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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

# METRO VANCOUVER REGIONAL DISTRICT
# REGIONAL PLANNING COMMITTEE

**MEETING**

**Friday, November 3, 2023**
**9:00 am**
**28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia**
**Webstream available at https://www.metrovancouver.org**

## A G E N D A[1]

**1. ADOPTION OF THE AGENDA**

**1.1 November 3, 2023 Meeting Agenda**
That the Regional Planning Committee adopt the agenda for its meeting scheduled for November 3, 2023 as circulated.

**2. ADOPTION OF THE MINUTES**

**2.1 October 6, 2023 Meeting Minutes** *pg. 4*
That the Regional Planning Committee adopt the minutes of its meeting held October 6, 2023 as circulated.

**3. DELEGATIONS**

**4. INVITED PRESENTATIONS**

**4.1 David van Hemmen, Vice President, GVBOT**
**Doris Mak, Vice President, InterVISTAS**
**Jason Kiselbach, Executive Vice-President and Managing Director, CBRE and Director, NAIOP Vancouver**
Subject: Economic Impact Study of the Critical Shortage of Industrial Land in Metro Vancouver

**5. REPORTS FROM COMMITTEE OR STAFF**

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

**5.1 Metro 2050 Implementation Guideline - Regional Growth Strategy Amendments** *pg. 8*

That the MVRD Board endorse the *Metro 2050* Implementation Guideline – Regional Growth Strategy Amendments as presented in the report dated October 15, 2023, titled "Metro 2050 Implementation Guideline – Regional Growth Strategy Amendments".

**5.2 Request for Sanitary Service Connection at 14500 Silver Valley Road, Maple Ridge** *pg. 28*

That the MVRD Board:

a) resolve that sewer service for the property at 14500 Silver Valley Road, City of Maple Ridge is generally consistent with the provisions of Metro 2050; and
b) forward the requested Fraser Sewerage Area amendment application for the property at 14500 Silver Valley Road in the City of Maple Ridge to the GVS&DD Board for consideration.

**5.3 Support for The National Housing Accord: A Multi-Sector Approach to Ending Canada's Rental Housing Crisis** *pg. 44*

That the MVRD Board endorse the National Housing Accord, a national campaign and policy proposal with recommendations to restore housing affordability, and to build at least two million new affordable and market rental units by 2030.

**5.4 Regional Context Statement from the University of British Columbia** *pg. 49*

That MVRD Board receive for information the report dated October 5, 2023, titled "Regional Context Statement from the University of British Columbia".

**5.5 Costs of Providing Infrastructure and Services to Different Residential Densities Study** *pg. 93*

That the MVRD Board receive for information the report dated October 16, 2023, titled "Costs of Providing Infrastructure and Services to Different Residential Densities Study".

**5.6 Manager's Report** *pg. 212*

That the Regional Planning Committee receive for information the report dated October 16, 2023, titled "Manager's Report".

**6. INFORMATION ITEMS**

**7. OTHER BUSINESS**

**8. BUSINESS ARISING FROM DELEGATIONS**

**9. RESOLUTION TO CLOSE MEETING**

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

**10. ADJOURNMENT/CONCLUSION**

That the Regional Planning Committee adjourn/conclude its meeting of November 3, 2023.

Membership:

Woodward, Eric (C) – Langley Township
Kruger, Dylan (VC) – Delta
Albrecht, Paul – Langley City
Dueck, Judy – Maple Ridge
Girard, Angela – North Vancouver City
Hodge, Craig – Coquitlam
Hurley, Mike – Burnaby
Knight, Megan – White Rock
Lahti, Meghan – Port Moody
Lambur, Peter – West Vancouver
Locke, Brenda - Surrey
McEwen, John – Anmore
West, Brad – Port Coquitlam

**METRO VANCOUVER REGIONAL DISTRICT**
**REGIONAL PLANNING COMMITTEE**

Minutes of the Regular Meeting of the Metro Vancouver Regional District (MVRD) Regional Planning Committee held at 9:00 am on Friday, October 6, 2023 in the 28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia.

**MEMBERS PRESENT:**
Chair, Mayor Eric Woodward*, Langley Township
Vice Chair, Councillor Dylan Kruger*, Delta
Councillor Paul Albrecht*, Langley
Councillor Judy Dueck*, Maple Ridge
Councillor Angela Girard*, North Vancouver City
Councillor Craig Hodge*, Coquitlam
Mayor Mike Hurley*, Burnaby
Mayor Megan Knight*, White Rock
Mayor Meghan Lahti*, Port Moody
Mayor Brenda Locke*, Surrey
Mayor John McEwen*, Anmore
Mayor Brad West*, Port Coquitlam (arrived at 9:01 am)

**MEMBERS ABSENT:**
Councillor Peter Lambur, West Vancouver

**STAFF PRESENT:**
Jerry W. Dobrovolny, Chief Administrative Officer
Heather McNell, Deputy Chief Administrative Officer, Policy and Planning
Jonathan Coté, Deputy General Manager, Regional Planning and Housing
Rapinder Khaira, Legislative Services Coordinator, Board and Information Services

## 1. ADOPTION OF THE AGENDA

### 1.1 October 6, 2023 Meeting Agenda

**It was MOVED and SECONDED**
That the Regional Planning Committee adopt the agenda for its meeting scheduled for October 6, 2023 as circulated.

**CARRIED**

*denotes electronic meeting participation as authorized by the *Procedure Bylaw*

## 2. ADOPTION OF THE MINUTES

### 2.1 September 7, 2023 Meeting Minutes

9:01 am Mayor West arrived at the meeting.

**It was MOVED and SECONDED**
That the Regional Planning Committee adopt the minutes of its meeting held September 7, 2023 as circulated.

**CARRIED**

## 3. DELEGATIONS

No items presented.

## 4. INVITED PRESENTATIONS

### 4.1 Jason Lum, Board Chair and Robin Beukens, Planner II, Strategic Planning and Initiatives, Fraser Valley Regional District

Members were presented an overview of the Fraser Valley Regional District Regional Growth Strategy.

Presentation material titled "Fraser Valley Future 2050 - Regional Growth Strategy" is retained with the October 6, 2023 Regional Planning Committee agenda.

## 5. REPORTS FROM COMMITTEE OR STAFF

### 5.1 2024 – 2028 Financial Overview

Jerry W. Dobrovolny, Commissioner/Chief Administrative Officer and Harji Varn, Chief Finance Officer/General Manager, Financial Services presented members with an overview of the 2024 – 2028 Financial Plan, including the 2024 budget cycle timeline, its major cost drivers, and the overall household impact.

Presentation material titled "2024 – 2028 Financial Plan Overview" is retained with the October 6, 2023 Regional Planning Committee agenda.

### 5.2 2024 – 2028 Financial Plan

Report dated September 26, 2023, from Jonathan Coté, Deputy General Manager, Regional Planning and Housing Development, Regional Planning and Housing Services, presenting the Regional Planning Committee the 2024 – 2028 Financial Plan for Regional Planning for consideration.

Members were provided with an overview of the 2024 – 2028 Financial Plan for Metro Vancouver's Regional Planning services, including a breakdown of the 2024 operating budget, and capital funding and expenditures.

Presentation material titled "2024 – 2028 Financial Plan – Regional Planning" is retained with the October 6, 2023 Regional Planning Committee agenda.

**It was MOVED and SECONDED**
That the Regional Planning Committee endorse the 2024 - 2028 Financial Plan for Regional Planning as presented in the report dated September 26, 2023, titled "2024 - 2028 Financial Plan – Regional Planning", and forward it to the Metro Vancouver Board Budget Workshop on October 20, 2023 for consideration.

**CARRIED**

**5.3 Request for Sanitary Service Connection at 1565 – 200 Street and 19925 – 12 Avenue, Township of Langley**

Report dated September 13, 2023, from Victor Cheung, Senior Policy and Planning Analyst, Regional Planning and Housing Services, seeking MVRD Board concurrence that sewer service for the properties located at 1565 – 200 Street and 19925 – 12 Avenue is generally consistent with *Metro 2050.*

**It was MOVED and SECONDED**
That the MVRD Board:

a) resolve that sewer service for the properties at 1565 – 200 Street and 19925 – 12 Avenue, Township of Langley is generally consistent with the provisions of Metro 2050; and
b) forward the requested Fraser Sewerage Area amendment application for properties at 1565 – 200 Street and 19925 – 12 Avenue in the Township of Langley to the GVS&DD Board for consideration.

**CARRIED**

**5.4 Manager's Report**

Report dated September 14, 2023, from Jonathan Cote, Deputy General Manager Regional Planning and Housing Development, Regional Planning and Housing Services, providing the Regional Planning Committee with an update on the Fraser Valley Regional District Regional Growth Strategy, the Metro 2050 Climate Policy Enhancement Joint Workshop, the GST rebate for new purpose build rental housing, and the Regional Planning Committee 2023 Work Plan.

**It was MOVED and SECONDED**
That the Regional Planning Committee receive for information the report dated September 14, 2023, titled "Manager's Report".

**CARRIED**

## 6. INFORMATION ITEMS

### 6.1 Metro Vancouver's Climate 2050 Agriculture Roadmap

**It was MOVED and SECONDED**
That the Regional Planning Committee receive for information item 6.1 Metro Vancouver's Climate 2050 Agriculture Roadmap.

**CARRIED**

## 7. OTHER BUSINESS

No items presented.

## 8. BUSINESS ARISING FROM DELEGATIONS

No items presented.

## 9. RESOLUTION TO CLOSE MEETING

No items presented.

## 10. ADJOURNMENT/CONCLUSION

**It was MOVED and SECONDED**
That the Regional Planning Committee conclude its meeting of October 6, 2023.

**CARRIED**
(Time: 10:11 am)

Rapinder Khaira,
Legislative Services Coordinator

Eric Woodward,
Chair

62888429 FINAL

To: Regional Planning Committee

From: Jessica Jiang, Regional Planner, Regional Planning and Housing Services

Date: October 15, 2023 Meeting Date: November 3, 2023

Subject: **Metro 2050 Implementation Guideline – Regional Growth Strategy Amendments**

**RECOMMENDATION**

That the MVRD Board endorse the *Metro 2050* Implementation Guideline – Regional Growth Strategy Amendments as presented in the report dated October 15, 2023, titled "Metro 2050 Implementation Guideline – Regional Growth Strategy Amendments".

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**EXECUTIVE SUMMARY**

Metro Vancouver staff are in the process of developing and updating a suite of implementation guidelines to support the interpretation and implementation of *Metro 2050*. The update to the Regional Growth Strategy Amendments Implementation Guideline is now ready for Board consideration.

The main changes in the updated *Metro 2050* Implementation Guideline – Regional Growth Strategy Amendments include:

- new information on submission requirements, engagement timelines, and relationship with Regional Context Statements;
- new examples of council resolutions and submission cover letter;
- a new regional growth strategy amendment process diagram; and
- formatting for better readability.

**PURPOSE**

To provide the Regional Planning Committee and the MVRD Board with the opportunity to consider and endorse the *Metro 2050* Implementation Guideline – Regional Growth Strategy Amendments.

**BACKGROUND**

Implementation Guidelines were first introduced as companion documents to support the previous Regional Growth Strategy, *Metro 2040*, adopted in 2011. This included *Metro 2040* Implementation Guideline #2: Amendments to the Regional Growth Strategy (Reference 1), which has been updated following the adoption of *Metro 2050* and is being presented for endorsement as part of this report.

**SUMMARY OF UPDATES TO THE IMPLEMENTATION GUIDELINE**

The *Metro 2050* Implementation Guideline – Regional Growth Strategy Amendments (Attachment 1) outlines the amendment request procedure, including the three types of regional growth strategy amendments, along with their submission and review process. The Implementation Guideline will be updated periodically to ensure the most current information is available to member jurisdictions.

The main changes between the updated *Metro 2050* Implementation Guideline and its *Metro 2040* predecessor include:

- new information on submission requirements, engagement timelines, and relationship with Regional Context Statements;
- new examples of council resolutions and submission cover letter;
- a new regional growth strategy amendment process diagram; and
- formatting for better readability.

The updated Implementation Guideline is intended to be a resource that member jurisdictions can refer to when considering *Metro 2050* amendments.

The Implementation Guideline includes the following key sections:

- Regional Growth Strategy Amendment Types: This section outlines the three types of amendments to *Metro 2050* and the corresponding minimum voting threshold for each to be approved.
- Regional Growth Strategy Amendment Common Examples: This section describes the scenarios under which a *Metro 2050* amendment may be considered.
- Regional Growth Strategy Amendment Submission: This section outlines how a member jurisdiction can request an amendment and the materials required for submitting an amendment request.
- Regional Growth Strategy Amendment Process: This section demonstrates a typical amendment submission and review process and outlines the initiating member jurisdiction's expected participation in presentations to Committees and the MVRD Board.

**REGIONAL PLANNING ADVISORY COMMITTEE FEEDBACK**

An information report for the *Metro 2050* Implementation Guideline – Regional Growth Strategy Amendments was brought forward to the October 13, 2023 Regional Planning Advisory Committee (RPAC) meeting to seek RPAC members' feedback. To date, no comments or concerns have been identified by RPAC members for this implementation guideline.

**ALTERNATIVES**

1. That the MVRD Board endorse the *Metro 2050* Implementation Guideline – Regional Growth Strategy Amendments as presented in the report dated October 15, 2023, titled "Metro 2050 Implementation Guideline – Regional Growth Strategy Amendments".

2. That the Regional Planning Committee receive for information the report dated October 15, 2023, titled "*Metro 2050* Implementation Guideline – Regional Growth Strategy Amendments" and provide alternative direction to staff.

**FINANCIAL IMPLICATIONS**

There are no financial implications associated with this report as all work to develop implementation guidelines are within the Regional Planning work program.

## CONCLUSION

The *Metro 2050* Implementation Guideline – Regional Growth Strategy Amendments was updated to support the interpretation and implementation of *Metro 2050* goals, strategies and actions. Staff recommend Alternative 1, that the MVRD Board endorse the updated *Metro 2050* Implementation Guideline – Regional Growth Strategy Amendments.

## ATTACHMENTS

1. *Metro 2050* Implementation Guideline – Regional Growth Strategy Amendments.
2. Presentation re: Metro 2050 Implementation Guideline – Regional Growth Strategy Amendments.

## REFERENCES

1. *Metro 2040 Implementation Guideline #2: Amendments to the Regional Growth Strategy*

62129118

# Metro 2050

## IMPLEMENTATION GUIDELINE
## Regional Growth Strategy Amendments

October 2023

# Preamble

The successful implementation of *Metro 2050*, the regional growth strategy, depends on ongoing cooperation and collaboration between Metro Vancouver and affected local governments. *Metro 2050* represents consensus among member jurisdictions to work collaboratively on meeting five long-term regional planning goals:

1. Create a compact urban area
2. Support a sustainable economy
3. Protect the environment, address climate change, and respond to natural hazards
4. Provide diverse and affordable housing choices
5. Support sustainable transportation choices

*Metro 2050* is the regional federation's collective vision for how growth will be managed to support the creation of complete, connected, and resilient communities, while protecting important lands and supporting the efficient provision of urban infrastructure.

Member jurisdictions can request that the Metro Vancouver Regional District Board consider an amendment to *Metro 2050.* This *Metro 2050* Implementation Guideline provides guidance to member jurisdictions on regional growth strategy amendments. Specifically, this Guideline outlines the three types of *Metro 2050* amendments, along with their submission and review processes.

The Implementation Guideline will be updated periodically to ensure the most current information is available to member jurisdictions. This guideline should be read in conjunction with *Metro 2050* and the *Local Government Act*, and does not replace or supersede the requirements set out in those documents.

# Table of Contents

# 1.0 REGIONAL GROWTH STRATEGY AMENDMENT TYPES

**AMENDMENT TYPES**

*Metro 2050,* the regional growth strategy, represents the collaborative vision of the regional federation, and is accepted by all affected local governments. *Metro 2050* may be amended from time to time to maintain consistency between local and regional land use designations, plans, and targets. *Metro 2050* has been designed so that the more regionally significant an issue, the higher the degree of regional federation involvement in decision-making. This is reflected in the three types of *Metro 2050* amendments and the votes required to pass each respective amendment type. For the purposes of this Implementation Guideline, the terms "Regional Growth Strategy Amendment" and "*Metro 2050"* amendment share the same meaning and are used interchangeably.

Type 1 Amendments to the Regional Growth Strategy

Type 1 Amendments require an amendment bylaw to be passed by an affirmative **50% + 1 weighted vote** of the MVRD Board and **acceptance by all affected local governments**. The following types of amendments are classified as Type 1:

a) The addition or deletion of a regional growth strategy goal or strategy;
b) An amendment to the process for making minor amendments to the regional growth strategy for Type 2 and 3 amendments; and
c) The matters specified in section 437(4) of the *Local Government Act*.

Type 2 Amendments to the Regional Growth Strategy

Type 2 Amendments require an amendment bylaw to be passed by an **affirmative two-thirds weighted vote** of the MVRD Board. Enhanced public engagement is also expected for Type 2 amendments, with additional details provided in section 4.0 of this Implementation Guideline. The following types of amendments are classified as Type 2:

a) Amendment to the Urban Containment Boundary;
b) Amendment of Agricultural or Conservation and Recreation regional land use designations, except for the Type 3 amendments listed at section 6.3.4(e), (f), and (g) of *Metro 2050* (also see Type 3 amendments below);
c) Amendment from a Rural to Industrial, Employment, or General Urban regional land use designations;
d) Amendment of sites located outside the Urban Containment Boundary from Employment to a General Urban regional land use designation;
e) The addition or deletion of an Urban Centre; or
f) The addition or deletion of, or amendment to, the descriptions of the regional land use designations or actions listed under each strategy of *Metro 2050*.

Type 3 Amendments to the Regional Growth Strategy

Type 3 Amendments require an amendment bylaw to be passed with an affirmative **50% + 1 weighted vote** of the MVRD Board. The following types of amendments are classified as Type 3:

a) The addition or deletion of a Frequent Transit Development Area;
b) For sites within the Urban Containment Boundary, amendments from Industrial, Employment or General Urban to any other such regional land use designation(s);
c) Amendment from Industrial, Employment, or General Urban to Rural, Agricultural, or Conservation and Recreation regional land use designations;

d) Amendment from Rural to Agricultural or Conservation and Recreation regional land use designation;
e) Amendment from a Conservation and Recreation to an Agricultural regional land use designation;
f) For sites that are contiguous with, or within, the Urban Containment Boundary, and are not within the Agricultural Land Reserve and are not subject to the *Agricultural Land Commission Act*, amendment from Agricultural or Rural to an Industrial regional land use designation, and associated Urban Containment Boundary adjustments;
g) For sites that are identified as Special Study Areas* on Map 12 of *Metro 2050*, an amendment to another regional land use designation and associated Urban Containment Boundary adjustments;
h) Removal of the Trade-Oriented Lands overlay from parcels with an Industrial regional land use designation;
i) Housekeeping amendments to figures, tables or maps, performance measures or other items related to document structure that do not alter the intent of the regional growth strategy;
j) Amendments to mapping to incorporate maps included in accepted Regional Context Statements;
k) The reclassification of a Frequent Transit Development Area to an Urban Centre, or reclassification of an Urban Centre type to another Urban Centre type;
l) An amendment to the Major Transit Growth Corridors; and
m) All other amendments not identified under a Type 1 or Type 2 Amendment.

*Special Study Areas identify locations where, prior to the adoption of the previous regional growth strategy, *Metro 2040*, a member jurisdiction had expressed an intention to alter the existing land use for some or part of an area after undertaking a planning process, and is anticipating requesting a future regional land use designation amendment as a result. Amending regional land use designations for areas with a Special Study Area overlay is a Type 3 amendment, and is intended to acknowledge some future land use change, lower the voting threshold for amendments for areas with an Agricultural, Rural, or Conservation and Recreation regional land use designation to an urban designation where a member jurisdiction has yet to undertake the planning process for the area, but anticipates land use change.

Member Jurisdiction Flexibility Provision

Section 6.2.7 of *Metro 2050* provides member jurisdictions with the flexibility to adjust the boundaries of regional land use designations within the Urban Containment Boundary (UCB) under certain circumstances without triggering a *Metro 2050* amendment. To utilize the discretionary provisions in this section, the member jurisdiction must include language within its Regional Context Statement permitting amendments to their Official Community Plan (OCP) for regional land use designations boundary adjustments, and must specify the circumstances outlined in section 6.2.7 where this can occur.

Section 6.2.8 of *Metro 2050* provides member jurisdictions with the flexibility to amend the boundaries of Urban Centres and Frequent Transit Development Areas without triggering an amendment to the regional growth strategy. Member jurisdictions must include appropriate language within their Regional Context Statement in order to have this flexibility. If a member jurisdiction includes language in its Regional Context Statement that permits flexibility as described in sections 6.2.7 and 6.2.8 of *Metro 2050*, these adjustments do not require a *Metro 2050* amendment and an accompanying Regional Context Statement amendment. All other adjustments to regional land use designation boundaries will

require an amendment, which must be submitted to the MVRD Board for acceptance in accordance with the requirements of the *Local Government Act*.

Should a member jurisdiction wish to engage the flexibility provisions, the member jurisdiction must notify the MVRD Board in writing, of any and all adjustments within thirty days after the member jurisdiction has adopted its Official Community Plan amendment bylaw in accordance with section 6.2.9 of *Metro 2050*.

# 2.0 REGIONAL GROWTH STRATEGY AMENDMENT COMMON EXAMPLES

A *Metro 2050* amendment may be sought by either a member jurisdiction or Metro Vancouver under several circumstances, including:

- Seeking the addition or deletion of a *Metro 2050* goal or strategy;
- Requesting amendments to a site's regional land use designation or movement of the Urban Containment Boundary;
- Seeking to add or amend an Urban Centre or Frequent Transit Development Area; or
- Seeking changes, additions or deletions to a particular policy, policy area, or performance measure.

The most common type of amendment request is to seek a regional land use designation amendment for a particular site. Three scenarios where a member jurisdiction may request a change to the regional land use designation for a site are outlined below. Member jurisdiction staff is encouraged to connect with Metro Vancouver staff if they are unsure which example applies, or if an amendment is required.

Member Jurisdiction amends OCP without a Regional Context Statement or *Metro 2050* Amendment

The member jurisdiction proposes to make amendments to its OCP land use designations which will not impact the regional land use designation or Regional Context Statement, or the proposed change falls within the flexibility provision in section 6.2.7 of *Metro 2050*. In this case, no amendments to the Regional Context Statement or *Metro 2050* are required. The member jurisdiction notifies the Metro Vancouver Corporate Officer of the change made to the OCP by letter within 30 days of the amendment being made.

Member Jurisdiction seeks to amend OCP that triggers a change to the Regional Context Statement, but does not require a *Metro 2050* Amendment

The member jurisdiction proposes to make amendments to its OCP land use designations or policies that are not consistent with the accepted Regional Context Statement, and that are beyond the flexibility provided for in section 6.2.7 of *Metro 2050,* but are 'generally consistent' with *Metro 2050*. For example, an amendment might be proposed to align the OCP designation with the existing use, which requires a corresponding amendment to the regional growth strategy. However, the amendment is small enough or considered an up-designation not requiring a regional dialogue and formal amendment process. In this case, the applicant would request an amendment to the Regional Context Statement, and if passed, Metro Vancouver staff would propose a subsequent housekeeping amendment to *Metro 2050* to incorporate changes made as a result of accepted Regional Context Statements. Member jurisdiction staff are encouraged to engage early with Metro Vancouver staff to determine whether an amendment to *Metro 2050* is also required. For guidance on developing, submitting, and the acceptance process for

Regional Context Statements that are not part of an *Metro 2050* amendment application, see the Regional Context Statement Implementation Guideline.

The MVRD Board may accept the revised Regional Context Statement, or may not agree with the member jurisdiction's assessment of general consistency and decline to accept the revised Regional Context Statement, asking instead for the member jurisdiction to submit a proposed amendment to *Metro 2050* and a consequential amendment to their Regional Context Statement.

Member Jurisdiction seeks to amend OCP that requires both a *Metro 2050* Amendment and a consequential amendment to the Regional Context Statement

The member jurisdiction proposes amendments to its OCP land use designations or policies that are inconsistent with *Metro 2050* regional land use designation(s) and/or policies and are also beyond the flexibility provided in section 6.2.7 of *Metro 2050* and that require a consequential amendment to the Regional Context Statement.

Often, member jurisdiction requests for *Metro 2050* amendments (e.g. a land use designation change for a site that amends *Metro 2050* maps), will also warrant an update to their Regional Context Statement maps to ensure general consistency between *Metro 2050* and the member jurisdiction's OCP. When preparing the OCP amending bylaw, member jurisdictions should ensure that the amending bylaw language includes both the local policy amendment (e.g. an OCP land use designation change) as well as the corresponding update to the Regional Context Statement that forms part of the OCP. Sample language for member jurisdictions amendment resolutions are provided as reference below.

***Sample bylaw resolution for a proposed Metro 2050 amendment and consequential Regional Context Statement amendment***

*Metro 2050 Amendment Sample Resolution Language*

> *That subject to Council granting Third Reading to [OCP Bylaw Amendment], authorize staff to submit a [Amendment Type] amendment to the Metro Vancouver Regional District Board for approval to change the regional land use designation from [current regional land use designation] to [proposed regional land use designation].*

*Regional Context Statement Amendment Sample Resolution Language*

> *That subject to Council granting Third Reading to [OCP Bylaw Amendment], authorize staff to submit a Regional Context Statement amendment reflecting the proposed regional land use designation change to the Metro Vancouver Regional District Board for approval.*

In this case, the member jurisdiction passes two Council resolutions, one seeking an amendment to *Metro 2050* and another seeking acceptance of a consequential amendment to the Regional Context Statement. The member jurisdiction submits only the *Metro 2050* amendment, not the Regional Context Statement amendment as a part of its initial request to the MVRD Board. The *Local Government Act* stipulates the MVRD Board has 120 days to either accept or refuse to accept a Regional Context Statement by resolution once it is received for consideration. Given that processing a proposed *Metro 2050* amendment may take more than 120 days, the member jurisdiction is requested to submit the Regional Context Statement amendment request once the MVRD Board has given initial readings to the *Metro 2050* amendment bylaw. The Regional Context Statement must be submitted in its entirety.

Metro Vancouver staff will then review the proposed *Metro 2050* amendment in relation to *Metro 2050* goals and policies, and draft a report for review by the Regional Planning Advisory Committee. The following month, the report is considered by the Regional Planning Committee, and the MVRD Board. The MVRD Board contemplates the Metro Vancouver staff assessment and considers initiating the amendment process. The MVRD Board will give initial readings to the amendment bylaw should it decide to consider the amendment.

Following the MVRD Board's initial readings of the amendment bylaw, it will be referred to affected local governments in the region and First Nations for comment as outlined in section 6.5 of *Metro 2050*. The amendment bylaw will also be posted to the Metro Vancouver website for public comment. The comment period will be for a minimum of 45 days.

Following the comment period, Metro Vancouver staff will bring a report to the MVRD Board summarizing any comments received. The MVRD Board may at this time decide to accept or decline the *Metro 2050* amendment. The final reading of the *Metro 2050* amendment bylaw and acceptance of the Regional Context Statement can be considered by the MVRD Board at the same meeting.

# 3.0 REGIONAL GROWTH STRATEGY AMENDMENT SUBMISSION

**EARLY ENGAGEMENT WITH METRO VANCOUVER AND OTHER PARTNER ORGANIZATIONS**

Member jurisdictions should engage with Metro Vancouver staff early when considering proposing a *Metro 2050* amendment to ensure that amendment procedures and submission requirements are clearly understood. At this stage, Metro Vancouver staff can advise member jurisdictions on potential timelines and presentation requirements.

TransLink

Member jurisdictions should connect with TransLink to discuss components that may have an impact on regional transportation systems or priorities. Member jurisdictions can also request Metro Vancouver staff and TransLink staff provide early feedback on any proposed Frequent Transit Development Areas. Metro Vancouver staff will forward any proposed *Metro 2050* amendments to TransLink as part of the standard referral process to partner organizations as outlined in section 6.6 of *Metro 2050*.

Agricultural Land Commission

*Metro 2050* includes policies for working with the Agricultural Land Commission (ALC) to protect the region's agricultural land base. Section 2.3.4 of *Metro 2050* states that Metro Vancouver will not consider amending the Agricultural or Rural regional land use designations of a site if it is still within the Agricultural Land Reserve (ALR).

Should the ALC provide conditional approval to exclude the site from the ALR, the MVRD Board may also provide conditional approval of a regional land use designation amendment, subject to the ALC exclusion conditions being met. The ALC process should be completed prior to initiating the Metro Vancouver process, and written confirmation of the ALC's decision must be included with the proposed *Metro 2050* amendment.

Port of Vancouver, YVR, and Ministry of Transportation and Infrastructure

If the proposed amendment involves redesignating a site from Industrial or Employment to General Urban, the MVRD Board will also notify the Port of Vancouver, the Vancouver International Airport Authority (YVR), and the Ministry of Transportation and Infrastructure, as appropriate.

**INITIATING A REGIONAL GROWTH STRATEGY AMENDMENT**

Member jurisdictions are encouraged to submit a proposed *Metro 2050* amendment to Metro Vancouver after their local public engagement process has been completed, specifically after the member jurisdiction's public hearing and subsequent bylaw reading of the OCP amendment bylaw. The MVRD Board has expressed preference that the proposal is supported by the local community via the results of the public hearing in advance of the region considering the proposal. In addition, submitting a proposed amendment to the MVRD Board before the member jurisdiction's public hearing may introduce the possibility that the *Metro 2050* amendment will need to be re-submitted to accommodate any bylaw changes made after the public hearing. Member jurisdictions can submit their amendment applications by email to Metro Vancouver's Corporate Officer.

**SUBMISSION REQUIREMENTS**

*Metro 2050* amendments should include the items listed below, as appropriate.

All applications

- *Correspondence:* A letter stating a member jurisdiction's intent to amend *Metro 2050* and their Regional Context Statement to ensure alignment with proposed OCP changes. The letter should reference the relevant council resolution, bylaw readings, and public hearing dates. A sample letter is provided in Appendix A for reference.

- *Member Jurisdiction Staff Report:* The staff report to Council outlining the OCP amendment, including the Regional Context Statement update. This report typically includes a Council resolution requesting that *Metro 2050* be amended, and that the member jurisdiction intends to submit an updated Regional Context Statement following third reading of the proposed *Metro 2050* amendment bylaw by the MVRD Board.

After the MVRD Board has given first, second, and third reading to the *Metro 2050* amendment bylaw:

- *Updated Regional Context Statement:* Correspondence conveying the relevant Council resolution and the proposed updates to the Regional Context Statement, along with a certified copy of the updated Regional Context Statement in its entirety.

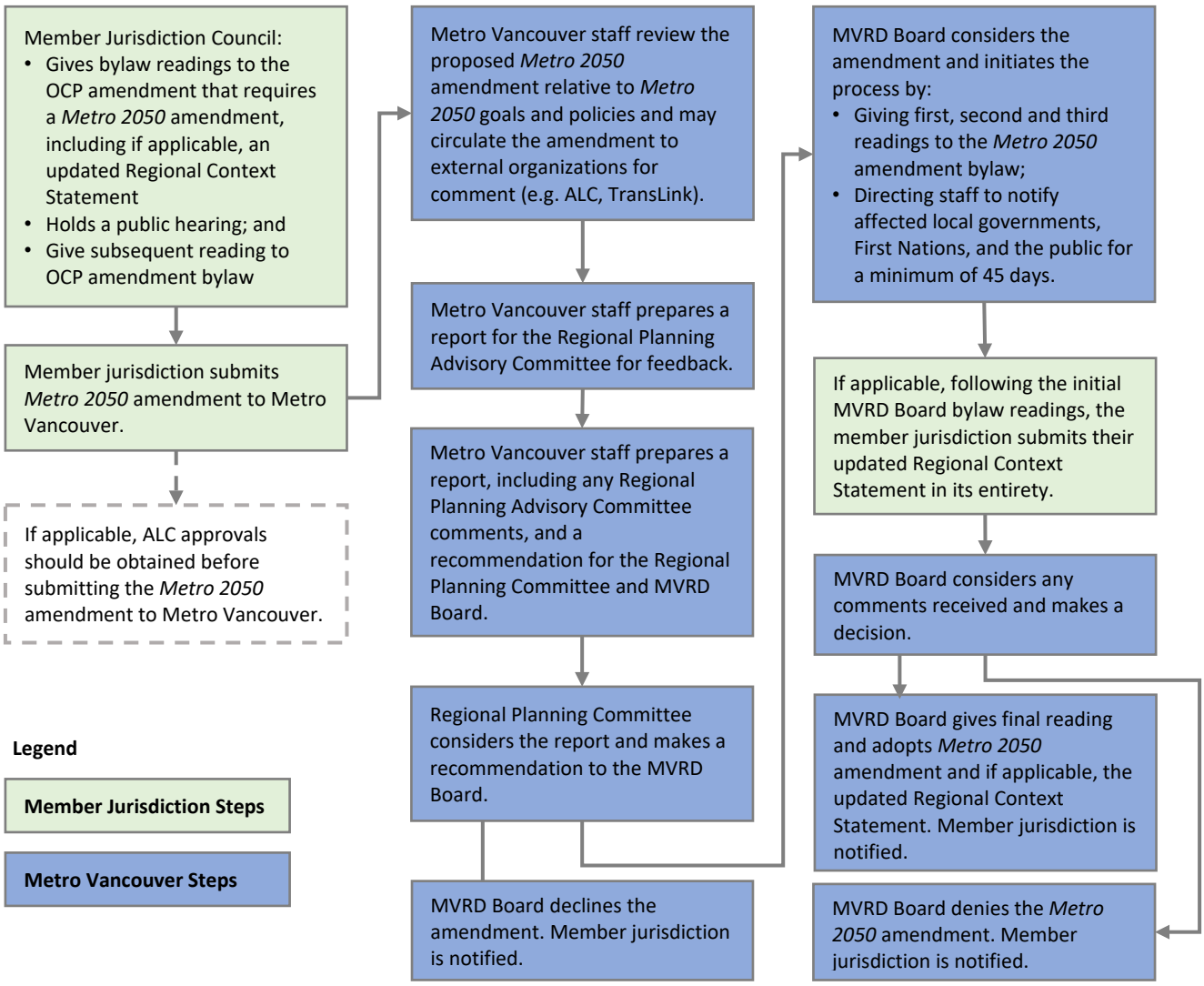
If applicable

- *Agricultural Land Commission Confirmation:* Written confirmation of the ALC's decision to exclude the affected site(s) from the ALR must be included with the *Metro 2050* amendment request.
- *Public Hearing Summary:* The member jurisdiction's agenda and minutes for the public hearing on the OCP amendment, including the Regional Context Statement.

# 4.0 REGIONAL GROWTH STRATEGY AMENDMENT PROCESS

The submission and Committee/Board consideration process for *Metro 2050* amendments are provided below.

**Figure 1: Regional Growth Strategy Amendment Process**




**MEMBER JURISDICTION PRESENTATIONS**

As the applicant, member jurisdictions are expected to provide presentations / briefings on the proposed *Metro 2050* amendment to both the Regional Planning Advisory Committee and Regional Planning Committee. Member jurisdictions should also be present when an amendment is considered by the MVRD Board, and be available to answer questions. Member jurisdictions must apply to be a delegation to the Regional Planning Committee. The property owners or their representatives can apply as a separate delegation should they wish to speak to the application as can any member of the public. The presentation and delegation guidelines for *Metro 2050* amendments are provided as followed.

**Table 2: Member Jurisdiction Presentations**

| **Regional Planning Advisory Committee (RPAC)** | |
|---|---|
| The purpose of the Regional Planning Advisory Committee is to provide a forum for senior representatives of municipal planning departments, Tsawwassen First Nation, Electoral Area A and agencies with an interest in regional planning to discuss and advise on planning issues of regional or inter-municipal significance; provide advice and comments on Metro Vancouver research and projects; and provide an opportunity for capacity building and shared learning for members. | |
| **Attendance** | Member jurisdiction staff should attend the meeting and present their application. Metro Vancouver staff will provide meeting details. |
| **Presentation** | Yes |
| **Hybrid or In Person** | Online or In Person |
| **Regional Planning Committee (RPL)** | |
| The Regional Planning Committee is the standing committee of the MVRD Board that provides advice and recommendations on plans, policies, programs, budgets and issues related to Metro Vancouver's Regional Planning service. | |
| **Attendance** | Member jurisdiction staff should attend the meeting and present their application by applying as a delegation to the Regional Planning Committee 7 working days prior to the scheduled meeting. Late applications within 7 days of the meeting are also accepted. Metro Vancouver staff will provide meeting details. |
| **Presentation** | Yes |
| **Hybrid or In Person** | In Person |
| **Metro Vancouver Regional District Board (MVRD)**<br>*Consideration of initial bylaw readings and referral for comments* | |
| The MVRD Board is comprised of elected officials from member jurisdictions. The MVRD Board approves or declines any proposed amendment to *Metro 2050* and accepts or refuses to accept Regional Context Statements. | |
| **Attendance** | Member jurisdiction staff should attend the meeting and can present their application by applying as a delegation to the Board no later than 48 hours prior to the scheduled meeting. Metro Vancouver staff will provide meeting details. |
| **Presentation** | Encouraged |
| **Hybrid or In Person** | In-Person |
| **Metro Vancouver Regional District Board (MVRD)**<br>*Consideration of referral comments and bylaw adoption* | |
| The MVRD Board is comprised of elected officials from member jurisdictions. The MVRD Board approves or declines any proposed amendment to *Metro 2050* and accepts or refuses to accept Regional Context Statements. | |
| **Attendance** | Member jurisdiction staff should attend the meeting to answer questions that may arise. Metro Vancouver staff will provide meeting details. |
| **Presentation** | No |
| **Hybrid or In Person** | In-Person |

**NOTIFICATION PROCESS AND PUBLIC ENGAGEMENT OPPORTUNITIES**

Should the MVRD Board resolve to proceed with the amendment process, it will provide written notice to all affected local governments with a minimum comment period of 45 days from date of notice, in accordance with section 6.4.2 of *Metro 2050*.

If the proposed amendment involves redesignating a site from Industrial or Employment to General Urban, the MVRD Board will also notify the Port of Vancouver, the Vancouver International Airport Authority, and the Ministry of Transportation and Infrastructure, as appropriate.

Additionally, the MVRD Board will notify the public of any proposed *Metro 2050* amendment by posting it on the Metro Vancouver website, with a minimum comment period of 45 days from the date of notice. Members of the public can comment on proposed amendments either in writing, or by requesting to speak as a delegation to the Regional Planning Committee or the MVRD Board.

Enhanced public engagement opportunities are required for Type 2 amendments. Examples of these public engagement opportunities are outlined in section 6.4.4 (c) of *Metro 2050,* and include:

- Notification of the proposed amendments on the Metro Vancouver website;
- Requesting written comments by way of a comment form on the Metro Vancouver website;
- Opportunities for the public to appear as a delegation to the Regional Planning Committee or the MVRD Board when the amendment is being considered;
- Conveyance of comments submitted from the respective local public hearing to the MVRD Board; and
- Hosting a public information meeting (digitally or in person).

Public engagement opportunities for Type 3 amendments may also be required by the MVRD Board. These opportunities may include those listed above for Type 2 amendments, and will be determined during the application process.

All comments received on the proposed *Metro 2050* amendment will be provided to the MVRD Board prior to final reading of the amendment bylaw. For all Type 1 amendments, notification will also be sent to the Regional Growth Strategy Intergovernmental Advisory Committee, which will be established in accordance with section 450 of the *Local Government Act*.

**AVOIDING TWO-STEP AMENDMENTS**

The MVRD Board discourages the use of multiple Type 3 amendments to achieve what is intended to be a Type 2 amendment to avoid the higher voting threshold and other requirements under a Type 2 amendment.

***Example:*** *Changing the regional land use designation of a site from Conservation and Recreation to Agricultural would be classified as a Type 3 amendment. A subsequent change of the regional land use designation for the site from Agricultural to Industrial would be another Type 3 amendment in circumstances where the site is contiguous with, or within, the UCB. A direct change of the regional land use designation from Conservation and Recreation to Industrial would be a Type 2 amendment, with more stringent amendment procedures.*

To prevent such two-step amendments from occurring, Metro Vancouver staff will investigate the evolution of the subject property's land use designation and include the history of the regional land use designations as part of the staff report to the Regional Planning Committee and the MVRD Board. If

there is evidence indicating a two-step amendment is being utilized to achieve a specific regional land use designation and procedurally avoid a Type 2 amendment, Metro Vancouver staff will generally recommend the MVRD board decline the proposed amendment.

**APPENDIX A: SAMPLE COVER LETTER FOR A REGIONAL GROWTH STRATEGY LAND USE DESIGNATION AMENDMENT AND CORRESPONDING REGIONAL CONTEXT STATEMENT AMENDMENT**

This Sample Cover Letter is provided for general reference only.

*Corporate Officer*
*Metro Vancouver*
*Metrotower III, 4515 Central Boulevard*
*Burnaby, BC V5H 0C6*

*Dear Corporate Officer,*

***RE:*** **[Member Jurisdiction]** ***Metro 2050*** **Regional Growth Strategy Amendment Request for [Site]**

*Introduction (Heading not required)*
[Member Jurisdiction] is processing an application for [site address] to permit [proposed land use and development information]. The proposal includes an amendment to *Metro 2050*, to amend the regional land use designation for the subject site from [current regional land use designation] to [proposed regional land use designation]. The proposed regional growth strategy amendment also requires an amendment to the [Member Jurisdiction's] Regional Context Statement. The [Member Jurisdiction] Council is requesting the Metro Vancouver Regional District (MVRD) Board consider an amendment to *Metro 2050*, and an amendment to the [Member Jurisdiction's] Regional Context Statement.

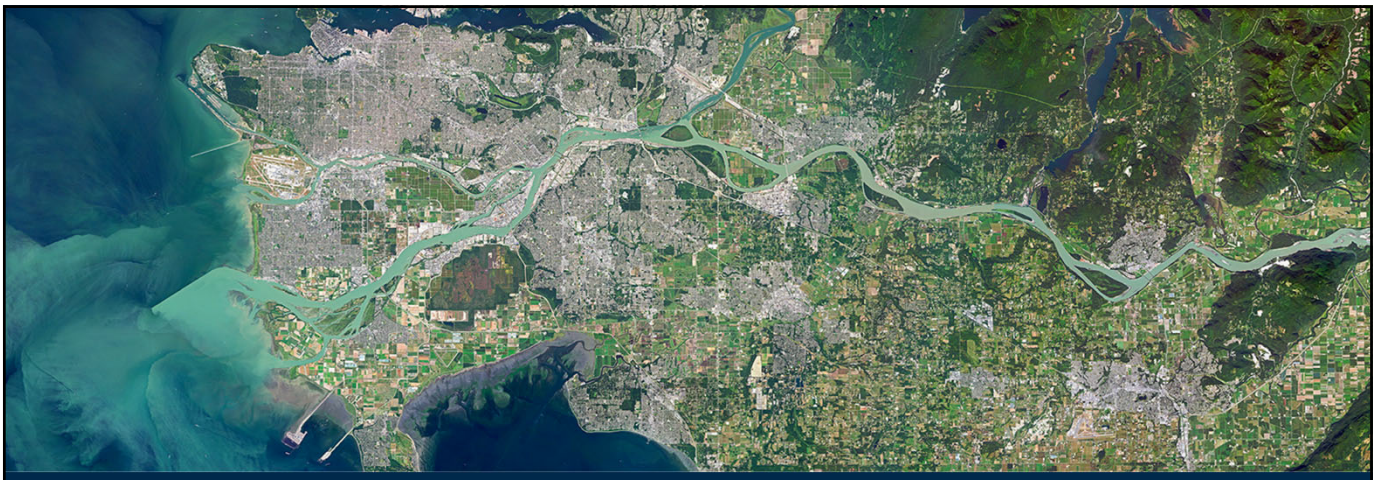
*Summary of the Council Resolutions (Heading not required)*
On [Date], at the Regular Council Meeting, [Member Jurisdiction] Council passed [Resolution or Bylaw name or number] to refer the [development application] to the MVRD Board for consideration and approval of a [Amendment Type] regional growth strategy amendment, to re-designate the site from [current regional land use designation] to [proposed regional land use designation]. Council is also requesting the MVRD Board consider acceptance of an amendment to the [Member Jurisdiction] Regional Context Statement at the same time as third and final reading of the *Metro 2050* amendment bylaw reading, should the MVRD Board give initial readings to the amendment. The [development application] received Third Reading on [date] and a Public Hearing was held on [date].

*Summary (Heading not required)*
[Member Jurisdiction] requests that the MVRD Board amend the regional growth strategy for the affected property from [current regional land use designation] to [proposed regional land use designation] and receive an amendment to the [Member Jurisdiction] Regional Context Statement for consideration at the time as final reading of the MVRD regional growth strategy amendment bylaw.

Should Metro Vancouver staff require any additional information regarding this matter, please contact [Member Jurisdiction Contact Name, Title], at [Phone Number] or at [Email Address].

Yours,
*Signature*
[Name]
[Title] [Department]

Attachments
[Title of Attachment, Date]



# Metro 2050 Implementation Guideline: Regional Growth Strategy Amendments

Jessica Jiang
Regional Planner, Regional Planning and Housing Services

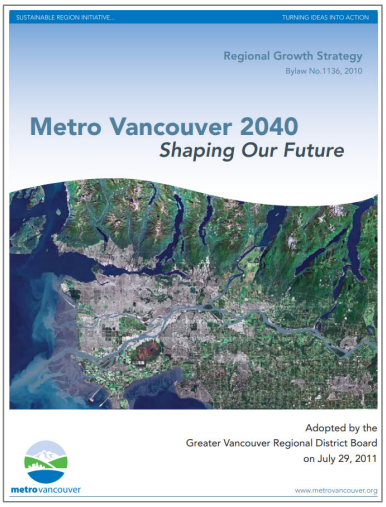
Regional Planning Committee, November 3, 2023

metrovancouver

## PREVIOUS AMENDMENTS UNDER *METRO 2040*

Over 11 years, 37 proposed amendments were brought forward under *Metro 2040,* the previous regional growth strategy.

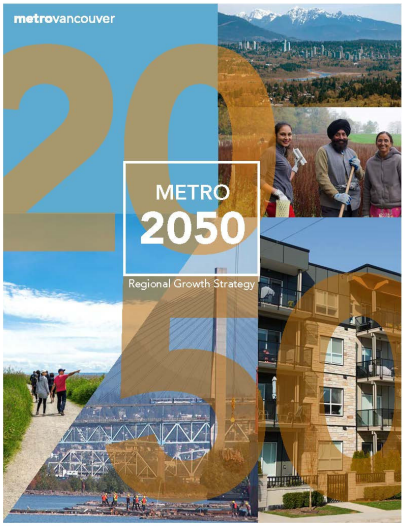
- 8 amendments initiated by MVRD (e.g. housekeeping, re-designating park land, revising GHG emissions targets);
- 29 amendments initiated by member jurisdictions (17 adopted, 8 declined, 4 not-completed);
- Majority Type 3 Amendments to re-designate regional land use for a site.



## *METRO 2050* AMENDMENTS

Member jurisdiction or Metro Vancouver can seek an amendment to *Metro 2050* under several circumstances, including to:

- Add or delete a *Metro 2050* goal or strategy;
- Re-designate a regional land use or adjust the Urban Containment Boundary;
- Add or amend an Urban Centre or Frequent Transit Development Area; or
- Add, delete, or change a specific policy, policy area, or performance measure.






## *METRO 2050* AMENDMENT TYPES

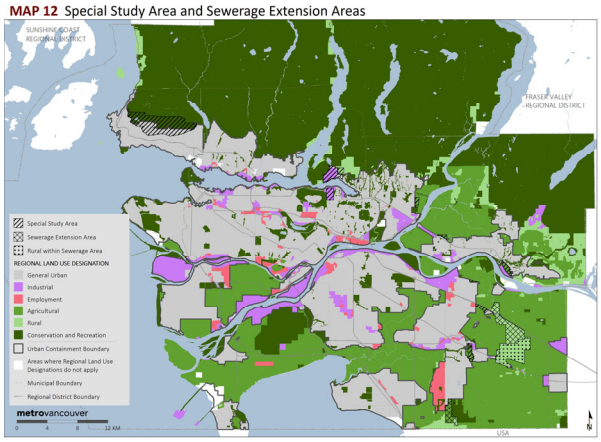
There are three types of *Metro 2050* amendments. The more regionally significant an issue, the higher the voting threshold required to pass the amendment type.

| Type 1 Amendment | Type 2 Amendment | Type 3 Amendment |
|---|---|---|
| Requires an affirmative **50% + 1 weighted vote** of the MVRD Board and **acceptance by all affected local governments**. | Requires an affirmative **two-thirds weighted vote** of the MVRD Board. Enhanced public engagement is expected for Type 2 amendments. | Requires an **affirmative 50% + 1** weighted vote of the MVRD Board. |

# *METRO 2050* SPECIAL STUDY AREAS

Special Study Areas were identified prior to the adoption of *Metro 2040.*

- Intent to alter existing land use, but have not yet completed the planning process;
- Anticipated Type 3 Amendment, which has a lower voting threshold for re-designating Agricultural, Rural, or Con Rec land to an urban designation, or adjusting the UCB;
- No new Special Study Areas are to be created, or boundaries expanded.






# *METRO 2050* AMENDMENT PROCESS

Member jurisdiction requests amendment.

Regional Planning staff assess amendment for consistency with *Metro 2050* and prepare an information report for RPAC.

RPAC reviews report and provides comments. Staff prepare report and recommendation for Regional Planning Committee and Board consideration.

Regional Planning Committee considers staff report and either endorses the recommendation, or provides alternate direction to staff.

If supported, MVRD Board initiates amendment and gives first, second, and third reading to amendment, and notifies affected local governments.

MVRD Board considers any comments received from local governments, and either gives final reading and adopts the amendment, or declines the amendment.

# *METRO 2050* IMPLEMENTATION GUIDELINES

A suite of implementation guidelines to support member jurisdictions with the interpretation and implementation of *Metro 2050* are under development.

| *Metro 2050* Implementation Guidelines | Type | Status |
|---|---|---|
| Drafting Regional Context Statements | Update | Complete |
| **Regional Growth Strategy Amendments** | **Update** | **Nov RPL** |
| Sewerage Area Amendments | Update | Early 2024 RPL |
| Industrial and Employment Lands | Update | Early 2024 RPL |
| Regional Liquid Waste Services Planning | New | Early 2024 RPL |
| Regional Affordable Rental Housing Target | New | Pending |
| Identifying Frequent Transit Development Areas | Update | Pending |
| Regional Green Infrastructure Network | New | Pending |

Outlines amendment request procedure, amendment types, submission requirements, and Regional Planning review process

metrovancouver 7

To: Regional Planning Committee

From: Victor Cheung, Senior Policy and Planning Analyst,
Regional Planning and Housing Services

Date: October 11, 2023 Meeting Date: November 3, 2023

Subject: **Request for Sanitary Service Connection at 14500 Silver Valley Road, Maple Ridge**

**RECOMMENDATION**

That the MVRD Board:

a) resolve that sewer service for the property at 14500 Silver Valley Road, City of Maple Ridge is generally consistent with the provisions of *Metro 2050*; and

b) forward the requested Fraser Sewerage Area amendment application for the property at 14500 Silver Valley Road in the City of Maple Ridge 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 amend the Fraser Sewerage Area (FSA) boundary to include four building footprints at 14500 Silver Valley Road to service the expansion of an existing UBC forestry research facility and accessory uses. In line with the requirements set out in *Metro 2050*, the request is being presented to the MVRD Board to consider consistency with the regional growth strategy prior to consideration by the Greater Vancouver Sewerage and Drainage District Board.

The application is seen to be generally consistent with *Metro 2050* given that:

- The application is related to an existing institutional facility and does not involve new residential or commercial development;
- The subject property is designated Conservation and Recreation and is included in the Natural Resource Overlay. It is currently in use as a forest research facility with institutional and recreation land uses. No further land use changes are proposed;
- A sanitary sewer analysis report indicates that on-site treatment is not justified due to varying and insufficient flow rates as well as potential impacts on nearby groundwater wells; and
- This is a single non-strata property and the proposed sanitary connection occurs from within the property to an existing maintenance hole that cannot facilitate additional connections from outside of the Fraser Sewerage Area. The City's staff report and Design Guideline further notes protections for Coho Creek through setbacks and storm water management.

**PURPOSE**

This report seeks MVRD Board concurrence that regional sewerage service for four buildings located at 14500 Silver Valley Road is generally consistent with *Metro 2050*.

## BACKGROUND

In August 2023, the City of Maple Ridge submitted an application to the Greater Vancouver Sewerage and Drainage District (GVS&DD) to amend the FSA to include four building footprints at 14500 Silver Valley Road (Attachment 1).

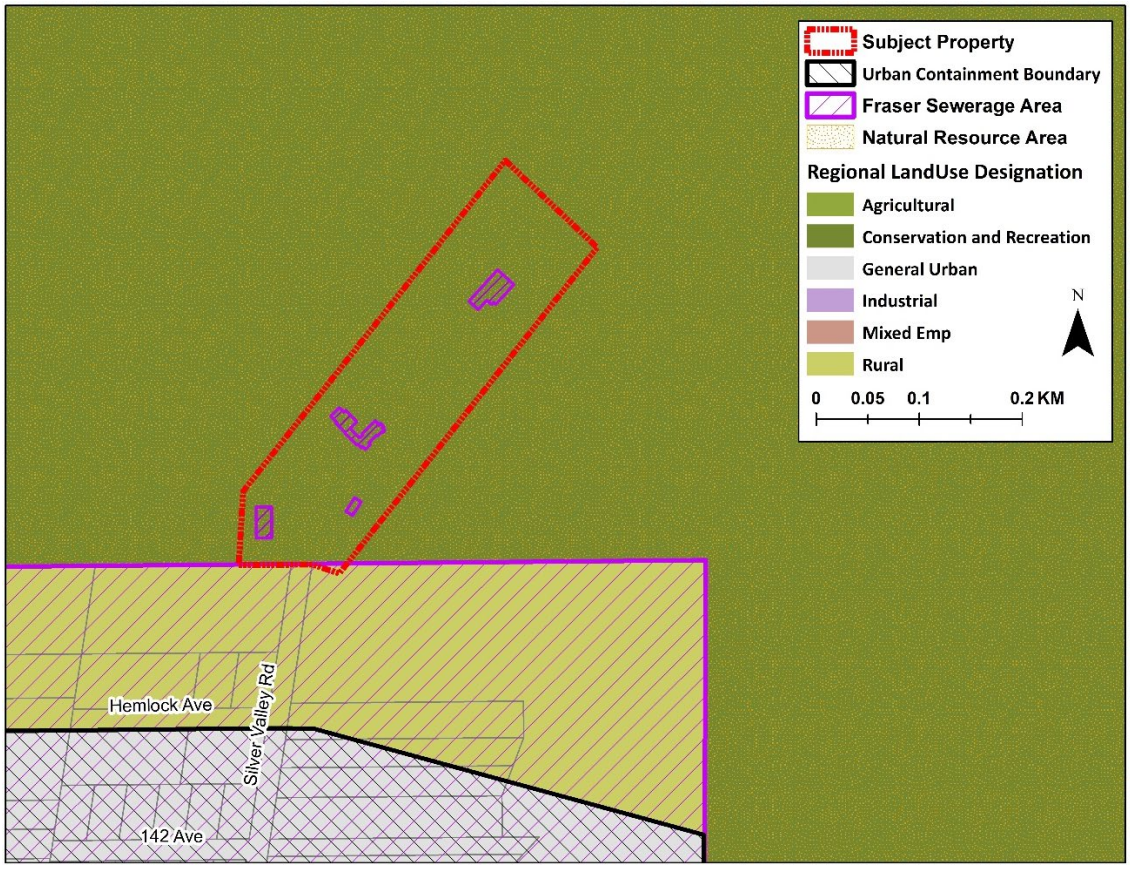
Consistent with the requirements in the *Local Government Act* and *Metro 2050*, the request is being presented to the MVRD Board for consideration of consistency with the regional growth strategy prior to it being considered by the GVS&DD Board.

## SITE DESCRIPTION

The subject property is part of UBC's Malcolm Knapp Research Forest. As noted in the City's staff report (Attachment 2), it was established in 1949 by a Crown Grant and is a 5,157 ha "working forest" for research, demonstration, and education in the field of forestry and allied sciences. UBC is proposing to construct works and improvements to the site that consist of a relocated caretaker's residence, a new workshop and office building, and a Katzie longhouse.

The property is on land with a regional Conservation and Recreation land use designation and is included in the Natural Resource Overlay in *Metro 2050*. It is outside of the Urban Containment Boundary (Map 1).

**Map 1: Map of Subject Property, Regional Land Use Designations, and Fraser Sewerage Area**



## *METRO 2050* AND SEWERAGE AREA EXTENSION REQUESTS

Section 6.8 of *Metro 2050* includes provisions for coordination amongst the Metro Vancouver Boards to ensure alignment between the policies of *Metro 2050*, 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 lands; and the efficient provision of regional infrastructure services, which are all key tenets of *Metro 2050*. In accordance with section 445 of the *Local Government Act*, *Metro 2050* requires that all services undertaken by the GVS&DD be consistent with *Metro 2050*. Specifically, Section 6.8.1 of *Metro 2050* 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 Metro Vancouver Regional District Board, inconsistent with the provisions of the regional growth strategy.*

While *Metro 2050* 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 2050* must be presented to the MVRD Board for consideration prior to be considered by the GVS&DD Board.

Section 3.1.1 of *Metro 2050* states that the GVS&DD Board will not allow connections to regional sewerage services from lands with a Conservation and Recreation 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:

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 lands with a Conservation and Recreation regional land use designation.*

The GVS&DD regional sewerage area boundaries were drawn prior to the adoption of *Metro 2050*. As a result, there are some locations where the FSA and regional land use designations do not align. For properties designated Agricultural, Rural, or Conservation and Recreation located outside of the FSA, as is the case with this application, the MVRD Board must determine whether servicing is appropriate and consistent with the intent of the respective land use designations of *Metro 2050*, after which the final decision to amend the GVS&DD sewerage area boundary rests with the GVS&DD Board. For properties within the FSA that are designated Agricultural, Rural or Conservation and Recreation, MVRD Board approval is required as well as technical analysis from GVS&DD. In both cases, where the MVRD Board determines the sewerage area boundary amendment is not consistent with *Metro 2050*, the GVS&DD is obligated to deny the application.

**REGIONAL PLANNING ANALYSIS**

The subject property is designated Conservation and Recreation in *Metro 2050*. Additionally, the site is included in the regional Natural Resource Overlay, indicating it is a working forest, not protected solely for ecological value, but rather for long term intent. Extending sewer services to the property's building footprints would service an existing forestry research facility with institutional (research) and recreational land uses. UBC is proposing to construct works and improvements to the site that consist of a relocated caretaker's residence, a new workshop and office building, and a Katzie longhouse. It will not include commercial or residential growth beyond existing (relocated) caretaker facilities.

There is no treatment plant currently on the subject property, and due to the varying flow rates caused by event-based and seasonal fluctuations in site occupancy, it is not justifiable to construct one for the site. In addition, there are concerns regarding the effluent receiving environment and proximity to groundwater wells. The land owner, University of British Columbia, has included a sanitary sewer analysis report by their consultant (Attachment 3) which stipulates compliance with Guideline #7 for which is summarized as part of Metro Vancouver's analysis.

The application is seen to be generally consistent with *Metro 2050* given that:

- The application is related to an existing institutional facility and does not involve new residential or commercial development;
- The subject property is designated Conservation and Recreation and is included in the Natural Resource Overlay. It is currently in use as a forest research facility with institutional and recreation land uses. No further land use changes are proposed;
- A sanitary sewer analysis report indicates that on-site treatment is not justified due to varying and insufficient flow rates as well as potential impacts on nearby groundwater wells; and
- This is a single non-strata property and the proposed sanitary connection occurs from within the property to an existing maintenance hole that cannot facilitate additional connections from outside of the Fraser Sewerage Area.

In preparing the above rationale, staff considered the criteria identified in 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. 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. The City of Maple Ridge passed a resolution at its meeting on July 18, 2023 which was forwarded by letter to Metro Vancouver Liquid Waste Services Staff (Attachment 1).

Should sewer service to this property's building footprints be supported by the MVRD Board, staff do not anticipate a significant impact to the *Metro 2050* objectives for urban containment or related regional land use designations, goals and strategies. Approval is not anticipated to lead to a proliferation of future applications for extension of regional sewerage service outside the Urban Containment Boundary.

**ALTERNATIVES**

1. That the MVRD Board:
   a) resolve that sewer service for the property at 14500 Silver Valley Road, City of Maple Ridge is generally consistent with the provisions of *Metro 2050*; and
   b) forward the requested Fraser Sewerage Area amendment application for the property at 14500 Silver Valley Road in the City of Maple Ridge to the GVS&DD Board for consideration.
2. That the MVRD Board resolve that the amendment application for the property at 14500 Silver Valley Road, City of Maple Ridge is not consistent with the provisions of *Metro 2050* 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 covenant discharge will be considered within the GVS&DD application review process.

**CONCLUSION**

The GVS&DD has received an application from the City of Maple Ridge to extend sanitary service connections to four building footprints at 14500 Silver Valley Road. If approved, the extension would service an existing forestry research facility in a rural area, with institutional (research) and recreational land use. It would also permit a relocated caretaker's residence, a new workshop and office building, and a Katzie longhouse. It will not include commercial or residential growth beyond existing (relocated) caretaker facilities. Should sewer service to this property be supported by the MVRD Board, staff do not anticipate a significant impact to the *Metro 2050* objectives for urban containment or related regional land use designations, goals and strategies.

As the subject property is designated Conservation and Recreation in *Metro 2050*, the MVRD Board must first determine if the proposed sewerage area amendment is consistent with the provisions of *Metro 2050* and the Conservation and Recreation regional land use designation. Based on the information contained in this report, the application is seen to be generally consistent with *Metro 2050*.

Staff recommend Alternative 1, that the MVRD Board confirm that the provision of regional sewerage services to the property is generally consistent with *Metro 2050* and forward the application for a sewerage area amendment to the GVS&DD Board for consideration.

**ATTACHMENTS**

1. Letter from the City of Maple Ridge dated August 18, 2023 to Metro Vancouver requesting the sanitary sewer service connection to 14500 Silver Valley Road
2. City of Maple Ridge Staff report dated July 18, 2023 for 14500 Silver Valley Road
3. Letter from Wedler Engineering dated April 13, 2023 for 14500 Silver Valley Road

**REFERENCES**

1. Implementation Guideline #7: Extension of Regional Sewerage Services

58505522

MAPLE RIDGE
British Columbia

August 18, 2023

Bryan Shoji
Director, Policy Planning and Analysis
Metro Vancouver
4730 Kingsway
Burnaby BC V5H 0C6

Dear Mr. Shoji:

**Re: Urban Containment Boundary – Request for Sanitary Sewer Service Connection**
**14500 Silver Valley Road, Maple Ridge**
**Our File: 11-5340-01 & 11-5245-20-B612**

On July 25, 2023, City of Maple Ridge staff presented a report to Council for the request to provide a sanitary sewer service connection to 14500 Silver Valley Road. The identified area is defined and described in the attached Council report.

Maple Ridge Council adopted the following resolution on July 25, 2023 (ref. attached):

> ***That the request to provide a sanitary sewer service connection to 14500 Silver Valley Road be supported and forwarded to the Greater Vancouver Sewerage and Drainage District Board for consideration and approval.***

Supporting documentation also includes the Extension Rationale Report prepared by Wedler Engineering (ref. attached).

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 rollenberger@mapleridge.ca or 604-467-7326.

Yours truly,

Rachel Ollenberger, AScT.
Manager of Infrastructure Development

/mi

Att.

Doc#3463798

MAPLE RIDGE
British Columbia
mapleridge.ca

I hereby certify this to be a true and correct copy of a resolution passed by the Council of the City of Maple Ridge at its Regular Council meeting held on July 25, 2023:

*R/2023-CM-184*
**That the request to provide a sanitary sewer service connection to 14500 Silver Valley Road be supported and forwarded to the Greater Vancouver Sewerage and Drainage District Board for consideration and approval.**

Dated this 27th day of July, 2023

Patrick Hlavac-Winsor
Acting Corporate Officer

**CITY OF MAPLE RIDGE**
11995 Haney Place, Maple Ridge, BC V2X 6A9, Canada | Tel: 604-463-5221 | Fax: 604-467-7329 | mapleridge.ca
enquiries@mapleridge.ca

MAPLE RIDGE British Columbia
mapleridge.ca

City of Maple Ridge

| | | | |
|---|---|---|---|
| **TO:** | His Worship Mayor Dan Ruimy and Members of Council | **MEETING DATE:** | July 18, 2023 |
| | | **FILE NO:** | 11-5340-01 |
| **FROM:** | Chief Administrative Officer | **MEETING:** | CoW |

**SUBJECT: 14500 Silver Valley Road – Request for Sanitary Sewer Service Connection Outside the Urban Containment Boundary**

## EXECUTIVE SUMMARY:

The University of British Columbia (UBC) Malcolm Knapp Research Forest (MKRF) is located at 14500 Silver Valley Road. UBC is proposing to construct works that requires connection to the municipal sanitary sewer system. The subject property lies outside Metro Vancouver's Urban Containment Boundary (UCB) and the Fraser Sewage Area (FSA).

Under the current Metro Vancouver regulations, any extension or amendment of sanitary sewer servicing (including on-site changes in use or capacity) to properties outside of the UCB and/or the FSA 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.

Under Guideline #7, the applicant has proposed that the additional connection to the municipal sanitary sewer system does not represent a significant change in the sanitary sewer capacity requirement and does not increase the pressure to provide sanitary sewer services for development properties outside of the UCB.

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

## RECOMMENDATION:

**That the request to provide a sanitary sewer service connection to 14500 Silver Valley Road be supported and forwarded to the Greater Vancouver Sewerage and Drainage District Board for consideration and approval.**

## DISCUSSION:

a) **Background Context:**
The UBC MKRF was established in 1949 by a Crown Grant to UBC and is located at 14500 Silver Valley Road. This "working" forest of 5,157 hectares is designed to be a facility for research, demonstration, and education in the field of forestry and allied sciences. UBC is proposing to construct works and improvements to the site that consist of a new office building, a new and relocated workshop, improvements to the parking lot, and a potential First Nations longhouse. To support these improvements, the applicant is requesting connection to the municipal sanitary sewer system. The subject property lies outside Metro Vancouver's Urban Containment Boundary (UCB) and the Fraser Sewage Area (FSA).

A primary goal of Metro Vancouver's long-range plan (Metro 2050) is to focus growth within Urban Containment Boundaries. In support of this initiative, Metro Vancouver adopted a number of strategies including Implementation Guideline #7. Implementation Guideline #7 outlines situations where Metro Vancouver may consider expansion of the sewer system outside of the Urban Containment Boundary. Applicants wishing to use or expand the sewer system must demonstrate their compliance with Guideline #7 and include all relevant documentation.

All applications under Implementation Guideline #7 must be endorsed by municipal Council prior to consideration by the GVS&DD Board.

UBC's consultant has provided a sanitary sewer analysis report that indicates the addition of the proposed works qualifies for consideration under Section 2.3.2 of Implementation Guideline #7, in that the connection will have no significant impact on the municipal sanitary sewer system

If approved by Metro Vancouver for connection, the future building permit application will be subject to all applicable bylaws and policies, and provide verification the water and sewer has capacity to support the proposed development. If improvements are triggered by this redevelopment, the applicant would be responsible for constructing those improvements.

b) **Desired Outcome:**
That Metro Vancouver approve the property owner's request for a sanitary sewer service connection to the municipal sanitary sewer system. The service connection shall be sized to accommodate a capacity no greater than necessary to service the proposed building.

c) **Alternatives:**
Not supporting the request would require the property owner to explore the use of an on-site septic system which may pose challenges that could impact the scope of redevelopment.

**CONCLUSION:**

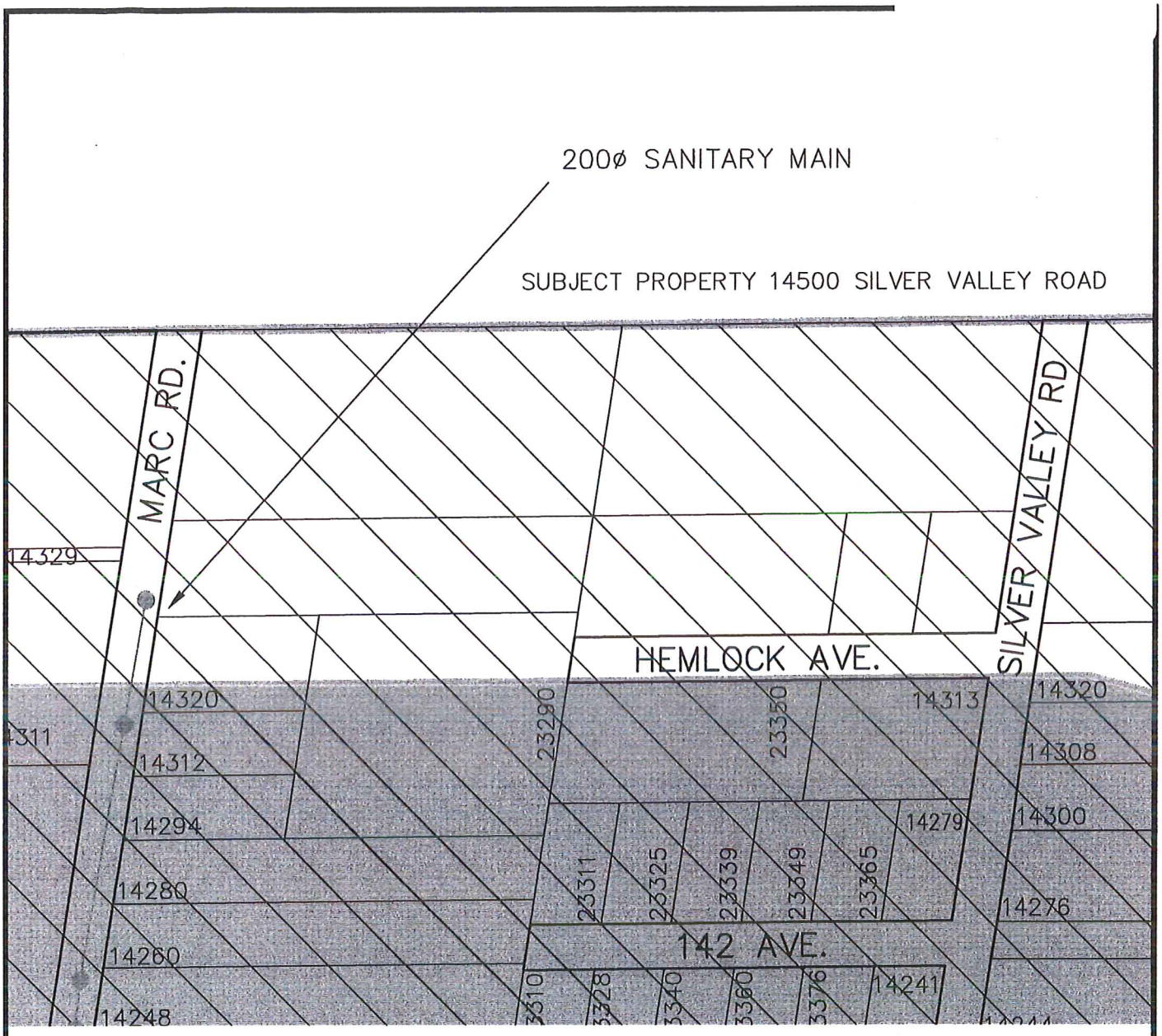
The application to seek Metro Vancouver approval to connect to the municipal sanitary sewer system is consistent with Section 2.3.2 of Metro Vancouver's Implementation Guideline #7, represents minimal increase to the sanitary sewer flows, and does not result in any decrease in the service levels of the 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.

*Prepared by:* **Rachel Ollenberger, AScT.**
**Manager of Infrastructure Development**

*Approved by:* **Forrest Smith, P.Eng.**
**Director of Engineering**

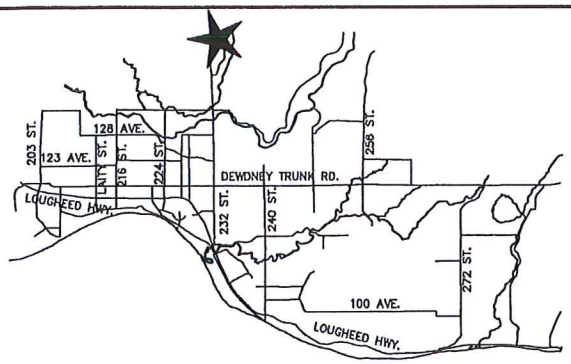
*Concurrence:* **Scott Hartman**
**Chief Administrative Officer**

Attachments:
(A) Map




Fraser Sewage Area Boundary

Metro Vancouver Urban Containment Boundary




N

SCALE: N. T. S.

**CITY OF MAPLE RIDGE**
**ENGINEERING DEPARTMENT**

PROPOSED SANITARY CONNECTION AND FSA INCLUSION
14500 SILVER VALLEY ROAD

DATE: JUN 2023 | FILE/DWG No SK0473

Wedler Engineering LLP
202-10216 128th Street
Surrey, BC V3T 2Z3

April 13, 2023 File Ref: S22-0423/A

Metro Vancouver Regional District
4515 Central Boulevard, Burnaby
V5H 0C6

To whom it may concern,

**Reference: Request Extension of GVS&DD to Allow Sanitary Service Connections**
**UBC Malcolm Knapp Research Forest - 14500 Silver Valley Rd, Maple Ridge**

## Introduction

Wedler Engineering LLP (Wedler) has been retained by the University of British Columbia (UBC) to review servicing options available for their proposed development at the Malcolm Knapp Research Forest (MKRF). Referred to as the Gateway Project by UBC, the proposed development consists of a new front entry/office building, a new and relocated workshop area, a new and relocated caretaker residence, relocating the parking lot to improve traffic flow and, a potential Katzie First Nation longhouse. There is also an option to facilitate growth of the research facilities and event space over the next 10 years. The site is located on the south end of the research forest grounds, north of the Silver Valley Road terminus.

The purpose of this memo is to apply for an extension to the Greater Vancouver Sewerage & Drainage District (GVS&DD), under the guidelines posed by "Metro 2040: Shaping our future, Implementation Guideline #7, Extension of Regional Sewerage services".

## Application

UBC is an extension to the GVS&DD to allow a sanitary sewer connection to the existing sanitary sewer system on Marc, in the City of Maple Ridge (CMR). Due to the topography of the site, sanitary flows will be collected pumped on-site to this off-site MH. The existing CMR gravity sewer would be extended approximately 114 m north to the end of Marc Road where it would meet the on-site force main. Refer to sanitary catchment analysis plan (Appendix A) for details on catchment areas, estimated equivalent population, and calculated sewer flows.

This memo is based on the requirements listed on Metro Vancouver 2040: Shaping our future, Implementation Guideline #7, Extension of Regional Sewerage services. Adopted by the Metro Vancouver Regional Board April 28,2017.

As per the section 2.3.2, UBC is specifically seeking a "Connection Exception for Limited Development Determined to Have No Significant Impact on Metro 2040 Provisions"

a) “the nature of development, existing or proposed, does not conflict with, or negatively impact, Metro 2040 Goal 1 urban containment provisions or related regional land use designations, goals and strategies”

1.1 “Contain urban development within the Urban Containment Boundary”
1.2 “Focus growth in Urban Centres and Frequent Transit Development Areas”
1.3 “Protect Rural areas from urban development”

This development is servicing a forestry research facility in rural area, with institutional and recreational land use, and will not include commercial or residential growth beyond existing (relocated) caretaker facilities. Therefore, urban development is contained within the Urban Containment Boundary.

b) “Extension of GVS&DD sewage services is provided to a single, non-strata, property, with service access to be contained within a specified GVS&DD sewerage boundary footprint comprising the structures proposed for sewerage connection within that property’’

This development is a single non-strata property and connection from the site is with in the property and connects to the existing MH at the boundary at Marc Road.

c) “The service connection is designed to accommodate a sewage flow capacity no greater than the capacity necessary to service the existing structures and activity located within the specified GVS&DD Sewerage Area footprint on the date of approval”

d) “The distance and routing of extended sewerage infrastructure to the subject property is proximate and located such that there is limited potential for prompting additional regional sewerage connection requests in the surrounding area. Proximity to an existing sewer main does not alone establish rationale for a sewerage connection.”

The proposed service connection is a 100mm on-site force main, pumped from a proposed on-site lift station. It will only facilitate the planned growth described within this memo and the attached Appendix A figure, which is within the research forest facility and will never be available to off-site connection. Therefore, the proposed service cannot facilitate additional connections from outside of the GVS&DD. There would be a 100m off-site extension to the existing gravity sewer on Marc Road that could potentially grant service to one existing lot that is already within the GVS&DD boundary, and is not a good candidate for development as it is outside of the practical limit of water service from the City of Maple Ridge.

“To be considered under this exception, applications must include documentation specifying:

a) The existing use of the property, the structures proposed for connection and any anticipated changes to the use or structures on the property”

## Supporting Information

The proposed development of this property is an extension to the existing institutional (research) and recreational land uses, and will include a new administration building, gallery, relocated caretaker's residence, relocated workshop area, and (in the future) a possible Katzie First Nation Longhouse.

> "The rationale for connecting to the GVS&DD sewage treatment system versus an on-site sewage treatment system"

There is no existing treatment plant on-site, and not enough flow (and very inconsistent flows given the event-based and seasonal fluctuations in site occupancy) to justify creating one for the facility. Also, there are concerns regarding the effluent receiving environment and proximity to groundwater wells.

> "The location of the existing GVS&DD or municipal sewer pipes and the proposed routing of the new sewer pipes required for connection to the subject site"

Proposed routing of new sewer pipes connects the subject site to the CMR sewer system, as shown on the plan attached with this memo (Appendix A). We propose to extend the existing CMR gravity system approximately 225m to the north of it's current terminus to a new gravity manhole, which UBC will connect to via 100mm force main.

> "the site plan showing the proposed GVS&DD sewerage boundary footprint containing only the structure(s) to be connected within the property"

We are proposing a 5.3 ha extension to the GVS&DD sewerage boundary, covering the structures within the property that will be connected to the proposed private lift station. See attached plan for details.

> "The servicing plan indicating the connection is designed to accommodate a flow capacity no greater than the capacity necessary to service the specified structures and activity to be located within the proposed GVS&DD Sewerage Area footprint"

a)

The proposed 100mm force main will have a design discharge rate of approximately 7 L/s. Our design flow rate into the pump station for the proposed equivalent population is approximately 1.6 L/s (short-term) and 2.3 L/s (long term after 10 years). The force main is selected to accommodate the design flow for the current and future planned growth of the site (i.e., future Katzie First Nation Longhouse, for hosting event-based groups), but without significant spare capacity for other unplanned growth, and without the capability to support other off-site flows.

> f) "the applicant and property owner acknowledge that Metro Vancouver consideration for exemption is specific to the information contained in the application, and that any works to extend capacity for collection of liquid waste generated outside of the GVS&DD sewerage boundary footprint, within or outside of the subject property, will require a new sewerage extension application to the GVS&DD"

Yes, applicant and property owner acknowledge and understand this requirement.

## Closure

Should you have any questions or inquiries regarding this letter, please don't hesitate to contact me.

Yours truly,
Wedler Engineering LLP

Per:


EGBC Permit to Practice #1000196

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Reviewed by:

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Permit to Practice number: 1000196

Endorsed by:

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p. 604-377-3719

## Appendix A: Site Plan

This represents typical occupancy.

| Development area<br>Our site | 3.28 ha (this area includes proposed and future Katzie Long House and future caretakers house and workshop |
|---|---|
| Total equivalent population | 50 people (Typical Occupancy) |
| Peaking factor (PF) | 4.39 |
| Base sanitary flow rate (BSF) | 170 l/cap/day |
| Base sanitary flow (BSF) | =170 l/cap/day*50 = 8500l/day =0.1l/s |
| Peak base sanitary flow (PBSF) | 4.39*8500= 37315 l/day = 0.43 l/s |
| Inflow and infiltration rate (I&I rate) | 11,232 L/ha/day |
| Inflow and infiltration form site | 11,232*3.28<br>l/ha/day =18645l/day = 0.42l/s<br>inflow area to the pipes = 0.29ha<br>inflow rate=0.29*11,232l/day =0.04l/s<br>Total inflow and infiltration =0.46l/s |
| Peak Wet weather flow (PWWF) | PBSF +I&I<br>0.43+ 0.46 = 0.89 l/s |

This represents peak occupancy. I.e.: When the museum and other facilities are hosting special events:

| Development area<br>Our site | 3.28ha (this area includes proposed and future Katzie Long House future caretakers house and workshop |
|---|---|
| Total equivalent population | Regular day population = 50 people<br>Event/ office classroom day population = 308 peopl |
| Peaking factor (PF) | 3.53 |
| Base sanitary flow rate (BSF) | For regular day population =170 L/cap/day<br>For event population = 60 l/cap/day |
| Base sanitary flow (BSF) | = For regular day population =170 L/cap/day*50 =0.1 l/s<br>For event population = 60 l/cap/day*308= 0.21 l/s<br><br>Total flow = 0.31 l/s |
| Peak base sanitary flow (PBSF) | 3.53*0.31= 1.09 l/s |
| Inflow and infiltration rate (I&I rate) | 11,232 L/ha/day |
| Inflow and infiltration form site | 11,232*3.2<br>l/ha/day =18645l/day = 0.42l/s<br>inflow area to the pipes = 0.29ha<br>inflow rate=0.29*11,232l/day0.04l/s<br>Total inflow and infiltration =0.46l/s |
| Peak Wet weather flow (PWWF) | PBSF +I&I<br>1.09+ 0.46 = 1.55l/s) |

Future within 10 years Katzie Long House (100 people), caretaker homes (8 people), workshop (62 people – area 1.62ha)

| Development area<br>Our site | Proposed area =1.66ha +1.62ha = 3.28 ha |
|---|---|
| Total equivalent population | Total population = 358 (proposed development)<br>+ 170 (future development)<br>=528 people |
| Peaking factor (PF) | 3.38 |
| Base sanitary flow rate (BSF) | Katize long house =60L/cap/day<br>Care takers home = 225L/cap/day<br>Workshop = 75L/cap/day |
| Base sanitary flow (BSF) | Long house =60 l/cap/day*100 = 6000 l/day =0.07<br>Care takers = 225 l/cap/day*8 =1800 l/day=0.02 l/s<br>Workshop = 75 l/cap/day*62 =4650 l/day=0.05 l/s<br>Total future=0.14 l/s<br>Total including current development = 0.14+0.31 =0.45 l/s |
| Peak base sanitary flow (PBSF) | 3.38*0.45 l/s = 1.52 l/s |
| Inflow and infiltration rate (I&I rate) | 11,232 L/ha/day |
| Inflow and infiltration form site | 11,232*(3.28)l/s<br>l/ha/day =36840 l/day = 0.42l/s |
| Peak Wet weather flow (PWWF) | PBSF +I&I<br>1.52+ 0.42 = 1.94 l/s |

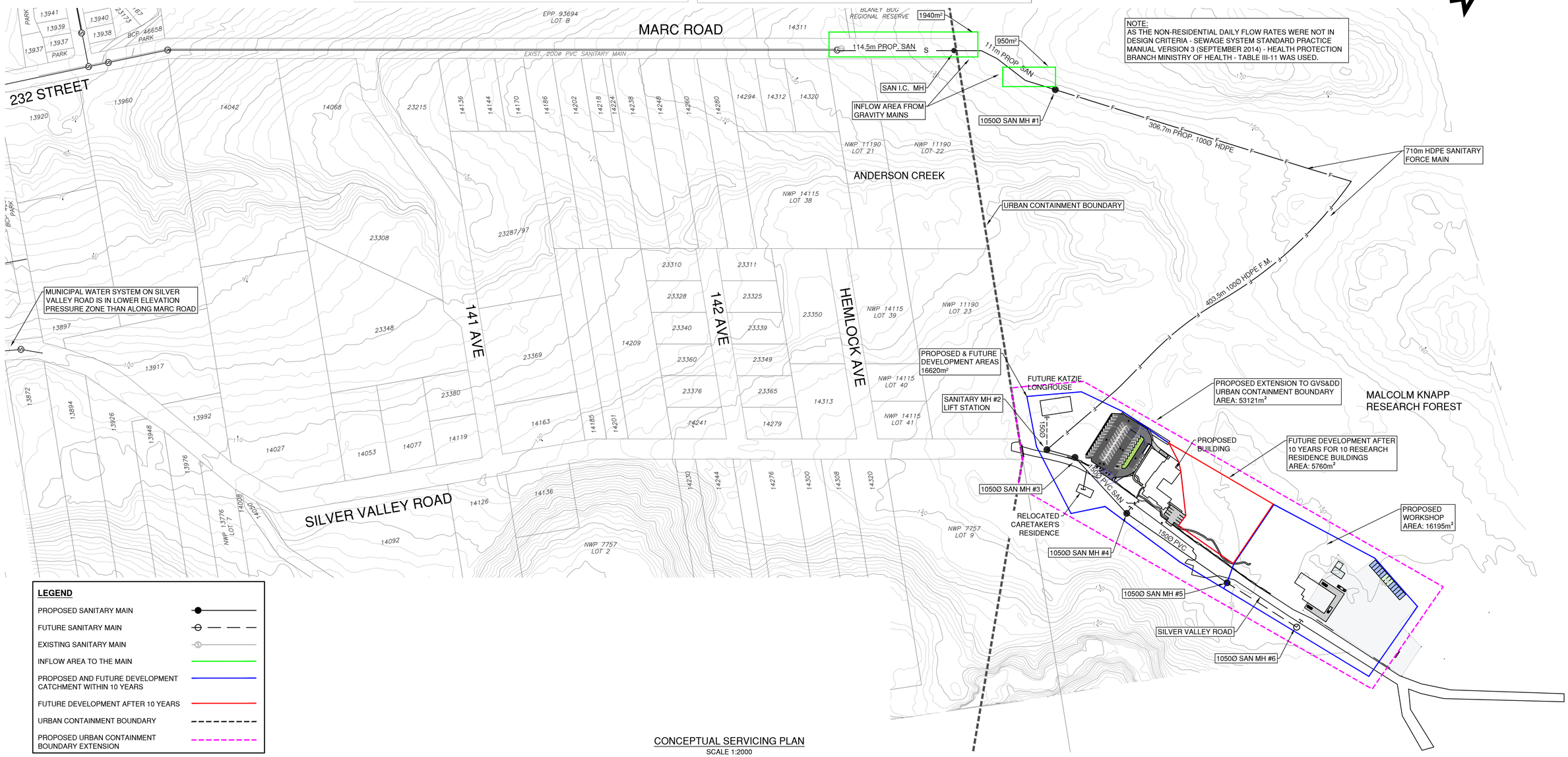
Long-term flows (more than 10 years in the future), including site service area growth: 10 research resident building will be added Equivalent population = 20 people

| Development area<br>Our site | 3.28+0.57 = 3.85ha |
|---|---|
| Total equivalent population | Total population =528 +20 = 548 |
| Peaking factor (PF) | 3.37 |
| Base sanitary flow rate (BSF) | 300L/cap/day for future research residents |
| Base sanitary flow (BSF) | =300l/cap/day*20 = 6000l/day =0.07l/s<br>Total flow =0.07+0.45 =0.52 l/s |
| Peak base sanitary flow (PBSF) | 3.37*0.52 = 1.75 l/s |
| Inflow and infiltration rate (I&I rate) | 11,232 L/ha/day |
| Inflow and infiltration form site | 11,232*(3.85)l/s<br>l/ha/day =43243 l/day = 0.5l/s |
| Peak Wet weather flow (PWWF) | PBSF +I&I<br>1.75+ 0.5 = 2.25l/s |

## SITE SERVICING RECOMMENDATIONS

**SANITARY**

- COLLECT SITE THROUGH GRAVITY TO A LOCAL LIFT STATION
- PUMP FROM LIFT STATION TO MH #1
- GRAVITY FLOW TO EXISTING SYSTEM ON MARC ROAD




**LEGEND**

- PROPOSED SANITARY MAIN
- FUTURE SANITARY MAIN
- EXISTING SANITARY MAIN
- INFLOW AREA TO THE MAIN
- PROPOSED AND FUTURE DEVELOPMENT CATCHMENT WITHIN 10 YEARS
- FUTURE DEVELOPMENT AFTER 10 YEARS
- URBAN CONTAINMENT BOUNDARY
- PROPOSED URBAN CONTAINMENT BOUNDARY EXTENSION

CONCEPTUAL SERVICING PLAN
SCALE 1:2000

| No. | DATE | REVISION | BY |
|---|---|---|---|
| 3 | 2023.03.07 | REVISED AS PER REVIEW COMMENTS | PT |
| 2 | 2023.02.28 | ISSUED FOR REVIEW | MP |
| 1 | 2023.02.06 | ISSUED TO GVSDD | JH |

BENCHMARK
CONTROL MONUMENT:
LOCATION:
ELEVATION:
VERTICAL DATUM:

CITY OF MAPLE RIDGE
ENGINEERING DEPARTMENT

EXISTING / PROPOSED: STORM SEWER STM; SANITARY SEWER SAN; GAS GAS; WATER W/M; U.G. LIGHTING S/L; U.G. HYDRO HYD; U.G. TELEPHONE TEL; MANHOLE; CATCH BASIN; WATER OR GAS VALVE
DITCH; UTILITY POLE / ANCHOR; FIRE HYDRANT; IRON PIN; BASEMENT ELEV. LEFT / RIGHT; EDGE OF PAVEMENT; FENCE; SIDEWALK; SURVEY MONUMENT; SAN. INSPECTION CHAMBER; STREET LIGHT
EDGE OF GRAVEL; TOP; SLOPE; TOE; SHRUB; HEDGE; CONIFEROUS; TREE; DECIDUOUS; BUILDING

WEDLER ENGINEERING
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- Surrey 1.604.588.1919

| | |
|---|---|
| DRAWN | SB |
| DESIGNED | IG |
| CHECKED | |
| APPROVED | |
| SCALES | |
| HORZ. | 1:2000 |
| VERT. | – |

SEAL

Malcolm Knapp Research Forest
GATEWAY PROJECT
Lower Site Redevelopment

SANITARY CATCHMENT ANALYSIS
SILVER VALLEY ROAD
MAPLE RIDGE, BC

DATE 2022.08.02
SHEET 01 OF .
DWG. No. S22–0423A

To: Regional Planning Committee

From: Jessica Hayes, Acting Program Manager, Housing Policy and Planning, Regional Planning and Housing Services

Date: October 16, 2023 Meeting Date: November 3, 2023

Subject: **Support for The National Housing Accord: A Multi-Sector Approach to Ending Canada's Rental Housing Crisis**

## RECOMMENDATION

That the MVRD Board endorse the National Housing Accord, a national campaign and policy proposal with recommendations to restore housing affordability, and to build at least two million new affordable and market rental units by 2030.

## EXECUTIVE SUMMARY

The National Housing Accord is a national campaign and policy proposal put forward by various housing sector organizations. It outlines ten recommendations to the federal government to address the shortage of rental housing in Canada, with the aim of building over two million new affordable and market rental units by 2030. The National Housing Accord includes ten recommendations that align strongly with the housing policy in *Metro 2050* policies and advocacy actions, as well as with other regional housing policy initiatives underway in the region. These are:

1. Create a coordinated housing plan involving all three orders of government
2. Create a national workforce and immigration strategy on housing
3. Reform CMHC fees and the federal tax system
4. Provide low-cost, long-term fixed-rate financing for constructing purpose-built rental housing
5. Develop a robust innovation strategy for housing
6. Reform the National Building Code for innovation and productivity
7. Streamline the CMHC approvals process
8. Create property acquisition programs for non-profit housing providers
9. Create a Homelessness Prevention and Housing Benefit (HPHB)
10. Reform the Canada Housing Benefit.

## PURPOSE

To seek Regional Planning Committee and MVRD Board endorsement of the National Housing Accord, a national campaign and policy proposal put forward by various housing sector organizations with recommendations to restore housing affordability and build at least two million new affordable and market rental units by 2030.

## BACKGROUND

The Regional Planning Committee's Terms of Reference outline specific Committee responsibilities, including facilitating dialogue between Metro Vancouver and other agencies around actions to encourage complete communities, and housing planning and policy as it relates to the objectives of *Metro 2050*, the regional growth strategy.

In August 2023, the National Housing Accord, led by the Canadian Alliance to End Homelessness (CAEH), the PLACE Centre at the Smart Property Institute and the Real Property Association of Canada (REALPAC), released ten recommendations to the federal government, specifically to address the shortage of rental housing in Canada. The report and its recommendations (Reference 1) are intended to act as a blueprint for a national action plan, for which the authors have put out a call for endorsement. This policy proposal aligns with and support the strategies outlined in Goal 4 of *Metro 2050*, particularly given the regional growth strategy's strong focus on rental housing, and the provision of non-market housing.

**NATIONAL HOUSING ACCORD RECOMMENDATIONS**

The National Housing Accord acknowledges that purpose-built rental housing is a critical component of the housing continuum, essential to meeting the needs of a growing population and lower income households. Yet, high land and construction costs have made the delivery of new rental units challenging, particularly those that are near transit, and that are affordable to low and moderate income households. At the same time, rents for existing and new rental units in many parts of the country have been increasing rapidly, as a result of the limited supply of both affordable and market-rate purpose-built rental units.

According to the Canada Mortgage and Housing Corporation (CMHC), restoring affordability will require the construction of 5.8 million new homes by 2030, and even with current projections, the overall housing supply gap would remain close to 3.5 million units. Around two million of these homes will need to be purpose-built rentals (including at least 655,000 deeply affordable and supportive housing units).

To address these challenges, the National Housing Accord lays out a blueprint for a national "Industrial Strategy" to build over 2 million purpose-built rental units, in collaboration with all levels of government and participants in the housing sector, including developers, investors, owners, non-profits, and the labour market.

The National Housing Accord includes ten recommendations, summarized below:

1. **Create a coordinated plan with all three orders of government**. This federal plan should take the form of an Industrial Strategy led by a roundtable of public and private builders, the non-profit housing sector, Indigenous housing experts, investors and labour, and include targets and accountability measures. The plan should include enhanced data collection, more robust and frequent population forecasts and better research to understand Canada's housing system. It should also include a blueprint to fund deeply affordable housing, co-operative housing and supportive housing, housing for seniors and students, and double the relative share of non-market community housing.

2. **Create a national workforce and immigration strategy on housing**. Led by the federal government, in collaboration with other orders of government, the higher education sector, trades unions, and builders, this strategy should include actions to support construction trades and other employment classes related to housing production, and co-develop a detailed workforce and immigration strategy on housing.
3. **Reform CMHC fees and the federal tax system**. The federal government should consider changes to capital cost provisions and eliminating the GST/HST on purpose-built rental housing to incentivize the construction of purpose-built rental housing.
4. **Provide low-cost, long-term fixed-rate financing for constructing purpose-built rental housing.** This should also include financing to upgrade existing purpose-built rentals to make them more accessible, climate-friendly and energy efficient.
5. **Develop a robust innovation strategy for housing**. To ensure innovations achieve scale, the federal government should create innovation centres for housing construction and procurement policy guidance.
6. **Reform the National Building Code for innovation and productivity.** The federal government should help to drive innovation and productivity in the homebuilding sector by making changes to the building code to enable purposed-built rental projects to be less labour intensive to build. This can include modular housing construction, mass timber and single egress for multi-unit residential buildings up to six storeys. The federal government could also develop a National Zoning Code, incorporating global best practices in creating density, particularly around transit lines.
7. **Streamline the CMHC approvals process**. This could include a Code of Conduct for developer and builders to qualify for government programs and borrowing, and a catalogue of pre-approved designs, including mid-rise purpose-built rentals, that use innovative methods such as modular housing and mass-timber, requiring less skilled labour than traditional forms. Developments that use these designs would then be fast-tracked for CMHC and other approvals.
8. **Create property acquisition programs for non-profit housing providers**. These programs would assist with purchasing existing rental housing projects and hotels and facilitate office-to-residential conversions. These programs could include capital grants, provision of pre-approved debt financing, funds that provide secondary debt and equity financing, or other innovative levers that help with the initial costs without saddling the providers with operating and significant debt servicing costs.
9. **Create a Homelessness Prevention and Housing Benefit (HPHB).** This benefit would provide immediate rental relief to up to 385,000 households at imminent risk of homelessness, help over 50,000 people leave homelessness, and reduce pressure on Canada's overwhelmed homeless systems. The benefit would have two streams: the first provide financial support of an average of $600-$700 per month to reduce the flow into chronic homelessness and accelerate exits from chronic homelessness, and the second to prevent "at risk" populations from becoming homeless by providing financial support to those paying 40 per cent or more of their income on rent.

10. **Reform the Canada Housing Benefit**. Ensuring that it will better target individuals and families with the greatest housing needs by replacing it with a Portable Housing Benefit (PHB)

**ALIGNMENT WITH METRO 2050 AND REGIONAL HOUSING POLICY INITIATIVES**

The actions outlined within the National Housing Accord are aligned with several of the strategies and actions of Metro 2050, including those outlined in Table 1.

| Metro 2050 Policy | | Related National Housing Accord recommendation |
|---|---|---|
| **4.2.5** | Advocate to the Federal Government and the Province to provide measures and incentives to stimulate private sector investment in rental housing to help achieve the current and anticipated need for rental housing units, as determined by housing needs reports or assessments. | Recommendation #3<br>Recommendation #6 |
| **4.3.3** | Advocate to the Federal Government and the Province for measures and incentives to stimulate non-market rental supply and capital and operating funding to support the construction of permanent, affordable, and supportive housing across the region. | Recommendation #1<br>Recommendation #7 |
| **4.3.4** | Advocate to the Federal Government and the Province to provide capital and operating funding to meet the current and anticipated housing needs of lower income households and populations experiencing or at risk of homelessness, as determined by housing needs reports or assessments. | Recommendation #3<br>Recommendation #7<br>Recommendation #8 |
| **4.3.5** | Advocate to the Federal Government and the Province for portfolio-based, long-term funding sources for non-profit housing providers that shift away from short-term, project-based funding models as a means of ensuring the sustainability of the non-profit housing sector. | Recommendation #7 |
| **4.3.6** | Advocate to the Federal Government and the Province to provide and expand ongoing rent supplements and housing benefits in a way that takes into account geographic and cost of living considerations, and to increase the shelter portion of income assistance to ensure that lower income households and populations experiencing or at risk of homelessness can afford suitable and adequate housing. | Recommendation #9<br>Recommendation #10 |

As well, several of the National Housing Accord recommendations support ongoing regional housing policy initiatives, and the objectives Metro Vancouver Housing under the *Metro Vancouver Housing 10-Year Plan*. For example, recent efforts to explore the use of standardized zones and guidelines, pre-reviewed designs for rental apartment development, and off-site construction through a forthcoming collaborative project led by the Province (related to Recommendation #2), and MVH's intent to explore the acquisition of existing purpose-built rental housing units under the BC Rental Protection Fund (related to Recommendation #8).

Metro Vancouver staff will further evaluate the potential impact of several of the policy actions recommended as part of the National Housing Accord policy proposal through the planned update of the 2016 "What Works: Municipal Measures for Sustaining and Expanding the Supply of Purpose-Built Rental Housing" Metro Vancouver resource guide (Reference 3).

**ALTERNATIVES**

1. That the MVRD Board endorse the National Housing Accord, a national campaign and policy proposal with recommendations to restore housing affordability and to build at least two million new affordable and market rental units by 2030, as it aligns strongly with *Metro 2050's* housing strategies and advocacy actions.

2. That the MVRD Board receive for information the report dated October 16, 2023, titled "Support for The National Housing Accord: A Multi-Sector Approach to Ending Canada's Rental Housing Crisis", and provide alternate direction to staff.

**FINANCIAL IMPLICATIONS**

There are no direct financial implications related to this report. A number of the recommendations outlined in the National Housing Accord have the potential to have positive financial impacts on the delivery of new rental housing supply. For example, as recommended in the National Housing Accord, the Federal government recently announced that it will waive the Goods and Services Tax (GST) on new purpose-built rental housing, to incentivize the construction of rental housing, which is expected to lead to more rental housing being delivered by the private sector.

Should the MVRD Board endorse the National Housing Accord, staff will add Metro Vancouver's endorsement and corporate logo to the National Housing Accord website (Reference 2), becoming one of the first governmental organizations to do so. Metro Vancouver has previously lent its endorsement to strategies and policy proposals advanced by other organizations and coalitions, for example, earlier this year, Metro Vancouver endorsed the Aboriginal Housing Management Society's provincial "Urban Rural and Northern Indigenous Housing Strategy".

**CONCLUSION**

The National Housing Accord lays out a blueprint for a national "Industrial Strategy" to build over 2 million purpose-built rental units, in collaboration with all levels of government and participants in the housing sector, including developers, investors, owners, non-profits, and the labour market. Given the strong alignment between the National Housing Accord, *Metro 2050* policies and advocacy actions, and regional housing policy initiatives underway in the region, staff recommend Alternative 1, to endorse the National Housing Accord.

**REFERENCES**

1. Full Report: The National Housing Accord: A Multi-Sector Approach to Ending Canada's Rental Housing Crisis
2. The National Housing Accord
3. Metro Vancouver What Works : Municipal Measures for Sustaining and Expanding the Supply of Purpose-Built Rental Housing (2016)

To: Regional Planning Committee

From: Jessica Jiang, Regional Planner, Regional Planning and Housing Services

Date: October 5, 2023 Meeting Date: November 3, 2023

Subject: **Regional Context Statement from the University of British Columbia**

**RECOMMENDATION**

That MVRD Board receive for information the report dated October 5, 2023, titled "Regional Context Statement from the University of British Columbia".

**EXECUTIVE SUMMARY**

As part of the Campus Vision 2050 process, the University of British Columbia (UBC) has developed a land use plan and updated its Regional Context Statement, which has been submitted to Metro Vancouver. Unlike the typical local government process for submitting Regional Context Statements, the *Municipalities Enabling and Validating Act* requires the UBC Board to forward any new or amended Regional Context Statement to Metro Vancouver's Chief Planning Officer for written comments on the relationship between the Regional Context Statement and the regional growth strategy. UBC then submits these comments to the provincial Minister responsible for UBC for review and consideration of adoption.

Regional Planning staff have reviewed UBC's Regional Context Statement relative to *Metro 2050*'s goals and policy actions, provided feedback to UBC, and UBC has revised its Regional Context Statement accordingly. Metro Vancouver staff, including the Chief Planning Officer, have reviewed the updated UBC Regional Context Statement and consider it to be generally consistent with *Metro 2050*. Therefore, a letter from Metro Vancouver's Chief Planning Officer will be sent to UBC noting that the submitted Regional Context Statement is generally consistent with the regional growth strategy. This report is provided for information to the Regional Planning Committee and Board.

**PURPOSE**

To provide the Regional Planning Committee and the MVRD Board with the opportunity to review the Chief Planning Officer's comments on UBC's Regional Context Statement.

**BACKGROUND**

UBC is undertaking a public planning process called Campus Vision 2050 (Reference 1) that includes an update to its land use plan and Regional Context Statement. In accordance with provincial requirements, UBC has submitted its Regional Context Statement to Metro Vancouver for comments, which are provided in this report for Committee and Board review.

**LEGISLATIVE REQUIREMENTS**

The *Municipalities Enabling and Validating Act* (No. 3), Part 10-2010, sections 38 and 39 (Reference 2) sets out that the UBC land use plan must contain a Regional Context Statement, and that:

1) *A Regional Context Statement in a land use plan for the Point Grey campus lands must describe the relationship between the land use plan and the regional growth strategy of the Greater Vancouver Regional District.*

2) *A Regional Context Statement and the rest of the land use plan must be consistent.*

It should be noted that unlike Section 866 of the *Local Government Act* (Reference 3), the legislation for UBC does not specify a deadline for submitting the Regional Context Statement, nor does it specify a 120-day deadline by which Metro Vancouver must respond.

For Regional Context Statements submitted by local governments, the MVRD Board's role is to consider acceptance. For UBC, Ministerial Order No. 229 (Reference 4) mandates that:

> *"Prior to submitting a new Land Use Plan or an amendment to the Land Use Plan to the Minister, the* [UBC] *Board is required to forward any new or amended Regional Context Statement to the Chief Planning Officer of the Greater Vancouver Regional District (GVRD) for written comments on the relationship between the new or amended Regional Context Statement and the GVRD's Regional Growth Strategy. The comments received from the Chief Planning Officer must be included in the package provided to the Minister."*

In this case, Metro Vancouver's Chief Planning Officer is the Deputy General Manager, Regional Planning and Housing Development, Regional Planning and Housing Services.

**REGIONAL CONTEXT STATEMENT ANALYSIS**

Staff have reviewed UBC's Regional Context Statement relative to *Metro 2050*'s goals and policy actions, and have provided comments to UBC staff. A summary of the analysis for UBC's Regional Context Statement relating to each *Metro 2050* goal area is provided below. UBC has incorporated Metro Vancouver staff comments, and has submitted an updated Regional Context Statement, provided as Attachment 1. Metro Vancouver staff, including the Chief Planning Officer, have reviewed the updated UBC Regional Context Statement and consider it to be generally consistent with *Metro 2050*. The comments below will be provided to the Province as Metro Vancouver's Chief Planning Officer's written comments on the relationship between the amended Regional Context Statement and the regional growth strategy.

***Metro 2050* Targets**

UBC's Regional Context Statement outlines relevant Land Use Plan policies and supplementary information that demonstrates how the UBC plan will meet the regional targets set out in *Metro 2050*. Specifically:

- 100% of UBC's projected growth is within the Urban Containment Boundary (UCB).

- 100% of UBC's projected residential growth is within a Frequent Transit Development Area (FTDA). 96% of UBC's projected employment growth is within a FTDA.
- UBC's Land Use Plan includes policies on providing open space, greenways, and managing biodiversity. Detailed strategies and targets for tree canopy cover and biodiversity will be included in future Neighbourhood Plans, subsequent to the adoption of the Campus Vision and Land Use Plan. These strategies and targets will contribute to *Metro 2050* targets for increasing the area of lands protected for nature from 40% to 50% of the region's land use, and increasing the total regional tree canopy cover within the UCB from 32% to 40% by 2050.
- UBC's Land Use Plan commits to net zero operational and community greenhouse gas (GHG) emission reductions by 2050. UBC's Climate Action Plan include additional policies that detail how GHG emissions reductions are to be achieved. These policies will contribute to the *Metro 2050* regional target of reducing GHG emissions to 45% below 2010 levels by 2030, and achieving a carbon neutral region by 2050.
- Over 80% of UBC's campus housing is non-market rental housing, including student housing and below-market faculty/staff rental housing. UBC's Land Use Plan, in concert with their Housing Action Plan commits to ensuring rental housing is available on campus. The Land Use Plan includes policies to ensure at least 30% of total neighbourhood housing is rental, of which half is to be non-market housing. UBC's Housing Action Plan commits to increasing student housing and campus rental by committing to up to 40% of new campus neighbourhood housing as rental. These policies will contribute towards the regional target of having at least 15% of newly completed housing units built within Urban Centres and FTDAs combined, to the year 2050 be affordable rental housing.

**Goal 1: Create a Compact Urban Area**

*Metro 2050* Goal 1 is intended to direct growth in the region to Urban Centres, and along transit corridors, within which are a variety of complete communities with access to a range of housing choices, employment opportunities, amenities and services. The UBC Campus is a part of Electoral Area A and located within the Urban Containment Boundary. A significant portion of the campus is also located within a Frequent Transit Development Area, which is an additional priority location for accommodating concentrated growth in higher density forms of development. UBC's Regional Context Statement outlines UBC's commitment to meeting the targets and regional aspirations set out in *Metro 2050.* Specifically, UBC's Regional Context Statement:

- Indicates that 100% of UBC's projected growth is located within the UCB.
- Estimates that the population within UBC Point Grey Campus lands neighbourhoods will reach 35,700 people by 2050, up from 14,900 people in 2023.
- Estimates that the number of units within UBC Point Grey Campus lands neighbourhoods will reach 16,300 units by 2050, up from 6,800 in 2023.
- States that the Land Use Plan, Campus Vision, and subsequent 10-year Campus Plan, Transportation Plan and Neighbourhood Plans will continue the evolution of the campus lands into a year-round complete community.
- References Land Use Plan policies that increase housing choice and affordability, provide green infrastructure and neighbourhood amenities, and prioritize sustainable and active transportation modes.

- Includes a map denoting the UCB that is generally consistent with the Regional Land Use Designations map in *Metro 2050.*
- Includes a commitment to coordinating with external infrastructure and service providers, including the Metro Vancouver Regional District, the Greater Vancouver Sewerage and Drainage District, and the Greater Vancouver Water District.
- Supports Metro Vancouver's economic development initiatives, including focusing projected employment growth with FTDAs.

UBC is expecting to see significant population and employment growth over the two decades. As the estimated population is expected to double by 2050, UBC is contemplating significant housing development to support growth. A significant driver of, and support for, this growth is the anticipated SkyTrain extension to UBC. UBC's Campus Vision 2050 and Land Use Plan explore integrating the campus environment with opportunities to enable a sustainable, transit-oriented community. Specifically, the UBC Extension will improve access to education and employment on campus and housing off campus and help the university meet its GHG reduction targets. It will also provide additional opportunities for UBC's FTDA, as it will open up new options for students, faculty, staff and residents for better connectivity with the region and attracting new amenities to campus.

**Goal 2: Support a Sustainable Economy**
*Metro 2050* Goal 2 is intended to protect and optimize the land use and transportation systems required to ensure the viability of business sectors by supporting regional employment and economic growth. In this context, *Metro 2050* is committed to the long-term protection of Industrial, Employment, and Agricultural land. As one of Canada's largest academic institutions and the third-largest employer in the BC, UBC is a generator of significant economic activity. Thousands of people travel from across the region each day to learn, work and play on UBC Point Grey Campus lands, which contributes to an estimated daytime population of more than 80,000 people, and a nighttime population of around 29,000 people. UBC's Regional Context Statement references Land Use Policies that supports UBC's role as a major employment centre in the region. These references include:

- Indicates 96% of employment targets for UBC will be concentrated in the UBC Frequent Transit Development Area.
- Estimates employment within UBC Point Grey Campus lands will reach 27,100 employees by 2050, up from 21,400 employees in 2023.

UBC does not have any industrial land on campus; and with the exception of the UBC Farm, there is no agricultural land on site. Therefore, the majority of the industrial and agricultural strategies outlined within *Metro 2050* do not apply.

**GOAL 3: Protect the Environment, Address Climate Change, and Respond to Natural Hazards**
*Metro 2050* Goal 3 recognizes that the region's vital ecosystems provide essential services for all life. Goal 3 includes strategies that promote a connected network of protected Conservation and Recreation lands and other green spaces to enhance physical and mental health, supports biodiversity, and increases community resilience. *Metro 2050* does not identify Conservation and Recreation lands on the UBC Point Grey campus lands. Therefore, the Conservation and Recreation strategies outlined within *Metro 2050* do not apply.

To support the climate and environment strategies outlined in *Metro 2050* Goal 3*,* UBC's Regional Context Statement indicates that several plans will work together to advance its climate action strategy. Future Campus and Neighbourhood Plans will include detailed strategies and targets to achieve *Metro 2050*'s shared goals, such as for tree canopy cover. UBC's Climate Action Plan and Neighbourhood Climate Action Plan include policies for achieving greenhouse gas emissions reduction targets. UBC's Regional Context Statement also references Land Use Plan policies that:

- Link green spaces on campus, establish greenways and green edges, provide open spaces that strengthen connectivity, and provide ecological buffer areas adjacent to sensitive ecosystems, which advance *Metro 2050* strategies related to the protection, enhancement, restoration and connection of ecosystem.
- Commit to net zero operation and community GHG emissions reductions by 2050, develop a compact campus that prioritize active transportation, and design for a human-scaled, compact, pedestrian friendly community, which advance *Metro 2050* strategies related to advancing land use, infrastructure, and human settlement patterns that reduce energy consumption and GHG emissions.
- Strategically renew, retrofit, and replace buildings, use natural systems and nature based solutions for future infrastructure, and work towards the targets and policies of an updated Rainwater Management Plan to address future climate impacts and green infrastructure strategies, which advance *Metro 2050* strategies related to advancing land use, infrastructure, and human settlement patterns that improve resilience to climate change impacts and natural hazards

**Goal 4: Provide Diverse and Affordable Housing Choices**

*Metro 2050* Goal 4 envisions a region with a diverse and affordable range of housing choices suitable for residents at any stage of their lives, including a variety of unit types, sizes, tenures prices, and locations, with a focus on increasing the supply of purpose-built rental housing in proximity to transit. UBC provides significant non-market housing for students, faculty and staff, and market housing for UBC and the broader community. The University's Housing Action Plan describes how UBC uses its land and financial resources to improve housing choice and affordability. The Land Use Plan, Campus Vision 2050, and Housing Action Plan work in concert to advance this work and provides additional details on housing tenure, type and size. UBC's Regional Context Statement also references Land Use Plan policies that:

- Encourage different housing types and tenures, provide significant non-market housing for students, faculty and staff, and market housing for the UBC and broader community, and commit to housing at least 25% of the full-time student population in different types of on-campus student and neighbourhood housing, with an ambition to increase to up to 33%, which advance *Metro 2050* strategies related to expanding the supply and diversity of housing to meet a variety of needs.
- Ensure at least 30% of total neighbourhood housing is rental, of which half is non-market housing, uphold the student housing targets outlined in the Housing Action Plan, including replacement strategies for redeveloped sites, which advance *Metro 2050* strategies related to protecting tenants and expanding, retaining, and renewing the rental housing supply.

- Increase housing choice and affordability through UBC's Housing Action Plan, which includes commitments to partner with groups such as BC Housing on innovative housing programs, which advance *Metro 2050* strategies related to meeting the housing needs of lower income households and populations experiencing or at risk of homelessness. UBC also has existing financial support and emergency housing programs in place for at-risk populations, including students.

**Goal 5: Support Sustainable Transportation Choices**

*Metro 2050* Goal 5 promotes compact, transit-oriented urban forms supported by a range of sustainable transportation choices. This pattern of development expands the opportunities for active transportation, GHG emissions reduction, and improving air quality. UBC's Regional Context Statement anticipates the future arrival of SkyTrain to campus and includes policies that supports compact campus development that prioritizes transit, walking and rolling, and cycling. The Regional Context Statement also references land use policies that support multi-modal transportation and that promote alternatives to single occupancy vehicles. UBC's Regional Context Statement also references Land Use Plan policies that:

- Prioritize transportation modes in the following order, walking and rolling, cycling and micro-mobility, public transit, carpool/shared use vehicles, ride-hailing and taxi, single occupancy vehicles, which advance *Metro 2050* strategies related to coordinating land use and transportation to encourage transit, multiple-occupancy vehicles, cycling and walking.
- Implement a network of multimodal street types, support mobility infrastructure and services, including service and delivery, and transit priority measures, which advance *Metro 2050* strategies related to coordinating land use and transportation to support the safe and efficient movement of vehicles for passengers, goods and services.

## ALTERNATIVES

This is an information report. No alternatives are presented.

## FINANCIAL IMPLICATIONS

There are no financial implications related to this report.

## CONCLUSION

UBC has incorporated Metro Vancouver staff comments into their updated Regional Context Statement, and staff recommend that it is generally consistent with *Metro 2050*. Metro Vancouver's Chief Planning Officer will forward a letter communicating this and the comments in this report to UBC, and UBC will include the letter as a part of its updated land use plan package submission to the Minister.

## ATTACHMENT

1. The University of British Columbia's Regional Context Statement

## REFERENCES

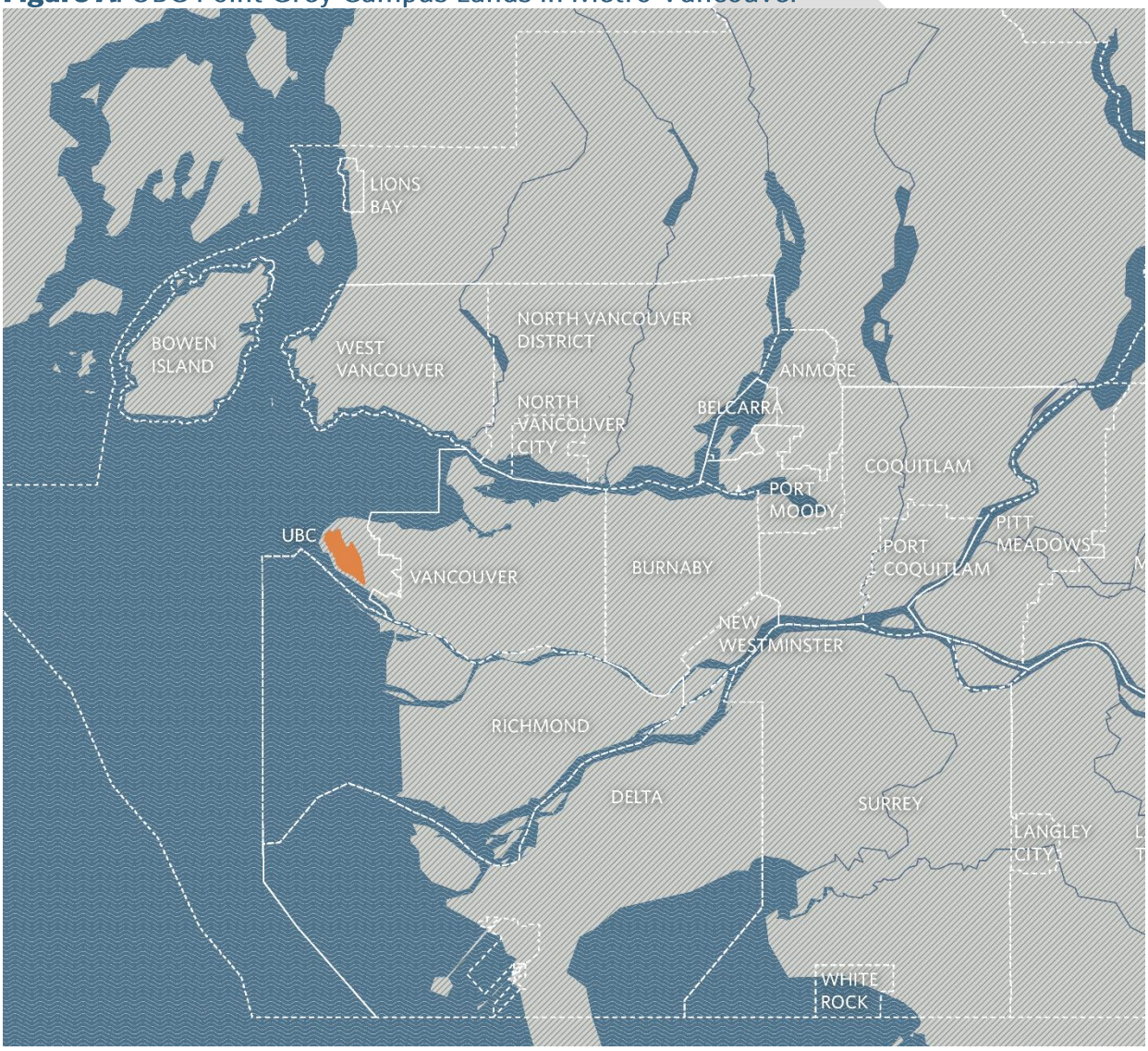
1. UBC Campus Vision 2050
2. The Municipalities Enabling and Validating Act
3. Local Government Act, section 866
4. Ministerial Order No. 229, dated August 18, 2010, section 16

# UBC Point Grey Campus Lands
# **Draft Regional Context Statement**

*September 2023*

This Regional Context Statement (RCS) describes the relationship between the University of British Columbia (UBC)'s Land Use Plan (LUP) and Metro Vancouver Regional District's Metro 2050: Regional Growth Strategy (Metro 2050). The *Municipalities Enabling and Validating Act (No.3) Part 10-2010* requires UBC to include a Regional Context Statement in a Land Use Plan.

**Figure A**: UBC Point Grey Campus Lands in Metro Vancouver



Metro 2050 sets out a series of strategies and actions for Metro Vancouver Regional District and member jurisdictions, including UBC, to guide growth and respond to challenges facing our region. The strategies and actions are arranged under five interrelated goals:

### 1. Create a Compact Urban Area

Metro Vancouver's growth is focused inside an Urban Containment Boundary, within which are a variety of complete communities with access to a range of housing choices, employment opportunities, amenities, and services. Concentrating growth in a network of transit-oriented centres and corridors helps reduce greenhouse gas emissions and pollution, while supporting an efficient transportation network and the efficient use of land.

### 2. Support a Sustainable Economy

The objective of this goal is to protect and optimize the land base and transportation systems required to ensure the viability of business sectors. This means supporting regional employment and economic growth, including the established and new emerging sectors and businesses. This is best achieved through the long-term protection of Industrial, Employment, and Agricultural lands, and ensuring that supports are in place to allow commerce to flourish in Urban Centres throughout the region, and heavy and light industrial activities on Industrial lands, connected by a diverse and reliable transportation system.

### 3. Protect the Environment, Address Climate Change, and Respond to Natural Hazards

The region's vital ecosystems provide essential services for all life. A connected network of protected Conservation and Recreation lands and other green spaces throughout the region provides opportunities to enhance physical and mental health, supports biodiversity, and increases community resilience. The strategies in this goal also help Metro Vancouver and its member jurisdictions contribute to meeting the regional greenhouse gas emission reduction targets, and prepare for the impacts of climate change and natural hazards.

### 4. Provide Diverse and Affordable Housing Choices

Metro Vancouver is a region of communities with a diverse and affordable range of housing choices suitable for residents at any stage of their lives, including a variety of unit types, sizes, tenures, prices, and locations. There is an increased supply of purpose-built rental housing, particularly in proximity to transit, and there are robust tenant protections in place to mitigate the impacts of renovation and redevelopment on renters. Residents experiencing or at risk of homelessness and those with lower incomes or special needs can access permanent, affordable, and supportive housing in neighbourhoods across the region.

### 5. Support Sustainable Transportation Choices

Metro Vancouver's compact, transit-oriented urban form supports a range of sustainable transportation choices. This pattern of development expands the opportunities for transit, walking, cycling, and multiple occupancy vehicles, which reduces greenhouse gas emissions and household expenditures on transportation, and improves air quality. The region's road, transit, rail, and waterway networks play vital roles in serving and shaping regional development, providing linkages among the region's communities, and providing important goods movement networks.

### How UBC Supports Metro 2050

UBC is an important part of the region as an educator, innovator, employer, and provider of affordable housing. UBC's Land Use Plan reflects this role, supporting the region's collaborative approach to growth and all five Metro 2050 goals with the following approaches:

## Regional Growth Strategy Targets

| Metro 2050 Regional Targets | | |
|---|---|---|
| **Goal 1 Create a Compact Urban Area Targets** | | |
| **Policy with Target** | **Applicable LUP Policies** | **Supplementary Information** |
| 1.1.9 b) Provide member jurisdiction population, dwelling unit, and employment projections, with reference to guidelines contained in Table 1, and demonstrate how local plans will work towards accommodating the projected growth within the Urban Containment Boundary in accordance with the regional target of **focusing 98% of residential growth inside the Urban Containment Boundary** | See RCS Table A.<br><br>100% of UBC's projected growth is within the Urban Containment Boundary. | The future Campus Plan, academic planning, and UBC Neighbourhood Plans will include more detailed population projections as UBC implements the Land Use Plan. |

**Table A**: Population, dwelling unit, employment projections

| | 2023 | 2030 | 2040 | 2050 |
|---|---|---|---|---|
| POPULATION | | | | |
| Estimated population within UBC Point Grey Campus lands Neighbourhoods* | 14,900 people | 24,600 people | 29,500 people | 35,700 people |
| DWELLING UNITS | | | | |
| Estimated number of units within UBC Point Grey Campus lands Neighbourhoods* | 6,800 units | 11,300 units | 13,500 units | 16,300 units |
| EMPLOYMENT | | | | |
| Estimated employment within UBC Point Grey Campus lands. | 21,400 employees | 23,400 employees | 25,200 employees | 27,100 employees |

*Residents living in Student Housing are not included in population projections or housing unit counts. Student Housing residences are included in population and household projections in Metro 2050: Regional Growth Strategy. Estimates of Student Housing and student enrolment are provided to Metro Vancouver and TransLink for associated regional growth/infrastructure demand modelling (e.g. transit).

| Policy with Target | Applicable LUP Policies | Supplementary Information |
|---|---|---|
| 1.2.24 a) provide dwelling unit and employment projections that indicate the member jurisdiction's share of planned growth and contribute to achieving the regional share of growth for Urban Centres and Frequent Transit Development Areas as set out in Table 2 (Dwelling Unit and Employment Growth Targets for Urban Centres and Frequent Transit Development Areas)<br>Regional Targets for Residential Growth by Location:<br>• All Urban Centre Types: 40%<br>• Frequent Transit Development Areas: 28%<br>Regional Targets for Employment Growth by Location:<br>• All Urban Centre Types: 50%<br>• Frequent Transit Development Areas: 27% | See RCS Table B, which reflects the concentration of UBC's projected growth in the Frequent Transit Development Area. | The future Campus Plan, academic planning, and UBC Neighbourhood Plans will include more detailed population projections as UBC implements the Land Use Plan. |
| 1.2.24 b) ii) include policies and actions for Urban Centres and Frequent Transit Development Areas that: focus and manage growth and development in Urban Centres and Frequent Transit Development Areas consistent with guidelines set out in Table 3 (Guidelines for Urban Centres and Frequent Transit Development Areas) and demonstrate how that growth will contribute to the Urban Centre and Frequent Transit Development Area targets set out in Table 2 and Action 1.2.13<br><br>1.2.13 Implement the strategies and actions of the regional growth strategy that contribute to regional targets as shown on Table 2 to:<br>a) focus 98% of the region's dwelling unit growth to areas within the Urban Containment Boundary; | See RCS Table B, which reflects the concentration of UBC's projected growth in the Frequent Transit Development Area;<br>Schedule A: Land Uses;<br>LUP 4.1.1.6 develop a compact campus that prioritizes sustainable transport; and,<br>LUP 4.1.1.8 develop mixed use communities. | The future Campus Plan, academic planning, and UBC Neighbourhood Plans will include more detailed population projections as UBC implements the Land Use Plan. |

| | | |
|---|---|---|
| b) focus 40% of the region's dwelling unit growth and 50% of the region's employment growth to Urban Centres; and<br>c) focus 28% of the region's dwelling unit growth and 27% of the region's employment growth to Frequent Transit Development Areas. | | |

**Table B**: Dwelling unit and employment growth targets for Frequent Transit Development Areas

| Location | Percentage of growth 2023-2050 |
|---|---|
| TARGETS FOR RESIDENTIAL GROWTH BY LOCATION | |
| Frequent Transit Development Areas | 100% |
| TARGETS FOR EMPLOYMENT GROWTH BY LOCATION | |
| Frequent Transit Development Areas | 96% |

| **Goal 3 Protect the Environment, Address Climate Change, and Respond to Natural Hazards Targets** | | |
|---|---|---|
| **Policy with Target** | **Applicable LUP Policies** | **Supplementary Information** |
| 3.2.7 a) identify local ecosystem protection and tree canopy cover targets, and demonstrate how these targets will contribute to the regional targets in Action 3.2.1:<br>• increase the area of lands protected for nature **from 40% to 50% of the region's land base by the year 2050**; and<br>• increase the total regional tree canopy cover within the Urban Containment Boundary **from 32% to 40% by the year 2050.** | LUP 4.4.1.3 provide open space;<br>LUP 4.4.1.4 provide campus greenways;<br>LUP 4.4.1.5 provide campus green edges;<br>LUP 4.4.3.1 identify, enhance and manage important areas of biodiversity;<br>LUP 4.4.3.3 develop biodiversity strategies as part of Campus Plan and Neighbourhood Plans, including tree canopy targets; and<br>LUP Schedule C Greenways and Green Edges. | Detailed strategies and targets (e.g. tree canopy cover and biodiversity) to be part of the subsequent Campus Plan and Neighbourhood Plans to implement the Land Use Plan. |
| 3.3.7 a) identify how local land use and transportation policies will contribute to meeting the **regional** | LUP 4.6.1.1 commit to net zero operational and community greenhouse gas emission | UBC's Climate Action Plan and updated Neighbourhood Climate Action Plan (finalized in 2024) |

| | | |
|---|---|---|
| **greenhouse gas emission reduction target of 45% below 2010 levels by the year 2030** and achieving a carbon neutral region by the year 2050; | reductions by 2050, while committing to faster reductions through UBC's Climate Action Plan and Neighbourhood Climate Action Plan. | include detailed policies to achieve greenhouse gas emissions reduction targets that will contribute to Metro Vancouver targets. |

| Goal 4 Provide Diverse and Affordable Housing Choices Targets | | |
|---|---|---|
| **Policy with Target** | **Applicable LUP Policies** | **Supplementary Information** |
| 4.2.7 a) indicate how they will, within their local context, contribute toward the regional target of having **at least 15% of newly completed housing units built within all Urban Centres and Frequent Transit Development Areas combined, to the year 2050, be affordable rental housing units** (recognizing that developing affordable rental housing units in transit-oriented locations throughout the urban area is supported) | LUP 4.2.1.1 uphold UBC's Housing Action Plan commitments to increase housing choice and affordability for students, faculty, staff and community.<br>UBC's Housing Action Plan includes: commitments to a portion of non-market and market rental housing as a percentage of all new Neighbourhood growth;<br>LUP 4.2.1.2 ensure at least 30% of total Neighbourhood Housing is rental—at least half of which is non-market housing including faculty/staff, social, or other housing needs—and enable higher targets for rental in new Neighbourhood Housing through UBC's Housing Action Plan;<br>LUP 4.2.1.4 uphold the Student Housing targets (all of which is non-market rental housing) in the Housing Action Plan;<br>LUP 4.2.1.5 commit to housing at least 25% of the full-time student population in different types of on-campus Student Housing and Neighbourhood Housing, with an ambition to increase to up to 33% depending on available funding, sites, and demand; and,<br>RCS Figure B and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area. | More than 80% of UBC's campus housing is non-market rental, including Student Housing and below-market faculty/staff rental Neighbourhood Housing. UBC's Housing Action Plan, which guides Land Use Plan implementation, commits to increasing student housing and campus rental. This includes a commitment to up to 40% of new campus Neighbourhood Housing as rental. UBC updates the Housing Action Plan at least every five years. |

## Regional Growth Strategy Goals 1

### Metro 2050 Goal 1: Create a Compact Urban Area

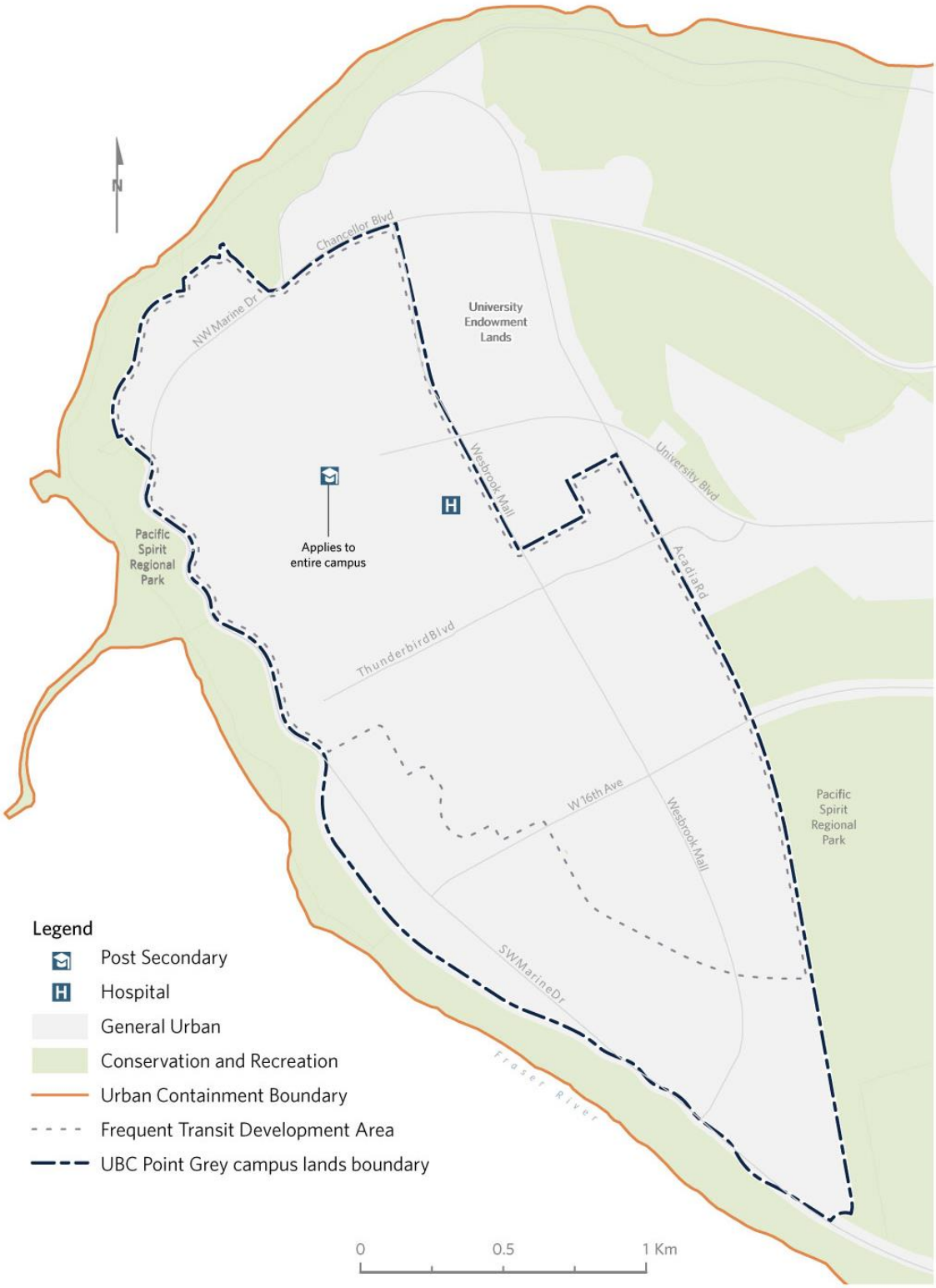
*Describe how the LUP and other supporting plans and policies contribute to this Goal:*

The Land Use Plan, Campus Vision 2050 and subsequent 10-Year Campus Plan, Transportation Plan and Neighbourhoods Plans continue the evolution of the UBC Point Grey campus lands into a year-round complete community. UBC's Campus Vision 2050 includes 7 guiding principles: Support UBC's academic mission; Take bold action to address climate change and enhance campus ecology; Confront the affordability crisis; Strengthen connectivity; Strengthen UBC's relationship with Musqueam and campus Indigenous communities; Make campus more inclusive, accessible and welcoming; Ensure the campus lands benefit the UBC community today and for generations to come. These guiding principles, supported by the policies outlined in the Land Use Plan work toward advancing Metro 2050's goal for creating a compact urban area.

### Strategy 1.1: Contain urban development within the Urban Containment Boundary

| | Section | Policy | Supplementary Information |
|---|---|---|---|
| Policy 1.1.9 | Adopt Regional Context Statements that: | | |
| | a) | Depict the Urban Containment Boundary on a map, generally consistent with the Regional Land Use Designations map (Map 2) | UBC's Point Grey Campus lands fall within the Urban Containment Boundary, with "General Urban" Land Use Designation, as shown on RCS Figure B. |
| | b) | Provide member jurisdiction population, dwelling unit, and employment projections, with reference to guidelines contained in Table 1, and demonstrate how local plans will work towards accommodating the projected growth within the Urban Containment Boundary in accordance with the regional target of focusing 98% of residential growth inside the Urban Containment Boundary | *See Targets Section above* |
| | c) | Include a commitment to liaise regularly with Metro Vancouver Liquid Waste Services and Metro Vancouver Water Services to keep them apprised of the scale and timeframe of major development plans as well as specific plans to separate combined sewers | LUP 4.7.1.4 coordinate with external infrastructure and service providers, including Metro Vancouver Regional District, the Greater Vancouver Sewerage and Drainage District and the Greater Vancouver Water District. |
| | d) | Integrate land use planning policies with local and regional economic development strategies, particularly in the vicinity of the port and airports, to minimize potential exposure of residents to environmental noise and other harmful impacts | The Land Use Plan supports Metro Vancouver's economic development initiatives, including focusing projected employment growth within the Frequent Transit Development Area. |

**Figure B**: UBC Point Grey Campus Lands Regional Context Statement Map



| Strategy 1.2: Focus growth in Urban Centres and Frequent Transit Development Areas | | | |
|---|---|---|---|
| Policy 1.2.24 | Section | Policy | Supplementary Information |
| | Adopt Regional Context Statements that: | | |
| | a) | provide dwelling unit and employment projections that indicate the member jurisdiction's share of planned growth and contribute to achieving the regional share of growth for Urban Centres and Frequent Transit Development Areas as set out in Table 2 (Dwelling Unit and Employment Growth Targets for Urban Centres and Frequent Transit Development Areas) | *See Targets Section above* |
| | b) | include policies and actions for Urban Centres and Frequent Transit Development Areas that: | |
| | i) | identify the location, boundaries, and types of Urban Centres and Frequent Transit Development Areas on a map that is consistent with the guidelines set out in Table 3 (Guidelines for Urban Centres and Frequent Transit Development Areas) and Map 4 | RCS Figure B, shows the developed and growth areas of UBC's campus as a Frequent Transit Development Area, consistent with Metro 2050 guidelines. |
| | ii) | include policies and actions for Urban Centres and Frequent Transit Development Areas that: focus and manage growth and development in Urban Centres and Frequent Transit Development Areas consistent with guidelines set out in Table 3 (Guidelines for Urban Centres and Frequent Transit Development Areas) and demonstrate how that growth will contribute to the Urban Centre and Frequent Transit Development Area targets set out in Table 2 and Action 1.2.13 | *See Targets Section above* |
| | iii) | encourage office development to locate in Urban Centres through policies, economic development programs, or other financial incentives | LUP 4.1.2.1 and 4.1.4.1 include office as a permitted use in Academic and Neighbourhood areas. |
| | iv) | support modal shift by establishing or maintaining reduced residential and commercial parking requirements in Urban Centres and FTDAs and consider the use of parking maximums | LUP 4.5.4.4 and 4.5.4.5 reduce commuter parking, remove structured parking on academic campus;<br>LUP 4.1.4.8 manage parking supply in neighbourhoods; and,<br>UBC currently uses parking maximums to regulate residential development (UBC's Development Handbook). |

| | | | |
|---|---|---|---|
| | v) | consider the identification of appropriate measures and neighbourhood plans to accommodate urban densification and infill development in Urban Centres, Frequent Transit Development Areas, and, where appropriate, Major Transit Growth Corridors in a resilient and equitable way (e.g. through community vulnerability assessments, emergency services planning, tenant protection policies, and strategies to enhance community social connectedness and adaptive capacity) | Land Use Plan guiding principles: "Make campus more inclusive, accessible and welcoming";<br>LUP 4.1.1.1, Schedule A: Land Uses concentrates Neighbourhood growth in re-developed areas;<br>LUP 4.2.1.1 increase housing choice and affordability through UBC's Housing Action Plan; and,<br>LUP 5.1.1.6, 5.1.1.7, 5.1.1.8 identify processes for future Neighbourhood Plans for residential areas. |
| | vi) | consider support for the provision of child care spaces in Urban Centres and Frequent Transit Development Areas | LUP 4.3.1.7 provide child care spaces in UBC's Child Care Expansion Plan, all within the Frequent Transit Development Area. |
| | vii) | consider the implementation of green infrastructure | LUP 4.4.3.4 provide green infrastructure in open spaces; and,<br>LUP 4.6.1.2 work towards the targets and policies of UBC's updated Rainwater Management Plan including green infrastructure strategies. |
| | viii) | focus infrastructure and amenity investments (such as public works and civic and recreation facilities) in Urban Centres and Frequent Transit Development Areas, and at appropriate locations within Major Transit Growth Corridors | LUP 4.3.1.1 provide amenities in neighbourhoods that support future populations; and,<br>LUP 4.7.1.3 update UBC's infrastructure Master Servicing Plans to reflect projected growth. |
| | ix) | support the provision of community services and spaces for non-profit organizations | LUP 4.3.1.1 provide amenities in Neighbourhoods; and,<br>LUP 4.3.1.5 provide a minimum per capita size of future community spaces, including varied community services. |
| | x) | consider, where Urban Centres and Frequent Transit Development Areas overlap with Employment lands, higher density forms and intensification of commercial and light industrial | Not applicable. Metro 2050 does not identify Employment lands on the UBC Point Grey campus lands. |
| | xi) | take appropriate steps to avoid or mitigate the negative health impacts of busy roadways on new or redeveloped residential areas | LUP 4.5.1.2, 4.5.5.3 prioritize sustainable transportation modes;<br>LUP 4.5.5.1 implement a network of multimodal street types;<br>LUP 4.5.5.4 manage traffic and enhancing safety in Academic and Neighbourhood areas;<br>LUP 5.1.1.6, 5.1.1.7, 5.1.1.8 identify processes for future Neighbourhood Plans for residential areas. |

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| | c) | Include policies for General Urban lands that: | |
| | i) | identify General Urban lands and their boundaries on a map generally consistent with Map 2 | RCS Figure B. |
| | ii) | exclude new non-residential Major Trip-Generating uses, as defined in the Regional Context Statement, from those portions of General Urban lands outside of Urban Centres and Frequent Transit Development Areas and direct new non-residential Major Trip-Generating uses to Urban Centres and Frequent Transit Development Areas | RCS Figure B and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area. |
| | iii) | encourage infill and intensification (e.g. row houses, townhouses, mid-rise apartments, laneway houses) in appropriate locations within walking distance of the Frequent Transit Network; | RCS Figure B and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area;<br>LUP 4.1.4.2 building heights in Neighbourhoods will be predominantly mid-rise (approximately 6 storeys) with some taller buildings up to a maximum of 14-39 storeys (maximum varies by Neighbourhood); and,<br>LUP Table 2: Neighbourhood Housing Development, including Neighbourhood Housing Gross Buildable Area and maximum building height per neighbourhood. |
| | iv) | encourage neighbourhood-serving commercial uses | LUP 4.1.2.1 Academic land use including retail, food, restaurant, and groceries;<br>LUP 4.1.4.1 Neighbourhood land use including commercial and retail;<br>LUP 4.1.5.1 Village Centre Academic land use, including shops, restaurants, food outlets, and groceries; and,<br>LUP 4.3.1.2 encourage a hierarchy of commercial uses including local-serving are encouraged across the campus. |
| | d) | with regards to Actions 1.2.16 and 1.2.24 c) ii), include a definition of "non-residential Major Trip- Generating uses" that includes, but is not limited to, the following uses: office or business parks, outlet shopping malls, post-secondary institutions, and large-format entertainment venues | As the province's largest post-secondary institution, UBC Vancouver is one of Metro Vancouver's most significant "non-residential Major Trip-Generators"; and,<br>RCS Figure B and Table B reflect the concentration of UBC Vancouver's projected growth in the Frequent Transit Development Area. |
| | e) | consider the identification of new Frequent Transit Development Areas in appropriate locations within Major Transit Growth | RCS Figure B shows the boundary of the campus Frequent Transit Development Area, |

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| | | Corridors, as part of the development of new or amended area or neighbourhood plans, or other community planning initiatives | reflecting projected campus growth in RCS Table A. |
| | f) | consider long-term growth and transportation planning coordination with adjacent municipalities, First Nations, TransLink, and Metro Vancouver for transit corridors that run through or along two or more adjacent jurisdictions | LUP 4.5.1.3 coordinate transportation planning activities;<br>LUP 4.7.1.4 coordinate with external infrastructure and service providers, including Metro Vancouver Regional District and TransLink;<br>LUP 5.1.1.1 continue regular and ongoing engagement with Musqueam through a deeper, formal co-developed engagement process, including coordinating with external engagement; and<br>LUP 5.1.1.3 work with regional service providers and neighbouring jurisdictions on Land Use Plan implementation. |

## Strategy 1.3: Develop resilient, healthy, connected, and complete communities with a range of services and amenities

| Policy 1.3.7 | Section | Policy | Supplementary Information |
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| | Adopt Regional Context Statements that: | | |
| | a) | support compact, mixed use, transit, walking, cycling and rolling-oriented communities | LUP 4.1.1.6 develop a compact campus that prioritizes walking and rolling, cycling, transit; and,<br>LUP 4.1.1.8 develop mixed use communities. |
| | b) | locate and support community, arts, cultural, recreational, institutional, medical/health, social service, education and child care facilities, and local serving retail uses in Urban Centres or areas with good access to transit | LUP 4.3 Amenities, describes the approach to on-campus amenities including commercial, community space, child care, health services, schools, and partnership space; and,<br>RCS Figure B and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area. |
| | c) | provide and encourage public spaces and other place-making amenities and facilities (e.g. community gardens, playgrounds, gathering places, etc.) in new and established neighbourhoods, for all ages, abilities, and seasons, to support social connections and engagement | LUP 4.1.4.10 design Neighbourhoods for social connection, interaction, health, wellbeing, and accessibility;<br>LUP 4.4.1.3 provide open space including playgrounds and community gardens; and,<br>LUP 4.4.2.2 requirements for Usable Neighbourhood Open Space. |
| | d) | respond to health and climate change-related risks by providing equitable access to: | |
| | i) | recreation facilities | LUP 4.3.1.5 provide a minimum per capita size of future community spaces (at least 0.15 square metres per neighbourhood resident), including recreation facilities;<br>LUP 4.4.1.3 provide open space; and, |

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| | | | LUP 4.4.2.2 requirements for Usable Neighbourhood Open Space. |
| | ii) | green spaces and public spaces (e.g. parks, trails, urban forests, public squares, etc.) | LUP 4.4.1.2 everyone on campus is within 400 metres (5-minute walk) of open space;<br>LUP 4.4.1.3 provide open space;<br>LUP 4.4.1.4 establish campus greenways;<br>LUP 4.4.1.5 establish campus green edges; and,<br>LUP 4.4.2.2 requirements for Usable Neighbourhood Open Space. |
| | iii) | safe and inviting walking, cycling, and rolling environments, including resting spaces with tree canopy coverage, for all ages and abilities | LUP 4.1.1.6 develop a compact campus that prioritizes walking and rolling, cycling, transit;<br>LUP 4.4.1.4 establish campus greenways; and,<br>LUP 4.5.5.1 multimodal street network that outlines how street types prioritize walking, cycling and rolling. |
| | e) | support the inclusion of community gardens (at-grade, rooftop, or on balconies), grocery stores and farmers' markets to support food security, and local production, distribution and consumption of healthy food, in particular where they are easily accessible to housing and transit services | LUP 4.1.3.1 and Schedule A: Land Uses, UBC Farm preserved as Green Academic land;<br>LUP 4.4.2.2 requirements for Usable Neighbourhood Open Space, including community gardens; and,<br>LUP 4.3.1.1, 4.3.1.2 provide amenities and encourage a hierarchy of commercial uses including grocery stores. |
| | f) | consider, when preparing new neighbourhood and area plans, the mitigation of significant negative social and health impacts, such as through the use of formal health and social impact assessment methods in neighbourhood design and major infrastructure investments | For consideration in future Neighbourhood Plans; and,<br>LUP 5.1.1.6, 5.1.1.7, 5.1.1.8 identify processes for future Neighbourhood Plans for residential areas. |
| | g) | provide design guidance for existing and new neighbourhoods to promote social connections, universal accessibility, crime prevention through environmental design, and inclusivity while considering the impacts of these strategies on identified marginalized members of the community | LUP 4.1.1.12 plan for vibrancy, activity, safety day and night;<br>LUP 4.5.7.1 design for safety and personal security; and,<br>LUP 4.5.7.2 plan for active uses and improve night-time safety. |
| | h) | consider where appropriate, opportunities to incorporate recognition of Indigenous and other cultures into the planning of Urban Centres, FTDAs, and other local centres | LUP 4.1.1.3 enrich UBC with strong Musqueam welcome and presence;<br>LUP 4.1.1.4 create spaces welcoming to and inclusive of Musqueam and all Indigenous peoples; and,<br>LUP 4.4.1.1 increase Musqueam presence in the landscape. |

| Strategy 1.4: Protect Rural lands from urban development | | | |
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| Policy | Section | Policy | Supplementary Information |
| | Adopt Regional Context Statements that: | | |
| | a) | identify Rural lands and their boundaries on a map generally consistent with Map 2 | |

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| | b) | limit development to a scale, form, and density consistent with the intent for the Rural land use designation, and that is compatible with on-site sewer servicing | Not applicable. Metro 2050 does not identify Rural lands on the UBC Point Grey campus lands. |
| | c) | specify the allowable density and form, consistent with Action 1.4.1, for land uses within the Rural regional land use designation | |
| | d) | prioritize and support agricultural uses within the Agricultural Land Reserve, and where appropriate, support agricultural uses outside of the Agricultural Land Reserve | |
| | 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 | LUP 4.1.3.1 and Schedule A: Land Uses, sensitive ecosystems on Metro 2050 Map 11 preserved as Green Academic land. |

## Regional Growth Strategy Goals 2

### Metro 2050 Goal 2: Support a Sustainable Economy

*Describe how the LUP and other supporting plans and policies contribute to this Goal:*

As one of Canada's largest academic institutions and the third-largest employer in the Province of British Columbia, thousands of people travel from all over Metro Vancouver each day to learn, work and play on the UBC Point Grey Campus lands, contributing to an estimated daytime population of more than 80,000 people and a nighttime population of around 29,000 people in 2023. The Land Use Plan, Campus Vision 2050 and subsequent 10-Year Campus Plan, Transportation Plan and Neighbourhoods Plans continue the UBC Point Grey Campus lands' evolution to support UBC's role in the region.

### Strategy 2.1 Promote land development patterns that support a diverse regional economy and employment opportunities close to where people live

| | Section | Policy | Supplementary Information |
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| Policy 2.1.10 | Adopt Regional Context Statements that: | | |
| | a) | include policies to support appropriate economic activities, as well as context-appropriate built form for Urban Centres, Frequent Transit Development Areas, Industrial lands, and Employment lands | UBC is one of the region's largest employers and a generator of significant economic activity. RCS Figure B and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area. |
| | b) | support the development and expansion of large-scale office and retail uses in Urban Centres, and lower-scale uses in Frequent Transit Development Areas through policies such as: zoning that reserves land for commercial uses, density bonus provisions to encourage office development, variable development cost charges, and/or other incentives | LUP 4.1.2.1, 4.1.4.1, 4.1.5.1, Schedule A: Land Uses, reflect the concentration of UBC's projected growth in the Frequent Transit Development Area. |
| | c) | discourage the development and expansion of major commercial uses outside of Urban Centres and Frequent Transit Development Areas and that discourage the development of institutional land uses outside of Urban Centres and Frequent Transit Development Areas | RCS Figure B and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area. |

### Strategy 2.2 Protect the supply and enhance the efficient use of industrial land

| | Section | Policy Text | Supplementary Information |
|---|---|---|---|
| Policy 2.2.9 | Adopt Regional Context Statements that: | | |
| | a) | identify the Industrial and Employment lands and their boundaries on a map generally consistent with Map 7 | Not applicable. Metro 2050 does not identify Industrial lands on the UBC Point Grey campus lands. |
| | b) | identify Trade-Oriented lands, if applicable, with a defined set of permitted uses that support inter-regional, provincial, national, and international trade (e.g. logistics, warehouses, distribution centres, transportation and intermodal terminals) | |

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| | | and location needs (e.g. large and flat sites, proximity to highway, port, or rail infrastructure) on a map consistent with the goals in the regional growth strategy. Strata and/or small lot subdivisions on these lands should not be permitted | |
| | c) | include policies for Industrial lands that: | |
| | i) | consistently define, support, and protect industrial uses, as defined in *Metro 2050*, in municipal plans and bylaws, and ensure that non-industrial uses are not permitted | |
| | ii) | support appropriate and related accessory uses, such as limited-scale ancillary commercial spaces, and caretaker units | |
| | iii) | exclude uses that are not consistent with the intent of Industrial lands and not supportive of industrial activities, such as medium and large format retail uses, residential uses, and stand- alone office uses, other than ancillary uses, where deemed necessary | |
| | iv) | encourage improved utilization and increased intensification/densification of Industrial lands for industrial activities, including the removal of any unnecessary municipal policies or regulatory barriers related to development form and density | |
| | v) | review and update parking and loading requirements to reflect changes in industrial forms and activities, ensure better integration with the surrounding character, and reflect improvements to transit service, in an effort to avoid the over- supply of parking | |
| | vi) | explore municipal industrial strategies or initiatives that support economic growth objectives with linkages to land use planning | |
| | vii) | provide infrastructure and services in support of existing and expanding industrial activities | |
| | viii) | support the unique locational and infrastructure needs of rail-oriented, waterfront, and trade-oriented industrial uses | |
| | 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 | |

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| | | industrial and sensitive land uses, and to improve resilience to the impacts of climate change | |
| | x) | do not permit strata and/or small lot subdivisions on identified Trade-Oriented lands | |
| | d) | include policies for Employment lands that: | |
| | i) | support a mix of industrial, small scale commercial and office, and other related employment uses, while maintaining support for the light industrial capacity of the area, including opportunities for the potential densification/intensification of industrial activities, where appropriate | |
| | ii) | allow large and medium format retail, where appropriate, provided that such development will not undermine the broad objectives of the regional growth strategy | |
| | iii) | support the objective of concentrating larger- scale commercial, higher density forms of employment, and other Major Trip-Generating uses in Urban Centres, and local-scale uses in Frequent Transit Development Areas | |
| | iv) | support higher density forms of commercial and light industrial development where Employment lands are located within Urban Centres or Frequent Transit Development Areas, and permit employment and service activities consistent with the intent of Urban Centres or Frequent Transit Development Areas, while low employment density and low transit generating uses, possibly with goods movement needs and impacts, are located elsewhere | |
| | v) | do not permit residential uses, except for:<br>- an accessory caretaker unit; or<br>- limited residential uses (with an emphasis on affordable, rental units) on lands within 200 metres of a rapid transit station and located within Urban Centres or Frequent Transit Development Areas, provided that the residential uses are located only on the upper floors of buildings with commercial and light industrial uses, where appropriate and subject to the | |

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| | | consideration of municipal objectives and local context. | |
| | 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) | |

## Strategy 2.3 Protect the supply of agricultural land and strengthen agricultural viability

| | Section | Policy | Supplementary Information |
|---|---|---|---|
| Policy 2.3.12 | Adopt Regional Context Statements that: | | |
| | a) | specify the Agricultural lands within their jurisdiction, denoting those within the Agricultural Land Reserve, on a map generally consistent with Map 8 | Not applicable. Metro 2050 does not identify Agricultural lands on the UBC Point Grey campus lands. |
| | b) | consider policies and programs that increase markets and the distribution of local food in urban areas to strengthen the viability of agriculture and increase availability of local food for all residents | LUP 4.1.2.1, 4.1.3.1, 4.1.4.1 include "farmer's markets and stalls" as permitted uses in Academic, Green Academic and Neighbourhood areas respectively. |
| | c) | include policies that protect the supply of agricultural land and strengthen agriculture viability including those that: | |
| | i) | assign appropriate land use designations to protect agricultural land for future generations and discourage land uses on Agricultural lands that do not directly support and strengthen agricultural viability | LUP 4.1.1.1 and Schedule A maintains a "Green Academic" designation for the UBC Farm, a facility where agriculture and plant research, teaching, education and growing occurs. |
| | ii) | encourage the consolidation of small parcels and discourage the subdivision and fragmentation of agricultural land | Not applicable. |
| | iii) | support climate change adaptation including:<br>- monitoring storm water, flooding, and sea level rise impacts on agricultural land,<br>- implementing flood construction requirements for residential uses, and<br>- maintaining and improving drainage and irrigation infrastructure that support agricultural production, where appropriate and in collabo- | - Not applicable<br>- LUP 4.6.1.2 work towards the policies and targets of UBC's updated Rainwater Management Plan that addresses future climate impacts.<br>- Not applicable |

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| | | ration with other governments and agencies | |
| | iv) | protect the integrity of agricultural land by requiring edge planning along the Urban Containment Boundary and adjacent to agricultural operations through activities such as screening, physical buffers, roads, or Development Permit area requirements | Not applicable. |
| | v) | demonstrate support for economic development opportunities for agricultural operations that are farm related uses, benefit from close proximity to farms, and enhance primary agricultural production as defined by the *Agricultural Land Commission Act* | |
| | vi) | align policies and regulations, where applicable, with the Minister's Bylaw Standards and Agricultural Land Commission legislation and regulations | |
| **Policy 2.3.13** | Section | Policy | Supplementary Information |
| | | In partnership with other agencies and organizations, support agricultural awareness and promote the importance of the agricultural industry, the importance of protecting agricultural land, and the value of local agricultural products and experiences. | Not applicable. |

## Regional Growth Strategy Goals 3

### Metro 2050 Goal 3: Protect the Environment, Address Climate Change, and Respond to Natural Hazards

*Describe how the LUP and other supporting plans and policies contribute to this Goal:*

The Land Use Plan, Campus Vision 2050, subsequent 10-Year Campus Plan and Neighbourhoods Plans, and UBC's climate action plans, support UBC's globally-leading climate action and prepare for climate change and resilience to future shocks and hazards. The Land Use Plan also preserves open space, forested and natural areas on the UBC Point Grey Campus lands, supporting ecological connectivity. The Land Use Plan also supports developing biodiversity strategies as part of the future Campus Plan and Neighbourhood Plan updates to advance Metro 2050 goals.

### Strategy 3.1: Protect and enhance Conservation and Recreation lands

| | Section | Policy | Supplementary Information |
|---|---|---|---|
| Policy 3.1.9 | Adopt Regional Context Statements that: | | |
| | a) | identify Conservation and Recreation lands and their boundaries on a map generally consistent with Map 2 | Not applicable. Metro 2050 does not identify Conservation and Recreation lands on the UBC Point Grey campus lands. |
| | 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: | |
| | i) | drinking water supply areas | |
| | ii) | environmental conservation areas | |
| | iii) | wildlife management areas and ecological reserves | |
| | iv) | forests | |
| | v) | wetlands (e.g. freshwater lakes, ponds, bogs, fens, estuarine, marine, freshwater, and intertidal ecosystems) | |
| | vi) | riparian areas (i.e. the areas and vegetation surrounding wetlands, lakes, streams, and rivers) | |
| | 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 | |
| | viii) | uses within those lands that are appropriately located, scaled, and consistent with the intent of the designation, including:<br>• major parks and outdoor recreation areas;<br>• education, research and training facilities, and associated uses that serve conservation and/or recreation users;<br>• commercial uses, tourism activities, and public, cultural, or community amenities; | |

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| | | • limited agricultural use, primarily soil-based; and<br>• land management activities needed to minimize vulnerability / risk to climate change impacts | |
| | c) | Include policies that: | |
| | i) | protect the integrity of lands with a Conservation and Recreation regional land use designation from activities in adjacent areas by considering wildland interface planning, and introducing measures such as physical buffers or development permit requirements | LUP 4.4.3.6 encourage public access to UBC areas to minimize impacts on Pacific Spirit Regional Park (identified in Metro 2050 as Conservation and Recreation lands); and,<br>LUP 4.4.3.7 provide an ecological buffer area adjacent to sensitive ecosystems, including Pacific Spirit Regional Park. |
| | ii) | encourage the consolidation of small parcels, and discourage subdivision and fragmentation of lands with a Conservation and Recreation regional land use designation. | Not applicable. |
| **Policy 3.2.7** | **Section** | **Policy Text** | **Supplementary Information** |
| | Adopt Regional Context Statements that: | | |
| | a) | identify local ecosystem protection and tree canopy cover targets, and demonstrate how these targets will contribute to the regional targets in Action 3.2.1 | *See Targets Section above* |
| | b) | refer to Map 11 or more detailed local ecological and cultural datasets and include policies that: | |
| | i) | support the protection, enhancement, and restoration of ecosystems through measures such as land acquisition, density bonusing, development permit requirements, subdivision<br>design, conservation covenants, land trusts, and tax exemptions | LUP 4.1.3.1 and Schedule A: Land Uses. Sensitive ecosystems on Metro 2050 Map 11 preserved as Green Academic land. |
| | ii) | seek to acquire, restore, enhance, and protect<br>lands, in collaboration with adjacent member jurisdictions and other partners, that will enable ecosystem connectivity in a regional green infrastructure network | LUP 4.4.3.5 link green spaces on campus and wider peninsula to enhance ecological connectivity. |
| | iii) | discourage or minimize the fragmentation of ecosystems through low impact development practices that enable ecosystem connectivity | LUP 4.4.1.3 provide open spaces that strengthen connectivity;<br>LUP 4.1.2.3 uphold UBC's North Campus Neighbourhood Plan, including low impact development north of NW Marine due to susceptibility to cliff erosion; and,<br>LUP 4.4.3.5 link green spaces on campus and wider peninsula to enhance ecological connectivity. |

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| | iv) | indicate how the interface between ecosystems and other land uses will be managed to maintain ecological integrity using edge planning, and measures such as physical buffers, or development permit requirements. | LUP 4.4.3.7 provide an ecological buffer area adjacent to sensitive ecosystems, including Pacific Spirit Regional Park. |
| | c) | Include policies that: | |
| | i) | support the consideration of natural assets and ecosystem services in land use decision-making and land management practices | LUP 4.4.1.3 provide open space;<br>LUP 4.4.1.4 establish campus greenways;<br>LUP 4.4.1.5 establish campus green edges;<br>LUP 4.4.2.3 develop neighbourhood tree and soil management plans;<br>LUP 4.4.3.1 Identify, enhance and manage important areas of biodiversity on campus;<br>LUP 4.4.3.3 develop biodiversity strategies as part of the Campus Plan and Neighbourhood Plans, including tree canopy targets; and,<br>Schedule C Greenways and Green Edges. |
| | 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 acquisition, street tree planting, and reforestation or restoration policies, with consideration of resilience | LUP 4.4.1.3 provide open space;<br>LUP 4.4.1.4 establish campus greenways;<br>LUP 4.4.1.4 establish campus green edges;<br>LUP 4.4.2.3 develop neighbourhood tree and soil management plans;<br>LUP 4.4.2.4 tree replacement requirements;<br>Schedule C Greenways and Green Edges;<br>LUP 4.4.3.1 Identify, enhance and manage important areas of biodiversity on campus;<br>LUP 4.4.3.3 develop biodiversity strategies as part of the Campus Plan and Neighbourhood Plans, including tree canopy targets; and,<br>LUP 4.5.5.3 design streets to provide tree canopy cover. |
| | iii) | reduce the spread of invasive species by employing best practices, such as the implementation of soil removal and deposit bylaws, development permit requirements, and invasive species management plans | LUP 4.4.2.3 develop neighbourhood tree and soil management plans. |
| | iv) | increase green infrastructure along the Regional Greenway Network, the Major Transit Network, community greenways, and other locations, where appropriate, and in collaboration with Metro Vancouver, TransLink, and other partners | LUP 4.4.3.4 provide green infrastructure in open spaces;<br>LUP 4.4.1.4 establish campus greenways;<br>LUP 4.4.1.5 establish campus green edges;<br>LUP 4.5.5.1 implement a network of multimodal street types;<br>LUP Schedule D: Multimodal Street Network; and,<br>LUP 4.5.5.3 design streets to provide rainwater management. |
| | v) | support watershed and ecosystem planning, the development and implementation of Integrated Stormwater Management Plans, and water conservation objectives. | LUP 4.4.3.4 provide green infrastructure in open spaces;<br>LUP 4.6.1.2 work towards the targets and policies of UBC's updated Rainwater |

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| | | | Management Plan including green infrastructure strategies; and,<br>LUP 4.6.1.5 work towards the targets and policies of UBC's Water Action Plan. Water Action Plan included water conservation. |

**Strategy 3.3: Advance land use, infrastructure, and human settlement patterns that reduce energy consumption and greenhouse gas emissions, create carbon storage opportunities, and improve air quality.**

**Policy 3.3.7**

| Section | Policy | Supplementary Information |
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| Adopt Regional Context Statements that: | | |
| a) | identify how local land use and transportation policies will contribute to meeting the regional greenhouse gas emission reduction target of 45% below 2010 levels by the year 2030 and achieving a carbon neutral region by the year 2050 | *See Targets Section above* |
| 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, zero-carbon district energy systems, and energy recovery and renewable energy generation technologies, such as solar panels and geoexchange systems, and zero emission vehicle charging infrastructure | LUP 4.6.1.1 commit to net zero operational and community greenhouse gas emission reductions by 2050, while committing to faster reductions through UBC's Climate Action Plan and Neighbourhood Climate Action Plan; and,<br>LUP 4.6.1.4 work towards the targets and policies of UBC's Green Building Action Plan in support of the vision for UBC's buildings to make net positive contributions to human and natural systems by 2035. |
| ii) | community design, infrastructure, and programs that encourage transit, cycling, rolling and walking | LUP 4.1.1.5 plan for the arrival of SkyTrain to campus;<br>LUP 4.1.1.6 develop a compact campus that prioritizes walking and rolling, cycling, transit;<br>LUP 4.1.1.8 develop mixed use communities; and,<br>LUP 4.1.4.7 design for a human-scaled, compact, pedestrian-friendly community. |
| c) | focus infrastructure and amenity investments in Urban Centres and Frequent Transit Development Areas, and at appropriate locations along Major Transit Growth Corridors | RCS Figure B and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area. |

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

| | Section | Policy | Supplementary Information |
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| Policy 3.4.5 | Adopt Regional Context Statements that: | | |
| | a) | include policies that minimize risks associated with climate change and natural hazards in existing communities through tools such as heat and air quality response plans, seismic retrofit policies, and flood-proofing policies | LUP 4.1.1.13 strategically renew, retrofit, and replace buildings, balancing factors such as climate performance, seismic safety, and building condition;<br>LUP 4.6.1.1 commit to net zero operational and community greenhouse gas emission reductions by 2050, while committing to faster reductions through UBC's Climate Action Plan and Neighbourhood Climate Action Plan;<br>LUP 4.6.1.2 work towards the targets and policies of UBC's updated Rainwater Management Plan to reflect current knowledge around climate change and risks;<br>LUP 4.6.1.3 work with Metro Vancouver Regional District and the Ministry of Transportation and Infrastructure to address slope stability;<br>LUP 4.6.1.4 work towards the targets and policies of UBC's Green Building Action Plan;<br>LUP 4.7.1.8 coordinate new infrastructure projects to improve resiliency; and,<br>LUP 4.7.1.9 use natural systems and nature-based solutions for future infrastructure. |
| | 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 | LUP 4.1.1.13 strategically renew, retrofit, and replace buildings, balancing factors such as climate performance, seismic safety, and building condition;<br>LUP 4.1.2.3 uphold UBC's North Campus Neighbourhood Plan, including low impact development north of NW Marine due to susceptibility to cliff erosion; and,<br>LUP 4.6.1.3 work with Metro Vancouver Regional District, the BC Ministry of Transportation and Infrastructure and the BC Ministry of Municipal Affairs to jointly address slope stability and erosion. |

| | Section | Policy | Supplementary Information |
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| **Policy 3.4.6** | | Incorporate climate change and natural hazard risk assessments into planning and location decisions for new municipal utilities, assets, operations, and community services. | LUP 4.1.1.13 strategically renew, retrofit, and replace buildings, balancing factors such as climate performance, seismic safety, and building condition;<br>LUP 4.1.2.3 uphold UBC's North Campus Neighbourhood Plan, including low impact development north of NW Marine due to susceptibility to cliff erosion;<br>LUP 4.6.1.1 commit to net zero operational and community greenhouse gas emission reductions by 2050, while committing to faster reductions through UBC's Climate Action Plan and Neighbourhood Climate Action Plan;<br>LUP 4.6.1.2 work towards the targets and policies of an updated Rainwater Management Plan to address future climate impacts and green infrastructure strategies;<br>LUP 4.6.1.3 work with Metro Vancouver Regional District, the BC Ministry of Transportation and Infrastructure and the BC Ministry of Municipal Affairs to jointly address slope stability and erosion;<br>LUP 4.6.1.4 work towards the targets and policies of UBC's Green Building Action Plan; and,<br>LUP 4.7.1.8 coordinate new infrastructure projects to improve resiliency, and minimize disruptions. |
| **Policy 3.4.7** | Section | Policy | Supplementary Information |
| | | Integrate emergency management, utility planning, and climate change adaptation principles when preparing land use plans, transportation plans, and growth management policies. | LUP 4.1.1.13 strategically renew, retrofit, and replace buildings, balancing factors such as climate performance, seismic safety, and building condition; and,<br>LUP 4.7.1.8 coordinate new infrastructure projects to improve resiliency, and minimize disruptions. |
| **Policy 3.4.8** | Section | Policy | Supplementary Information |
| | | 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. | LUP 4.6.1.2 work towards the targets and policies of UBC's updated Rainwater Management Plan to reflect current knowledge around climate change and risks;<br>LUP 4.6.1.3 work with Metro Vancouver Regional District, the BC Ministry of Transportation and Infrastructure and the BC Ministry of Municipal Affairs to jointly address slope stability and erosion;<br>LUP 4.7.1.8 coordinate new infrastructure projects to improve resiliency, minimize disruptions, and improve resiliency; and,<br>LUP 4.7.1.9 use natural systems and nature-based solutions for future infrastructure. |

## Regional Growth Strategy Goals 4

### Metro 2050 Goal 4: Provide Diverse and Affordable Housing Choices

*Describe how the LUP and other supporting plans and policies contribute to this Goal:*

UBC plays an important role in addressing the region and UBC's affordability crisis by increasing housing choice and affordability for faculty, staff, students and other campus residents. The Land Use Plan, Campus Vision 2050, Housing Action Plan and subsequent 10-Year Campus Plan and Neighbourhoods Plans continue this work. The Housing Action Plan includes additional information on housing tenure, type and size.

### Strategy 4.1 Expand the supply and diversity of housing to meet a variety of needs

**Policy 4.1.8**

| Section | Policy | Supplementary Information |
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| Adopt Regional Context Statements that: | | |
| a) | indicate how they will work towards meeting estimated future housing needs and demand, as determined in their housing needs report or assessment | UBC provides significant non-market housing for students, faculty and staff, and market housing for the UBC and broader community. UBC's Housing Action Plan describes how UBC uses its land and financial resources to improve housing choice and affordability. This includes undertaking housing needs studies for faculty, staff and students. The Housing Action Plan is approved by UBC's Board of Governors and updated at least every five years in response to housing needs.<br>LUP 4.2.1.1 increase housing choice and affordability through UBC's Housing Action Plan;<br>LUP 4.2.1.4 uphold the Student Housing targets in the Housing Action Plan; and,<br>LUP 4.2.1.5 commit to house at least 25% of the full-time student population in different types of on-campus Student Housing and Neighbourhood Housing, with an ambition to increase to up to 33% depending on available funding, sites, and demand.<br>Note: Under the Housing Needs Report Regulation, Metro Vancouver Regional District is not required to prepare a housing needs report for Electoral Area A, which includes the UBC Point Grey campus lands. |
| b) | articulate how local plans and policies will meet the need for diverse (in tenure, size, and type) and affordable housing options | LUP 4.2.1.1 uphold UBC's Housing Action Plan commitments to increase housing choice and affordability, which includes: commitments to a portion of non-market and market rental housing as a percentage of all new Neighbourhood growth; affordable options for students and moderate-income faculty and staff; and a range of unit types and sizes to meet different needs;<br>LUP 4.2.1.2 ensure at least 30% of total Neighbourhood Housing is rental—at least half of which is non-market housing including |

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| | | | faculty/staff, social, or other housing needs—and enable higher targets for rental in new Neighbourhood Housing through UBC's Housing Action Plan;<br>LUP 4.2.1.3 aspire to have at least 50% of Neighbourhood Housing occupied by those who work or study on campus;<br>LUP 4.2.1.4 uphold the Student Housing targets in the Housing Action Plan; and,<br>LUP 4.2.1.5 commit to house at least 25% of the full-time student population in different types of on-campus Student Housing and Neighbourhood Housing, with an ambition to increase to up to 33% depending on available funding, sites, and demand. |
| | c) | identify policies and actions that contribute to the following outcomes | |
| | i) | increased supply of adequate, suitable, and affordable housing to meet a variety of needs along the housing continuum | LUP 4.1.4.3, Table 2 and Schedule B describe amounts of Neighbourhood Housing development for each area of the UBC Point Grey campus lands;<br>LUP 4.1.4.6 provide a range of housing types and tenures in Neighbourhood areas;<br>LUP 4.2.1.1 uphold UBC's Housing Action Plan commitments to increase housing choice and affordability for students, faculty, staff and community, which includes: commitments to a portion of non-market and market rental housing as a percentage of all new Neighbourhood growth; affordable options for students and moderate-income faculty and staff; and a range of unit types and sizes to meet different needs;<br>LUP 4.2.1.2 ensure at least 30% of total Neighbourhood Housing is rental—at least half of which is non-market housing including faculty/staff, social, or other housing needs—and enable higher targets for rental in new Neighbourhood Housing through UBC's Housing Action Plan;<br>LUP 4.2.1.4 uphold the Student Housing targets in the Housing Action *Plan*; and,<br>LUP 4.2.1.5 commit to house at least 25% of the full-time student population in different types of on-campus Student Housing and Neighbourhood Housing, with an ambition to increase to up to 33% depending on available funding, sites, and demand. |
| | ii) | increased supply of family-friendly, age-friendly, and accessible housing | LUP 4.1.1.8 develop mixed use communities;<br>LUP 4.1.1.11 develop a range of housing on campus;<br>LUP 4.1.4.6 provide a range of housing types and tenures in Neighbourhood areas; |

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| | | | LUP 4.1.4.7 design for a human-scaled, compact, and accessible community; and,<br>LUP 4.2.1.1 uphold UBC's Housing Action Plan commitments to increase housing choice and affordability for students, faculty, staff and community, which includes: commitments to a portion of family-friendly units in rental buildings; demand studies including for student family housing growth; accessibility improvements. |
| | iii) | increased diversity of housing tenure options, such as attainable homeownership, rental, co-op housing, rent-to-own models, and cohousing | LUP 4.1.1.11 develop a range of housing on campus;<br>LUP 4.1.4.6 provide a range of housing types and tenures in Neighbourhood areas; and,<br>LUP 4.2.1.1 uphold UBC's Housing Action Plan commitments to increase housing choice and affordability for students, faculty, staff and community, which includes: attainable ownership programs; innovative tenure options. |
| | iv) | increased density and supply of diverse ground-oriented and infill housing forms in low-density neighbourhoods, such as duplex, four-plex, townhouse, laneway/coach houses, and apartments, particularly in proximity to transit | LUP 4.1.1.1, Schedule A: Land Uses concentrates Neighbourhood growth in undeveloped areas;<br>LUP 4.1.1.11 develop a range of housing on campus;<br>LUP Table 2 and Schedule B describe amounts of Neighbourhood residential development for each area of the UBC Point Grey campus lands;<br>LUP 4.1.4.6 provide a range of housing types and tenures in Neighbourhood areas;<br>LUP 4.1.4.7 design for a human-scaled, compact, and accessible community; and,<br>RCS Figure B and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area. |
| | v) | integration of land use and transportation planning such that households can reduce their combined housing and transportation costs | RCS Figure B and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area;<br>LUP Schedule A: Land Uses;<br>LUP 4.1.1.6 develop a compact campus that prioritizes sustainable transport;<br>LUP 4.1.1.8 develop mixed use communities; and,<br>LUP 4.1.4.7 design for a human-scaled, compact, and accessible community. |
| | vi) | increased social connectedness in multi-unit housing | LUP 4.1.4.1 identifies land uses to complement Neighbourhood growth, including amenities and services like community centres and playgrounds; and, |

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| | | | LUP 4.1.4.10 design neighbourhoods for social connection, interaction, health, wellbeing, and accessibility. |
| | vii) | integrated housing within neighbourhood contexts and high quality urban design | LUP 4.1.1.8 develop mixed use communities;<br>LUP 4.1.4.7 design for a human-scaled, compact, and accessible community;<br>LUP 4.1.4.10 design neighbourhoods for social connection, interaction, health, wellbeing, and accessibility; and,<br>LUP 5.1.1.6, 5.1.1.7, 5.1.1.8 processes for future Neighbourhood Plans for residential areas, including urban design. |
| | viii) | existing and future housing stock that is low carbon and resilient to climate change impacts and natural hazards | LUP 4.6.1.1 commit to net zero operational and community greenhouse gas emission reductions by 2050, while committing to faster reductions through UBC's Climate Action Plan and Neighbourhood Climate Action Plan; and,<br>LUP 4.6.1.4 work towards the targets and policies of UBC's Green Building Action Plan in support of the vision for UBC's buildings to make net positive contributions to human and natural systems by 2035. |
| **Policy 4.1.9** | Section | Policy | Supplementary Information |
| | Prepare and implement housing strategies or action plans that: | | |
| | a) | are aligned with housing needs reports or assessments, and reviewed or updated every 5-10 years to ensure that housing strategies or action plans are based on recent evidence and responsive to current and future housing needs | UBC's Housing Action Plan describes how UBC uses its land and financial resources to improve housing choice and affordability. This includes undertaking housing needs studies for faculty, staff and students and determining actions to support UBC's housing priorities. The Housing Action Plan is approved by UBC's Board of Governors and updated at least every five years in response to housing needs.<br>LUP 4.2.1.1 uphold UBC's Housing Action Plan commitments to increase housing choice and affordability for students, faculty, staff and community.<br>Note: Under the Housing Needs Report Regulation, Metro Vancouver Regional District is not required to prepare a housing needs report for Electoral Area A, which includes the UBC Point Grey campus lands. |
| | b) | are based on an assessment of local housing market conditions, by tenure, including assessing housing supply, demand, and affordability | |
| | c) | identify housing priorities, based on the assessment of local housing market conditions, household incomes, changing population and household demographics, climate change and natural hazards resilience, and key categories of local housing need, including specific statements about special needs housing and the housing needs of equity-seeking groups; | |
| | d) | identify implementation measures within their jurisdiction and financial capabilities, including actions set out in Action 4.1.8 | |

| Strategy 4.2 Protect tenants and expand, retain, and renew rental housing supply | | | |
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| | Section | Policy | Supplementary Information |
| | Adopt Regional Context Statements that: | | |
| Policy 4.2.7 | a) | indicate how they will, within their local context, contribute toward the regional target of having at least 15% of newly completed housing units built within all Urban Centres and Frequent Transit Development Areas combined, to the year 2050, be affordable rental housing units (recognizing that developing affordable rental housing units in transit-oriented locations throughout the urban area is supported) | *See Targets Section above* |
| | b) | articulate how local plans and policies will mitigate impacts on renter households, particularly during redevelopment or densification of Urban Centres and Frequent Transit Development Areas | LUP 4.1.1.1 Schedule A: Land Uses concentrates Neighbourhood growth in undeveloped areas, resulting in no impact on existing renter households; and,<br>LUP 4.2.1.1 uphold UBC's Housing Action Plan commitments to increase housing choice and affordability for students, faculty, staff and community, including programs to support moderate-income rental households. |
| | c) | identify the use of regulatory tools that protect and preserve rental housing | LUP 4.1.1.1 Schedule A: Land Uses concentrates Neighbourhood growth in undeveloped areas, resulting in no impact on existing renter households;<br>LUP 4.2.1.1 increase housing choice and affordability through UBC's Housing Action Plan, which includes: commitments to a portion of non-market and market rental housing as a percentage of all new Neighbourhood growth;<br>LUP 4.2.1.2 ensure at least 30% of total Neighbourhood Housing is rental—at least half of which is non-market housing including faculty/staff, social, or other housing needs—and enable higher targets for rental in new Neighbourhood Housing through UBC's Housing Action Plan;<br>LUP 4.2.1.4 uphold the Student Housing targets (all of which is non-market rental housing) in the Housing Action Plan; and,<br>LUP 4.2.1.5 commit to house at least 25% of the full-time student population in different types of on-campus Student Housing and Neighbourhood Housing, with an ambition to |

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| | | | increase to up to 33% depending on available funding, sites, and demand. |
| | d) | identify policies and actions that contribute to the following outcomes: | |
| | i) | increased supply of affordable rental housing in proximity to transit and on publicly-owned land | LUP 4.2.1.1 increase housing choice and affordability through UBC's Housing Action Plan;<br>LUP 4.2.1.2 ensure at least 30% of total Neighbourhood Housing is rental—at least half of which is non-market housing including faculty/staff, social, or other housing needs—and enable higher targets for rental in new Neighbourhood Housing through UBC's Housing Action Plan;<br>LUP 4.2.1.4 uphold the Student Housing targets (all of which is non-market rental housing) in the Housing Action Plan;<br>LUP 4.2.1.5 commit to house at least 25% of the full-time student population in different types of on-campus Student Housing and Neighbourhood Housing, with an ambition to increase to up to 33% depending on available funding, sites, and demand; and,<br>RCS Figure A and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area. |
| | ii) | increased supply of market and below-market rental housing through the renewal of aging purpose-built rental housing and prevention of net rental unit loss | LUP 4.1.1.1 Schedule A: Land Uses concentrates Neighbourhood growth in undeveloped areas; and,<br>LUP 4.2.1.1 increase housing choice and affordability through UBC's Housing Action Plan, which includes: commitments to a portion of non-market and market rental housing as a percentage of all new Neighbourhood growth. |
| | iii) | protection and renewal of existing non-market rental housing | LUP 4.1.1.1 Schedule A: Land Uses concentrates Neighbourhood growth in undeveloped areas;<br>LUP 4.2.1.2 ensure at least 30% of total Neighbourhood Housing is rental—at least half of which is non-market housing including faculty/staff, social, or other housing needs—and enable higher targets for rental in new Neighbourhood Housing through UBC's Housing Action Plan;<br>LUP 4.2.1.4 uphold the Student Housing targets (all of which is non-market rental housing) in the Housing Action Plan, including |

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| | | | replacement strategies for redeveloped sites; and,<br>LUP 4.2.1.5 commit to house at least 25% of the full-time student population in different types of on-campus Student Housing and Neighbourhood Housing, with an ambition to increase to up to 33% depending on available funding, sites, and demand. |
| | iv) | mitigated impacts on renter households due to renovation or redevelopment, and strengthened protections for tenants | LUP 4.1.1.1 Schedule A: Land Uses concentrates Neighbourhood growth in undeveloped areas; and,<br>LUP 4.2.1.4 uphold the Student Housing targets (all of which is non-market rental housing) in the Housing Action Plan, including replacement strategies for redeveloped sites. |
| | v) | reduced energy use and greenhouse gas emissions from existing and future rental housing stock, while considering impacts on tenants and affordability | LUP 4.6.1.1 commit to net zero operational and community greenhouse gas emission reductions by 2050, while committing to faster reductions through UBC's Climate Action Plan and Neighbourhood Climate Action Plan; and,<br>LUP 4.6.1.4 implement UBC's Green Building Action Plan, which includes policies and commitments to academic and neighbourhood district energy systems as well as green building standards as part of academic and neighbourhood growth. |
| | Section | Policy | Supplementary Information |
| **Policy 4.2.8** | Prepare and implement housing strategies or action plans that: | | |
| | a) | encourage the supply of new rental housing and mitigate or limit the loss of existing rental housing stock; | LUP 4.1.1.1 Schedule A: Land Uses concentrates Neighbourhood growth in undeveloped areas; and,<br>LUP 4.2.1.4 uphold the Student Housing targets (all of which is non-market rental housing) in the Housing Action Plan, including replacement strategies for redeveloped sites. |
| | b) | encourage tenant protections and assistance for renter households impacted by renovation or redevelopment of existing purpose-built rental housing | LUP 4.1.1.1 Schedule A: Land Uses concentrates Neighbourhood growth in undeveloped areas; and,<br>LUP 4.2.1.4 uphold the Student Housing targets (all of which is non-market rental housing) in the Housing Action Plan, including replacement strategies for redeveloped sites. |
| | c) | cooperate with and facilitate the activities of Metro Vancouver Housing under Action 4.2.2. | LUP 5.1.1.3 work with Metro Vancouver Regional District on Land Use Plan implementation. |

| Strategy 4.3 Meet the housing needs of lower income households and populations experiencing or at risk of homelessness | | | |
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| Policy 4.3.7 | Section | Policy | Supplementary Information |
| | Adopt Regional Context Statements that: | | |
| | a) | indicate how they will collaborate with the Federal Government, the Province, and other partners, to assist in increasing the supply of permanent, affordable, and supportive housing units | LUP 4.2.1.1 increase housing choice and affordability through UBC's Housing Action Plan, which includes: commitments to advocate to the Province for housing affordability measures, and to collaborate with other partners on innovative housing programs on the UBC Point Grey campus lands.<br>UBC collaborates regularly with the Province on Student Housing opportunities, including financial support and innovative building technologies. |
| | b) | identify policies and actions to partner with other levels of government and non-profit organizations in order to create pathways out of homelessness and contribute to meeting the housing and support needs of populations experiencing or at risk of homelessness | LUP 4.2.1.1 increase housing choice and affordability through UBC's Housing Action Plan, which includes commitments to affordable options for students and moderate-income faculty and staff.<br>UBC also has existing financial support as well as emergency housing programs in place for at-risk populations, including students. |
| Policy 4.3.8 | Section | Policy | Supplementary Information |
| | Prepare and implement housing strategies or action plans that: | | |
| | a) | identify opportunities to participate in programs with other levels of government to secure additional housing units to meet the housing needs of lower income households | LUP 4.2.1.1 increase housing choice and affordability through UBC's Housing Action Plan, which includes commitments to partner with groups such as BC Housing on innovative housing programs.<br>UBC collaborates regularly with the Province on Student Housing opportunities, including financial support and innovative building technologies. |
| | b) | identify strategies to increase community acceptance and communicate the benefits of affordable and supportive housing development | LUP 4.2.1.1 increase housing choice and affordability through UBC's Housing Action Plan, which includes commitments to developing communications strategies including on the benefits of affordable housing. |
| | c) | are aligned with or integrate plans to address homelessness, and identify strategies to reduce the total number of households that are in core housing need and populations experiencing or at risk of homelessness | LUP 4.2.1.1 increase housing choice and affordability through UBC's Housing Action Plan, which focuses on housing measures for UBC's faculty, staff, students and community. UBC also has existing financial support as well as |

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| | | | emergency housing programs in place for at-risk populations, including students. |

## Regional Growth Strategy Goals 5

### Metro 2050 Goal 5: Support Sustainable Transportation Choices

*Describe how the LUP and other supporting plans and policies contribute to this Goal:*

UBC promotes the use of active and sustainable modes of transportation and the continued development of a more equitable and accessible transportation system for all via both transportation and land use plans. The Land Use Plan, Campus Vision 2050 and subsequent 10-Year Campus Plan, Neighbourhood Plans and Transportation Plan continue this development. UBC's Campus Vision 2050 includes key strategies to expand the pedestrian priority zone in the campus core, creating a safe legible and efficient cycling and micro mobility network, and building a network of zero-emission local transit/shuttle routes that integrate with regional services.

### Strategy 5.1 Coordinate land use and transportation to encourage transit, multiple-occupancy vehicles, cycling and walking

| | Section | Policy | Supplementary Information |
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| Policy 5.1.14 | Adopt Regional Context Statements that: | | |
| | a) | identify land use and transportation policies and actions to encourage a greater share of trips made by transit, shared mobility options, cycling, walking, and rolling | LUP 4.1.1.5 plan for the arrival of SkyTrain to campus;<br>LUP 4.1.1.6 develop a compact campus that prioritizes walking and rolling, cycling, transit;<br>LUP 4.5.1.2 prioritize transportation modes in the following order: 1. walking and rolling; 2. cycling & micromobility; 3. public transit; 4. carpool/shared use vehicles; 5. ride-hailing and taxi vehicles; 6. single occupancy vehicles;<br>LUP 4.5.2.1 provide dedicated space for active transportation, including protected cycling facilities; and,<br>RCS Figure B and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area. |
| | b) | support the development and implementation of transportation demand management strategies, such as: parking pricing and supply measures, transit priority measures, end-of-trip facilities for active transportation and micro-mobility, and shared mobility services | LUP 4.1.2.1, 4.1.3.1, 4.1.4.1, 4.1.5.1 all land uses support mobility infrastructure and services;<br>LUP 4.1.4.8 manage Neighbourhood parking supply;<br>LUP 4.5.1.1 work towards UBC's Transportation Plan, which includes commitments to end-of-trip facilities;<br>LUP 4.5.1.2 prioritize transportation modes, including shared use vehicles;<br>LUP 4.5.4.1 promote alternatives to single occupancy vehicles;<br>LUP 4.5.4.2 continue to support the U-Pass BC program for students;<br>LUP 4.5.4.3 pursue a discounted transit pass program for faculty, staff and residents;<br>LUP 4.5.4.4 reduce commuter parking; and, |

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| | | | LUP 4.5.5.6 support transit priority measures. |
| | c) | manage and enhance municipal infrastructure in support of transit, multiple-occupancy vehicles, cycling, walking, and rolling | LUP 4.1.1.6 develop a compact campus that prioritizes walking and rolling, cycling, transit;<br>LUP 4.5.1.2 prioritize transportation modes in the following order: 1. walking and rolling; 2. cycling & micromobility; 3. public transit; 4. carpool/shared use vehicles; 5. ride-hailing and taxi vehicles; 6. single occupancy vehicles;<br>LUP 4.5.2.1 provide dedicated space for active transportation;<br>LUP 4.5.5.1 implement a network of multimodal street types;<br>LUP 4.5.5.6 support transit priority measures, and,<br>Schedule D: Multimodal Street Network. |
| | d) | support the transition to zero-emission vehicles | LUP 4.1.2.1, 4.1.3.1, 4.1.4.1, 4.1.5.1 all land uses support mobility infrastructure and services, including electric vehicle charging facilities;<br>LUP 4.6.1.1 commit to faster reductions through UBC's Climate Action Plan and Neighbourhood Climate Action Plan, which includes measures for electric vehicles; and,<br>LUP 4.6.1.4 implement UBC's Green Building Action Plan, which includes policies that support the transition to zero-emission vehicles as part of academic and neighbourhood growth; and,<br>LUP 4.7.1.4 coordinate with external infrastructure and service providers, including transition to zero emission vehicles and transit. |
| | e) | support implementation of the Regional Greenway Network and Major Bikeway Network, as identified in Map 10 | LUP 4.5.5.1 implement a network of multimodal street types;<br>LUP 4.5.5.5 integrate with regional greenway, bikeway, and open space networks; and,<br>LUP Schedule D: Multimodal Street Network. |
| | f) | support implementation of local active transportation and micro-mobility facilities that provide direct, comfortable, all ages and abilities connections to the Regional Greenway Network, Major Bikeway Network, transit services, and everyday destinations | LUP 4.1.2.1, 4.1.3.1, 4.1.4.1, 4.1.5.1 all land uses support mobility infrastructure and services;<br>LUP 4.5.2.1 provide space for active transportation;<br>LUP 4.5.5.1 implement a network of multimodal street types;<br>LUP 4.5.5.5 integrate with regional greenway, bikeway, and open space networks;<br>LUP 4.5.6.1 design a barrier-free, universally accessible campus, including buildings, Open Spaces and active transportation facilities; and,<br>Schedule D: Multimodal Street Network. |

| Strategy 5.2 Coordinate land use and transportation to support the safe and efficient movement of vehicles for passengers, goods, and services | | | |
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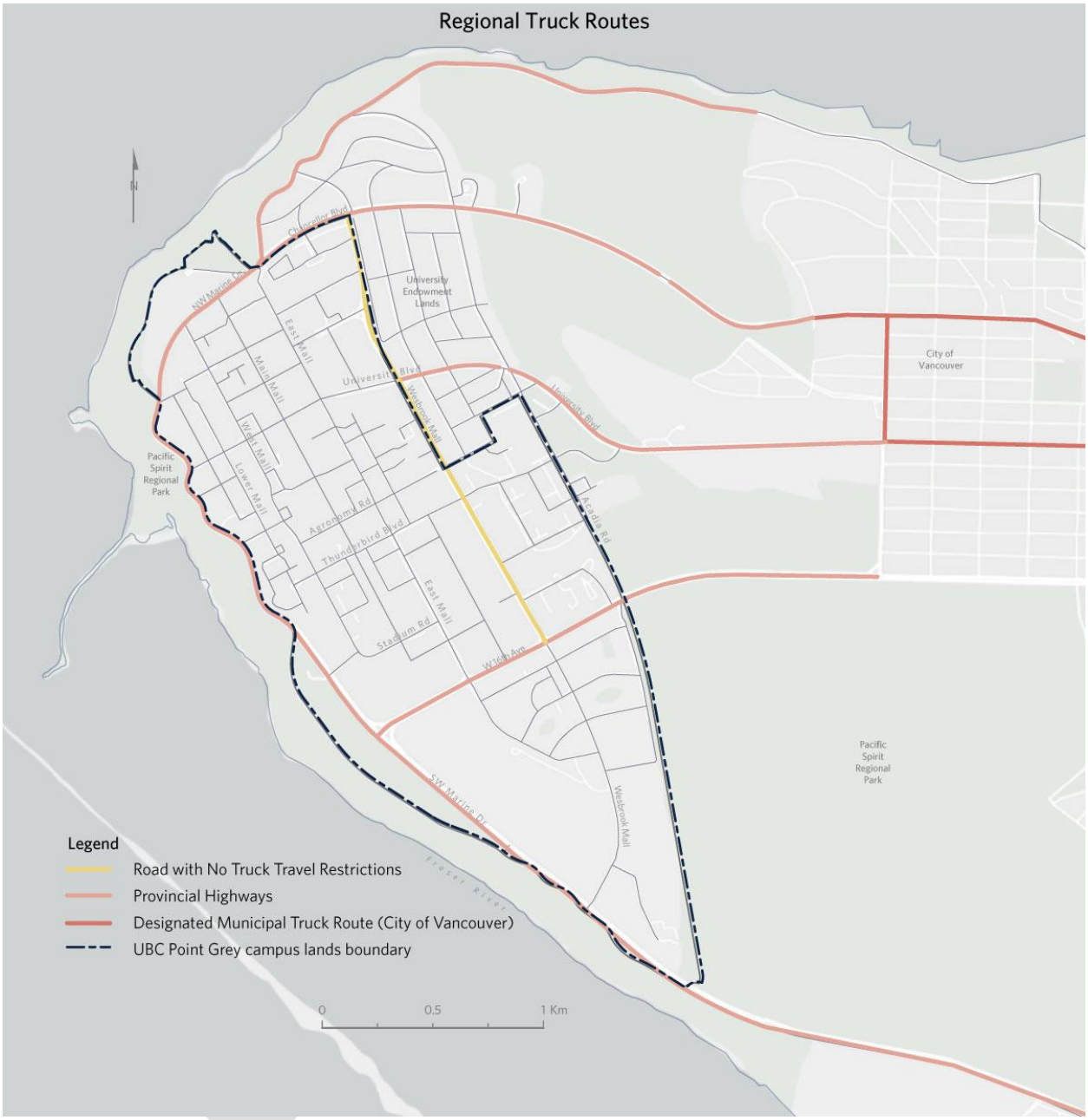
| | Section | Policy | Supplementary Information |
| Policy 5.2.6 | Adopt Regional Context Statements that: | | |
| | a) | identify routes on a map for the safe and efficient movement of goods and service vehicles to, from, and within Urban Centres; Frequent Transit Development Areas; Major Transit Growth Corridors; Industrial, Employment, and Agricultural lands; ports; airports; and international border crossings | LUP 4.5.5.1 implement a network of multimodal street types; and,<br>LUP Schedule D: Multimodal Street Network.<br>RCS Figure B and Table B reflect the concentration of UBC's projected growth in the Frequent Transit Development Area. |
| | b) | identify land use and related policies and actions that support the optimization and safety of goods movement via roads, highways, railways, aviation, short sea shipping, and active transportation | LUP 4.1.2.1, 4.1.3.1, 4.1.4.1, 4.1.5.1 all land uses support mobility infrastructure and services, including service and delivery;<br>LUP 4.5.5.1 implement a network of multimodal street types; and,<br>LUP Schedule D: Multimodal Street Network. |
| | c) | support the development of local and regional transportation system management strategies, such as the provision of information to operators of goods and service vehicles for efficient travel decisions, management of traffic flow using transit priority measures, coordinated traffic signalization, and lane management | LUP 4.5.1.3 coordinate transportation planning activities with local partners;<br>LUP 4.5.5.1 implement a network of multimodal street types in collaboration with the Ministry of Transportation and Infrastructure;<br>LUP 4.5.5.6 support implementation of transit priority measures; and,<br>LUP 5.1.1.3 work with regional service providers and neighbours on Land Use Plan implementation. |
| | d) | identify policies and actions that support the protection of rail rights-of-way, truck routes, and access points to navigable waterways in order to reserve the potential for goods movement | RCS Figure C: Regional Truck Routes below. Note: UBC does not have designated truck routes. Roads on UBC Point Grey campus lands can be used between City of Vancouver truck routes or Provincial Highways, and the final destination at UBC. |
| | e) | identify policies and actions to mitigate public exposure to unhealthy levels of noise, vibration, and air pollution associated with the Major Road Network, Major Transit Network, railways, truck routes, and Federal / Provincial Highways | LUP 4.1.1.6 develop a compact campus that prioritizes walking and rolling, cycling, transit;<br>LUP 4.5.5.1 implement a network of multimodal street types in collaboration with the Ministry of Transportation and Infrastructure (for the Major Road Network); and,<br>LUP Schedule D: Multimodal Street Network. |
| | f) | identify policies and actions that anticipate the land and infrastructure requirements for goods movement and drayage, such as truck parking, zero-emission vehicle charging infrastructure, and e-commerce distribution centres, and mitigate any negative impacts of these uses on neighbourhoods | LUP 4.1.2.1, 4.1.3.1, 4.1.4.1, 4.1.5.1 all land uses support mobility infrastructure and services, including service and delivery;<br>LUP 4.5.5.1 implement a network of multimodal street types; and,<br>LUP Schedule D: Multimodal Street Network. |

**Figure C:** Regional Truck Routes




*Note: UBC does not have designated truck routes. All roads on UBC Point Grey campus lands can be used between City of Vancouver truck routes or Provincial Highways, and the final destination at UBC.*

To: Regional Planning Committee

From: Eric Aderneck, Senior Planner, Regional Planning and Housing Services

Date: October 16, 2023 Meeting Date: November 3, 2023

Subject: **Costs of Providing Infrastructure and Services to Different Residential Densities Study**

## RECOMMENDATION

That the MVRD Board receive for information the report dated October 16, 2023, titled "Costs of Providing Infrastructure and Services to Different Residential Densities Study".

## EXECUTIVE SUMMARY

The Costs of Providing Infrastructure and Services to Different Residential Densities Study was completed as an initiative to support the implementation of *Metro 2050*. The study aims to better understand the costs and revenues associated with different types of housing by exploring the associated municipal infrastructure capital and operating costs, property taxation and utility fees. Similar analyses have been completed in other jurisdictions around the world, but not in the Metro Vancouver region. Drawing from available sources, this study provides data specific to this region to inform the discussion about the possible costs, benefits, and implications of development within the existing urban / high density (infill) areas of the region vs. expansion into new suburban / low density (greenfield) areas.

Consistent with the findings of studies completed in other jurisdictions, the data confirms that low density 'urban sprawl' is more costly to build and maintain than redevelopment and intensification in established urban areas. Some of the study's notable findings include:

- Higher density forms of development are more cost-effective in urban / developed areas, where public infrastructure investments can be best utilized.
- Achieving compact, complete communities does not necessarily require extremely high density development forms. For example, moving from low density to medium densities in urban centres and along transit corridors can provide significant improvements in infrastructure servicing cost outcomes.
- The costs of infrastructure and utility fees should be set to better reflect actual service costs.
- Applying Development Cost Charges that vary by residential unit type / size / density as well as sub-area geography, better reflects the actual costs of servicing demand.
- Closely coordinating and integrating land use planning, engineered infrastructure, asset management, and municipal financial decision-making including full lifecycle costing, leads to improved land use and financial outcomes.

## PURPOSE

To provide the Regional Planning Committee and MVRD Board with the findings of the Costs of Providing Infrastructure and Services to Different Residential Densities Study (Attachment 1).

## BACKGROUND

A foundational principle of *Metro 2050* is directing growth within the Urban Containment Boundary and, in particular, to Urban Centres and Frequent Transit Development Areas. This overarching tenet advances a number of objectives, including the efficient provision and use of infrastructure, increased transit ridership, supporting the building of compact, complete, mixed-use, and walkable communities, protecting natural and agricultural areas, and reducing the need for driving and the consequent reduction in energy consumption and GHG emissions.

To better understand the costs and revenues associated with 'urban' vs. 'sprawl' residential development in the Metro Vancouver region, this study explores the municipal infrastructure capital and operating costs for different residential forms and densities, and property taxation and utility fees, on a per unit and per capita basis.

## PROJECT OBJECTIVES AND COMPLEXITIES

Various research into this matter has been completed in a number of American, Australian, and other Canadian geographies, but not in the Metro Vancouver region. This study summarizes that research as well as other available references, provides a literature review of related publications, case studies, and best practices, and is supplemented with informational interviews with leading practitioners and academics, focused on the findings most relevant to this region.

This study provides an accessible, current, and a comprehensive informational resource to inform municipal planning initiatives and the implementation of regional growth policies pertaining to different densities and forms of residential development in different contexts. The results will also inform the *Metro 2050* Urban Centres and Frequent Transit Development Area target review and update which is planned for 2024.

### Methodological Complexities and Assumptions

Defining, calculating, and attributing costs and revenues for services by different asset classes or unit types is a data and methodological challenge. For the purposes of this study, the categories used include both infrastructure (capital) costs and revenues, and service (operating) costs and revenues. Some of these costs may be paid for by a developer as one-time charges during initial construction, by either directly providing the infrastructure or by paying Development Cost Charges (DCCs), while some are paid by owners / residents in the form of ongoing property taxes and utility user fees.

Based on a review of current municipal budgets in the region, it was found that approximately one-third of expenditures (i.e., both capital and operating costs) are related to utilities / engineering services that could be impacted to some degree by land uses, development forms / densities, and associated infrastructure requirements, with the balance (approximately two-thirds) being unrelated.

Some practical challenges for such calculations including defining 'urban' or 'sprawl' development forms / densities for data collection and reporting purposes, and the attribution of a portion of costs and revenues to other non-residential land uses, such as commercial and industrial uses. Furthermore, many municipal services and associated costs are a function of residential population

rather than housing density, and some services, such as capital-intensive infrastructure, can benefit from economies of scale, while labour-intensive services generally do not.

There are also significant local and contextual considerations. Some municipal costs may be higher on an absolute basis in a high-density, established urban location because of 'urban harshness' and increased construction complexities, but lower on a per unit or per capita basis because of the greater development densities. Given these and other complexities and limitations, the study's calculations should be considered as high-level estimates for guidance.

**Project Timeline**

A scope of work report for the study was presented to the Regional Planning Committee on April 14, 2023 (Reference 1). The final draft of the study was presented to the Regional Planning Advisory Committee at its meeting on October 13, 2023. Committee members expressed interest in the topic and about how the study could be used to inform regional and municipal land use planning initiatives and decision making that are both financially and environmentally sustainable and better communicate the trade-offs.

**KEY FINDINGS**

'Urban sprawl' refers to dispersed, segregated (single-use), automobile-oriented, urban-fringe development, while 'smart growth' comprises more compact, mixed-use, multi-modal forms of development. Some, but not all, public services are sensitive to a city's development patterns and residential densities. From a high level review of total budget expenditures of the larger municipalities in the Metro Vancouver region (i.e., Vancouver, Surrey, Burnaby, Richmond), the majority of costs are associated with providing services of various types that do not generally have a direct relationship with development densities or forms. For example, costs like community parks, recreational facility, library, licensing / permitting, police, fire, and general government are largely a function of the number of residents (or per capita), rather than density of development.

The study confirms that more compact development forms tend to reduce infrastructure costs on a per capita basis, support a more efficient use of resources, and encourage more cost-effective forms of transportation. For the cities in the Metro Vancouver region that were analyzed, it appears that in the range of 27-37% of municipal expenditures are associated with these types of utilities / engineering services (i.e., both capital and operating costs).

Higher density development forms are associated with lower per capita municipal expenditures in the areas of:

- Operational costs for: fire protection, streets and highways, parks and recreation, sanitary sewer, solid waste management, and water servicing;
- Construction costs for: streets and highways, parks and recreation, sewer, and water; and
- Facility costs for: police, sanitary sewer, and water servicing.

The relationships between residential densities and public costs are complex. Costs are typically dependent on the specific services (their age and conditions), service levels, and local context.

## Costs by Development Type

For this study, three residential density typologies (i.e., houses, townhouses, apartments) were used as the basis to prepare the simplified infrastructure / servicing cost estimates, each with a 'low' and 'high' density variant, resulting in a total of six typologies. For each typology, the servicing costs to construct the public roadway with infrastructure and lot utility connections were estimated using the same amount of land and road areas for each. The road and servicing requirements vary slightly depending on the development scenario, and the size and number of utility connections for each scenario may differ as well.

## Key Findings

The following are the study's key findings for the Metro Vancouver region:

*Cost of infrastructure*

- The costs for onsite infrastructure / servicing for house vs. apartment developments in the Metro Vancouver region are approximately five to nine times more expensive on a per capita basis ($13,000 vs. $2,400) and on a per unit basis ($40,000 vs. $4,500), respectively.

*Development Cost Charges (DCC)*

- In Metro Vancouver, the municipal DCC rates per unit are almost always highest for single-detached houses (up to $40,000 to $60,000), lowest for apartment units (approximately $10,000), and in between for townhouses.
- However, when adjusted for the typical number of residents in a household, which varies by unit type, the range of per capita DCC rates vary only by a few thousand dollars, averaging: $9,000 per apartment resident, $10,000 per townhouse resident, and $11,000 per house resident.

*Property Taxes*

- On average in Metro Vancouver, detached houses pay $5,600 in property taxes; the amounts are lower for townhouses ($3,000) and apartments ($2,100). These amounts vary by municipality.

Table 1 shows the resulting unit yields and costs per unit and per capita for each of the six residential typologies. The results illustrate the greater cost effectiveness of higher density and multi-unit residential development forms can be as compared to lower density, single-detached development, because the infrastructure costs can be apportioned to more units.

**Table 1 – Servicing Cost by Residential Typology**

| | Scenario | Unit Yield | Servicing Costs | Cost Per Unit | *Persons per Household* | Cost Per Capita |
|---|---|---|---|---|---|---|
| 1 | House (Low) | 16 | $640,000 | **$40,000** | *3.10* | **$ 12,903** |
| 2 | House (High) | 24 | $880,000 | **$36,667** | *3.10* | **$ 11,828** |
| 3 | Townhouse (Low) | 40 | $680,000 | **$17,000** | *2.75* | **$ 6,182** |
| 4 | Townhouse (High) | 60 | $700,000 | **$11,667** | *2.75* | **$ 4,242** |
| 5 | Apartment (Low) | 100 | $800,000 | **$ 8,000** | *1.85* | **$ 4,324** |
| 6 | Apartment (High) | 200 | $900,000 | **$ 4,500** | *1.85* | **$ 2,432** |

As most of these infrastructure costs are initially borne by a developer and ultimately the purchaser or resident, lower infrastructure costs can help contribute to lower housing costs. Furthermore,

after construction and development, the cost of maintaining the infrastructure is typically the responsibility of the municipality and ultimately taxpayers, therefore more efficient infrastructure systems can reduce public operating costs and fees / taxes over the long term.

**CONSIDERATIONS**

Municipalities routinely make land use decisions that can impact livability, affordability, and sustainability over the long term. The results of this study and others that were reviewed as part of this work indicate that those decisions can also inadvertently encourage inefficient growth patterns and work against policy objectives. These growth patterns can be costly not only from an environmental and social perspective, but also on long-term municipal finances. This can result in rising servicing costs, mounting infrastructure deficits, reduced service levels, declining quality of life, and a loss of economic competitiveness.

The following should be considered when making land use and urban form decisions, public infrastructure investments to support desired forms of residential land uses and densities, and when reviewing property tax and utility fee policies:

- It is critical to permit and facilitate higher density and more cost-effective forms of development in urban / developed areas (i.e., infill, intensification, redevelopment), where public infrastructure investments can be best utilized. Where regulatory barriers exist to urban densification in such locations, consider a review of policies and regulations, and discourage developments that are not compact form, mixed-use, and that cannot be cost-efficiently serviced.
- Achieving compact, complete communities does not necessarily require extremely high density development forms. Optimum densities are a factor of context, and are often a combination of densities and uses that result in more livable, sustainable, and balanced communities. For example, moving from low density to medium densities in urban centres and along transit corridors can provide significant improvements in infrastructure servicing cost outcomes, while meeting other policy objectives pertaining to neighbourhood design and GHG reductions.
- The costs of infrastructure and utility provision should be set to better reflect actual service costs and charge those who directly benefit:
    - The use of metering for utilities should be considered, where possible, such as for water and sewer. With new and emerging technologies, such as improved metering, user fees can be more precise and effective, and managed electronically.
    - Utility fees should not be focused simply on raising revenues, but also on changing behaviours and outcomes. Fees and incentives can be set and adjusted to encourage desired actions and choices to meet community building and climate action objectives.
- Applying Development Cost Charges that vary by residential unit type / size / density as well as sub-area geography, better reflects the actual costs of servicing demand.
- Closely coordinating and integrating land use planning, engineered infrastructure, asset management, and municipal financial decision-making including full lifecycle costing, leads to improved land use and financial outcomes.

**ALTERNATIVES**

This is an information report. No alternatives are presented.

## FINANCIAL IMPLICATIONS

This work was completed in by Regional Planning staff. There were no financial costs associated with this project.

## CONCLUSION

To better understand the costs and revenues associated with different residential development forms and densities in the Metro Vancouver region, this study explores the municipal infrastructure capital and operating costs for different types of housing, and property taxation / utility fees.

Compact development forms tend to reduce infrastructure costs on a per unit and per capita basis, provide residents with broader housing and transportation choices, support a more efficient use of resources, and encourage more sustainable forms of transportation. The case studies completed as part of the study generally indicate that the infrastructure servicing costs per dwelling unit declines as residential densities increase. It is critical to permit and facilitate higher densities and more cost-effective forms of development in urban areas (i.e., infill, intensification, redevelopment), where public infrastructure investments can be most-efficiently utilized over the long-term. Achieving compact, complete communities does not necessarily require extremely high density development; optimum densities are based on context, and are often a mix of densities and uses that result in more livable, sustainable, and vibrant communities.

There are opportunities through land use planning decisions, property taxation, setting utility fees, and applying Development Cost Charges that vary by residential unit type / size / density as well as sub-area geography, to better advance municipal and community interests relative to development patterns and housing forms. Understanding the trade-offs associated with the costs and revenues of different land use types and residential densities is critical to long-term financial sustainability and changing outcomes and resident behaviours to meet community building and climate action objectives.

Along with being shared with member jurisdictions, stakeholders and the public, the study will be used to inform further regional policy work in support of *Metro 2050*, municipal land use policy planning and development initiatives, and communicating the importance of cost-effective and coordinated land use and infrastructure planning. The findings of this study will be foundational to supporting the *Metro 2050* Urban Centre and Frequent Transit Development Area target review project which is on the Regional Planning work plan for 2024.

## ATTACHMENTS

1. 'Costs of Providing Infrastructure and Services to Different Residential Densities Study', Metro Vancouver Regional Planning, September 2023.
2. Presentation re: Costs of Providing Infrastructure and Services to Different Residential Densities.

## REFERENCES

1. Report titled "Costs of Providing Infrastructure and Services to Different Forms and Densities of Housing – Scope of Work" presented to the Regional Planning Committee on April 14, 2023

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# Costs of Providing Infrastructure and Services to Different Residential Densities

**September 2023**

**Prepared by:**
**Metro Vancouver**
**Regional Planning**

# Thank You

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- Lyle Walker, Lead Planner, TransLink
- Phillip Walters, Senior Analyst, Urban3
- Jay Wollenberg, Principal, Wollenberg Munro Consulting

# Table of Contents

# 1 Executive Summary

This study documents the costs of providing infrastructure and services to different residential densities. It is an accessible, informational resource to inform municipal planning initiatives and regional growth policies pertaining to different densities and forms of residential development, such as 'infill' and 'greenfield'.

This study summarizes available references, case studies, best practices, and informational interviews, and is focused on findings and implications most relevant to the Metro Vancouver region. It is based on a literature review of available publications and informational interviews with leading practitioners and academics.

**KEY CONSIDERATIONS**

The following should be considered when making land use and urban form decisions, as well as those associated with public infrastructure investments to support desired forms of residential land uses and densities, and when reviewing property tax and utility fee policies:

- It is critical to permit and facilitate higher density and more cost-effective forms of development in urban / developed areas (i.e., infill, intensification, redevelopment), where public infrastructure investments can be best utilized. Where regulatory barriers exist to urban densification in such locations, consider a review of policies and regulations and discourage developments that are not compact form, mixed-use, and that cannot be cost-efficiently serviced.
- Achieving compact, complete communities does not necessarily require extremely high density development forms. Optimum densities are a factor of context, and are often a combination of densities and uses that result in more livable, sustainable, and balanced communities. For example, moving from low density to medium densities in urban centres and along transit corridors can provide significant improvements in infrastructure servicing cost outcomes.
- The costs of infrastructure and utility provision should be set to better reflect actual service costs and charge those who directly benefit:
    - The use of metering for utilities should be considered, where possible, such as for water and sewerage; with new and emerging technologies, such as improved metering, user fees can be more precise and effective, and managed electronically.
    - Utility fees should not be focused simply on raising revenues, but also on changing behaviours and outcomes. Fees and incentives can be set and adjusted to encourage desired actions and choices and meet community buildings objectives.
- Applying Development Cost Charges that vary by residential unit type / size / density as well as sub-area geography, better reflects the actual costs of servicing demand.
- Closely coordinating and integrating land use planning, engineered infrastructure, asset management, and municipal financial decision-making including full lifecycle costing, leads to improved land use and financial outcomes.

## SUMMARY FINDINGS OF THE STUDY

### Literature Review

- 'Urban sprawl' refers to dispersed, segregated (single-use), automobile-oriented, urban-fringe development, while 'Smart Growth' comprises more compact, mixed-use, multi-modal forms of development. Some, but not all, public services are sensitive to a city's development patterns and residential densities.
- More compact development forms tend to reduce infrastructure costs on a per capita basis, support more efficient use of resources, and encourage more sustainable forms of transportation. However, the relationships between residential densities and public costs are complex; actual costs depend on the specific services and conditions, and local context.
- Higher density development forms are associated with lower per capita municipal expenditures for streets and highways, sewer, water, and solid waste.
- While property taxes are for general municipal services and are calculated on assessed property values, a user fee, such as for utilities, is a charge for consuming a municipally provided good or service.
- User fees are a 'cost-recovery revenue tool' and must be set based on the costs of providing the good or service to the user.

### Case Studies

- The case studies generally indicate that the infrastructure servicing costs per dwelling unit declines as residential densities increase.
- This is largely associated with reduced linear infrastructure (i.e., roads, water pipes, sewer lines) per capita for higher density, compact design and development forms, as compared to lower density forms.
- However, large urban infill projects still require significant infrastructure investments. Other costs, such as labour-intensive services (rather than capital-intensive infrastructure), are more directly related to population levels and incurred on a per capita basis.
- Thus, the relationship between residential density and municipal costs is nuanced, and also can be impacted by local matters, such as the condition (age, capacity) of infrastructure and other physical elements such as geography and topography.

### Infrastructure Servicing Costs

- The costs for onsite infrastructure / servicing for house vs. apartment developments are approximately five to nine times more expensive on a per capita basis ($13,000 vs. $2,000) and on a per unit basis ($40,000 vs. $5,000), respectively.
- This illustrates the greater cost effectiveness of higher density and multi-unit residential development forms can be as compared to lower density, single-detached development, because the infrastructure costs can be apportioned to more units.
- As most of these infrastructure costs are initially borne by a developer and ultimately the resident, lower infrastructure costs can help contribute to lower housing costs.

- Furthermore, after construction and development, the cost of maintaining the infrastructure is typically the responsibility of the municipality and ultimately taxpayers, therefore more efficient infrastructure systems can reduce public operating costs and fees / taxes over the long term.

**Development Cost Charges**

- Development Cost Charges (DCCs) in British Columbia are enabled under provincial legislation to pay for new or expanded infrastructure (sewer, water, drainage, parks, and roads) necessary to adequately service the demands of new development.
- In Metro Vancouver, the municipal DCC rates per unit are almost always highest for single-detached houses (up to $40,000 to $60,000), lowest for apartment units (approximately $10,000), and in between for townhouses.
- However, when adjusted for the typical number of residents in a household, which varies by unit type, the range of per capita DCC rates vary only by a few thousand dollars, averaging: $9,000 per apartment resident, $10,000 per townhouse resident, and $11,000 per house resident.
- The DCC rates by unit type can vary considerably by municipality, yet within individual municipalities generally do not vary. While allowable under provincial legislation, most municipalities do not charge different DCC rates for different sub-areas or catchment areas.

**Municipal Expenditures Analysis**

- Based on a review of current municipal budgets in the region, approximately one-third of expenditures (i.e., both capital and operating costs) are related to utilities / engineering services that could be impacted to some degree by land uses, development forms, and densities, and associated infrastructure requirements with the balance (approximately two-thirds), being unrelated.
- The balance of municipal costs (operating and capital) are for various types of 'soft' services that are generally labour-intensive and more a function of population than density.
- While there are potential municipal cost savings associated with more compact forms of development, the scale of this possible amount should be considered within the overall municipal context.

**Property Taxes and Utility Fees**

- Property taxes are a function of the assessed value of a property, with municipal tax rates set by the host municipality. Nearly half of the property taxes collected go to other levels of government than the local municipality, such as to the provincial government and other agencies.
- Municipal utility fees for such services as water, sewage, and garbage, may also apply.
- On average in Metro Vancouver, detached houses pay $5,600 in property taxes; the amounts are lower for townhouses ($3,000) and apartments ($2,100).
- These amounts vary by municipality as the mill rates vary by jurisdiction, and also vary within municipalities depending on the assessed values of properties. Of the total taxes and fees paid by typical households, a quarter to a third of that amount goes to utility fees.

**Methodological Complexities**

- Defining, calculating, and attributing costs and revenues for different services by different asset classes or unit types can be a data and methodological challenge.
- Conceptually, there are four categories: infrastructure (capital) costs and revenues, and service (operating) costs and revenues.
- Some of these may be paid for by a developer as one-time charges during construction, be it through providing the infrastructure and / or paying DCCs, and some by residents in the form of ongoing property taxes and utility fees.
- Some practical challenges for such calculations are defining 'urban' or 'suburban' development forms / densities for data collection and reporting purposes, and potentially attributing some costs and revenues to other non-residential land uses (such as commercial and industrial).
- Many municipal services and associated costs are more a function of residential population level rather than housing density, and some services, such as capital-intensive infrastructure can benefit from economies of scale, while labour-intensive services do not.
- There are also significant local considerations and contextual issues. Some municipal costs may be higher on an absolute basis in a high-density, established urban location because of 'urban harshness' and increased complexities, but lower on a per unit or per capita basis because of the greater development densities.
- Given these complexities and limitations, the expectations about the resulting values should be understood as high-level or estimates.

# 2 Introduction and Context

The Metro Vancouver region is home to 2.8 million residents and 1.6 million jobs. With a limited land base and continued growth, development patterns and housing forms should be guided by cost-effectively using existing and new infrastructure investments and services. The region is also well-known as having high housing costs and strong demand for additional housing supply which can be addressed, in part, by reducing infrastructure costs through efficient land use and infrastructure planning.

Various research into this matter has already been completed in Canadian (mostly Ontario), American, and Australian geographies, but no similar study has been undertaken in the Metro Vancouver region to date. This study provides an analysis that goes beyond 'business as usual' planning and development to elevate the conversation, and address possible some prevailing misconceptions about municipal costs and revenues based on residential forms and densities in the Metro Vancouver region.

Documenting the costs of providing infrastructure and services to different residential densities, this study summarizes available references, case studies, best practices, and informational interviews with leading practitioners and academics, focusing on findings and implications most relevant to the region. It is based on a literature review of available publications and provides an accessible, current, central, informational resource to inform municipal planning initiatives and regional growth policies pertaining to different densities and forms of residential development, such as 'smart growth' (infill and intensification) and 'urban sprawl' (greenfield development). The results are summarized in the following sections, and supplemented with detailed data in appendices.

## 2.1 Study Objectives

*Metro 2050*, the Regional Growth Strategy, directs, supports, and encourages growth within the Urban Containment Boundary and specifically to the region's Urban Centres and Frequent Transit Development Areas. This overarching goal advances a number of objectives, including the efficient provision and use of infrastructure, increased transit ridership, building complete, mixed, and walkable communities, protecting environmental areas, and reduced driving, energy consumption, and GHG emissions. This principle has been a long-standing growth management objective for the region, and is still relevant as the population continues to grow.

To better understand the costs and revenues associated with different residential unit types in the region this study explores the municipal infrastructure / servicing capital and operating costs for different residential forms / densities of housing (e.g., typologies). This study helps inform the discussion about the possible financial benefits and drawbacks of housing development within existing urban / high density (infill) areas vs. expanding housing development to new suburban / low density (greenfield) areas.

This study defines six residential typologies, each with different attributes, including density and form, and estimates the associated infrastructure servicing costs, typical DCCs, and average property taxes and utility fees. Specifically, this study documents the municipal servicing costs and property taxes / utility fees for different forms / densities of residential housing, on a per unit and/or per capita basis. This illustrates the differences between them and outlines the considerations that can inform effective land use planning and infrastructure investments at the regional and local scales. A series of case studies were created representing the characteristics and densities of the various geographies and residential forms to further illustrate these costs.

While there are many environmental, economic, and social benefits of compact residential development forms (i.e., more efficient use of resources, protection of important lands, supporting walkable and transit-oriented communities, etc.), the focus of this study is on municipal financial considerations, specifically related to public infrastructure and services.

## 2.2 Scope of Work

The following is the study scope of work:

- Compile and complete research / literature review on the topic:
  - Review of the urban form and infrastructure cost analysis completed in other jurisdictions;
  - Review the latest research, focused on relevant sources and examples.
  - Complete informational interviews with key informants, such as academics and subject matter experts.
  - Analyze local government services provided in the Metro Vancouver region, and consider both capital costs and operating costs, and property taxes / utility fees.
  - Summarize existing publications and associated costing / financial estimates.
- Identify a series of case study locations using land uses / densities and residential form characteristics to determine costs per unit.
- Profile findings that are most relevant to the Metro Vancouver context.

The study did not intend to:

- Address non-residential forms of development, such as commercial or industrial land uses.
- Make recommendations about possible changes in levels of municipal services or amenities, property taxation, or Development Cost Charges / Community Amenity Contributions.
- Compare costs / revenues of services for housing by municipality within the region.
- Consider housing supply and demand implications or the recommendations of completed Housing Needs Reports.
- Address the impacts of land use regulations on housing costs, or the development approval / review process.
- Explore other indirect advantages or disadvantages of different housing forms / densities.

## 2.3 Development Forms

Compact development forms are often nearly synonymous with the term ‘smart growth’ or sustainable, complete communities, the key principles of which include:

- Efficient use of land and infrastructure.
- A greater mix of uses and housing choices.
- Complete neighbourhoods and communities focused around human-scale, walkable, mixed-use centres.
- A balanced, multi-modal transportation system providing increased transportation choice.
- Well-defined community edges, such as agricultural areas, natural corridors, or open spaces.

‘Urban sprawl’ is a term generally defined as homogenous low density residential development, typically in the form of single-detached housing, a separation of land uses, spread out development patterns, and auto-oriented transportation modes.

In terms of servicing costs for such different forms or densities of residential development:[1]

- The longer distance water and wastewater facilities are from the property they service, the costlier it is to serve, holding density constant.
- The farther away properties are from fire stations, the greater the risk of loss from fire and the higher the fire insurance costs.
- As the distance between origin and destination increases, the road costs per trip increases as do the road costs per vehicle kilometres travelled.
- For many facilities: as distance increases between the service and those who are served, the cost of service increases per person and the amount or quality of service decreases.
- More spread out and lower density development requires more infrastructure to support it.

## 2.4 Defining the Issue

Research shows that as residential density increases, municipal costs per residential unit decreases for roads and other transportation, linear infrastructure like water and sewage pipes, as well as some services. Density can be measured as units per hectare, and reflected in different building forms, be it large single-detached house lots, townhouse units, and high rise apartment buildings.

Costs associated with development and growth can be separated into two categories: infrastructure / capital costs, and service / operating costs. Over the lifecycle of the infrastructure, which can span 30-100 years, the operation, maintenance, and repair costs of public facilities is often comparable to their initial capital costs.

Typically, most of the infrastructure costs are initially paid for by the developer in the form of installing on-site engineering civil works and paying DCCs for off-site works as part of the initial development. The perpetual ongoing operating and maintenance costs are the responsibility of the municipality, funded by property taxes / utility fees. However, it is not always the case in that some 'local' services may be provided by other agencies, such as transit, hospitals, and schools, and some infrastructure costs may be funded by senior levels of government, such as capital grants for rapid transit lines and treatment plants. Furthermore, there is also necessary large scale regional infrastructure provided by Metro Vancouver to municipalities (e.g., treatment facilities, major trunk lines) which convey services via local infrastructure to properties within their geography.

## 2.5 Study Structure

This study explores the relevant costs and revenues of different housing forms and densities, extracting highlights from a review of available publications and studies completed in other jurisdictions, with some calculations provided as examples for typical typologies in the Metro Vancouver region.

Notably, there are considerable methodological and practical challenges to calculating and allocating costs and revenues. The results of this study are profiled and summarized in each of the sections, with additional materials included in the appendices. The final section identifies considerations for policy actions associated with the noted challenges and opportunities.

[1] Rationale for Smart Growth Fiscal Impact Analysis and Model, Smart Growth America, Arthur Nelson, 2022.

# 3 Literature Review

This section summarizes results from a review of available relevant literature (see Appendix A for greater detail).

## 3.1 Sprawl and Compact Development Forms

This section defines 'urban sprawl' or low-density development forms, and 'smart growth' or compact development forms, and explains the difference between them.

Urban Sprawl – Sprawl is defined as excessive or inefficient suburbanization[2]. Research suggests this excessive spatial growth is the result of market failures to consider: the social value of open space; the social costs of commuting patterns by individuals; and the public, social, economic, and environmental costs of development projects. This leads to excessive commuting, homogenous land uses, cities that are geographically too large, and artificially inexpensive developments on the urban fringe.

Urban sprawl refers to dispersed, segregated, single-use, automobile-oriented, urban-fringe forms of development. The alternative, often referred to as smart growth, involves more compact, mixed-use, multi-modal forms of development. Figure 3.1 compares these two development patterns[3].

Smart Growth – Compact, complete communities is a general set of planning principles that can be applied in many different ways. In rural areas, it creates compact, walkable villages with a mix of single- and multi-unit housing oriented around a commercial centre. In large cities, smart growth creates dense, mixed-use, walkable, and transit-oriented neighbourhoods. Between these is a wide range of neighbourhood types, a common theme of which is being compact and multi-modal. In mature cities, smart growth consists primarily of incremental infill and redevelopment in existing neighbourhoods, but in growing cities it often consists of outward urban expansion.[4] Smart growth does not necessarily require all residents to live in high-rise apartments and forego automobile travel, nor does it preclude outward expansion.

[2] The Fiscal Impacts of Urban Sprawl: Evidence from US County Areas, Christopher B. Goodman, 2019.
[3] Analysis of Public Policies that Unintentionally Encourage and Subsidize Urban Sprawl, Victoria Transport Policy Institute, Todd Litman, 2015.
[4] Analysis of Public Policies that Unintentionally Encourage and Subsidize Urban Sprawl, Victoria Transport Policy Institute, Todd Litman, 2015.

**Figure 3.1: Urban Sprawl and Smart Growth Comparison**

| | Sprawl | Smart Growth |
|---|---|---|
| **Density** | Lower-density, dispersed activities. | Higher-density, clustered activities. |
| **Land use mix** | Single use, segregated. | Mixed. |
| **Growth pattern** | Urban periphery (greenfield) development. | Infill (brownfield) development. |
| **Scale** | Large scale. Larger blocks and wide roads. Less detail, since people experience the landscape at a distance, as motorists. | Human scale. Smaller blocks and roads. Attention to detail, since people experience the landscape up close. |
| **Services (shops, schools, parks, etc.)** | Regional, consolidated, larger. Requires automobile access. | Local, distributed, smaller. Accommodates walking access. |
| **Transport** | Automobile-oriented. Poorly suited for walking, cycling and transit. | Multi-modal. Supports walking, cycling and public transit. |
| **Connectivity** | Hierarchical road network with many unconnected roads and walkways. | Highly connected roads, sidewalks and paths, allowing direct travel. |
| **Street design** | Streets designed to maximize motor vehicle traffic volume and speed. | Reflects *complete streets* principles that accommodate diverse modes and activities. |
| **Planning process** | Unplanned, with little coordination between jurisdictions and stakeholders. | Planned and coordinated between jurisdictions and stakeholders. |
| **Public space** | Emphasis on private realms (yards, shopping malls, gated communities, private clubs). | Emphasis on public realms (shopping streets, parks, and other public facilities). |

## 3.2 Municipal Infrastructure

The most common factors influencing infrastructure project costs and service delivery costs include[5]:

- Urban form: population size, density, lot size and shape, location of development, dispersion of development, housing typology, and street network pattern.
- Site conditions / topography: geographical location, space availability, transportation access, slope.
- Utility capacity utilization: catchment of existing infrastructure and the level of augmentation required is an important location specific factor affecting costs, especially in infill areas.
- Proximity to service areas: distance of the new development from existing utility plants and trunk infrastructure.

Many public services are sensitive to a community's pattern of development because the configuration of a community and the way the community is connected geographically can profoundly affect service delivery. A compact development pattern will, at the very least, save operating costs simply because service vehicles are required to drive fewer kilometres. In some cases, the actual number of vehicles and facilities can be decreased, along with the personnel required to provide those services.[6]

The relationship between density and public costs is complex. Actual costs depend on the specific services and conditions. There can be costs associated with development density including increased congestion and friction between activities, special costs for infill development, and higher design standards. One study concludes that costs are[7]:

- Lowest in rural areas where most households provide more of their own services.
- Increase in suburban areas where services are provided to dispersed development forms.
- Lowest for infill redevelopment in areas with adequate infrastructure capacity.
- Increase at very high densities due to congestion and high land and construction costs.

[5] Literature Review of the Costs of Infrastructure Provision for Different Development Forms, Shivani Ragha, and Dena Kasraian, Eric J. Millers, 2019.
[6] Building Better Budgets: A National Examination of the Fiscal Benefits of Smart Growth Development, Smart Growth America, 2013.
[7] Evaluating Transportation Land Use Impacts, Victoria Transport Policy Institute, Todd Litman, 2022.

## 3.3 Housing Density and Infrastructure Costs

Development density was found to be negatively associated with per capita municipal expenditures for the following cost categories:

- Operational costs for: fire protection, streets and highways, parks and recreation, sanitary sewer, solid waste management, and water servicing.
- Construction costs for: streets and highways, parks and recreation, sewer, and water.
- Facility costs for: police, sanitary sewer, and water servicing.

Results tend to be insignificant for other cost categories. In general, results support the conclusion that increased development density is associated with reduced per capita municipal spending for several cost categories.[8]

Lower density, auto-oriented developments tend to require more infrastructure per capita than do more compact developments. Sprawling cities tend to have a greater length of streets and water and sewer pipes per person to maintain, and services such as trash collection and fire and police protection have a larger area to service per resident. This can result in an increase in per capita infrastructure, maintenance, and service costs for cities. More compact developments can lead to cost savings through economies of scale and economies of geographic scope. Economies of scale are exhibited when the marginal cost of providing services per person decreases as more residents cluster within an area. Economies of geography are found when the marginal cost decreases as each person locates more closely to existing major public facilities.[9]

Dispersed development tends to increase the per capita length of roads and utility lines (e.g., water, sewage, power, etc.), and the travel distances needed to provide public services (e.g., garbage collection, policing, emergency response, etc.). While rural residents tend to accept lower service quality (unpaved roads, slower emergency response times, lack of water and sewer servicing, etc.) and provide many of their own services (well water, septic systems, garbage disposal, etc.), suburban developments tend to attract residents who often expect urban levels of services in dispersed, low density locations, which greatly increases public costs.[10]

## 3.4 Property Taxes

Property taxes are the largest source of revenue for local governments and fund local services. Their application can in some cases be considered unfair as they are unrelated to ability to pay or to the benefits received, unsuitable as they support services that are not related to the property, and inadequate as they do not provide sufficient public revenues to meet local expenditure needs.[11]

Benefits from services are more closely reflected in property values than in the size of the property. For example, properties close to transit or parks tend to see higher property values. Moreover, market value

[8] Relationships between Density and per Capita Municipal Spending in the United States, Upper Great Plains Transportation Institute, Jeremy Mattson, 2021.
[9] Relationships between Density and per Capita Municipal Spending in the United States, Upper Great Plains Transportation Institute, Jeremy Mattson, 2021.
[10] Analysis of Public Policies That Unintentionally Encourage and Subsidize Urban Sprawl, Victoria Transport Policy Institute, Todd Litman, 2015.
[11] How to Reform the Property Tax: Lessons from around the World, IMFG Papers on Municipal Finance and Governance, Enid Slack and Richard M. Bird, 2015.

also has the advantage of capturing the value added by neighbourhood amenities created by government expenditures and policies.[12]

There is less economic rationale for higher taxation of non-residential property. Differentially higher taxation can distort land use decisions and favour residential use over commercial and industrial uses.

## 3.5 User Fees

A user fee is a charge for a publicly provided good or service. The revenues from such a fee must be used solely to fund the provision of that good or service, and the amount of the fee is dictated by the cost of providing the good or service. Furthermore, payment of the fee is a necessary condition for consuming the good or service. User fees, therefore, are valuable tools when it comes to covering the operating costs of municipal services. There are many examples of user fees at the municipal level, such as: public transit fares, recreation fees, electric and natural gas provision, and utility and garbage collection payments.[13]

These features of user fees have several implications for their design, implementation, and use. First, user fees are a 'cost-recovery revenue tool' (i.e., the fees must be used to recoup the actual costs incurred). The revenues from the fees must be used solely to offset the costs of providing the good or service, and a link must exist between the activity being charged and the activity funded by the revenue from the user fee. That is to say, user fees involve a need to track: (1) the money collected and (2) how the money is spent.

Second, the user fee must be designed in such a way that it does not intentionally generate a surplus of public revenues. Ongoing surpluses are a clear indication that the fee charged exceeds the costs incurred and thus violates the cost-recovery nature of the revenue tool. At the same time, there is no requirement that the revenue from the user fee fully offset costs (although any shortfall must be made up from other revenues, typically property taxation).

Third, the fee charged to the user must be reasonably connected to the costs of providing the good or service to that user. If the costs of providing the service are fixed (i.e., if it costs the same amount to provide each unit, or if it costs the same amount to provide the service to every user) the fee charged cannot vary by unit or user.[14]

## 3.6 Setting User Fees[15]

User fees should be set and designed by considering the cost differentials attributed to economies of scale, capacity constraints, and differential demand in peak and non-peak periods, when second-best circumstances are prevalent and when externalities exist. Ultimately, the objective in setting fees should be the establishment of a clear link between services received and the charges for these services.

Current practice in setting user fees, however, is often to set fees to generate revenue rather than to allocate resources to their most efficient use. As an example, the tendency to charge a fixed price for water, regardless of the quantity consumed can be considered unfair, on the premise that lower income

[12] How to Reform the Property Tax: Lessons from around the World, IMFG Papers on Municipal Finance and Governance, Enid Slack and Richard M. Bird, 2015.
[13] Non-Tax Revenue for Funding Municipal Governments, Funding the Canadian City, Lindsay M. Tedds, 2019.
[14] Non-Tax Revenue for Funding Municipal Governments, Funding the Canadian City, Lindsay M. Tedds, 2019.
[15] Municipal Taxes and User Fees, Tax Policy in Canada, H.M. Kitchen and A. Tassonyi, 2012.

earners cannot afford to pay, provides an implicit subsidy for higher-income households with more bathroom fixtures, and larger lawns to water.

Failure to set prices efficiently can lead to a demand for more services and subsequently a demand for infrastructure that is not efficiently or optimally allocated. Inefficiently set user fees have led to overinvestment and larger facilities than would otherwise be justified if more efficient pricing practices were adopted.

## 3.7 Fees vs. Taxes

User fees are not only efficient but also can be more equitable than taxes, depending on how they are implemented. They satisfy the benefits-received principle of equity, which prescribes a clear link between the good, service, or right being provided and the benefit that the consumer receives.[16]

Opponents of user fees often discount them as a means for raising revenues on the basis that they are regressive -- that is to say, they take up more of the income of a lower-income household than of a higher-income one. This argument ignores the fact that the relative regressivity of a revenue tool depends not on the fee itself but on how it is designed and implemented. The potential regressivity of a user fee can often be offset by careful implementation, such as discounts, increased service provision, and cash transfers.[17]

## 3.8 Summary

'Urban Sprawl' refers to dispersed, segregated (single-use), automobile-oriented, urban-fringe development, while 'Smart Growth' comprises more compact, mixed-use, multi-modal forms of development. Some, but not all, public services are sensitive to a city's development patterns and residential densities. More compact development forms tend to reduce infrastructure costs on a per capita basis, support more efficient use of resources, and encourage more sustainable forms of transportation. However, the relationships between residential densities and public costs are complex; actual costs depend on the specific services and conditions, and local context. Higher density development forms are associated with lower per capita municipal expenditures for streets and highways, sewer, water, and solid waste. While property taxes are for general municipal services and calculated on assessed property values, a user fee, such as for utilities, is a charge for consuming a municipally-provided good or service. User fees are a 'cost-recovery revenue tool' and must be set based on the costs of providing the good or service to the user.

[16] Non-Tax Revenue for Funding Municipal Governments, Funding the Canadian City, Lindsay M. Tedds, 2019.
[17] Non-Tax Revenue for Funding Municipal Governments, Funding the Canadian City, Lindsay M. Tedds, 2019.

# 4 Case Studies

The literature review completed as part of this study included identifying and reviewing published studies from other jurisdictions relating to infrastructure servicing and municipal finance.

These studies are varied but generally address in whole or in part the infrastructure expenditures associated with different residential forms / densities, developer contributions towards infrastructure, operating costs of services, and / or property tax and utility fee revenues.

The summaries profile ten cities / regions as case studies, presenting key points in table format, for the following jurisdictions:

- Ottawa; Ottawa-Carleton; Kingston; Calgary; Edmonton; Halifax (Canada)
- Portland (USA)
- Perth, Adelaide (Australia)

Each profile contains a summary of the study purpose, geography covered, scenarios and typologies documented, results and key findings (see Appendix B for greater detail).

The purpose / objective of the profiled studies varied, as well as the methodology. In some cases, fiscal analysis was for existing developed areas, while in other cases evaluating multiple possible development scenarios for a large, new greenfield site (sometimes referred to as 'sprawl' or 'suburban development' vs. 'compact' or 'infill development'). In some cases, the costs were calculated on a per unit or per capita basis, and in other cases only totals were provided. Furthermore, some studies considered the entire lifecycle costs of infrastructure and services, and others only parts of it. The costs that were included in the analyses varied and are not consistent, thus direct comparison between results is not feasible. The site / area specific factors and geographies can greatly influence required infrastructure improvements and costs, and introducing mixed-use development forms with commercial components can also affect the attribution of costs.

Some of the case studies note other matters, such as development costs for developers which can be higher in an urban location due to additional complexities, and personal transportation costs which are not borne by the municipality, etc. Furthermore, the case studies note, but do not quantify, other considerations, such as land uses and environmental impacts.

## 4.1 Summary

The case studies generally indicate that the infrastructure servicing costs per dwelling unit declines as residential densities increase. This is largely associated with reduced linear infrastructure (i.e., roads, water pipes, sewer lines) per capita for higher density, compact design and development forms, as compared to lower density forms. However, large urban infill projects still require significant infrastructure investments. Other costs, such as labour-intensive services (rather than capital-intensive infrastructure), are more directly related to population levels and incurred on a per capita basis. Thus, the relationship between residential density and municipal costs is nuanced, and also can be impacted by local matters, such as the condition (age, capacity) of infrastructure and other physical elements such as geography and topography.

# 5 Infrastructure Servicing Cost Estimates by Residential Typology

## 5.1 Residential Housing Typologies Defined - Densities, Forms, Types

Residential housing 'types' or 'typologies' can be classified and organized in many ways, including along a spectrum or continuum. This definitional analysis can be based on tenure (from below market rental to luxury ownership), or density / form (from low rural density to high urban density) (see Appendix C for greater detail).

The measure of density changes (e.g., Floor Area Ratio (FAR) or Units per Hectare (UPH)), as other attributes are also affected by and part of the typology. This can include building size, height, and site coverage, etc. This influences the built form, be it ground oriented housing with yards or stairs and elevators for upper levels. For example, lower density forms can have surface level parking and be constructed out of wood frame, whereas higher densities are likely to have underground or structured parking facilities and concrete construction, which can vary widely in terms of construction costs.

The ratio of the neighbourhood lands devoted for roads and parks may also vary, as well as area amenities and transit service. This all contributes to the amount of population, required infrastructure, transportation patterns, commercial activities, etc., for the area. A community can include multiple typologies, and these land uses / densities can change over time and intensify to more urban forms through redevelopment.

## 5.2 Typologies for Study and Servicing Cost Estimates

For this study, the following residential density typologies were used as the basis to prepare the simplified infrastructure / servicing cost estimates. Three residential types were established (i.e., houses, townhouses, apartments), each with a 'low' and 'high' density variant, creating a total of six typologies. See Figures 5.1, 5.2, and 5.3 for representative images for these typologies.[18]

**Figure 5.1: House Typologies (Low and High)**


[18] Visualizing Density, Lincoln Institute of Land Policy, Julie Campoli and Alex S. MacLean, 2007.

**Figure 5.2: Townhouse Typologies (Low and High)**

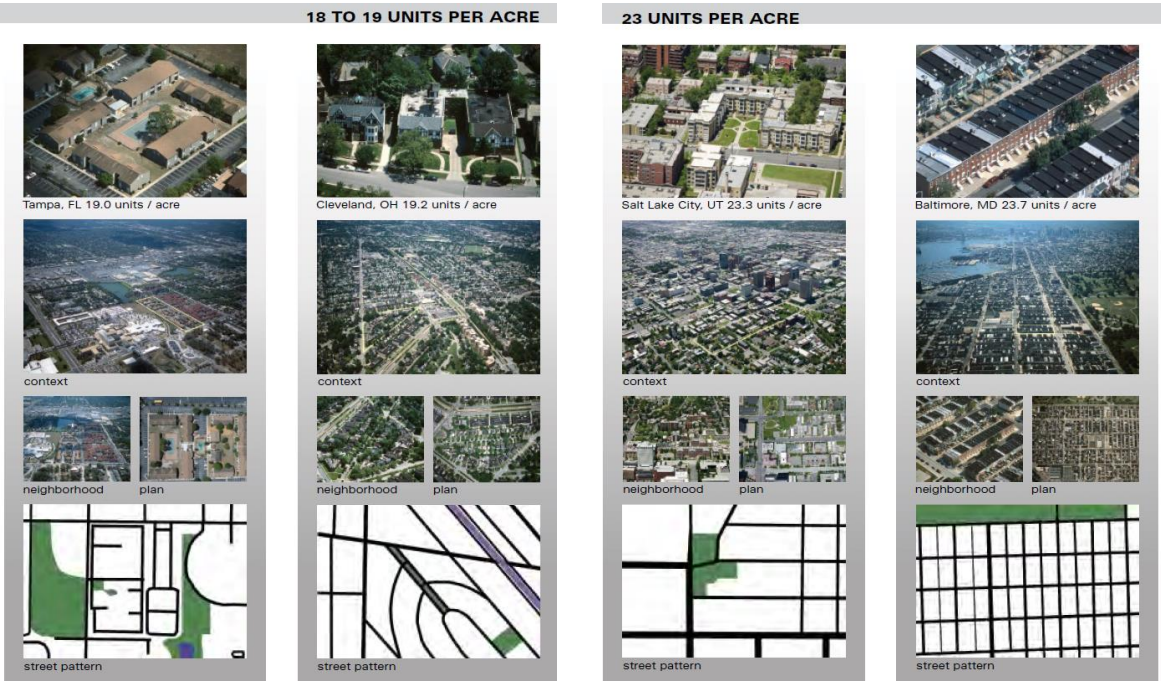
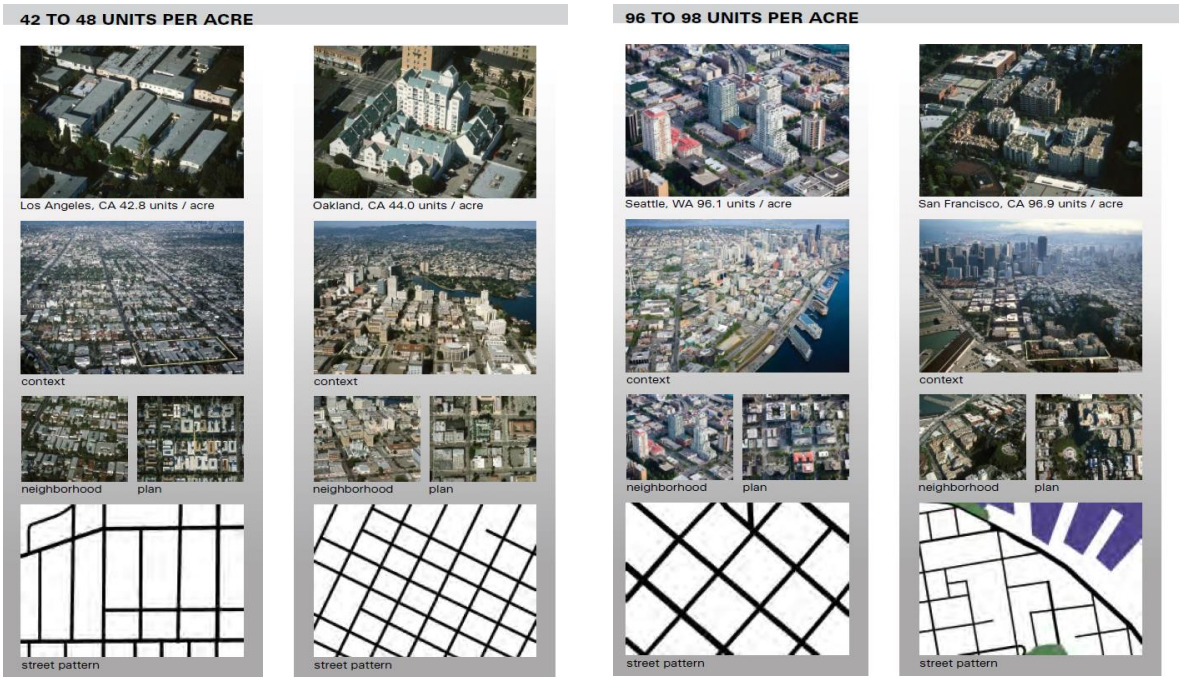



**Figure 5.3: Apartment Typologies (Low and High)**



While these typologies are simplistic and with limitations, for consistency and comparability the development scenarios and costing estimates prepared for the six scenarios all use the same amount of land and road areas, i.e.,:

- Road: 100 metres length, 18 metres wide, though the centre of the site (with developable land on both sides).
- Land: 100 metres strip of land on both sides of the road, 40 metres deep.
- Site: 8,000 $m^2$ (0.8 hectare / approx. 2 acres) of net developable land (plus the road in-between).

With this assumed constant amount of land and road, the development scenarios by residential form and density are as follows:

1. HOUSE (Low) – 100 metre road length, with 8 lots / houses on each site (Lots: 12.5 m wide x 40 m deep; 500 $m^2$ lot size) = 16 lot utility connections (16 houses), plus the road with services.
2. HOUSE (High) – 100 metre road length, with 12 lots / houses on each site (Lots: 8.33 m wide x 40 m deep; 333 $m^2$ lot size) = 24 lot utility connections (24 houses), plus the road with services.

3. TOWNHOUSE (Low) – 100 metre road length, with 2 townhouse strata lots on each side (each 50 m wide x 40 m deep; 200 $m^2$ lot size) = 4 lot utility connections (40 townhouse units total), plus the road with services.
4. TOWNHOUSE (High) – 100 metre road length, with 2 townhouse strata lots on each side (each 50 m wide x 40 m deep; 200 $m^2$ lot size) = 4 lot utility connections (60 townhouse units total), plus the road with services.

5. APARTMENT (Low) – 100 metre road length, with 2 apartment strata lots on each side (each 50 m wide x 40 m deep; 200 $m^2$ lot size) = 4 lot utility connections (100 apartment units total), plus the road with services.
6. APARTMENT (High) – 100 metre road length, with 2 apartment strata lots on each side (each 50 m wide x 40 m deep; 200 $m^2$ lot size) = 4 lot utility connections (200 apartment units total), plus the road with services.

For each of the six scenarios, the servicing costs to construct the public road with infrastructure and lot utility connections were estimated using the same amount of land and road areas for each. The road and servicing requirements vary slightly depending on the development scenario, such as assuming that for single-detached (house) lots a local road standard would be adequate, and for multiple units (townhouses and apartments) the road standard would be higher at three lanes instead of two, and larger pipes sizes. Furthermore, the size and number of utility connections for each scenario may differ as well. Table 5.1 shows the resulting unit yields and densities.

**Table 5.1: Residential Typologies and Densities**

| | NET LAND AREA (excluding public road) | | | | | |
|---|---|---|---|---|---|---|
| | Scenario | Unit Yield | Land Area Ha | Land Area Ac | Net UPH | Net UPA |
| 1 | House (Low) | 16 | 0.80 | 1.98 | 20.0 | 8.1 |
| 2 | House (High) | 24 | 0.80 | 1.98 | 30.0 | 12.1 |
| 3 | Townhouse (Low) | 40 | 0.80 | 1.98 | 50.0 | 20.2 |
| 4 | Townhouse (High) | 60 | 0.80 | 1.98 | 75.0 | 30.4 |
| 5 | Apartment (Low) | 100 | 0.80 | 1.98 | 125.0 | 50.6 |
| 6 | Apartment (High) | 200 | 0.80 | 1.98 | 250.0 | 101.2 |
| | | | | | | |
| | **GROSS LAND AREA (including public road)** | | | | | |
| | Scenario | Unit Yield | Land Area Ha | Land Area Ac | Gross UPH | Gross UPA |
| 1 | House (Low) | 16 | 0.98 | 2.42 | 16.3 | 6.6 |
| 2 | House (High) | 24 | 0.98 | 2.42 | 24.5 | 9.9 |
| 3 | Townhouse (Low) | 40 | 0.98 | 2.42 | 40.8 | 16.5 |
| 4 | Townhouse (High) | 60 | 0.98 | 2.42 | 61.2 | 24.8 |
| 5 | Apartment (Low) | 100 | 0.98 | 2.42 | 102.0 | 41.3 |
| 6 | Apartment (High) | 200 | 0.98 | 2.42 | 204.1 | 82.6 |

The total infrastructure costs, irrespective of if installed or funded by a developer or a municipality, were estimated, and divided by unit yield to calculate cost per residential unit. It is again noted that this is an estimate, using simple industry averages for construction, and does not take into account any local considerations, off-site infrastructure, etc.

The resulting cost estimates are shown below in Table 5.2. The cost of constructing the road to a higher standard for multiple units is slightly higher than for single-detached use. With single-detached developments, each lot has a utility connection to the public system, whereas for multiple-unit developments, each complex has a connection.

As the densities / yields are much higher for the apartment scenarios, dividing the total servicing costs by the number of residential units provides for significantly lower infrastructure costs per unit. When adjusted for the number of persons per household which varies by unit type (1.85 per apartment, 2.75 per townhouse, and 3.10 per house based on 2021 Census data), the cost per capita is also seen to be lower as densities increase, but not to the same degree.

**Table 5.2: Residential Typologies - Servicing Costs**

| | Scenario | Unit Yield | Servicing Costs | Cost Per Unit | *Persons per Household* | Cost Per Capita |
|---|---|---|---|---|---|---|
| 1 | House (Low) | 16 | $640,000 | **$40,000** | *3.10* | **$ 12,903** |
| 2 | House (High) | 24 | $880,000 | **$36,667** | *3.10* | **$ 11,828** |
| 3 | Townhouse (Low) | 40 | $680,000 | **$17,000** | *2.75* | **$ 6,182** |
| 4 | Townhouse (High) | 60 | $700,000 | **$11,667** | *2.75* | **$ 4,242** |
| 5 | Apartment (Low) | 100 | $800,000 | **$ 8,000** | *1.85* | **$ 4,324** |
| 6 | Apartment (High) | 200 | $900,000 | **$ 4,500** | *1.85* | **$ 2,432** |

## 5.3 Summary

The costs for onsite infrastructure / servicing for house vs. apartment developments are approximately five to nine times more expensive 1) on a per capita basis ($13,000 vs. $2,000) and 2) on a per unit basis ($40,000 vs $5,000), respectively. This illustrates the greater cost effectiveness of higher density and multi-unit residential development forms can be as compared to lower density, single-detached development, because the infrastructure costs can be apportioned to more units. As most of these infrastructure costs are initially borne by a developer and ultimately the resident, lower infrastructure costs can help contribute to lower housing costs. Furthermore, after construction and development, the cost of maintaining the infrastructure is typically the responsibility of the municipality and ultimately taxpayers, therefore more efficient infrastructure systems can reduce public operating costs and fees / taxes over the long term.

# 6 Calculating Typical Development Cost Charges in the Region

## 6.1 Development Cost Charges[19]

Local governments in British Columbia can levy development cost charges (DCCs) on new development to pay for new or expanded infrastructure such as sewer, water, drainage, parks, and roads necessary to adequately service the demands of that development.

DCCs are established by bylaw with the approval of the provincial Inspector of Municipalities. A DCC bylaw may establish charges over the entire local government or just a portion of it.

DCCs are calculated separately for each category of infrastructure: water, sewer, drainage, parks, and roads. The amount of a DCC for each infrastructure category is determined by dividing the expected infrastructure costs (required to service new development over the DCC timeframe) by the number of new development units that will be served.

Separate DCCs may be established for different classes of development, for example, residential, commercial, industrial, and institutional. Charges may then be collected from developers either at the time of subdivision approval (for single-detached lots) or at the issuance of a building permit (for multi-unit residential and commercial buildings). Area specific charges can also be imposed to defined benefiting areas.

## 6.2 Community Amenity Contributions[20]

Beyond DCCs, municipalities may charge Community Amenity Contributions (CACs) or density bonusing fees. As defined by the Province:

> *Community amenity contributions are negotiated amenity contributions agreed to by the developer and local government as part of a rezoning process initiated by the developer. Community amenity contributions typically include the provision of amenities, affordable housing and/or financial contributions towards amenities. The agreed-to contribution is obtained by the local government, if the local government decides to adopt the rezoning bylaw.*
>
> *As an additional approach, local governments sometimes negotiate CACs from those seeking a change in zoning. A change in use or an increase in density generally boosts the value of land, and provides the possibility of a financial benefit to the land owner, developer or local government. Increasingly, local governments and residents see this as a reasonable opportunity to help fund community amenities.*

[19] Province of British Columbia, Development Cost Charges, Website: www2.gov.bc.ca/gov/content/governments/local-governments/finance/local-government-development-financing/development-cost-charges

[20] Province of British Columbia, Density Bonusing and Amenities, Website: www2.gov.bc.ca/gov/content/governments/local-governments/planning-land-use/land-use-regulation/zoning-bylaws/density-bonusing-amenities

## 6.3 Regional Development Cost Charges

In this region, Metro Vancouver and TransLink also charge DCCs, noted as follows in Tables 6.1, 6.2 and 6.3:

**Table 6.1: Metro Vancouver Water DCC Rates**

| Residential | Townhouse | Apartment | Non-Residential |
|---|---|---|---|
| $6,692 / unit | $5,696 / unit | $4,261 / unit | $3.39 / $ft^2$ of floor area |

**Table 6.2: Metro Vancouver Liquid Waste DCC Rates**

| Sewerage Area | Residential | Townhouse | Apartment | Non-Residential |
|---|---|---|---|---|
| Fraser | $6,254 / unit | $5,390 / unit | $4,269 / unit | $3.30 / $ft^2$ of floor area |
| Lulu Island West | $3,313 / unit | $2,756 / unit | $2,042 / unit | $1.54 / $ft^2$ of floor area |
| North Shore | $3,300 / unit | $2,786 / unit | $2,030 / unit | $1.67 / $ft^2$ of floor area |
| Vancouver | $3,335 / unit | $2,983 / unit | $1,988 / unit | $1.63 / $ft^2$ of floor area |

**Table 6.3: TransLink Transportation DCC Rates**

| Type of Development | Rates effective January 1, 2022 |
|---|---|
| Single Family Dwelling | $2,993 per Dwelling Unit |
| Duplex | $2,485 per Dwelling Unit |
| Townhouse Dwelling Unit | $2,485 per Dwelling Unit |
| Apartment Dwelling Unit | $1,554 per Dwelling Unit |
| Retail/Service | $1.26 per sq. ft. of Floor Area* |
| Office | $1.01 per sq. ft. of Floor Area* |
| Institutional | $0.50 per sq. ft. of Floor Area* |
| Industrial | $0.30 per sq. ft. of Floor Area* |

Depending on the unit type and location, these regional DCCs can total approximately $8,000 to $16,000 per housing unit.

## 6.4 Municipal Development Cost Charges in Metro Vancouver

Using eight representative municipalities in the Metro Vancouver region, the applicable municipal DCCs were calculated for each of the six residential typologies studied. This reporting excludes other DCCs, such as those levied by Metro Vancouver and TransLink, as well as other possible municipal fees or charges such as Community Amenity Contributions or special area charges. Furthermore, developers may be expected to pay for infrastructure servicing costs for both on-site and off-site works associated with development, depending on a site's location or context.

The results are show in Table 6.4. DCC rates by unit type can vary considerably by municipality within the region, yet within individual municipalities generally do not vary. Municipal DCCs range up to $40,000 to $60,000 for a single-detached house, to as low as approximately $10,000 for an apartment.

**Table 6.4: Representative Municipal Development Cost Charges by Unit Type**

| Residential Typology | Langley Twp | Langley City | Pitt Meadows | Coquitlam | Port Moody | Surrey | Richmond | DNV | AVERAGE | *AVG HHS* | AVG per Capita |
|---|---|---|---|---|---|---|---|---|---|---|---|
| House (Low) | $40,104 | $18,409 | $13,493 | $60,422 | $33,453 | $48,595 | $41,533 | $33,269 | $ 36,160 | *3.10* | $ 11,664 |
| House (High) | $40,104 | $18,409 | $13,493 | $60,422 | $33,453 | $43,050 | $41,533 | $33,269 | $ 35,467 | *3.10* | $ 11,441 |
| Townhouse (Low) | $32,704 | $14,503 | $10,686 | $35,807 | $20,045 | $38,790 | $33,885 | $23,808 | $ 26,278 | *2.75* | $ 9,556 |
| Townhouse (High) | $32,704 | $14,503 | $10,686 | $35,807 | $20,045 | $38,790 | $33,885 | $23,808 | $ 26,278 | *2.75* | $ 9,556 |
| Apartment (Low) | $26,647 | $ 9,549 | $ 9,250 | $22,694 | $ 9,844 | $23,488 | $19,024 | $13,653 | $ 16,769 | *1.85* | $ 9,064 |
| Apartment (High) | $26,647 | $ 9,549 | $ 9,250 | $22,694 | $ 9,844 | $23,200 | $19,024 | $13,653 | $ 16,733 | *1.85* | $ 9,045 |
| Municipal DCCs only - excludes: School Site Acquisition Charge, Metro Vancouver Utilities Charge, TransLink Transportation Charge. | | | | | | | | | | | |
| Excludes Community Amenity Contributions or Bonus Density Charges, etc | | | | | | | | | | | |
| Includes Parkland Acquisition fee where included in municipality DCC bylaw. | | | | | | | | | | | |

The number of persons per household also varies by unit type, which is different by municipality. Based on the 2021 Census, the number of residents per unit was determined (1.85 per apartment, 2.75 per townhouse, and 3.10 per house). When calculating the municipal DCCs by the number of household residents (rather than per unit), the results indicate a very close relationship between DCC rates and residents, averaging approximately $10,000 per person, as shown in Table 6.5. This suggests that DCCs rates are largely set based on population or per capita, rather than building form.

**Table 6.5: Representative Municipal Development Cost Charges per Capita**

| Municipal Development Cost Charges by Unit Type and per Capita | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Residential Typology | Langley Twp | *AVG HHS* | DCC per Capita | Langley City | *AVG HHS* | AVG per Capita | Pitt Meadows | *AVG HHS* | AVG per Capita | Coquitlam | *AVG HHS* | AVG per Capita |
| House (Low) | $40,104 | *3.20* | $12,533 | $18,409 | *3.00* | $ 6,136 | $13,493 | *3.00* | $ 4,498 | $60,422 | *3.20* | $18,882 |
| House (High) | $40,104 | *3.20* | $12,533 | $18,409 | *3.00* | $ 6,136 | $13,493 | *3.00* | $ 4,498 | $60,422 | *3.20* | $18,882 |
| Townhouse (Low) | $32,704 | *2.35* | $13,917 | $14,503 | *2.40* | $ 6,043 | $10,686 | *2.70* | $ 3,958 | $35,807 | *2.95* | $12,138 |
| Townhouse (High) | $32,704 | *2.35* | $13,917 | $14,503 | *2.40* | $ 6,043 | $10,686 | *2.70* | $ 3,958 | $35,807 | *2.95* | $12,138 |
| Apartment (Low) | $26,647 | *1.80* | $14,804 | $ 9,549 | *2.05* | $ 4,658 | $ 9,250 | *1.85* | $ 5,000 | $22,694 | *1.95* | $11,638 |
| Apartment (High) | $26,647 | *1.80* | $14,804 | $ 9,549 | *2.05* | $ 4,658 | $ 9,250 | *1.85* | $ 5,000 | $22,694 | *1.95* | $11,638 |

| Port Moody | *AVG HHS* | AVG per Capita | Surrey | *AVG HHS* | AVG per Capita | Richmond | *AVG HHS* | AVG per Capita | DNV | *AVG HHS* | AVG per Capita | AVG | *AVG HHS* | AVG per Capita |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $33,453 | *3.10* | $10,791 | $48,595 | *3.40* | $14,293 | $41,533 | *3.20* | $12,979 | $33,269 | *3.00* | $11,090 | $36,160 | *3.14* | $11,400 |
| $33,453 | *3.10* | $10,791 | $43,050 | *3.40* | $12,662 | $41,533 | *3.20* | $12,979 | $33,269 | *3.00* | $11,090 | $35,467 | *3.14* | $11,196 |
| $20,045 | *2.80* | $ 7,159 | $38,790 | *2.75* | $14,105 | $33,885 | *2.90* | $11,684 | $23,808 | *2.65* | $ 8,984 | $26,278 | *2.69* | $ 9,749 |
| $20,045 | *2.80* | $ 7,159 | $38,790 | *2.75* | $14,105 | $33,885 | *2.90* | $11,684 | $23,808 | *2.65* | $ 8,984 | $26,278 | *2.69* | $ 9,749 |
| $ 9,844 | *1.90* | $ 5,181 | $23,488 | *2.10* | $11,185 | $19,024 | *1.95* | $ 9,756 | $13,653 | *1.85* | $ 7,380 | $16,769 | *1.93* | $ 8,700 |
| $ 9,844 | *1.90* | $ 5,181 | $23,200 | *2.10* | $11,048 | $19,024 | *1.95* | $ 9,756 | $13,653 | *1.85* | $ 7,380 | $16,733 | *1.93* | $ 8,683 |

Although some infrastructure use may have a close relationship to the number of residents regardless of unit type (e.g., sewers), other services like water consumption can be heavily influenced by built form (e.g., single-detached residents tend to use more water for lawn watering and have a higher number of bathroom fixtures). Other services can have somewhat mixed relationships to densities / forms, for example lower density neighbourhoods tend to be more auto-oriented and thus use more roads, while residents of houses with yards may use less park space. Stormwater / drainage is largely a function of site coverage / impervious areas, rather than development density per se.

## 6.5 Summary

The municipal Development Cost Charges (DCCs) in British Columbia are enabled under provincial legislation to pay for new or expanded infrastructure (sewer, water, drainage, parks, and roads) necessary to adequately service the demands of new development. In the Metro Vancouver region, the municipal DCC rates per unit are almost always highest for single-detached houses (up to $40,000 to $60,000), lowest for apartment units (approximately $10,000), and in between for townhouses. However, when adjusted for the typical number of residents in a household, which varies by unit type, the range of per capita DCC rates vary only by a few thousand dollars, averaging: $9,000 per apartment resident, $10,000 per townhouse resident, and $11,000 per house resident. That noted, the DCC rates by unit type can vary considerably by municipality within the region, yet within individual municipalities generally do not vary. While allowable under provincial legislation, most municipalities do not charge different DCC rates for different sub-areas or catchment areas.

# 7 Municipal Budgets Expenditures Analysis

Municipal budgets typically comprise revenue from various sources (e.g., property taxes, user fees, and grants) and expenditures of various types for operating or capital matters. Some municipal functions tend to be very capital intensive like infrastructure, whereas others are very labour-intensive like services or amenities. Thus, possible efficiencies of scale and efficiencies of geography will vary by the function (see Appendix D for greater detail).

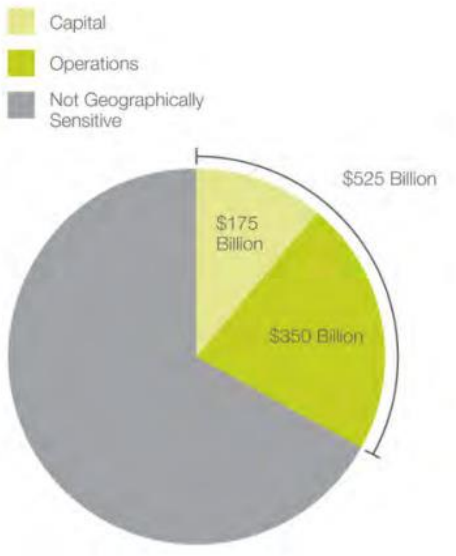
In British Columbia, municipalities are not generally responsible for services and associated costs for transit, school, and social or health provision, unlike in some other jurisdictions in Canada and the United States.

## 7.1 Budgets of American Cities

According to one American study completed in 2010, and as illustrated in Figure 7.1[21]:

- The cost of infrastructure like roads and sewers, as well as services like fire departments, ambulances and police are major budget items for any municipality, and decisions about development patterns can raise or lower the cost of these services.
- Local governments in the United States raised and spent $1.6 trillion USD, representing more than 10% of the U.S. Gross Domestic Product. Of that, approximately one-third ($525 billion) was expended on projects and activities that are heavily affected by local development patterns. That means future decisions about where to build will have implications for one-third of a typical municipality's budget.
- Of the $525 billion, $175 billion was spent on capital projects such as school buildings, roads and highways, water and sewer facilities, libraries and utilities. The remainder (about $350 billion) was spent on operations for the provision of public services such as police and fire service, utility service, highways and water and sewer service.

**Figure 7.1: Part of Local Budgets Influced by Land Use Choices**




## 7.2 Metro Vancouver Municipal Budgets

From a high level review of the larger municipalities in the Metro Vancouver region (i.e., Vancouver, Surrey, Burnaby, Richmond), of their total budget expenditures, the majority of costs are associated with providing services of various types that do not generally have a direct relationship with development densities or forms. For example, costs like community parks, recreational facility, library, licencing / permitting, police, fire, general government / administration, are largely services required for the population, thus a function of the number of residents or per capita, rather than density of development.

[21] Building Better Budgets: A National Examination of the Fiscal Benefits of Smart Growth Development, Smart Growth America, 2013.

Municipal services that have a more direct relationship to land use patterns and densities are utilities / engineering relating to roads, water, sanitary, and garbage services.

For the cities in the Metro Vancouver region that were analyzed, it appears that in the range of 27-37% of municipal expenditures are associated with these types of utilities / engineering services (i.e., both capital and operating costs).

This suggests that approximately one-third of municipal budgets could be impacted to some degree by land uses, densities, development patterns, and associated services required. Furthermore, some of these utilities / engineering services may not have a direct relationship between costs and development densities. For example, the costs of a water or sewage treatment plant may be fixed and largely a function of number of residents in the catchment area, while the pipes to connect the plant to the service area are a function of the development pattern / density.

Thus, while there are potential municipal cost savings associated with more compact forms of development, the scale of it should be considered within an overall municipal context. It is important to note that some of these costs are related to commercial and industrial land uses, which are not the focus of this study.

Separate from this analysis are other 'local' services such as transit, hospitals, and schools, which are the responsibility of different levels of government in British Columbia.

## 7.3 Summary

Based on a review of current municipal budgets in the region, approximately one-third of expenditures (i.e., both capital and operating costs) are related to utilities / engineering services that could be impacted to some degree by land uses, development forms, and densities, and associated infrastructure requirements. The balance of municipal costs (operating and capital) are for various types of 'soft' services that are generally labour-intensive and more a function of population than density. Thus, while there are potential municipal cost savings associated with more compact forms of development, the scale of this possible amount should be considered within the overall municipal context.

# 8 Calculating Typical Property Taxes and Utility Fees in the Region

## 8.1 Property Taxes in British Columbia Explained[22]

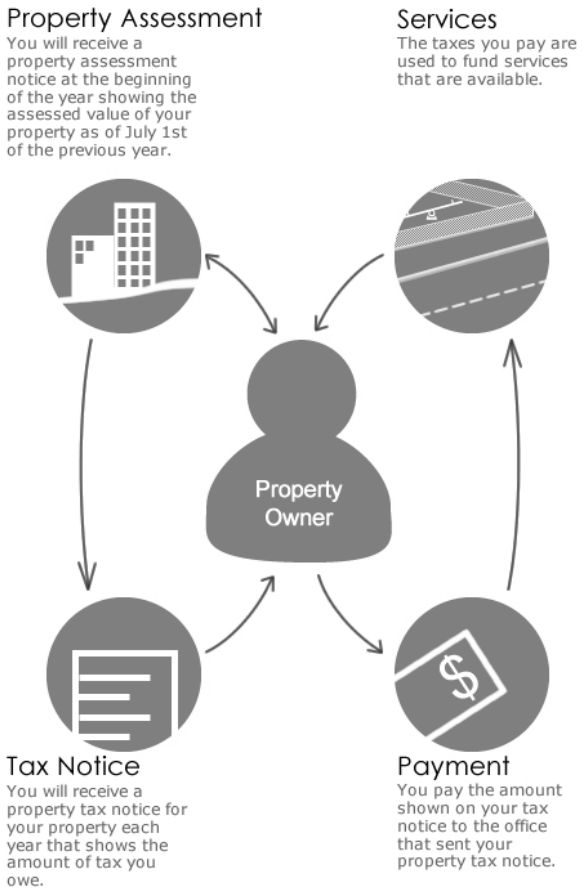
Municipal property taxes must be paid annually for each property (Figure 8.1). The money collected from property taxes funds local programs and services, such as:

- Police and fire protection
- Emergency rescue services
- Road construction and maintenance
- Garbage collection services
- Recreation and community centres
- Parks
- Libraries
- Local government administration
- Schools
- Hospitals

In addition to annual property taxes there may be a separate bill for utilities or services in the area. This may be an additional bill from an improvement district, municipality or private company for services, such as:

- Water
- Fire protection
- Street lighting
- Sewage
- Parks

**Figure 8.1: BC Property Tax System**




## 8.2 Property Classes and Exemptions[23]

In BC, there are nine classes for property taxation purposes. These classes are listed below, with the definition for Class 1 Residential. The property tax rate varies by class; notably for most municipalities the tax rate is much higher for utilities, industry, and businesses than it is for residential uses.

BC Assessment completes an annual value assessment of every property and categorizes them in one or more of the nine classes, typically based on a property's type or use. Municipal zoning does not determine the property class, though it may be a factor in some cases.

[22] Province of British Columbia, Annual Property Tax, Website: www2.gov.bc.ca/gov/content/taxes/property-taxes/annual-property-tax

[23] BC Assessment Authority, Understanding property classes and exemptions, Website: https://info.bcassessment.ca/Services-products/property-classes-and-exemptions/understanding-property-classes-and-exemptions

BC Assessment Property Classes:

- **Class 1, Residential –** single-family residences, multi-family residences, duplexes, apartments, condominiums, nursing homes, seasonal dwellings, manufactured homes, some vacant land, farm buildings and daycare facilities.
- **Class 2, Utilities**
- **Class 3, Supportive Housing**
- **Class 4, Major Industry**
- **Class 5, Light Industry**
- **Class 6, Business and Other**
- **Class 7, Managed Forest Land**
- **Class 8, Recreational Property, Non-profit Organization**
- **Class 9, Farm**

- **Split Classification –** Properties with several distinct uses can fall into more than one class. For example, commercial and residential space might be combined in one building, or a property combines residential, farm and forest land. In these cases, BC Assessment determines the share of the value of the property attributable to each class.

## 8.3 Calculations for Typical Housing Units in the Region

Using a sample of seven representative municipalities in the Metro Vancouver region (i.e., Vancouver, Burnaby, Richmond, Surrey, Langley Township, Coquitlam, North Vancouver District), the average or typical property taxes and utility fees were calculated based on available information for the three different unit typologies used in this study (i.e., house, townhouse, apartment). This was based on the benchmark or index market price from local real estate board publications (April 2023 values), the 2022 property tax mill rates, and the utility charges for different services, such as for water, sewage, and garbage by municipality.

The results in Table 8.1 show that, on average, in the Metro Vancouver region houses pay $5,600 in property taxes and $1,700 in utility fees, totalling approximately $7,400 per year. The amounts are lower for townhouses and apartments. These amounts vary by municipality as the mill rates vary by jurisdiction, and furthermore would also vary within individual municipalities depending on assessed value of the representative properties. For multi-unit complexes (i.e., townhouses and apartments) there may be a strata organization responsible for some private on-site utilities and services, which would be charged to the owner as a strata amenity fee rather than a municipal fee or property tax.

**Table 8.1: Average Property Taxes and Utility Fees by Unit Type**

| House | Unit Value | General Municipal | School | Regional District | Hospital | BCA, MFA and Other | Total Taxes | Total Charges | Total Taxes and Charges | *Taxes as % of Total Tax & Charge* | *% of Total Taxes to City* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Average* | *$1,953,852* | *$3,192* | *$1,860* | *$100* | *$0* | *$510* | *$5,663* | *$1,718* | *$7,381* | *77%* | *56%* |
| | | | | | | | | | | | |
| Townhouse | Unit Value | General Municipal | School | Regional District | Hospital | BCA, MFA and Other | Total Taxes | Total Charges | Total Taxes and Charges | *Taxes as % of Total Tax & Charge* | *% of Total Taxes to City* |
| *Average* | *$1,050,133* | *$1,721* | *$999* | *$54* | *$0* | *$274* | *$3,048* | *$1,285* | *$4,333* | *71%* | *56%* |
| | | | | | | | | | | | |
| Apartment | Unit Value | General Municipal | School | Regional District | Hospital | BCA, MFA and Other | Total Taxes | Total Charges | Total Taxes and Charges | *Taxes as % of Total Tax & Charge* | *% of Total Taxes to City* |
| *Average* | *$737,119* | *$1,204* | *$700* | *$38* | *$0* | *$192* | *$2,135* | *$1,201* | *$3,336* | *64%* | *56%* |

Of the property taxes only, slightly over half (56%) of the amount is for the local / host municipality, and the rest to other authorities such as Metro Vancouver, TransLink, and the Province (via school taxes). Furthermore, of the total taxes and fees paid by typical households, a quarter to a third of that amount goes towards utility fees. Table 8.2 shows these results for the sample municipalities in the Metro Vancouver region.

## Table 8.2: Average Property Taxes and Utility Fees by Unit Type for Select Municipalities

| City / House | Unit Value | General Municipal | School | Regional District | Hospital | BCA, MFA and Other | Total Taxes | Res Parcel Taxes | Res User Fees | Total Charges | Total Taxes and Charges | Taxes as % of Total Tax & Charge | % of Total Taxes to City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vancouver | *Mill Rate* | *1.53131* | *0.84770* | *0.05042* | *0.00000* | *0.26100* | ***2.69043*** | | | | | | |
| | $2,535,200 | $3,882 | $2,149 | $128 | $0 | $662 | $6,821 | | $2,264 | **$2,264** | $9,085 | *75%* | *57%* |
| Burnaby | *Mill Rate* | *1.54710* | *0.98440* | *0.05030* | *0.00000* | *0.26100* | ***2.84280*** | | | | | | |
| | $1,943,067 | $3,006 | $1,913 | $98 | $0 | $507 | $5,524 | | $782 | **$782** | $6,306 | *88%* | *54%* |
| Richmond | *Mill Rate* | *1.65745* | *0.99580* | *0.05127* | *0.00000* | *0.26100* | ***2.96552*** | | | | | | |
| | $2,137,600 | $3,543 | $2,129 | $110 | $0 | $558 | $6,339 | | $2,011 | **$2,011** | $8,350 | *76%* | *56%* |
| Surrey | *Mill Rate* | *1.50005* | *0.99140* | *0.05079* | *0.00000* | *0.26100* | ***2.80324*** | | | | | | |
| | $1,579,100 | $2,369 | $1,566 | $80 | $0 | $412 | $4,427 | | $2,088 | **$2,088** | $6,515 | *68%* | *54%* |
| Langley Twp | *Mill Rate* | *1.75720* | *1.02420* | *0.05158* | *0.00000* | *0.26100* | ***3.09398*** | | | | | | |
| | $1,541,200 | $2,708 | $1,578 | $79 | $0 | $402 | $4,768 | | $1,434 | **$1,434** | $6,202 | *77%* | *57%* |
| Coquitlam | *Mill Rate* | *1.94270* | *1.00730* | *0.05270* | *0.00000* | *0.26100* | ***3.26370*** | | | | | | |
| | $1,747,900 | $3,396 | $1,761 | $92 | $0 | $456 | $5,705 | | $1,526 | **$1,526** | $7,231 | *79%* | *60%* |
| DNV | *Mill Rate* | *1.57023* | *0.87870* | *0.05225* | *0.00000* | *0.26100* | ***2.76218*** | | | | | | |
| | $2,192,900 | $3,443 | $1,927 | $115 | $0 | $572 | $6,057 | | $1,919 | **$1,919** | $7,976 | *76%* | *57%* |
| ***Average*** | ***$1,953,852*** | ***$3,192*** | ***$1,860*** | ***$100*** | ***$0*** | ***$510*** | ***$5,663*** | | ***$1,718*** | ***$1,718*** | ***$7,381*** | ***77%*** | ***56%*** |

| City / Townhouse | Unit Value | General Municipal | School | Regional District | Hospital | BCA, MFA and Other | Total Taxes | Res Parcel Taxes | Res User Fees | Total Charges | Total Taxes and Charges | Taxes as % of Total Tax & Charge | % of Total Taxes to City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vancouver | *Mill Rate* | *1.53131* | *0.84770* | *0.05042* | *0.00000* | *0.26100* | ***2.69043*** | | | | | | |
| | $1,296,300 | $1,985 | $1,099 | $65 | $0 | $338 | $3,488 | | $1,777 | **$1,777** | $5,265 | *66%* | *57%* |
| Burnaby | *Mill Rate* | *1.54710* | *0.98440* | *0.05030* | *0.00000* | *0.26100* | ***2.84280*** | | | | | | |
| | $925,833 | $1,432 | $911 | $47 | $0 | $242 | $2,632 | | $708 | **$708** | $3,340 | *79%* | *54%* |
| Richmond | *Mill Rate* | *1.65745* | *0.99580* | *0.05127* | *0.00000* | *0.26100* | ***2.96552*** | | | | | | |
| | $1,116,400 | $1,850 | $1,112 | $57 | $0 | $291 | $3,311 | | $1,590 | **$1,590** | $4,901 | *68%* | *56%* |
| Surrey | *Mill Rate* | *1.50005* | *0.99140* | *0.05079* | *0.00000* | *0.26100* | ***2.80324*** | | | | | | |
| | $849,200 | $1,274 | $842 | $43 | $0 | $222 | $2,381 | | $762 | **$762** | $3,143 | *76%* | *54%* |
| Langley Twp | *Mill Rate* | *1.75720* | *1.02420* | *0.05158* | *0.00000* | *0.26100* | ***3.09398*** | | | | | | |
| | $811,200 | $1,425 | $831 | $42 | $0 | $212 | $2,510 | | $1,354 | **$1,354** | $3,864 | *65%* | *57%* |
| Coquitlam | *Mill Rate* | *1.94270* | *1.00730* | *0.05270* | *0.00000* | *0.26100* | ***3.26370*** | | | | | | |
| | $1,037,600 | $2,016 | $1,045 | $55 | $0 | $271 | $3,386 | | $1,181 | **$1,181** | $4,567 | *74%* | *60%* |
| DNV | *Mill Rate* | *1.57023* | *0.87870* | *0.05225* | *0.00000* | *0.26100* | ***2.76218*** | | | | | | |
| | $1,314,400 | $2,064 | $1,155 | $69 | $0 | $343 | $3,631 | | $1,624 | **$1,624** | $5,255 | *69%* | *57%* |
| ***Average*** | ***$1,050,133*** | ***$1,721*** | ***$999*** | ***$54*** | ***$0*** | ***$274*** | ***$3,048*** | | ***$1,285*** | ***$1,285*** | ***$4,333*** | ***71%*** | ***56%*** |

| City / Apartment | Unit Value | General Municipal | School | Regional District | Hospital | BCA, MFA and Other | Total Taxes | Res Parcel Taxes | Res User Fees | Total Charges | Total Taxes and Charges | Taxes as % of Total Tax & Charge | % of Total Taxes to City |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vancouver | *Mill Rate* | *1.53131* | *0.84770* | *0.05042* | *0.00000* | *0.26100* | ***2.69043*** | | | | | | |
| | $1,043,900 | $1,599 | $885 | $53 | $0 | $272 | $2,809 | | $1,777 | **$1,777** | $4,586 | *61%* | *57%* |
| Burnaby | *Mill Rate* | *1.54710* | *0.98440* | *0.05030* | *0.00000* | *0.26100* | ***2.84280*** | | | | | | |
| | $774,333 | $1,198 | $762 | $39 | $0 | $202 | $2,201 | | $708 | **$708** | $2,909 | *76%* | *54%* |
| Richmond | *Mill Rate* | *1.65745* | *0.99580* | *0.05127* | *0.00000* | *0.26100* | ***2.96552*** | | | | | | |
| | $751,200 | $1,245 | $748 | $39 | $0 | $196 | $2,228 | | $1,271 | **$1,271** | $3,499 | *64%* | *56%* |
| Surrey | *Mill Rate* | *1.50005* | *0.99140* | *0.05079* | *0.00000* | *0.26100* | ***2.80324*** | | | | | | |
| | $537,000 | $806 | $532 | $27 | $0 | $140 | $1,505 | | $762 | **$762** | $2,267 | *66%* | *54%* |
| Langley Twp | *Mill Rate* | *1.75720* | *1.02420* | *0.05158* | *0.00000* | *0.26100* | ***3.09398*** | | | | | | |
| | $575,500 | $1,011 | $589 | $30 | $0 | $150 | $1,781 | | $1,354 | **$1,354** | $3,135 | *57%* | *57%* |
| Coquitlam | *Mill Rate* | *1.94270* | *1.00730* | *0.05270* | *0.00000* | *0.26100* | ***3.26370*** | | | | | | |
| | $675,300 | $1,312 | $680 | $36 | $0 | $176 | $2,204 | | $1,181 | **$1,181** | $3,385 | *65%* | *60%* |
| DNV | *Mill Rate* | *1.57023* | *0.87870* | *0.05225* | *0.00000* | *0.26100* | ***2.76218*** | | | | | | |
| | $802,600 | $1,260 | $705 | $42 | $0 | $209 | $2,217 | | $1,354 | **$1,354** | $3,571 | *62%* | *57%* |
| ***Average*** | ***$737,119*** | ***$1,204*** | ***$700*** | ***$38*** | ***$0*** | ***$192*** | ***$2,135*** | | ***$1,201*** | ***$1,201*** | ***$3,336*** | ***64%*** | ***56%*** |

## 8.4 Summary

Property taxes are a function of the assessed value of a property, with municipal tax rates set by the host municipality. Nearly half of the property taxes collected go to other levels of government than the local municipality, such as to the provincial government and other agencies. Municipal utility fees for such services as water, sewage, and garbage, may also apply. On average in the Metro Vancouver region, detached houses pay $5,600 in property taxes and $1,700 in utility fees, totalling approximately $7,400 per year; the amounts are lower for townhouses and apartments. These amounts vary by municipality as the mill rates vary by jurisdiction, and furthermore also vary within individual municipalities depending on the assessed values of properties. Of the total taxes and fees paid by typical households, a quarter to a third of that amount goes to utility fees.

# 9 Methodological Complexities

Based on the literature review and informational interviews undertaken, the following is a summary of methodological considerations and complexities with the calculation and attribution of municipal costs and revenues and related matters (see Appendix E for greater detail).

## 9.1 Overview of Considerations

It is difficult to compare findings between locations and jurisdictions, such as different provinces, as there are many different variables, in terms of services, costs, revenues, allocation, governance, etc. For example, BC and Alberta municipalities tend to spend less on social services compared to Ontario; transit service is the responsibility of the Province in BC but of the municipalities in Alberta and regions in Ontario. Ambulance services are provided by regions in Ontario, but are the responsibility of the province in BC.

A range of uses and facilities are required for a community, and must be provided, regardless of cost and revenue distributions, even if not all are revenue neutral from a municipal finance perspective. In a metropolitan context like in the Metro Vancouver region, people and economic activities tend to move around during the day from home (residential) to work (industrial), and to shops (commercial) and services (institutional), each with their own attributes, contributing to and impacting the municipal and regional economies and services.

The definitions used for low and high development densities and areas can vary widely and thus associated boundaries and measures may not be consistent, resulting in different calculations and values.

Separating and allocating costs is not simple or consistent. There are theoretical and ideal policies on one hand, and on the other hand what typically occurs in practice. The difference (and similarities) between a tax and a fee, noting some items may not be properly classified, can confuse the matter.

## 9.2 Allocating Costs

Total costs by service are generally tracked and reported by municipalities for their entire jurisdiction, but it is difficult to disaggregate and allocate by sub-area and by unit types and forms of development. There are different catchment areas for different service types and different cost profiles. The results can be heavily influenced by the assumed attribution of costs to non-residential uses and taxpayers, such as commercial and industrial uses.

There are challenges with apportioning costs, be it by land use type, housing unit type, location / geography, components of services, and infrastructure amortization periods. For example, crime may occur in one area by a resident or victim from another area, and traffic flows between and through communities.

How municipal governments decide to value an asset and the associated amortization / depreciation schedule affects assigned costs per year. Some infrastructure may last longer or shorter than initially estimated. Reserve allowances for replacement costs can vary, and may be fully funded, or not, in municipal budgets.

In some cases, a service can have both a fixed and variable aspect, each with different cost profiles. The cost of producing and delivering a service can be very different, with only the delivery varying by its location within a municipality (e.g., a water treatment plant for the city, with service mains to local properties). Regional infrastructure facilities may be less impacted by development density than municipal / local service infrastructure connections. Therefore, the cost implications of different densities may vary by function and authority.

Some services and infrastructure with economies of scale can best be provided regionally, whereas others can be done more effectively and efficiently at the local level.

## 9.3 Municipal Revenues

Municipal services in Canada are largely funded by property taxes generally based on a system of the assessed value of property, rather than on a 'services consumed' basis. More expensive properties generally pay more towards city services.

User fees are applied only for some services. Some utilities / services are metered (such as water, or garbage) vs. others are not (and funded via general taxation). User fees are charged for products / services consumed that can be readily allocated to the user / benefiter, and the other municipal services are funded through general property taxation.

Some major infrastructure may be funded through grants by senior levels of government rather than local government. Maintenance of this infrastructure may later become a long-term operating cost for the municipality.

Municipal DCCs are typically applied at a municipal-wide rate as it is administratively simpler and provides more flexibility, rather than having to limit infrastructure expenditures to within the individual revenue generating geographies. Note this is a one-time charge for construction only and does not fund operation, maintenance, or replacement costs.

Municipal capital infrastructure costs are one-time costs and, unlike variable user fees, do not influence consumption / usage decisions in the same way as metered charges for water, electricity, natural gas, etc.

## 9.4 Local Considerations / Contexts

Some municipal and related services and costs are a function of per capita demand, and others a function of geography or development density. There is an overlap between economies of scale and efficiencies of geography. Higher population municipalities, not necessarily high development densities, tend to achieve economies of scale to a certain point before becoming less efficient thereafter.

Servicing costs in many cases are generally heavily impacted by local context-specific matters, such as the condition of existing infrastructure (i.e., capacity, age), geography, topography, etc. Infrastructure capacity available vs. incremental threshold reached can result in very different costs to provide additional services for new development.

Beyond residential densities and types, level of service decisions, as well as the delivery costs, may vary by location and circumstances due to such thing as topography, geography, street pattern, condition, and the capacity of existing infrastructure, sharing with non-residential uses, etc. Residential densities

and neighbourhood ages are also factors that may impact servicing and infrastructure costs in other ways.

Historic downtown cores tend to have older infrastructure, and thus more expensive to maintain, whereas the suburban fringe areas that were developed more recently have newer infrastructure that does not require as much short-term maintenance.

Major infrastructure facilities that are large and expensive are generally constructed and financed all at once (referred to as 'lumpy' investments). Given the indivisible nature of major infrastructure capital assets / projects, municipal service capacity cannot easily be expanded incrementally to match the gradual increase in demand that comes from new development. In some cases, creating excess capacity may have been done intentionally for future planned development that has not yet occurred. Initial overbuild typically needs to be publicly funded upfront for future users / benefiters.

The redevelopment of areas that were not planned for higher densities, such as identified urban infill / intensification areas, can be a challenge and more expensive to service if the needed infrastructure capacity is not present. This may necessitate extensively replacing and expanding existing infrastructure before it would otherwise need to be replaced due to age.

## 9.5 Relationship Between Costs and Development Densities

Some costs are more or less sensitive to development density and form than others. The relationship between residential density and infrastructure demand is intuitive for some items, e.g., larger house lots require more linear distance of pipes and pavement per household resulting in higher costs. Yet parks and recreation costs are generally based on the demand associated with population. Stormwater management costs are most directly relevant to building site coverage / impervious surface, than development density or population.

Most of the municipal operating budgets are for labour costs and therefore do not vary much due to geography or development densities / forms as compared to other costs such as linear infrastructure. Often there are economies of scale associated with capital intensive infrastructure (e.g., water and sewage treatment plants) that can vary by type of infrastructure, but not for labour-intensive services. There are natural economies of scale for some types of infrastructure, which work at different levels and vary by type of infrastructure / service. Thus there is no single optimum level for all combined municipal services.

Some costs increase with higher densities in established urban areas associated with 'urban harshness', such as higher land costs and more complex and time consuming construction works. While absolute project costs may be higher in urban areas, it tends to support more intense development accommodating a greater population, thus resulting in lower per unit and per capita costs.

Although charges / fees may vary by residential unit types, often that variance is mostly due to the differences in the number of occupants in each unit, not significantly by other attributes; thus per capita rates are similar when adjusted for the number of persons per household.

Even though the per capita infrastructure costs in dense urban sites may be lower, the land development and construction costs tend to be higher. This can result in higher housing costs in city centres, pushing some residents to seek out lower density suburban locations in search of lower housing

costs. The Housing and Transportation Cost Burden Study [24]has shown that in those cases, often the associated household increases in transportation costs offset much of the perceived savings.

While infill and intensification development may have lower infrastructure costs, they generally do not have lower municipal DCCs. This may indicate that DCCs may not be set correctly if they are the same for the entire municipality despite variances in infrastructure costs, and as a result may unintentionally incent lower density urban fringe developments which are most costly to service.

## 9.6 Community Preferences

Public residential preferences are a major determinate of urban form, and housing choices are important. Different communities have different population profiles and resident behaviours that can be influenced by where they currently live and their associated environment or other self-selecting location decisions and preferences. Different demographics desire or consume different amounts and types of services, which is often impacted by income levels and ability to pay for certain services, demographics, and household composition.

Different municipalities may choose to provide different levels of services in terms of quantity or quality, which are difficult to consider and estimate in any financial analysis. The presence of a large industrial or commercial property tax base in a municipality compared to its residential areas will result in a different distribution of municipal costs and revenues as well as the services demanded and provided.

## 9.7 Other Considerations

Based on the literature review, below are some of the common findings and suggestions when considering costs and revenues related to residential development:

- Wherever reasonably possible, utility fees could be considered rather than property taxes as a cost recovery tool, as they are more reflective of the actual cost of service delivery. This would move closer to linking revenues and expenditures to the party benefiting and paying, via transparent user fees that are based on the actual consumption of services.
- Transparently illustrate and explain infrastructure / servicing costs and trade-offs when multiple scenarios are being considered for a proposed development or redevelopment, such as when preparing a master plan for greenfield lands (e.g., using different development and density options with resulting cost per unit and per capita calculations to reflect the trade-offs being considered).
- Direct efforts towards items that matter the most with the greatest opportunity for improvement. The capital and operating costs that are most impacted by spatial and development density factors should be the principal focus rather than the population-based costs apportioned on a per capita basis.
- Given the many possible methodological complexities and challenges, expectations about precision should be adjusted when completing any cost / revenue analysis. Noting the degree to which any such analysis can be influenced by context, modelling assumptions and data, the results should be treated more as indicators or estimates for consideration as a means to better understand the trade-offs of service levels and short- and long-term implications.

[24] Housing and Transportation Cost Burden Study, Metro Vancouver, 2015.

## 9.8 Summary

Defining, calculating, and attributing costs and revenues for different services by different asset classes or unit types can be a data and methodological challenge. Conceptually, there are four categories: infrastructure (capital) costs and revenues, and service (operating) costs and revenues. Some of these may be paid for by a developer as one-time charges during construction, be it through providing the infrastructure and / or paying DCCs, and some by residents in the form of ongoing property taxes and utility fees. Some practical challenges for such calculations are defining 'urban' or 'suburban' development forms / densities for data collection and reporting purposes, and potentially attributing some costs and revenues to other non-residential land uses (such as commercial and industrial). Furthermore, many municipal services and associated costs are more a function of residential population level rather than housing density, and some services, such as capital intensive infrastructure, can benefit from economies of scale, while labour-intensive services do not. There are also significant local considerations and contextual issues. Some municipal costs may be higher on an absolute basis in a high-density, established urban location because of 'urban harshness' and increased complexities, but lower on a per unit or per capita basis because of the greater development densities. Given these complexities and limitations, the expectations about the resulting values should be understood as high-level or estimates.

# 10 Summary of Findings and Considerations

The study's findings and considerations are not meant to be definitive, and should be further explored and discussed with stakeholders and decision-makers to better understand the trade-offs inherent in all land use plans and development approvals, and to support more financially-sustainable and cost-effective forms of residential development.

## 10.1 Key Considerations

The following should be considered when making land use and urban form decisions, as well as those associated with public infrastructure investments to support desired forms of residential land uses and densities, and when reviewing property tax and utility fee policies:

- It is critical to permit and facilitate higher density and more cost-effective forms of development in urban / developed areas (i.e., infill, intensification, redevelopment), where public infrastructure investments can be best utilized. Where regulatory barriers exist to urban densification in such locations, consider a review of policies and regulations and discourage developments that are not compact form, mixed-use, and that cannot be cost-efficiently serviced.
- Achieving compact, complete communities does not necessarily require extremely high density development forms. Optimum densities are a factor of context, and are often a combination of densities and uses that result in more livable, sustainable, and balanced communities. For example, moving from low density to medium densities in urban centres and along transit corridors can provide significant improvements in infrastructure servicing cost outcomes.
- The costs of infrastructure and utility provision should be set to better reflect actual service costs and charge those who directly benefit:
    - The use of metering for utilities should be considered, where possible, such as for water and sewerage; with new and emerging technologies, such as improved metering, user fees can be more precise and effective, and managed electronically.
    - Utility fees should not be focused simply on raising revenues, but also on changing behaviours and outcomes. Fees and incentives can be set and adjusted to encourage desired actions and choices and meet community buildings objectives.
- Applying Development Cost Charges that vary by residential unit type / size / density as well as sub-area geography, better reflects the actual costs of servicing demand.
- Closely coordinating and integrating land use planning, engineered infrastructure, asset management, and municipal financial decision-making including full lifecycle costing, leads to improved land use and financial outcomes.

## 10.2 Summary

The result of such shortcomings is that municipalities may be inadvertently encouraging inefficient growth patterns. These patterns are costly not only from an environmental and social point of view, but also from a municipal finance perspective. The symptoms include mounting infrastructure deficits, reduced service levels, growing threats to quality of life, and a loss of economic competitiveness.

There are many opportunities through planning and taxation / fee setting policy adjustments to better advance municipal and community interests relative to land use patterns and housing forms. This can include: better aligning the parties who receive services with those who pay for them via enhanced

utility user fees, where appropriate; fully understanding the short and long-term costs and revenues associated with different land use types and development densities; applying Development Cost Charges based on smaller geographies to more accurately reflect the different local marginal servicing costs; and encouraging, including through reducing barriers and costs, and though public education programs, higher density and mixed-use development in urban locations already served by infrastructure, where possible. Utility user fees and charges can be an incentive to achieve the desired development forms and encourage more compact and cost-effective forms of growth.

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# Appendix A: Literature Review – Concept and Theory

The following is text extracted from the referenced publications, providing key points from the literature review. These publications and research were used to inform the study.

**Urban Sprawl: Do its Financial and Economic Benefits Outweigh its Costs for Local Governments?**[25]

In general, the growth of urban sprawl has a significant effect on local costs. The nature of "sprawl communities" creates a greater demand for costly new investments (roads, sewage systems, as well as, for example, kindergartens). In addition, local authorities in suburban municipalities are under pressure from "new residents" (who previously lived in central cities and were accustomed to higher levels of municipal services) due to the need for new investments. Urban sprawl is associated with large infrastructure investments such as roads for new residents on the outskirts of the city.

Many of the adjustments for urban sprawl are tolerated by the upper levels of the government through the financing of grants (mainly capital transfers) along with its role related to the property cycle (taxes and fees on land use improvement, building permits, construction tax, public land sales, etc.). However, municipalities' reliance on grants and fees to adjust their budgets highlights a potential problem. The additional infrastructure needs associated with large-scale spatial growth are met mainly by the upper levels of government and can encourage municipalities to expedite urban expansion without considering the full financial implications of such policies.

On the other hand, urban sprawl has immediate consequences for political institutions because construction, land development, fees, and sale of building materials and structures, once completed, mean taxes and revenue for municipal and other governments. Local government incentives to slow down or change the direction of urban sprawl are limited. Initially, it is a significant source of employment, contract opportunities, and tax revenue for your constituency. This new model of urban development is also a potential source of revenue for municipalities. Land development has not only served as a passive result of urbanization but has also been actively pursued by local governments as a means of generating revenue to finance local economic growth. Due to the budget constraints of municipalities, revenues from urban sprawl quickly become local government expenditures.

**Municipal Finances and Growth Planning in the Greater Golden Horseshoe: Opportunities for Better Integration to Support Smart Growth**[26]

These are complex matters and some of the connections between growth patterns and fiscal costs are still being debated in the academic literature, but the general picture that has emerged is clear: low-density, auto-dependent growth requires more infrastructure that is more expensive to operate and maintain over its life-cycle. Despite this finding, municipalities in Canada have an uneven record when it comes to integrating the management of growth and financial decisions. There are three key weaknesses:

- Municipalities tend to perform well when it comes to assessing the immediate costs of planned growth, but not so well when it comes to assessing long-term financial sustainability of that growth. In other words, municipalities are geared towards the immediate problem of financing anticipated

[25] Urban Sprawl: Do its Financial and Economic Benefits Outweigh its Costs for Local Governments?, GeoJournal, Mehran Hajilou, Abolfazl Meshkini, Mohammad Mirehei, Safar Ghaedrahmati, 2022.
[26] Municipal Finances and Growth Planning in the Greater Golden Horseshoe: Opportunities for Better Integration to Support Smart Growth, Greenbelt Foundation, Ray Tomalty, 2022.

growth in terms of the up-front capital costs. They tend to pay less attention to assessing the long-term costs of growth in terms of operating, maintaining, refurbishing, and ultimately replacing the infrastructure that growth entails. This is a serious issue because much of the infrastructure needed to support growth have long lifetimes and therefore imply long-term (typically permanent) commitments in both operating and capital dimensions. These so-called life-cycle costs often exceed the original cost of installing the infrastructure, sometimes by several fold. Some municipalities seem to believe that property taxes and user fees arising from growth will cover these long-term costs, but this often turns out not to be the case. A failure to adequately foresee and budget for long-term commitments could distort decision-making concerning the amount and pattern of growth that is desirable in a community.

- Municipalities routinely shape growth to help achieve political, economic, social, and environmental goals, but they pay far less attention to the potential for shaping growth to achieve financial objectives. Municipalities seldom look at growth parameters such as greenfield density, concentration around transit, and intensification as tools for reducing the long-term financial costs associated with growth. They may also be driven by the desire to attract investment that will create new jobs and attract new residents, provide housing to a growing population, or expand the assessment base. In some cases, growth is managed to preserve agricultural lands and natural heritage features. However, it's less common for municipalities to consider shaping growth as a way of ensuring the optimum use of infrastructure dollars and reducing long-term costs to the municipality. As a result, accommodating population and employment growth may be unnecessarily expensive in the short- and long-term.
- Municipalities are very good at shaping their revenue tools to ensure they generate the needed funds to cover upcoming capital and operating costs (minus debt and grants from other governments) but not as good at thinking through how those design choices might impact growth patterns. The rules that govern the way taxes and user fees are collected from residents and businesses and the way development cost charges are exacted from developers have the potential to generate a system of subsidies from some property types or locations to others, generating impacts on decisions that affect the shape of growth. For example, property taxes that charge more to the owners of high-density residential buildings than those of low-density buildings are effectively subsidizing low-density housing (unless it can be shown that such housing is cheaper to service than high-density buildings, which it is generally agreed it is not). There are many such subsidies that are operating in communities. While the impacts of each subsidy may be small, on a cumulative basis, they may be contributing to inefficient growth patterns and higher financial costs for everyone.

The result of such shortcomings is that municipalities may be inadvertently encouraging inefficient growth patterns. These patterns are costly not only from an environmental and social point of view, but also from a municipal finance perspective. The symptoms include mounting infrastructure deficits, reduced service levels, growing threats to quality of life, and a loss of economic competitiveness.

This state of affairs can be partly attributed to the oft-noted silos through which municipal governments organize their work. Typically, the task of managing growth falls to professional planners in the planning department, while infrastructure decisions are made by engineers in the transportation and public works departments, and financial decisions are taken by officials trained in public finance, economics and accounting in the finance department. Bringing together these diverse professionals into a system of integrated decision-making can be a challenge. Another reason is the inertia that is built into growth planning and financial management systems.

Based on best practices an ideal "Integrated Growth Planning Program" would look like:

- Growth scenario assessment: In the context of an official plan review, the municipality develops a growth management strategy that describes the anticipated location, structure, density, and housing mix of development needed to accommodate the forecasted growth. The strategy includes an assessment of several possible growth scenarios based on a range of parameters that reflect public priorities, including fiscal long-term sustainability. In two-tiered regions (with a regional [upper-tier] and municipal [lower-tier] governments), the process is led by staff from the upper-tier, but local municipalities are fully involved throughout the process. The growth management strategy includes a phasing plan that concentrates growth in a limited number of areas at any one time and coordinates major infrastructure projects to take advantage of potential economies.
- Master plans: The growth management strategy is carried out concurrently and iteratively with master plans for the key infrastructure classes, including water, wastewater, stormwater, roads, and transit. Staff responsible for preparing the master plans feed high-level ("order of magnitude") cost, revenue, and fiscal impact data related to the infrastructure needed to support the different scenarios into the scenario assessment process. Master plans identify spare capacity in the system and ensure it is filled before taking on new liabilities. Once the preferred growth scenario is selected, the master planning process moves on to detailed costing and revenue projections for the preferred scenario.
- Development cost charges background study: A development cost charges background study is prepared concurrently with the above processes, itemizing the prioritized capital projects and showing how the up-front costs of the infrastructure projects proposed in the various master plans will be funded (primarily through development cost charges). The study analyzes the associated long-term, life-cycle costs and revenues associated with the contemplated projects, identifying potential shortfalls and other financial risks. The results of the analysis are fed back into the growth management process to help mitigate any identified financial risks.
- Asset management plans and long-term financial planning: The results of the development cost charge background studies are also fed forward into Asset Management Plans and Long-Term Financial Plans, which are designed to flag any serious financial risk to the municipality. Risks that can be mitigated through better growth planning are taken into account in the next growth planning cycle.

Occasionally, municipalities review individual revenue tools to assess whether they are achieving the goals that are set for them or if they are having negative effects on some public priority issue. For example, a higher property tax rate on commercial or industrial buildings compared to residential buildings may be reviewed to see if it is inadvertently chasing away new business investment. A fiscal alignment audit does that for all the fiscal instruments that the municipality uses but takes a growth management lens instead of an economic development one.

Following is a list of items that could be considered for inclusion in an audit, phrased as measures that could improve alignment with Smart Growth objectives:

Development cost charges:

- differentiate charges by area instead of using municipality-wide charges,
- differentiate charges applied to larger vs. smaller dwelling units (e.g., by floor area or number of bedrooms) within the various dwelling-type categories,
- differentiate residential charges applied to larger vs. smaller lots,
- differentiate among non-residential uses to avoid favouring uses that generate more vehicular traffic,

- discount/exempt development above a target density in targeted locations,
- discount/exempt intensification or redevelopment to a higher density of a residential or non-residential parcel in targeted locations,
- discount/exempt charges on agricultural land,
- discount/exempt charges on higher-density affordable housing,
- use accurate assumptions (e.g., for population, housing mix, intensification rates, greenfield densities) as inputs into development cost charge background studies.

Property taxes:

- avoid applying a higher tax rate on multi-residential properties than on other residential properties,
- avoid taxing parking lots and commercial properties that generate car traffic, such as shopping centres, at a lower rate than other properties in that class,
- avoid taxing vacant non-residential (commercial and industrial) properties at a lower rate than other properties in that class,
- discount/rebate property taxes in specific areas (e.g., along frequent bus routes) or on specific types of sites (e.g., brownfields) to encourage development that is consistent with Smart Growth principles.

User fees:

- charge for parking on residential streets, in municipal parking lots, in commercial areas (e.g., metres), and at municipal facilities,
- incorporate lot size and/or location into the calculation of water and sanitary sewer charges,
- charge a stormwater user fee based on lot (or non-pervious surface) size and/or location,
- discount planning fees for development that supports Smart Growth objectives in targeted locations,
- set transit fares at a level low enough to achieve the modal share targets in the municipality's official plan or transportation master plan.

**Development Charges and City Planning Objectives[27]**

Hardly anywhere is there an attempt to structure development cost charges so as to achieve planning goals. There has been a gradual shift in municipal infrastructure financing practices from a marginal cost or "site-specific" approach, favoured by developers, to an average cost or "municipal-wide" approach, favoured by municipalities.

In designing a local development cost charge regime, municipalities must choose between an average cost and a marginal cost approach. An average cost approach would see the charges assigned on a municipal-wide basis according to specific criteria, such as number and type of dwelling units, so that all projects meeting the criteria pay the same charge, regardless of the actual costs they create. In contrast, a marginal cost approach tries to estimate the actual costs created by specific projects. A site-specific regime estimates the impact that the development is likely to have on the need for public infrastructure provision. In this approach, sites that are more expensive to service because of their topography, their distance relative to existing infrastructure, or their location outside areas targeted for intensification would pay higher fees. Sites that are within the existing urban envelope or within designated sub-

[27] Development Charges and City Planning Objectives: The Ontario Disconnect, Canadian Journal of Urban Research, Ray Tomalty, Andrejs Skaburskis, 2003.

centres, where infrastructure could be more efficiently provided, would have lower development cost charges.

Moreover, the argument that infill development using existing capacity should pay charges seems to contradict the notion that development cost charges are meant to pay for development that increases the need for services. This suggests that the equity principles used to justify the municipal-wide approach - that growth must pay for itself and users should pay for benefits received - may be contradictory.

Because the area-specific approach levies different amounts on different areas of the municipality depending on the cost of servicing that area, it can approximate a marginal cost approach. For instance, an area-specific development cost charge may reflect cost differences attributable to the distance of the development area from major facilities.

The area-specific approach is described by advocates of the municipal-wide system as administratively cumbersome because it requires more elaborate studies to forecast population growth and capital needs for a variety of smaller areas. It also requires a more complicated accounting system to separate the reserve funds for the various development cost charge areas. The area-specific approach is also frowned upon by advocates of the municipal-wide approach for equity reasons: i.e., it unfairly burdens the population in some areas of the municipality that happen to have high growth-related costs.

This reflects the widespread belief that development cost charges are meant to raise funds for growth-related infrastructure, not to influence development patterns or the production of different housing types. The overall conclusion is that development cost charges are geared almost exclusively to their revenue-raising role and are disconnected from planning goals. This emphasis on the revenue raising aspect of development cost charges reflects an underlying political reality: the municipal decision-makers who preside over the design of development cost charges tend to be more concerned with reducing the impacts of growth on existing tax payers (voters) and not so much motivated by a desire to achieve other social objectives.

**Understanding Smart Growth Savings: Evaluating Economic Savings and Benefits of Compact Development[28]**

*Smart Growth* is a general term for policies that result in more compact, accessible, multimodal development, in contrast to *urban sprawl*, which refers to dispersed, urban fringe, automobile-dependent development. Comprehensive Smart Growth policies create transit-oriented communities, neighbourhoods where high quality walking, cycling, public transit and carsharing services allow households to minimize their vehicle ownership and use. The following table compares the attributes of Smart Growth and urban sprawl, and the figure map illustrates these different land use patterns.

[28] Understanding Smart Growth Savings: Evaluating Economic Savings and Benefits of Compact Development, Victoria Transport Policy Institute, Todd Litman, 2023.

***Table 1*** **Comparing Smart Growth and Sprawl** ("Smart Growth," VTPI 2006)

| | Smart Growth | Sprawl |
|---|---|---|
| Growth pattern | Mostly infill (brownfield) development. | Mostly urban fringe (greenfield) development. |
| Density | Higher-density, clustered activities. | Lower-density, dispersed activities. |
| Land use mix | Mixed land use. | Homogeneous (single-use, segregated) land uses. |
| Scale | Human scale. Smaller blocks and roads, more local services, for pedestrian access | Large scale. Larger blocks, wider roads, more regional services, assuming automobile access. |
| Services (shops, schools, parks) | Local, distributed, smaller. Accommodates walking access. | Regional, consolidated, larger. Requires automobile access. |
| Housing types | Diverse, including compact housing types such as townhouses an d apartments. | Primarily single-family housing. |
| Transport | Multi-modal. Supports walking, cycling and public transit. | Automobile-oriented. Poorly suited for walking, cycling and transit. |
| Transport connectivity | Highly connected roads, sidewalks and paths, and good connections between modes. | Poorly connected networks with numerous dead-end streets, few paths, and inadequate intermodal connections. |
| Parking supply | Lower parking supply, higher parking prices | Parking facilities are abundant and usually unpriced |
| Street design | *Complete streets* that accommodate diverse modes and activities. | Streets designed to maximize motor vehicle traffic volume and speed. |
| Planning process | Planned and coordinated between jurisdictions and stakeholders. | Poorly planned, with little coordination between jurisdictions and stakeholders. |
| Public space | Emphasis on the public realm (streets, sidewalks and public parks). | Emphasis on the private realm (yards, shopping malls, gated communities, private clubs). |

Smart Growth is a set of general principles that can be applied in many ways. In rural areas, it creates compact, walkable villages with a mix of single- and multi-family housing organized around a commercial centre. In large cities, Smart Growth may create dense, urban neighbourhoods with high-rise buildings organized around transit stations. Between these is a wide range of neighbourhood types, their common theme is compact and multi-modal development. In mature cities, Smart Growth consists primarily of incremental infill in existing neighbourhoods, but in growing cities it can consist of urban expansion. Smart Growth does not require that all residents live in high-rise apartments and forego automobile travel; excepting cities with severe geographic constraints, the approach focuses more on providing a variety of ground-oriented and other housing forms, with an overall higher density. See examples in the following figure.

***Figure 3*** **Sprawl and Smart Growth Illustrated**

**Smart Growth**


*This German town has concentrated and mixed development, with houses close to services and well-defined boundaries. A major portion of travel is by walking, cycling and public transit.*

**Sprawl**


*This U.S. suburb has residential development scattered among farms. Many streets lack sidewalks and there is virtually no transit service. This results in high rates of automobile travel.*

**Analysis of Public Policies That Unintentionally Encourage and Subsidize Urban Sprawl[29]**

Although urban sprawl and Smart Growth differ in many ways, they are often measured based only on density (residents or employees per acre or hectare) or its inverse land consumption (e.g., square feet or metres per resident or employee). Density is a useful indicator because it is widely available and easy to understand, and because it tends to be positively correlated with other Smart Growth factors including development mix (the proximity of residential, commercial and institutional buildings), transport network connectivity (density of sidewalks, paths and roads), centricity (the degree that employment is concentrated into commercial centres), and transport diversity (quality of walking, cycling and public transport).

However, by itself, density is an imperfect indicator since it is possible to have dense sprawl (high-rise buildings in isolated, automobile-dependent areas), and rural Smart Growth (such as compact, walkable villages linked by high quality public transit). If possible, Smart Growth should be analyzed using an index which reflects various land use factors including density, mix, and connectivity.

Density analysis can be confusing because it is measured in many different ways:

- What is measured: residents, residents plus employees, dwelling units (du) and motor vehicles.
- Land area units: acre, hectare, square mile / kilometre.
- Geographic scale: parcel (just the land that is developed), neighbourhood (including local streets, schools, parks, etc.), or region (including industrial areas and regional open space).
- Weighting: Population-weighted density, which measures the density that residents actually experience, is a better indicator than simple average densities for evaluating land use economic and livability impacts, but is more difficult to compute.

A common justification for urban sprawl is that it increases residents' access to "nature" (open space). Sprawl advocates sometimes argue that urban living results in "nature deficit disorder." However, Smart Growth does include open space, including public parks, street trees, and preserved farmlands. Although sprawl residents may have more private open space, they displace more total open space per capita, so sprawl residents can be considered to consume nature while Smart Growth residents preserve nature, resulting in more open space overall.

Open space external benefits are well recognized, including agricultural productivity, wildlife habitat, stormwater percolation, and support for tourism. The loss of these benefits can sometimes be quantified and monetized based on direct economic costs, such as reduced agricultural production or tourism activity, or increased stormwater management costs, or based on the value that nearby residents place on greenspace.

**Fiscal Impact Analysis: Methodologies for Planners[30]**

There are two basic approaches to fiscal evaluations: using average costs and using marginal costs. Average-cost approaches are simpler and more popular; costs and revenues are calculated based on the average cost per unit of service multiplied by the demand for that unit. Average-cost approaches assume a linear relationship and do not consider excess or deficient capacity of facilities or services.

[29] Analysis of Public Policies That Unintentionally Encourage and Subsidize Urban Sprawl, Victoria Transport Policy Institute, Todd Litman, 2015.

[30] Fiscal Impact Analysis: Methodologies for Planners, American Planning Association, L. Carson Bise II, 2010.

**DEFINING FISCAL IMPACT ANALYSIS**

A Financial Impact Analysis (FIA) projects the net cash flow to the public sector (the local government and, in many cases, the school district) resulting from new development, whether residential, commercial, industrial, or other. An FIA is similar to the cash-flow analysis a developer conducts in order to project costs and revenues likely to result from a proposed development over multiple years. Just as a household benefits by forecasting its long-term cash-flow needs (e.g., incorporating anticipated expenses for higher education and other expensive items) and setting money aside to pay for future outlays, local governments are better prepared to manage community needs during changing financial circumstances if they anticipate and plan for future costs and revenues.

Fiscal analysis enables local governments to estimate the difference between the costs of providing services for new development and the taxes, user fees, and other revenues that will be collected as a result of new development. FIA can be used to evaluate the fiscal effect of an individual development project (e.g., a request for rezoning), a change in land use policy (e.g., increasing allowable densities for development), or a proposed annexation.

It is important to keep in mind that the fiscal impact of development policies, programs, and activities is only one of the issues that local government officials should consider when evaluating policy or program changes related to land use and development. Land uses that are a financial drain or are less beneficial financially than other alternatives should not necessarily be excluded, since they may be necessary to the community's goals related to affordable housing, economic diversity, quality of life, and so on. Moreover, localities have a responsibility to consider other impacts, too, such as the need to evaluate environmental impacts, needs for housing and employment, and other concerns. Nevertheless, fiscal impact data can be used as part of a larger cost-benefit analysis to craft a land use plan that incorporates the appropriate mix of land uses necessary to achieve fiscal sustainability or, at a minimum, fiscal neutrality.

Marginal-cost approaches describe the unique characteristics of a jurisdiction's capital facilities. Although over the long term, average- and marginal-cost techniques will produce similar results, the real value of fiscal analysis is in the longer term period, when a community can incur costs. Marginal-cost analysis is most useful in this time frame. However, average-cost techniques are generally simpler to use, so for relatively small development projects with modest impacts or impacts that are realized over a long time frame, they may be preferred. Some local governments may find it worthwhile to use more than one analysis approach and compare the assumptions and results as part of the decision-making process.

In communities where facilities in geographic sub-areas already are insufficient, the average-cost approach will underestimate costs, whereas the marginal-cost approach will more accurately project the short- to mid-term costs of infrastructure required to accommodate new development. For instance, if an analysis examined school services costs, the average-cost approach would divide the expenditure for school services by the number of students to arrive at a figure per student. This analysis would not consider any spatial distribution of new homes and the resulting schoolchildren. The marginal-cost approach would consider both current school enrollment as well as capacity in each school. If new residential growth were to occur in areas where schools have excess capacity, the only real cost increase will be for operating expenses, whereas if new residential development was to locate in an area with no school capacity, costs would be incurred for additional school capacity (i.e., capital costs) as well as the associated operating expenses.

## AVERAGE-COST TECHNIQUES

### Per Capita Multiplier

The most popular average-cost technique is the per capita multiplier. This is obtained by dividing the budget for a particular service, such as parks, by the current population, yielding an estimated service cost per person. Under the per capita approach, it is assumed that each service level will be maintained into the future and that each additional resident will generate the same level of costs to the jurisdiction as each existing resident currently generates. This figure is then used to estimate additional costs resulting from new development.

The per capita approach is easy to use but has the disadvantage of being less accurate than other approaches if local officials want to look beyond broad levels of overall costs and expenditures.

### Service Standard

A second average-cost approach is the service-standard method. This approach estimates the future costs of development based on average staffing and capital facility service levels for municipalities of similar size and geographic location. This methodology assumes that service levels for both personnel and capital facilities are, to a large extent, a function of a jurisdiction's total population, and that communities of a similar size will therefore have similar service levels, especially within a geographic region.

Since a fundamental assumption is that personnel growth within one community is equivalent to average personnel growth in the region, to the extent that a community is dissimilar to the "average" in terms of services, costs, or demographics, the figures will be in error.

### Proportional Valuation

The third average-cost approach is the proportional valuation method; it is typically used for evaluating the fiscal impacts of non-residential growth. This methodology assumes that assessed property values are directly related to public services costs.

Also included as part of the analysis are refinement coefficients, which are intended to prevent significant differences in the value of residential and non-residential property from skewing cost relationships. The total number of non-residential land parcels is divided by the total number of land parcels, and this figure is used to select the area of a refinement coefficient curve.

The proportional-valuation approach is used infrequently because most analyses include a residential component and because selecting a refinement coefficient for each public service is a fairly subjective process. Additionally, this method assumes that costs increase with land use intensity. This may or may not be the case.

## MARGINAL-COST TECHNIQUES

### Local Case Study

The most thorough of the FIA approaches uses locally based case information. This case-study approach assumes that every community is unique and that the assumptions regarding levels of service and cost and revenue factors should reflect what is occurring in that community. Department representatives are interviewed about existing public facilities and service capacities. Local information on excess park

capacity, for example, makes it possible to predict when new facilities, programs, or personnel may be needed.

In cases where it is difficult to obtain marginal-cost information, communities might use average-cost data in place of local data. For example, estimating the increase over time in general government operating expenses may be done most efficiently using the per capita average-cost approach. On the other hand, local interviews could indicate that the cost for a particular local government service is fixed (i.e., not affected by growth) or semi-variable by population (i.e., affected by growth but not fully variable on a per capita basis).

The primary drawbacks of the case-study approach are that it can require a significant amount of time and that the accuracy of the data depends on the accuracy of each department's estimates. It is not uncommon for departments to estimate that the marginal impacts from new development will require more resources than are currently provided, resulting in new development being charged for a higher level of service than is currently provided.

### Comparable City

The second marginal-cost approach looks at costs in comparable jurisdictions. The data are organized by population and by growth rate. This approach assumes that growth will affect expenditure patterns and includes that effect in projecting future costs. Without the rate of population increase or decrease reflected in the tables, this methodology would be very similar to the service-standard approach. This methodology is used infrequently.

## BENEFITS OF FISCAL IMPACT ANALYSIS

### Encourages Anticipation of Change

One of the major benefits of FIA is that it describes what is likely to happen due to change within a jurisdiction. A fiscal analysis measures the impact of growth or decline on a local government's services, including capital facilities, and the resulting costs and revenues. This is different from the preparation of the next year's budget. In most cases, a fiscal analysis does not replicate the budget; it projects marginal changes in the budget given possible land use, demographic, and employment changes. Fiscal analysis enables local officials to ask "what if" something happens and to consider the effects beyond the next fiscal year. While the resulting data are not necessarily completely accurate, they do provide a clear sense of the likely effects of various policies, which can be crucial to local officials making policy decisions.

### Helps Define Achievable Levels of Service

The level of service the local government will provide is an important factor in calculating impact fees and other user fees. To quantify levels of service, department managers must choose an indicator as a basis: the number of residents or jobs in the community, the number of average daily trips on local roads, or some other appropriate denominator. Defining the level of service promotes discussion about the adequacy of services and enables the local government to determine through fiscal analysis whether the community can afford various levels of service, both in terms of the costs of new or expanded capital facilities and annual operating costs.

**Projects Capital Facility Needs**

A fiscal impact analysis can incorporate information on the available capacity of current capital facilities and project when additions or new facilities will be needed for each development alternative being evaluated. Fiscal analysis also can be used to help allocate new capital facilities to geographic subareas of the community.

The evaluation of capital facilities needs can be helpful in developing or revising the local government's capital improvement program (CIP). The costs and staging of facilities included in the CIP are often based on the independent best estimates of the departments that have activities or programs affected by the proposed capital improvements. Fiscal analysis can add an additional perspective.

Fiscal analysis can help the local government forecast capital-facilities needs over a longer period of time and in a more thorough fashion, giving decision makers more information to make better investment decisions.

**Clarifies Development Policy Impacts**

In most cases, fiscal impact analysis focuses on the effects of growth or development, usually defined in a development scenario. Development scenarios must be defined for each year of the forecast period in terms of population, employment, housing by type, and non-residential square footage.

Defining development scenarios can be useful. The process of describing in narrative form how and why the numbers were developed is a very important aspect of a fiscal impact analysis, which provides local officials with information to evaluate the logic of the assumptions underlying policies or proposals.

The development scenario and fiscal impact analysis can be used to project how providing the various types of housing that could accommodate this growth (e.g., garden apartments, townhouses, single-detached homes, and condominiums) would affect the need for services over time. Since this scenario projects job growth as well, the fiscal analysis could also assess the fiscal impact of alternative job-growth pictures (e.g., mostly offices with some retail versus industrial growth with some office and retail). Using this process, local officials can review existing and proposed policies from a more informed perspective. Fiscal impact analysis can help not only local officials but also developers take realistic looks at the viability of proposed development.

**Calculates Capital Costs and Operating Expenses**

The calculation of capital costs and operating expenses is an obvious benefit of a fiscal impact analysis. If the FIA focuses on the marginal costs associated with growth, rather than using an average-cost approach, the results are more likely to accurately reflect annual needs and therefore will be more useful. The calculation of capital costs and operating expenses associated with service changes clearly shows decision makers how the local government's budget will be affected by growth or redevelopment.

**Calculates Revenues; Helps in the Development of Revenue Strategies**

A fiscal analysis calculates the additional local government revenues resulting from new development, assuming existing rates and fee structures. A fiscal analysis can show the magnitude of the revenues that would be collected under different development scenarios and can show whether there would be a surplus or deficit of revenues over expenditures on an annual as well as a cumulative basis for each alternative considered. This enables local officials to consider alternative sources of revenues.

The first area to evaluate is the structure of rates for various revenue sources. Revenue formulas used to set user fees, utility rates, and property taxes should be reviewed as part of developing a revenue strategy. Possible new revenue sources can also be evaluated.

Even if the fiscal analysis projects a surplus of revenues over expenditures as a result of new development, rate structures for revenues such as user fees should be evaluated regularly so that appropriate fees can be applied to new growth.

**Encourages "What If" Questions**

A good fiscal impact analysis with a narrative explaining all assumptions and inputs encourages managers to ask a number of "what if" questions. Alternative scenarios can be described for service levels, for the cost and revenue factors, for growth itself, or for almost any other aspect of the analysis. Decision-makers find that some of the major benefits of fiscal analysis are the explicit defining of all the different service level and cost and revenue factors, as well as the ability to change assumptions and quickly see the impact of the changes. This makes fiscal analysis a very effective policy tool.

# Appendix B: Case Study Profiles

<table>
<tr><td>Name / Area</td><td>City of Ottawa, Ontario</td></tr>
<tr><td>Study Purpose</td><td>The Update to Comparative Municipal Financial Analysis examines the comparative operating and capital costs and revenues attributable to four categories of development in the City of Ottawa: higher-density urban; lower-density urban greenfield; low-density villages; scattered estate and low-density rural.<br><br>The analysis of local services and development charges employs a marginal cost approach derived from 13 representative developments. The capital analysis considers one-time and long-term replacement costs of growth-related capital.</td></tr>
<tr><td>Scope / Year</td><td>City-wide analysis. Operating and capital costs and revenues.<br>Four different residential categories.<br>Study completed in 2013.</td></tr>
<tr><td>Scenarios / Typologies</td><td>To account for differences at a more detailed level, a marginal cost approach was employed in regard to growth-related capital. The marginal approach was also used to estimate the revenue (one-time and ongoing taxation and utility rates) that could be anticipated from new development.<br><br>The marginal cost and revenue estimates developed were based on a sample of recently built developments. The unit composition for the four scenarios is shown in the following table, ranging from exclusively single-detached housing form in the two rural scenarios, to 41% townhouses in the lower density greenfield scenario, and 30% townhouses and 46% apartments in the higher density urban scenarios.<br><br>
<table>
<tr><th colspan="3">Urban</th><th colspan="3">Rural</th></tr>
<tr><th colspan="2">Higher-Density</th><th colspan="2">Lower-Density Greenfield</th><th colspan="2">Low-Density Village</th><th colspan="2">Scattered Estate and Low-Density</th></tr>
<tr><th colspan="3">Unit Composition</th><th colspan="3">Unit Composition</th><th colspan="2">Unit Composition</th><th colspan="2">Unit Composition</th></tr>
<tr><td>Singles</td><td>125</td><td>20%</td><td>Singles</td><td>1,251</td><td>57%</td><td>Singles</td><td>545</td><td>100%</td><td>Singles</td><td>558</td><td>100%</td></tr>
<tr><td>Semis</td><td>28</td><td>4%</td><td>Semis</td><td>46</td><td>2%</td><td>Semis</td><td>0</td><td>0%</td><td>Semis</td><td>0</td><td>0%</td></tr>
<tr><td>Towns</td><td>189</td><td>30%</td><td>Towns</td><td>894</td><td>41%</td><td>Towns</td><td>0</td><td>0%</td><td>Towns</td><td>0</td><td>0%</td></tr>
<tr><td>Apts.</td><td>290</td><td>46%</td><td>Apts.</td><td>0</td><td>0%</td><td>Apts.</td><td>0</td><td>0%</td><td>Apts.</td><td>0</td><td>0%</td></tr>
<tr><td>Total</td><td>632</td><td></td><td>Total</td><td>2,191</td><td></td><td>Total</td><td>545</td><td></td><td>Total</td><td>558</td><td></td></tr>
</table>
</td></tr>
<tr><td>Annual Tax Levy and Rate Supported Services (per capita)</td><td>Costs:<ul><li>Higher Density Urban - $1,220</li><li>Lower Density Urban Greenfield - $1,627</li><li>Low Density Rural Village - $1,823</li><li>Scattered Estate and Low Density Rural - $1,734</li></ul>Revenues:<ul><li>Higher Density Urban - $1,811</li><li>Lower Density Urban Greenfield - $1,358</li><li>Low Density Rural Village - $1,757</li><li>Scattered Estate and Low Density Rural - $1,490</li></ul></td></tr>
<tr><td>Net Annual Variance</td><td><ul><li>Development in the higher density urban category produces a surplus of $590/capita ($1,124 per household) when levy and rate services are combined.</li></ul></td></tr>
</table>

| | |
|---|---|
| (per capita / household) | • Lower-density urban greenfield category has a negative variance of $269/capita ($770 per household).<br>• Low-density rural categories have a negative variance of $66/capita ($188 per household).<br>• Scattered estate have a negative variance of $244/capita ($623 per household). |
| Key Findings | A significant infrastructure funding gap can be observed when comparing the City's current capital spending to that required, according to ideal asset replacement schedules. As growth occurs the gap will continue to grow.<br><br>The City should encourage development in higher-density urban areas as it is generally the most cost-efficient. Practically, however, not all future growth can be accommodated by this form of development. One of the primary reasons why the higher-density urban category is preferable in the analysis is due to the higher proportion of apartments and other multiple dwellings in the representative developments. The City should encourage the development of these units throughout the City which would reduce cost disparities.<br><br>Although the initial capital costs of local services infrastructure are borne by the developer, the long-term replacement of the assets is an important consideration in the analysis. The lower the amount of local infrastructure required by new development, the lower the annual replacement provisions. This is a major reason why apartment developments are preferable from a fiscal standpoint.<br><br>The City should encourage the development of larger apartment units suitable for families as the municipal cost and revenue per capita values are favourable. However, from a homebuyer's standpoint, the cost per floor area of these units is often higher than of comparatively sized ground-oriented units.<br><br>When feasible, the City should make use of existing facilities to accommodate growth while looking for opportunities to combine facilities across departments to reduce future upfront capital costs and replacement provision. |
| Source | 'Update to Comparative Municipal Financial Analysis', City of Ottawa.<br>Completed by HEMSON Consulting Ltd. Revised August 2013. |

| Name / Area | **Regional Municipality of Ottawa-Carleton, Ontario** |
|---|---|
| Study Purpose | The Infrastructure Costs Associated with Conventional and Alternative Development Patterns study compares the cost effectiveness of two patterns of development: a conventional suburban development and a mixed-use compact development pattern. The analysis considers the long-term life-cycle costs of various linear infrastructure and community services, and differentiates between public and private costs. |
| Scope / Year | An existing development site (338 ha gross) within the Ottawa-Carleton region.<br>Operating and capital costs and revenues.<br>Two different development scenarios.<br>Study completed in 1995. |
| Scenarios / Typologies | The studied conventional site exhibits all of the characteristics of a conventional post-war suburban development pattern, including a curvilinear street pattern, relatively low residential densities, homogeneity and separation of land uses, and an emphasis on the private automobile over other modes of travel. An alternative development, planned according to the principles of New Urbanism (with a finer mix of land uses, higher residential densities, narrower rights-of-way and pavement widths, a modified grid system of streets, transit supportive design), was overlaid onto the existing site, and the life-cycle infrastructure costs of the two plans, including emplacement, replacement, and operating and maintenance costs, were calculated and compared.<br><br>The conventional plan includes 184 ha of residential land, which yields 4,005 dwellings and a population of 13,045. By comparison, the alternative plan includes 158 ha of residential land, yielding 6,857 dwellings and a population of 20,949. The net residential density of the conventional plan was 21.7 units per hectare, with a gross density of 12.2 uph, while the corresponding residential densities for the alternative plan was a net 43.3 uph and gross 20.9 uph.<br><br>There are some significant differences between the two plans:<br>• The alternative plan has more than twice as much land devoted to commercial uses, and 20% more recreation and open space lands.<br>• The alternative plan contains 71% more dwelling units than the conventional plan, due, in part, to smaller lot sizes.<br>• There are over 500 more apartments in the alternative plan, mixed in with commercial, retail and office uses along the main street.<br>• The alternative plan has a 16% greater length of roads, and almost 15% more asphalt road surface area, not including the rear lanes. |
| Capital Costs (per unit) | The initial capital cost of emplacing the infrastructure is approximately $5,300 per unit less in the alternative plan (i.e., 16% cheaper) than in the conventional plan. Savings for road construction are a result of: (1) the increase in residential density spreading the cost of roads over more dwelling units; and (2) the higher proportion of non-residential land uses (7.5% more) lowering the percentage of total road costs apportioned to the residential sector.<br><br>Significant cost savings in the areas of storm and sanitary sewers, water distribution, and other services which parallel the road network arise for the same reasons. |

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|---|---|
| | **Comparison of Per Unit Emplacement Costs ($)**<br><br>**Service Component** / **Conventional Site** / **Alternative Plan** / **Difference** / **%**<br>1. Roads (inc. utilities & service connections) / 5,272 / 3,311 / -1,961 / -37<br>2. Sidewalks & Streetlighting / 498 / 636 / +138 / +28<br>3. Sanitary Sewer / 1,885 / 1,191 / -694 / -37<br>4. Stormwater Management / 3,491 / 2,210 / -1,281 / -37<br>5. Water Distribution / 1,758 / 1,258 / -500 / -28<br>6. Transit / 1,059 / 881 / -178 / -17<br>7. Fire Protection / 348 / 301 / -47 / -14<br>8. Police Protection / 362 / 313 / -49 / -14<br>9. Parkland / 3,591 / 3,368 / -223 / -6.2<br>10. Recreational Facilities / 3,335 / 3,183 / -152 / -4.6<br>11. Libraries / 522 / 489 / -33 / -6.3<br>12. Works & Parks Department / 417 / 358 / -59 / -14<br>13. Garbage Collection / 0 / 0 / 0 / 0<br>14. Hydro-Electric Services / 1,992 / 1,731 / -261 / -13<br>15. School Facilities/Transportation / 10,034 / 10,033 / -1 / 0<br>**Total** / **$34,564** / **$29,263** / **$-5,301** / **-16** |
| Lifecycle Costs (per unit) | Infrastructure costs were more economical in the alternative plan; life-cycle savings of approximately $11,000 per unit over a 75-year period. Expressed as a percentage, the linear infrastructure, including roads, utilities, sewer, water, and stormwater management, represents the greatest per unit cost savings.<br><br>A reduction in infrastructure emplacement (i.e., roads, street lights, piped services, parks) costs of approximately $5,300 per unit represents the largest life-cycle cost savings. Operating and maintenance costs are $3,700 less per unit in the alternative plan, and infrastructure replacement is $2,000 less per unit. Construction, replacement, operating, and maintenance costs, as a proportion of total lifecycle costs, remain relatively constant in both plans, at approximately 26%, 7%, and 65-68%, respectively. |
| | **Comparison of Per Unit Total Life-Cycle Costs ($)**<br><br>**Service Component** / **Conventional Site** / **Alternative Plan** / **Difference** / **%**<br>1. Roads (inc. utilities & service connections) / 10,446 / 7,392 / -3,054 / -29<br>2. Sidewalks & Streetlighting / 936 / 1,225 / +289 / +31<br>3. Sanitary Sewer / 2,652 / 1,677 / -975 / -37<br>4. Stormwater Management / 4,105 / 2,606 / -1,499 / -37<br>5. Water Distribution / 3,534 / 2,446 / -1,088 / -31<br>6. Transit / 9,104 / 7,774 / -1,330 / -15<br>7. Fire Protection / 5,204 / 4,496 / -708 / -14<br>8. Police Protection / 7,466 / 6,450 / -1,016 / -14<br>9. Parkland / 4,735 / 4,325 / -410 / -8.7<br>10. Recreational Facilities / 7,794 / 7,434 / -360 / -4.6<br>11. Libraries / 2,934 / 2,752 / -182 / -6.2<br>12. Works & Parks Department / 772 / 663 / -109 / -14<br>13. Garbage Collection / 2,453 / 2,301 / -152 / -6.2<br>14. Hydro-Electric Services / 6,270 / 5,893 / -377 / -6.0<br>15. School Facilities/Transportation / 56,804 / 56,799 / -5 / 0<br>**Total** / **$125,209** / **$114,233** / **$-10,977** / **-8.8** |
| Key Findings | In addition to providing significant public and private cost savings, the alternative development plan accommodates many more units, thereby reducing pressures to find and develop new residential land. The increased density supports mixed-use development, stimulates the provision of a range of housing and transportation options, and a variety of employment, commercial, and community activities. |
| Source | 'Infrastructure Costs Associated with Conventional and Alternative Development Patterns: Final Report and Summary Report', for CMHC, Regional Municipality of Ottawa-Carleton, prepared by: Essiambre Phillips Desjardins Associates Ltd., in association with J.L. Richards & Associates Limited, C.N. Watson Associates Ltd., A Nelessen Associates Inc., 1995.<br>'Infrastructure Costs Associated with Conventional and Alternative Development Patterns', CMHC Research Highlights, Socio-Economic Series, Issue 26, 1996. |

| | |
|---|---|
| Name / Area | **City of Kingston, Ontario** |
| Study Purpose | The intent of the Lifecycle Fiscal Impacts of Development study was to draw observations from the analysis that can be used to inform strategic growth management decisions. The study measures the fiscal impacts of growth as anticipated within the City's Population, Housing and Employment Growth Forecast, 2016 to 2046. |
| Scope / Year | City of Kingston, 2021 |
| Scenarios / Typologies | The study considered the full cost accounting obligations of new development, including operating and lifecycle capital costs of service on an annualized basis at full development. Residential Development Types:<br>• Low Density: Single/Semi-Detached; With Second Residential Units<br>• Medium Density: Townhouse; Row; Duplex, Triplex, Quad, Sixplex<br>• High Density: Condominium; Apartment; Retirement Home |
| Fiscal Impacts by Geographic Area | The table below summarizes the fiscal impacts for residential development by geographic area. The first part of the table provides the full cost lifecycle accounting fiscal impacts by dwelling unit type for each of the surveyed developments, and by land area (net hectare) based on the underlying development type and density assumptions of the City's Growth Forecast. The second half of the table aggregates these observations by geographic area, comprising the averages of each surveyed development in the respective geographic area. |

**Residential Fiscal Impacts by Geographic Area (2020 dollars per hectare)**

| Area | 2020 Surplus/(Deficit) per Dwelling Unit | | | | | 2020 Total Surplus/(Deficit) per Hectare | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low | Low (w/ 2nd Unit) | Medium | Apartment | Condo | Low | Low (w/ 2nd Unit) | Medium | Apartment | Condo | Total |
| Cataraqui North | (1,130) | (2,915) | (313) | (224) | 1,061 | (13,301) | | (1,157) | (2,003) | 1,675 | (14,785) |
| Williamsville Main Street | (764) | (2,584) | (964) | (220) | 1,458 | (324) | (13,247) | (4,491) | (9,227) | 10,804 | (16,485) |
| Greenwood Park | (1,668) | (3,776) | (732) | (80) | 2,619 | (21,754) | | (2,482) | (195) | 1,127 | (23,304) |
| Westbrook | (1,040) | (3,358) | (711) | (299) | 2,730 | (12,243) | | (2,631) | (2,674) | 4,308 | (13,240) |
| Near Queen's Campus | 2,738 | (289) | (367) | (515) | 7,981 | 1,160 | (1,480) | (1,712) | (21,616) | 59,163 | 35,516 |
| North King's Town | (1,232) | (2,584) | (1,640) | (457) | 1,503 | (522) | (13,247) | (7,644) | (19,176) | 11,139 | (29,450) |
| Bayridge | (908) | (2,584) | (788) | (299) | 2,730 | (10,684) | | (2,916) | (2,674) | 4,308 | (11,966) |

| Area | 2020 Surplus/(Deficit) per Dwelling Unit | | | | | 2020 Total Surplus/(Deficit) per Hectare | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low | Low (w/ 2nd Unit) | Medium | Apartment | Condo | Low | Low (w/ 2nd Unit) | Medium | Apartment | Condo | Total |
| Kingston West | (1,026) | (2,952) | (604) | (274) | 2,174 | (12,076) | | (2,235) | (2,450) | 3,430 | (13,330) |
| Kingston Central | 247 | (1,819) | (990) | (397) | 3,647 | 105 | (9,324) | (4,615) | (16,673) | 27,035 | (3,473) |
| Kingston East | (1,668) | (3,776) | (732) | (80) | 2,619 | (21,754) | | (2,482) | (195) | 1,127 | (23,304) |
| **Total Kingston** | (572) | (2,584) | (788) | (299) | 2,869 | (5,231) | (3,212) | (3,075) | (4,879) | 8,262 | (8,135) |

| | |
|---|---|
| Fiscal Impacts by Development Type | The table below summarizes the net levy fiscal impacts on a per dwelling unit basis for different types of residential uses, and on a per 1,000 square feet of gross floor area basis for various non-residential development, in 2020 dollars. |

**Fiscal Impact Summary for Residential and Non-Residential Developments ($2020)**

| Type | Average assessed value | 2020 Property tax revenue | 2020 Net operating expenditure | Incremental facility/ equipment operating expenditures | 2020 Operating surplus | Incremental life cycle capital expenditures | Incremental local service capital expenditures | 2020 Surplus/ deficit |
|---|---|---|---|---|---|---|---|---|
| **Single detached, semi-detached** | 408,099 | 4,614 | 2,023 | 347 | 2,244 | 1,685 | 1,131 | -572 |
| **With second residential unit** | 363,376 | 4,067 | 2,754 | 473 | 841 | 2,294 | 1,131 | -2,584 |
| **Rowhouse, townhouse** | 243,544 | 2,741 | 1,584 | 272 | 886 | 1,319 | 354 | 788 |
| **High rise condominium** | 472,790 | 5,273 | 1,151 | 198 | 3,924 | 959 | 96 | 2,869 |
| **High rise apartment** | 188,373 | 2,105 | 1,151 | 198 | 756 | 959 | 96 | -299 |
| **Commercial retail** | 151,021 | 3,276 | 585 | 242 | 2,449 | 1,072 | 293 | 1,084 |
| **Commercial office** | 142,315 | 3,185 | 836 | 346 | 2,004 | 1,532 | 376 | 96 |
| **Industrial** | 68,913 | 1,954 | 641 | 265 | 1,047 | 1,176 | 567 | -695 |

| | |
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| Fiscal Impacts by Land Area (Net Hectare) | Based on this weighting of development:<br>• Kingston West would produce an annual fiscal deficit per net hectare of $13,460 for full cost lifecycle accounting obligations. This would equate to an increase to 2020 tax rates of 15% to fully fund these obligations.<br>• Kingston Central would produce an annual fiscal surplus of $2,309 per ha.<br>• Kingston East forecast development would produce an annual fiscal deficit of $24,464 per ha. or requiring 2020 tax rate increases of 33% to achieve full cost accounting recovery. Incorporating the respective development across the three geographic areas would produce a weighted overall deficit of $7,701/ha.<br>• To achieve full cost lifecycle accounting levels, the 2020 tax rate would be required to increase by 7%. |
| Key Findings | Based on the current average assessed value per residential unit in the respective geographies, the study found the following:<br>• Low density residential development (in the Near Queen's Campus area) would fiscally perform better as compared to the other areas, generating surplus revenues of $2,738 per unit. Similar development in the Greenwood Park area would fiscally perform worse at an annual deficit of $1,668 per unit.<br>• For second residential units (in the Near Queen's Campus area) would fiscally perform better as it has a comparative advantage in assessed value to the other surveyed areas of the City.<br>• Medium density residential development (in the Cataraqui North area) would fiscally perform better compared to the other areas, generating an annual deficit of $313 per unit. Similar developments in the North King's Town area would fiscally perform worse at an annual deficit of $1,640 per unit.<br>• High rise condominiums (in the Near Queen's Campus area) would fiscally perform better which produces higher than average annual surplus revenues per unit. Comparatively, similar developments within the Cataraqui North area would produce the lowest per unit assessed values for the surveyed geographic areas.<br>• High rise apartment residential (in the Greenwood Park area) would fiscally perform better and worse in the Near Queen's Campus area given the property assessment values across the surveyed geographic areas of the City for these types of residential dwelling units is generally consistent. |
| Source | 'Lifecycle Fiscal Impacts of Development', City of Kingston.<br>Watson & Associates Economists Ltd. March 23, 2021. |

**Overall Fiscal Impacts by Geographic Area (2020 dollars per hectare)**

| Area | Residential | | Non Residential | | Total 2020 Surplus/ (Deficit) per Ha | Total 2020 Tax Revenues per Ha | Full Lifecycle Cost Tax Impact |
|---|---|---|---|---|---|---|---|
| | Net Developable Land (Ha) | 2020 Surplus/ (Deficit) per Ha | Net Developable Land (Ha) | 2020 Surplus/ (Deficit) per Ha | | | |
| Kingston West | 80% | (13,330) | 20% | (13,970) | (13,460) | 87,437 | -15% |
| Kingston Central | 69% | (3,473) | 31% | 15,335 | 2,309 | 155,001 | 1% |
| Kingston East | 65% | (23,304) | 35% | (26,590) | (24,464) | 73,256 | -33% |
| **Total Kingston** | 75% | (8,135) | 25% | (6,378) | (7,701) | 105,817 | -7% |

| Name / Area | **Calgary, Alberta** |
|---|---|
| Study Purpose | The City of Calgary commissioned to study to assist in development of an integrated plan for land use and transportation. Over the projected 60 years the population of Calgary is expected to grow from approximately 1 million to 2.3 million people, with another 0.5 million people in the surrounding region.<br><br>The types of infrastructure investigated in the report are transportation (i.e., roads and transit), water and sewage service, police, fire, parks, recreation centres in schools. |
| Scope / Year | City-wide analysis. Capital and operating costs totals (not per capita).<br>Two different growth / development scenarios.<br>Study completed in 2009. |
| Scenarios / Typologies | The study examines the infrastructure implications of two growth patterns: the dispersed scenario, reflecting current trends and the continuation of current city policy; while the recommended direction intensifies jobs and population in specific areas in the city and links them with high quality transit infrastructure.<br><br>Comparison of alternative development forms: conventional suburban development or Sprawl vs. traditional neighbourhood development or Smart Growth. The land required for the recommended direction / scenario is 25% smaller than the dispersed scenario. |
| Infrastructure Costs | As shown in the table below, the cost to build the recommended direction is 33% less expensive than the dispersed scenario.<br><br>**Total Cost ($billion)**<br><br>**Dispersed Scenario** / **Recommended Direction** / **Difference** / **Percent Difference**<br>Road Capital Cost: $17.6 / $11.2 / $6.4 / -36%<br>Transit Capital: $6.8 / $6.2 / $0.6 / -9%<br>Water and Wastewater: $5.5 / $2.5 / $3.0 / -54%<br>Fire Stations: $0.5 / $0.3 / $0.2 / -46%<br>Recreation Centres: $1.1 / $0.9 / $0.2 / -19%<br>Schools: $3.0 / $2.1 / $1.0 / -32%<br>Total: $34.5 / $23.1 / $11.4 / -33% |
| Operating Costs (total) | As shown in the table below, the recommended direction would be 14% less expensive to operate over the 60 years of the scenario.<br><br>**"Horizon Year" Annual Operating Cost Comparison ($billion)**<br><br>**Total Cost ($billion)**<br><br>**Dispersed Scenario** / **Recommended Direction** / **Difference** / **Percent Difference**<br>Road Operations: $0.23 / $0.19 / $0.04 / -18%<br>Transit Net Operating: $0.30 / $0.30 / $0.00 / 0%<br>Water and Wastewater: $0.06 / $0.03 / $0.03 / -55%<br>Fire Stations: $0.28 / $0.23 / $0.05 / -18%<br>Parks: $0.13 / $0.12 / $0.01 / -9%<br>Total: $0.99 / $0.86 / $0.13 / -14% |

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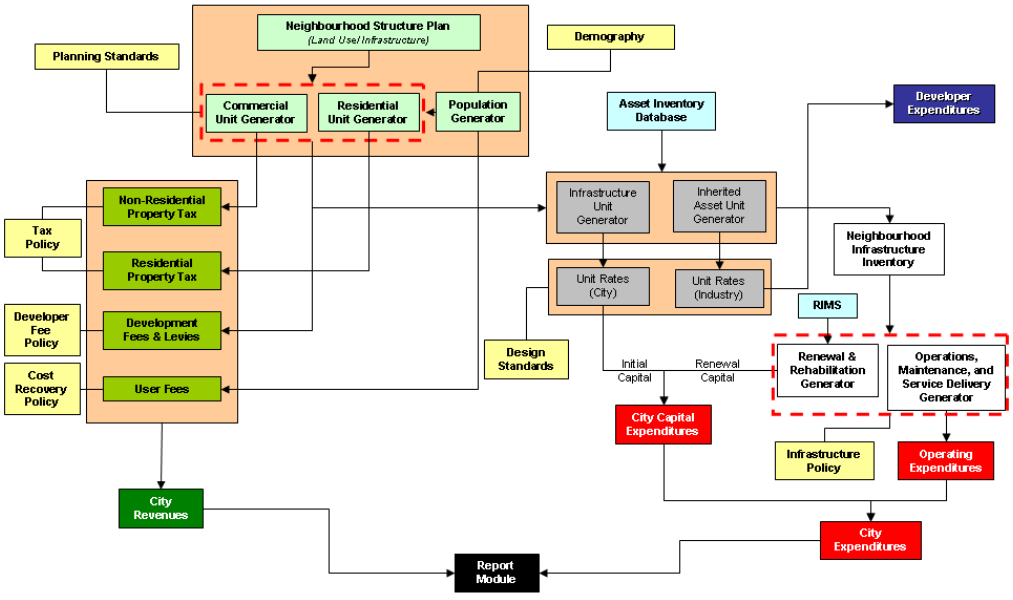
| Net Variance | The fiscal estimates provide for a relative comparison of the two growth patterns. The compact growth 30-year scenarios (2010 to 2040) identified savings of 33% for the City of Calgary, for the capital cost of roads, transit, water, emergency response, schools and recreation services, and savings of 14% on operational costs. |
| Key Findings | The primary development settings for urban growth include high-density, clustered infill development (Smart Growth) within inner city areas and low-density, dispersed greenfield developments (Urban Sprawl) in fringe areas. Compact growth through infill instead of fringe development reduces per-capita land consumption and saves on costs of new land development, building new roads and extending underground linear utilities. |
| Source | 'The implications of alternative growth patterns on infrastructure costs', City of Calgary, Report by IBI Group, 2009. |

| Name / Area | **Edmonton, Alberta** |
|---|---|
| Study Purpose | The City of Edmonton encounters infrastructure challenges owing to rapid growth, including issues of sustainability, land use planning, changing service levels, and municipal financing. New developments have a significant impact on the short and long term financial health of the City in terms of revenues and expenditures. To overcome these challenges, the City developed an analytical model to assess neighbourhood growth on a case-by-case basis. The Development Infrastructure Impact Model is a prototype model that was developed to understand the growth and development of new neighbourhoods in Edmonton. |
| Scope / Year | 17 neighbourhoods in the city-region.<br>Study completed in 2012. |
| Scenarios / Typologies | The model was developed to understand the growth and development of new neighbourhoods in Edmonton. The model provides a high level quantitative analysis of infrastructure, in terms of physical quantities and financial investment in individual neighbourhoods, whose build-out is based on anticipated growth patterns.<br><br>The model uses neighbourhood-specific information provided by a developer, detailing expected population, land use areas, circulation areas and residential density breakdowns. This information is used by the model to create infrastructure requirements based on three related drivers:<br>• *Population based requirements* and costs for service facilities such as libraries, police stations, fire halls and community recreation facilities.<br>• *Area based requirements* and costs for infrastructure such as local, collector and arterial roads, storm and sanitary sewers, and parks.<br>• *Population and area based requirements* such as transit service.<br><br>  |
| Infrastructure Costs | 17 neighbourhoods were selected for the analysis and were based on current development status, neighbourhood areas, population demographics, land use patterns (residential vs. commercial), and residential densities. The Neighbourhood Structure Plans that had been created by the development industry served as input for the analysis. |

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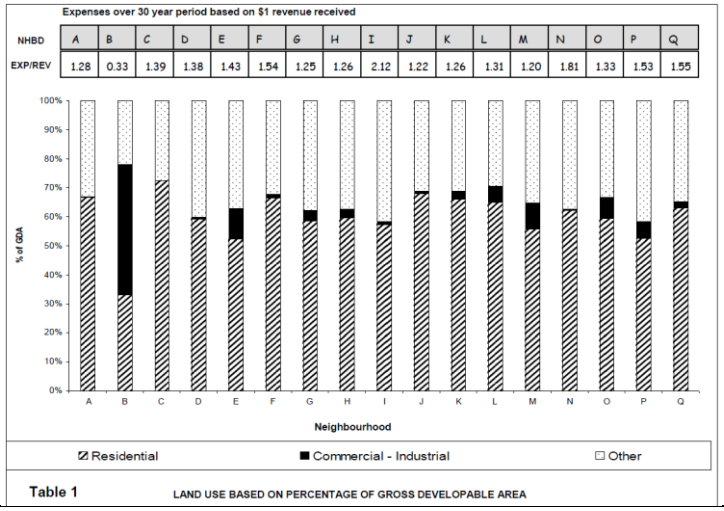
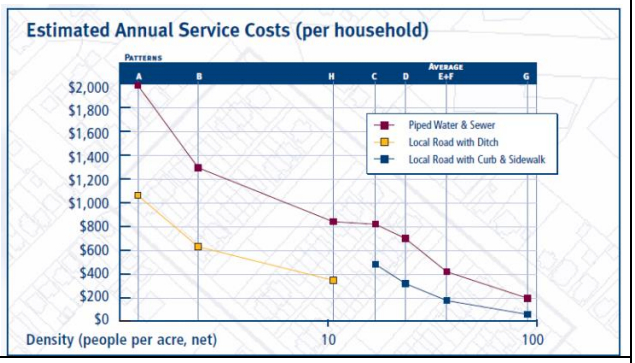
| Operating Costs over 30 years (total) | The table below summarizes the revenue and expenditure ratio for each of the analyzed neighbourhoods against its ratio of residential, commercial and other land uses. The revenue and expenditure ratio depicts the amount of expenditure for each dollar of revenue received during the first 30 years (i.e., once the neighbourhood is fully developed). All have greater expenses than revenues, with one exception, i.e., the highest land use mix and residential densities.   Table 1 LAND USE BASED ON PERCENTAGE OF GROSS DEVELOPABLE AREA |
| Net Variance | It is worth noting that the renewal values presented within the first 30 years reflect an attempt to depict realistic expenditure. In other words, major renewal expenditures do not occur until later in the lifecycle of an asset, and in some assets little activity would typically occur in the first 30 years. The ongoing expenses and revenues beyond the 30-year period are represented on an annual basis, based on the trend analysis of each of the 17 neighbourhoods. |
| Key Findings | It is very clear that expenditures incurred far exceed the revenues generated from the neighbourhoods, in all but the one case.<br><br>Direct revenues (i.e., property taxes and user fees) resulting from residential development are not sufficient to pay for the initial capital, operation, maintenance, and life cycle renewal costs of services and infrastructure. However, these developments have a broader positive effect on the community and economy overall.<br><br>From the results of the case study, it is evident that neighbourhoods by themselves do not pay for themselves. Rather there are several contributing factors that need to come into play while determining a sustainable neighbourhood, including a dynamic mix of land use patterns, residential density mixes, and various tax patterns. Given the interconnectivity and proximity of neighbourhoods within their vicinity, there is a need to take a holistic approach when dealing with neighbourhood analysis. |
| Source | 'Quantifying Financial Impacts of New Suburban Development: A Case Study', 1st International Specialty Conference on Sustaining Public Infrastructure, Edmonton, 2012. |

| Name / Area | **Halifax Regional Municipality, Nova Scotia** |
|---|---|
| Study Purpose | The 2005 study analyzes the impact of local densities on servicing costs. Samples of different residential patterns that may be seen in the Halifax Regional Municipality and estimates of service costs were used.<br>The 2013 study assesses four regional growth scenarios for the Halifax region, to determine and compare public, private, and social costs and benefits anticipated from these scenarios over the period from 2011 to 2031. |
| Scope / Year | 2005 study: eight case studies of densities.<br>2013 study: four growth scenarios. |
| Scenarios / Typologies | The first scenario was to reflect Regional Municipal Planning Strategy goals for growth in designated urban (Regional Centre), suburban, and rural portions of the region. The second scenario was to reflect the continuation of recent trends that have fallen short of the Strategy's goals. The third and fourth scenarios were to reflect stronger regional goals emphasizing greater concentration of growth in the core of the region. |
| Servicing Costs Per Household by Density | The following public services were considered: Roads, Transit, Water, Wastewater & Stormwater, Solid Waste, Parks & Recreation, Libraries, Police, Fire. The figure shows three services very closely linked to land use (i.e., roads, water and sewer) and illustrates the link between density and costs. |
| Operating Costs by unit | The table below shows the costs across different density patterns for comparable levels of service. A summary of the costs for each of the eight sample patterns: from left to right, density increases from lower to higher, as costs decrease.<br><br>In Pattern A, there are more than 122 metres (400 feet) of total road frontage for each household, while the frontage is less than 1.8 m (6 ft) per household in Pattern G, which includes apartments. Of the services that are commonly available, Pattern A is nearly three times as expensive as Pattern G.<br><br>From the perspective of public services, the higher levels of service and cost available in more urbanized areas, such as sidewalks and central water and wastewater services, will offset some of this differential. However, this is only true to the extent that: 1) these services are never extended to the low density areas and, 2) the costs of private water and sewage treatment, as well as other private, social, and environmental costs, are excluded. |




**SUMMARY** ESTIMATED ANNUAL COSTS PER HOUSEHOLD (LISTED ACCORDING TO DENSITY)

| | Pattern A[1] Rural Commutershed Low Density 1.2 people/acre | Pattern B[1] Rural Commutershed Low Density 2.2 people/acre | Pattern H[1] Rural Commutershed Low Density 10.4 people/acre | Pattern C[1] Suburban Low Density 16 people/acre | Pattern D[1] Urban Low Density 22 people/acre | Pattern E[2] Suburban Mid Density 36 people/acre | Pattern F[2] Urban Mid Density 36 people/acre | Pattern G[3] Urban High Density 92 people/acre |
|---|---|---|---|---|---|---|---|---|
| **Common Services:** | | | | | | | | |
| Roads (no curbs) | $1,053 | $621 | $339 | $280 | $184 | $76 | $124 | $26 |
| Solid Waste | $200 | $200 | $200 | $185 | $185 | $185 | $185 | $185 |
| Libraries[4] | $72 | $72 | $72 | $72 | $72 | $48 | $48 | $38 |
| Parks/Recreation[4] | $129 | $129 | $129 | $129 | $129 | $86 | $86 | $69 |
| Police[4] | $360 | $360 | $360 | $360 | $360 | $240 | $240 | $192 |
| Fire[4] | $324 | $324 | $324 | $406 | $379 | $231 | $248 | $177 |
| School Bussing | $186 | $186 | $186 | $87 | $25 | $58 | $17 | $13 |
| Culture/Economy | $36 | $36 | $36 | $36 | $36 | $24 | $24 | $19 |
| Governance | $297 | $297 | $297 | $297 | $297 | $198 | $198 | $158 |
| HRM to Province | $435 | $435 | $435 | $435 | $435 | $290 | $290 | $232 |
| **Subtotal** | **$3,092** | **$2,660** | **$2,378** | **$2,287** | **$2,102** | **$1,436** | **$1,460** | **$1,109** |
| **Other Services:** | | | | | | | | |
| Curbs&Sidewalks | $0 | $0 | $0 | $194 | $128 | $52 | $86 | $27 |
| Transit[4] | $171 | $171 | $171 | $171 | $171 | $114 | $114 | $91 |
| Water | $425 | $425 | $425 | $197 | $176 | $77 | $146 | $42 |
| Waste/Stormwater | $625 | $625 | $625 | $613 | $514 | $235 | $364 | $147 |
| **Subtotal** | **$1,221** | **$1,221** | **$1,221** | **$1,175** | **$989** | **$479** | **$710** | **$307** |
| extended[5] Water/Wastewater | $927 | $234 | -$219 | | | | | |
| **Total** | **$5,240** | **$4,115** | **$3,380** | **$3,462** | **$3,091** | **$1,914** | **$2,170** | **$1,416** |

1) Household size estimated at 3 people per household
2) Household size estimated at 2 people per household
3) Household size estimated at 1.6 people per household
4) Costs allocated simply on "per capita" basis
5) Incremental on-going (annual) costs, only; does not include remediation/installation (capital) costs

<table>
<tr><td>Total Costs</td><td>The top three cost categories that drive the differences between scenarios are transportation (e.g., travel time, travel costs, road construction, and capital), water and wastewater capital and operation, and health and environment (e.g., GHG emissions, traffic accidents, and other transport-related environmental costs). For the municipality, the main cost drivers are: local / regional road capital, water / wastewater capital, and services for solid waste, police, and fire protection.<br><br>These differences to the year 2031 shared across the new dwelling units would represent an $8,845 cost savings ($385/year); a $22,841 savings ($993/year) for Scenario A; and a $31,645 savings ($1,376/year) for Scenario B (totals are shown in the table).<br><br>Table 9.4 Summary of Municipal Revenues ($000s) by Scenario, HRM, 2009-2031<br><table><tr><th>Dwelling Unit Type</th><th>RMPS Goals</th><th>Post RMPS Trend</th><th>Scenario A</th><th>Scenario B</th></tr><tr><td>Singles and Semis</td><td>$1,088,552</td><td>$1,079,812</td><td>$865,955</td><td>$714,617</td></tr><tr><td>Difference from trend</td><td>$8,741</td><td>$0</td><td>-$213,856</td><td>-$365,195</td></tr><tr><td>Apartments and Other</td><td>$292,795</td><td>$287,253</td><td>$388,015</td><td>$449,175</td></tr><tr><td>Difference from trend</td><td>$5,542</td><td>$0</td><td>$100,761</td><td>$161,922</td></tr><tr><td>TOTAL REVENUES</td><td>$1,381,347</td><td>$1,367,065</td><td>$1,253,970</td><td>$1,163,791</td></tr><tr><td>Difference from trend</td><td>$14,282</td><td>$0</td><td>-$113,095</td><td>-$203,274</td></tr></table><br>Relative to the trend since the adoption of the Strategy, adherence to its goals would yield $14 million more property tax revenue over the 2009 to 2031 period ($0.6 million/year); while Scenario A would produce $113 million less revenue (-$5 million/year), and Scenario B would yield $203 million less (-$9 million/year). The lower revenues found for Scenarios A and B are attributable to the greater number of apartment units.<br><br>Overall municipal costs estimated to deal with new development substantially exceeded expected revenues by a factor of at least two under all four scenarios. These costs produce net losses (municipal revenues minus costs), ranging from just over $1 billion for Scenario A to nearly $2 billion for the Trend Scenario. New residential developments, in other words, do not pay their way and are subsidized by the existing tax base and by new commercial development that they complement and support.<br><br>The net savings for each scenario relative to the trend over the period is $66 million for the strategy, $337 million for Scenario A, and $715 million for Scenario B.<br><br>Table 9.5 Summary of Net Municipal Impacts ($000s) by Scenario, HRM, 2009-2031<br><table><tr><th>Category</th><th>RMPS Goals</th><th>Post RMPS Trend</th><th>Scenario A</th><th>Scenario B</th></tr><tr><td>Costs</td><td>$3,243,263</td><td>$3,294,595</td><td>$2,844,354</td><td>$2,375,832</td></tr><tr><td>Revenues</td><td>$1,381,347</td><td>$1,367,065</td><td>$1,253,970</td><td>$1,163,791</td></tr><tr><td>Revenues - Costs</td><td>-$1,861,916</td><td>-$1,927,530</td><td>-$1,590,384</td><td>-$1,212,041</td></tr><tr><td>Difference from trend</td><td>$65,614</td><td>$0</td><td>$337,146</td><td>$715,489</td></tr></table></td></tr>
<tr><td>Key Findings</td><td>Densities of residential areas and their distance to commercial areas and large public infrastructure (e.g., treatment plants) have a significant impact on the costs of ‘hard’ infrastructure-based services such as water, wastewater, and roadways. Some residential patterns may have life-cycle costs ten times that of other patterns. Often, the capital cost of a new road or facility is seen as the main financial barrier to service growth, however most of the service costs occur after it is built.</td></tr>
<tr><td>Source</td><td>‘Settlement Pattern and Form with Service Cost Analysis’, Halifax Regional Municipality, 2005.<br>‘Quantifying The Costs And Benefits Of Alternative Growth Scenarios’, Halifax Regional Municipality, Stantec, 2013.</td></tr>
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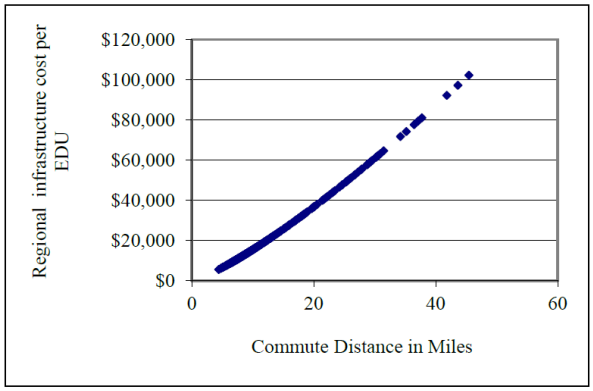
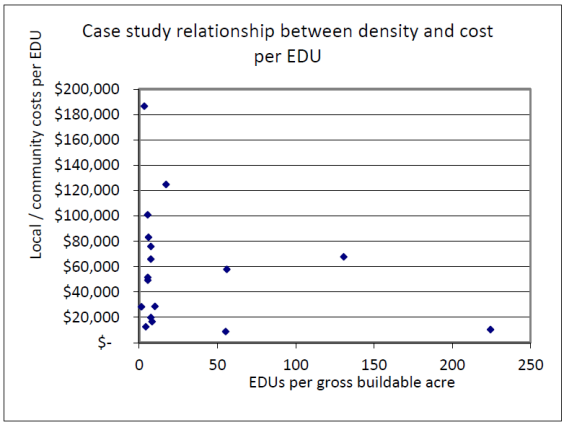
| Name / Area | **Portland Region, Oregon, USA** |
|---|---|
| Study Purpose | To assist in growth management decisions, the Comparative Infrastructure Costs: Local Case Studies analysis focuses on the infrastructure capital costs for new developments in both urban and newly urbanizing areas from throughout the Portland Region. These developments are each unique, having different benefits, proposed uses, levels of service, surrounding uses, and topography. Nevertheless, these case studies are a useful means of understanding what factors may influence infrastructure costs. |
| Scope / Year | 17 different case studies in the region.<br>Capital costs only.<br>Study completed in 2008. |
| Scenarios / Typologies | The case studies have different sizes, proposed uses (e.g., residential or employment), access to existing facilities and amenities, locations, and topographies. The analysis does not control for all of these differences as these factors all influence infrastructure costs. In the case of land use, however, the analysis standardizes the case studies because employment and residential uses place different demands on infrastructure. Therefore the analysis uses a standardized measurement called an equivalent dwelling unit (EDU).<br><br>The analysis divides infrastructure into two categories, depending on the infrastructure's user base: local / community and regional infrastructure, and only documents the public capital costs of providing new infrastructure. It does not include the cost of ongoing maintenance and operations of public facilities. |
| Infrastructure | The focus of this analysis is on the following categories of infrastructure:<br>• Civic buildings, parking structures, public plazas<br>• Regional facilities, such as marine and air ports<br>• Parks, Schools<br>• Sanitary Sewers, Stormwater, Water<br>• Transportation (Roads, bridges, highways; Transit, bike, pedestrian)<br><br>  <br><br>Depending on the type of regional infrastructure, either flat or variable costs were applied for each anticipated household or job. Flat costs were applied for marine, air, and other non-transportation regional facilities. These costs are not for specific facilities but were instead intended to represent the typical regional infrastructure demands that new households and jobs create.<br><br>To estimate the demand that different case study locations may place on regional transportation facilities (e.g., highways, transit and bridges), variable costs were calculated. As illustrated in the figure, an EDU that makes longer distance trips places greater demands on transportation facilities than an EDU that makes shorter distance trips. An EDU's demand for regional transportation facilities was assumed to vary according to forecasted commute distance. |

| | |
|---|---|
| Cost per Unit | This analysis is not a statistical analysis that can definitively determine the effects of any particular factor on infrastructure costs. However, some general lessons can be gleaned. The case studies indicate that some factors that can influence the costs of serving an EDU include:<br>• Site topography;<br>• Environmental features;<br>• Land ownership patterns;<br>• Distance from existing infrastructure;<br>• Presence or absence of existing infrastructure capacity;<br>• Development density;<br>• Proposed use;<br>• Level of service or quality of amenities; and<br>• Travel behaviour (of residents or employees). |
| Key Findings | As illustrated in the figure, all other things being equal, higher density developments are less expensive to serve (on a per EDU basis) than lower density developments. The relationship between residential density and infrastructure demand is fairly intuitive, i.e., larger lots require more lineal feet of pipes and pavement per household. These increased lengths translate into higher costs. Despite this general rule, however, the lower density case study areas reveal a great deal of variation in the costs per EDU. This variation is attributable to the many other factors that can influence costs. These factors may include level of service or the provision of amenities such as parks and sidewalks and other facilities such as schools.<br><br>Most of the higher density case studies (e.g., those with 50 or more EDUs per gross buildable acre) do, however, have relatively low local / community infrastructure costs per EDU.<br>  <br> |
| Source | 'Comparative Infrastructure Costs: Local Case Studies', Discussion draft, Metro Portland, 2008. |

<table>
<tr><td>Name / Area</td><td>Perth, Australia</td></tr>
<tr><td>Study Purpose</td><td>The Costs of Urban Sprawl – Infrastructure and Transportation, Environment Design Guide and Cost Comparison of Infrastructure on Greenfield and Infill Sites examined the implications of two alternative approaches to urban development: i.e., redevelopment in walkable transit-oriented developments, and fringe development in conventional low-density car dependent suburbs.</td></tr>
<tr><td>Scope / Year</td><td>Comparing two different theoretical development forms.<br>Papers completed in 2010 and 2017 respectively.</td></tr>
<tr><td>Scenarios / Typologies</td><td>As shown below, the research examined the economic costs associated with the two forms of development, first assessing the physical planning costs associated with the different transport and infrastructure requirements.
<table>
<tr><th></th><th>Urban Redevelopment</th><th>Fringe Development</th></tr>
<tr><td>Daily per capita Greenhouse Gas Emissions from transport (Measured in $CO_2$-e)</td><td>0 to 4 Kg</td><td>8 up to 10 Kg</td></tr>
<tr><td>Distance to CBD</td><td>less than10 km</td><td>more than 40 km</td></tr>
<tr><td>Activity Intensity (measured by population and jobs per hectare)[1]</td><td>> 35</td><td>< 20</td></tr>
<tr><td>Transit Accessibility[2]</td><td>more than 80% with >15min service</td><td>less than 15% with >15min service</td></tr>
</table>
The challenge in interpreting the assessments is that infrastructure costs are so heavily dependent on area-specific factors. For example: road costs among different prospective development areas may vary based on the necessity for major arterial roads; costs for sewerage and water infrastructure could vary immensely depending on terrain and soil conditions; and many other infrastructure components will differ depending on the level and degree of excess capacity. It is also difficult to determine who bears the costs of new infrastructure developments because of constantly changing government-induced fees, taxes, policies, and building standards.</td></tr>
<tr><td>Infrastructure Costs (total)</td><td>The table displays the economic breakdown of inner city and urban fringe initial capital costs, and represent the higher estimates reported by the studies surveyed by the City of Perth.<br><br>Despite the area-specific nature of calculating development costs, the evidence suggests that initial capital costs and operating costs of sprawling developments outweigh the costs associated with inner-city redevelopment.
<table>
<tr><th></th><th>Inner</th><th>Outer</th></tr>
<tr><td>Roads</td><td>$5,086,562</td><td>$30,378,881</td></tr>
<tr><td>Water and Sewerage</td><td>$14,747,616</td><td>$22,377,459</td></tr>
<tr><td>Telecommunications</td><td>$2,576,106</td><td>$3,711,851</td></tr>
<tr><td>Electricity</td><td>$4,082,117</td><td>$9,696,505</td></tr>
<tr><td>Gas</td><td>$0</td><td>$3,690,843</td></tr>
<tr><td>Fire and Ambulance</td><td>$0</td><td>$302,509</td></tr>
<tr><td>Police</td><td>$0</td><td>$388,416</td></tr>
<tr><td>Municipal Services</td><td>Not Reported</td><td>Not Reported</td></tr>
<tr><td>Education</td><td>$3,895,458</td><td>$33,147,274</td></tr>
<tr><td>Health</td><td>$20,114,867</td><td>$32,347,327</td></tr>
<tr><td>Total</td><td>$50,502,726</td><td>$136,041,065</td></tr>
</table>
Table 4: Initial capital costs for redevelopment versus fringe development infrastructure</td></tr>
<tr><td>Transportation Costs</td><td>The cost of infrastructure for fringe development was determined to be significantly higher (approximately $136,000 per dwelling) than that for inner suburban development ($50,500 per dwelling). Of note are the costs of infrastructure for education and roads which were determined to be ten times and six times higher for fringe developments respectively. The analysis assumed that no additional infrastructure for gas, emergency services or police was required in inner suburban locations.</td></tr>
</table>

| | |
|---|---|
| | The estimated transportation costs were calculated as functions of vehicle kilometres travelled and covered all of private, public, and external costs. The table displays a summary of the costs for transportation costs for residents / households, which constitute the recurring annual costs of a development of 1,000 dwellings. 'Outer' can be seen to be approximately twice as expensive as 'Inner'.<br><br>Data collected is not always directly comparable. Nevertheless, the studies suggest that the infrastructure cost of infill development appears to be significantly less costly for government than greenfield development on the urban fringe across Australian capital cities.<br><br>**Table 5: Transportation costs for 1000 inner-city and fringe dwellings**<br><br>The evidence of cost effectiveness for developers is less definitive since diverse factors such as development site size, open space contributions, and final market value complicate the analysis. |
| Net Variance | Once established, there are many ongoing operational costs of both urban typologies, but the most significant operational costs are associated with transportation. Private and public costs are incurred to ensure people travel more easily to and from these urban areas. |
| Key Findings | The cost of both private and public transport operations for greenfield development is around $18,000 per household per year more than that for urban redevelopment forms. Over a 50-year period this adds up to a difference of $251 million for 1,000 dwellings, or $251,000 per household.<br><br>The savings in transport and infrastructure for 1,000 dwellings are in the order of $86 million up-front for infrastructure and $250 million for annualized transportation costs over 50 years. |
| Source | 'The Costs of Urban Sprawl – Infrastructure and Transportation, Environment Design Guide', Roman Trubka, Peter Newman, Darren Bilsborough, 2010. |

| Cost For 1000 Dwellings | Inner | Outer |
|---|---|---|
| Capital cost of car ownership | $2,990,802 | $8,628,654 |
| Fuel costs | $1,203,925 | $3,255,349 |
| Other operating car costs | $1,476,392 | $4,259,675 |
| Time costs (total)* | $6,158,348 | $8,210,448 |
| Private transport | $3,116,810 | $8,210,448 |
| Public transport | $3,041,538 | $0 |
| Walking and cycling | $0 | $0 |
| Road costs | $1,216,597 | $3,508,806 |
| Parking costs | $2,184,489 | $7,709,869 |
| Externalities (total) | $243,731 | $703,250 |
| Fatalities | $73,368 | $211,693 |
| Injuries | $23,627 | $68,172 |
| Property damage | $38,549 | $111,228 |
| Air pollution | $90,777 | $261,925 |
| Noise pollution | $17,409 | $50,232 |
| Transit costs (capital, and operating) | $3,136,540 | $470,481 |
| **Total** | **$18,610,824** | **$36,746,532** |

| Name / Area | **Adelaide, Australia** |
|---|---|
| Study Purpose | The Cost Comparison of Infrastructure on Greenfield and Infill Sites paper explores the range of infrastructure provision issues to identify the actual costs of provision in different locations. Three case studies in metropolitan Adelaide were used to explore the cost factors for developers and governments. |
| Scope / Year | Case studies.<br>Completed in 2017. |
| Scenarios / Typologies | Three case studies in Australia were examined: 1) Playford greenfield; 2) Playford Alive (urban renewal); 3) Bowden Urban Village (infill TOD). |
| Infrastructure Costs (total) | Infill TOD developer costs per dwelling were determined to be significantly less than the infill development of urban renewal. The developer was charged less for open space contributions per dwelling in the infill TOD compared to the Urban Renewal project and expended less on roads. While there is a higher cost to the developer to provide energy infrastructure in the infill TOD site compared to the other sites, overall the developer expended less on infrastructure in the infill TOD site, which supports the view that infill development results in reduced need for infrastructure per dwelling.<br><br>It should be noted that the costs to developers and to governments are different. |
| Net Variance | The table shows that there is very little difference in total infrastructure costs for government and developer between the greenfield and renewal areas of Playford Alive, while the total cost of infrastructure for infill TOD at Bowden Urban Village is only one-third of that for the Playford project. |

Table 6. Developer infrastructure costs per dwelling—3 cases.

| Infrastructure category | Case 1: playford greenfield | Case 2: playford urban renewal | Case 3: Bowden infill TOD |
|---|---|---|---|
| Infrastructure design and approvals | $2580 | $2775 | $749 |
| Roads | $45,500 | $28,400 | $10,433 |
| Water and sewerage | $1650 | $7750 | $2887 |
| Telecommunications | n.a. | n.a. | $105 |
| Electricity | $3850 | $4000 | $8188 |
| Gas | n.a. | $250 | $963 |
| Open space | (land) | $6488 | $3330 |
| Total per dwelling | $53,580 | $49,663 | $26,655 |

n.a. = not available.
Note: These are costs of provision of the listed infrastructure and do not include maintenance costs.

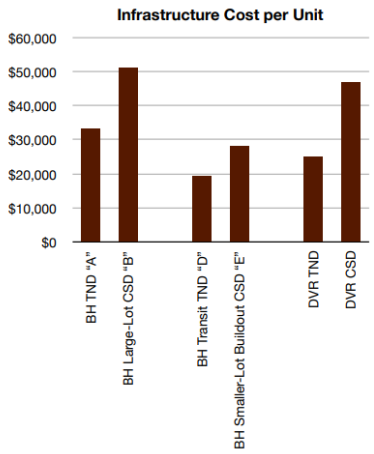
Table 7. Summary of government capital costs for infrastructure in the case study areas.

| Infrastructure category | Case 1: playford greenfield | Case 2: playford urban renewal | Case 3: Bowden infill TOD |
|---|---|---|---|
| Roads | $4,975,000 | $10,600,000 | n.a. |
| Public transport system upgrade | $13,000,000 | | |
| Fire and ambulance | n.a. | n.a. | n.a. |
| Police | | Police and community working together programme | |
| Open space | $5,000,000 | $2,250,000 | $4,900,000 |
| Municipal services | $17,301,000 | $8,170,000 | $403,000 |
| Education | $68,400,000 to $88,400,000 | $44,800,000 | $579,674 |
| Health | $7,500,000 | OPAL programme | |
| Total | $116,176,000 to $136,176,000 | $65,820,000 | $5,882,674 |
| Cost per dwelling | $29,044 to $34,044 (4000 dwellings) | $36,566 (1800 dwellings) | $2451 (2400 dwellings) |

(n.a. = not available).
Note: These are costs of provision of the listed infrastructure and do not include maintenance costs. Where these relate to items listed in Table 6 these costs are additional. The total development cost to government in each case may be higher than the infrastructure total as total development costs may include land purchase, remediation, marketing and other sundry expenditure.

| | |
|---|---|
| | Table 8. Combined developer and government infrastructure costs per dwelling.<br><br>\| Infrastructure category \| Case 1: playford greenfield \| Case 2: playford urban renewal \| Case 3: Bowden infill TOD \|<br>\|---\|---\|---\|---\|<br>\| Developer \| $53,580 \| $49,663 \| $26,655 \|<br>\| Government \| $29,044 to $34,044 \| $36,566 \| $2451 \|<br>\| Total \| $82,624 to $87,624 \| $86,229 \| $29,106 \|<br><br>The estimated cost to the developer to provide infrastructure to the greenfield site ($53,580 per dwelling) is similar to the renewal area ($49,663 per dwelling), which is an interesting finding as the latter was previously serviced. |
| Key Findings | The infrastructure required in delivering new residential development is site-specific and is influenced by the type of housing being delivered. This in turn is driven by the market demographics of household type, age, income and employment. In established areas, the increased density of planned development implies the need for a review of the capacity of existing infrastructure.<br><br>While some absolute costs were determined from the review of budget documents and annual reports of state and local government agencies, the analysis demonstrates the difficulty of obtaining detailed information about government infrastructure costs for specific projects. Some data could not be provided or apportioned to either local government or state government, so were aggregated and presented as government cost since details of cost-sharing for open space and street infrastructure upgrades were not available.<br><br>In general, the evidence suggests that it is less costly in infrastructure terms to develop on infill sites rather than greenfield sites. However, there is some evidence to suggest that developer's construction costs can be higher in infill situations, which may go some way to explaining the resistance on the part of the development industry to current urban growth policy.<br><br>Planning policies need to recognize the variety ownership patterns that can have an impact on development costs for both government and the development industry. In addition, the analysis confirms the importance of understanding the capacity of the existing infrastructure to cope with growth and the extent to which infill development renews established areas. As governments plan for increased density in established areas, they should ensure they understand and direct development toward areas where there is spare existing infrastructure capacity. In addition, government should develop mechanisms to fund infrastructure shortfalls that may limit infill development. Where government proposes mechanisms to spread the cost burden of new infrastructure, the standards for such infrastructure should be agreed beforehand so developers may make informed decisions about where and what they build. |
| Source | 'Cost Comparison of Infrastructure on Greenfield and Infill Sites', Cathryn Hamilton, Jon Kellett, 2017. |

| Name / Area | **Smart Growth and Conventional Development, U.S.A.** |
|---|---|
| Study Purpose | Several Conventional Suburban Development (CSD) and Traditional Neighbourhood Development (TND) alternatives were prepared for two case study sites, and then the total infrastructure costs were calculated. Variables that drive infrastructure cost including lot size, product type, residential density, thoroughfare cross section, and thoroughfare network pattern, which were studied to quantify and compare the impact on the total infrastructure cost.<br><br>The following figure illustrates the different density, form, and design attributes between conventional suburban development and Smart Growth development.<br><br>**Conventional Suburban Development (CSD)**<br>  <br>Dover Kohl & Associates<br>CSD development usually reflects the following characteristics:<br>**1.** Dispersed form with no distinct edge, disturbing the majority of the site's buildable land;<br>**2.** Single-use pods, containing one kind of lot and building type in each (e.g. office parks, residential subdivisions, and strip shopping centers);<br>**3.** One way in and out of each pod;<br>**4.** Garage doors and garbage pickup facing the street;<br>**5.** Large blocks with irregular shapes and cul-de-sacs;<br>**6.** Open space in the residual "left-over" land between pods and around regulated wetlands; and<br>**7.** Strip shopping centers with big box retail and large parking lots between buildings and the street.<br>*CSD & TND characteristics adapted from Dover Kohl & Associates*<br>**Smart Growth & Traditional Neighborhood Development (TND)**<br>  <br>Dover Kohl & Associates<br>New Urbanism and TND take advantage of Smart Growth regional development principles by implementing specific urban design techniques including:<br>**1.** Compact form with a distinct edge yielding large contiguous preserved open space;<br>**2.** Mixing of land uses;<br>**3.** Complete neighborhoods proportioned generally according to 5 minutes walking distance;<br>**4.** Grid network of interconnected streets with short, walkable blocks and multiple route choices;<br>**5.** Alleys with garage access and rear garbage pickup;<br>**6.** On street parking & shared parking strategies to reduce parking lot size; and<br>**7.** Community parks, squares, and open spaces faced by the fronts of buildings and located within walking distance of residential homes. |
| Scope / Year | Two scenario case studies.<br>Completed in 2010. |
| Scenarios / Typologies | Each development scenario was engineered at a schematic level including thoroughfare typology analysis, streetscape design, parking analysis, and utility design. The engineering design ended at the building footprints; building foundations and cost of vertical construction were not part of the study. Once an estimate of infrastructure quantities was compiled for each development scenario, material quantities were multiplied by industry standard unit cost data and adjusted to account for regional cost variations.<br><br>TND scenarios designed according to Smart Growth and New Urbanist principles with smaller lot sizes, compact urban form, a variety of multi-unit housing types, and a mix of land uses results in infrastructure systems that serve more development in proportion to their cost to construct. In comparison, typical lower density Conventional Suburban Development (CSD) alternatives require far-reaching infrastructure systems to serve lower-density development, with higher costs to build. The case studies showed a clear reduction in infrastructure costs for scenarios with higher density. |

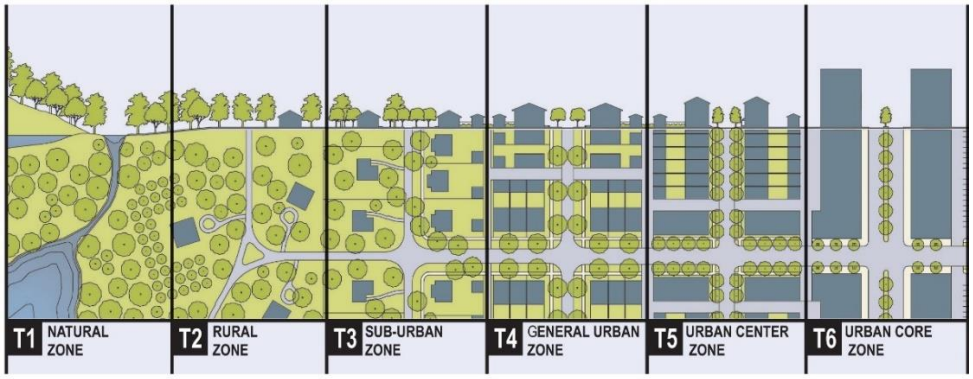
| | |
|---|---|
| Servicing Programs | Although numerous TND (high density) and CSD (low density) case study examples were evaluated, the following three direct comparisons were selected for presentation in the report to isolate the effects of specific development variables:<br><br>• Belle Hall TND A vs. Belle Hall Large-Lot CSD B Using the same development program, a comparison of TND vs. Large-Lot sprawl.<br>• Belle Hall TND D vs. Belle Hall Smaller Lot Buildout CSD E Using the same development program, a comparison of transit supportive TND vs. CSD using smaller residential lot sizes comparable to that of TND.<br>• Dove Valley Ranch TND vs. Dove Valley Ranch CSD A comparison of built CSD single-family residential with a hypothetical TND demonstrating the land's potential.<br><br>To directly compare development scenarios with different development build-out, the results were divided by the scenario's number of residential units to provide per-unit metrics. Infrastructure serving mixed-use areas of the Belle Hall and Dove Valley Ranch TND scenarios was counted as residential infrastructure so as not to unfairly benefit TND scenarios in the comparisons. Therefore, commercial development above residential can be considered a TND 'bonus' where the same infrastructure serves multiple uses. |
| Costs per Unit | The bottom line results of the comparative infrastructure cost study are illustrated in the table. The variables discussed in the report including density, urban form, and impervious area led to a clear cost savings for TND infrastructure when compared with that of CSD.<br><br>  |
| Key Findings | When comparing CSD (low density) scenarios to alternative TND (high density) designs, the study found that infrastructure costs for the TND scenarios were consistently less than CSD. Reductions in infrastructure costs due to TND development patterns ranged from 32% to 47%, with the extent of TND cost savings based principally on density. |
| Source | 'Smart Growth & Conventional Suburban Development: An infrastructure case study', completed for the EPA, 2010. |

# Appendix C: Residential Typologies and Attributes

**Rural to Urban Transect 'Zones'**

The rural to urban 'transect' is a tool used to analyze and categorize community form and character. The transect is divided into six 'zones' based on intensity of the built environment and physical characteristics and other attributes. Certain forms and elements belong in certain environments. As transect zones become more urban, they also increase in complexity, density, and intensity.

This transect is illustrated in the below figure[31], from T2 Rural Zone (with very low density residential, in the form of single-detached houses on large estate lots), to T5 Urban Centre Zone (with multi-unit residential ranging from stacked townhouses to apartment towers). As depicted, the road network, amount of green space, and other infrastructure and amenity attributes also vary along this spectrum.




These six transects / zones are described in greater detail as follows[32]. For the purpose of this servicing cost study, the residential typologies used for analysis are in the T3 to T5 range[33].

- **T-1: The natural zone,** is an area with little or no human impact consisting of lands approximating or reverting to a wilderness condition. This includes lands unsuitable for development due to hydrology, topography, vegetation, or special and unique areas such as protected areas like a park, environmentally-sensitive areas, etc.
- **T-2: The rural zone,** comprises sparsely settled lands in a cultivated or open state. Often they are made up of woodlands, agricultural lands and grasslands. The typical building located in this zone would be farmhouses, agricultural buildings, large estate style homes, and cabins or other isolated housing types.
- **T-3: The sub-urban zone,** consists of low density residential areas. Setbacks are relatively wide and plantings are natural in character. There is some mixed uses but primarily in areas adjacent to higher transect zones. Blocks are large and roads can be irregular to accommodate the natural features.
- **T-4: The general urban zone,** consists of mixed uses but primarily residential urban fabric. A wide variety of attached and detached housing types are found in this zone. Setbacks and landscaping are variable. Streets with curbs and sidewalks define the small to medium sized blocks, and street connectivity is high with storm sewers and urban servicing such as water and sewer.
- **T-5: The urban centre zone,** comprises higher density mixed uses that provide for retail offices, and a range of housing types including rowhouses and apartments. Setbacks are minimal and buildings

[31] https://transect.org/rural_img.html
[32] https://www.canr.msu.edu/news/where_are_you_located_on_the_transect
[33] https://www.canr.msu.edu/news/understanding_the_urban_transect

are close to the sidewalks, which are wide. There is a fine-grained street network forming small blocks and high connectivity and intersection density. The urban centre is often the location of traditional mixed-use downtowns in many North American cities.

- **T-6: The urban core zone,** consists of the highest density and building height with the highest intensity and diversity of land uses. Buildings are sited on the sidewalk, which are wide and there is good street connectivity. The largest cities tend to have such an urban core area(s).

Outside of urban core areas, ground-oriented housing forms can range from semi-detached or duplex houses, to multiplexes, to townhouses to low rise apartment buildings, often referred to as 'missing middle' housing.[34] Missing middle housing is a range of multi-unit or clustered housing types, compatible in scale with single-detached homes, that help meet the demand for walkable urban living, and meet the need for more housing choices at different price points.

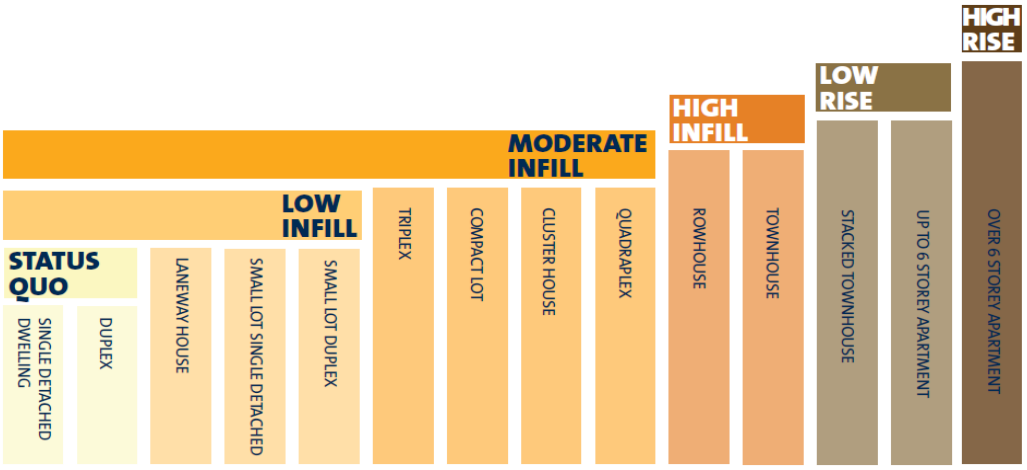
On the left-hand side of the figure below are single-detached homes.[35] The suburban growth in North American cities has primarily been dominated by these housing types since the 1940s. Towards the right-hand side of the figure is the other end of the form / density spectrum with large, five-to-seven-plus floor, multi-unit apartment, strata, or mixed-use buildings.


**Residential Typology by Tenure[36]**

In addition to building form, typology of units can also consider different tenures, including above and below market rental, fee simple (ownership), and other forms.

[34] Missing Middle Housing: Thinking Big and Building Small to Respond to Today's Housing Crisis, Daniel G. Parolek, 2020. https://missingmiddlehousing.com
[35] Missing Middle Housing: Thinking Big and Building Small to Respond to Today's Housing Crisis, Daniel G. Parolek, 2020. https://missingmiddlehousing.com
[36] City of New Westminster.

There can be a relationship between building form and housing tenure. Generally single-detached houses and townhouses are owner-occupied, while many apartments are either renter or strata owner occupied. This is conceptually shown in both the above and below figures. For the purposes of this servicing cost study, only built form, not tenure or affordability, is considered in the analysis.




**Defining Typologies and Terms – Additional Considerations and Attributes**

Land use patterns can generally be defined and evaluated based on the following attributes[37]:

- Density – the number of people, jobs, or housing units over an area.
- Clustering – whether related destinations are located close together (e.g., commercial centres, residential clusters, urban villages).
- Land Use Mix – whether different land use types (commercial, residential, etc.) are located together or in close proximity.
- Connectivity – the number of connections within the street and pedestrian / cycling networks, with a high intersection density.
- Impervious surface – land covered by buildings and pavement, also called the footprint, which creates rain runoff that must be managed.
- Greenspace – the portion of land used for lawns, gardens, parks, woodlands and other natural spaces.
- Accessibility – the ability to reach desired activities and destinations.
- Non-motorized accessibility – the quality and connectivity / completeness of walking, cycling, and rolling infrastructure.

[37] Evaluating Transportation Land Use Impacts, Victoria Transport Policy Institute, Todd Litman, 2022.

Land use attributes can be evaluated at various scales[38]:

- Site – an individual parcel, building, facility or campus.
- Street – the buildings and facilities along a particular street or stretch of roadway.
- Neighbourhood or centre – a walkable area, that is typically defined by unique use or building forms, often with a commercial centre or node.
- Local community – a small geographic area, often consisting of several neighbourhoods that share a defining geographic, historical, or landform characteristic.
- Municipal – a town or city jurisdiction.
- Region – a geographic area where residents share services and employment options. A metropolitan area typically consists of one or more cities and various suburban areas, smaller commercial centres, and surrounding semi-rural areas that share large public, commercial, and industrial infrastructure.

Geographic areas can be categorized in the following ways[39]:

- Village – a small urban settlement (generally less than 10,000 residents).
- Town – a medium size urban settlement (generally less than 50,000 residents).
- City – a large settlement (generally more than 50,000 residents).
- Metropolitan region or metropolis – a large urban region (generally more than 500,000 residents) that usually consists of one or more large cities, and various smaller peripheral cities and towns, which development pattern is considered 'polycentric'.
- Urban – relatively high densities (25+ residents and 15+ housing units per hectare), with: mixed-use development forms; employment / commerce and institutional / education centres; shared public infrastructure such as water, sewer, garbage collection; and a multi-modal transportation system.
- Suburban – medium densities (8-20 residents and 3-15 housing units per hectare), separated, homogenous land uses, and an automobile-oriented transportation system.
- Central business district – the main commercial centre in a town or city.
- Exurban – low densities (less than 6 residents or 2 housing units per hectare), primarily estate-style detached homes, rural landscapes and undeveloped lands, located peripheral and near enough to an urban area that exurban residents often commute, shop and use urban services there.
- Rural – very low densities (less than 6 residents or 2 housing unit per hectare), primarily farms and undeveloped lands.

There are often debates about the different development patterns and characteristics of 'urban sprawl' and 'smart growth' and how they should be measured. The following table compares different development patterns, generally termed urban sprawl and smart growth (or compact development)[40].

[38] Evaluating Transportation Land Use Impacts, Victoria Transport Policy Institute, Todd Litman, 2022.
[39] Evaluating Transportation Land Use Impacts, Victoria Transport Policy Institute, Todd Litman, 2022.
[40] Evaluating Transportation Land Use Impacts, Victoria Transport Policy Institute, Todd Litman, 2022.

| Attribute | Sprawl | Smart Growth |
|---|---|---|
| Density | Lower-density | Higher-density. |
| Growth pattern | Urban periphery (greenfield) development. | Infill (brownfield) development. |
| Activity Location | Commercial and institutional activities are dispersed. | Commercial and institutional activities are concentrated into centers and downtowns. |
| Land use mix | Homogeneous land uses. | Mixed land use. |
| Scale | Large scale. Larger buildings, blocks, wide roads. Less detail, since people experience the landscape at a distance, as motorists. | Human scale. Smaller buildings, blocks and roads, care to design details for pedestrians. |
| Transportation | Automobile-oriented transportation, poorly suited for walking, cycling and transit. | Multi-modal transportation that support walking, cycling and public transit use. |
| Street design | Streets designed to maximize motor vehicle traffic volume and speed. | Streets designed to accommodate a variety of activities. Traffic calming. |
| Planning process | Unplanned, with little coordination between jurisdictions and stakeholders. | Planned and coordinated between jurisdictions and stakeholders. |
| Public space | Emphasis on the private realm (yards, shopping malls, gated communities, private clubs). | Emphasis on the public realm (streetscapes, sidewalks, public parks, public facilities). |

**Land Use Patterns**

Additional considerations associated with varied development forms and densities also include the amount of land devoted to roads and housing in cities. The following figures illustrate some planning objectives and considerations when arranging land uses and patterns as part of a municipal or regional structure, and the relationships between different uses, and associated attributes, what can and cannot be measured. The figures also show typical amounts of land used for different functions in a city, as well as how both the amount of road area and the design of road network can vary. Notably, suburban areas may have proportionally less land devoted to roads, yet are still auto-centric. Furthermore, the amount of space devoted for commercial uses tends to be higher in urban centres, which also have mixed uses and higher densities for all land uses, which can better sustain public transit systems.

The following four figures show conceptual considerations when arranging land uses and city or region scale land use framework.

## Land Use Patterns

- Land requirements for different purposes
- Hierarchy / structure / distribution of functions / uses at different scales, examples:
  - Live close to work
  - Amenities close to homes
  - Industry close to transportation
  - Stores close to customers

**Evolution of uses / patterns over time**


## Relationships Between Land Uses

- Defining and Measuring Uses:
  - **Type** - what is it
  - **Amount** - how much
  - **Intensity / density** - measures
  - **Location / proximity** - access
- Interactions – adjacency / linkages / transport
- Impacts / implications – complement / conflict

## Typical Municipal Forms

**Urban Function (% land):**

- Residential – 51%
- Commercial – 3%
- Industrial – 8%
- Institutional – 8%
- Transport./Utility – 5%
- Rec./Open Space – 5%
- Streets – 20%

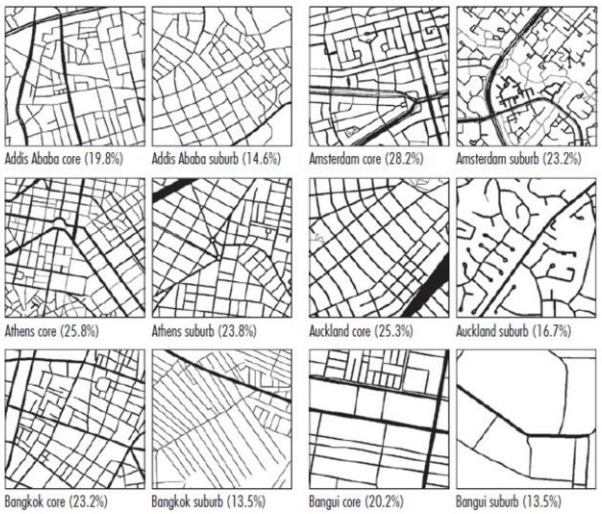
**Travel Times:**

- Work – 20-30 min.
- CBD – 30-45 min.
- Local shopping – 10 min.
- School – 5-10 min.
- Major parks – 30-45 min.

Note: Approximate / typical amounts

## Road Networks and Land Use Patterns

*Different Designs and Different Issues*




% share of the land that is streets

Land and the City Lincoln Institute 2015: One-Square Kilometer Street Maps in the Core and Suburban Areas of Selected Cities

**Calculating Residential Densities**

For analysis purposes, residential density in the form of units per hectare is a key component of the density for the typologies used in this servicing cost study. The below figures show the difference between gross land areas and land net land areas, which must be considered when calculating and comparing development densities and urban form.

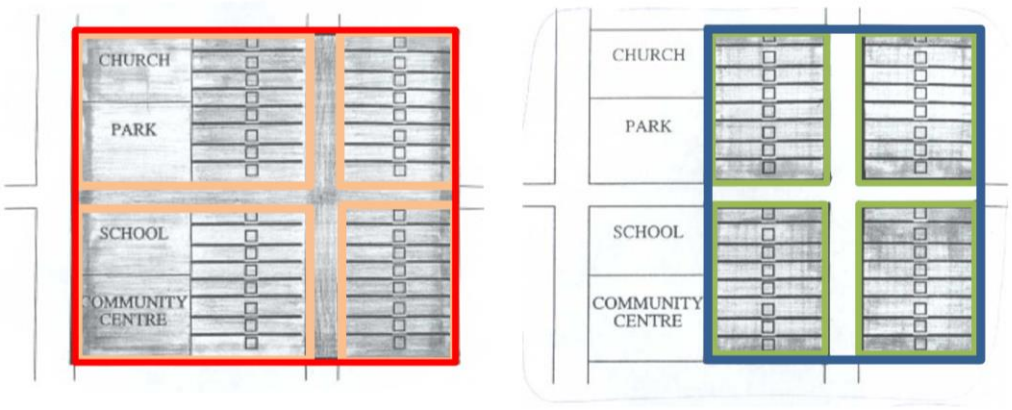
# Calculating Density (Site Area)

- Gross Density / Net Density
- Site Area:
  - Gross Area (total site)
  - Net Developable Area (excl. non -develop. areas)
  - Net Saleable Area (excl. also road dedications)
- Calculating Density: Units and Floor Area

# Site Area: Gross / Net Land

**Gross:** includes all lands (roads, parks, enviro)

**Net:** remaining subdivided parcels of land (lots)

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The figures below show how to calculate density (shown as units per acre in the figure), by dividing the number of units (which should be clearly defined; for example, consistently including or excluding secondary suites in houses) by the amount of land area, and associated built form.

## Calculating Density (Units)

- Density ratio = amount of use (number of units) divided by amount of area (ac or ha of land)
- Different measures:
  - Number of 'Units' – housing, residents, jobs, etc
  - Units per Acre ( upa) or Units per Hectare ( uph)
  - Ex. Number of houses per acre of land

$$\text{UPA} = \frac{\text{Number of Units}}{\text{Land Area Acres}}$$

## Housing Forms and Densities

*…. 1 upa to 100 upa ….*


**Visualizing Density**[41]

The Visualizing Density: The Density Catalog helps define both the physical qualities and numerical measures of development density and urban form. While density may vary or be the same, the design and desirability of neighbourhoods may vary. Notably, it is not development density that makes a neighbourhood appealing or unattractive, but rather the built and urban form, e.g., the street layout,

[41] Visualizing Density: The Density Catalog, Lincoln Institute of Land Policy, Julie Campoli, Alex S. MacLean, 2007.

the arrangement of buildings, the quality of architecture and building design, and use of landscaping and open space.

> *Density is easy to calculate. Divide the number of persons by the number of square* [kilometres], *or the number of housing units by the number of* [hectares], *and you will know the* [gross] *density of a given area.*
>
> *But, although measuring density is a rational process, our perception of density is neither rational nor quantifiable. What does a place look like? How does it feel to be there? These qualitative factors, not numbers, determine how we perceive density.*
>
> *We react to the physical environment, which can be shaped in countless ways. How we arrange the streets, buildings, and open spaces of cities and neighbourhoods affects the perception, or feeling, of density.*[42]

Below are some residential density / form examples from the Visualizing Density catalog, from very low to very high densities. These were used to create and inform the typologies for this study.

[42] Visualizing Density: The Density Catalog, Lincoln Institute of Land Policy, Julie Campoli, Alex S. MacLean, 2007.

## 4 UNITS PER ACRE

Delano, CA 4.0 units / acre

Sun City, AZ 4.1 units / acre

Buckeye, AZ 4.1 units / acre

context

context

context

neighborhood

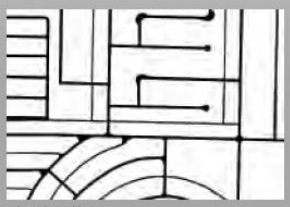
plan

neighborhood

plan

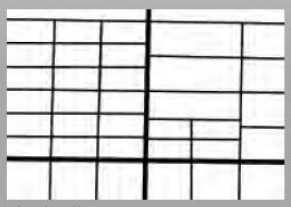
neighborhood

plan



street pattern

street pattern



street pattern

## MORE THAN 100 UNITS PER ACRE

Seattle, WA 100.1 units / acre

Las Vegas, NV 104.8 units / acre

New York, NY 112.2 units / acre

context

context

context

neighborhood

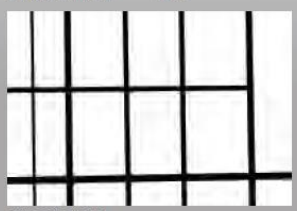
plan

neighborhood

plan

neighborhood

plan

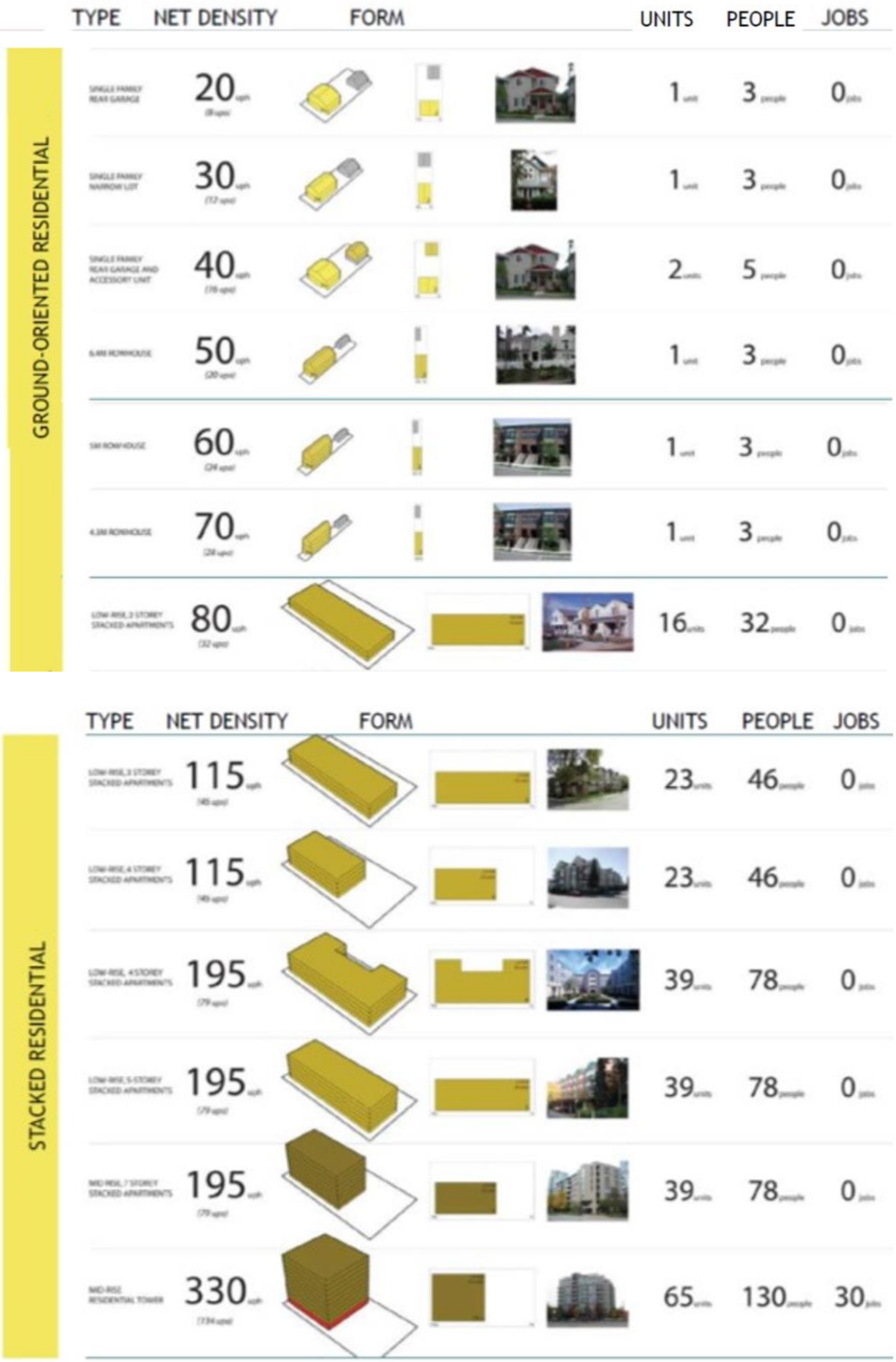


street pattern

street pattern

street pattern

The following figures show the other quantifiable attributes associated with a range of residential densities and forms, noting the number of units and residents (and jobs, if applicable).[43]




[43] UBC Design Centre for Sustainability.

# Appendix D: Cost Estimate Studies

Literature on sprawl is much related to capital and operating costs, both public and private. Public capital and operating costs usually refer to roads, water and sewer infrastructure, and public buildings, as well as annual expenditures to maintain them. Private capital and operating costs refer to the construction and occupancy costs of private housing and how metropolitan location and the density and form of development might cause them to vary. The following text is extracted from the referenced publications, providing key findings from the literature review.

**Literature Review of the Costs of Infrastructure Provision for Different Development Forms[44]**

All linear infrastructure like roads, transit, water and wastewater distribution and collection network and electricity distribution lines, needs to extend to service new areas as a city undergoes physical expansion. Most cities have response time goals for emergency services like ambulance or fire protection, which require additional medical centres / fire stations and vehicles to be located in new growth areas and ongoing improvements to infrastructure to be able to reach a target within the designated response time. The same is true for schools, which are planned based on maximum travel distances by walk and school bus for students to access the school safely, as well as a target teacher to student ratio. Police infrastructure is generally based on staffing ratio for police officers to residents as well as emergency response time goals, which relate the service planning to both population and city growth. Minimum population standards are set for providing parks and open spaces, which tend to be related to population growth and spatial distribution, but they impact urban form as more land is converted to urban uses.

The most dominating development forms for managing growth discussed in all studies are the high-density centralized or clustered development, and the low-density dispersed development. The former compact urban form is also referred to as 'Smart Growth' or 'Infill' development and the latter is referred to as 'Urban Sprawl' or 'Greenfield' development. This report discusses the impact of the individual features (like density and dispersion) of these two alternative development settings on infrastructure and development costs. The basic four dimensions of urban sprawl and their related urban characteristics have been defined in a seminal report. These urban form features are the most critical factors defining alternative development settings.

**Table 1. Urban form factors of sprawl. Source: Ewing et al. (2002)**

| Sprawl dimension | Urban form factors |
|---|---|
| A population that is widely dispersed in low-density development | Residential density |
| Rigidly separated homes, shops, and workplaces | Neighborhood mix of homes, jobs, and services |
| A network of roads marked by huge blocks and poor access; | Accessibility of the street network |
| A lack of well-defined, thriving activity centers, such as downtowns and town centers | Strength of activity centers and downtowns |

Development cost is a function of land costs, infrastructure costs and structure costs, which eventually influence the final cost of dwelling units. Out of these, infrastructure costs are typically of the highest concern to local governments and authorities. However, analyzing costs of infrastructure provision for

[44] Literature Review of the Costs of Infrastructure Provision for Different Development Forms, University of Toronto Transportation Research Institute, Shivani Ragha, Dena Kasraian, Eric J Millers, 2019.

different development settings is challenging due to variations in urban contexts of cities, socio-demographic differences as well as varying record keeping and accounting practices.

The common major factors influencing infrastructure asset project costs and service delivery costs are listed and described briefly below.

Cost factors affected by the development setting:

- Urban form: population size, density, lot size and shape, location of development, dispersion of development, housing typology, and street network pattern.
- Site conditions / topography: geographical location, space availability and transportation access, slopes.
- Utility capacity utilization: catchment of existing infrastructure and the level of augmentation required is an important location specific factor affecting costs, especially in infill areas.
- Proximity to service areas: distance of a new development from existing utility plants and trunk infrastructure.

Other cost factors:

- Technological change: Infrastructure materials, construction methods and service delivery technology have largely been the same for decades, but there have been design and efficiency improvements in capacity planning and equipment specifications. It is difficult to account for these differences when comparing cost estimates.
- Factor price measures: costs for design and engineering, technical specifications, vertical construction, equipment redundancy, price premiums, market demands, labour factors and many other local area market factors.
- Demographics: age distribution, household size, etc.
- Service delivery standards: per capita service level goal.

Serving large populations may offer a cost advantage from economies of scale, although empirical evidence is mixed about whether scale economies in infrastructure delivery exist, and suggests that it depends on the type of infrastructure service. Generally, services with large capital inputs capture economies of scale in production, like a treatment plant of a given capacity can treat additional water at low marginal costs, allowing for periodic increases in serviced population. However, low per unit costs of treatment may be offset by the higher per capita cost of water distribution, if the population is distributed over a large geographic area.

In terms of drinking water servicing, increasing distance from the source of raw water increases the cost of distribution (i.e., extensive pipeline network and numerous water storage towers) as well as the operational costs of pumping water through the system. Residential density and distance to treatment plants have a significant impact on the costs of ‘hard’ infrastructure-based services. Distribution infrastructure is much more compact and efficient for a dense development consisting of high-rise towers built in a small area, producing cost savings.

In other words, low density developments are spread over a large area, resulting in high capital costs for linear infrastructure for all capital-intensive hard infrastructure like water, sewerage and stormwater drainage as well as roads and rail-based transit systems. Similarly, each additional kilometre of road or pipeline results in additional maintenance costs over time.

However, costs for labour-intensive services like fire-fighting and education services (i.e., the number of schools / classrooms / teachers) tend to increase with population size and density, because these have a fixed ratio of personnel to serviced population.

While high density development can reduce the cost of producing services (on a per unit basis), it does tend to increase the overall cost due to increase in total demand for services. Thus, effects of density on costs of providing community services cannot be generalized as scale economies are complex and service-specific.

Researchers have suggested designing separate cost-minimizing service-specific districts for infrastructure elements such as water, sewerage, fire protection and schools, to capture scale and size economies for a given residential population and density. This strategy may not be a practical solution however due to differing size jurisdictions for the different services.

Another noteworthy finding is that the majority of cost savings associated with high-density compact developments are made in the user-pay component of infrastructure (i.e., service delivery charges). For example, existing rail-based transit station areas are excellent opportunities for infill transit-oriented developments (TOD) with shared public-private infrastructure costs. TODs create dense, walkable, mixed-use centres of activity and are an essential Smart Growth strategy.

The primary development settings for urban growth include high-density, mixed-use, clustered infill development (Smart Growth) within inner city areas and low-density, dispersed greenfield developments (Urban Sprawl) in fringe areas. These different development patterns are illustrated in the figure below. Compact growth through infill developments instead of fringe growth reduces per-capita land consumption and saves on costs of new land development, building new roads, and extending and maintaining underground linear utilities.

Fig. 3.a. Fig. 3.b.

**Figure 3.a-b. Comparison of alternative development forms (Conventional suburban development or Sprawl vs. Traditional neighborhood development or Smart Growth). Source: Ford, 2009.**

Infill and intensification of development is generally recognized as having lower infrastructure costs due to the opportunity for developers to utilize servicing capacity within existing infrastructure systems, provided that spare capacity exists. Several studies have established that municipal infrastructure and service delivery costs tend to decline with increased density achieved by infill developments relative to that of greenfield expansion.

If development cost charges are applied as location-specific and reflect the full costs and benefits of development, then developers and public sector decision makers will be incentivized to make more efficient location choices for new development.

Comparing infrastructure costs for different development settings and locations in a metropolitan region can be complex, due to the sharing of costs across municipal boundaries, a lack of long-term data availability, variable units of analysis, cost components, recording methods and their interpretations, and different local contexts. Despite these challenges, the common significant cost factors for infrastructure provision have been identified and some conclusions can be drawn about the effects of two principal alternative development forms on infrastructure costs: high-density infill redevelopment and low-density urban sprawl, greenfield development.

These findings indicate that density and location are the major determinants of infrastructure costs in a metropolitan region. Infrastructure costs are found to be inversely related to density. However, density-related savings from economies of scale are scale and service-specific, that is savings may be captured in production (e.g., a water or sewage treatment plant) but additional demand may or may not result in distribution savings as distribution infrastructure depends on the form and density of development (e.g., compact or dispersed).

Another important trend observed in infrastructure costs varying by urban density is that cost savings may be subject to diminishing returns and decline at very high densities in urban areas. This is in part due to the negative effects of overcrowding, and access constraints and saturation / over use of existing infrastructure capacity in the area. Density benefits need to be combined with spatial factors (i.e., distance from a city centre and from existing infrastructure) to capture cost savings in existing infrastructure. Scale and size economies can be exploited by creating separate cost-minimizing service districts for different infrastructure services. Cost analysis may be conducted for a single infrastructure service at a given time, as it is easier to determine appropriate input and output measures for designing optimum-sized service districts.

Similarly, neighbourhood design and street patterns can affect the costs of linear infrastructure. Mixed housing neighbourhoods based on a grid street pattern, as opposed to curvilinear or cul-de-sac based suburban streets, tend to be the most efficient and cost effective for infrastructure service delivery.

Policies supporting the redevelopment of land in urban areas in the form of infill redevelopments, are needed as providing and maintaining new infrastructure for greenfield developments is fiscally challenging for local governments, especially in the absence of the true pricing of infrastructure costs of development. Moreover, Smart Growth savings from compact, mixed-use and more accessible land use patterns extend beyond municipal government costs to savings for other stakeholders like private sector utilities, school districts, other levels of government, businesses and consumers.

**Addressing the Fairness of Municipal User Fee Policy[45]**

User fees fund some or all of the costs of a range of municipal services in Canada. These include water supply, sewers, solid waste collection and disposal, public recreation, public transit, and parking, as well as some social services. Fees can range from fixed charges that are unrelated to consumption levels, to charges that vary directly with quantity consumed, to a mix of fixed and variable charges, and may cover

[45] Addressing the Fairness of Municipal User Fee Policy, Institute on Municipal Finance and Governance, Almos Taassonyi, Harry Kitchen, 2021.

all or only a portion of production and delivery costs.

Decisions about pricing structures and the proportion of costs recovered from user fees depend on considerations such as the type of service, the preferences of residents, and the willingness of local officials to substitute fees for local taxes. Furthermore, in two-tier local governing structures, the importance of user fees in the overall revenue mix is determined by the distribution of functional jurisdiction.

The current design of fees is based largely on the principle of 'benefits-received' and addresses ways in which the fee policy could be modified to take the 'ability-to-pay' criterion of property tax and fee design into account. Put simply, the benefits-received principle is that "the costs of providing a good or service are borne as directly as possible by those benefiting from them". The ability-to-pay criterion suggests that those with higher incomes should bear a greater proportion of the cost of providing a good or service.

From an economist's perspective, user fees should be adopted whenever and wherever possible. They are ideal for funding services for which specific beneficiaries can be identified, non-users can be excluded, and the quantity of service consumed can be measured. These are services such as water, sewers, solid waste collection and disposal, and public transit.

User fees may be less appropriate in the funding of services with certain public good characteristics, i.e., services for which it is difficult or more costly to exclude individuals from using a service and there is a broader benefit to a community. Examples include local roads, and neighbourhood and community parks. Inefficiently set user fees can lead to overinvestment and larger facilities than would be justified if more efficient pricing practices were adopted.

Growing concerns over municipal fiscal sustainability and increasing pressure on the property tax base have highlighted the importance of examining where user fees might be used and how they should be structured to ensure that resources are not wasted or applied in an unfair and inequitable manner.

**Building Better Budgets: A National Examination of the Fiscal Benefits of Smart Growth Development[46]**

The report surveys 17 studies that compare different development scenarios. The development scenarios are separated into two categories:

- 'Smart Growth development' is characterized by more efficient use of land; a mixture of homes, businesses and services located closer together, and better connections between streets and neighbourhoods; and
- "Conventional suburban development" is characterized by less efficient use of land with homes, schools and businesses separated and areas designed primarily for driving.

When compared to one another, findings indicate:

[46] Building Better Budgets: A National Examination of the Fiscal Benefits of Smart Growth Development, Smart Growth America, 2013.

*1. In General, Smart Growth Development Costs One-Third Less for Upfront Infrastructure.*

Smart Growth development saves an average of 38% on upfront costs for new construction of roads, sewers, water lines and other infrastructure. Many studies have concluded that this number can be as high as 50%.

Smart Growth development patterns require less infrastructure, meaning upfront capital costs, long-term operations and maintenance costs, and, presumably, cost for eventual replacement are all lower. Smart Growth development also often uses existing infrastructure, lowering upfront capital costs even more.

All development requires infrastructure to support and supply it. The studies included in this report primarily refer to roads, water lines and sewer lines, which account for most of the infrastructure cost associated with new development. Smart Growth development patterns require less infrastructure, meaning upfront capital costs, operations, maintenance and, presumably, cost for eventual replacement are all lower. Smart Growth development also often reuses and increases the use of existing infrastructure, lowering the upfront capital costs even more.

The survey determined one-third savings in upfront infrastructure costs by compiling the estimated savings from case studies considering infrastructure costs. The case studies compared urban and suburban growth between a Smart Growth and a conventional suburban development; the fiscal impacts of rural development scenarios were excluded because their geographic differences produced significantly higher savings.

*2. Smart Growth Development Saves an Average of 10% on Ongoing Delivery of Services.*

Smart Growth development saves municipalities an average of 10% on police, ambulance and fire service costs.

The geographic configuration of a community and the way streets are connected significantly affect public service delivery. Smart Growth patterns can reduce costs simply by reducing the distances service vehicles must drive. In some cases, the actual number of vehicles and facilities can also be reduced along with the personnel required.

Many public services are sensitive to a community's pattern of development. The configuration of a community and the way it is connected geographically profoundly affects service delivery.

The survey determined an average of 10% savings in service delivery costs by compiling the estimated savings from case studies considering service costs. Services considered across studies were not consistent, and levels of service and economic conditions vary. However, all case studies consistently demonstrated a cost reduction in delivery of services examined when pursuing Smart Growth development. The overall savings figure is a conservative, rough average of savings reflective of available data.

*3. Smart Growth Development Generates 10 Times More Tax Revenue per Acre than Conventional Suburban Development.*

On an average per-acre basis, Smart Growth development produces 10 times more tax revenue than conventional suburban development.

Tax revenue, typically refers to property taxes and sales taxes, and in some instances licensing fees and other small sources of revenue. Property tax in particular is an extremely important source of revenue for most communities. In a 2010 U.S. Census survey of local government budgets nationwide, 48% of revenue from municipalities' own sources came from property taxes, and 10% came from sales taxes, though the relative importance of these taxes varies across the country.

**Relationships Between Density and per Capita Municipal Spending in the United States[47]**

The objective of this research was to determine the relationship between land use, particularly density, and per capita spending levels in cities across the United States for different spending categories. A model was developed using data for 2012–2016 from the U.S. Census Bureau's Annual Survey of State and Local Government Finances. This data source provides individual city spending levels for several different spending categories.

This study focused on municipal spending for eight categories that theoretically could be influenced by land use development: fire protection, streets and highways, libraries, parks and recreation, police, sewer, solid waste management, and water. Results from the model show how density and other independent variables are associated with per capita municipal expenditures.

Density was found to be negatively associated with per capita municipal expenditures for the following cost categories: operational costs for fire protection, streets and highways, parks and recreation, sewer, solid waste management, and water; construction costs for streets and highways, parks and recreation, sewer, and water; and land and existing facility costs for police, sewer, and water. Results were insignificant for other cost categories, and a positive relationship was found for police operations costs. In general, results support the conclusion that increased density is associated with reduced per capita municipal spending for several cost categories.

Lower density, auto-oriented developments require more infrastructure per capita than do more compact developments. Sprawling cities have more kilometres of streets and water and sewer pipes per person to maintain, and services such as trash collection and fire and police protection have a greater distance to cover per person. This can result in an increase in per capita infrastructure, maintenance, and service costs for cities. More compact developments can lead to cost savings through economies of scale and economies of geographic scope. Economies of scale are exhibited when the marginal cost of providing services to each additional person decreases as more residents cluster within a smaller geographic area. Economies of geographic scope are found when the marginal cost decreases as each person locates more closely to existing major public facilities.

Urban sprawl was defined as including non-contiguous development, larger lot sizes, and lower floor-to-area ratios for non-residential development. Smart Growth was described as more compact and concentrated around existing urban centres, limiting peripheral developments and reducing the need for new infrastructure. Results showed the substantial savings for water and sewer infrastructure, road infrastructure, and local public service costs that would result by pursuing Smart Growth development instead of conventional sprawl.

The following table illustrates the per capital municipal spending by budget line item.

[47] Relationships between Density and per Capita Municipal Spending in the United States, Upper Great Plains Transportation Institute, Jeremy Mattson, 2021.

**Table 1.** Per capita municipal spending data, cities with population greater than 25,000.

| Spending Category | N | Mean | Median | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|---|
| | | | | dollars per capita | | |
| *Operations* | | | | | | |
| Fire | 942 | 164.55 | 157.13 | 76.51 | 1.99 | 567.97 |
| Streets/highways | 994 | 93.32 | 81.06 | 55.15 | 2.64 | 457.33 |
| Libraries | 535 | 37.01 | 30.52 | 28.17 | 0.09 | 206.58 |
| Parks and recreation | 954 | 88.92 | 74.11 | 78.19 | 0.60 | 1331.94 |
| Police | 998 | 253.06 | 232.74 | 108.28 | 2.13 | 1077.97 |
| Sewer | 902 | 111.19 | 98.22 | 72.36 | 0.64 | 619.49 |
| Solid waste | 814 | 69.70 | 61.74 | 48.39 | 0.07 | 594.77 |
| Water | 826 | 139.48 | 121.39 | 84.71 | 0.12 | 746.93 |
| *Construction* | | | | | | |
| Fire | 114 | 7.68 | 5.36 | 7.35 | 0.04 | 38.92 |
| Streets/highways | 593 | 87.55 | 67.95 | 77.12 | 0.04 | 578.89 |
| Libraries | 58 | 9.34 | 3.61 | 14.09 | 0.13 | 81.43 |
| Parks and recreation | 382 | 33.02 | 18.05 | 79.70 | 0.15 | 1406.53 |
| Police | 120 | 13.29 | 6.66 | 18.85 | 0.01 | 111.86 |
| Sewer | 418 | 71.92 | 44.14 | 82.96 | 0.02 | 673.67 |
| Solid waste | 68 | 16.43 | 7.14 | 37.77 | 0.09 | 294.83 |
| Water | 416 | 79.66 | 52.34 | 112.26 | 0.51 | 1356.78 |
| *Land and Existing Facilities* | | | | | | |
| Fire | 357 | 7.40 | 5.36 | 7.88 | 0.01 | 53.29 |
| Streets/highways | 362 | 14.58 | 7.03 | 24.83 | 0.01 | 219.23 |
| Libraries | 84 | 3.26 | 1.68 | 4.15 | 0.06 | 24.18 |
| Parks and recreation | 373 | 8.84 | 4.41 | 12.44 | 0.06 | 98.39 |
| Police | 471 | 7.72 | 5.96 | 6.90 | 0.04 | 53.14 |
| Sewer | 222 | 25.95 | 9.17 | 61.91 | 0.13 | 694.14 |
| Solid waste | 138 | 7.84 | 5.58 | 8.23 | 0.03 | 52.17 |
| Water | 218 | 19.68 | 9.77 | 28.72 | 0.11 | 217.38 |

Developments were classified as either Smart Growth or conventional suburban. They defined Smart Growth as being characterized by more efficient use of land, greater land use mix, and better connections between streets and neighbourhoods. Conventional suburban (urban sprawl) was then defined by less efficient use of land, separated land uses, and development designed primarily for driving. Their main findings were that Smart Growth development costs about one-third less for upfront infrastructure and saves an average of 10% on ongoing delivery of services, specifically for police, ambulance, and fire.

The research is mixed, but there is some evidence that increased density and Smart Growth development patterns reduce public service expenditures for local governments (on a per capita basis). A number of studies have shown a reduction in total costs. With regard to specific services, different studies provide different results. While it may be expected that many costs would decrease with density, most studies tend to show only some cost reductions to be significant or evident. Many studies find costs decrease with density for roadways, police, and fire protection, while others show similar results for parks and recreation, libraries, or education. Fewer studies have shown reductions in costs for water, sewer, or sold waste, though this may be expected. Some costs have also been shown to increase with density, such as housing and community development or police.

Besides density, previous research has examined several other factors that can influence per capita municipal expenditures. Many studies have examined the effect of population size and whether economies of scale exist. Some research shows that smaller municipalities exhibit higher per capita costs than larger municipalities.

In the construction costs models, density is negative and statistically significant for streets / highways, parks and recreation, sewer, and water, indicating that per capita construction costs are lower in these categories as densities increase, while the relationship is insignificant for the other cost categories. In the land and existing facilities costs models, density is negative and statistically significant for police, sewer, and water, indicating that per capita land and existing facility costs are lower in these categories

as densities increase. For police costs, while the results show a positive correlation between density and operational costs, there was a negative relationship between density and land / existing facility costs.

Overall, the models clearly show a general negative relationship between density and per capita municipal expenditures for several cost categories. These results indicate that a 10% increase in density would reduce operational costs for fire protection by 1.3%, streets and highways by 2.7%, sewer by 3.1%, etc.

Median house age was positive and statistically significant in all operational cost models except for parks and recreation. This suggests older neighbourhoods require increased operational expenditures, except that parks and recreation expenditures were higher in cities with newer housing. Construction costs for streets / highways, sewer, and water were also higher in cities with older housing, everything else equal. There is some correlation between the age of a neighbourhood and density, as older neighbourhoods tend to be denser. The density contributes to lower costs, while the age of the buildings and infrastructure may contribute to higher costs.

The findings have important implications for the fiscal sustainability and resiliency of cities. By increasing population density, cities can use resources more efficiently and reduce the cost per person of constructing and maintaining infrastructure and providing services. Practices that cities can employ to achieve these outcomes include focusing on infill development, providing a diversity of housing types beyond single family homes, avoiding non-contiguous development, promoting more compact development with smaller lot sizes and multi-use buildings, and building cities at a human scale, where distances between buildings and activities are shorter. Many cities are pursuing these strategies to promote sustainability, reduce automobile use, and create more vibrant, livable communities. This research provides further evidence that these strategies also lessen the burden on taxpayers and reduce some types of municipal spending.

**Analysis of Public Policies that Unintentionally Encourage and Subsidize Urban Sprawl[48]**

These density and costing relationships are complex. Denser, infill development can increase some costs due to higher design standards and infrastructure development costs in dense areas, and sometimes brownfield remediation (cleaning up hazardous conditions such as polluted soils), but such costs are not significantly related to development density. A tall building has similar utility connection and brownfield remediation costs as a smaller building, so unit costs often decline with Smart Growth policies that allow higher densities.

Critics argue that sprawl infrastructure costs are exaggerated, citing studies which indicate that per capita government expenditures are often higher in higher-density counties, although such aggregate analyses do not account for important factors such as the tendency of rural residents to supply their own utilities and services (e.g., water, sewage and garbage collection), and incomes (which tend to be higher in larger cities), and the additional public service costs borne by urban areas which tend to contain a disproportionate share of businesses and lower income residents. In addition, such aggregate analysis, which only considers population density at a jurisdictional scale, does not accurately reflect Smart Growth policies which include other factors related to the location and type of development that occurs within a jurisdiction. Two different geographic areas can have the same overall density but differ significantly to the degree that they reflect Smart Growth principles. As a result, if evaluated at an aggregate scale, any Smart Growth public service cost savings would be negligible.

[48] Analysis of Public Policies that Unintentionally Encourage and Subsidize Urban Sprawl, Victoria Transport Policy Institute, Todd Litman, 2015.

This review indicates that numerous credible studies demonstrate that sprawl typically increases the costs of providing a given level of infrastructure and public services by 10-40%, and sometimes more. These studies reflect lower-bound impacts since most only consider a subset of total public service costs and relatively modest Smart Growth policies, such as more compact single-detached development, as opposed to substantial shifts from single-detached to multi-unit housing. Comprehensive Smart Growth policies that result in greater density increases can provide even larger savings and efficiency benefits.

Some of the largest impacts result from the way that sprawl increases per capita vehicle travel, which increases transport costs including road and parking facility costs, consumer expenditures, traffic accidents and pollution emissions.

### Understanding Smart Growth Savings: Evaluating Economic Savings and Benefits of Compact Development[49]

Ewing and Hamidi's 2014 report, *Measuring Sprawl*, calculated a compactness index score for 221 U.S. metropolitan areas and 994 counties reflecting four factors: *density* (people and jobs per square mile), *mix* (combination of homes, jobs and services), *roadway connectivity* (density of road network connections) and *centricity* (the portion of jobs in major centres). The table summarizes the key results.

***Table 3*** **Summary of Smart Growth Outcomes** (Ewing and Hamidi 2014)

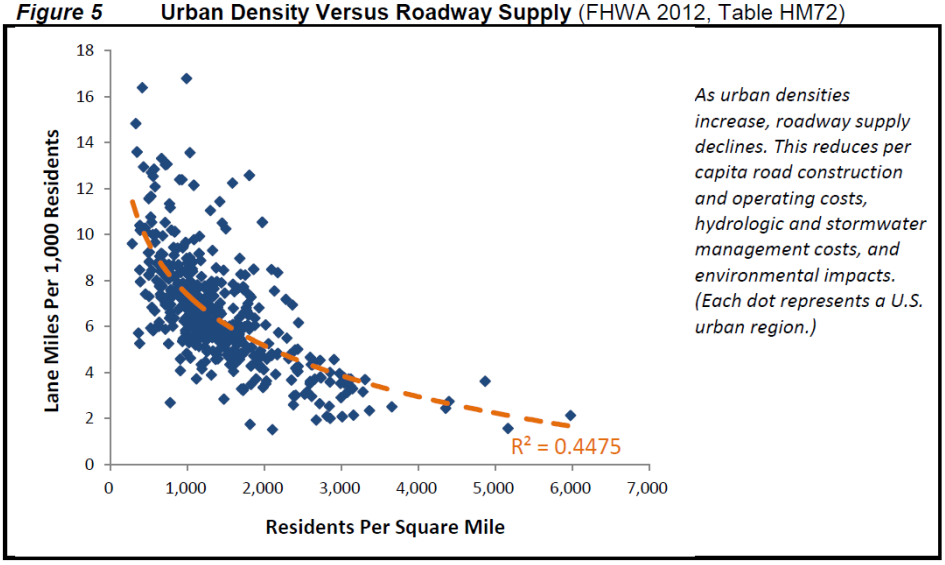
| Outcome | Impact of 10% Compactness Score Increase |
|---|---|
| Average household vehicle ownership | 0.6% decline |
| Vehicle miles traveled | 7.8% to 9.5% decline |
| Walking commute mode share | 3.9% increase |
| Public transit commute mode share | 11.5% increase |
| Average journey-to-work drive time | 0.5% decline |
| Traffic crashes and injuries per 100,000 population | 0.4% to 0.6% increase |
| Fatal crash rate per 100,000 population | 13.8% decline |
| Body mass index | 0.4% decline |
| Obesity | 3.6% decline |
| Any physical activity | 0.2% increase |
| Diagnosed high blood pressure | 1.7% decline |
| Diagnosed heart disease | 3.2% decline |
| Diagnosed diabetes | 1.7% decline |
| Average life expectancy | 0.4% increase |
| Upward mobility (probability a child born in the lowest income quintile reaches the top quintile by age 30) | 4.1% increase |
| Transportation affordability | 3.5% decrease in transport costs relative to income |
| Housing affordability | 1.1% increase in housing costs relative to income. |

*This table summarizes various economic, health and environmental impacts from more compact development.*

The table above shows how per capita lane-miles decline with urban density. U.S. cities with less than 1,000 residents per square mile (approximately 1.6 residents per acre) have about 670 square feet of road space per capita, nearly three times as much as the 235 square feet in denser cities with more than 4,000 residents per square mile (approximately 6 residents per hectare). Similarly, central neighbourhoods require less road space per capita than at the urban fringe, as illustrated in the following figure.

[49] Understanding Smart Growth Savings: Evaluating Economic Savings and Benefits of Compact Development, Victoria Transport Policy Institute, Todd Litman, 2023.

***Figure 5*** **Urban Density Versus Roadway Supply** (FHWA 2012, Table HM72)




Smart Growth reduces the costs of providing many types of public infrastructure and services. More compact development reduces the length of roads and utility lines, and travel distances needed to provide public services such as garbage collection, policing, emergency response, and school transport, and so reduces the per capita costs of providing these services. However, some of these impacts are complex and require detailed analysis.

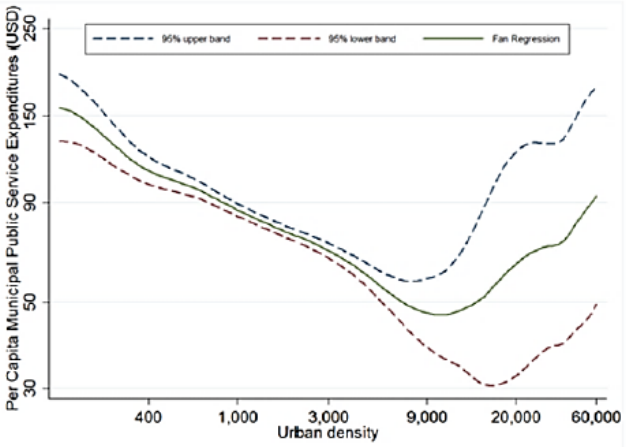
Rural residents traditionally accept lower public service quality, such as unpaved roads and volunteer fire departments, and provide many of their own utilities (e.g., well water, septic systems, garbage disposal), but urban sprawl tends to attract residents who demand urban level services in dispersed locations, despite the higher costs. Infill development can increase some infrastructure costs by increasing design standards, planning requirements and brownfield remediation, but such costs are not proportionate to density; taller buildings usually have similar development mitigation requirements and brownfield remediation costs as a smaller building, so unit costs tend to decline with density.

**Understanding Smart Growth Savings: Evaluating Economic Savings and Benefits of Compact Development[50]**

- Burchell and Mukherji (2003) found that sprawl increases local road lane-miles 10%, annual public service costs about 10%, and housing development costs about 8%, increasing total costs an average of $13,000 per dwelling unit, or about $550 in annualized costs.
- A Charlotte, North Carolina study found that neighbourhoods with low densities and disconnected streets require four times the number of fire stations at four times the cost compared with more compact and connected neighbourhoods (CDOT 2012).
- Analyzing municipal budgets in 8,600 municipalities of Brazil, Chile, Ecuador and Mexico, de Duren and Compeán (2015) found that low-density development approximately triples per capita expenditures on public service, with the greatest efficiencies at approximately 90 residents per hectare (see figure below). This justifies policies that encourage densification, particularly in medium-sized cities.

[50] Understanding Smart Growth Savings: Evaluating Economic Savings and Benefits of Compact Development, Victoria Transport Policy Institute, Todd Litman, 2023.

***Figure 7*** **Municipal Service Costs By Urban Density** (de Duren and Compeán 2015)

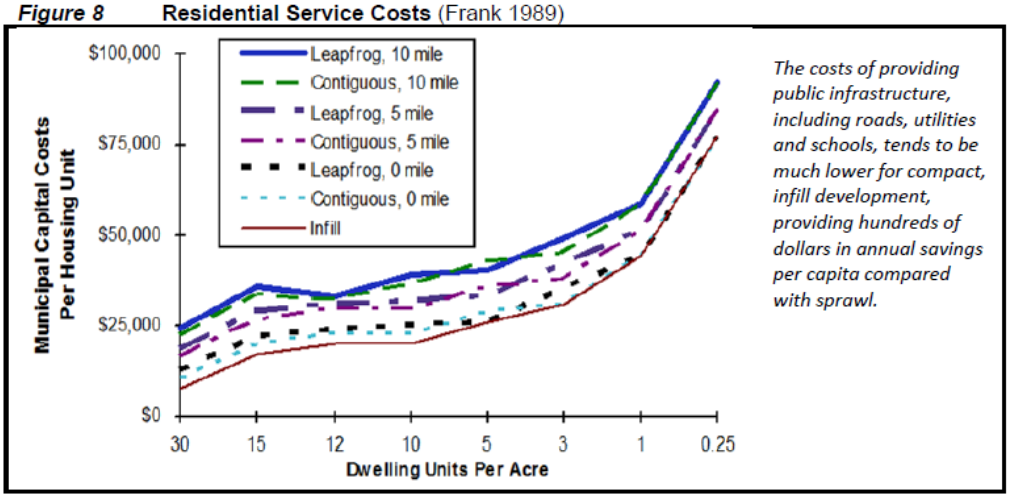



*All else being equal, the annual costs of providing public water, sewage, garbage collection by municipal governments in Brazil, Chile, Ecuador, and Mexico range from more than $150 in very low density areas to about $50 per capita.*

- A study by Mattson (2021) found that the construction and operating costs of municipal streets and highways, emergency services (expect police operations), parks and recreation, water, sewage and solid waste management tend to decline with density.
- Goodman (2019) analyzed separately the effects of development density and sprawl on the costs of providing public services. The study found that increased density slightly increases some public costs, but this effect is small compared with the costs of sprawl, which increases per capita costs for education, fire services, police protection, and sewerage. Increasing a city's density from the 25th to the 50th percentile ranking increases annual per capita expenditures by $5, but reducing its sprawl ranking from the 50th to the 25th percentile reduces per capita annual expenditures by $61.
- Detailed analysis of 2,500 Spanish municipal budgets found that lower-density development increases per capita costs of providing local services (Rico and Solé-Ollé 2013). The study found that in lower density urban areas with less than 25 residents per acre, each 1% increase in urban land area per capita increases municipal costs by 0.11%. Of this, 21% is due to increased basic infrastructure costs, 17% to increased culture and sports program costs, 13% to increased housing and community development costs, 12% to increased community facilities costs, 12% to increased general administration costs, and 6% due to increased local policing costs.
- Fernández-Aracil and Armando Ortuño-Padilla (2016) found that each 1% increase in compact population is associated with a 0.217% per capita decrease in public service costs in Spanish urban areas.
- Using data from three U.S. case studies, the study, *Smart Growth & Conventional Suburban Development: Which Costs More?* (Ford 2010) found that more compact residential development can reduce infrastructure costs by 30-50% compared with conventional suburban development.
- *Building Better Budgets: A National Examination of the Fiscal Benefits of Smart Growth Development* (SGA 2013) found that Smart Growth development typically reduces public infrastructure construction costs by a third and ongoing public services costs by 10%.
- The City of Calgary (2016) developed cost-based development fees using detailed and transparent accounting of infrastructure costs, such as new water and sewage lines, roadway improvements and other public services. The resulting fees are significantly higher in sprawled locations to reflect the higher costs of providing public infrastructure and services there. Fees range from $2,593 per multi-unit unit, $6,267 for a single family home, and $422,073 to $464,777 per hectare in suburban areas.

The figure below illustrates the results of a study showing that municipal infrastructure costs tend to decline with density and are lowest for infill development.

*Figure 8* **Residential Service Costs** (Frank 1989)




**Evaluating Transportation Land Use Impacts**[51]

- More compact development could save Calgary, Alberta about a third in capital costs and 14% in operating costs for roads, transit services, water and wastewater, emergency response, recreation services and schools (IBI 2008).
- A Charlotte, North Carolina, USA study found that lower density neighbourhoods with disconnected streets require four times the number of fire stations at four times the cost compared with more compact and connected neighbourhoods (CDOT 2012).
- A study for the City of Madison, Wisconsin, USA (SGA and RCLCO 2015a) found that annual net fiscal impacts (incremental tax revenues minus incremental local government and school district costs) are $6.8 million net revenue ($203 per capita and $4,534 per acre), compared with $4.4 million ($185 per capita and $1,286 per acre) for the low density scenario.
- A similar study for West Des Moines, Iowa, USA predicts that, to accommodate 9,275 new housing units, compact development designed to maximize neighbourhood walkability would generate a total annual net fiscal impact of $11.2 million ($417 per capita and $17,820 per acre), about 50% more than the $7.5 million ($243 per capita and $2,700 per acre) generated by the least dense scenario (SGA and RCLCO 2015b).
- Similarly, de Duren and Compeán (2015) found that in 8,600 municipalities of Brazil, Chile, Ecuador, and Mexico, municipal service efficiencies are optimized at about 90 residents per hectare, which justifies densification policies, particularly in medium-sized cities of developing countries.

**Analysis of Public Policies that Unintentionally Encourage and Subsidize Urban Sprawl**[52]

- Burchell and Mukherji (2003) found that sprawl increases local road lane-miles 10%, annual public service costs about 10%, and housing costs about 8%, increasing total costs an average of $13,000 per dwelling unit, or about $550 in annualized costs.
- A Charlotte, North Carolina, USA study found that a fire station in a low-density neighbourhood with disconnected streets serves one-quarter the number of households at four times the cost of an otherwise identical fire station in a more compact and connected neighbourhood (CDOT 2012).
- In a detailed analysis of 2,500 Spanish municipalities' expenditures, Rico and Solé-Ollé (2013) found that lower-density development patterns tend to increase per capita local public service costs.

[51] Evaluating Transportation Land Use Impacts, Victoria Transport Policy Institute, Todd Litman, 2022.
[52] Analysis of Public Policies That Unintentionally Encourage and Subsidize Urban Sprawl, Victoria Transport Policy Institute, Todd Litman, 2015.

- The Delaware Valley Regional Planning Commission, USA (DVRPC 2003) estimated the infrastructure costs of five alternative development scenarios for the Philadelphia region. They found that roads, schools and utilities would cost $25,000 per household for the most compact scenario, 44% less than the $45,000 required by the most sprawled scenario. The compact option provides approximately $850 in annual savings per household.
- Analysis of options for accommodating 1.25 million additional residents and 800,000 additional jobs in Central Texas, USA found $3.2 billion ($2,560 per capita) lower infrastructure costs if development is concentrated in existing urban areas, 70% less than the $10.7 billion ($8,560 per capita) required if lower-density development trends continue (Envision Central Texas 2003).
- Using data from three U.S. case studies, the study, Smart Growth & Conventional Suburban Development: Which Costs More? (Ford 2010) found that more compact residential development can reduce infrastructure costs by 30-50% compared with conventional suburban development.
- More compact development could save Calgary, Alberta about a third in capital costs and 14% in operating costs for roads, transit services, water and wastewater, emergency response, recreation services and schools (IBI 2008).
- Building Better Budgets: A National Examination of the Fiscal Benefits of Smart Growth Development (SGA 2013) found that Smart Growth development costs one-third less for upfront infrastructure costs and saves an average of 10% on ongoing public services costs.
- The Utah Governor's Office, USA (2003) sponsored the Municipal Infrastructure Planning and Cost Model (MIPCOM), an easy-to-use spreadsheet model that estimates how factors such as development location and density affect various costs including regional (regional roads, transit and water supply facilities), subregional (water, sewage and stormwater networks, and minor arterials) and on-site infrastructure (local roads, water and sewer lines, stormwater systems, telephone, electricity, etc.).

**Literature Review of the Costs of Infrastructure Provision for Different Development Forms**

- For Los Cabos, Mexico, savings on capital costs were 38% and operational cost savings were 60% (Sustainable Cities International, 2012).[53]
- Growth simulations for the USA using mathematical impact models suggest that sprawl developments increase local road lane-miles by 10%, annual public service costs by 10%, and housing development costs by 8%, increasing total development costs by about $550 per dwelling unit per annum (Burchell & Mukherji, 2003).[54]
- The city of Halifax, Nova Scotia, studied how different settlement patterns affect the cost of services delivered by the city. They studied eight different types of development patterns, and similar to other research, they found that cost decreases with density for many services, especially for roads but also for libraries, parks and recreation, police, fire, water, transit, and sewer. Specifically for roads, they estimated that the cost per household is $1,053 for low-density rural development (2.5 acres per dwelling unit), $280 for low-density suburban (8,100 sq ft per dwelling unit), $124 for mid-density urban (2,400 sq ft per dwelling unit), and $26 for high-density urban (760 sq ft per dwelling unit). Total per household costs ranged from $5,240 for low-density rural to $1,416 for high-density urban. They also noted that operations and maintenance make up 60% to 90% of the overall service costs.[55]

[53] Literature Review of the Costs of Infrastructure Provision for Different Development Forms, University of Toronto Transportation Research Institute, Shivani Ragha, Dena Kasraian, Eric J Millers, 2019.
[54] Literature Review of the Costs of Infrastructure Provision for Different Development Forms, University of Toronto Transportation Research Institute, Shivani Ragha, Dena Kasraian, Eric J Millers, 2019.
[55] Relationships Between Density and per Capita Municipal Spending in the United States, Upper Great Plains Transportation Institute, Jeremy Mattson, 2021.

# Appendix E: Methodological Complexities of Costs and Revenues of Infrastructure by Residential Densities

The following is a summary of methodological considerations and complexities with the calculation and attribution of municipal costs and revenues related to infrastructure by residential densities. These findings were identified through the research associated with preparing the study, and particularly the literature reviews and informational interviews. These noted challenges and complexities do not preclude the need to complete financial analysis, however identify some of the limitations that participants should be aware of. For example, expectations about precision of numeric amounts should be understood as estimates rather than exact; coordination is required between different municipal departments and related functions; and there may be non-financial matters that should be considered as part of the land use planning and community building program.

**Definitions, Concepts and Complexities of Calculating Costs and Revenues**

- The definition of low / sprawl and high / urban densities and areas can vary, and thus associated boundaries and measures may not be consistent, resulting in different calculations and values.
- To define density consistently, data analysis can try to use a standardized proximity measure database (i.e., Walk Score, Statistics Canada).
- The link between costs and benefits (or payers / users), or lack thereof, is complex.
- What is the relevant scale, as arguably these different uses are all part of a city / region / community / society.
- Policy approaches (and associated studies) that seek to capture value associated with rezoning land are not the same thing as actual measures of infrastructure / service costs (i.e., development impacts and their costs).
- The differences (and similarities) between a tax and a user fee, noting some items may not be properly classified, is not easy to define.
- The definition and attributes of 'hard' infrastructure vs. 'soft' services vary.
- Fixed costs and past investments vs. variable costs, including baseline operating costs. In some cases, part of a service will have a 'fixed' aspect, and part a 'variable' aspect, each with different cost profiles.
- The difference between the costs of producing and delivering a service, where the cost of the latter may vary by location / geography (e.g., a treatment plant for the city, with service mains to the different areas). Thus, the cost implications of different densities may vary by function and authority; e.g., regional infrastructure treatment facilities may be less impacted by development density than municipal local service infrastructure connections.
- Average costs vs. marginal / incremental costs can differ. Marginal costs may be relevant at the development scale (or for the individual), but average costs are more relevant for the community (and society) longer term / larger scale. In practice, the costs are incurred when infrastructure upgrades are needed. The selected timeframe for amortization is a part of the answer to such cost allocation matters.
- Cumulative impact consideration; the argument that infrastructure costs should be borne by everyone in a community, not just new development / population growth.
- Some services / infrastructure with economies of scale should be provided regionally where possible, whereas others can be done more effectively and efficiently at the local level.

- There are natural economies of scale for some types of infrastructure. Economies of scale work at different levels and vary by type of infrastructure / service. And these economies usually come to an end after a certain size. Thus no single / simple optimum level for all combined services.
- Often an economy of scale is associated with capital-intensive infrastructure (such as water and sewerage treatment plants), but not for labour-intensive services (such as library services, administration).
- Local considerations / context are important. Infrastructure capacity available and incremental thresholds reflect existing local infrastructure and their respective costs.
- In some cases, creating excess capacity may have been done intentionally for future planned development that has not yet occurred (i.e., upsizing pipes for future capacity while replacing them is more cost effective than having to upsize later).
- Some local government and related services and costs are a function of per capita demand, and others based on geography / density, and some a bit of both.
- There are differences, similarities, and overlapping relationships between economies of scale and efficiencies of geography. Higher population cities, not necessarily higher density, can achieve economies of scale, while denser cities can also achieve economies of geography.
- Per unit calculations often fail to acknowledge that the housing unit types are different (i.e., a house and an apartment are both residential units, but not the same in terms of size, number of residents, and infrastructure / service demand).
- Different housing unit types/sizes or household sizes generate different per capita or costs by floor area, rather than just costs per 'housing unit'.
- Smaller housing units generally have lower assessed property values and generally pay less property taxes.

**Allocating Costs**

- Separating and allocating growth and non-growth related costs is complex.
- There are challenges with allocating / apportioning costs by land use, housing unit type, location / geography, components of services, and infrastructure amortization periods. Cities often do not track sub-area budgets or data.
- When comparing infrastructure costs between scenarios and allocating it to different types and numbers of residential units the results can be influenced by the assumed attribution of costs to non-residential land uses, such as commercial and industrial uses.
- Different development scenarios may not simply be defined as 'high' or 'low' residential densities, but have a mixture of different unit sizes, and different types non-residential uses which pay different tax rates. A higher density community is likely to have more housing units and households, thus more population / consumers that could support a greater amount of local population-based retail and other businesses.
- Any analysis of cost and revenue data for exclusively residential uses would need to separate out values associated with non-residential sectors.
- How best to allocate some infrastructure costs can be complex; e.g., roads could be budgeted by lane kilometre, by area, per year, yet roads are also used by people who do not live in an area or even the community.
- Notably there are some local-serving services such as public transit and schools that are not provided, maintained, or paid for by municipalities, but may be relevant considerations.

- Some other costs such as major infrastructure can be funded by one-time grants by senior levels of government rather than local ratepayers. Even if such capital projects are funded, they become a long-term operating cost liability for a municipality.
- Property taxes calculated based on the value of the property may not be ideal, as the amount of municipal services a household consumes is not directly related to property values.
- User fees could be charged for services consumed that can be readily allocated to a user, while other municipal services could be funded through general property taxation. In Canada taxation is set on assessed property value, but it could be differently allocated, such as based on lot size, lot frontage, building area, etc., as property value is not always an ideal measure of services needed or consumed.
- Based on research, larger cities tend to depend proportionally greater on user fees than smaller ones.
- The manner in which municipalities decide to value a capital asset and associated amortization / depreciation schedule effects assigned costs per year is complex. Some infrastructure may last longer or shorter than initially estimated.
- Reserve allowances for replacement costs may be funded or not, and show up differently in municipal budgets.
- There are different catchment areas for different service types, and thus costs.
- Data about revenues and expenses by item may not be readily available or assignable by sub-geography or unit type.
- Municipal DCCs are typically applied at a municipal-wide rate as it is administratively simpler and provides more flexibility, rather than having to limit infrastructure expenditures to within separate geographies.
- It can be simpler to use averages and equalize tax rates, but that can result in the most efficient areas subsidizing other areas.
- Some services and costs can be metered while others are not, and funded via general taxation.
- Some property taxes go to other levels of government rather than the local municipality.
- Private infrastructure is not typically included in municipal financial analysis. Some services are private responsibilities and do not show up as municipal cost; e.g., strata amenity fees for multi-unit housing which includes private utilities is a cost to those homeowners.
- Some items are not included in the financial analysis; e.g., in some rural communities service levels are low, and there is no reported financial cost as they are paid for privately (e.g., water, sewer) or provided via volunteers, such as firefighting.
- What level of government should provide societal responsibilities is a complex question; e.g., poverty, homelessness, affordable housing, etc. may be addressed via municipal efforts at local costs, but may be the responsibility of other levels of government.

**Local Considerations / Contexts**

- Servicing costs in many cases are impacted by local matters, such as the available capacity, age, and condition of existing infrastructure, which is often a context / area specific matter. Available infrastructure capacity provides for very different costs to service new development.
- Beyond residential density and type, level of, and costs to provide services may vary by location and circumstances, due to topography, geography, street pattern, condition and capacity of existing infrastructure, non-residential uses, etc.

- If neighbourhoods were developed at different times / places, they may be built to different standards, thus different infrastructure capital and maintenance costs.
- Residential densities and neighbourhood ages are associated with other attributes, which may impact servicing and infrastructure costs in other ways.
- The intensification of areas that were not initially planned for higher densities, such as urban infill areas, can be a challenge and more expensive if infrastructure capacity is not present. This may necessitate replacing existing infrastructure to increase capacity before it would otherwise need to be replaced due to age.
- Older cities have older infrastructure, which is more expensive to maintain, whereas outer suburban areas that may have been developed / built more recently will have newer infrastructure that may not require as much maintenance, and associated cost impacts.
- Complexities and costs of developing in urban areas are notable as 'urban harshness'. Although absolute project costs may be higher, it can be spread over a larger population, thus the per unit cost is lower.
- There are trade-offs between the densities and harshness of a place. Density and agglomeration, both localized and urbanized, may save costs, however some costs increase with higher densities, such as land costs, more complexities, construction works in urban environments. Municipal labour costs may also be higher in larger cities.

**Relationship Between Costs and Densities**

- Some costs are more or less sensitive to density than others. Some items / categories of costs and their attribution are clear while others may not be.
- Impacts of growth and development, irrespective of location or form / density, can be the same or can vary.
- There are different issues between high growth and no or low growth cities / regions.
- The relationship between residential density and infrastructure demand is fairly intuitive for some items; i.e., larger residential lots require more linear distance of pipes and pavement per household, thus higher costs, yet parks and recreation costs are based on population of a community, and stormwater drainage costs tend to be related to building site coverage rather than density per se.
- Most of the municipal operating budgets tend to be for labour costs. Some government services are very labour-intensive, thus the costs do not vary much due to geography / density, vs. other costs such as linear infrastructure.
- Urban development provides for lower infrastructure costs, but that's on a per unit basis, not on an absolute basis. Not all services are more efficient with higher densities, and some may have diseconomies of scale.
- Different municipalities may provide different levels of service, in terms of quantity or quality, with unique efficiencies or inefficiencies, which are difficult to address in any cost analysis.
- At some threshold levels, some types of services must move from one delivery program to another, with a significant change in cost structure. This is most often associated with population growth, not density per se; e.g., moving from a volunteer firefighting service to a professional paid one once a municipality reaches a certain size.

**Policies / Regulations**

- The notion that urban sprawl is caused by planning policies that distort market decisions, fails to acknowledge that other planning policies can cause their own sets of distortions.
- Allowing higher density development forms in urban areas can be a challenge in terms of local resident opposition, a complex and lengthy approvals process, and higher municipal fees, which all add costs over greenfield forms of development.
- While 'Smart Growth' and similar concepts support infill, intensification, and redevelopment, it does not prohibit single-detached housing forms. Many Smart Growth illustrations show the inclusion of small lot, ground-oriented houses as a means of encouraging a greater diversity of housing mix, not all high-density housing forms.
- While 'Smart Growth' is not synonymous with reducing the supply of land that can be developed, it generally discourages greenfield development and outward urban expansion. All else being equal, a reduced land supply in a market with strong demand for housing is likely to create upward pressures on housing price.
- Even though infrastructure costs (per capita) in dense infill sites may be lower, the land development and construction costs tend to be higher due to municipal policies or space / access constraints, which can result in higher housing costs in city centres. An unintended result is a push of some residents to lower-density suburban areas where housing costs are comparatively less, but household transportation costs are higher.
- While infill development may have lower municipal infrastructure costs, it generally does not see lower Development Cost Charges. This indicates that DCCs may not be set correctly if they are the same for an entire municipality, and in fact subsidize some forms of development. In fact, that approach encourages the development of lower density, suburban development where the DCC rates do not necessarily reflect actual infrastructure costs.
- While some charges / fees may vary by residential unit types, often that variance is mostly due to differences in the number of occupants per unit, not significantly by other inputs. Thus the per capita rates are similar when adjusted for the number of residents per household.

**Community Populations / Preferences**

- Residential market preferences are a major determinate of urban form, and housing choices are important.
- Differing demographics / populations require or consume different levels and types of services, with, as example, poverty, homelessness and crime and the associated costs tending to concentrate in the urban areas.
- Different areas / communities have different population profiles and behaviours as a result of where they live and the environment, or their decisions to live there.
- Different levels of municipal services can be demanded by different communities, often a result of income levels, demographics, cultural background, ability to pay, and household composition.
- Consumer expectations regarding level of service are increasing. In many suburban areas residents expect urban levels of services given the proximity to and familiarity with the services provided in urban communities.
- Communities that have a large industrial or commercial property tax base compared to residential, have the benefit of a different distribution of municipal costs and revenues for residents.
- Externalities and impacts may be within the municipality, or they may extend beyond the geographies / jurisdictions.

- Low growth jurisdictions may have very low DCCs or waive them to attract development activity, indicating that the community benefits from such development, investment, and growth. This results in an infrastructure shortfall that must be made up generally from taxation or other revenue sources.

**Decision Making**

- Costs and benefits are borne by different parties (i.e., individuals, businesses, society). Thus calculations can vary from the perspective of the consumer vs. municipality.
- There is an element of uncertainty about future costs vs benefits about decisions made now.
- Maintenance can be deferred for a time and not reflected in municipal budgets, although infrastructure deficits typically end up costing more to address the longer they accumulate. Similarly deferring maintenance of infrastructure and waiting for a failure to address also typically end up costing more.
- A range of uses and facilities are required for a community, and must be provided even if not all are high preforming from a municipal finance perspective. Infrastructure and service planning should consider the economic and functional needs of the entire city or region over the long term.
- Municipal services in Canada are largely funded by property taxes on an ad valorem system (value of property), rather than on a service consumed basis. Higher value properties pay more towards city services, while user fees are applied only for some services.
- Cities typically charge city-wide average DCCs instead of variable ones by sub-area. This approach is often seen as fairer, and setting different rates for different areas could result in pressures to alter city service provision and reduce city-wide cooperation.

**Scale / Timeframe Allocation**

- A geographic analysis of spatial activity may be unrealistic or calculated results may vary depending on the selected scales. The scale at which the analysis is undertaken of costs and revenues will impact the results.
- Total costs by service may be tracked and reported by municipalities for their entire jurisdiction, but it is much more difficult to disaggregate by sub-area and by unit type.
- Some major infrastructure that serves one municipality and regional services that support multiple municipalities like sewerage, water, dikes, etc., may be funded by senior levels of government, rather that local government and not reflected in municipal budgets.
- Paying for infrastructure by Development Cost Charges puts the cost on the respective developer and the new residents instead of the broader community through general municipal taxation, thereby transferring infrastructure costs to the private sector from the public sector.
- Some services also have different levels of consumption depending on the unit type, which is associated with development density, such as water, sewerage, and waste, which tend to be much higher in houses than apartments.
- The infrastructure in some municipalities have been over-planned for much larger populations than they currently have, thus affecting services and costs.
- Major infrastructure is large, expensive, and often has to be built all at once and cannot be spread out over time or expanded incrementally to match the gradual increase in demand as a community grows. In those cases, the overbuild needs to be funded upfront for future users / benefiters.

**Other Considerations**

- Costs to build infrastructure increase every year, primarily driven by labour costs. The construction sector, unlike other sectors such as manufacturing, has not become more efficient / productive over the past decades, through technological innovation.
- Municipal capital infrastructure costs are incurred at once, and unlike variable user fees, do not necessarily influence consumption / usage decisions, such as is the case with water meter charges, for example.
- It is difficult to compare findings between locations and jurisdictions as there can be many different variables in terms of services, costs, revenues, allocations, governance, etc. For example, Quebec's property tax system is more in line with a user-fee basis, with a direct link to services provided to property users, than is Ontario's. BC and Alberta municipalities spend relatively little on social services. Public transit service is the responsibility of the Province in BC and of the municipalities in Alberta, where is the responsibility of regions in Ontario.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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

**5.5 ATTACHMENT 2**

Lulu Island Wastewater Treatment Plant

# Study Findings – Density Impacts on Infrastructure Costs

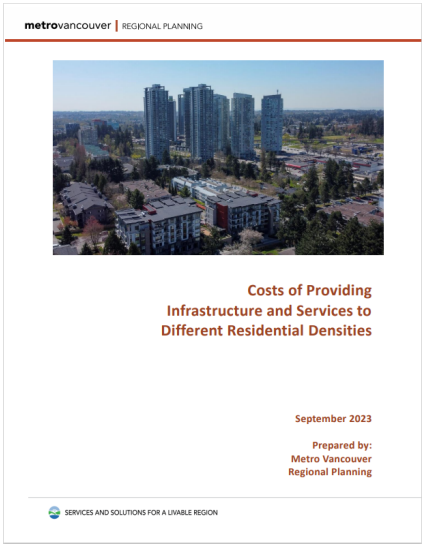
Eric Aderneck, RPP, MPL, BCOM, DULE
Senior Planner, Regional Planning and Housing Services

Regional Planning Committee | November 3, 2023

metrovancouver

## STUDY PURPOSE

- Document the costs of providing infrastructure and services to different residential densities / forms
- Create an accessible resource to inform municipal and regional growth decision making
- Compile available references, case studies, best practices, and informational interviews
- Present findings most relevant to the region



## SCOPE OF WORK

- Complete research / literature review:
  - Review urban form and infrastructure cost analysis in other jurisdictions
  - Compile the latest research, focused on relevant sources and examples
  - Informational interviews with key informants
  - Consider both capital and operating costs and revenues
  - Summarize existing publications and associated financial estimates
- Identify a series of case study locations using residential densities / forms to determine estimated costs per unit and capita
- Profile findings relevant to the Metro Vancouver context



## METHODOLOGICAL COMPLEXITIES

- Attributing costs and revenues for different services by asset class or unit type is a data challenge
- Many municipal services / costs are more a function of population than density
- Capital-intensive infrastructure can benefit from economies of scale, while labour-intensive services do not
- Significant local considerations and contextual issues
- The complexities / limitations should temper expectations – the results are high-level estimates, rather than precise

# FINDINGS – SERVICING COSTS BY UNIT TYPE

| | Scenario | Unit Yield | Servicing Costs | Cost Per Unit | *Persons per Household* | Cost Per Capita |
|---|---|---|---|---|---|---|
| 1 | House (Low) | 16 | $640,000 | **$40,000** | *3.10* | **$ 12,903** |
| 2 | House (High) | 24 | $880,000 | **$36,667** | *3.10* | **$ 11,828** |
| 3 | Townhouse (Low) | 40 | $680,000 | **$17,000** | *2.75* | **$ 6,182** |
| 4 | Townhouse (High) | 60 | $700,000 | **$11,667** | *2.75* | **$ 4,242** |
| 5 | Apartment (Low) | 100 | $800,000 | **$ 8,000** | *1.85* | **$ 4,324** |
| 6 | Apartment (High) | 200 | $900,000 | **$ 4,500** | *1.85* | **$ 2,432** |

- The costs for onsite infrastructure / servicing for a house vs. apartment are approximately 5X to 9X more expensive on a per capita and a per unit basis
- When adjusted for number of persons per household the cost per capita is also lower as densities increase



# FINDINGS – EXAMPLE DCCS BY UNIT TYPE

| Residential Typology | Langley Twp | Langley City | Pitt Meadows | Coquitlam | Port Moody | Surrey | Richmond | DNV | AVERAGE | *AVG HHS* | AVG per Capita |
|---|---|---|---|---|---|---|---|---|---|---|---|
| House (Low) | $40,104 | $18,409 | $13,493 | $60,422 | $33,453 | $48,595 | $41,533 | $33,269 | $ 36,160 | *3.10* | $ 11,664 |
| House (High) | $40,104 | $18,409 | $13,493 | $60,422 | $33,453 | $43,050 | $41,533 | $33,269 | $ 35,467 | *3.10* | $ 11,441 |
| Townhouse (Low) | $32,704 | $14,503 | $10,686 | $35,807 | $20,045 | $38,790 | $33,885 | $23,808 | $ 26,278 | *2.75* | $ 9,556 |
| Townhouse (High) | $32,704 | $14,503 | $10,686 | $35,807 | $20,045 | $38,790 | $33,885 | $23,808 | $ 26,278 | *2.75* | $ 9,556 |
| Apartment (Low) | $26,647 | $ 9,549 | $ 9,250 | $22,694 | $ 9,844 | $23,488 | $19,024 | $13,653 | $ 16,769 | *1.85* | $ 9,064 |
| Apartment (High) | $26,647 | $ 9,549 | $ 9,250 | $22,694 | $ 9,844 | $23,200 | $19,024 | $13,653 | $ 16,733 | *1.85* | $ 9,045 |

- DCCs range up to $60,000 for a house, to as low as $10,000 for an apartment
- Municipal DCC rates by unit type vary considerably by municipality, yet within individual municipalities generally do not vary
- When calculating DCCs by the number of household residents, there is a very close relationship between DCC rates and residents, averaging $10,000 per person

## FINDINGS – TAXES AND FEES BY UNIT TYPE

- On average:
  - Houses pay $5,600 in property taxes per year
  - Townhouses pay $3,000
  - Apartments pay $2,100
- Of the property taxes, approximately 56% is to the local municipality, and the rest to other authorities
- Approximately ⅓ of municipal budget expenditures are impacted to some degree by form / density, while ⅔ are not



## FINDINGS AND CONSIDERATIONS

- Higher density forms are more cost-effective in urban areas, where infrastructure investments can be best utilized
- Achieving compact development does not necessarily require extremely high densities

## FINDINGS AND CONSIDERATIONS (CONT'D)

- The use of utility user fees better reflects actual service costs and charges those who benefit:
  - Enhanced use of metering for utilities, where possible
  - Utility fees should not just be focused on raising revenue but also on changing behaviours and outcomes
- Applying DCCs that vary by residential unit type / size / density and by sub-area geography better reflects actual costs of servicing demands
- Closely coordinating / integrating land use planning, infrastructure servicing, asset management, and municipal finance, improves decision-making and outcomes



## NEXT STEPS

- Share with member jurisdictions, stakeholders and the public
- Communicate the importance of cost-effective urban form and coordinated land use and infrastructure planning
- Inform further regional policy work to support *Metro 2050*, municipal land use policy planning and development initiatives
- Support the *Metro 2050* Urban Centre and Frequent Transit Development Area target review project


Thank you

metrovancouver

To: Regional Planning Committee

From: Jonathan Coté, Deputy General Manager Regional Planning and Housing Development, Regional Planning and Housing Services

Date: October 16, 2023 Meeting Date: November 3, 2023

Subject: **Manager's Report**

**RECOMMENDATION**

That the Regional Planning Committee receive for information the report dated October 16, 2023, titled "Manager's Report".

**REGIONAL PLANNING COMMITTEE 2023 WORK PLAN**

The Regional Planning Committee's Work Plan for 2023 is attached to this report (Attachment 1). 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.

**HOUSING TARGET ORDERS AND ALIGNMENT WITH METRO 2050**

On May 31, 2023 the Province of BC identified the first cohort of ten municipalities that would be subject to housing target orders under the *Housing Supply Act* (Reference 1). Of the ten BC municipalities, five Metro Vancouver member jurisdictions were selected, including the City of Delta, the District North Vancouver, the City of Port Moody, the City of Vancouver, and the District of West Vancouver. On September 26, 2023, five-year housing targets for net new housing in these jurisdictions were announced. Housing target orders identify the total number of net new units to be completed within five years in each municipality. The Province has also provided a further breakdown with regards to the recommended unit size (studio/1-bed, 2-bed, and, 3+ bedroom) and tenure type (rental vs. ownership) for the total units. For rental units, the target is divided into a recommended number of below-market and market rental units. Targets also include an additional recommendation for the number of supportive rental housing units with on-site supports. The Province has stated that housing targets for the ten municipalities represent a 38% increase in overall housing to be built in these communities over the base case. It is anticipated that 16 to 20 municipalities will be selected for provincial housing target orders each year.

The total five-year housing target for each Metro Vancouver member jurisdiction is:

- City of Delta – 3,607 housing units;
- District North Vancouver – 2,838 housing units;
- City of Port Moody – 1,694 housing units;
- City of Vancouver – 28,900 housing units;
- District of West Vancouver – 1,432 housing units.

There are several opportunities for provincial housing targets to support the goals and objectives of *Metro 2050*, including the following areas of alignment:

- Target that 15% of new dwelling units in Urban Centres and FTDAs be affordable rental units;
- Dwelling unit and employment growth targets for Urban Centres and Frequent Transit Development Areas;
- Regional planning and growth management principles, including compact urban development, complete communities, housing affordability and diversity, and climate adaptation and mitigation.

As housing target orders are put in place, they can be considered as a new growth management tool that can be used at the local and regional scale in conjunction with the existing Metro 2050 framework, to strengthen the connection between infrastructure investment and growth, and to support shared housing objectives.

Metro Vancouver staff are engaging with the Province, and with member jurisdictions via the Regional Planning Advisory Committee (RPAC) on how best to ensure this alignment. In particular, the following topics are proposed for further and ongoing discussion:

- How can new planning tools, such as provincial housing targets, best be deployed in conjunction with existing reporting tools and planning exercises such as: Housing Needs Reports, Housing Action Plans, and Official Community Plans?
    - Going forward, how can Metro Vancouver assist its members to streamline the use of overlapping and complementary reporting tools and housing policy and planning exercises?
- How can housing targets best be achieved while ensuring alignment with regional planning and growth management principles, including efforts to ensure compact urban development, complete communities, housing affordability and diversity, and climate adaptation and mitigation?
- How can Metro Vancouver work collaboratively with its members to secure the funding needed to achieve the recommended number of below-market and supportive housing units identified as part of new housing target orders?

Staff will report back to the Regional Planning Committee and MVRD Board in early 2024 on the outcomes of this engagement. In addition, Metro Vancouver staff will continue to offer support to its member jurisdictions to facilitate data and information collection to support housing target reporting under the *Housing Supply Act*, as well as monitoring and reporting support as needed.

**ECONOMIC IMPACT STUDY OF THE CRITICAL SHORTAGE OF INDUSTRIAL LAND IN METRO VANCOUVER**

Associated with the invited presentation (agenda item 4.1), Reference 2 is a link to the referenced study prepared by InterVISTAS Consulting for the Greater Vancouver Board of Trade and NAIOP Vancouver.

Metro Vancouver also commissioned InterVISTAS Consulting to complete a study in 2019 associated with the preparation of the Regional Industrial Lands Strategy (Reference 3): Metro Vancouver Industrial Lands: Economic Impact and Future Importance (Reference 4).

**ATTACHMENT**

1. Regional Planning Committee 2023 Work Plan

**REFERENCES**

1. Targets released for 10 municipalities to deliver more homes for people | BC Gov News
2. Economic Impact Study of the Critical Shortage of Industrial Land in Metro Vancouver.
3. Regional Industrial Lands Strategy
4. Metro Vancouver Industrial Lands: Economic Impact and Future Importance

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**Regional Planning Committee 2023 Work Plan**
Report Date: October 16, 2023

**Priorities**

| 1st Quarter | Status |
|---|---|
| E-Commerce Study Findings | Complete |
| Municipal Liaison Review Implementation | Complete |
| Adoption of Metro 2050 | Complete |
| Metro 2050 Climate Policy Enhancement Project – Scope | Complete |
| Equity Study Phase 3 – Final Report | Complete |
| Tree Canopy Cover and Impervious Services Update – Scope | Complete |
| Metro Vancouver Office Inventory Update | Complete |
| Community and Social Data Model – Phase 1 | Complete |
| **2nd Quarter** | **Status** |
| Ecosystem Services on Agricultural Lands | Complete |
| Regional Food Systems Strategy Update – Scope | Complete |
| Agricultural Land Protection and Viability Strategy – Scope | Pending |
| Transportation Corridor Study | In Progress |
| Metro 2050 Implementation Guidelines – Phase 1 (Technical Documents) | In Progress |
| Develop Immigration Model | Complete |
| Metro Vancouver 3D Model | In Progress |
| Community and Social Data Model – Phase 2 | In Progress |
| **3rd Quarter** | **Status** |
| Conduct Urban Centres and FTDAs Policy and Target Review | Pending |
| Recommended Actions – Industrial Land Strategy | Pending |
| Regional Green Infrastructure Network Guidelines | In Progress |
| Metro 2050 Climate Policy Enhancement Project | In Progress |
| Metro 2050 Implementation Guidelines – Phase 2 (Best Practice Guide) | In Progress |
| Regional Land Use Model | In Progress |
| Housing + Transportation Cost Burden Update | In Progress |
| Metro Vancouver Regional Data Book | Pending |
| **4th Quarter** | **Status** |
| Regional Food Strategy Update | In Progress |
| Regional Green Infrastructure Network Guidelines | Pending |
| Sensitive Ecosystem Inventory | In Progress |
| Regional Parking Strategy | In Progress |
| Agricultural Land Use Inventory | In Progress |
| Agricultural Data Book | Pending |
| Metro Vancouver Housing Data Book | Pending |
| 2021 Census Custom Data Report Outs | Pending |