredibly complex, layered and multi-jurisdictional. Food systems that are sustainable and able to adapt to changing climate, economic and societal conditions must be energy efficient, protect ecosystems as part of their operations, build and bind a local community, and provide for sustained and attainable economic development opportunities.

In the context of this Roadmap, sustainable food systems are not just about providing local, healthy food, they are about ensuring the resiliency of the farm system in the context of significant major driving forces such as development pressures, climate change impacts, greenhouse gas emissions reductions, increasing transportation costs, pandemics and global health crises, and droughts, floods and an increased incidence of severe weather events to name a few. A transition to a sustainable, adaptable and resilient food system will require a multitude of interventions, decisions and changes in business and consumer practices both at the community and individual level.





1. Update Food System Strategy

A key step in examining the resiliency of Metro Vancouver's food system is to update the existing Regional Food System Strategy. This would allow for a separate process to answer tough questions about sustainability, adaptability and resiliency solely from the perspective of food. New experiences such as a global pandemic and exacerbated experiences such as extended heat waves and droughts can be examined cohesively with other issues such as vulnerabilities in the food chain, Indigenous access to traditional foods, inefficiencies in the transportation system, expansion of agricultural waste reduction; and Agritech and the role of technology and innovation.

2. Plan for Systemic Agricultural Changes

Large portions of the most productive agricultural land occupy low-lying, reclaimed coastal regions are susceptible to coastal flooding and are at risk from increased soil salinization and widespread farmland inundation and crop losses. A significant amount of work has already been done examining how communities are going to manage sea level rise and increased coastal flooding but there has not been a singular, regional examination of what that means specifically to the agricultural community, how it can be addressed and what systemic changes are needed in order to ensure the long-term viability of the region's farms. Focusing on cover crops, improving soil structure, switching to salt-tolerant crops are all elements that need to be examined in more detail and applied under a regional scale.

REGIONAL FOOD SYSTEM STRATEGY

In 2011, the Metro Vancouver Board endorsed the Regional Food System Strategy to create a collaborative approach to a sustainable, resilient and healthy food system. Since that time, the region has experienced a significant amount of urban growth, has seen increased and unprecedented pressure for agricultural lands to accommodate non-farm uses, has experienced increased food insecurity among vulnerable populations and among new demographic sectors as a result of a global pandemic, has experienced increasing changes to climate such as heat waves and droughts and has not addressed gaps in the previous Strategy including managing for hazards such as floods and earthquakes and engaging with the Indigenous community to help them expand access to traditional food sources.

In order for these issues to be explored from a purely food-centric perspective, they will be included in a review of Metro Vancouver's Regional Food System Strategy separate from this Roadmap. Of particular note, the following items should also be explored from a food system point of view:

- i. examine the Milan Urban Food Policy Pact to determine what regional monitoring frameworks can be implemented to evaluate gaps in policy and resource mobilization and reveal overall food system improvements;
- ii. examine the entire food system chain from a regional level to determine where emissions can be reduced and what efficiencies can be achieved;
- iii. examine the Food and Agriculture Organization of the UN to determine what sustainability indicators can be applied regionally to Metro Vancouver;
- iv. identify partnerships with industry, for example, Cleanfarms.ca, to determine ways to reduce packaging waste in the agriculture and food industries;
- v. work with the Indigenous Advisory Council on Agriculture and Food, as well as other Indigenous partners, to identify opportunities to strengthen Indigenous food systems and increase Indigenous participation in the agriculture and food sectors;
- vi. establish partnerships and programs to support and increase information sharing with farmers about the sustainability challenges faced by the agricultural sector;
- vii. establish partnerships and programs to support and increase information sharing with the consumer about how food is produced, sustainability challenges faced by the food sector, and the benefits of supporting local farmers;
- viii. examine how the local agriculture community can diversify including: new, more resilient crop species; appropriate locations for crops based on soil type and hazard vulnerabilities (e.g., coastal flooding); and new adaptive agricultural management and production models;
- ix. gain a complete and comprehensive understanding of a farmer's realities regarding regulations, jurisdictional requirements, food safety needs, access to labour, profit margins, machine and equipment purchasing and maintenance costs and how that relates to the price of food to the local consumer; intended to bridge the gap between the realities of the farming community and expectations of the consumer;
- x. establish inter-municipal learning opportunities for staff, administration and council to learn from each other and understand how municipal interests and activities intersect with food systems planning and decision-making;
- xi. determine the content for a toolkit to be used by new or young farmers interested in starting a farm operation within Metro Vancouver, including step-by-step instructions to follow, Beneficial Management Practices to follow, and financial sources to seek;
- xii. address the tension that exists between food safety (health protection) and food security (health promotion) activities.

Enable Long-Term Investment in Agriculture

Agricultural producers understand and largely support the need to adapt and adjust their processes to remain viable as an sector; however, they have experienced gaps in the knowledge, financial support, policy structure or understanding of what these adjustments should be, how to go about making them happen on their farms, and how they can be applied to their business practices.





1. Support Champions and Provide Strong Leadership

In order for the agricultural sector to make the necessary adjustment to manage for climate change and keep their farming operations running and viable, long-term investment in agriculture and farming operations is necessary at all levels and through multiple streams: financial, support services, leadership, innovation, education, policy and regulation. While climate adaptation requires changes to individual behaviour as well as business practices, these changes are often unsuccessful without the necessary champions and leaders (e.g., BC Climate and Agricultural Initiative).

2. Ensure Policy, Regulatory and Financial Support

In order for the agricultural sector to remain viable and to continue to adapt to changing climate conditions, all levels of government in Canada will need to ensure there are adequate policies and regulations established to support innovation and create opportunities for businesses to be flexible to adjust to changing international, national, local and sector needs. Regulators will also need to show leadership in understanding and supporting that conventional farming models will likely not be applicable in the future and that alternative models with new and multiple objectives should be pursued. Tax reform, incentive programs, learning opportunities, research funding, and an overall recognition and understanding of the importance of supporting the agricultural sector as it adjusts and adapts to the new climate realities will go a long way. Coupled with the policy and regulatory support needed by the agricultural sector is the financial support farmers need to make this transition. Financial support doesn't just have to show up through complicated adjustments to tax structures or finding ways to reduce the impact of the high cost of land in the Metro Vancouver region, it can also take place through offering programs that provide specialized agricultural advisement to primary producers, supporting extension services that help understand supply chain, packaging, food safety, human resources, and marketing and distribution commitments.

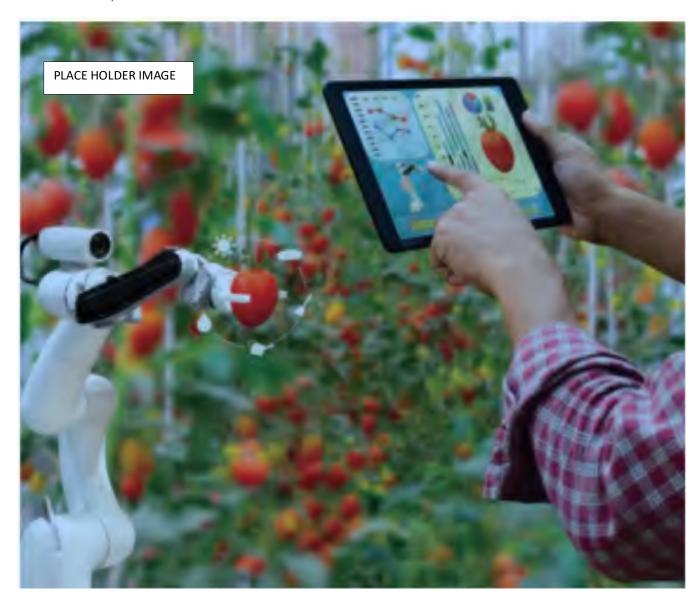
3. Create Opportunities to Increase Self-Sufficiencies

Many farmers rely on others to provide them information on how they can adjust their operational practices to become more resilient. Production improvements are often suggested to farmers, for example, to incorporate new growing practices, add new building technologies, or participate in educational opportunities that may require expensive testing to implement (e.g., soil for carbon sequestration), may not be readily available (e.g., solar powered equipment) or that may be offered during the most productive part of a farmer's day. Part of the leadership gap that exists in the agricultural sector is the lack of resources that could help farmers increase their existing self-sufficiencies by relying less on outside sources to determine if a new farming method is successful or not. Programs such as COMET (US Department of Agriculture) allow farmers to use an online evaluation tool to determine a generalized estimate of the greenhouse gas impacts of a conservation or adaptive principle implemented by the farming operation. Tools like these provide more knowledge and information to the farmer to make better decisions and allow for more adaptive and innovations on their own farms. Online programs like AgPal (Canadian Government) allow farmers and agri-businesses to find relevant resources and information (for example, funding and grants, licensing and regulations, business practices, science, environment and sustainability) in an easy to access platform that they can use at a time that is suitable to them. Expanding and supporting these types of

resources go a long way in increasing a farmer's ability to be self-sufficient and able to adjust and pivot to outside changes and pressures.

4. Integrate the Use of Technological Solutions

While the agricultural sector is making great strides in using regenerative agricultural practices and ecosystem services to create sustainable farming operations, technology is also playing a vital part in helping farmers adjust to climate change and increase their overall operational resiliency. Supporting technology to optimize fertilizer application, generate renewable energy from agricultural residues, and assist with pest, water and soil management are great examples of how farming is benefiting from high-tech innovations. Continuing to innovation and technology, as well as Provincial programs such as Agritech (supports agriculture and food and seafood processing) will help the agriculture sector in Metro Vancouver, and throughout the province, remain competitive, diverse, resilient and adaptive.



Barriers and Opportunities

Most barriers are also chances for opportunities....

International Pressures

Barrier	Opportunity
Farm businesses are expected to accommodate all	Climate change is experienced locally but it is being
climate-related policy and regulatory changes while	experienced globally and throughout the world people
working with global commodity prices and also	are experimenting and researching solutions that may
competing with inexpensive imports.	be applicable in a local setting; solutions can be shared.

Sea-level Rise and Extreme Weather Events

Barrier	Opportunity
Salt water intrusion is an on-going issue and drainage problems and flooding pose great risks; the extreme land shortage in the Lower Mainland doesn't provide opportunities to 'move' farmland to somewhere else.	Pushing the sector and all levels of government to collaboratively develop solutions by developing salt-resistant crops and by supporting crop diversification within the region thereby establishing a more resilient agricultural sector.
Lack of knowledge and understanding by the consumer on how extreme weather events, for example an on-going heat wave, affect their own food security. Crop damages due to extended droughts and high temperatures not only affect crop production, they affect a farmer's livelihood, decrease the amount of food available for consumption and increase food costs.	Communication with surrounding urban communities is an opportunity to connect them with their local food and strengthen the urban population's understanding of agriculture and how their personal decisions and choices toward managing climate change can be connected to the cost of the food they consume.
Ongoing insufficient access to water for irrigation for agricultural purposes.	Determine how using practices such as regenerative agriculture can directly impact the amount of water needed by the agricultural sector to reduce the effects of climate change; test and implement alternative water storage and recycling methods and strategies to overall increase the resiliency of the farming community within Metro Vancouver.

Local Decision Making

LOCAL DECISION IVIANING	
Barrier	Opportunity
Financial costs from the effects of climate change	Adjust policies, regulations, and financial structures to
hinder the agricultural sector's ability to produce food.	shift toward supporting the agricultural sector in
	becoming more resilient and finding ways to best
	adapt to the climate challenges ahead.
Urban development impacts and the effects of climate	Local governments can apply local solutions to
change have not been factored into managing and	ensuring the resiliency of the agricultural resiliency; not
protecting local agricultural land and managing and	all of their decisions are reliant on other levels of
dealing with water shortages.	government to approve.
The agricultural community is marginalized and	Communication with surrounding urban communities
produce food for consumers who do not understand	is an opportunity to connect them with their local food
the challenges and risks that go into local farming.	and strengthen the urban population's understanding
	of agriculture and how their personal decisions and
	choices toward managing climate change can be
	connected to the cost of the food they consume.
Lack of access to irrigation for agricultural purposes	Determine how using practices such as regenerative
including: water licences that are over prescribed;	agriculture can directly impact the amount of water

water taken without a licence; marginal ground water	needed by the agricultural sector to reduce the effects
quality; and difficulty accessing ground water sources.	of climate change; test and implement alternative
	water storage and recycling methods and strategies to
	overall increase the resiliency of the farming
	community within Metro Vancouver.
Standing in the way of farmers to fully integrate	Support and expand programs such as Farmland
adaptability and sustainability into their farm	Advantage that directly provide support services to
operations includes no capacity to do so and the	assess a farmer's land, determine remediation needs (if
processes, applications and permitting being too	any), follow-up with additional inspections and provide
onerous, costly and time consuming.	payment for ecosystem services.
There are more non-farm landowners in ALR than	Adjust policies, regulations and financial structures to
farmers in Metro Vancouver making it difficult to	make non-farm uses that do not support agricultural
comprehensively use agricultural land to manage for	operations harder to support for the long-term and
climate change; high absentee landlords in the ALR	that make it less financially viable to use agricultural
make it difficult to access underused agricultural land;	land for uses other than agriculture.
agricultural land is held idle by non-farm land owners	
while at the same time there are operators who cannot	
find land to use for farming purposes.	
Metro Vancouver farmland is very desirable for estate	Adjust policies, regulations and financial structures to
and non-farm use development and activities that	make non-farm uses that do not support agricultural
generate higher financial gains compared to food	operations harder to support for the long-term and
production and agricultural uses, makes it difficult to	that make it less financially viable to use agricultural
comprehensively use agricultural land to manage for	land for uses other than agriculture.
climate change.	
Ongoing tension and pressure from industrial sector to	Adjust policies to re-affirm using Agricultural land for
expand into and convert agricultural land to ease	agricultural purposes; specifically examine how
regional industrial land shortages.	agriculture and ag-industrial uses can co-benefit and
	co-exist within a region that experiences pressures for
	both use types.

Ongoing Research and Support

Barrier	Opportunity
Switching to high-value crops may be challenged by	The integrated pest management approach inherent in
exposure to pests, soil salinization etc.	regenerative agriculture provides an opportunity to
	address increased pest exposure; research and
	technology can determine ways to adapt crops and
	farmland to better manage sea water inundation and
	the increased salinization of soil as a result.

Journey to Net-Zero Emissions, Resilient Agriculture

Agriculture contributes to the regional economy and provides fresh, healthy food for local consumption and export. Protecting agricultural land supports regional food security and provides ecosystem services, which are public benefits that include flood management, carbon sequestration and wildlife habitat. Agricultural activities also generate emissions of greenhouse gases and other air contaminants.

Linkage to Other Issue Areas

There are several linkages between agriculture and other issue areas and Metro Vancouver is exploring which linkages must be considered when developing policies and actions. This Roadmap primarily addresses agriculture within our region and impacts and actions related to climate change or air contaminants. Some of the related issue areas for agriculture are:

<u>Land Use and Growth Management</u> – Containing urban growth protects agricultural land for farming. Agriculture is vulnerable to impacts from adjacent land uses and new housing developments and transportation infrastructure.

<u>Human Health and Well-Being</u> – Fresh local and imported food, especially fruits and vegetables, support healthy communities; food choices affect health as well as emissions and agriculture viability.

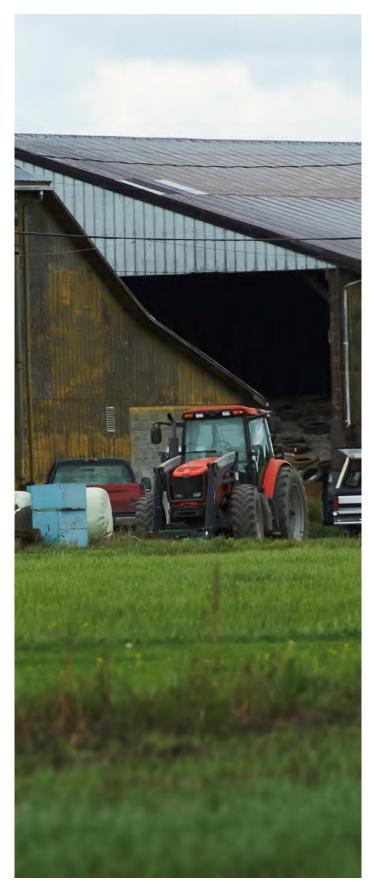
<u>Transportation</u> – Transporting imported and exported foods and food distribution within the region, are sources of emissions.

<u>Waste</u> – Food loss and food waste increase air contaminant emissions, including greenhouse gases.

Industry and Energy - Production of renewable natural gas from agricultural organic residues has the potential to supply energy to the agriculture sector as well as other industries thereby reducing greenhouse gas emissions from manure and from industrial energy use.

Nature and Ecosystems – Protecting, restoring and connecting natural areas, and enhancing ecosystem services on agricultural land support a climate resilient agriculture sector. The significant connection the Nature and Ecosystems Roadmap has to the agricultural sector is explored in more detail below.

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



CLIMATE 2050 NATURE AND ECOSYSTEMS ROADMAPCONNECTION TO AGRICULTURE

General flag – we have a lot of background in N&E on ecosystem services. Could point to this in the agr roadmap to provide people with more info? Not sure yet how we're making these links so we could discuss how we want to do this (likely other concepts where this applies to, e.g. Regional Green Infrastructure Network)

A link here could be drawn with N&E because it is a Big Move. Could say 'for more information on the natural asset management approach see the Nature & Ecosystems roadmap/issue area'

We can point to Agr natural asset actions from N&E also.

Another link here with N&E. Ours is a more general action around exploring innovative financial mechanisms. We can point to Agr for a deeper dive on agr focused financial options.

We noted in N&E DP that the salt water intrusion in Fraser could potentially impact water supply for agr areas

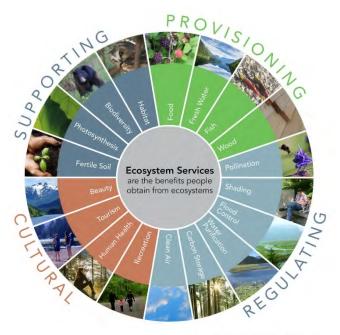
From Jamie Vala: Parks are an allowable use in the ALR and are more compatible with farming than many other uses. They also share many of the same adaptation challenges. Several of the strategies in the road map move to closer alignment between agriculture and parks (e.g. objectives, focus on ecosystems services). Is there a way of recognizing this in the language around protecting agricultural land from non-farm uses.

Framing in N&E – MV will develop guidance materials to support natural asset management and provide a forum to share best practice $\,$

Could point to N&E and say it's explored in more detail elsewhere. Otherwise it's a big item to introduce at the end of an action dealing with other (connected) things.

Qu for AQCC is how do we flag topics that are dealt with in more detail in other roadmaps (e.g. italicized text?)

Possible idea – increased amount or condition of sensitive/modified ecosystems (i.e. captured in the SEI) on agricultural land – if you like this idea we could discuss framing.



Source: Metro Vancouver Regional Planning 2018

Strategies and Actions

ROLES AND RESPONSIBILITIES

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, and for preparing an update to that strategy, *Metro 2050* (draft). Both *Metro 2040 and Metro 2050* contain Metro Vancouver's greenhouse gas reduction targets and include strategies to protect agricultural land and promote agricultural viability through policies such as the Urban Containment Boundary.

While Metro Vancouver plays a pivotal role in advancing climate strategies and actions for the agricultural community in response to climate change issues, air quality management and climate action require close coordination among all governments, as well as private businesses, utilities, institutions and residents. The government and agency organizations that fill key roles in reducing agricultural emissions and helping increase resiliency of Metro Vancouver's agricultural community are outlined below:

ENTITY	ROLE
BC Ministry of Agriculture, Food and Fisheries (AFF)	Supports the production, marketing, processing and merchandising of agricultural products, provides guidance for agricultural operations and secures agricultural production through the mandate of the Agricultural Land Commission.
Agricultural Land Commission (ALC)	Preserves agricultural land, encourages farming in British Columbia and encourages local governments to enable and accommodate farm use of agricultural land.
BC Ministry of Environment and Climate Change Strategy (MOECCS)	Responsible for the protection, management and conservation of BC's water, land and air and living resources and leads climate action through various policies, legislation, regulation and programs.
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 through Farm Bylaws approved by the BC Ministry of Agriculture.
Energy Utilities	Provide rebates, infrastructure and energy for agricultural operations as well as access to market for energy sources such as renewable natural gas (RNG) (e.g., BC Hydro, FortisBC)
Farm Industry Review Board	An independent administrative tribunal that is responsible for hearing complaints from person aggrieved by odour, noise, dust or other disturbances arising from agriculture and may also study and report on farm practices.
Industry Associations	Support agricultural producers with the latest information on technologies, policies and regulations.
Academic Institutions Non-Profits Other Organizations	Conduct research and provide education and training as well as advocate and inform others about ways to transition to a low-carbon and resilient future.
Local Residents	Make food choices that can support agriculture by buying local food.

STRATEGY 1:

Protect Agricultural Land

Above all else, farming cannot take place, food cannot be produced, and ecosystem services cannot be gained if farmland does not exist. Agricultural land in Metro Vancouver is increasingly threatened from non-farm land uses. Currently, there are more non-farm landowners in the Agricultural Land Reserve (ALR) than there are farm owners which is a significant barrier to not only turning unused or non-productive land into operating farms and to ensuring the ALR is cohesively used to protect farming operations from climate change, but it is also a substantial barrier that prevents new or young farmers from gaining access to land to farm, whether it be through leasing or purchasing. This imbalance in land ownership and use of the ALR represents lost economic development opportunity for the region and places strains on the local food system when the demand for local food is constrained by the availability of land for farming. The agricultural sector stimulates links with restaurants, retail, food manufacturing and tourism making its protection a regional priority.

1.1 Continue to Protect Agricultural Land From the Impacts of Land Development

Advocate to member jurisdictions to use the powers provided to them through the *Local Government Act* and *Agricultural Land Commission Act* and Regulations to: 1. adopt policies, regulations and Development Permit Guidelines requiring agricultural impact assessments for development taking place adjacent to the ALR; and 2. limit the extend of urban development and commercial uses that seek to extend utility services into the ALR.

1.2 Provide Secure Tenure for Farmers.



Work with member jurisdictions to protect the supply of agricultural land and promote agricultural viability with emphasis on food production by actively monitoring the status of agricultural land, including the amount of actively farmed land and other indicators to be able to promote agricultural viability and food production. Metro Vancouver will continue to work with its Agricultural Advisory Committee to protect the region's agricultural land base and will continue to work with the Agricultural Land Commission to protect and optimize the use of agricultural land in order to preserve farmland capability well into the future.

1.3 Enable Long-term Investment in Agricultural Lands.

Metro Vancouver will update its Regional Food System Strategy to determine appropriate, effective and measurable actions that will enable investment in agricultural lands for the long-term, including how to support local food production that will contribute to food security and regional resilience.

1.4 Encourage Adjustment of Agricultural Practices to Ensure Long-Term Local Food Sources.



Work with the BC Government, Federal Government, industry and other regional partners to determine the changing conditions for farming in the region and what farming practices can be adjusted to ensure food production can successfully continue here well into the future. This should include examining irrigation infrastructure and water use, adjustments to farming techniques to account for climate change and incorporating regenerative agriculture and nature-based solutions into farming daily practices.

1.5 Increase Entry In To and Reduce Barriers to Local Farming.

Advocate to the BC Government for changes to the tax structure for agricultural properties to reduce incentives for non-farm use development in the ALR. Work with member jurisdictions to support existing land matching initiatives or to create their own programs (e.g., municipal-owned agricultural land trust provided for long-term leasing for incubator farms) that would help eliminate the barriers to local farming experienced by young or new farmers.



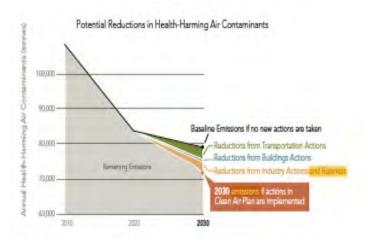
1.6 Protect Agricultural Land for Ecosystem Services

Metro Vancouver will examine the use of ecosystem services as a benefit to the regional agricultural sector including what programs are most beneficial to farmers financially and what methods are most effective in securing land for ecosystem services and for ensuring the long-term health and resiliency of farming operations.

STRATEGY 2:

Support Farmers as Climate Action Leaders

Agricultural activities generate 4% of regional greenhouse gas emissions, primarily from heaters and boilers in greenhouses, agricultural equipment, and livestock. Improving energy efficiency and switching to clean, renewable energy for greenhouses and agricultural equipment and using enhanced Beneficial Management Practices (BMP) will help achieve 2030 agriculture emission targets for greenhouses gases. Increasing the production of renewable natural gas through anaerobic digestion of agricultural and other waste will help to displace natural gas from fossil fuels in sectors where zero emission solutions are more challenging.



The agricultural sector has demonstrated its leadership in continually looking at ways to adjust production methods to reduce costs and increase efficiencies and has demonstrated its willingness to continue to innovate and make adjustments in order to remain competitive and viable and be a positive, contributing factor to a healthy future. Supporting farmers and the agricultural sector in continuing this tradition of leadership is an essential step in leading to a net-zero greenhouse gas emissions future.

Potential Impacts of Strategy 2	Key Partners
Reduce annual greenhouse gases by up to 100,000 tonnes Reduce annual health-harming air contaminants by up to 50 tonnes	Government of Canada
	BC Government
	Agriculture Community
	Member Jurisdictions

2.1 Reduce Emissions from Greenhouses



Work with the BC Government, BC Agricultural Council, BC Greenhouse Growers Association and member jurisdictions to explore opportunities to reduce emissions from greenhouses. Opportunities could include improving energy performance and transitioning to using cleaner, renewable energy, while considering the need for supplemental carbon dioxide in greenhouses to support plant growth. This can be supported by preparing passive design standards specific to greenhouse operations and providing an on-line decision support tool for how to best upgrade greenhouses. Metro Vancouver will update the regional emissions inventory with data specific to greenhouses to increase the understanding of their level of greenhouse gas emissions and will work with industry to determine how much carbon dioxide is used for their processes.

2.2 Improve Soil Health to Help Address Carbon Emissions

BIG

Work with the BC Government, member jurisdictions, industry and other regional partners to expand the knowledge and understanding the role of soil health in ensuring long-term agricultural viability and resilience against climate change and as a local source able to reduce carbon emissions within the Lower Mainland.

Examine ways to financially support expansion of data collection in soil carbon measuring and establish actionable programs specific to soil carbon storage and sequestration.

2.3 Outreach Program on Reducing Agricultural Emissions

Develop and implement an awareness and outreach program on reducing agricultural emissions. The program would be developed with the agriculture community, member jurisdictions and BC Government, and would supplement existing agricultural outreach and support programs. The program would include examining all sources of agricultural emissions to determine how agricultural practices could be adjusted (for example, adjusting cattle feed to reduce methane, using field mapping to apply fertilizer more efficiently, and using crops and soil on farms to capture and sequester carbon) to not only reduce agricultural emissions, but include farmers in an effort to reverse the effects of climate change in the region.

2.4 Enhance Funding for Environmental Farm Plans

Advocate to the Government of Canada and BC Government to enhance the funding for developing and implementing Environmental Farm Plans. This program helps agricultural operations reduce emissions of particulate matter, ammonia, nitrous oxide, methane and odorous air contaminants. This should include continued development and promotional Beneficial Management Practices (BMP), as well as providing reliable incentives and technical guidance to farms to support adoption of low emission practices and technologies.

2.5 Provide Incentives for Farmers to Transition to Lower Emission Equipment

Advocate to the BC Government and Government of Canada to enhance or develop funding supports for cleaner agricultural equipment (e.g., incentives, tax credits, loans, etc.). This would help accelerate the transition to lower emission equipment (e.g., a harvester with better emission controls) or encourage the installation of improved emission controls on existing equipment (e.g., diesel particulate filters). Higher incentives should be available for zero emission equipment to increase their adoption.

2.6 Pilot Study with Zero Emission Agricultural Equipment and Heating Sources

Work with the BC Government, industry, and the agriculture community to develop a pilot study for zero emission agriculture equipment such as an electric tractor. The study could identify the long-term pathways for wider adoption of zero emission agricultural equipment, including charging and related infrastructure, and could focus on emerging alternative fuels such as hydrogen, RNG and clean recycled CO₂.

2.7 Streamline Requirements for Anaerobic Digestion Facilities

Develop an emission regulation for anaerobic digestion of manure, other agricultural waste and commercial food waste. The updated regulation would maintain equivalent protections for regional air quality and human health as the existing permit process, and would provide a simpler path to regulatory compliance.

2.8 Expand Anaerobic Digestion of Agricultural Waste

Advocate to the BC Government, Government of Canada, Local Government, energy utilities and member jurisdictions to expand development of anaerobic digestion facilities to process manure, other agricultural waste and commercial food waste. This could include financial incentives (and tax credits) and removal of barriers in existing regulations. Any expansion should avoid the loss of agricultural land in the Metro Vancouver region.

2.9 Encourage Local Agriculture

Metro Vancouver will update the Regional Food System Strategy and will continue to advocate to member jurisdictions and other regional partners to address regional food security issue, to encourage more local food production, and to prioritize agricultural practices that reduce emissions or help maintain or sequester carbon.

STRATEGY 3:

Support Long-Term Farm Health and Resiliency

Farmers and agricultural operations have adapted and evolved over time accommodating changes in economics, consumers, weather, technology, transportation, and markets. Resiliency and adaptation are not new concepts and have been requirements for the long-term success of the agricultural sector in general for centuries. While facing adversity is not a new concept, the degree to which farmers need to adapt to continue to succeed in the face of a rapidly changing climate is.

Farmers and their businesses will not be able to continue to withstand the effects of climate change, feed present and future populations or provide ecosystem services to adjacent urban areas without adjusting their practices to ensure the health of their farm is a top priority. These adjustments will need to incorporate and connect to the ecosystem, natural biological applications and regenerative techniques more than ever before. This involves first understanding a farm's specific vulnerabilities and then second, pursuing actions so that they can directly benefit from the ecosystem services (e.g., soil nutrient and organic matter, habitat for wildlife, food for pollinators, carbon sequestration and flood management) provided by their agricultural land.

3.1 Expand the Use of Regenerative Agriculture



Work with the BC Government to normalize regenerative agricultural practices for farming operations within the lower mainland by offering additional extension services, financial support and information sharing opportunities. Metro Vancouver will examine the feasibility of establishing a regional network for farmers (for example, Texas' Soil for Water Network) that provides access to peer-to-peer knowledge sharing from research, pilot projects and operational adjustments to increase the support for local farmers to increase their resiliency to climate change.

3.2 Support and Expand Ecosystem Services



Work with the BC Government, member jurisdictions, the farming community and other regional partners such as Farmland Advantage to determine how much agricultural land is available and appropriate to be used for ecosystem services, how individual farms can benefit from the restoration and protection of these lands (including riparian areas) on their farms, and how farmers and land owners can be compensated for keeping these lands set aside for ecosystem services. Metro Vancouver will provide regionally-appropriate guidance on the valuation methodologies, tools and decision-making frameworks needed to identify, preserve, restore, and, where necessary, expand natural ecosystems on agricultural land and will examine the benefits of connecting these areas within a regional Green Infrastructure Network, as a way to increase agriculture's role in contributing to a resilient region, both on and off the farm.

3.3 Support Innovations in Agricultural Operations



Work with the BC Government, Federal Government, industry and regional partners to expand digital and high-tech agricultural systems to improve production operations that will increase the resiliency and longevity of agricultural operations, including GPS-guided machinery, sensor and data-driven analytics, quantification platforms and technology hubs, precision farming, drone monitoring and data collection, and using cognitive systems to help address labour shortages.

3.4 Ensure Long-term, Reliable Access to Water



Work with the BC Government to provide viable and tangible solutions to ensuring water resources needed by the farming community are provided in a sustainable, consistent and reliable manner including: exploring innovative sources and new technologies for water re-use (e.g., municipal waste water, sea water, brackish water, meat and dairy processing wastewater, and agricultural drainage water) and water conservation (e.g., applying mulches to field crops); and developing a new reservoir or storage systems that takes advantage of rainfall collection when it is abundant to be used during periods of low or no rainfall during the growing season. Metro Vancouver will update the agricultural water demand model to incorporate current climate conditions, crop irrigation systems and soil information data to contribute to the discussion of water availability for the agricultural community and will develop a toolkit on how a circular water economy can be supported within the Metro Vancouver farming community.

STRATEGY 4:

Leverage Economic Opportunities, Innovation and Leadership

Agriculture requires long-term investment, financial support and leadership from all levels of government (federal, provincial, regional and local), from private industry (transportation, finance, support services, logistics, retail, and research), and from society (consumers, education, non-profits, places of worship). Farming is the corner stone to the agricultural sector providing healthy food to every individual and as every human being needs to eat, every human being should be invested in ensuring the longevity and resilience of farming.

4.1 Prioritize Agriculture Via Strategic Action



Metro Vancouver will illustrate leadership in the importance of prioritizing agriculture within the region by committing to provincial, federal or international programs that establish bench-line policies, measurable targets and achievable actions. Metro Vancouver will also encourage member jurisdiction engagement and participation in the programs aimed at the municipal level, for example, the Mexico City Pact and Milan Food Policy Pact, as they can help communities commit to addressing the effects of climate change on agriculture and provide reporting frameworks by which to monitor the effectiveness of policies and the progress of actions.

4.2 Continue Long-term Financial Investment in the Agricultural Sector

Work with the Federal and BC Governments to support the agricultural sector through direct and indirect financial investment that: provide incentive programs to help farmers adjust their operations to become more sustainable; expand funding sources for long-term, consistent and reliable funding to agricultural producers to pay for agricultural land to be used for ecosystem services and advance the resiliency of farming operations in the lower mainland; and designate resources for testing practices and technology to help farmers effectively use soil as a means to store carbon for a greater societal benefit.

4.3 Increase Access to Information for Local Farmers and Agricultural Producers



Work with member jurisdictions and the BC Government to provide information to the farming community in formats that are compatible with the specific needs of farmers, including providing on-field workshops, supporting Farmer-to-Farmer information sharing, and providing existing and new educational materials, guidelines, regulations and toolkits in different languages and as audio books to expand outreach and ease of accessing information.

4.4 Reduce Confusion with Provincial Legislative Overlaps

Prepare a joint and coordinated toolkit that brings together all legislation applicable to agriculture and farming from the Ministry of Agricultural, Food and Fisheries, Agricultural Land Commission, Ministry of Environment and Ministry of Municipal Affairs to collectively address legislation that can be contradictory (e.g., riparian protection within the Agricultural Land Reserve) to make it transparent, clear and concise about the expectation from farmers for managing these areas on their farms.

4.5 Support Long-term Local Food Production

Metro Vancouver will update the Regional Food System Strategy to ensure food-specific challenges, gaps and opportunities are identified for the region to specifically include climate change issues and will include examining impacts and considerations specific to food production vulnerability and longevity within the region.

4.6 Bridge the Gap Between the Agriculture Community and the Consumer

Metro Vancouver will develop engaging and approachable educational campaigns aimed toward the public about agriculture and how it is affected by climate change, what costs and processes go into producing food (e.g., the farm to food cost spectrum), what actions farmers are taking to adapt to significant regional climate issues and how consumers can be a positive contributor to agricultural resiliency through their actions and decision making. These campaigns will specifically work to bridge the gap between the public and the realities of what climate change is, helping to increase understanding and awareness of it broadly and as it relates specifically to food costs and availability.

4.7 Help Farmers Build Capacity to Adapt to Climate Change



Work with the BC Government, member jurisdictions, industry and other regional partners to increase the agricultural community's capacity to integrate climate change considerations into their ongoing business decisions and operations. This will include a wide spectrum of support mechanisms, including: encouraging and aiding farm-level preparation of emergency plans; working at the farm level to help producers implement water back-up plans or determine appropriate methods to recycle or store water; increasing producer access to programs, tools, practices, equipment and finances to help them self-monitor and manage soil (e.g., US Department of Agriculture on-line COMET carbon sequestration evaluation tool); and help prepare farm-level business continuation plans for prolonged extreme weather events and disruptions to water and energy supplies.

Setting the Path Ahead

The "Setting the Path Ahead" section will eventually be found on Metro Vancouver's Climate 2050 webpages under "Agriculture" and will serve as a companion to the Agriculture Roadmap. This will allow Metro Vancouver to track progress towards targets and add and adjust strategies and actions in response to performance measurements.

The timeline below includes all of the actions included in this Roadmap. There is much work to be done; however, there are some critical actions that, if started over the next two years, will make a major difference to accelerating the region's drive to zero emission and resilient agriculture.

CLIMATE 2050 AGRICULTURE ROADMAP ACTION TIMELINE

STRATEGY	2021-2024 2025-2029 2030-BEYOND				
STRATEGY 1	Continue to Protect Agricultural Land From the Impacts of Land Development				
Protect Agricultural	Provide Secure Tenure for Farmers				
Land	Enable Long-term Investment in Agricultural Lands Encourage Adjustment of Agricultural Practices to Ensure Long-Term Local Food Sour				
	Increase Entry Into and Reduce Barriers to Local Farming				
	Protect Agricultural Land for Ecosystem Services				
STRATEGY 2	Reduce Emissions from Greenhouse Gases				
Support farms as	Support Improving Soil Health to Help Reduce Carbon Emissions				
leaders in Climate	Enhance Funding for Environmental Farm Plans				
Change mitigation.	Provide Incentives for Farmers to Transition to Lower Emission Equipment				
Pilot Study with Zero Emission Agricultural Equipment and Heating					
Sources					
	Streamline Emission Requirements for Anaerobic Digestion Facilities				
	Expand Anaerobic Digestion of Agricultural Waste				
	Encourage Local Agriculture				
STRATEGY 3	Expand the Use of Regenerative Agriculture				
Support Long-Term	Support and Expand Ecosystem Services				
Farm Health and	Support Innovations in Agricultural Operations				
Resiliency	Ensure Long-term, Reliable Access to Water				
STRATEGY 4	Prioritize the Agriculture Sector Via Strategic Action				
Enable Long-Term	Continue Long-term Financial Investment in the Agricultural Sector				
Investment in	Increase Access to Information for Local Farmers and Agricultural Producers				
Agriculture	Reduce Confusion with Provincial Legislative Overlaps				
	Support Long-term Local Food Production				
	Bridge the Gap Between the Agriculture Community and the Consumer Help Farmers Build Capacity to Adapt to Climate Change				

Measuring Our Progress

The table below lists examples of some of the performance indicators that could be used to help Metro Vancouver measure regional progress towards meeting the targets set out for this purpose. The performance indicators used will depend on the availability of this information from other organizations. Because the Agriculture Roadmap is calling for actions from many different partners and stakeholders, and because, in some instances, it is suggesting using technology that either does not currently exist or that is not readily available at a consumer level, data availability may be limited until technologies advance and industry markets further advance toward full operational sustainability. Additionally, data sharing from partner organizations will be foundational to understanding the pace of progress toward s our common goals and will help governments to continue to shape equitable and cost-effective pathways to a zero emission and resilient future.

ROADMAP ELEMENT	KEY PERFORMANCE INDICATOR	DATA SOURCE	DATA IS CURRENTLY COLLECTED	
Resilient Agriculture	% ALR used for long-term set aside ecosystem services	ALUI	no	
Protected Agricultural	% ALR actively farmed	ALUI	yes	
Land				
Regional GHG Impact	The agricultural sector is carbon neutral by 2050.	various	yes	
Regional GHG Impact	% greenhouse gas emissions from greenhouses	various	yes	
	The agricultural sector produces clean, renewable energy to meet all its production needs by 2050.	various	yes	
	The agricultural sector provides clean, renewable energy to other energy users by 2050.	various	no	

Feedback and Engagement Process

This Roadmap was generated with input from many organizations, including other levels of government, and residents across the region. The project team is continuously assessing that input, and many of the recommendations are reflected in the structure and content of this Roadmap.

This Roadmap reflects current policies and the best ideas, approaches and technologies available at time of writing. As with all climate planning, it must be viewed as an iterative, dynamic path forward. The goals remain clear, and new policies, ideas, approaches and technologies must be anticipated and reflected in the Roadmap.

The project team continues to be open to feedback, at any time, in this Agricultural Roadmap and any other aspect of the climate action initiatives led or coordinated through Metro Vancouver. Send any comments direct to the Project Team through Climate 2050@metrovancouver.org or phone 604-432-6200.

Glossary

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.

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.

Agroecology applies ecological principles to agriculture ensuring a regenerative use of natural resources and ecosystem services while addressing the need for food sovereignty. While the practices can be wide-ranging, agroecology is characterized by diversifying farms and farming landscapes, replacing chemical inputs with organic materials and processes, optimizing biodiversity and stimulating interactions between different species.

Agroforestry is a collective name for land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land-management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence.

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.

Ammonia (NH₃) 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 capture technologies stop carbon dioxide from entering the atmosphere (by filtering out carbon dioxide before it's released from the facility) or remove carbon dioxide that's already in the air (known as "direct air capture"). After carbon dioxide is captured, it can be stored permanently underground ("carbon capture and storage") or converted into a carbon-containing product ("carbon capture and utilization").

Carbon dioxide (CO₂) 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.

Ecosystem services are the benefits people obtain from ecosystems. Ecosystem services provided by farmland include nutrient and organic matter recycling (from food waste), food for pollinators, wildlife habitat, flood control, and carbon sequestration.

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).

Green Infrastructure "Natural and human made elements that provide ecological and hydrological functions and processes. Green infrastructure can include components such as natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces, and green roofs. - Green Infrastructure Ontario

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.

Natural infrastructure can be considered an *active* form of nature likely focused on the most important of these benefits. Natural infrastructure comprises an *active management component* aimed at providing (or conserving) the key advantages—such as climate resilience, clean water and biodiversity. It differs from traditional "grey"

infrastructure, such as pipes, tunnels and factories, which are completely constructed by humans. Natural infrastructure is a form of "green" infrastructure, a term that also includes systems with positive environmental outcomes, such as renewable energy or electric vehicles.

Nature-based solutions (NBS) refers to the <u>sustainable management</u> and use of nature for tackling socioenvironmental challenges. The challenges include issues such as <u>climate change</u>, <u>water security</u>, <u>water pollution</u>, food security, human health, and disaster risk management.

A definition by the <u>European Union</u> states that these solutions are "inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build <u>resilience</u>. The <u>Nature-based Solutions Initiative</u> meanwhile defines them as "actions that work with and enhance nature so as to help people adapt to change and disasters". Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions". With NBS, healthy, resilient and diverse <u>ecosystems</u> (whether natural, managed or newly created) can provide solutions for the benefit of societies and overall <u>biodiversity</u>. Nature-based Solutions (NbS) are defined by IUCN as "actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits".

Promoting nature-based solutions to enhance ecosystem functions, expand green infrastructure and increase resilience.

Nitrogen dioxide (NO₂) 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 agriculture 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. OR/AND: is a holistic land management practice that holds the potential of reversing climate change by rebuilding soil organic matter and restoring degraded soil biodiversity resulting in carbon drawdown and improvement of the water cycle (Regeneration International, 2017). This farming method that regenerates soil fertility, improves water retention, fosters biodiversity, and sequesters carbon.

Resilient/Resilience capacity to withstand and/or recover from hazards, risks and challenges associated with a changing climate. Also referred to as adaptive capacity which is 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, resilience involves changing services and functions so they are more sustainable.

Sensitivity is the degree to which a community or system is affected (positively or negatively) by climate variability or change. The effect may be direct or indirect.

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



LIVING TOGETHER:

Connecting housing, social well-being and resilience

Dates: June 7-8, 2022

Format: Attend in-person for one or both days, OR attend select panels virtually via Zoom livestream.

In-person venue: SFU Wosk Centre for Dialogue, 580 W Hastings St, Vancouver

Please join us for a two-day series of engaging presentations and dialogues about tackling loneliness and social isolation in our homes and urban communities.

Well before COVID-19, loneliness and social isolation were on the rise locally and globally, deeply impacting personal and collective health and well-being. Unlike the United States, which has declared a loneliness epidemic, or the U.K. and Japan, which have appointed Ministers of Loneliness, Canada has yet to meaningfully identify loneliness as a public health crisis, though trends here are similar.

Many socio-economic factors create higher vulnerability to loneliness and social isolation, including where and how we live. Some studies have shown that residents of multi-unit housing are less likely to know their neighbours or do small favours for them than residents of less dense housing types, and that they report higher levels of loneliness and lower levels of trust in neighbours.

In the Metro Vancouver region, most of our communities are growing up, making multi-unit housing the norm, particularly for low- and middle-income residents. *This should compel us to creatively interrogate how we design, redesign and program housing and surrounding neighbourhoods.*

The good news is that, although Canada does not have a unified or adequately funded strategy to help us tackle loneliness and social isolation, much is happening locally and across Canada.

Living Together is a space for concerned professionals and advocates to exchange ideas about efforts happening now and develop a stronger collective voice. You'll be in good company: we are expecting a diverse gathering of housing professionals, municipal planners, public health professionals, architects, non-profits, funders, emergency management professionals, academics and students.

JUNE 7	In-person	Virtual		
8:00 a.m.–9:00 a.m.	Networking, coffee, registration	amming		
9:00 a.m.–11:00 a.m.	 Tackling loneliness: Lessons from near and far Sarah Silva, CEO, Hiỷám ta Skwxwú7mesh Housing Society Joan Ramon Riera Alemany, Councillor, City of Barcelona Ashley Flanagan, Research Fellow, National Institute on Ageing 			
11:00 a.m.–11:30 a.m.	BREAK	Online discussion	n	
11:30 a.m.–12:30 p.m.	DIALOGUE ACTIVITIES WITH ATTENDEES	JE ACTIVITIES WITH ATTENDEES No virtual programming		
12:30 p.m.–1:45 p.m.	CATERED LUNCH No virtual programming			
1:45 p.m.–3:15 p.m.	 FLUID Sociability tool: Demonstration and panel discussion Bruce Haden, Co-Founder, Human Studio Sadhu Johnston, Former City Manager, City of Vancouver Iris Lok, University of British Columbia, Department of Psychology Madyson McKay, Project Manager, City of Calgary 			
3:15 p.m.–3:20 p.m.	BREAK	No virtual programming		
3:20 p.m.–4:20 p.m.	 Towards Metro 2050: Equity report and mapping tools Erin Rennie, Senior Planner, Metro Vancouver Laurie Bates-Frymel, Senior Planner, Metro Vancouver 			
JUNE 8	In-person		Virtual	
10:00 a.m.–12:00 p.m.	 Resilient and socially connected housing: Learning from industry champions Michael Eliason, Founder, Larch Lab John Wall, Public Architecture, Vienna House project Kent Patenaude, Development Manager, Lu'ma Development 			
12:00 p.m.–1:00 p.m.	CATERED LUNCH No virtual			
1:00 p.m.–4:00 p.m.	 WORKSHOP - Guidelines and policies for social connection in multi-unit housing: A co-creative workshop Michael Epp, Director of Planning, City of North Vancouver Madeleine Hebert, Housing Researcher / Intern Architect, Happy Cities Houssam Elokda, Interim Managing Principal, Happy Cities 			

REGISTER HERE

PROFESSIONAL PLANNERS: Each day of the symposium is eligible for 5.0 PIBC CPL units.

ARCHITECTS: You can self-report the following sessions as non-core learning units to the AIBC Continuing Education system.

- FLUID demonstration (Tuesday 7th) = 1.5 hours
- Resilient & connected housing presentation (Wednesday 8th) = 2 hours
- Guidelines & policies for social connection in multi-unit housing workshop (Wednesday 8th) = 3 hours

SESSION DESCRIPTIONS & SPEAKER BIOGRAPHIES

Tackling loneliness: Lessons from near and far

Tuesday June 7th, 9:00 a.m.-11:00 a.m.

In-person OR virtual

No one is immune from loneliness or social isolation, but strong evidence shows that this crisis disproportionately affects lower-income households, seniors and people facing discrimination (not unlike socioeconomic factors putting people more at risk of COVID-19). In recent years, younger people have also expressed worrisomely high rates of loneliness—often higher than seniors. For seniors, though—the demographic that receives the strongest attention from Canadian policymakers on this issue—the health consequences can be severe, often compounding other age-related vulnerabilities.

We all have a role to play in tackling loneliness and social isolation. The leadership that we need includes government policymakers and funders; municipal planners and health professionals; developers, architects and housing operators; non-profits, faith groups and businesses; researchers and consultants and individuals.

Learn from a fantastic panel of Indigenous, local, national and international leaders and then join fellow participants—both online and in person—to learn from each other, find ideas for deepening your work and build a stronger collective voice.

SPEAKERS

Sarah Silva, Chief Executive Officer, Hiyam ta Skwxwu7mesh Housing Society

• What have Hiyam Housing leaders learned so far on their journey to providing new affordable housing that helps welcome more Squamish home? How will Hiyam Housing offer solutions to social isolation for residents, and how can Squamish culture be advanced within new buildings? What can non-Indigenous communities learn from this journey to improve opportunities for social connections and better relations within other homes and communities?

Joan Ramon Riera Alemany, Councillor, City of Barcelona

• What are the roots of loneliness as a problem demanding civic action in Barcelona, giving rise to their 2020-2030 Municipal Strategy Against Loneliness? What were the key steps in crafting and launching this 10-year strategy? What impacts have they seen so far and what can Canadian municipalities learn?

Ashley Flanagan, Research Fellow, National Institute on Ageing

• Where are we at in Canada in terms of policy attention on loneliness and social isolation as it pertains to older adults? How do we compare internationally and what can we learn from other jurisdictions? Where are there strengths and gaps in Canadian policy approaches and how might we build upon efforts underway and perhaps expand beyond older adults to encompass all impacted Canadians?

SPEAKER BIOGRAPHIES

Sarah Silva, CEO, Hiyam ta Skwxwú7mesh Housing Society

Hiỷám ta Skwxwú7mesh Housing Society is a non-profit organization mandated to develop and manage affordable housing for the Squamish People and raise the standard of housing for the community. The organization is mandated to build on strong cultural practices and traditions of the Squamish Nation.

Sarah Silva is a proud member of the Skwxwú7mesh Úxwumixw (Squamish Nation) with lineage on her mother and grandmother's side and Scottish/German on her father's. Indigenous and housing rights drive her career and values, believing everyone deserves a safe and affordable home to thrive and be healthy. She is also passionate about building diverse and sustainable communities, while respecting traditional practices. Previously, Sarah was the Manager of Housing Operations with the Aboriginal Housing Management Association (AHMA). In this senior role Sarah oversaw all provincially funded Indigenous off-reserve non-profit housing operations in B.C. and was responsible for funding delivery of 4,000 units and 35 programs and managing the department and staff. Her most treasured work experience was as the Property Manager at the Squamish Nation, Business Revenue & Services Department.

Sarah is a certified property manager and has worked as a real estate agent on the North Shore for many years. Sarah brings lived experience and expertise in Indigenous non-profit housing, real estate management, best practices, and leadership to the organization.

Joan Ramon Riera Alemany, Councillor, City of Barcelona

Joan was elected to Barcelona City Council in 2020 as a Councillor in charge of the Children, Youth, the Elderly and People with Disabilities Office, the same year he presented the 2020-2030 Strategy Against Loneliness. His background includes 10 years of experience in publishing sector, degrees in Business Science at the University Pompeu Fabra (UPF), Business Management and Administration at Universitat Oberta de Catalunya (UOC), and a postgraduate course in Public Policy at University of Barcelona (UB).

Ashley Flanagan, Research Fellow, National Institute on Ageing

Ashley is a Research Fellow at the National Institute on Ageing (NIA), a Ryerson University think tank focused on the realities of Canada's ageing population. She was also recently named Research Chair in Rural Diversity & Aging at Gateway Centre of Excellence in Rural Health and is a member of the Ontario Centre for Learning, Research and Innovation (CLRI)'s Supporting Diversity & Inclusion in Long-Term Care Advisory Group. She completed her PhD in Ageing, Health, and Wellbeing at the University of Waterloo and brings extensive expertise in the areas of socio-cultural gerontological and leisure perspectives, social justice and diversity, qualitative research methodologies, and social theory. Specifically, Ashley's research focuses on 2SLGBTQIA+ ageing and old age with the goal of advancing comprehensive health and wellness policy, programs, and services for older adults with diverse gender and sexual identities.

Ashley is part of the NIA team working on an upcoming report that will provide a comprehensive overview of the risk factors and consequences of social isolation and loneliness in older adults, with a focus on why social isolation and loneliness are important public health concerns that need to be addressed. It will also synthesize existing estimates on the prevalence of social isolation and loneliness in Canada, as well as at-risk individuals, to identify the full extent of the problem. Finally, drawing on both existing Canadian initiatives and best practices of other countries, the report will outline six policy recommendations to address the growing issue of social isolation and loneliness in older Canadians.

FLUID Sociability tool: Demonstration and panel discussion

Tuesday, June 7th, 1:45 p.m.–3:15 p.m.

In-person OR virtual

Join us for a session led by Bruce Haden from Human Studio. During the session, Human Studio will do a demonstration of the FLUID Sociability tool. FLUID is a public good agent-based online simulation tool that allows for quantitative sociability comparisons of different options while buildings are in the early design stages.

The FLUID demonstration will be followed by a panel-style discussion featuring Sadhu Johnston, former City of Vancouver City Manager, Iris Lok from UBC Psychology and Madyson McKay of the City of Calgary. Together, they will discuss the potential impact of FLUID for architects, developers and municipalities and its ability to provide quantitative and comparative data to support design for social connection. They will also discuss the next steps in the project's evolution.

About FLUID

The FLUID project helps address social connection within our built environment. Social connectivity is a central tool for increasing societal resilience and being able to successfully respond to challenges such as economic

inequality, climate change and other potential shocks. Architectural and environmental design can foster (or hinder) certain aspects of social interaction, and so make it easier or harder to form the relationships that lead to individual and community resilience.

FLUID Sociability allows architects to compare designs at early stages in terms of how they support Encounters (the physical opportunity for social interaction), Greetings, and Conversations. The FLUID work is led by Human Studio as a public good project. It is funded by BC Housing and the Robert Woods Johnson Public Health Foundation. Software builders are District.

SPEAKER BIOGRAPHIES

Bruce Haden, Co-Founder, Human Studio

In 2017 Bruce Haden founded Human Studio with Peter Atkinson. Human Studio's work includes multiple social housing projects, Indigenous cultural and housing projects, and post-secondary and cultural work. Bruce leads work on FLUID Sociability. He is also an author (with Mark Holland and Bruce Irvine) of *Urban Magnets*, a book about enhancing sociability in the public realm through a focus on activity. Urban Magnets and FLUID are the urban and building-level strategies for Human Studio's focus on evidence-based sociability.

As an active member of the Canadian design community, Bruce has many roles. He is the Jury Chair for the international design competition for Block 2 on Parliament Hill in Ottawa. He sits on both the National Capitol Commission's and UBC's design review panels, he is a founding board member of the Urbanarium, he has twice chaired the City of Vancouver Urban Design Panel, and he assisted both Waterfront Toronto and the City of Toronto in setting up Design Review Panels. Last, he is an advisor and guest on the Urbanarium City Talks housing podcast, "Should I Stay or Should I Go?"

Madyson McKay, Project Manager, City of Calgary

As a registered architect, Madyson brings 10 years of architectural and project management expertise from her work in the private and public sectors. Since joining the City of Calgary's affordable housing team in 2018, she has led design initiatives that focus on tenant outcomes and community building. Madyson is a firm believer in the power of the built environment, and using design as a tool for social equity.

Madyson is active in the community, serving with the Alberta Architects Association (AAA), teaches as a sessional instructor at the School of Architecture, Planning and Landscape and is a past volunteer board member of D.talks. She is passionate about creating and discovering vibrant places and is happiest in the mountains.

Sadhu Johnston, Former City Manager, City of Vancouver

Sadhu is a thought leader on cities: how they work, how they can be improved, and how they are evolving to handle the myriad of challenges that they are forced to take on. He was the City Manager of Vancouver, B.C. from March 2016 until January 2021 where he was responsible for managing the operations of the City, including oversight of a budget of over \$1.6 billion and over 7,000 staff. As City Manager he spearheaded initiatives to address the growing housing, homelessness and climate change issues in Vancouver.

He was the Chief Environmental Officer of Chicago and Deputy Chief of Staff to Mayor Richard M. Daley where he led the development of the first climate action plan in a major North American city. He is co-author of *The Guide to Greening Cities* (Island Press, 2013) and is a co-founder of the Urban Sustainability Directors Network (USDN).

Iris Lok, University of British Columbia

Iris is a PhD student at the University of British Columbia. She is interested in understanding the barriers that prevent people from making new connections and harnessing social psychology to increase sociability. In the FLUID project, Iris designs experiments to validate FLUID sociability against real world data.

Towards Metro 2050: Equity report and mapping tools

Tuesday June 7th, 3:20 p.m.-4:20 p.m.

In-person OR virtual

As part of its work to inform Metro 2050—this region's draft updated regional growth strategy—Metro Vancouver commissioned a social equity report and produced a set of 49 social equity maps for the region based on different indicators of equity including demographic, housing, environmental, economic, and social development data. These maps will be updated with 2021 census data next year.

In 2022/2023 research into social equity and regional planning will continue with a series of "case studies" looking at how spatial equity analysis can support planning decisions that foster equitable outcomes.

Join other Living Together participants to learn about these resources and tools and to take part in a conversation about what types of future case studies might be useful as we work towards more equitable, complete, socially connected and resilient communities.

SPEAKER BIOGRAPHIES

Erin Rennie, Senior Planner, Metro Vancouver

Erin Rennie is a Senior Planner at Metro Vancouver working with the Growth Management and Transportation team within the Regional Planning and Housing Services Department. She is also the Metro 2050 Project Manager, working with a cross-sectional team of planners to update the regional growth strategy for Metro Vancouver. Her policy portfolio includes Urban Centres, Complete Communities, Transit-Oriented Development, Health and the Built Environment, and Social Equity in Planning.

Laurie Bates-Frymel, Senior Planner, Metro Vancouver

Laurie Bates-Frymel is currently a Senior Planner in Metro Vancouver's Regional Planning and Housing Department and her work focuses on advancing ecological health, nature-based solutions, climate action, health and the built environment, social equity, and data-driven decision-making across the region. Laurie was a key member on Erin's Metro 2050 team, having led the review and update of environmental policies.

Resilient and socially connected housing: Learning from industry champions

Wednesday June 8th, 10:00 a.m.-12:00 p.m.

In-person OR virtual

Join us to hear from industry champions who are working to design and develop more sustainable, affordable and socially connected housing. Each presenter will share a short presentation, followed by a guided Q&A discussion.

There is enormous opportunity to alleviate loneliness and social isolation—and build community, social connectedness and resilience—through the design and programming of multi-unit housing (while advocating for renter protections, more equitable housing policy and poverty eradication!). Forward-thinking architects, developers, housing operators and non-profits are working hard to create and maintain innovative housing forms that support social connectedness and well-being. However, we need supportive policy and funding systems to mainstream this innovative housing.

Our champions will present innovative projects and policies that overcome systemic barriers to create spaces and programming that foster social connectedness. They will also share examples of challenges and barriers to mainstreaming innovative housing across the province.

SPEAKER BIOGRAPHIES

Michael Eliason, Founder, Larch Lab (Seattle)

Michael Eliason is the founder of Larch Lab—part architecture and urbanism studio, part "think and do" tank—focusing on research and policy; decarbonized, climate-adaptive, low-energy urban buildings; and sustainable urbanism. Michael is also a writer, and an award-winning architect specializing in mass timber, social housing, baugruppen (urban cohousing), and ecodistricts. His career has been dedicated to advancing innovation and broadening the discourse on sustainable development, passivhaus, non-market housing, and decarbonized construction. His professional experience includes work in both the Pacific Northwest and Germany.

In his presentation, Michael will share results of his recent study with the City of Vancouver on Point Block Access Housing. He will also share examples of how housing policy and design guidelines can impact the sustainability, affordability and social connection potential in neighborhoods.

Kent Patenaude, Development Manager, Lu'ma Development (West Vancouver)

Kent is a development manager with Lu'ma Development. He is a Cree Status Indian from the Sucker Creek First Nation in northern Alberta. Kent provides research and develops professional affordable housing needs assessments for municipalities, government agencies and non-profit organizations, develops and coordinates comprehensive proposal packages to lenders and funding agencies, develops and negotiates contracts and agreements between clients and stakeholders, works to obtain municipal approvals such as rezoning, development and building permits, implements effective public consultation processes, manages a diverse range of stakeholders and supports clients throughout the design, approval and construction processes - resolving issues and managing risks.

In his presentation, Kent will share some of Lu'ma's recent development projects, including Sixth Street Housing in New Westminster and the ALT Hastings project. He will share the success and challenges of creating housing for urban-Indigenous people and the importance of partnerships.

John Wall, Public Architecture, Vienna House (Vancouver)

In his presentation, John will share his experience as the architect of the Vienna House project. The Vienna House project is a proposed East Vancouver housing community that aims to advance innovative solutions to affordability, climate change and social equity. This project includes many partners including BC Housing, Vancouver Affordable Housing Agency (VAHA), More Than a Roof Housing Society and more.

WORKSHOP

Guidelines and policies for social connection in multi-unit housing: A cocreative workshop

Wednesday June 8th, 1:00 p.m.-4:00 p.m.

In-person only

Join us for an in-person workshop led by the team at Happy Cities. The design of the built environment can be pivotal in our ability to feel healthy, safe, and socially connected. During this workshop, we will use design thinking to envision what design guidelines for social connectedness in multi-unit housing could look like and what accompanying policies are needed to implement and incentive such guidelines.

The workshop will feature a presentation by Michael Epp, Director of Planning from the City of North Vancouver, on the Active Design Guidelines. Michael Epp will share how the municipality built, implemented and incentivized the guidelines. Using the Active Design Guidelines and other examples as inspiration, we will work in multidisciplinary breakout teams.

In the first breakout activity, we will look at successful examples of multi-unit housing that enables social connectedness and identify important spatial criteria. Using different lenses including building codes, existing policy and guidelines, affordability, equity and sustainability, we will identify important elements for social connectedness. Once we've identified elements, we will co-create "roadmaps" for stakeholders to design and implement guidelines and policies for social connectedness in multi-unit housing.

This workshop is meant to kick off future cross-sectoral policy design dialogues with municipalities across B.C. Following the workshop, Happy Cities will compile the workshop results into a brief.

SPEAKER BIOGRAPHIES

Michael Epp, Director of Planning, City of North Vancouver

BIO TO COME

Madeleine Hebert, Housing Researcher and Intern Architect, Happy Cities

Madeleine is a researcher, systems-thinker, project manager and Intern Architect AIBC. At Happy Cities, she uses her practical knowledge of housing design to manage and execute multi-year housing research and consulting projects. Madeleine is curious about how buildings influence people's well-being, seeking to understand how big and small design decisions impact people's lives in various housing types.

Recently, Madeleine has played a key role in Happy Cities' CMHC-funded Solutions Lab and Demonstrations projects. Through these projects, she facilitated engagement that helps stakeholders work through complex challenges in the housing system. She enjoys co-creating community-driven solutions to these challenges, grounded in evidence.

Houssam Elokda, Interim Managing Principal, Happy Cities

Houssam is a community designer, transit planner, and housing and land use policy planner. He leads Happy Cities' work in supporting the development of community masterplans and housing projects. Houssam has a passion for creating urban plans, policies and designs that boost human happiness. He brings an evidence-based approach that helps governments, developers and non-profit clients maximize urban health and happiness. Houssam has led complex masterplanning and policy projects in diverse settings that range from the rural Nova Scotian town of Bridgewater to metropoles such as Dubai, Cairo and Vancouver. He also led Shore to Core, Happy Cities' groundbreaking collaboration with neuroscientists to examine the psycho-social effects of public space design in West Palm Beach. Houssam is part of the Canada Mortgage and Housing Corporation (CMHC) college of experts on housing and is an expert reviewer for CMHC grants. He brings to his planning and policy work a background in real estate development and construction. He also helped deliver multi-year research projects investigating how the design and programming of housing influences well-being.

ABOUT THE SYMPOSIUM HOSTS



Using a collective impact approach, Hey Neighbour Collective (HNC) brings together housing providers, non-profits, researchers, local and regional governments, housing associations and health authorities. Together with residents of multi-unit housing, our mission is to experiment with and learn about ways of alleviating loneliness and social isolation while building capacity for neighbourly support and mutual aid.

Learn more here: https://www.heyneighbourcollective.ca/



Happy Cities is an interdisciplinary firm working at the intersection of urban design, policy, engagement and human well-being. We turn evidence into action for happier, healthier and more inclusive communities. Since 2016, we have been researching the keys to addressing the loneliness crisis in multi-unit buildings. We now know that planning and housing design decisions can make or break social connections, elevate or reduce health and happiness, foster inclusion or deepen disconnection. In 2017, we published the Happy Homes toolkit, complete with design and programming actions to boost social connection in multi-unit buildings. Since then, we have been working with the Happy Homes framework to conduct research and consult with developers across the province.

Learn more here: https://happycities.com/



SFU Urban Studies is located in the heart of downtown Vancouver, and we use our neighbourhood, city and region as living laboratories.

Our interdisciplinary faculty includes geographers, public policy scholars, political scientists, historians, economists and anthropologists whose teaching and research interests lie both within and outside Metro Vancouver, and who straddle both theory and practice.

The students we attract have diverse academic and professional backgrounds, which makes for robust, dynamic classroom environments where we explore the many different ways to read, understand and analyze the city.

Learn more here: https://www.sfu.ca/urban.html



SFU Public Square is situated at 312 Main, a centre for social and economic innovation in Vancouver's Downtown Eastside. We work across all of SFU's campuses, supporting faculty, students, staff, alumni and diverse communities to convene accessible, innovative and inclusive programming that brings people together to find ways to meaningfully contribute to the issues that affect our lives.

Every year, we collaboratively program dozens of workshops, debates, public conversations, discussion panels and other gatherings. These spaces encourage different perspectives and ways of knowing to collide and influence each other. The experience is transformative, inspiring deeper conversations, igniting networks, building capacity and catalyzing curiosity and concern into advocacy and action.

Learn more here: https://www.sfu.ca/publicsquare.html

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