Planting the seed: Connecting Vancouver children with nature

by

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Bachelor of Ecology & Evolutionary Biology, University of Toronto 2014

Project Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Public Policy

in the School of Public Policy Faculty of Arts & Sciences

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SIMON FRASER UNIVERSITY

Spring 2018

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Abstract

Concern over the disconnection between children and nature has been growing in the last decade. Childhood outdoor play is declining, especially in urban areas. The disconnection puts both children and nature at risk. Experiencing natural environments through play and organized activities benefits children’s physical health, mental health, well-being, cognitive performance, and pro-environmental attitudes. Children engaging with nature have a strong sense of place, and greater sense of neighbourhood cohesion than those who do not, and tend to develop life-long environmental ethics and willingness to protect nature. This study explores the opportunities children across the City of Vancouver have to connect with nature; opportunities that vary geographically and face decline due to densification and development pressures. While all children in the city could benefit from more access to nature and nature programming in their schools, mapping shows that some of Vancouver’s lower income areas have significantly fewer natural areas in public parks. This study investigates current opportunities and potential public sector policies to promote a more equitable nature connection in elementary school-aged Vancouver children. Nature mapping, case study analyses of Austin, Texas and San Francisco, California, expert interviews, and an analysis of a Vancouver Park Board survey help identify and assess policies to address the gaps. I recommend that local officials undertake a collective impact approach to strengthen policy effectiveness through greater reach, capacity, and funding as a core first step. This should be followed by the development of co-managed green schoolyards by the Vancouver School Board and the Vancouver Park Board and as greater support to educators in pilot projects in high-priority schools.

Keywords:  childhood connection to nature; urban nature connection; nature equity; environmental education; environmental stewardship; education policy; environmental policy; parks planning; park activation; Vancouver
To the earth and all its beings, for every moment of awe you have given. The accumulation of these define my every day.

May others learn and prosper under your care. May others care so that you might prosper.
Acknowledgements

It takes a village to raise a child. As it happens, it also takes a village to write about raising a child connected with nature. The intellectual and emotional support from many friends, peers, family, and mentors were indispensable in the writing of this capstone; I am forever grateful to you. Specific thanks to the following:

My Science Outside the Lab - North cohort: through the unpacking of our origin stories of environmental and science stewardship, the idea of this capstone was planted. To my interviewees, who allowed me to tap in to their deep expertise and knowledge on this subject. My MPP cohort: what a stand-out community. You have made me a more attentive member of society, a more contemplative researcher, and a better friend. To my external examiner, Dr. Kora DeBeck, for your thoughtful questions and attentiveness. To my supervisor, Dr. Nancy Olewiler, for your constancy, encouragement, tranquility, and guidance. Sometimes I needed fires under me; you lit them. And finally, to the friends and family that have provided sustenance for my stomach, for my heart, and for my brain through the years. It gives me great joy to explore this beautiful world with you.

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## Glossary

<table>
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<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Biophilic design</td>
<td>Design that incorporates natural materials, natural light, vegetation, nature views and other experiences of the natural world into the modern built environment</td>
</tr>
<tr>
<td>Children</td>
<td>Elementary school-aged</td>
</tr>
<tr>
<td>Green space</td>
<td>Also includes blue space; private or public; vegetation abundance, cover</td>
</tr>
<tr>
<td>Home range</td>
<td>The area over which children regularly travel unsupervised</td>
</tr>
<tr>
<td>Nature play</td>
<td>Free, unstructured play as child-driven, spontaneous, and without direction from adults</td>
</tr>
<tr>
<td>Nearby nature</td>
<td>Nature within the home range of an individual</td>
</tr>
<tr>
<td>Park space</td>
<td>Green space that is publicly accessible unless specified otherwise</td>
</tr>
<tr>
<td>Place-based environmental education</td>
<td>Nature-focused and place-specific learning with an emphasis on connection to the spaces individuals live and learn</td>
</tr>
<tr>
<td>Place-making</td>
<td>The process of creating quality places that people want to live, work, play and learn in</td>
</tr>
<tr>
<td>Urbanisation</td>
<td>The complex process in which a country's population centres tend to become larger, more specialized and more interdependent over time</td>
</tr>
</tbody>
</table>
# Common Acronyms

## Vancouver

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COV</td>
<td>City of Vancouver</td>
</tr>
<tr>
<td>VPB</td>
<td>Vancouver Park Board</td>
</tr>
<tr>
<td>VSB</td>
<td>Vancouver School Board</td>
</tr>
<tr>
<td>GCAP</td>
<td>Greenest City Action Plan</td>
</tr>
</tbody>
</table>

## Other

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCCN</td>
<td>Cities Connecting Children to Nature</td>
</tr>
<tr>
<td>SFC&amp;N</td>
<td>San Francisco Children &amp; Nature Forum</td>
</tr>
</tbody>
</table>
Executive Summary

Concern over the disconnection between children and nature has been growing in the last decade. Childhood outdoor play is declining, especially in urban areas. This disconnection puts both children and nature at risk. Experiencing natural environments through exploratory play and organized activities benefits children’s physical health, mental health, well-being, cognitive performance, and pro-environmental attitudes. Children engaging with nature have a strong sense of place, and greater sense of neighbourhood cohesion, and tend to develop life-long environmental ethics and willingness to protect nature compared to those who do not.

This study first explores the opportunities children across the City of Vancouver have to connect with nature. Such opportunities vary geographically and face decline due to densification and development pressures. While all children in the city could benefit from more access to nature and nature programming in their schools, mapping shows that some of Vancouver’s lower income areas have fewer natural areas in public parks.

This study further investigates current opportunities and potential public-sector policies to promote a more equitable nature connection in elementary-school aged Vancouver children. Nature mapping, case study analyses of Austin, Texas and San Francisco, California, expert interviews, and an analysis of a Vancouver Park Board survey help identify and assess policies to address the gaps.

Several core policies are identified as foundational to supporting policies directly connecting children to nature: a collective impact approach to create a formal multi-sector network with shared agenda and goals; releasing a Children’s Outdoor Bill of Rights; collecting data on the issue and impacts of policies; and taking an equity lens. From there, three key policies are determined as those viable for implementation in the current policy landscape of Vancouver. These are: implementing green schoolyards in elementary schools; increasing rewilding and nature programming in Vancouver Park Board public parks; and increasing professional development and curriculum support for Vancouver School Board teachers. These key policies are compared using several criteria evaluating how the policy increases connection to nature in the short- and long-term; how equitable the policy is; how costly; what other city and school goals the policy
also supports; how much collaboration is necessary between different entities; and stakeholder acceptance from the educators, parents, the Vancouver School Board, and the Vancouver Park Board.

I recommend that local officials undertake a collective impact approach to strengthen policy effectiveness through greater reach, capacity, and funding as a core first step. This should be followed by the development of green schoolyards co-managed by the Vancouver School Board and the Vancouver Park Board and greater professional development support to educators. Implementation should be targeted to identified high-priority neighbourhoods and a site assessment within these neighbourhoods should be undertaken to determine high-priority schools. The two recommended policy options should then be piloted within select schools, maximising efficiency and equity of the policies. As well, a pilot program will help to build excitement and confidence in green schoolyards and supporting teachers.
Chapter 1. Introduction

Through its Greenest City 2020 Action Plan, the City of Vancouver has asserted its commitment to urban sustainability and environmental values. Vancouver itself is nestled in a mecca of nature, providing ready access to coastlines, forest, and mountains. However, what little green spaces exist within city boundaries is being put under increasing strain in the face of rapid development and growing populations. In the last 20 years, our canopy cover has declined from 22.5% to 18% (Vancouver Board of Parks and Recreation 2014d), and public parkland per 1,000 people is expected to decrease 18% between 2017 to 2042, from 1.75 to 1.41 (Vancouver Board of Parks and Recreation 2017d).

In tandem with the declining availability of nature is growing concern over the disconnection between children and nature, sometimes known as nature deficit disorder (Louv 2008). Childhood outdoor play is declining, especially in urban areas. Almost two-thirds of British Columbians say that their children spend less time outdoors than they did at their age (TD 2017). This trend is expected to continue as some of the primary drivers of nature disconnect grow, such as technology usage and urbanisation.

The value of nature contact as an integral part of a child’s life is increasingly recognized by governing bodies. The Canadian federal government has signaled the importance of nature connection recently by making national parks admission for children permanently free (Rangan 2018) and through their environmental learning framework, stating that “Canadians of all generations and from all sectors of society should be given opportunities to engage in environmental learning within and beyond the classroom walls” (Government of Canada 2002). In the United States, municipalities and states have gone as far as to declare nature contact a right of children (Lipman 2011). And a recent Cities Connecting Children to Nature Initiative in several cities across North America strives to create opportunities for children’s connection to nature through collaborative, government-led initiatives.

In this report, I focus on the role of the public sector in providing equitable nature connection to children in the dense urban environment of Vancouver. I begin with a background that addresses the need identified in Vancouver, causes of nature
disconnection, why connection to nature matters, and how nature connection can be encouraged through urban policies. Next, I review entities in Vancouver that play a role in providing nature connection, including the Vancouver Park Board and the Vancouver School Board. Primary research helps determine current gaps and possible policy solutions. This includes nature equity mapping, survey analysis, case study analysis, and expert interviews. Using the results from this work, I present three supporting core policy recommendations and analyse three comparable, mutually inclusive policy options for further recommendation.

1.1. Policy problem

Too many children in Vancouver lack connection to nature, leading to negative outcomes on individuals, communities, and the environment.

1.2. Research questions

- How can local officials (City of Vancouver, Vancouver Park Board, Vancouver School Board) encourage connections to nature in elementary-school aged children?
- How can they do so equitably?
- How can they facilitate meaningful connections to nature that may in turn support environmental stewardship into adulthood?
Chapter 2. Background

2.1. Gaps in connecting kids with nature in Vancouver

Surrounded by ocean and mountains, Vancouver is world-renowned for its unparalleled beauty and access to nature. There are over 230 parks in the City of Vancouver (COV) (City of Vancouver 2018f) and several large, forested parks accessible near or within city limits (Figure 2.1). About 40% of Vancouver’s waterfront is also preserved as public park, making it quite distinct from other metropolitan areas (Vancouver Board of Parks and Recreation 2006). Within the Greater Vancouver Regional District and North Shore, residents can take advantage of access to the ocean and mountains through outdoor activities including kayaking, hiking, climbing, and skiing. Residents in the Vancouver region report greater participation in outdoor activities close to home, including 23% of Vancouver residents reporting participation in hiking compared to 13% nationally (Statistics Canada, 153-0153). Within the city, a 2017 survey found that respondents reported high use in the last year of city parks (97%), beaches (86%), and trails (76%) (Vancouver Board of Parks and Recreation 2017c).

Hand in hand with Vancouverites’ enjoyment of outdoor activities is the municipality’s explicit dedication to sustainable action through its plans and policies. The most prominent is the City’s ambitious goal of becoming the greenest city in the world by 2020. Within the COV, the Vancouver Park Board (VPB) is working to rewild parks and facilitate stronger stewardship between Vancouver residents and their park spaces, driven by its Rewilding Vancouver plan. In the current development of their new 25-year park plan, the Vancouver Playbook, one objective of the VPB is to increase access, education, and engagement with nature (Vancouver Board of Parks and Recreation 2017b). Similarly, the Vancouver School Board (VSB) is currently developing a multi-year Sustainability Action Plan that focuses on strengthening environmental education and outdoor learning opportunities in Vancouver schools.
The policy actions of COV and the VSB indicate a desire and awareness of supporting strong parks, strong communities, and stronger access to nature. However, “the reality is that we are not as ‘green’ as we think we are”, despite “a commonly held perception […] that Vancouver is a ‘green’ city with abundant park space” (Vancouver Board of Parks and Recreation 2006). And, the municipal government currently has no institutionalized policies that directly recognize the need to connect children to nature. There also exist no collaborative networks to unite the many public, private, and non-profit institutions working towards connecting children to nature.

As pressures on our park system grows, explicitly interweaving perspectives of nature and children through city and school policy will become increasingly important. Over 630,000 people live in Vancouver in less than 115 km², making it one of the most densely populated cities in North America. Densification will only intensify as the population is expected to increase by 150,000 people over the next 25 years (Vancouver Board of Parks and Recreation 2017d). As such, hectares of parkland per 1,000 people are expected to decrease 18% between 2017 to 2042, from 1.75 to 1.41. This, in
addition to rising land costs, puts pressure on the quantity and quality of available parks and recreation spaces.

There is need today to improve park space and distribute it more equitably. While 34% of Vancouver residents reported being very satisfied with the Vancouver’s Park and Recreation amenities, 50% reported somewhat satisfied, and the balance neutral or not, indicating an opportunity to create a more satisfactory park system (Vancouver Board of Parks and Recreation 2017c). In a comparison of 9 North American cities’ percentage of land devoted to parks and park ratio per capita, Vancouver ranked 8th and 6th, respectively (Vancouver Board of Parks and Recreation 2006). Moreover, while hectares of public green space per capita (1,000 people) in Vancouver exceed a 1.1 hectare minimum set in the Park Board's 1992 Management Plan (Vancouver Board of Parks and Recreation 2006), a disaggregated perspective reveals high inequities between different neighbourhoods (see Figure 2.2). Certain neighbourhoods, such as Dunbar Southlands and Killarney, far exceed the minimum at 11.53 and 7.30 hectares per capita respectively. In contrast, 9 of 22 of the neighbourhoods fall below the 1.1 minimum. With current distribution of and future increasing demands on Vancouver’s park systems, there are diminishing opportunities for many of Vancouver’s children to connect to nature through Vancouver’s public land.

Schools are also critical actors in facilitating connection to nature. In 2016, the BC Ministry of education released its new curriculum. The curriculum makes it easier for educators to provide environmental education for children; however, it and other professional development opportunities may be insufficient in providing teachers with the tools to implement environmental education lesson plans. And while school gardens are now found in over two-thirds of VSB schools (Vancouver School Board 2018a), creating nature play opportunities on school properties is left to the discretion of individual schools and lacks a systemic perspective. In addition to the public park perspective, the Vancouver education system likewise has room to strengthen its role in facilitating children’s connection to nature.
Figure 2.2  Public green space per 1000 people in Vancouver, disaggregated by the 22 neighbourhoods in Vancouver. The darker green a neighbourhood, the more green space is accessible to residents in the area. Adapted from City of Vancouver Open Data Catalogue and OpenStreetMap.

2.2. Children and the nature disconnect

Facilitating children’s connection to nature relies on understanding the barriers to and benefits of it. I define nature for the purposes of this report, review the factors associated with the growing disconnect between children and nature, explain why a connection to nature is important, and discuss the equity concerns surrounding who can and does connect to nature.

2.2.1. Defining nature

What ‘nature’ means differs amongst individuals based on personal experience, an individual’s locality, and economic and social factors such as culture. Gundersen et
al. 2016’s simplified nature continuum (Figure 2.3) illustrates a range of outdoor spaces with natural elements or nature.

![Nature Continuum Diagram](image)

**Figure 2.3** Nature continuum from a child’s perspective from more to less managed outdoor spaces. More managed spaces are those that are designed, planned, and maintained for different purposes. At the other end of the continuum are more natural and less managed spaces such as forests, fields, mires, watercourses, nature-like parks etc. Adapted from Gundersen et al. 2016.

While a clear distinction between ‘nature’ and ‘not-nature’ is not possible, nature for this report are those spaces with less human intervention and greater connectivity to components such as soil, vegetation, and wildlife. These are typically found on the ‘less managed’ end of the above continuum. Even at small scales, nature connection for children can be promoted through biophilic design features, or design that incorporates experiences of the natural world, such as: sensory richness, motion, serendipity, variations on a theme, resilience, sense of freeness, and prospect and refuge (Heerwagen and Gregory 2008). In Chapter 2.3.1, I discuss why these spaces are more likely to promote meaningful connections.

### 2.2.2. Factors associated with children’s disconnection with nature

Urbanisation, technological changes that provide substitutes for playing outdoors, and cultural changes are associated with a trend toward decreasing connection with nature during childhood.

More than 80% of Canadians live in urban areas, and this proportion is increasing (Statistics Canada, 2011 Census). In accommodating urban population growth, development can diminish existing urban green space and vegetation that provide residents opportunity for nature connection (Freeman et al. 2015). Even if urbanisation does not directly affect land use, population shifts from rural and wild areas to urban ones will diminish the proportion of those with exposure to nature.
Behavioural shifts are also driving a disconnection between nature and children. Technology usage among children is increasing rapidly – in 2015, a quarter of Canadian fourth graders and half of seventh graders had cell phones (Steeves 2014). Between 1999 and 2009, total media consumption for children ages 8-18 grew by more than an hour to 7 hours and 38 minutes a day and is projected to increase (Rideout, Foeher, and Roberts 2010). As we now spend an estimated 90% of our lives indoors (Evans and McCoy 1998), technology usage alongside other behavioural shifts displace nature play and contact.

Independent mobility of children is increasingly inhibited by cultural changes, further reducing children’s contact to nature. Parental fears of injury from risky play and safety concerns of unsupervised roaming are growing (Barratt Hacking, Barratt, and Scott 2007; Louv 2008; Carver, Timperio, and Crawford 2008). Consequently, children’s home ranges have shrunk and fewer children are allowed to walk to school or cycle on the road without an adult (Hillman 1993). As well, free unstructured time has diminished recently given increased demands on both parents’ and children’s time (Skar et al. 2016).

2.2.3. Why connection to nature matters

The benefits of children’s engagement to nature are wide-ranging, impacting individual development and well-being, individual attitudes and behaviours towards the environment, and community cohesion. Without childhood connections to nature, especially for children 12 and under, individuals, communities, and the environment suffer.

Consequences for individuals

A recent systematic literature review finds strong support for the benefits of nature for children’s physical health, mental health, well-being, cognitive performance, and pro-environmental attitudes (Gill 2014). Spending time and playing in natural environments leads to improvements in physical health, decreased BMI, and improved motor fitness in pre-school children (Gill 2014; Wade 2014). It also benefits mental health and emotional regulation for children with ADHD and children in general. Children who participate in school gardening projects improve their scientific learning, and students have improved performance on standardized tests, no matter the subject, when
taught in outdoor classrooms (Ballantyne and Packer 2002). As well, quality of nature contact – species richness and habitat complexity – is correlated with benefits to adult’s well-being (Kaplan 2001), and may likewise have similar positive impacts on children.

**Consequences to the community**

The positive consequences of greening projects and children’s play in nature extend out to the community. In comparison to children without access to nature in their neighbourhoods, children with greater access and knowledge of nearby nature have a stronger sense of place and greater sense of neighbourhood cohesion (Kroencke et al. 2015). City greening projects can also increase the overall sense of a community (Murphy Dunning 2009) and are opportunities to create outdoor play space. Finally, connections to nature have been linked to pro-social behaviour in adults -- individuals tend to be more empathetic and altruistic after spending time in nature (Zhang et al. 2014), and similar patterns may occur in children. Therefore, connecting urban children to both nearby nature and wild nature can have positive impacts on their local communities.

**Consequences on sustainable action**

There is a growing body of research finding that many environmental professionals, and more broadly individuals with environmental concern, had significant, intimate childhood experiences in nature (Chawla 2007; Cheng and Monroe 2012). Childhood exposure to nature promotes (i) an interest in nature (emotional change); (ii) values, beliefs perceived norms of environmental ethics, and a willingness to protect nature (attitudinal change); and (iii) pro-environmental behaviours (behavioural change) (Soga and Gaston 2016). Without these, there is a risk of entering the ‘cycle of disaffection’, a feedback loop in which the consequences of lack of nature interactions accelerate further the loss of interactions with the environment (Figure 2.4). Early childhood experiences in nature contribute to a paradigm shift in understanding the human-nature relationship, ‘one in which humankind is embedded in and part of nature’ (Hughes et al. 2013). Even in the short term, exposure to nature in adults may increase cooperation and intentions to undertake sustainable behaviour such as reducing water and energy use (Zelenski, Dopko, and Capaldi 2015).
2.2.4. Geographic equity

It is increasingly recognized that children have a right to daily contact with nature. See, for example, Moore (1997) and San Francisco’s Children’s Outdoor Bill of Rights (2014). But not all children have equal opportunity to spend time outdoors, in part because not all green space is distributed nor created equally. Because urban residents’ use of green spaces has been found to decline with increasing distance from home and decreasing greenness of the site (Ellaway, Macintyre, and Bonnefoy 2005), geographic inequities in green space access can lead to inequities in green space use.

There is evidence to suggest that in some cities, the quantity of nature varies across the socioeconomic gradient. In the city of Austin, Texas a mapping of natural spaces against median income identified that lower socioeconomic neighbourhoods correlated with less public green space (City of Austin 2016). A recent meta-analysis found income-based inequity in urban forest cover (Gerrish and Watkins 2018). In Brisbane, Australia, socio-economic advantaged neighbourhoods have higher tree cover relative to disadvantaged neighbourhoods (Shanahan et al. 2014). Notably, most tree cover occurs on residential properties, implying that in Brisbane private green space positively correlates with socioeconomic status. Similarly, in Sheffield, UK, public park space is well provided across the socioeconomic gradient but private vegetation cover increases for advantaged neighbourhoods (Barbosa et al. 2007). In other cities, quality but not quantity of nature can differ across socioeconomic gradients. In Phoenix, AZ, species richness of natural spaces increases with increasing socioeconomic status.
Similarly, the most biodiverse habitats in the UK are more likely to be absent from low-income areas (UK National Ecosystem Assessment 2011). However, patterns of socioeconomic differences of private or public green spaces are not always found and differ on a municipal scale.

Across Vancouver, Burnaby, and New Westminster, vegetation abundance, or quantity, strongly correlate with median income (Tooke, Klinkenberg, and Coops 2010). And a recent analysis of all green space in Metro Vancouver reveals that environmental quality was significantly better in high-income than low-income areas (Rugel et al. 2017). While both studies aggregate public and private green space, they indicate socio-economic differences in access to quality and quantity of all green spaces in the Vancouver region.

Besides the role of income levels on quantity and/or quality of nearby nature, other cultural, societal, demographic, and economic factors can also impact a child’s connection to nature. Analysis of these factors is outside the scope of this report but should be considered in future work.

### 2.3. Connecting children to nature

Childhood exposure to nature can have life-long impacts on their level of concern for and actions towards protecting the environment, as reviewed in Chapter 0.0.1008013320. However, not all childhood nature connections contribute equally to environmental stewardship in adulthood. Therefore, I review what factors of childhood connection to nature contribute to creating environmental stewards and what role cities can have in this.

#### 2.3.1. The creation of environmental stewards

Several factors related to quality and quantity of childhood contact with nature lead to meaningful connection, in turn deepening the development of environmental stewardship in adulthood. These include physical aspects of nature quality, experiential aspects of frequency and mentorship, and significant life experiences through civic engagement.
Nature type across the nature continuum (Figure 2.3) that children interact with influences environmental stewardship later in life. Nature activities in less managed spaces, such as hiking or camping, and those in more managed spaces such as caring for plants or gardening are both positively related to adult environmental attitudes. And while both have a positive impact on adult environmental behaviours, the former has a higher impact than the latter (Wells and Lekies 2006). Therefore, increasing quality of nature (i.e., in less managed spaces) correlates with environmental stewardship later in life.

Even at the small scale, quality of play spaces influences the value children derive from natural areas. Nature play, or free, unstructured play is child-driven, spontaneous, and without direction from adults (Burdette and Whitaker 2005). Spaces that provide the best nature play opportunities for children are those with biophilic design features (Chapter 2.2.1) with minimal design and loose materials to manipulate and construct (Zamani 2016). Places with these features that are “left to the power of nature” (Hart 1982) may allow for greater connections to nature (Nabhan and Trimble 1994). Even within small spaces, valuable nature connection can be created if nature play is considered.

Experiential factors also influence the likelihood of environmental stewardship in adulthood. These factors include: exposure to nature at an early age (Chawla 2007; Wells and Lekies 2006), high frequency of exposure, and coupling experience with mentors such as parents or educators who teach respect for it (Wells and Lekies 2006; Hsu 2009). Additionally, when environmental experiences occur through the formal education system, educator quality matters. In one study, environmental literacy in students was highest when teachers had advanced degrees in education or science education (Stevenson et al. 2013).

Finally, significant life experiences such as involvement in environmental decision-making can contribute to environmental stewardship into adulthood. Children, as present and future citizens, are greatly affected by environmental decisions. Despite this, children’s perspectives are not systematically considered in the decision-making process. This often leaves children frustrated and voiceless in matters that concern them directly; involving them in decision-making can have a lasting impact on promoting active care for the environment in children and youth (Chawla and Flanders Cushing 2007).
Moreover, there is evidence to suggest that political education and experience can be influential in developing pro-environmental behaviour (Barratt Hacking, Barratt, and Scott 2007). Thus, involvement of children in decision-making is another mechanism to create meaningful connections to nature, in turn influencing environmental attitudes and behaviours later in life.

2.3.2. The role of cities

The responsibility of connecting children to nature often falls on parents – to bring their children themselves to the playground or camping or to seek out opportunities for their children through out-of-school events, outdoor schools, or other outdoor-oriented learning experiences. If parents don’t prioritise a connection to nature because they choose not to or do not have the means to, children may not gain adequate exposure to nature. As a result, these children are less likely to value nature, and may not seek out nature for their future children. If one asserts that children have a right to experience daily contact with nature (Moore 1997), there is a role for cities and schools to provide this right to all its children. While urban areas carry the burden as a driver of nature disconnection, municipalities have opportunities to reconnect through thoughtful policies, programming, and place-making.

In recent years, there has been growing momentum of municipalities dedicated to providing children with regular access to the natural world. In 2016, seven U.S. cities participated in the Cities Connecting Children to Nature (CCCN) Initiative. This initiative is a multi-agency effort between the National League of Cities, an advocacy organisation for American cities and their leaders, and the Children & Nature Network, a non-profit organization leading the movement to connect all children to nature. Features of these initiatives include San Francisco’s Children’s Outdoor Bill of Rights, green schoolyard agreements between school boards and municipalities, and public awareness and marketing campaigns. Municipal governments and education boards can connect children to nature through partnerships and place-making, programming, and policies. Examples of these mechanisms are reviewed in Chapter 8, where I present the policy options for Vancouver.
Chapter 3. The role of government entities in Vancouver in providing connection with nature

Public sector entities play an important role in facilitating nature connection for Vancouver children. Although a formal network of cross-sector organizations does not exist, informal networks and strong individual entities have been critical in shaping the current Vancouver landscape. I review the actors, their roles and responsibilities, current relevant programming, and, if applicable, pertinent policies and their status of implementation.

3.1. City of Vancouver

As the primary elected representative of the residents of Vancouver, the City of Vancouver ("COV") is a critical actor in connecting its children to nature. Under the provincial statute, the Vancouver Charter, COV has the power to pass bylaws regulating land use, collect property taxes and other taxes, and approve major spending (Vancouver Charter 1953). As such, COV’s influence extends to two primary matters that relate to children in nature: zoning/design codes and budget allocations to programming, personnel, and infrastructural changes. COV can also politically signal the importance of connecting children to nature through symbolic acts like a Children’s Outdoor Bill of Rights. The following are current mechanisms by which COV aligns with the goal of connecting children to nature.

3.1.1. Greenest City Action Plan

In 2011, COV approved its Greenest City 2020 Action Plan (GCAP; “Greenest City 2020 Action Plan” 2012). Through ten goals and fifteen targets, the action plan underscores the city’s commitment to incorporate green thinking into all aspects of the city, including in the local economy, green infrastructure, and improvements in access to nature. While GCAP focusses predominantly on infrastructural changes, a relevant target of the plan is that all Vancouver residents live within a five-minute, or 300m, walk of a park, greenway, or other green space by 2020 (City of Vancouver 2010). While this goal is not specifically geared to children, it does facilitate connection through increasing access to nearby nature.
In 2016, 92.7% of the city’s land base was within a 5-minute walk to a park, greenway or other green space (City of Vancouver 2018a).

3.1.2. Funding opportunities

COV can also indirectly support children’s connection to nature by providing funding opportunities for its residents or non-profit organizations. Small funding opportunities ranging from 500$ to 10,000$. See Appendix A for a review of these.

3.2. Vancouver Board of Parks and Recreation

As the body with exclusive possession, jurisdiction, and control over almost all public parks within the COV, the Vancouver Park Board (VPB) is a critical entity in providing public space and programming to connect children to nature. The Vancouver Board of Parks and Recreation, commonly referred to as the VPB, is an elected body, the only one of its kind in Canada. Under the Vancouver Charter, the VPB is responsible for the construction and maintenance of facilities and structures within the parks including playgrounds as well as conducting or contracting others to organize recreational programs.

The following policies set by VPB promote connection to nature.

3.2.1. Rewilding Vancouver Plan

In 2014, the VPB released Rewilding Vancouver: An Environmental Education & Stewardship Action Plan with the aim “to improve and enhance experiences of nature for all Vancouverites, and to increase understanding and awareness of nature in the city” (Vancouver Board of Parks and Recreation 2014b). Although not specifically targeted to children, many of the goals directly or indirectly support the goal of connecting children to nature. Relevant goals are found below and the associated sub-actions are found in Appendix B:

- Enhance, protect, maintain and monitor the special wild places in Vancouver parks, beaches and open spaces through collaboration and strong partnerships. Encourage stewardship and education activities in and around these places.
• Initiate and enhance city-wide partnerships on a variety of nature-focused topics.

• Initiate and enhance communication, coordination, networking, access to information, and learning opportunities to build stronger cross-sector collaboration and partnerships amongst people and organisations with experience and expertise to share about environmental education and stewardship.

• Support partnerships and volunteer recruitment, engagement, training, and activation aligned with city priorities and staff needs.

3.2.2. Biodiversity Strategy

The Biodiversity Strategy, released in 2016, works towards identifying, protecting, and enhancing biodiversity hot-spots in the city. The strategy’s goal is to increase the amount and ecological quality of Vancouver’s natural areas to support biodiversity and enhance access to nature. Some of the priority actions include planting trees, restoring habitat, and adding pollinator meadows. By enhancing Vancouver’s physical space, the Biodiversity Strategy is providing more opportunities for children to engage with nature.

3.2.3. VanPlay and Vancouver’s Playbook

The VPB is currently developing their new 25-year Vancouver Park plan, Vancouver’s Playbook. In 2017-2018, they are undertaking conversations with the public, VPB staff, partners, stakeholders, and experts to help formulate the plan. This work has potential to develop new policy that is relevant to connecting children to nature. Six key themes drive the creation of Vancouver’s Playbook: innovation and vision; resilience and wellbeing; places and access; recreation and community; celebration and tourism; and ecology and nature. Two themes are relevant to my study:

• Resilience and well-being:
  
  o To acknowledge vulnerable populations, historic disparities, and demographic groups with inequitable distribution of resources.

  o To consult with the diverse spectrum of Vancouver’s population to identify barriers to access and different cultural perspectives.

• Ecology + nature:
To increase access, education, and engagement with nature.

3.2.4. Current park development and programming

The VPB is developing and renewing parks and playgrounds across the city, many of which enhance natural aspects of parks or natural play opportunities for children. The VPB also provides several nature-related programming. The most relevant park changes that have or will take place recently are shown in Figure 3.1\(^1\) and a detailed list of park changes and programming are found in Appendix C.

Figure 3.1  Current and future VPB-led changes to parks and playgrounds that increase quality of nature or nature play opportunities for children
Adapted from City of Vancouver Open Data Catalogue and OpenStreetMap.

Taken individually, the VPB’s current actions show promise in promoting nature connection in children. However, the documents lack an overarching or even explicit focus on children. While a few actions directly do target children (such as collaborations

\(^1\) This list was collated from the listed changes and additions on the City of Vancouver’s parks and recreation page > “Improving parks and recreation” > “New parks” / “Park renovation” / and “Recently completed parks”
with the VSB (Appendix B)), most benefits that children will derive from VPB actions will be indirect consequences of related goals. Children’s needs for nature access can differ from those of adults; without clear consideration of these needs, there exist missed opportunities to provide valuable nature connection for children through the VPB.

3.3. British Columbia Ministry of Education

As the entity responsible for establishing the provincial curriculum, the BC Ministry of Education influences how connections to nature are promoted through the formal education system.

3.3.1. Redesigned Curriculum (2016)

The BC government released its new curriculum in 2016, which strengthened the role of place-based environmental education throughout all subjects and practices. The curriculum gives teachers more flexibility in teaching by making it easier for teachers to take students off-site and more thoroughly engage in environmental education (Rawlyk). The Environmental Educators Provincial Specialist Association (EEPSA) released the following statement in support of the new curriculum:

Teachers are encouraged by the emphasis on a placed-based approach and connection to First Nations. Also welcome is the idea behind the new Core Competencies and Big Ideas, which are meant to give greater autonomy to teachers. (Environmental Educators Provincial Specialist Association 2018)

However, the new curriculum lacks operational strategies explaining how to achieve some learning goals, such as in the Science Overview (Environmental Educators Provincial Specialist Association 2018). In a field where educators lack confidence and experience, place-based environmental education may not be prioritized if teachers are not given sufficient support in lesson planning (Rawlyk). Moreover, there is a lack of inclusion of ecological literacy throughout the grades (Environmental Educators Provincial Specialist Association 2018). While the new curriculum enables educators to incorporate more environmental education in elementary school classrooms, it is largely dependent on the initiative of the individual instructors to do so.
3.4. Vancouver School Board (VSB)

The VSB is a key player in addressing equitable connection to nature. Public education can connect students to nature given its wide reach – approximately 70% of elementary-school aged children in the COV attend a VSB school. As well, children spend over 850 hours a year in school instruction time, or nearly 15% of their waking hours. Children build friendships and relationships with mentors at school. As discussed in Chapter 2.3.1, environmental stewardship is built upon frequent connection to nature and with the support of mentorship, two things that can be accomplished through public education.

The VSB administers the operation of all the K-12 public schools in Vancouver. The Board’s most important functions are as follows:

- formulating and interpreting policies and by-laws;
- delegating administrative duties;
- making decisions on educational and budget matters;
- making continual appraisals of the educational, administrative, and planning processes in light of the Board's stated goals and objectives;
- administering public funds;
- communicating with the citizenry of the district. ("BBA: School Board Powers and Duties" 1996)

The influence of the “head office” staff on educational changes is limited as there is “autonomy of the classroom, autonomy of the principal” in the school system (Macdonald). In many cases, particularly when it comes to environmental education and outdoor learning spaces, the role of the “head office” staff is to facilitate, not dictate.

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2 29,000 elementary (5-13 years old) students are enrolled in the VSB system (Vancouver School Board 2018b) and Vancouver’s total population for children age’s 5-14 is approximately 41,313 (calculated from: 22,905 (5-9 years of age) and 23,010*.8 (10-14) 23,010*.8 (Statistics Canada, 2011 Census).

3 There are 8760 hours in a year; assuming kids sleep 8 hours a day there are 5840 waking hours in a year. According to the BC School Act, there are between 850-878 hours of instruction time in a calendar year.
Within VSB, the Green Board is the lead on all sustainable and green matters at the Board. Their work supports that of teachers, students, parents and staff, who advance sustainability at their schools. Projects have focused on increasing energy efficiency, creating gardens and outdoor learning opportunities, and promoting active transportation.

3.4.1. Sustainability plans, current and pending

The VSB Sustainability Framework was released in 2010 and largely concentrates on infrastructural and operational practices to promote sustainability, rather than a recognized need to connect children to nature. The Framework includes no specific focus on connecting children to nature or education.

The VSB is currently undertaking the development of a multi-year Sustainability Action Plan (SAP). It will include support for educator initiatives and in recent years there has been a demand for gardens and outdoor learning spaces (Macdonald). This interest does not appear to be waning. Because of the autonomous nature of schools and teachers, the primary goal of the SAP is to facilitate grassroots initiatives.

3.4.2. VSB Garden Policy

Over two thirds of VSB schools have gardens. VSB encourages and supports the development of school food gardens through several measures, which could be used as a model for related nature connection policies such as designing an outdoor learning space. These measures include:

- The VBE School Garden Policy: provides guidelines to help the school community plan and implement a successful, sustainable project, which meets codes and district standards
- The VBE Gardens Process: outlines the process of planning, designing, implementing, maintaining and sustaining school and daycare food gardens (located on VBE property) to ensure their success over the long term
- Helping to start the Vancouver Schools Food Network, which organizes food related professional development opportunities for VSB schools
3.4.3. Existing natural areas and learning spaces

Besides garden development support, there are currently no overarching VSB policies, guidelines, or funding mechanisms for schools to facilitate nature connection on school property. Nevertheless, several VSB schools facilitate nature connection through bottom-up initiatives. For example, Lord Kitchener Elementary launched the Outdoor Learning Classroom in 2013, featuring a garden and green space (Vancouver School Board 2013). David Thompson and VanTech Secondary have a non-profit-run organic garden, which is used as a field trip destination for elementary school students in their catchment areas. Besides connecting children to nature, these visits may have the co-benefit of easing the transition to secondary school by making elementary students comfortable in their future school (Macdonald). Such initiatives evidence that there is desire and capacity to support nature connection through Vancouver schools, and can be used to inspire for future district-wide strategies.

3.5. Shared jurisdiction

3.5.1. Joint agreements

Currently, there exist several types of joint agreements between the COV, the VSB, or community organisations that are indirectly relevant to this project. One type of joint agreement between the VPB and the VSB allows some schools to use park space, typically adjacent to schools (e.g., a sports field), during school hours for sports (Macdonald). Similarly, joint agreements between the COV’s Park Board and community centres allow the use of these parks for community programming. However, there exist no joint agreements that allow for schoolyards to be considered public green space and co-managed by both the Park Board and School Board.

3.5.2. Park Partners

Park Partners are organisations with formal stewardship arrangements with the Board for a specific park in Vancouver. Three park partners currently operate in Stanley Park, Jericho Park, and Everett Crowley Park. The Park Board and Park Partners form an agreement about co-stewardship of the park, be it formally or informally. Park partnerships do not come with direct funding.
3.6. Non-government entities in Vancouver in providing connection with nature

Other entities are fundamental in providing nature connection to children, either directly or by supporting individuals that do. Key non-government entities can be found in Appendix D. A fulsome review of all organisations that provide nature connection to children in Vancouver is outside the scope of this report but should be conducted in an implementation plan.
Chapter 4. Methodology

4.1. Nature equity mapping

To identify which of COV’s neighbourhoods had the most need for nature access, I conducted a spatial analysis of Vancouver using the City of Austin’s Nature Equity GIS mapping project (see Chapter 0) as a guide.

To discern if there were nature inequities geographically or based on median incomes, it was important to spatially disaggregate Vancouver into smaller geographic units of COV’s local planning areas (“neighbourhoods”). The boundaries determined by COV roughly correspond to different neighbourhoods across the city, and thus are a relevant and relatable unit for both Vancouverites and local officials.

I examined four variables in each neighbourhood, two on the physical aspects of nature and two demographic variables. For an evaluation of nature, I calculated public green space per 1000 people based on 2011 census population data. Hectares of public (non-restricted access) park space\(^4\) were determined for park space that fell within each neighbourhood using COV’s open data catalogue (City of Vancouver 2018h). However, five neighbourhoods (Downtown, Dunbar-Southlands, Hastings-Sunrise, West End, West Point Grey) are adjacent to large, natural park spaces (Pacific Spirit Regional Park, Stanley Park, and Central Park in Burnaby), so I included any park space from these parks that was within 400m (5-minute walk) from the edge of the neighbourhoods.

For a qualitative measure of nature, I evaluated VPB’s grading of park spaces from (1) cultured vegetation (e.g., mowed lawn); to (5) natural vegetation, (e.g., heavily forested areas) (Vancouver Board of Parks and Recreation 2014a). Most parks in Vancouver are (1) cultured vegetation or (2) altered vegetation. Thus, I applied a simple\(^4\)

\(^4\) Note that public golf courses (McCleery, Langara, and Fraserview in Dunbar-Southlands, Marpole, and Killarney neighbourhoods respectively) are accessible to the public but do require an admission fee for golfers and non-golfers to enter the green. They were still included in the analysis given that they are city-operated parks open to the public and are considered public parks by the VPB, but future work should further consider the implications of pay-to-access green spaces.
binary presence/absence test to any of the vegetation in the neighbourhood that ranked (3) semi-natural vegetation or higher.⁵

Demographic factors – Median Household Income (MHI) and proportion of children – across neighbourhoods were also examined to further determine which neighbourhoods would benefit most from public sector intervention (Statistics Canada, 2011 Census; City of Vancouver 2018b). The greater proportion of children, the more interventions will benefit children directly. Income may influence how much parents can put towards their children’s extra-curricular activities (such as nature camps), as well as how much money they can fundraise for school activities or modifications (field trips, outdoor classrooms, etc.). Income levels may also influence how much private green space is accessible to children, as high-income homes may have more space to develop child-friendly nature play areas.

Using these variables, I sought to determine which neighbourhoods should be the highest priority for public sector intervention. First, I screened out neighbourhoods that fell above the VPB’s standard of a minimum 1.1 hectares of green space per person, leaving nine neighbourhoods. Then, I screened out neighbourhoods with small proportion of children (<15%), as nature interventions to promote childhood connection to nature would be less impactful in these spaces. This left five neighbourhoods for equity consideration.

Finally, to determine if public green space availability differed based on socio-economic status, I conducted a linear regression of green space per capita (dependent variable) as a function of median household income (independent variable) using all 22 neighbourhoods.

Visual maps were produced using COV Open Data Catalogue for local planning area boundaries, city boundary, and COV-operated park spaces (City of Vancouver

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⁵ This is a high-level assessment of nature quality across neighbourhoods and does not discern disparities in access to ‘altered’ vegetation that may still provide valuable nature connection. A more thorough analysis of nature quality in public green spaces would be valuable in the future, but such analysis is beyond the scope of this report. In the future, calculating quantity of altered and natural vegetation across neighbourhoods would provide greater insight into nature equity.
4.2. VanPlay survey

To gain insights on the perceived needs of the community, I examined a recent survey conducted by the VPB in 2017. As part of the VanPlay discussions, the VPB surveyed 2,754 respondents to understand the community’s perception and use of parks and recreation, as well as key priorities, challenges and opportunities identified for the future. The survey was disseminated online in both English and Chinese using the TalkVancouver platform, an online space for civic engagement.

Topic areas for questions included: perception and use (satisfaction, which amenities used); priorities (top 3 for improvement; top 3 factors to consider); challenges/barriers; and opportunities and ideas for the future of parks and recreation.

VPB provides disaggregated data separating the respondents by two relevant categories: Neighbourhood (22 neighbourhoods) and Presence of Children in Household (Have Children <19, Children 19+, No Children. I focused on responses from the five neighbourhoods who scored highest for Nature Equity needs (Chapter 4.1) and responses from those with a presence of children <19 in the household.

30% of respondents had children under the age of 18 and the majority of respondents lived in the Downtown, West End, Kitsilano, and Mount Pleasant neighbourhoods, followed by Fairview and Grandview-Woodlands neighbourhoods.

Because the survey was conducted by the VPB for purposes not directly related to providing connection to nature for children, there are several issues in applying their results to this research. (1) I did not have access to the fully disaggregated data. (2) VPB combines parks and community centres when asking about amenities, while this report focuses only on park spaces. (3) There is no cultural lens applied to survey respondents; e.g., certain neighbourhoods have a high proportion first-language Punjabi speakers, and it is unclear if these surveys reached them. (4) There is disproportionate sampling, i.e. distribution of respondents does not reflect distribution of population across neighbourhoods. Certain neighbourhoods (e.g., Mount Pleasant, Kensington-Cedar
Cottage) are overrepresented (+5.6%, +4.6% respectively) while others (e.g., Renfrew-Collingwood, Victoria-Fraserview, and Sunset) are underrepresented (e.g., -5.3%, -4.1%, -4%, respectively) when compared to 2011 population census data. As is determined in Chapter 5, these three underrepresented neighbourhoods are determined to be high-priority neighbourhoods, and thus robust and accurate understanding of their identified needs would be valuable to create impactful policy changes.

4.3. Case studies

To identify the policy options available to the Vancouver public sector in connecting children to nature, I undertook a case study analysis of two cities: Austin, Texas and San Francisco, California. These cities were chosen for several factors, including similarities to Vancouver in terms of current access to green spaces, the perceived value of nature to its residents, and/or demographic factors. Through the literature review and interviews, it was evident these two cities are leaders in high-impact approaches to address children’s connection to nature through collaborative, multi-sector approaches. I assess the governance structures and other high-level policy tools used to indirectly support strategies facilitating connection to nature and the policies that local officials have taken to increase nature connection in children.

I also provisionally examined Berlin, Germany, and Boulder, Colorado, as both have physical or experiential opportunities that promote nature connection in children. However, neither city had an overarching policy program connecting nature to children, and a lack of English policy information in the former and dissimilar demographic and urbanisation patterns in the latter weakened them as comparators. Therefore, they were eliminated from the final analysis.
Table 4.1  A comparison of city features between Vancouver and case study cities of San Francisco and Austin.

<table>
<thead>
<tr>
<th>City factor</th>
<th>Vancouver</th>
<th>San Francisco</th>
<th>Austin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total area (km²)</td>
<td>115</td>
<td>121</td>
<td>524.57</td>
</tr>
<tr>
<td>Population</td>
<td>631,486</td>
<td>884,363</td>
<td>963,116</td>
</tr>
<tr>
<td>Population density (people/km²)</td>
<td>5,630</td>
<td>7,309cc</td>
<td>1,836</td>
</tr>
<tr>
<td>Percent of population &lt;18</td>
<td>16.6%</td>
<td>13%</td>
<td>22.2%</td>
</tr>
<tr>
<td>Green or blue space (km²)</td>
<td>13</td>
<td>16.6</td>
<td>118</td>
</tr>
</tbody>
</table>

Vancouver: Statistics Canada 2018
Austin: City of Austin 2018a; City of Austin 2010; Austin Parks and Recreation 2013

4.4. Expert interviews

The aim of the expert interviews was to attain specific knowledge from the vantage point of the municipal governments, the VSB, and community organisations that could or do partner with the public sector. The interviews helped to determine how to best implement strategic, systematic interventions to equitably connect children to nature within the Vancouver region.

Questions included some or all the following topics in a semi-structured interview style:

1. Accessibility to green space – quality of green space for children and/or meaningful connections to nature, real vs. perceived access, equitable distribution

2. Opportunities to connect children through schools – educational components such as outdoor classrooms, field trips, outdoor education programs; physical aspects such as green schoolyards

3. Community engagement and nature connection projects such as child participation in restoration projects

4. Partnerships between schools, municipal government, and community organisations

5. Barriers and challenges of providing equitable connection to nature

6. Possible solutions to address equity issues in access
(7) Possible solutions to address meaningful (rather than superficial) access to nature

(8) Opinions on how the COV and the VSB should implement policies, partnerships, and programs to stimulate children’s connection to nature, given

(10) Opinions on the perceived viability of the implementation of these approaches given COV/VSB resource and/or political constraints.

The following experts were interviewed:

- Ron Macdonald, Manager of Energy and Sustainability – Vancouver School Board
- Dylan Rawlyk, School Programs Manager – Stanley Park Ecological Society
- Damien Raffa, Program Manager – Presidio Trust and member of San Francisco Children & Nature Forum
- Karen Knight, Program Coordinator for the Austin Cities Connecting Children to Nature Initiative

I also had informal discussions with a staff member at the VPB as well as with teachers within the VSB system. However, I was unable to secure official interviews with either a representative of VPB or an elementary school teacher.
Chapter 5. Nature equity mapping

Disaggregating physical and demographic factors revealed that certain Vancouver neighbourhoods are in the highest need for public sector intervention to create nature connection.

Figure 5.1 Public green space (ha) per 1000 people in Vancouver, disaggregated by the 22 neighbourhoods in Vancouver. The darker green a neighbourhood, the more green space is accessible to residents in the area. The orange leaf symbol indicates which neighbourhoods contain no public parks with semi-natural or natural vegetation. Adapted from City of Vancouver Open Data Catalogue and OpenStreetMap.

Figure 5.1 augments Figure 2.2 by noting that for the 9 neighbourhoods that fall below the VPB 1.1 ha/1000 people standard set in the 1992 Park Management Plan (Vancouver Board of Parks and Recreation 2006), 7 of them feature no parks that include any semi- or natural vegetation.
Figure 5.2 shows that certain neighbourhoods, especially those closest to the downtown area, have a lower population of children.
Figure 5.3  Median Household Income in Vancouver, disaggregated by the 22 neighbourhoods in Vancouver. The darker yellow a neighbourhood, the greater the median income. Adapted from City of Vancouver Open Data Catalogue and OpenStreetMap, and Statistics Canada 2016 Census.

Figure 5.3 indicates high variation in median household income across the different neighbourhoods. Chapter 2.2.4 provided evidence to support a positive correlation between income and quality and quantity of all green space in the Vancouver area and my regression of median household income and public green space per capita likewise reveals a significant positive relationship between the two ($R^2 = 0.322, p = 0.0059$).

Filtering for neighbourhoods with low green space per capita and high proportions of children, the following high-priority neighbourhoods for enhancing nature to access are Marpole, Renfrew-Collingwood, Sunset, Victoria-Fraserview, and Kensington-Cottage (Table 5.1, Figure 5.4).
Table 5.1  High-priority neighbourhoods (orange) in Vancouver with greatest potential for green interventions. Compare to neighbourhoods with high access to nature (green) and the Vancouver average.

<table>
<thead>
<tr>
<th>Neighbourhood</th>
<th>Population &lt;19 years old</th>
<th>Median Household Income ($)</th>
<th>Green space (ha/1000 people)</th>
<th>Semi-natural to natural vegetation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria-Fraserview</td>
<td>20%</td>
<td>61,857</td>
<td>0.59</td>
<td>-</td>
</tr>
<tr>
<td>Sunset</td>
<td>24%</td>
<td>60,773</td>
<td>0.68</td>
<td>-</td>
</tr>
<tr>
<td>Marpole</td>
<td>19%</td>
<td>48,308</td>
<td>0.72</td>
<td>+</td>
</tr>
<tr>
<td>Renfrew-Collingwood</td>
<td>20%</td>
<td>55,074</td>
<td>0.74</td>
<td>+</td>
</tr>
<tr>
<td>Kensington-Cedar Cottage</td>
<td>20%</td>
<td>56,879</td>
<td>1.03</td>
<td>+</td>
</tr>
<tr>
<td>Dunbar-Southlands</td>
<td>25%</td>
<td>107,374</td>
<td>11.53</td>
<td>+</td>
</tr>
<tr>
<td>West Point Grey</td>
<td>21%</td>
<td>84,448</td>
<td>18.63</td>
<td>+</td>
</tr>
<tr>
<td>Vancouver total</td>
<td>17%</td>
<td>56,113</td>
<td>1.75</td>
<td>+</td>
</tr>
</tbody>
</table>

Figure 5.4  The 5 high-priority neighbourhoods identified for nature intervention. Adapted from City of Vancouver Open Data Catalogue and OpenStreetMap.
Chapter 6. VanPlay survey results

The following are a selection of relevant findings from the VanPlay survey.

Top amenities to prioritize for improvement:

- Most prioritized: parks (49% overall)
  - Kensington Cedar Cottage and Victoria Fraserview were more likely to prioritize parks (56% and 65%)
  - Marpole was less likely to prioritize parks (29%)
- Third most prioritized: natural areas (38% overall)
  - Households with children <19 were less likely to prioritize natural areas (30% compared to overall 38%)
- Seventh most prioritized: playgrounds (18% overall)
  - Households with children <19 were more likely to prioritize playgrounds (38%)
  - Neighbourhoods Kensington-Cedar Cottage, Sunset, Marpole, and Renfrew-Collingwood were more likely to prioritize playgrounds (24%, 29%, 24%, and 22% respectively)

The following top factors were identified by respondents to consider in planning:

- Community health and wellbeing (47%)
- Improving existing services, facilities and amenities (38%)
- Social connections and community belonging (36%)
- Passive recreation (34%)
- Healthy urban ecologies (23%)
  - Victoria-Fraserview was less likely to report this as a top factor (16%)
- Biodiversity of plants and animals (23%)
  - Victoria-Fraserview and Renfrew-Collingwood were more likely to report this as a top factor (38% and 26%)

The majority of challenges and barriers reported included:
• 33% of overall respondents reported no challenges or barriers to enjoying Vancouver’s parks and recreation
  
  o Households with children <19 were less likely to report there were no challenges or barriers (27%)
  
  o All five focus neighbourhoods were less likely to report there were no challenges or barriers (17%, 18%, 21%, 25%, and 31%)

• Lack of availability of programs and activities of interest (23%)
  
  o Households with children <19 were more likely to report this as barrier (30%)
  
  o Neighbourhoods Kensington Cedar Cottage, Victoria Fraserview, and Renfrew-Collingwood were more likely to report this as a barrier (34%, 31%, and 27% respectively)

• Timing of programs and/or events are not convenient (20%)
  
  o Households with children <19 more likely to report this as barrier (28%)
  
  o All five focus neighbourhoods were more likely to report this as a barrier (23%, 30%, 31%, 35%, and 35%)

• Lack of parking (17%)
  
  o Neighbourhood Victoria Fraserview was considerably more likely to report this as a barrier (37%)

• Cost (17%)
  
  o Neighbourhoods Kensington Cedar Cottage, Sunset, Victoria Fraserview, and Renfrew-Collingwood were slightly more likely to report this as a barrier (18%, 21%, 20%, and 23% respectively)

The number one response for the big idea for the future of parks and recreation in Vancouver was protecting and expanding green spaces, natural areas, wildlife, and biodiversity (15%).
Chapter 7. Case studies

Both San Francisco and Austin have cohesive, multi-sectoral initiatives to connect children to nature. Below, I describe why these cities were chosen, a list of their policies, and the key findings. A detailed description of the policies can be found in Appendix G.

Table 7.1 Summary of municipal-scale strategies to connect children to nature and underlying policies to support these efforts in Vancouver, San Francisco and Austin.

<table>
<thead>
<tr>
<th>Policy measures</th>
<th>Vancouver</th>
<th>San Francisco</th>
<th>Austin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green schoolyards</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Rewilding</td>
<td>Some</td>
<td>Some</td>
<td>Yes</td>
</tr>
<tr>
<td>Nature programming</td>
<td>Some</td>
<td>Some</td>
<td>Yes</td>
</tr>
<tr>
<td>Youth stewardship</td>
<td>Some</td>
<td>Some</td>
<td>No</td>
</tr>
<tr>
<td>Outdoor recess time</td>
<td>N/A</td>
<td>N/A</td>
<td>Universal</td>
</tr>
<tr>
<td>Design codes</td>
<td>No</td>
<td>Potentially</td>
<td>Yes</td>
</tr>
<tr>
<td>Public awareness campaign</td>
<td>No</td>
<td>Targeted</td>
<td>Yes</td>
</tr>
<tr>
<td>Outdoor bill of rights</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Organisational structure</td>
<td>None</td>
<td>Collective impact model</td>
<td>Collective impact model</td>
</tr>
<tr>
<td>Data collection</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
7.1. San Francisco

7.1.1. Context

San Francisco bears several cultural and geographic similarities to the Vancouver, making it an ideal candidate for comparative study. San Francisco and Vancouver are green leaders, ranking the top two greenest cities in North America in 2011 (“The Green City Index” 2011). Both are West Coast cities known for innovation, interest in the outdoors, and diverse, multicultural populations. The cities are of similar areas and population densities, geographically contained and surrounded by ocean. In combination with rapidly growing populations, this puts pressure to develop pre-existing land, risking the reduction of urban natural green space.

Like Vancouver, it is a city set within great natural beauty, but has limited nature within the dense city. San Francisco does feature several large park spaces within the city and adjacent to its borders (see Figure 7.1), much like Vancouver does (Figure 2.1).
Figure 7.1  San Francisco and its public green spaces. Adapted from OpenStreetMap.

7.1.2. Core policies

The collaborative group working towards connecting children to nature in San Francisco is known as the San Francisco Children & Nature Forum (SFC&N). SFC&N is composed of city agencies, non-profits and educators directly and indirectly involved in nature connection for children in San Francisco. Prior to the involvement of the national CCCN Initiative (Chapter 2.3.2) in 2016, SFC&N formed in 2011 as a forum to convene experts in the area and to ultimately create a Children’s Outdoor Bill of Rights. This bill was supported by an eloquent proclamation from city hall that expressed a commitment to urban children and their connection to nature (Raffa).

Today, SFC&N uses a collective impact structure built on five conditions for success:

- a common agenda;
• use of shared measurements;
• mutually reinforcing activities supporting collaborative capacity;
• continuous communication;
• and funded backbone support for management and coordination.

Several best practices of the initiative were identified by a member of SFC&N (Raffa):

• Support cross-sector buy-in and involvement to bring together top-down with bottom-up: high-level policy creators with access to budget and stakeholders that serve the community and have ears to the ground;
• Capitalize and build off existing networks and sub-networks;
• Foster cross-pollination between groups, helping to find co-benefits and shared goals;
• A full-time coordinator for SFC&N to help carry forward and support the work; in the case of SFC&N, this position will be housed in the Recreation and Parks Department;
• A carefully assembled steering committee and executive council for SFC&N to represent key cross-sector stakeholder and policy maker/influencer perspectives (including government agencies and non-profit organizations).

7.1.3. Key policy

Key actions that SFC&N have taken or are planning to take include:

• Identifying equity zone neighbourhoods to maximise impact of actions
• Supporting the existing SF Unified School District shared-use agreement Green Schoolyard Program, funded in part by over $17 million USD in voter-approved funds since 2003
• Provided input to SF Planning Department’s “Urban Design Guidelines” regarding inclusion of nature connection

• Influence other organisations’ projects in place-making for nature connection design

• Youth-led community research gathering baseline data on nature connection experiences

7.2. Austin, TX

7.2.1. Context

The city of Austin is demographically and physically distinct from the City of Vancouver. Austin’s population is one and a half times that of Vancouver, but a third of the density. Austin is facing serious urban sprawl in the coming years (City of Austin 2018b). That Austin is landlocked with minimal geographic features to restrain urban growth, such as mountains or ocean, contributes to this sprawl. Climatically, Austin is warmer and drier than Vancouver, although it does receive annual average rainfall 920 mm compared to 1199 mm in Vancouver (“Average Daytime Temperatures for Vancouver, Canada vs Austin, Tx, Usa.” 2018).

Nevertheless, it is a city with citizens who value the green and blue space found throughout Austin. Important natural features include: the Colorado River, which transects the city; the Barton Springs, a 3-acre “crown jewel” of the city where residents can swim; and the scrubby landscape (Figure 7.2). To many, the nature and landscape of Austin is what makes Austin unique (Knight).
7.2.2. Core policies

Over the years, a network of organisations, governmental departments, healthcare professionals, and educators dedicated to connecting children regularly to nature has been growing in Austin (Austin CCCN Implementation Plan 2016). In 2016, the City of Austin launched the Cities Connecting Children to Nature Initiative (“Austin
The Austin Initiative takes a Collective Impact approach to create equitable access to nature by involving city leadership with actors across many sectors. The initiative’s governance’s structure is composed of a Core Planning Team and six Working Groups with interdepartmental and cross-sectors members. Like San Francisco, Austin brought to resolution the Austin’s Children’s Outdoor Bill of Rights, which made a “strong statement to the city at large about [the City’s] commitment to connecting our children to nature”, (Cities Connecting Children to Nature 2017a). The Austin Initiative also established shared metrics and baseline data.

Several best practices of the initiative were identified by the Program Coordinator of the Austin Initiative (Knight):

- Seek collaborative opportunities and alignment across different departments to increase efficiency
  - E.g., high demand for trees from the community, so by planting new trees and creating trails around schoolyards find co-benefit by fulfilling both a community desire and CCCN goal
- Bring together entities and individuals with value alignment to identify synergies, generate excitement, and increase participation
- Have strong mayoral oversight to drive and maintain network; without this oversight, it is unlikely that the sustained and profound participation and collaboration seen today would have occurred in the Austin Initiative

### 7.2.3. Key policies

The following are the Initiative’s priority strategies:

- **Greening School Yards**: Creating a new network of “school parks”
- **Citywide Public Awareness Campaign**: Informing residents on the importance of regular nature access for overall healthy development
- **Program and Park Activation**: Creating a comprehensive nature-based program directory and aligning programs with available park space in neighborhoods of need
- **Policy Tracking**: Developing and proposing nature access policy initiatives for inclusion in city development code and department master plans
Independent of the Initiative, The Austin Independent School District also recently adopted a policy to mandate all elementary students receive 30 minutes of unstructured outdoor playtime each day.

7.3. Key findings

- Strong collective approaches and creation of a backbone program to coordinate support will help to find synergies and co-benefits, and help inspire greater volunteering and collaboration across different organisations
- Build off existing networks and efforts
- Raise public support through an Children’s Outdoor Bill of Rights
- Collect baseline and impact data to maximise benefits of strategies and policies
- Seeking diverse funding sources from NGOs and municipal departments can act as initial seed money to build collaborative networks
- Green schoolyards are a viable approach to create more public green space in high-density cities, providing co-benefits of increasing amount of public green space
- Public awareness campaigns may be necessary given that city residents may not be aware of the benefits of nature connection nor the opportunities that exist within the city
- Together, experiential and structural changes to increase nature connection in children can increase impact and reach of policy changes
Chapter 8. Core policies

From the case study, interviews, and VanPlay survey, I identify core policies that will facilitate the implementation of the policy options in Vancouver. While these policies do not directly increase connection to nature, they facilitate the policy implementation of such direct measures by: identifying co-benefits and building capacity across sectors; facilitating public and financial support; and increasing comprehension of the need for and consequences of policies. From there, policy options that directly connect children to nature will be compared in Chapter 9.

To gain public support and increase access to budget, I recommend the COV pass a Children’s Outdoor Bill of Rights to emphasize the necessity of exposing all children to nature. The City of Austin and the City of San Francisco, in addition to several other cities and states in North America (Lipman 2011) have all passed bill of rights for children to engage with nature. No municipality in Canada has yet to pass an equivalent bill, although the Government of Ontario released the Outdoor Charter in 2013 (Ontario Children’s Outdoor Charter 2018). Such a resolution is largely symbolic and does not come attached with legislation or financial support. In Austin and San Francisco, these bills have catalyzed their respective CCCN Initiatives, as they provide public recognition of mayoral support and raise public awareness of the initiative (City of Austin 2016; Raffa). This, in turn, supports the acquisition of funding and capacity support for the initiative as organisations, city agencies, and non-governmental organisations can more readily align around nature connection goals.

To have consequential policy change, it is important for Vancouver to collect data. Policies should target gaps identified by data and the impacts of policies should be tracked. The national CCCN Initiative emphasizes the importance of collecting high quality, city- or neighborhood-level data on children’s connection to nature (Cities Connecting Children to Nature 2017c) and provides resources and publicly-available metric toolkits (Cities Connecting Children to Nature 2018; Cities Connecting Children to Nature 2017b) to support cities undergoing nature connection campaigns. Metrics to understand children’s connection to nature depend on the type of intervention (infrastructural, experiential), and can range from the increase in green space, measures of natural and play environment quality, ease of access to nature, hours in school in
outdoor play, and programming attendance. As well, data collection should emphasize equity by disaggregating by neighbourhood, median income, and culture whenever possible. Considering equity (socioeconomic, cultural, physical) will maximise the impact of action that Vancouver local officials can have even if resource constrained. Finally, a jurisdictional scan of all organisations that provide nature connection opportunities for children will support cross-sectoral collaborations. For whatever interventions are chosen, it will be critical to collect initial and periodical measurements following modification.

Representatives from both the Austin and San Francisco heavily emphasized the need for significant interdepartmental and cross-sector collaboration and partnership (Raffa; Knight). Although labour intensive, these facilitate the involvement of stakeholders and can connect organisations to funding and create networks for capacity building. One of Rewilding Vancouver’s objective is to “develop and grow informal collaborations”, which is a significant start. However, to maximise successful policies targeting all children of Vancouver, nature access policy would benefit from a formal, strong steering committee and working groups with funding support.
Chapter 9. Comparative key policy options

9.1. Screening policy alternatives

Opportunities for facilitating nature connection can be created throughout almost all aspects of a child’s life – in their backyard, on their walk to school, through educators and parents, and through nature play. Having influence on their citizens’ everyday lives, the public sector therefore has a multitude of different options it can take to address nature connection in children.

The policy options described in Table 9.3 were identified by interview participants, in case studies, and through the literature review. A thorough comparison of all options would be ideal but is outside of the scope of this report. Some of the options determined from the research may not be suitable for implementation by the Vancouver public sector given the current policy landscape. As such, I used a screening process with five criteria (Table 9.1) to select the policy options that best address the issues identified in this study and have the potential for implementation in the short-term.

Table 9.1 Screening criteria applied to potential policy options.

<table>
<thead>
<tr>
<th>Screening criterion</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td>Can the option actively provide connection to nature to children to those who may not otherwise have opportunity to do so?</td>
</tr>
<tr>
<td>Impact</td>
<td>Does the option address a gap in the Vancouver landscape?</td>
</tr>
<tr>
<td>Meaningful nature connection</td>
<td>Does the option meet at least two of three criteria required for meaningful connections to nature: frequent access to nature; quality access to nature to facilitate profound experiences; or mentorship?</td>
</tr>
<tr>
<td>Appropriate agent</td>
<td>Is the public sector the right agent to implement these policies, as opposed to private sector, community organisations, or other associations?</td>
</tr>
<tr>
<td>Ease of implementation</td>
<td>Can barriers (financial, administrative, land use, jurisdictional) be overcome in the short-term to implement the option?</td>
</tr>
</tbody>
</table>
Options were evaluated if they: pass, uncertain, or does not pass each criterion (Table 9.2). In many of the options, the success of passing the screening test may depend not on the option itself but the qualitative and operational components of the option – in these cases, options received an uncertain ranking. Options might also receive an uncertain ranking if there is a lack of information. Options are retained if they receive no “does not pass” rankings. The extent to which an option is viable (i.e., how many criteria it passes) is not evaluated. See Appendix H for justifications for each ranking.

Table 9.2  Legend for screening test

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Passes screening</td>
<td>✓</td>
</tr>
<tr>
<td>Uncertain</td>
<td></td>
</tr>
<tr>
<td>Does not pass</td>
<td>X</td>
</tr>
</tbody>
</table>
Table 9.3  Screening criteria matrix evaluating potential policy options.

<table>
<thead>
<tr>
<th>Policy strategy</th>
<th>Equity</th>
<th>Meaningful</th>
<th>Impact</th>
<th>Appropriate agent</th>
<th>Ease of implementation</th>
<th>Pass?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared-use green schoolyards</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Stewardship initiatives in planning</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Support for teachers – Professional development, curriculum</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>City development codes/guidelines</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Rewilding park activation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Nature programming</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Increased green connectivity in neighbourhoods</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Funding for field trips</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mandatory recess time</td>
<td>✓</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Awareness campaign</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Immersive, year-long outdoor school</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

From the screening, five options were sufficiently viable for present implementation and therefore consideration for analysis. Of the five, three could be rolled into one option under the sole jurisdiction of the VPB: stewardship initiatives in
planning, rewilding park activation, and nature programming. Therefore, three policy options, below, are considered for analysis. These policy options are not mutually exclusive.

9.2. Option 1: Green schoolyards

Implementing green schoolyards requires two actions: (a) the greening of schoolyards, which includes creating nature play and outdoor learning spaces and (b) joint schoolyard agreements between schools and the City to establish responsibilities between both entities. Green schoolyards are spaces that can include outdoor classroom, native gardens, nature play areas, trees, and more. Appendix I for a general guide to components of success and resources for implementation.

In Vancouver, the success of this policy option will be most dependent on:

- Willingness of VPB and VSB to be jointly responsible for the construction and maintenance of the space;
- Buy-in from school and community to participate in the design and use of the space;
- Securing sustainable and diverse funding from city agency’s budgets and organisations such as: Vancouver Parks Board, Vancouver’s Green Infrastructure team; non-profits; private corporations.

In partnership with VPB, VSB would be responsible for the planning, development, and implementation of the capital component of the school. Given high autonomy of schools, each school would lead on the design and operations of the schoolyard. Therefore, to help the school community carry out a successful project within the district codes and standards, VSB could provide guiding principles to schools akin to their ‘Guiding Principles for the VBE School Garden Policy’ (Chapter 3.4.2). VSB is likely to provide relevant outdoor classroom principles in its upcoming Sustainability Action Plan (Chapter 3.4.1).

VPB involvement is not fundamental to greening schoolyards but would be integral to wider success. The involvement of the VPB would increase access to capital, capacity, and maintenance staff for the VSB. And involvement allows the VPB deliver on its mandate of providing a minimum 1.1 ha per capita of public green space and the COV’s mandate of having all residents within a 5-minute walk to a public green space.
Ultimately, all elementary schools in Vancouver without immediate access to nearby natural spaces (e.g., near Pacific Spirit or Everett Crowley) would have a green schoolyard. Rollout would begin through pilot projects implemented in the identified high-priority neighbourhoods.

Rain

An identified barrier in connecting children to nature in Vancouver is the city’s high precipitation in the fall and winter (Rawlyk). Outdoor learning classrooms may benefit from having covered spaces, as it can facilitate use through the winter. However, covered spaces can be problematic as they can create issues with after-hours activity. Any implementation must carefully consider the potential operational issues that could result.

9.3. Option 2: Rewilding and nature programming

The second policy option evaluated is rewilding and nature programming. This option would expand upon some of the current work being undertaken by the VPB under the Biodiversity Strategy and Rewilding Vancouver plans to increase natural areas, programming, and partnerships with community organisations. The main distinction is a re-focusing to (a) implement changes in identified high-priority neighbourhoods and (b) more deeply incorporate the child’s perspective.

Rewilding

Geographically, many of the recent or planned park upgrades are occurring where the city borders oceans or rivers (Figure 3.1) and none in Marpole, Victoria-Fraserview, and Kensington-Cedar Cottage, three neighbourhoods identified as high-priority. Park improvements will ultimately take place in Marpole in the coming years given the high-priority on the development of the Cambie Corridor (City of Vancouver 2018e). However, Kensington-Cedar Cottage and Victoria-Fraserview’s Community Vision plans were approved by City Council in 1998 and 2002, respectively, with no current plans for park upgrades in the short-term. Therefore, there is a need to focus attention on these underserved areas.
As well, the nature of current and planned changes may not sufficiently consider the child’s perspective, both in promoting nature play and in the design process of park redevelopments.

Rewilding could therefore incorporate more semi-natural or natural vegetation and exploratory nature playgrounds. Although less aesthetically pleasing and less important to adults, spontaneous and unmanaged vegetation may best support child’s play activities (Gobster et al. 2007).

Rewilding could also include child participation in the design process, as in Boulder, CO’s Growing up Boulder: Civic Area Project. In Boulder, children were empowered “with opportunities for inclusion, influence, and deliberation on local issues that affect their lives” (Growing Up Boulder 2018). Boulder’s youth participated in decision-making through the involvement of several park plans and in providing recommendations to the City of Boulder Parks and Recreation Department’s Urban Forest Strategic plan.

Nature programming

Nature programming would increase nature-based program availability through community centres, which was identified as a need in high-priority neighbourhoods through the VanPlay survey (Chapter 6). It could also include facilitating other organisations in their programming through collaborations, advertising, and funding support to facilitate, as San Francisco’s CCCN Initiative is currently doing.

Rain

As with green schoolyards, rewilding and nature programming can target the perceived barrier of rain. Increasing programming that supports recognition and appreciation for rain nature play as well as human/man-made outdoor spaces that reduce impacts of rain (e.g., covered spaces, trees with dense foliage) should be a key focus of rewilding and nature programming, although it can bear the same risk of attracting unintended users.
9.4. Option 3: Support for teachers

The final policy option is to support school teachers in place-based environmental education through greater funding of professional development and curriculum tools. Appreciating that school-systems and educators are generally resource- or time-constrained, there is still a need to provide better environmental education support to teachers. Teachers may be the sole provider of environmental education in a child’s life, and thus proper investment in their professional development is critical. Recent changes to the BC curriculum emphasize the desire of governing bodies to provide children with environmental learning; teachers must be given tools to appropriately implement these desires.

Professional development for Vancouver educators is currently provided by a range of levels: district-wide, school-wide; through unions and teachers associations (e.g., Vancouver Teachers’ Federation, EEPSA); and non-public organisations (e.g., Sierra Club, Stanley Park Ecological Society). VPB is also beginning to support educators in implementing curricula (Vancouver Board of Parks and Recreation 2014c). Environmental learning and curriculum support also exists through EEPSA and the BC Ministry of Education. Despite the varied opportunities for professional development, environmental education offerings are generally piecemeal and difficult for educators to connect into.

Greater support for teachers can address several barriers teachers face in implementing environmental education in their teachings. There is insufficient guidance to implement the new curriculum; a lack of confidence in outdoor classroom management; and a lack of confidence in environmental knowledge generally (Rawlyk). Administrative culture due to risk management concerns can also inhibit teachers from taking their students outdoors (Rawlyk). Finally, teachers are more opposed than students to going outside when it is raining (Rawlyk); therefore, support could promote the value of connecting to the natural world, rain or shine, as SPES does through some of its programming.

Therefore, this policy option increases access and availability of environmental education professional development and curriculum support. This option would not modify how many professional development days are given in a year, but instead
increase access to guidance. The mechanisms by which these changes occur might include the following actions from local officials:

- fund peer-lead professional development training to increase the availability of trainers, as peers have the greatest understanding of the context and operational components of implementation (from informal discussions with a VSB school teacher);

- hire an education contractor to develop Vancouver-based lesson plans for teachers to access;

- encourage district-level and school-level recognition and support (organizational culture or financial) of environmental education;

- Encourage network-building through the continued cooperation and communication of VSB staff (Macdonald) and the creation of a local Vancouver chapter of EEPSA (see Appendix D for more on EEPSA’s mission and function).
Chapter 10. Evaluation framework

This section outlines the criteria and measures used to evaluate each policy option. The criteria were determined through the literature, case studies, and interviews, and are important considerations for local officials in comparing the relative merit of each option.

10.1. Effectiveness

10.1.1. Connection to nature in the short-term

This criterion estimates how the policy option will increase connection to nature in Vancouver children. Connection to nature relies on both physical and experiential opportunities. The physical availability of space (physical opportunity) is the first component measured by this criterion. Experiential opportunities depend on a myriad of interacting factors and barriers (social, structural, cultural, and physical distance as reviewed in Chapter 2.2.2). For the purposes of this research, I assume that children are limited in their ability to seek out nature experiences on their own but will do so when able to access natural areas. Therefore, the experiential component of this criterion evaluates if parents or educators facilitate contact to nature for their children or students given each policy.

10.1.2. Connection to nature in the long-term

This criterion estimates how the policy option facilitates meaningful connection to nature that, in turn, may lead to environmental stewardship later in life. While meaningful connection to nature cannot be manufactured, several factors do enable its likelihood (Chapter 2.3.12.3.1). These are: (i) strong mentorship in nature learning, (ii) frequent interaction with nature, and (iii) interaction with high-quality nature. The number and level of these factors being met is evaluated each policy option. This criterion also assumes children are connecting to nature, and therefore evaluates not if children are connecting to nature, but to what extent given the above factors.

Early contact and youth stewardship opportunities were also identified factors that facilitate meaningful connection. Nevertheless, they are not considered for this
criterion unless otherwise stated as this work does not discern between connection to nature at different ages for the former and, for the latter, youth stewardship opportunities are rare.

10.2. Equity

This criterion estimates the accessibility to and uptake of policy options from all children, particularly focusing on low-income populations. At the granular scale of this research, low-income populations are identified as high-priority neighbourhoods (Table 5.1). Future research should more finely assess equity, evaluating at a household scale and for other demographics including culture, language spoken at home, and gender. Given the significance of equity identified in San Francisco’s and Austin’s CCCN Initiatives, equity is double-weighted when comparing options.

10.3. Cost

10.3.1. Minimal cost to government or VSB

This criterion provides rough estimates of the costs that the COV and/or the VSB would need to undertake to implement this policy option. Ideally, I would have data on capital costs (e.g., infrastructural or policy development) and operating costs (e.g. continued training or maintenance). It is difficult to estimate exactly how much each option will cost. Therefore, this criterion estimates cost of each option relative to the others. Austin and San Francisco indicate that start-up costs can be covered through NGO grant funding.

10.3.2. Minimal cost to parents

This criterion estimates costs to parents to participate in the policy option, such as through fundraising for capital changes or individual small programming fees.

10.4. Co-benefits

This criterion estimates how the policy option aligns with pre-existing goals and policies of the COV, VPB, or VSB. It focuses on recently established goals that have
high salience within these institutions. The number of aligned policy goals determines the level of co-benefit.

10.5. Collaborative administrative ease

This criterion estimates how easy the administrative relationships between the different entities will be (i.e., none, informal, or formal agreements; how many parties responsible) and how feasible implementation will be given the roles, responsibilities, and actions of the different entities.

10.6. Stakeholder acceptance

These criteria estimate the acceptance of each policy option from the following stakeholders: educators; parents; VPB; VSB. Initially, inferences were also made regarding public acceptance. However, the public are not decision-makers and the influence they carry as decision influencers was either captured by policy co-benefits or parent acceptance. Therefore, the public was not included as a stakeholder.
### Table 10.1 Criteria and measures matrix

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Measure</th>
<th>Benchmark</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy effectiveness</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection to nature (CTN) in short-term</td>
<td>Extent to which policy will increase (i) physical or (ii) experiential opportunities to connect to nature</td>
<td>Provides a little of either (i) or (ii) or provides a little of both or many of one</td>
<td>LOW&lt;br&gt;MED&lt;br&gt;HIGH</td>
</tr>
<tr>
<td>Connection to nature in long-term</td>
<td>Extent to which policy meets meaningful factors of CTN: mentorship; frequency; quality</td>
<td>Meets none of the factors</td>
<td>LOW&lt;br&gt;MED&lt;br&gt;HIGH</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal opportunity to connect to nature</td>
<td>Equal access and use of green spaces by all children, especially those in low-income neighbourhoods</td>
<td>Few children guaranteed to CTN</td>
<td>LOW&lt;br&gt;MED&lt;br&gt;HIGH</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimal capital and operating costs to COV or VSB</td>
<td>Amount of additional capital and operating costs</td>
<td>High capital cost, some/high operating cost</td>
<td>LOW&lt;br&gt;MED&lt;br&gt;HIGH</td>
</tr>
<tr>
<td>Minimal cost to parents</td>
<td>Fundraising or personal contributions required</td>
<td>High financial input</td>
<td>LOW&lt;br&gt;MED&lt;br&gt;HIGH</td>
</tr>
<tr>
<td><strong>Co-benefits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alignment with other city/school policies or goals</td>
<td>Extent to which policy supports many or salient goals of the COV, VPB, or VSB</td>
<td>Supports no salient goals</td>
<td>LOW&lt;br&gt;MED&lt;br&gt;HIGH</td>
</tr>
<tr>
<td><strong>Collaborative administrative ease</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of collaboration necessary from public sector (VSB, COV/VPB with each other or NGOs)</td>
<td>Extent to which different organisations will have to collaborate with others to implement policy</td>
<td>Formal collaboration needed</td>
<td>LOW&lt;br&gt;MED&lt;br&gt;HIGH</td>
</tr>
<tr>
<td><strong>Stakeholder acceptance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educators</td>
<td>Extent to which policy will be supported by relevant stakeholders</td>
<td>Will oppose</td>
<td>LOW&lt;br&gt;MED&lt;br&gt;HIGH</td>
</tr>
<tr>
<td>Parents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COV / VPB</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>VSB</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Chapter 11. Policy analysis

11.1. Option 1: Green schoolyards

11.1.1. Effectiveness

Connection to nature in the short-term

Besides park playgrounds, the only outdoor public spaces designated for children are schoolyards. Because Vancouver children spend 5 days a week, 10 months a year at school, it is a space frequently accessed by them. Therefore, creating high-quality green space in the form of a green schoolyard would lead to very high connection to nature in Vancouver children by providing access to space during both school hours and non-school hours.

Connection to nature in the long-term

Green schoolyards have the potential to support all three of the identified factors necessary for meaningful connection to nature. As above (Chapter 11.1.1), schoolyards provide frequent access to nature. Given adequate design, schoolyards could provide high-quality nature. Given adequate support to teachers, there would also be mentorship opportunities for children. Thus, this option ranks as high.

11.1.2. Equity

Given that 70% of Vancouver children regularly access schoolyards, this option is expected to have high equity. Even if there is minimal space to green, small biophilic interventions at a child’s scale can still facilitate greater nature connection or nature play.

11.1.3. Cost

Minimal cost to municipal government and/or school board

Capital costs would be high, requiring assessment of land, costing for design, and construction. In San Francisco, initial construction values were set between $70,000 - $100,000 USD per green schoolyard (San Francisco Unified School District 2014),
while Chicago’s Space to Grow schoolyard costs around $1.5 million USD per schoolyard (Children and Nature Network 2016). Capital costs will be site-specific and vary across different schoolyards in Vancouver.

Operating costs would require increased maintenance of newly created park spaces. In the proposed 2018 budget, park maintenance and operation expenditure is $35,711 (Vancouver Board of Parks and Recreation 2017a). This does not include staffing costs for park maintenance; data was not available to determine this cost. Given that green schoolyards would only nominally increase total park space, it is expected that park maintenance would not increase substantially.

This option has high capital costs and low operating costs, thus ranks low for minimal cost to the public sector.

**Minimal cost to parents**

This option could result in minimal incremental financial costs to parents, at most fundraising through Parent Advisory Committees (PACs) to help support capital and/or operational costs. Given equity concerns, it is recommended that funding be sourced as minimally as possible from PAC funding, as low-income communities have a lower capacity to secure funding for school modification. Therefore, this option ranks high for minimal cost to parents.

**11.1.4. Co-benefits**

Because Vancouver is a highly-urbanized city with limited potential to create new park spaces, green schoolyards provide the co-benefit of creating more publically-available green space available. This supports the Greenest City goal of having 100% of residents within a 5-minute walk to green space.

Green schoolyards could also incorporate a component of green rainwater infrastructure (Children and Nature Network 2016), supporting the COV’s Citywide Integrated Rainwater Management Plan.

Therefore, this option ranks high for co-benefits.
11.1.5. Collaborative administrative ease

This option will require a joint agreement between VPB and VSB distinguishing maintenance and financing responsibilities. It will also require buy-in and support from each school, which will have to take place on a case-by-case basis. Given the strong autonomy of schools, it is essential that school administrations are in support of implementing a green schoolyard. This option may also require the involvement of other government bodies (e.g., COV’s engineering department) or private corporations (e.g., for donations). Given the need for both formal and informal engagement across several public entities, this option ranks low for administrative ease.

11.1.6. Stakeholder acceptance

Educators

It is expected that educators will be in high support of more outdoor learning spaces and opportunities to connect children to nature. Such changes will be most relevant in neighbourhoods lacking close access to nature and in schools that may not have the fundraising capacity to procure field trip funds to leave the site.

Parents

It is expected that parents will be supportive of creating more public spaces for their children to play in, especially high-quality spaces. There may be some concern about promoting new green or covered spaces to the public. Vancouver, like much of North America, is currently experiencing an opioid epidemic, and there has been an increase of needles found in parks (Nam 2017). As of June 2017, the VPB has increased safety patrols to address this concern and continued and increasing safety efforts will be important to preserving the space children’s use. Despite these concerns, it is anticipated that parents will be highly supportive of providing improved green space for their children if sufficient safety measures are implemented.

COV & VPB

Given capital and operating costs and added administrative burdens associated with this option, the COV may be hesitant to take on this option. However, it would also
further one of the city’s Greenest City Action Plans of access to nature and provide a fundamental need for a quarter of its residents. Therefore, this option is expected to receive some support from COV.

**VSB**

Similarly, this option will increase administrative and potentially financial burdens on VSB. Given that VSB’s role is largely one of facilitation, there may also be some tensions in designating responsibilities between VSB and individual schools during implementation. However, this option would promote VSB’s mission of providing high-quality learning experiences for their children. Therefore, this option is expected to receive some support from VSB.
<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>Equity</th>
<th>Cost</th>
<th>Co-benefits</th>
<th>Admin. Ease</th>
<th>Stakeholder acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTN ST</td>
<td>CTN LT</td>
<td>Equal opp. to connect to nature</td>
<td>Min. cost public sector</td>
<td>Min. cost parents</td>
<td>Aligned policies</td>
</tr>
<tr>
<td>Schoolyards</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>
11.2. Option 2: Rewilding and nature programming

11.2.1. Effectiveness

Connection to nature in the short-term

This policy option will create more biodiverse and natural park spaces for adults and children alike, identified by half of surveyed Vancouver residents as an amenity to prioritize for improvement. As well, it will increase the amount of programming available, addressing the barrier of a lack of programming and/or poor timing of programs as identified by one-fifth of all survey respondents and nearly one-third of survey respondents with children. This indicates that if parks and programs are activated, they are fulfilling a recognized lack of supply. However, this option does not guarantee use. Unlike schoolyards, which children engage with daily and with some independence, children’s park and program use is dependent on their parents. Therefore, this option is not guaranteed to lead to experiential changes of nature connection, and thus is ranked medium.

Connection to nature in the long-term

Although this option does not guarantee an increased frequency of nature contact, once parents facilitate their children’s use of these spaces, they will have increased access to high-quality nature and/or exposure to mentors through programming. If this option includes child participation in the design process, it would empower them and provide a long-lasting appreciation and connection to nature. However, there may still be some equity concerns for children who may not have the economic means to participate. Overall, this policy does meet two of the three criteria to achieve a ranking of high.

11.2.2. Equity

Equal opportunity to connect to nature

As identified in the nature equity mapping, three of the identified high-priority neighbourhoods lack any park space with semi-natural to natural vegetation. Therefore, by creating more natural spaces, this option will increase equal opportunities to connect
to nature. In comparison to the general population of survey respondents, lack of programming or poor timing of programming was identified more often as a barrier to most high-priority neighbourhoods and to parents with children under the age of <19. Therefore, if this option is prioritized in these neighbourhoods, it will address some geographical equity concerns.

However, some neighbourhoods may simply lack the park space to be rewilded or to have valuable nature programming. And, as noted previously, other barriers may still exist that lead to inequities in connection to nature for children. Without a cultural lens, it is unknown if parks and programs will be used by all communities in the city. Further, while program fees from the park board are relatively low (e.g., $128 for four 6-hour days), high-priority neighbourhoods were more likely to identify cost as a barrier to entry for programming. Overall, increasing nature opportunities in a public space does not guarantee that they will be used.

Therefore, this option will lead to some increases in equitable access to nature and ranks medium.

11.2.3. Cost

Minimal cost to municipal government and/or school board

This option would likely require some increase in capital and operational costs to the VPB to make modifications to parks and playgrounds and to increase programming availability. However, many of these changes could be a re-focusing of current funds. Therefore, this option ranks medium for costs.

Minimal cost to parents

Park use will not cost parents anything. There are small fees (<$150) associated with programming; however, it is not anticipated that these costs will be additional costs compared to other activities parents enlist their children in. Therefore, this option ranks high for minimal cost to parents.
11.2.4. Co-benefits

Being an extension of the VPB’s *Environmental Stewardship* plan, this option is implicitly aligned with the current and planned work of the VPB to rewild public spaces and facilitate environmental learning and stewardship. As well, this option incorporates some of the themes of the VanPlay discussions and is therefore in part aligned with the public discussion of the future of Vancouver parks. Therefore, this option ranks high for co-benefits.

11.2.5. Collaborative administrative ease

The VPB would be the clear leader in implementing this option. However, it would still require building relationships with other community organisations. Moreover, including public participation in design is not a simple task, and would heighten the administrative burden on VPB employees. Therefore, this option ranks medium.

11.2.6. Stakeholder acceptance

*Educators*

Although parks are not necessarily always nearby school grounds, this option would generally increase potential park spaces for educators to take their students to. Educators would have no reason to oppose these changes and therefore this option ranks high for acceptance.

*Parents*

The programming component would have high support from parents, as lack of programming has been identified as a need disproportionately by survey respondents with children. However, depending on the nature of rewilding, this option may receive some pushback from parents. Encouraging children to play in nature through beneficial nature play may be perceived as dirty or risky by some parents. While parents can choose to restrict access to wilder or ‘riskier’ spaces, it might then limit their space. Through proper education and awareness campaigns of the benefit of nature connection, parents will likely come to accept the value of aesthetically displeasing
spaces. Therefore, this ranks as medium for acceptance to reflect the time and education needed to secure strong support.

**COV & VPB**

This option would have high support from the COV and VPB, as it aligns closely with the work currently being undertaken through the Rewilding Vancouver plan.

**VSB**

The VSB is not a relevant stakeholder for this option.
Table 11.2  Analysis summary for rewilding and nature programming.

<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>Equity</th>
<th>Cost</th>
<th>Co-benefits</th>
<th>Admin. Ease</th>
<th>Stakeholder acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTN ST</td>
<td>CTN LT</td>
<td>Equal opp. to connect to nature</td>
<td>Min. cost public sector</td>
<td>Min. cost parents</td>
<td>Aligned policies</td>
</tr>
<tr>
<td>Rewilding</td>
<td>Med</td>
<td>High</td>
<td>Med</td>
<td>Med</td>
<td>High</td>
</tr>
</tbody>
</table>


11.3. Option 3: Professional development for teachers

11.3.1. Effectiveness

*Connection to nature in the short-term*

Teachers are instrumental in shaping children’s perceptions of the world. If teachers have the tools to prioritize environmental education, an appreciation of and connection to nature can be woven throughout their learning experiences. While teachers are heavily resource constrained (time, money, and physical access to nature), there is still the opportunity for teachers to refocus their attention towards nature. Therefore, although this option does not directly provide physical changes to nature access, it is expected that increased support can help educators capitalize on other underutilized resources to promote experiential opportunities in nature. Therefore, this option ranks medium.

*Connection to nature in the long-term*

Teachers are important mentors in a child’s life, given that they see their students every weekday over an academic year. Therefore, if educators are given the appropriate tools, they can greatly foster their student’s connection and appreciation to nature. Mentorship would increase and both frequency and quality of nature contact could increase if teachers prioritize it, although physical components of nature connection are not guaranteed. As such, this option ranks medium.

11.3.2. Equity

*Equal opportunity to connect to nature*

This option could be implemented everywhere, regardless of access to park or playground space. In this sense, this option would be very equitable if all educators sought out training and resources for environmental education. However, uptake of support and implementation of that knowledge is not guaranteed, given autonomy of the classroom. This concern could be addressed by encouraging strong connections with superintends and principals, who can raise awareness and support for the value of environmental education training in teachers. As well, other barriers might need to be overcome to allow teachers to fully foster nature connection, including lack of immediate
access to nature and lack of funding for busses to transport. Therefore, given these concerns, this option ranks as medium for equity.

11.3.3. Co-benefits

This option does not provide any co-benefits to high salience COV or VPB policy. It generally supports the BC Ministry of Education’s new curriculum and general objectives of the VSB “to enable students to reach their intellectual, social, aesthetic and physical potential in challenging and stimulating settings which reflect the worth of each individual and promote mutual respect, cooperation and social responsibility” (Vancouver School Board 2018b). However, this goal is not salient and therefore the co-benefits for this option rank low.

11.3.4. Cost

*Minimal cost to municipal government and/or school board*

Unlike options 1 and 2, this option would not require any capital infrastructure costs. There would be low costs of hiring a part-time education contractor to develop curriculum support. Costs would also derive from hiring people to run workshops; to increase accessibility and availability of workshops (by location, time); and any advertising/marketing necessary to increase educator’s awareness of these. In comparison to the other options, this option ranks high for minimal cost.

*Minimal cost to parents*

This option would lead to no extra costs to parents, and thus ranks high for this criterion.

11.3.5. Collaborative administrative ease

This option would require no formal arrangements between different organisations but might require some collaboration in hiring individuals to run training courses. This option ranks high in administrative ease.
11.3.6. Stakeholder acceptance

*Educators*

In the present, educators may feel generally under-resourced and under-supported in implementing the environmental component of the new curriculum. Providing support from the district-level and encouraging support from their principals would fill a much-needed gap. As well, because this option is voluntary, there is no obligation for educators to undergo professional development in this field. Therefore, this option ranks high for acceptance.

*Parents*

Parents are anticipated to be highly supportive of this measure as it provides better support for the educators of their children.

*COV & VPB*

The VPB is already in initial stages of providing some curriculum support to educators. This option also does not (necessarily) require high level of resource commitments from VPB. Therefore, the municipal bodies are expected to be in high support of this option.

*VSB*

Teachers and principals are ultimately the individuals that make decisions on what is taught to students within the constraints of the curriculum. As a facilitator, the VSB would fit the role well of providing support for teachers if they wanted to develop environmental education skills. However, this would require increased resources from an organisation with limited budget and funding opportunities. Unless given enough support from a larger network, this would put strain on VSB’s finances. Therefore, it is anticipated the VSB would have some support for this option.
Table 11.3  Analysis summary for increasing support to teachers.

<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>Equity</th>
<th>Cost</th>
<th>Co-benefits</th>
<th>Admin. Ease</th>
<th>Stakeholder acceptance</th>
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<tbody>
<tr>
<td></td>
<td>CTN ST</td>
<td>CTN LT</td>
<td>Equal opp. to connect to nature</td>
<td>Min. cost public sector</td>
<td>Min. cost parents</td>
</tr>
<tr>
<td>Teachers</td>
<td>Med</td>
<td>Med</td>
<td>Med</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Table 11.4  Summary of options and criteria scoring for three policy options: green schoolyards, rewilding and nature programming, and support for teachers.

<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>Equity</th>
<th>Cost</th>
<th>Co-benefits</th>
<th>Admin. Ease</th>
<th>Stakeholder acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CTN ST</td>
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<td>Equal opp. to connect to nature</td>
<td>Min. cost public sector</td>
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</tr>
<tr>
<td>Schoolyards</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Med</td>
</tr>
<tr>
<td>Rewilding</td>
<td>Med</td>
<td>High</td>
<td>Med</td>
<td>Med</td>
<td>High</td>
</tr>
<tr>
<td>Teachers</td>
<td>Med</td>
<td>Med</td>
<td>Med</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>
Chapter 12. Recommendations and conclusion

12.1. Recommendation

Despite the high costs and administrative complexity that accompanies it, my main recommendation is to begin rolling out option 1, green schoolyards. The option is the highest performing in addressing the primary policy problem of lack of equitable nature connection in Vancouver children: it provides high connection to nature in childhood, high potential to foster environmental stewardship in adulthood, and does so in an equitable manner. This option also provides the rare opportunity to create more public green space in Vancouver, a city with limited opportunities to acquire more public land given its high density. Therefore, green schoolyards are an innovative way of creating more public green space and supporting the COV goal of 100% nature within a 5-minute walk.

The use of green schoolyards would be maximised if accompanied by thoughtful place-based environmental education. Therefore, my secondary recommendation is to simultaneously begin rolling out the third option, professional development and curriculum support for VSB elementary-school teachers. In many ways, these two options are complementary – green schoolyards provide physical opportunities to connect to nature with high initial investments; teacher support facilitates experiential opportunities at low cost with high support from most stakeholders. Moreover, these two options can support each other synergistically: educators may be more likely to seek environmental education training knowing their school will have a green schoolyard; green schoolyard buy-in is more likely to occur if teachers and schools are passionate about environmental education.

To reduce financial costs and deliver nature connection more equitably, phase-in of green schoolyards should target high-priority neighbourhoods of Vancouver. Within these neighbourhoods, site assessments of elementary schools should determine high-priority schoolyards as those with little natural vegetation and lacking in nearby nature in public parks. Once determined, green schoolyards and support for educators can be piloted within select schools. Pilot projects will maximise equitable impact efficiently and help raise excitement and interest in the nature access initiatives. Some schools may not
need support in greening schoolyards, as they already have natural areas and outdoor learning spaces on or nearby their property (e.g., Tyee in Mount Pleasant; Lord Kitchener in Dunbar-Southlands).

The VPB could continue undertaking its rewilding and nature programming, with focus given to the high-priority neighbourhoods and those that currently contain no parks with semi-natural vegetation. It is somewhat effective in addressing the primary needs identified in this report of increasing connection to nature in the short-term and equitably. It is also highly effective in increasing connection to nature in the long-term. However, this is only the case if children use these spaces, who are reliant on their parents. Given equity concerns, I recommend this option not be prioritized above the other options, despite its high alignment with existing policies.

The implementation of these strategies and other future strategies to connect children to nature will be greatly aided by the core recommendations identified in Chapter 8. A collective impact model, or, at minimum formal collaboration of the VPB and VSB, will help unlock potential that already exists in the city. By turning pre-existing informal networks to formal ones, there will be greater cross-pollination between entities who share the common goal of nature access for children. This, in addition to an Outdoor Bill of Rights, will help strengthen public awareness and help draw greater funding from a diversity of sources. In taking these actions, the City of Vancouver will establish itself as the Canadian leader in creating meaningful connection to nature for its young citizens.

Cities are more than just its physical streets, buildings, and parks; they are the interwoven lives of organisms and communities within one ecosystem, human and non-human alike. Caring for and understanding our part in the world benefits us as individuals, our human communities, and the environment. Through policies of education and the greening of public spaces, Vancouver can germinate nature connection in its children and grow environmental stewards into adulthood, ready to fiercely protect our precious earth.
12.2. Future considerations

There are several suggestions I would make for future work on connecting Vancouver children to nature. With a longer timeframe, greater data collection and analyses would have benefited this research. These include: how children in Vancouver are currently connecting to nature; a more comprehensive metric of ‘nature’ in public and private spaces (greater diversity of measures, including tree coverage, nature quality, and some measure of private amenities); a more precise regression of green space per capita against smaller census blocks to increase sample size and power; schoolyard assessments; and an equity analysis extending past economic or biophysical constraints to include social, cultural, or other barriers. Given that Vancouver is becoming an increasingly diverse city, a cultural understanding of nature use will be critical in informing this work.

Multi-sectoral implementation plans should also consider other age groups besides elementary-school aged students. Many of the policy options reviewed could provide benefits to other age groups, including toddlers and teenagers. And other forms of nature intervention exist at these different groups. These might include early childcare sites for toddlers and imitating the existing TREK outdoor education program for grade 10 students. A cohesive implementation strategy should incorporate strategies across all age groups.

Further, the relationship between the VSB, VPB, and individual schools requires a more intricate understanding than provided in this report. Such understanding will support the implementation of green schoolyards, as success relies on buy-in from all involved parties.

A strong focus of this report was to evaluate nearby nature opportunities - what changes could be made within city boundaries. This scope was chosen because of equity concerns and potential policy options identified from case study analyses. However, one of the appeals of living in a city like Vancouver is the opportunity to connect with wilderness only an hour or two away. Future work should consider what equitable opportunities exist to increase children’s time in these spaces, taking cues from other VSB programming such as the TREK program, private organisation programming, or field trips.
Finally, no children were interviewed for this project. Any implementation plan would ideally engage children throughout the process of designing and implementing strategies to give voice to their perspectives.
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———. n.d. “Table 153-0153 - Households and the Environment Survey, Participation in
Outdoor Activities, Canada, Provinces and Census Metropolitan Areas (CMA), Every 2 Years (Percent).” CANSIM (Database).


Appendix A.

COV funding sources

There are several applicable current funding sources available: Greenest City – Neighbourhood Small Grants; Neighbourhood Matching Fund; and the Childcare Program Development Grant.

The Greenest City – Neighbourhood Small Grants grants $500 to $1,000 for Vancouver residents to support and build grassroots action on Greenest City targets, such as access to nature.

The Neighbourhood Matching Fund supports neighbourhood-based groups that want to make creative improvements to local public lands with up to $10,000. Unlike other funding opportunities, the Neighbourhood Matching Fund requires demonstrated, equivalent contributions from volunteer labour, other funding sources, and in-kind donations.

The Childcare Program Development Grant is available to non-profit organizations that are developing new programs or expanding existing licensed group childcare or school-age care programs and awards up to $5,000.

In past years, a much larger grant known as the Greenest City Grant was available to registered charities or registered BC not-for-profits to fund projects and programs that aim to establish, test, or build on ideas or actions that support Greenest City targets such as increasing access to nature. Grants average $35,000 to $45,000 per grant. The grant applications took place in early 2017 and 2018 and are not guaranteed to be renewed past 2020.
Appendix B.

VPB’s Rewilding Vancouver Plan

Aligned goals and sub-actions:

<table>
<thead>
<tr>
<th>Goal</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhance, protect, maintain and monitor the special wild places in Vancouver parks, beaches and open spaces through collaboration and strong partnerships. Encourage stewardship and education activities in and around these places.</td>
<td>Develop and grow informal collaborations to support activities at each priority wild place, including: shared stewardship plans, collaborative education plans, access to Park Board infrastructure and assets, funding, and other relevant types of support.</td>
</tr>
<tr>
<td>Initiate and enhance city-wide partnerships on a variety of nature-focused topics.</td>
<td>Explore opportunities to use Park Board infrastructure and staff resources to support activity and programming in special wild places (e.g. community centres, fieldhouses, gardening and programming staff, arborists)</td>
</tr>
<tr>
<td></td>
<td>Research and build database of existing organisations, programs, people, and other resources already working on priority topics and develop relevant and effective partnerships focused on collaborative planning and strategy development.</td>
</tr>
<tr>
<td></td>
<td>Develop understanding of curricular needs of environmental educators and other teachers and work to build partnerships that utilise Park Board assets.</td>
</tr>
<tr>
<td></td>
<td>Create an adopt-a-park program that encourages schools and other community groups to undertake stewardship and environmental education activities in their neighbourhood park.</td>
</tr>
<tr>
<td></td>
<td>Develop a collaborative strategy with the VSB to identify opportunities where environmental education and stewardship priorities between the Park Board and the VSB can be achieved together.</td>
</tr>
<tr>
<td></td>
<td>Explore further opportunities to utilise Vancouver Public Library resources (i.e. staff, space, materials) in support of environmental education and programming (e.g. nature themed book clubs in community centres).</td>
</tr>
</tbody>
</table>
Appendix C.

VPB parks and programs

The VPB is developing and renewing the physical aspects of parks and playgrounds across the city. The most relevant changes that have taken place in the last few years below and highlighted in Figure 3.1:

- The Outdoor Learning Project at Everett Crowley Park (2015 – present)
  - A partnership between CityStudio Vancouver, Everett Crowley Park Committee, and SFU Semester in Dialogue
  - Co-creating a community-driven outdoor learning space open to everyone including school groups, community organizations, and park users
  - Supported financially by a Vancouver Foundation grant and contributions from VPB
- Fifth and Pine Pop-up Park (completed 2016)
  - Includes trees, large wildflower meadow, and pollinator houses to benefit bees and other pollinators
  - Host community planting and tidying events to promote stewardship of space
- Sunset Park upgrade (planned)
  - Additional green space
  - Rebuilt playground
  - Planting areas with rain garden and lost creek feature
  - Naturalized areas with new trees
- Northeast False Creek (planned)
  - Will include a saltmarsh and habitat for urban wildlife
  - Will provide enhanced access to water
- Oakridge (planned)
  - Will be a nine-acre public park partially on the roof top and ground
- Will create a biodiverse, lush urban forest and connection to nature.
- Will ensure large canopy trees will thrive on all levels of the park.
- Natural play elements

**East Fraserland Parks (planned)**
- Development of a stretch of industrial land
- Will promote nature appreciation and play

**Smaller park restoration work:**
- New Brighton Shoreline Habitat Restoration project, with viewing decks to view wildlife (completed 2017)
- Tatlow and Volunteer Park stream restoration (planning phase)
- Renfrew Ravine and Renfrew Community Parks Master Plan implementation, which will preserve and enhance ecology in the area and increase educational opportunities for the public (implementation phase)

**Smaller playground work:**
- Creekside Park playground renewal, with natural play opportunities (completed 2017)
- Hillcrest and Riley Park improvements, with natural play opportunities (completed 2016)
- Douglas Park playground renewal, with outdoor classroom and natural play opportunities (*construction phase*)
- Clinton Park renewal, with natural play and water play opportunities (concept plan approved 2017)
- China Creek North renewal, with natural play opportunities (*planning phase*)

The following are nature-related programming currently provided through community centres by the VPB.

- **Summer series: Outdoor Drawing Class (Kerrisdale)**
- **Summer series: Nature Journaling (Trout Lake)**
• Summer series: Outdoor Adventure (Douglas Park)
• One-time: Animal Aware (Hastings)
• One-time: Parks Canada Trip Planning 101 (Hastings)
Appendix D.

Other entities facilitating nature connection

Environmental Educators Provincial Specialist Association

Environmental Educators Provincial Specialist Association (EEPSA) is a volunteer organization within the BC Teachers’ Federation (BCTF) that promotes networking, curriculum support, and professional development in environmental education. It provides links to environmental education programs throughout the province as well as classroom resources, including curriculum maps for teacher planning developed in consultation with the Ministry of Education. Additionally, teachers can attend professional development days such as leadership training, discussion of experiential and place-based learning in the renewed curriculum. Several communities across BC host local chapters, and EEPSA provides support for running a local chapter. Currently, Vancouver does not have one.

Vancouver Elementary School Teachers’ Association

The Vancouver Elementary School Teachers’ Association (VESTA) is a membership body of elementary school teachers in Vancouver. VESTA has several standing committees, which help organize activities for members, strategize around issues, and advise the VESTA Executive Committee on a variety of topics.

The Social Justice & Solidarity Committee strives to work with the sustainability contact at the school level. One of the VESTA Sustainability Committee’s Terms of Reference is “to consider, and potentially design and create projects, professional development opportunities, and lessons aids related to environmental justice topics for the use of VESTA member” (Vancouver Elementary School Teachers’ Association 2017).

Stanley Park Ecological Society (SPES)

SPES is a park partner with VPB through a formal stewardship agreement. They host educational and stewardship programs each year for school children and the public,
focused on increasing knowledge of Stanley Park while protecting it for future generations. They host school field trips from day programs to overnight camping for grades 4-7. They also host children’s programs, such as spring and summer day camps, birthday parties, and community group programs. SPES “promotes awareness of and respect for the natural world and plays a leadership role in the stewardship of Stanley Park through collaborative initiatives in education, research and conservation” (Stanley Park Ecological Society 2018). They provide reduced rates for inner-city schools, which are funded by donations to SPES. However, one of the biggest barriers to schools participating in SPES programming is not the cost of the programming, but instead the cost of transportation (Rawlyk).

**Pacific Spirit Park Society (PSPS)**

PSPS is a non-profit society that works with Metro Vancouver as a Regional Park Partners Program. Programming focuses on ecological restoration, data collection, monitoring, and environmental education. The primary aim of PSPS is to empower community volunteers through skills development and stewardship training. Programming and educational support include: monthly nature walks, volunteer invasive plant mapping, volunteer monitoring and maintenance, and educational kits for teachers to use in their classrooms.

**Environmental Youth Alliance**

EYA is a non-profit charity that cultivates transformative nature experiences for children and youth in urban environments to foster community connectedness, build ecological leadership skills, and enhance their well-being. Their primary focus is on programming such as hands-on native plant gardening, wild pollinator monitoring, wildlife habitat stewardship, urban rewilding projects, and citizen science data collection. Some of upcoming work will include providing the Wild Mind classroom workshops to middle- and high-school aged youth for hands-on activities as well as several rewilding, native plant, or garden opportunities for older youth.
VanDusen Botanical Garden

The VanDusen Botanical Garden is a public garden that provides programming in summer day camps and school field trips for children. They also provide professional development support for educators.

Charity grants

Habitat Conservation Trust Foundation GO Grants

The focus of GO Grants is to help get students outdoors learning and participating in hands-on experiences in nature. Field trip grant applications are available to K-12 classes and schools in BC. The maximum amount a single class can apply for is $600 and supports transportation, outdoor field trip equipment, and program fees.

Vancouver Foundation

The Vancouver Foundation has provided a range of grants over the years related to this field.

Others

Other organisations such as Boy Scouts, Girl Scouts, and the YMCA provide relatively affordable field trips and nature experiences.
Appendix E.

Nature Equity factors by Vancouver neighbourhood

Neighbourhoods in red are those that are high-priority and lacking in natural vegetation in public parks. Those in yellow are high-priority but have some semi-natural vegetation. Those in green are neighbourhoods with the highest public green space per capita.

<table>
<thead>
<tr>
<th>Neighbourhood</th>
<th>Population &lt;19 years old</th>
<th>Median Household Income ($)</th>
<th>Public green space (ha /1000 people)</th>
<th>Presence of semi-natural or natural vegetation?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grandview-Woodland</td>
<td>14%</td>
<td>43,038</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>Fairview</td>
<td>9%</td>
<td>61,431</td>
<td>0.42</td>
<td>y</td>
</tr>
<tr>
<td>Mount Pleasant</td>
<td>12%</td>
<td>48,394</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>Victoria-Fraserview</td>
<td>20%</td>
<td>61,857</td>
<td>0.59</td>
<td></td>
</tr>
<tr>
<td>Sunset</td>
<td>24%</td>
<td>60,773</td>
<td>0.68</td>
<td></td>
</tr>
<tr>
<td>Marpole</td>
<td>19%</td>
<td>48,308</td>
<td>0.72</td>
<td>y</td>
</tr>
<tr>
<td>Renfrew-Collingwood</td>
<td>20%</td>
<td>55,074</td>
<td>0.74</td>
<td>y</td>
</tr>
<tr>
<td>Downtown</td>
<td>8%</td>
<td>60,387</td>
<td>0.99</td>
<td>y</td>
</tr>
<tr>
<td>Kensington-Cedar Cottage</td>
<td>20%</td>
<td>56,879</td>
<td>1.03</td>
<td>y</td>
</tr>
<tr>
<td>Kitsilano</td>
<td>13%</td>
<td>60,147</td>
<td>1.16</td>
<td>y</td>
</tr>
<tr>
<td>West End</td>
<td>6%</td>
<td>43,041</td>
<td>1.24</td>
<td>y</td>
</tr>
<tr>
<td>Arbutus-Ridge</td>
<td>23%</td>
<td>60,513</td>
<td>1.36</td>
<td>y</td>
</tr>
<tr>
<td>Strathcona</td>
<td>12%</td>
<td>20,866</td>
<td>1.41</td>
<td></td>
</tr>
<tr>
<td>South Cambie</td>
<td>19%</td>
<td>70,883</td>
<td>1.64</td>
<td>y</td>
</tr>
<tr>
<td>Hastings-Sunrise</td>
<td>20%</td>
<td>59,952</td>
<td>1.94</td>
<td>y</td>
</tr>
<tr>
<td>Riley Park</td>
<td>20%</td>
<td>68,465</td>
<td>3.27</td>
<td>y</td>
</tr>
<tr>
<td>Shaughnessy</td>
<td>22%</td>
<td>104,300</td>
<td>3.32</td>
<td>y</td>
</tr>
<tr>
<td>Kerrisdale</td>
<td>22%</td>
<td>70,409</td>
<td>4.64</td>
<td>y</td>
</tr>
<tr>
<td>Oakridge</td>
<td>20%</td>
<td>55,594</td>
<td>5.03</td>
<td>y</td>
</tr>
<tr>
<td>Killarney</td>
<td>22%</td>
<td>59,711</td>
<td>7.30</td>
<td>y</td>
</tr>
<tr>
<td>Dunbar-Southlands</td>
<td>25%</td>
<td>107,374</td>
<td>11.53</td>
<td>y</td>
</tr>
<tr>
<td>West Point Grey</td>
<td>21%</td>
<td>84,448</td>
<td>18.63</td>
<td>y</td>
</tr>
<tr>
<td>All of Vancouver</td>
<td>17%</td>
<td>56,113</td>
<td>1.75</td>
<td>y</td>
</tr>
</tbody>
</table>
Appendix F.

VanPlay survey results

For all respondents, respondents with children <19, and for 5 focus neighbourhoods

<table>
<thead>
<tr>
<th>Question</th>
<th>Have Children &lt;19</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What do you think should be the top three (3) priorities for Vancouver's parks and recreation amenities over the next 25 years?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parks</td>
<td>46.22</td>
<td>49</td>
</tr>
<tr>
<td>Community Centre facilities</td>
<td>46.83</td>
<td>38.72</td>
</tr>
<tr>
<td>Natural areas</td>
<td>30.37</td>
<td>37.63</td>
</tr>
<tr>
<td>Playgrounds</td>
<td>38.29</td>
<td>17.51</td>
</tr>
<tr>
<td><strong>What do you think are the top three (3) factors for us to consider as we plan for the future of Vancouver's parks and recreation? Other responses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population growth</td>
<td>22.22</td>
<td>11.64</td>
</tr>
<tr>
<td>New and expanded amenities</td>
<td>24.07</td>
<td>22.22</td>
</tr>
<tr>
<td><strong>Are there any challenges or barriers that prevent you from enjoying Vancouver’s parks and recreation?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>27.37</td>
<td>33</td>
</tr>
<tr>
<td>Facility and program availability</td>
<td>30.33</td>
<td>23.22</td>
</tr>
<tr>
<td>Timing of programs and/or events</td>
<td>27.5</td>
<td>19.76</td>
</tr>
<tr>
<td><strong>In your opinion, what could we do to improve the quality of Vancouver's parks and recreation?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve quality of services and programs</td>
<td>37.42</td>
<td>33.22</td>
</tr>
<tr>
<td>Increase availability of services and programs currently not offered</td>
<td>42.58</td>
<td>33.19</td>
</tr>
<tr>
<td><strong>What’s your BIG IDEA for the future of parks and recreation in Vancouver?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protect and expand green spaces, natural areas, wildlife, biodiversity</td>
<td>12.39</td>
<td>14.7</td>
</tr>
<tr>
<td>Improve, repair and upgrade existing amenities</td>
<td>14.21</td>
<td>11.66</td>
</tr>
</tbody>
</table>
### What do you think should be the top three (3) priorities for Vancouver's parks and recreation amenities over the next 25 years?

<table>
<thead>
<tr>
<th></th>
<th>Kensington-Cedar Cottage</th>
<th>Sunset</th>
<th>Victoria-Fraserview</th>
<th>Marpole</th>
<th>Renfrew-Collingwood</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks</td>
<td>56.38</td>
<td>42.86</td>
<td>64.86</td>
<td>29.41</td>
<td>50.00</td>
<td>49.00</td>
</tr>
<tr>
<td>Natural areas</td>
<td>38.26</td>
<td>35.71</td>
<td>32.43</td>
<td>41.18</td>
<td>35.23</td>
<td>38.72</td>
</tr>
<tr>
<td>Trails</td>
<td>16.78</td>
<td>19.05</td>
<td>18.92</td>
<td>14.71</td>
<td>22.73</td>
<td>37.63</td>
</tr>
<tr>
<td>Playgrounds</td>
<td>24.16</td>
<td>28.57</td>
<td>16.22</td>
<td>23.53</td>
<td>21.59</td>
<td>17.51</td>
</tr>
<tr>
<td>Gardens</td>
<td>6.04</td>
<td>2.38</td>
<td>10.81</td>
<td>5.88</td>
<td>5.68</td>
<td>8.97</td>
</tr>
</tbody>
</table>

### What do you think are the top three (3) factors for us to consider as we plan for the future of Vancouver's parks and recreation?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Kensington-Cedar Cottage</th>
<th>Sunset</th>
<th>Victoria-Fraserview</th>
<th>Marpole</th>
<th>Renfrew-Collingwood</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy urban ecologies</td>
<td>20.81</td>
<td>23.81</td>
<td>16.22</td>
<td>20.59</td>
<td>21.59</td>
<td>23.33</td>
</tr>
<tr>
<td>Healthy ecologies: urban forest and biodiversity</td>
<td>15.44</td>
<td>21.43</td>
<td>37.84</td>
<td>11.76</td>
<td>26.14</td>
<td>22.64</td>
</tr>
</tbody>
</table>

### Are there any challenges or barriers that prevent you from enjoying Vancouver’s parks and recreation?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Kensington-Cedar Cottage</th>
<th>Sunset</th>
<th>Victoria-Fraserview</th>
<th>Marpole</th>
<th>Renfrew-Collingwood</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>24.32</td>
<td>21.43</td>
<td>17.14</td>
<td>17.65</td>
<td>30.68</td>
<td>33</td>
</tr>
<tr>
<td>Facility and program availability</td>
<td>33.78</td>
<td>19.05</td>
<td>31.43</td>
<td>17.65</td>
<td>27.27</td>
<td>23.22</td>
</tr>
<tr>
<td>Timing of programs and/or events</td>
<td>30.41</td>
<td>30.95</td>
<td>22.86</td>
<td>35.29</td>
<td>35.23</td>
<td>19.76</td>
</tr>
<tr>
<td>Parking</td>
<td>37.14</td>
<td>20.59</td>
<td>20.45</td>
<td>29.41</td>
<td>20.45</td>
<td>17.11</td>
</tr>
<tr>
<td>Cost</td>
<td>18.24</td>
<td>21.43</td>
<td>20.00</td>
<td>29.41</td>
<td>20.45</td>
<td>16.85</td>
</tr>
</tbody>
</table>
Appendix G.

Case studies

San Francisco, California

Overview of Initiative

The collaborative group working towards connecting children to nature in San Francisco is known as the San Francisco Children & Nature Forum (San Francisco Children & Nature 2017). Their vision is “nature connection for every child, every day” (San Francisco Children & Nature 2017). SFC&N was first formed in 2011 as a forum to convene experts in the area and to ultimately create a Children’s Bill of Outdoor Rights.

In both the above endeavours SFC&N was successful, but the national Cities Connecting Children to Nature Initiative catalyzed more direct action and funding support from the municipal government. Today, SFC&N is driven by the mission “to equitably improve nature connection for children and youth in San Francisco through advancing institutional and public support, using data to identify inequities and measure change over time, and supporting coordinated planning and action among a diverse set of local organizations and agencies” (San Francisco Children & Nature 2017).

SFC&N uses a collective impact structure and is composed of city agencies, non-profits and educators directly and indirectly involved in nature connection for children in San Francisco. Some of these include: the Mayor’s Office, the SF Recreation and Parks, San Francisco Unified School District (SFUSD), the YMCA, Education Outside (a non-profit organization providing science activation and environmental stewardship education outdoors in public schools), and the Presidio Trust (a federal agency managing Presidio park).

Members of these groups participate in several different teams: Executive Council; Backbone Team; Steering Committee; Core Team; Work Groups; and Affiliates. Each team performs a different function and are critical to sustaining the long-term work of the Initiative.
The work of SFC&N concentrates on the following areas and goals:

- **Educational Environments**: Increase equity, quality and abundance of nature experiences for children in their schools, with an initial emphasis on early childhood education sites.

- **Neighborhood and Recreational Environments**: Increase equity, quality and abundance of nearby nature experiences for children and youth where they live and within San Francisco.

- **Community and Youth Engagement**: Engage community and youth leaders from equity zone neighborhoods

- **Cultural Relevancy**: Ensure that children in San Francisco have culturally relevant nature experiences.

- **Measurement and Data**: Develop shared performances measures for collaborative and collect data on those measures to identify inequities and measure change over time

**Supporting policies**

An important step in public awareness was the Children’s Outdoor Bill of Rights, which was brought as a resolution by the City and County of San Francisco in 2014. The Bill recognized that "direct exposure to nature is a necessary component of a child's physical and emotional wellbeing, and cognitive development" ("San Francisco Children’s Outdoor Bill of Rights" 2014). Many stakeholders approached to endorse the Bill would later become members of the new iteration of SFC&N following the involvement of the national CCCN Initiative, and thus was an important step in easing the process of creating the collective impact team.

As well, SFC&N emphasizes the importance of shared measurement. The following data and frameworks were or will be collected:

- **An Assets Inventory** of places, programs, partnerships, policies and plans that involve nature connection for children

- **Identification of Equity Zone Neighbourhoods** using CalEnviroScreen 2.0, to identify California communities that are disproportionately burdened by multiple sources of pollution

- **Results-Based Accountability framework** to determine and gather overall indicator and performance measures
• **Outcome Framework** to ultimately measure equitable nature-based experiences

Finally, the initiative had funding support from a variety of sources, including the Implementation Grant from the national initiative -- $50,000 USD for general implementation (from Presidio Trust) and a $25,000 Kaiser grant to support assessment of green schoolyards (Education Outside) (San Francisco Children & Nature 2018).

**Green schoolyards**

The San Francisco schools have a robust Green Schoolyard Program for K-12. The Green Schoolyard program is supported by over $17 million USD in voter-approved funds since 2003 (“SFUSD Green Schoolyard Bond Program Program Update” 2017) through a municipal Bond Program. As of 2017, 102 of 145 elementary, middle, or high schools are involved with the Green Schoolyard Program; 78 of those schools have completed projects and 9 more are in the design phase (“SFUSD Green Schoolyard Bond Program Program Update” 2017). The main priority of the Program is to create outdoor learning and nature environments in designated elementary schools as well as to enable schools to expand and/or improve current outdoor education and green schoolyard facilities (“SFUSD Green Schoolyard Bond Program Program Update” 2017).

Eligible schools request funds via an application process, with priority given to those who have not received Green Schoolyard Program funding in the past. School communities are given autonomy in the design of their green space to meet the school’s objectives. The program also encourages the participation of the school community, including parents, students, teachers, and administrators (“SFUSD Green Schoolyard Bond Program Program Update” 2017). Greening of a schoolyard can range from replacing asphalt with social seating, trees, or gardens to outdoor classrooms.

Further work through the SFCCCN is currently concentrating on increasing equity and abundance of nature experiences for children in early childhood education sites (ECE sites). In 2017, an assessment of 33 ECE sites was conducted to define and evaluate the quality of nature experiences. Future work will expand assessment to all ECE sites; determine high-priority sites; develop intervention plans; connect with identified schools and communities to secure their participation, and Identify projects,
funding resources and trainings to increase equitable access to nature for ECE sites (San Francisco Children & Nature 2018).

**Place-making for nature connection design**

The Neighbourhood and Recreational Environments team focuses on place-making and modifying physical spaces in the city to facilitate nature connection. Because place-making requires tangible changes, it can be quite resource-intensive. As such, the team decided early on to influence other projects as they came online, rather than be the place-makers themselves (Raffa). The following objectives lead the place-making work:

- Define tiered standards for (1) natural features and (2) nature connection for children in public spaces.
- Assess nature connection opportunities in high-priority neighborhoods using targeted data measures
- Capitalize on existing policies, partnerships and emerging initiatives in the City of San Francisco to address the need for equitable nature experience (public realm collaboration) through identification and support of projects

The primary outcome of this work is influencing the SF Planning’s Urban Design Guidelines to include nature connection opportunities, which is currently in the draft phase. Application of and compliance with the Urban Design Guidelines is mandatory in the permit review process.

**Community and Youth Engagement**

Finally, the community and youth engagement team’s primary goal is to engage community and youth leaders from equity zone neighborhoods. They are driven by three objectives:

- Objective 1: Gather strategic data on nature connection for children and youth in San Francisco, including what children and families want to see and experience in their neighborhoods.
- Objective 2: Identify issues and barriers to equitable nature connection and use data to inform planning towards addressing those issues and barriers.
- Objective 3: Involve community, parents and youth leaders in planning for equitable nature connection for children and youth.
Ultimately, there will be youth-led community research to gather baseline data for outcomes framework on nature connection experiences that will then be used to help inform the work of the other three work teams and the overall CCCN-SF initiative.

Austin, Texas

Overview of Initiative

The City of Austin has emerged as a strong leader in taking action to equitably connect children to nature. Over the years, a network of organisations, governmental departments, healthcare professionals, and educators dedicated to connecting children regularly to nature has been growing in Austin (Austin CCCN Implementation Plan 2016). This network, known as the Children in Nature Collaborative of Austin, has over 40 member organisations, with the primary function of providing a venue for stakeholders to come together and share and seek resources collectively, collaborate more effectively and streamline programmatic efforts (“Children in Nature Collaborative of Austin,” n.d.).

In 2016, the City of Austin launched the Cities Connecting Children to Nature Initiative. Applying an equity perspective was critical in the Austin Initiative, as Austin has a history of systemic issues of equitability and segregation. This complexity of social issues has created major barriers to nature access for children cannot be solved by one policy or government organisation (City of Austin 2016). Therefore, the Austin Initiative took a Collective Impact approach to involve city leadership with actors across many sectors in creating equitable access to nature.

The CCCN brought together different municipal departments, the Austin Independent School District (AISD), and representatives from multiple sectors and industries. While a previous network of groups with shared values existed, the new CCCN Initiative brought deeper collaboration and a unified vision of ensuring every child has abundant and equitable access to nature at their home, neighborhood, and school.

The Initiative governance’s structure is composed of a Core Planning Team and six Working Groups with interdepartmental and cross-sectors members. The Core Planning team coordinates the strategic planning process and provides backbone support through identifying a common agenda, shared metrics, and mutually reinforcing
activities. The Working Groups identify major gaps, barriers, opportunities, and priorities in the following focus areas: Data collection and analysis; education; non-profit; health; policy; community engagement.

**Supporting policies**

Like San Francisco, Austin took two actions to support the work that directly connects children to nature: an outdoor bill of rights and data collection to establish baselines and impacts of policies.

Austin’s Children’s Outdoor Bill of Rights was brought as a resolution by city council in 2016. The Bill provides public recognition of the CCCN Initiative and public awareness of the importance of connecting children to nature (City of Austin 2016).

The establishment of shared metrics and baseline data was also critical to the Initiative. To understand equity concerns and distribution of nature, the Data and Gap Analysis Working Group designed a GIS model that created a nature equity score. This score is composed of two factors: a nature score (including park acreage, tree canopy, and the level of restriction to access a park) and potential impact score (median income and the population of children). The nature equity score was then used to establish three high-priority neighbourhoods to concentrate efforts. A measurement framework to understand baseline conditions and the success of the implementation plan strategies within Austin was also established. The framework measures indicators in different categories (e.g., health, stewardship, policy, and green infrastructure), proposes potential data sources, and evaluates if data can be disaggregated by demographic or geographical factors. A community survey was used to identify barriers and favourite nature spaces. The CCCN also collated a directory of nature-based programming offered by non-profits, schools, the City, and private industry through a program survey that was completed by over 90 organisations. Further assessment is still needed, including the need to understand the opportunities for environmental education through public-school curriculum (Knight).

Like San Francisco, Austin also received the $75,000 implementation grants from NLC and CNN. The PARD has also dedicated an additional $25,000 in funding to assist in the planning.
Green schoolyards

The primary implementation strategy for the CCCN Project is a Green School Parks Initiative. The aim of the initiative is to create nature-rich environments on school campuses in areas of Austin with low Nature Equity Scores. Because this strategy capitalizes on shared ownership agreements between AISD and the Parks and Recreation Department, there are fewer barriers to activating the land to connect children to nature. Currently, 25 AISD campuses have these agreements. Besides institutionalizing green schoolyard practice in schools, they are also a cost-effective way to create more community park space (Knight) and thus serve a dual function. Moreover, the strategy addresses two barriers identified in the community survey: a perceived lack of safety in parks, and the lack of access to nearby park space. This work is also in line with a 2017 AISD bond specifying that all new or renovated school facilities will have outdoor learning environments (Knight).

Currently, the Initiative is in the piloting phase, working with one school to collaboratively implement a green schoolyard. This work will serve as a model to be replicated across other schools. Schools that can be part of the initiative must meet the following requirements: must be in a focus area, as calculated by the nature equity score; the school must have an existing shared ownership agreement for the park space between the City and the School District; there must be active interest in participating from the school’s administration, Parent Teacher Advisory (PTA), and others; there must be support within the school and community. Once chosen, an Implementation Manager housed in the Parks and Recreation Department will lead the initiative, collaborating with school administration, teachers, parents, the PTA, and surrounding community to implement changes.

Public awareness

Through community engagement and strategic planning, the Initiative determined that there was a general lack of awareness of the benefits of nature connection for children and what park and nature resources exist in residents’ local communities. Therefore, another strategy underway is a public awareness campaign to promote a connection to nature for children, as well as specialized campaigning for
neighbourhoods to learn what is available in their communities. The Children’s Outdoor Bill of Rights was one component of the campaign.

**Program and park activation**

Because Austin already has a rich body of organisations providing nature-based programs for youths, the strategy undertaken by the Initiative is to develop a cohesive network for nature-based program providers. As well, in neighbourhoods where respondents cited a lack of programming as a barrier, the Parks and Recreation Department is beginning to schedule park activities in these areas.

**School support – recess and curriculum development**

In the 2016/2017 school year, the AISD adopted a policy to mandate all elementary students receive 30 minutes of unstructured outdoor playtime each day. Previously, elementary students were only guaranteed a 135 minutes of weekly structured play time as mandated by the state. In low-income schools, this may have been the only playtime students would have due to pressure in preparing students for standardized tests (McGee 2017).

As well, the Austin Initiative recently hired a part-time curriculum expert to work with staff to build outdoor learning lesson plans that follows the Texas curriculum (Knight). This position was funded through a 3M grant.

**Policy tracking**

Finally, the Austin Initiative is also working on developing and proposing nature access policy initiatives for inclusion in city development code and department master plans. These include the creation of the Nature Space type, a menu of choices for private developers developing parks to satisfy their parkland dedication requirements for space open to the public, and storm-water amenity rules within the Environmental Criterial Manual (ECM) for recreational ponds (Knight). In the future, the Initiative may develop nature play guidelines or help guides for developers, led by the Austin Parks and Recreation Department (Knight).
## Appendix H.

### Screening criteria matrix

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Question</th>
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<tbody>
<tr>
<td>Equity</td>
<td>Can the option <em>actively</em> provide connection to nature to children to those who may not otherwise have opportunity to do so?</td>
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<tr>
<td>Impact at reasonable cost</td>
<td>Does the option address a gap in the Vancouver policy landscape?</td>
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<tr>
<td>Meaningful nature connection</td>
<td>Meets at least two of the tree criteria for meaningful connections to nature: frequent; profound experiences; or mentorship</td>
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<tr>
<td>Appropriate agent</td>
<td>Is the public sector the right agent to implement these policies, as opposed to private sector, community organisations, or other associations?</td>
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<tr>
<td>Ease of implementation</td>
<td>Can barriers (financial, administrative, land use, jurisdictional) be overcome to implement the option?</td>
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<tr>
<td>Policy strategy</td>
<td>Equity</td>
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<td></td>
<td>Option can be implemented in targeted communities with nature deficiency, and likely to be used in some capacity by all students in school.</td>
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<tr>
<td></td>
<td>Option can be implemented in targeted communities with nature deficiency, but threshold for entry from children and parents is quite high.</td>
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<tr>
<td></td>
<td>Requires buy-in and interest from teachers, who must balance many educational priorities and values.</td>
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<tr>
<td>Option will facilitate more creation of natural spaces, but likely to be guidelines (not standards). As well, development is occurring at different rates across the city.</td>
<td>Option will facilitate more creation of natural spaces, but likely to be guidelines (not standards). As well, development is occurring at different rates across the city.</td>
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<tr>
<td>Option will create more natural spaces and can be implemented in areas with greatest need.</td>
<td>Provides quality access to nature, and likely frequent access if parks are used by communities.</td>
<td>VPB is activating parks through the Environmental Stewardship plan but could have stronger focus on rewilding at a child-scale and in high-priority neighbourhoods.</td>
<td>The VPB is the appropriate agent.</td>
<td>Option would only require slight re-focusing of initiatives VPB is already undertaking.</td>
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<tr>
<td>Option will facilitate greater use of pre-existing public spaces and can be implemented in areas with greatest need. Identified as a need in target neighbourhoods.</td>
<td>Potential to provide mentorship and frequent access to nature.</td>
<td>VPB is aware of the need to increase access programming, but unclear if aware of need to target high-priority neighbourhoods.</td>
<td>Different organisations can provide this option, and some may be better equipped than the public sector to do so. Supporting these organisations in their provision of this option may be preferred.</td>
<td>Option would only require slight re-focusing of initiatives VPB is already undertaking or planning to undertake.</td>
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<tr>
<td>Option will create more natural spaces and can be implemented in areas with greatest need.</td>
<td>Provides frequent access to nature, but no guarantee to provide quality access or mentorship.</td>
<td>COV already working to build stronger green corridors, although could have a stronger focus on child-scale and greater natural features.</td>
<td>The VPB and COV are the appropriate agents.</td>
<td>Limited public land available to increase green connectivity except on greenways.</td>
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<tr>
<td>Greatest support can be targeted to communities with nature deficiency and little other means to access nature.</td>
<td>Potential to provide mentorship and access to quality nature, but scale and quality of option can vary greatly.</td>
<td>Financial constraint for field trips was identified as a barrier by several interviewees.</td>
<td>Funding is usually provided by Parent-Teacher Associations or charities and not the public sector. However, there could be a role for small grants like the neighbourhood grant.</td>
<td>Would require sustained financial support over the years, reducing likelihood of equitable coverage.</td>
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<tr>
<td>Will guarantee all public school students receive a minimum of time outdoors.</td>
<td>Provides frequent access to nature, but quality and mentorship is not guaranteed.</td>
<td>Insufficient recess time has not been identified as a concern in Vancouver.</td>
<td>The VSB is the appropriate agent.</td>
<td>Passing by-law or modifying VSB policy may be administratively complex.</td>
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<tr>
<td>Can be targeted to communities with nature deficiency.</td>
<td>Can increase frequency and quality of access to nature, as well as mentorship, but is not guaranteed.</td>
<td>There are no data on Vancouverites’ awareness of the need for children to connect to nature or programming that already exists.</td>
<td>The COV is an appropriate agent, and a campaign would provide co-benefit of supporting several other policy goals of the City.</td>
<td>Requires funding and a COV department lead, but government levers for awareness campaigns already exist.</td>
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<tr>
<td>Immersive, year-long outdoor school</td>
<td>Would not be able to be implemented on a large scale due to high expenses.</td>
<td>Will increase frequency, quality of access to nature and mentorship.</td>
<td>There is high demand for the equivalent high-school level program.</td>
<td>Requires serious funding from VSB, a very resource-constrained organisation.</td>
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Appendix I.

Green Schoolyards Resources

Components of successful green schoolyard implementation, from the Children & Nature Initiative’s Green Schoolyard Strategy:

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<tr>
<th>School Support</th>
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<tr>
<td>School Administration Leadership</td>
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<tr>
<td>Teacher Training &amp; Curriculum Integration</td>
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<td>On-Going Maintenance</td>
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<tr>
<th>Design</th>
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<td>Research-Based Design</td>
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<td>Participatory Design</td>
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<td>Design for Environmental Impact</td>
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<th>Community Engagement</th>
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<tr>
<td>Out-of-School-Time Access</td>
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<td>After School Programming</td>
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<td>Community Recreational Use</td>
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<th>Foundational Elements</th>
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<td>Supporting Policy</td>
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<td>Sustainable Funding</td>
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<td>Strategic Partnerships</td>
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Further resources for Green and Joint Schoolyard Agreements:

There is a green schoolyard movement happening worldwide. Several cities (e.g., San Francisco (Chapter 0), Austin (Chapter 0); as well as Berlin, Germany (“Grün Macht Schule” 2018) and Paris, France (Voce 2017). have green schoolyards and/or joint schoolyard agreements that can be used as templates. The CCCN and Harvard Law’s Centre for Health Law and Policy Innovation several resources available to municipalities seeking support on implementation planning, including potential funding sources (“Green Schoolyards Resource Hub” 2018; Downer 2016).