THE ST. GEORGE RAINWAY:
BUILDING COMMUNITY RESILIENCE WITH GREEN INFRASTRUCTURE

by

Joshua Welsh

Bachelor of Fine Arts, School of Design, Rochester Institute of Technology,
Rochester, NY, 1997

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Abstract

This thesis was written with cognizance of humanity’s passage into the current epoch: the Anthropocene. Impacts the human species currently have upon the biosphere are physically and chemically altering it to degrees that have crossed thresholds of sustainability. The side effects of this call for resilience to enable healthful transitions into the unstable and unpredictable future. Central to global climate change and central to the profession of landscape architecture is the element: water. The St. George Rainway offers a new opportunity to be a demonstration project for the City of Vancouver where the City and the community of Mount Pleasant act as collaborators with design, construction, and maintenance of a project with water in the public realm.

There are three components essential to this work: a community survey, a series of stakeholder and expert interviews, and a design-application of theory using landscape architecture. The survey and interviews establish the local context for the thesis, a baseline for presence of social cohesion, and a framing for the applicability of the ten prominent characteristics of resilient communities. Taken together, the application of design responds to the collective voice and needs of the community and provides a set of goals, phases, strategies for design as a framework to help realize future implementation of the St. George Rainway.

The voluntary engagement in the physical transformation of one’s community can provide opportunity for a growth in social cohesion. Subsequently, this growth can improve the conditions that fostered the bonds and bridges within that community that inspired the initial voluntary engagement. Green infrastructure, when considered through this lens, has a reciprocal relationship with social cohesion, where the improvement of one feeds into the improvement of the other. This model could therefore provide both a resilient option for physical development of land and for social development of community for a neighbourhood like Mount Pleasant by encouraging more interaction among neighbours and with the local public realm. The St. George Rainway: Building Community Resilience with Green Infrastructure aims to provide a framework for this.
Preface

This thesis is original, unpublished, intellectual product of the author, J. T. Welsh. The fieldwork used as a foundation for Chapters 3-4 was covered by UBC Human Ethics ID #H13-00450.
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Definitions

**Adaptive Management** is “an integrated, multidisciplinary approach for confronting uncertainty in natural resources issues...[that] acknowledges that managed resources will always change as a result of human intervention, that surprises are inevitable, and that new uncertainties will emerge...Adaptive management acknowledges that policies must satisfy social objectives, but also must be continually modified and flexible for adaptation to these surprises” (Gunderson, 1999, p. 2).

**Blueways** are “existing and potential access to waterways” (France, 2005, p. 210). In the case of the St. George Rainway, the term *blueway* is synonymous with *rainway*.

**Cascadia** refers to the “geographical affinity...[that] crosses state, provincial, and international boundaries and is variously defined as comprising British Columbia, the Yukon, and the US states of Washington, Oregon, Idaho, Montana, and Alaska. The more common definition, however, limits its area to Washington, Oregon, and British Columbia” (Hodge & Robinson, 2002, p. 310). This project uses the more common definition.

**Combined Sewer Overflow (CSO)** occurs when “a combined sewer system conveys both sanitary sewage and stormwater in one piping system. During normal dry weather conditions, sanitary wastewater collected in the combined sewer system is diverted to the wastewater treatment plant before it enters natural waterways. During periods of significant rainfall, the capacity of a combined sewer may be exceeded. When this occurs, excess flow, a mixture of stormwater and sanitary wastewater, is discharged at CSO points, typically to rivers and streams. Release of this excess flow is necessary to prevent flooding in homes, basements, businesses, and streets” (US EPA, 2013b).

**Complex Adaptive Systems (CAS)** are systems “in which macroscopic system properties such as trophic structure, diversity-productivity relationships, and patterns of nutrient flux emerge from interactions among components, and may feed back to influence the subsequent development of those interactions” (Levin, 1998, p. 431).
Daylighting refers to a process that takes a historically present body of water with a current, that was once channeled into a pipe, and bring it to the surface of the land. The goal is to remove the body of water’s flows from the loads of the sewer system and revitalize the historic stream, creek, river, etc. to a degree of its original condition above ground and open to the air and sky (France, 2010).

The Dedicated Fire Protection System (DFPS) in Vancouver is a “project that will make sure there is a good supply of water for fighting fires in the high-density areas of the downtown peninsula, Kitsilano, and Fairview Slopes. The DFPS consists of two saltwater pumping stations, and a dedicated, earthquake-resistant pipeline” (City of Vancouver, 2012c).

Downspout Disconnection “refers to the rerouting of rooftop drainage pipes to drain rainwater to rain barrels, cisterns, or permeable areas instead of the storm sewer. Downspout disconnection stores stormwater and/or allows stormwater to infiltrate into the soil. This simple practice may have particularly great benefits in cities with combined sewer systems” (US EPA, 2013c).

The Ecological Footprint “tracks humanity’s demands on the biosphere by comparing humanity’s consumption against the Earth’s regenerative capacity, or biocapacity. It does this by calculating the area required to produce the resources people consume, the area occupied by infrastructure, and the area of forest required for sequestering CO2 not absorbed by the ocean” (World Wildlife Fund, 2012, p. 36).

Ecosystem Services are “the benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services, such as nutrient cycling, that maintain the conditions for life on Earth” (World Health Organization, 2005).

Green infrastructure is an approach “to maintain healthy waters, provide multiple environmental benefits and support sustainable communities. Unlike single-purpose gray stormwater infrastructure, which uses pipes to dispose of rainwater, green infrastructure uses vegetation and soil to manage rainwater where it falls. By weaving
natural processes into the built environment, green infrastructure provides not only stormwater management, but also flood mitigation, air quality management, and much more” (US EPA, 2012a).

**Greenways** are “the publicly accessible parks, trails, and corridors of open space often bordering rivers and streams” (France, 2005, p. 210).

**Global Climate Change (GCC)** refers to “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods” (UNFCCC, 2013).

**Grey Infrastructure** “takes wastewater away from our fields, homes and businesses. In cities and towns, we rely on sewers to move and treat human or commercial waste. Storm sewers carry rain and snowmelt. Often this water contains pathogens and bacteria from human and animal waste, chemicals and heavy metals from our industries, gas & oil from roads, and fertilizers and pesticides from farms and gardens...[but] the idea that ‘dilution is the solution to pollution’ is not the way to get away from stormwater and its pollutants” (US EPA, 2013a).

**Greywater** contains “water from the kitchen, bath and/or laundry, which generally does not contain significant concentrations of excreta” (World Health Organisation, 2006, p. 136). This type of water can be commonly used for non-potable tasks such as toilet flushing and laundry washing.

**Panarchy** describes “a concept that explains the evolving nature of complex adaptive systems. Panarchy is the hierarchical structure in which systems of nature (for example, forests, grasslands, lakes, rivers, and seas), and humans (for example, structures of governance, settlements, and cultures), as well as combined human-nature systems (for example, agencies that control natural resource use)...and social-ecological systems (for instance, co-evolved systems of management)...are interlinked in never-ending adaptive cycles of growth, accumulation, restructuring, and renewal” (Holling, 2001, p. 392).
Permeable Paving refers to “paved surfaces that infiltrate, treat, and/or store rainwater where it falls. Permeable pavements may be constructed from pervious concrete, porous asphalt, permeable interlocking pavers, and several other materials” (US EPA, 2013c).

Pocket Wetlands “are constructed shallow marsh systems designed and placed to control stormwater volume and facilitate pollutant removal. As engineered constructed facilities, pocket wetlands have less biodiversity than natural wetlands but still require a base flow to support the aquatic vegetation present. Pollutant removal in these systems occurs through the settling of larger solids and course organic material and also by uptake in the aquatic vegetation” (WERF, 2009).

Rain Gardens, “also known as bioretention or bioinfiltration cells...are shallow, vegetated basins that collect and absorb runoff from rooftops, sidewalks, and streets. Rain gardens mimic natural hydrology by infiltrating and evapotranspiring runoff” (US EPA, 2013c).

Rainwater Harvesting (RWH) use systems to “collect and store rainfall for later use. When designed appropriately, rainwater harvesting systems slow and reduce runoff and provide a source of water” (US EPA, 2013c). Harvested water is most commonly acquired from rooftops, but could be sourced from other impervious surfaces such as parking lots, sidewalks, and roadways.

Rainway (see Blueways)

Resilience is the “ability of a social system to respond and recover from disasters and includes those inherent conditions that allow the system to absorb impacts and cope with an event, as well as postevent, adaptive processes that facilitate the ability of the social system to reorganize, change, and learn in response to a threat” (Cutter, et al., 2008). Further, “in a resilient socialecological system, disturbance has the potential to create opportunity for doing new things, for innovation and for development” (Folke, 2006).
Social Capital “considers both ‘individual social capital’ (the social networks through which an individual finds the resources he or she needs), as well as ‘collective social capital’ (the networks formed by social groups within a community to achieve the resources needed to attain their goals)” (Health Canada, 2006).

Social Cohesion is “a state of affairs concerning both the vertical and the horizontal interactions among members of society as characterized by a set of attitudes and norms that includes trust, a sense of belonging and the willingness to participate and help, as well as their behavioural manifestations” (Chan, et al., 2005).

Socioecological Systems (SES) exist with the understanding that “there are neither natural or pristine systems without people nor social systems without nature. Social and ecological systems are not just linked but truly interconnected and co-evolving across spatial and temporal scales...[and] that earth’s ecosystems, from local areas to the biosphere as a whole, provide the biophysical foundation and ecosystems services for social and economic development” (Stockholm Resilience Centre, 2007).

Sustainable Development is composed of two parts. “Sustainability is the capacity to create, test, and maintain adaptive capability. Development is the process of creating, testing, and maintaining opportunity. The phrase that combines the two, ‘sustainable development’, therefore refers to the goal of fostering adaptive capabilities while simultaneously creating opportunities. It is therefore not an oxymoron but a term that describes a logical partnership” (Holling, 2001, p. 399).

Traffic Calming “is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behaviour and improve conditions for non-motorized street users” (Transportation Association of Canada & Canadian Institute of Transportation Engineers, 1998, p. 1). In Vancouver, common traffic calming methods include traffic circles, curb bulges, laneway speed humps, traffic diverters, and separated lanes.

Water Balancing refers to the following: “At land surfaces the soil column responds dynamically to the climatic sequence of precipitation and evapotranspiration events and accepts part of the moisture during periods of precipitation, pumps some of this back to the surface during evaporative periods, and rejects the remainder to the
water table more or less continuously...The quantitative relation among the long-term averages of this partition of precipitation is called the 'water balance'” (Eagleson, 1978, p. 705).

**Water Regulation** is the “role of land cover in regulating runoff & river discharge” (De Groot, et al., 2002, p. 396).

A **Woonerf** is a “living or shared street, which represents a powerful strategy for calming streets and neighbourhoods. (Woon means ‘residential’ in Dutch, and erf means ‘yard’). Specifically, the woonerf is a residential street where, through bends and curves in roadways and through tree plantings and brick and stone designs, car traffic is slowed significantly...and the roadways are shared with pedestrians, bicyclists, and children” (Beatley, 1999, p. 142).
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Dedication

This work is dedicated to you, my grandmother, Mary Ellen Jobes. For thirty years since your John L. passed, you kept the ghosts of solitude at bay by keeping busy with life. Thank you for waiting for me to see you one last time before moving on to the next. Your ninety-six years of living and loving will always inspire me and each those who were graced by your joyous presence and selfless dedication to the happiness of others.
1 An Introduction

The Interplay of Local Decisions and Global Consequences

1.1 A Preface

Social cohesion refers to “a state of affairs concerning both the vertical and the horizontal interactions among members of society as characterized by a set of attitudes and norms that includes trust, a sense of belonging and the willingness to participate and help, as well as their behavioural manifestations” (Chan, et al., 2005). Green infrastructure is an approach “to maintain healthy waters, provide multiple environmental benefits and support sustainable communities [that] uses vegetation and soil to manage rainwater where it falls. By weaving natural processes into the built environment, green infrastructure provides not only stormwater management, but also flood mitigation, air quality management, and much more” (US Environmental Protection Agency, 2012a).

Regarding social cohesion, green infrastructure can be considered a “behavioural manifestation” of a community in its efforts to increase the bonds and bridges between its residents and other groups. Through this lens, it can provide both a resilient option for physical development of land, and also for the growth of community for the neighbourhood of Mount Pleasant.

At the global scale, this thesis should be considered as a narrative that expresses the power that lies in replication of initiatives similar to the St. George Rainway throughout a city to create “more vibrant communities [and]... design living spaces that encourage more interaction among neighbours” (DiPaula et al., 2012, p.6). It is through the pivotal step of building bonds and bridges within community that we might create vibrant and resilient cities to help plan for and face the inevitable climate and resource challenges of the future. It is by utilizing public open space that communities can provide opportunities for fostering interaction among neighbours. The natural systems present in the public realm require tending and stewardship to ensure they can thrive, and provide ecosystem services, “the benefits people obtain from ecosystems” (World Health Organization, 2005) that characterize healthy natural places. Therefore, a provision for community involvement with implementation and maintenance of ecosystems can additionally offer social cohesion as an ecosystem service.
The findings of this thesis, *The St. George Rainway Project: Building Community Resilience with Green Infrastructure*, demonstrate how the implementation of green infrastructure can offer another dimension beyond the ecosystem services it traditionally offers. Further, it posits that the voluntary engagement involved in the physical transformation of one’s community can simultaneously provide opportunity for increasing the bonding and bridging (social cohesion) within it. Therefore, social cohesion both increases, and can be increased by, the implementation of green infrastructure. Furthermore, social cohesion can create a positive feedback loop in its ability to reciprocally improve the establishment and success of the green infrastructure from where it grew. (See Figure 1.1.)

**Figure 1.1:** The reciprocal relationship between social cohesion and green infrastructure

### 1.2 The Salmon & The Jay: Framing The Need for Green Infrastructure

Somewhere beyond city limits in the region known as the Lower Mainland to some and as Cascadia to others, there exists a coho salmon fortunate enough to be one of an unbroken line of upstream swimmers whose spawning place remains. Free from the encroachment of human development, his ancestral migration route is
one of a few to remain healthy, away from various diseases plaguing many of his brethren. His home is where he will come to rest. Here he will provide nourishment to his temperate rainforest ecosystem; here he will provide an opportunity to continue his ancient lineage until the next run from salt to fresh.

Nearby, a Steller’s Jay flits and whistles with fervor up and around an ancient oak. It is non-breeding season, so she is here to stockpile as many dispersed stores of acorns as she can before the tree lightens its heavy limbs and its seeds are lost under cover of frost and snow. This year, like every year, she will gather more food than she needs in case a redundant stash here or there is lost or forgotten.

Of all the challenges facing development, the two most prominent are global climate change and resource depletion (Newman et al., 2009). Until this century, the practice of developing and maintaining cities has existed without heeding ecological and water footprints. Earth and its bounties were assumed to be limitless. All signs however, point to the waning of the comforts of predictable weather and cheap and abundant energy and commodities (Rockström et al., 2009; World Wildlife Fund, 2012). By the time this piece of graduate work joins the archives of its host institution, the concentration of carbon in the atmosphere will have surpassed 400 parts-per-million (ppm). As a time-stamp for the start of this work: it is 398 ppm currently, up three points from March one year ago (NOAA & Mauna Loa Observatory, 2013). To maintain a “safe operating space” for humanity and keep the planet “well away from climatic tipping points,” a reduction to maintain a concentration of 350 ppm would be immediately necessary (Foley, 2010; Rockström et al., 2009). (See Figure 1.2.) Currently, no signs point to a reversal of CO2 concentration (Gillis, 2013). One of these tipping points and thresholds is another number: 450. This concentration of atmospheric CO2 has been shown to be the point at which the world’s oceans begin to acidify (McNeil & Matear, 2008). At 500 ppm, which will be reached by the end of the century given the current trajectory, the tipping point of functional collapse for coral reef systems will have been surpassed (Hoegh-Guldberg et al., 2007). The discussion of climate change and the harbingers of the collapse of life on earth is no longer one of prevention, but of preparation and stemming the tide of its forces and impacts, of which the severity is historically unprecedented.
As regards to resource depletion, the collective global human civilization in 2008 would require 1.5 years to generate the resources used in just that year. This “ecological overshoot,” this 50% deficit to biocapacity of the planet, began around 1970 when collective consumption outpaced the ability for the Earth to replenish its bounty (World Wildlife Fund, 2012). Another means to understand this would be to look at the hectares per person it would take for human civilization to live with sustainable consumption. In 2008, the biocapacity of the planet could provide the equivalent of 1.78 hectares (4.4 acres) to each member of the global human population. In North America, the consumptive practices put an average demand of 7.12 hectares (17.59 acres) per person (World Wildlife Fund, 2012). To understand the context local of this thesis, one should consider the City of Vancouver. Noting the 2011 population, when multiplied by the average Canadian ecological footprint of 6.43 hectares, the city requires a global biophysical area of a landmass over 337 times its size (Statistics Canada, 2013b). (See Figure 1.3 on the following page.)
<table>
<thead>
<tr>
<th>Size of Vancouver</th>
<th>Landmass Required to Support the Collective Consumption of Vancouver = 337 Times Its Size</th>
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**Figure 1.3:** The ecological footprint of the City of Vancouver (data adapted from Statistics Canada, 2013b; World Wildlife Fund, 2012)

To avoid systemic ecological, social, and economic collapses, how we build and repair cities must anticipate the unpredictable forces of known unknowns caused by ecological overshoots of climate and resources. Before expense or a catastrophic event makes it harder to implement changes, it is crucial that cities plan for and implement these shifts now. Cities may never be sustainable regarding their own carrying capacities (Folke et al., 1997), yet they host boundless opportunity for creating changes that inspire a more resilient means of existence and a realigning of civilization with nature. They are home to the world’s majority of humans, ideas, and opportunities for transdisciplinary, transcultural, and transgenerational collaboration. Those professions situated within the realm of development would do well to heed the salmon and the Jay. The stories of these creatures is one that expands the understanding and role of green infrastructure.
1.2.1 Stormwater Infrastructure

Traditional grey infrastructure, the common practice of North American cities, does not concern itself with the actions of the jay or the existence of the salmon. Rather, it maintains its rigid nature as a centralized system that relies on a set of relative constants to provide one service—stormwater regulation. Its approach is one that builds capacity into storm sewer systems to manage 100-year storm events but without concern for smaller storm events, water cleansing, habitat provision, recreation, and so on (Pincetl, 2010). Urban waterways grow more polluted with development, and the once rare storms for which storm sewer systems are designed are now experienced at frequencies that belie their name and redefine how cities must consider systems for managing stormwater (Milly et al., 2002).

In many North American cities, storm sewer systems are combined with waste sewer systems to help manage flows of water that overwhelm the design of the storm sewer system. In some cities, at the end of these pipes is a waste treatment plant, with a life span of up to 50 years, designed to remove the pollutants from the flows of water (Metro Vancouver, 2011c). In other cities, these combined sewage events (CSOs) empty directly into urban waterways, befouling water resources and habitat with a cocktail of excreted pharmaceuticals, heavy metals, petroleum, bits of microscopic plastic, and so on (Browne et al., 2011; Maestre & Pitt, 2005). This system is quite reliable if the goals are to: 1. treat all water as a waste product; 2. maintain the flows within an anticipated range; and 3. ensure the system can be maintained with the allotted budget and labor force. The current state rather is one of a need to embrace water as a resource, increasing unpredictability in precipitation, city budget shortfalls, and an increasing urban impermeability leading to higher, more polluted water flows and systems (Mehan, 2011; US EPA, 2001; US EPA, 2012a; US EPA, 2012b; US EPA, 2012c).

By comparison, the stormwater regulation aspect of green infrastructure embodies a dynamic decentralized system with redundancies that allow for flexibility. Its network of vegetated elements favor infiltration over conveyance. This network is one of vegetated elements that simulate natural systems’ ability of infiltration, filtering, storage, and evaporation of stormwater runoff on site (Benedict & McMahon, 2006; US EPA, 2012a;
Prince George’s County DER, 1999). By simulating natural systems’ abilities, waterways can be cleaned and water balance can be achieved despite variability in weather (Boyle et al., 2010). In addition, there is an inverse relationship to the values between green and grey over time. As ecosystems and their components embodied by green infrastructure mature and grow healthier, they improve their provision of a collection of ecosystem services—the ways in which ecosystems provide benefits to people—which are discussed in greater detail in Chapter 2 (Brauman, 2007; Turner, et al., 2008; Walsh et al., 2005). Conversely, as grey infrastructure grows older, the need for reinvestment and repair increases (Foster et al., 2011; Kessler, 2011). (See Figure 1.4.)

![Figure 1.4](image.png)

**Figure 1.4:** The inverse relationship of green and grey infrastructure (data adapted from Foster et al., 2011; Kessler, 2011)

When grey and green infrastructure are used together, the smaller storm events that account for the majority of the flows and pollution can be managed with provisions for major overflow events.
1.2.2 Resilience

In concert with green infrastructure, the broad theory of resilience, or the ability to return quickly to a preferred condition after disruption, can help continue to re-imagine how cities might provide their accustomed amenities with greater longevity (Bahadur, Ibrahim, & Tanner, 2010). In the case of North American cities, residents expect trash to be collected regularly, electricity to be provided at the flip of a switch, and the flows of water to be regulated despite our usage patterns. How does a society, one of its cities, or a community within that city develop in a way that allows it to rebuild and return to its preferred state quickly after a catastrophic event? Such events could disrupt any basic function of cities and take the form of severe storms or drought, commodity price spikes, or a major, fire, storm, or earthquake. The challenge is both about preparing for and adapting to the unprecedented forces such as global climate change that will disrupt the status quo of civilization. With her tendency for redundancy and decentralization, the Steller’s Jay can boost her resilience and anticipate an ever-present supply of food for her lifetime. Even if the oak is lost to a lightning strike or disease or wind storm, she can always find another tree, or feast on an array of nut, berry, and invertebrate or small rodent options.

A deeper understanding of resilience is articulated as the “ability of a social system to respond and recover from disasters...as well as post-event, adaptive processes that facilitate the ability of the social system to reorganize, change, and learn in response to a threat” (Cutter et al., 2008). Yet, regardless of the definition, the underlying theme to each is adaptation. So often do designed landscapes attempt to exist as snapshots of their pinnacle function and aesthetic, and yet nothing in nature reaches equilibrium or maintains a static state, but is in a constant state of flux (Holling, 1973). To discount this premise and create built worlds that require continual maintenance of their static structure fails to acknowledge the natural order. Further, it fails to anticipate changes to their systems the future will bring. The landscapes that we design have the opportunity, if not the responsibility as well, to be adaptive and anticipate disruptions of familiar weather patterns and flows of resources. Professionals and projects with the opportunity to implement green infrastructure have the power to seed resilience and anticipate unpredictable forces.
Upstream the coho is still swimming. With the stature as a keystone species, he exemplifies each of the four parent categories of ecosystem services as originally devised by the Millennium Ecosystem Assessment (World Health Organization, 2005). As a food source for humans and over 200 species of wildlife, he is the product of a provisioning service (Willson & Halupka, 1995). As a third-tier carnivore, his feeding acts as a regulating service as a biological control to keep populations of various subspecies in check (Shiomoto, et al., 1997). His existence also provides cultural services, namely spiritual and religious values, educational value, recreational and ecotourism value, and a sense of place to regions like Cascadia (Brodeur, et al., 2003; Jacob et al., 2010). Lastly, the coho postmortem personifies a supporting service with his contribution to help provision his region’s temperate rainforest habitat after his essential nutrients release back into the environment (Gresh et al., 2000).

1.2.3 Urban Resilience

While urban development projects might not readily identify with the salmon or the Jay, the wisdom in their stories warrants exploration. To consider and test new biophilic modes of design and planning that follow the lead of natural systems is to embrace adaptation and foster resilience. For green infrastructure to function optimally, development must consider its capacity for resilience and its support of ecosystems. It would be prescient to emulate the coho’s multifunctional stature, and it would be best to take heed of the Jay’s anticipation of known unknowns—storms are gathering everywhere and one cannot be sure of their impending severity. Cities need to be better prepared; green infrastructure as applied through the lens of resilience can help; and, this thesis, guided by the question—Could green infrastructure provide both a resilient option for physical land development as well as opportunity for social cohesion within communities?—aims to provide a model to illustrate how it can.

1.3 The Neighbourhood Context

1.3.1 The St. George Rainway

Bounded by the streets of Clark and Cambie to the east and west and Great Northern Way and 16th Avenue to the north and south is the Vancouver neighbourhood of Mount Pleasant. This neighbourhood was once home to
the first downtown core of Vancouver, when Broadway was known only as 9th Avenue and Kingsway was called Westminster. It is situated upon the slopes leading down to False Creek Flats that were once in a past age home to several Salmon-spawning creeks, including the historic Brewery Creek (City of Vancouver, 2010).

Figure 1.5: 2013 Mount Pleasant Days Parade

Of the lesser creeks was one of note that flowed alongside that of Brewery Creek. This creek today is called by the name of the street paved above the majority of its original run. St. George Creek is the subject of this thesis. In concert—the modern existence of the St. George’s right-of-way with the ecological heritage of the stream beneath—this corridor has become known as the St. George’s Rainway. The remaining flows from this creek travel northward beneath the street and are piped as part of the storm sewer main buried there. A study of the storm sewer catchment and contours creating this corridor reveals a pipe sub-basin that roughly encompasses one-quarter of the area of Mount Pleasant. This is home to the study site of and contributing namesake to this thesis. (See Figure 1.6 on the following page.)

In 2010, the St. George Rainway initiative was organized as a subgroup of the False Creek Watershed Society. It was established to help support a healthy False Creek watershed by transforming St. George Street into a
**Figure 1.6:** Existing condition of the St. George Rainway sub-basin
blueway. Since then, studies have envisioned options for daylighting sections of the culverted creek as well as establishing a freshwater wetland in the False Creek Flats to remediate runoff water from Mount Pleasant before it contributes to the combined sewage overflow and adds pollution to False Creek. In partnership with the False Creek Watershed Society, the St. George Blueway Group created a report in 2011 illustrating the challenges and opportunities for constructed wetlands and potential daylighting (Davidson, 2011). Later that year, a graduate study from the University of Victoria partnered with the St. George Rainway initiative to create a feasibility study for the creation of the proposed freshwater wetland in False Creek Flats, fed by the St. George storm sewer (Blair, 2011). Yet, as this thesis will illustrate, while the sister cities of Seattle and Portland and nearby municipalities of North Vancouver and Burnaby have grown their initiatives with green infrastructure, the City of Vancouver remains cautious to adopt such initiatives and expand their program. Communities within the city however, aim to force the issue.

During the summer of 2012, the St. George Rainway initiative distributed a survey and held two design charrettes to guide the creation of the mural that now adorns the surface of the roadway between 7th and 8th Avenues (Sakiyama & Wong, 2012). The mural’s goal is to initiate the story of how the rain that falls on Vancouver might someday help to “renew the greenway, strengthening our resilience, reducing burden on the sewers.” Further, the founders of the initiative state, “in reconnecting with our watershed, we’ll build a better future for our neighbourhood’s children, for our swirling planet” (Viva Vancouver, 2012). (See Figure 1.5 for an image of the mural.) This awareness-building project was made possible through their partnership with the Mount Pleasant Elementary School and collaboration with local groups including the False Creek Watershed Society as well as with Vancouver’s Water and Sewer Division and Viva Vancouver, a City-run initiative to close roads to vehicle traffic and transform them into public spaces (City of Vancouver, 2012d).

During the Autumn of 2012, the 24-year old Vancouver Society of Storytelling inspired and organized members of the community to help create and build a bench from cob and mosaic. The placement and aesthetic of the bench located at the Northwest corner of Mount Pleasant’s Robson Park, calls attention to the symbolic

12
headwaters of St. George Creek. (See Figure 1.7 for an image of the bench.) Here, next to the park’s community
garden and next to the Mount Pleasant Family Centre, anyone can sit with prospect of the St. George Street
corridor and imagine its past and the future the community is galvanized to usher in. Over the span of three
years, community members of Mount Pleasant have grown public awareness of the stream and of the potential
for the nine-block residential section of the street. They have activated other members of the community and
have engaged members of City staff and of local organizations to become more involved with the
transformation. The interview findings in Chapter 4 will expound upon the drivers and impacts of this
transformation.

1.3.2 Efforts From Community

During these three years as the activation of community was increasing and awareness around contextual issues
was being raised, an initiative was created and a document was published to guide its work between July 2012
and December 2014. Both call attention to the need for this type of community engagement and enrichment to
flourish. The initiative, *Weaving Policy, People and Place Together (WPPPT)*, was spearheaded by the Mount
Pleasant Neighbourhood House, a not-for-profit group dedicated to hyperlocal community development since 1967, to “help coordinate collaborative work on how Mount Pleasant develops: specifically, changes to the built environment and how that built environment helps nurture community” (Mount Pleasant Neighbourhood House, 2012, p.1). This work is contained in the vision of the Mount Pleasant Community Plan of 2010, which grew out of four years of work gathering the input of over 2,000 individuals who work and live in Mount Pleasant (Mount Pleasant Neighbourhood House, 2012). Of its seven “bedrock intentions,” the following two are highly relevant to the St. George Rainway Project are:

To strengthen the public realm and “turn strangers into neighbours” by improving the area’s walking appeal and enhancing both the number and nature of public gathering spaces (possibly modest in size yet powerful in their programming and design elements): spaces that encourage people of all ages and stripes to venture out, explore, mix and learn with/from one another [and]...To increase the overall social cohesion in Vancouver neighbourhood(s) while also deepening citizen engagement in ongoing city-building (Mount Pleasant Neighbourhood House, 2012, p.2).

Much beyond these two particular guiding intentions is stated throughout this document, yet all is steeped in the pursuits of creating a sense of place, civic literacy and stewardship, and increasing the bonds and bridges amongst members of the Mount Pleasant community.

1.3.3 A Survey from The Vancouver Foundation

Another relevant document, which was published just a few months prior to WPPPT, is titled, “From Connections to Engagement: Pathways to a More Caring and Involved Citizenry” (DiPaula et al., 2012). It contains survey findings published by the Vancouver Foundation that are echoed in the intentions of WPPPT—identifying a strong need for both strengthening of social cohesion throughout Vancouver. Of the findings, those key to note are as follows:
1. Metro Vancouver can be a hard place to make friends; 2. Our neighbourhood connections are cordial, but weak; 3. Many people in Metro Vancouver are retreating from community life; 4. There are limits to how people see diversity as an opportunity to forge meaningful connections; [and] 5. The affordability issue in Metro Vancouver is affecting people’s attitudes and beliefs (Vancouver Foundation, 2012b, p.7).

The survey was the first step in working towards building more connected communities within Metro Vancouver and is the benchmark for the St. George Rainway Project. The survey and its findings ask of projects like the Rainway to “include a dimension that builds bridges and brings together people who may not have had the opportunity to work together before” (Vancouver Foundation, 2012b, p.40).

The interface between the St. George Rainway and the controlled flows of stormwater through Vancouver provides a unique condition. The Rainway offers a new opportunity to be a demonstration project for the City of Vancouver where the city and the community act as collaborators with design, construction, and maintenance of the project. Having successfully daylighted portions of Still Creek and implemented sustainable street initiatives like Crown Street, the City of Vancouver has set a precedent for investing in the health of urban streams (City of Vancouver Community Services, 2002; City of Vancouver, 2006). (See Figures 1.8 and 1.9 for

![Figure 1.8: A daylighted portion of Still Creek (City of Vancouver, n.d.)](image-url)
corresponding images.) The Country Lanes Demonstration Project of 2002 and the still active Green Streets program set the precedent for a collaborative model between community and city to implement and maintain green infrastructure initiatives (City of Vancouver, 2002; City of Vancouver, 2013a). Meanwhile, Metro Vancouver’s 2011 Drinking Water Management Plan, Vancouver’s Greenest City 2020 Action Plan, and the Mount Pleasant Community Plan each guide the additional work needed to meet the visions of the region, the city, and the neighbourhood that all are home to The Rainway (City of Vancouver, 2012b; Metro Vancouver, 2011a; City of Vancouver, 2010).

### 1.4 The St. George Rainway Project: Objectives and Limitations

The primary objective of this thesis is to provide assistance to both the residents of the community of Mount Pleasant and the employees for the City of Vancouver to progress the physical manifestation of the St. George Rainway. The secondary objective is to demonstrate transferability of such a project citywide. Through several opportunities for consultation with community and city, various needs have been identified and act as drivers for this thesis.
For the residents, the need for a greater understanding of the opportunities and constraints within the community concerning the increase of pathways to bonding and bridging within and between communities, or the existence of social cohesion, has been identified. The cited Vancouver Foundation report identifies the shortcomings of the region as a whole. To move forward and address these needs in a hyperlocal context, more data is required. One half of this thesis collects this data through use of a community survey and selected stakeholder and expert interviews, and identifies opportunities for growth of social cohesion as well as community resilience.

For the planning staff of the city, the need for additional biophysical site assessment and design exploration of the St. George Rainway was identified. Staff from various departments have toured the site and generated discussion and ideas for the site, but have not taken the Rainway further due to lack of time and funding. The second half of this thesis tackles aspects of this assessment, sufficient to also create strategies for design of the rainway that proposes several green infrastructure strategies to improve the water balance and functionality of the site.

As outlined in the introduction, the timing for this thesis aligns with several initiatives taking place throughout the community. However, due to the scope of such a project, involving no less than the re-envisioning of a ten-block long urban local street, the scope of this thesis cannot progress further than the phases of data collection and analysis and schematic design. Steps involving such things as community organization and activation, or the design development and creation of construction documents for the building phases of the rainway, will not be included in this scope of work. A re-administering of the survey to achieve the larger response rate could provide opportunity for a multivariate analysis of perspectives within the community to greater understand challenges and opportunities within its makeup.

In addition, a charrette process where the community contributes and responds directly to design details for the Rainway is highly recommended for next steps, but will also not be included in this work. To overcome these limitations for those leading its subsequent phasing, it is also an objective of this thesis via the cited literature,
published data, and proposed design direction, to establish a framework to progress the next steps for the Rainway to improve its chances for implementation in a timely and directed manner.

1.5 Research Methodology

_The St. George Rainway Project: Building Resilience with Green Infrastructure_ involves a literature review of applicable theory, both qualitative and quantitative research elements, and strategies for a landscape design. The product of each of these phases is unveiled in this order as the following four chapters. The chapter following this includes a synopsis of the findings for the work. To start, the literature review establishes the theoretical and practical foundations for the work, and covers topics including: complex adaptive systems, socioecological resilience, social cohesion, ecosystem services, green infrastructure, and place attachment. Subsequently, the community survey and expert interviews establish the local context for the thesis, a baseline for presence of social cohesion, and a framing for the applicability of the ten prominent characteristics of resilient communities. Taken together, the application of design responds to the collective voice and needs of the community and provides a set of goals, phases, strategies for design as a framework to help realize future implementation of the St. George Rainway. (See Figure 1.10 on the following page.)
Could green infrastructure provide both a resilient option for physical land development as well as opportunity for social cohesion within communities?

**Research Question**

**Quantitative Research**
- Comparative Survey

**Qualitative Research**
- Professional + Stakeholder Interviews

**Design**
- Baseline Understanding of Context & Needs of Study Location
- Articulation of Goals, Phases, Projects, and Technologies

**Conclusions**

**Figure 1.10:** Research flow diagram
2 \hspace{1em} The Nature of The Built Environment

\textit{Matters of Resilience, Water Regulation, & Social Cohesion}

2.1 \hspace{1em} A Synopsis

The following chapter addresses the bulk of the theory that is the foundation for the work of this thesis. It contains four sections to provide the theoretical background to this work. In the first section, \textit{The Urban Context of Resilience}, socioecological resilience is introduced as the type most aligned with community development. The first section introduces resilience in the urban context. From here, the section transitions into a discussion of the interconnectedness between socioecological resilience, stormwater regulation, and social cohesion, which is a theme carried throughout the thesis. Research of socioecological resilience produced a series of ten characteristics that guide the discussion and applications of building resilient urban communities. Cities and the communities of which they are comprised are socioecological systems; by association, these characteristics directly apply.

The second section of this chapter builds \textit{the case for water in Vancouver}. It does this to frame the primary vehicle for delivering green infrastructure, the chosen method for applying the ten characteristics outlined in the previous section. Water is an element central to the identity of Vancouver and the region of Cascadia. Through an analysis of its relationship with various bylaws, as well as reasoning for the region’s belief in infinite supply, water is shown to provide opportunities if the perception of it shifts from it as a waste product to it as a resource. Furthermore, an additional goal–conveyed water cleanliness–is proposed for the Greenest City 2020 Action Plan.

The third section introduces the concept of ecosystem services, also in the urban context. In Chapter 5, a set of ecosystem services taken from the literature review will provide the framework for the goals of the design. Special attention is given to social cohesion, as it is central to the success of collaborative projects involving the public realm. The fourth section defines social cohesion and proposes the means by which to view it as an additional ecosystem service. It does this by framing its context to the levels of connections and engagement highlighted in the 2012 Vancouver Foundation survey and how their actuation requires the public realm. As a component of this
section, the relationship between social cohesion and social capital is described to solidify its association with socioecological resilience and the modes for building resilience in urban communities.

### 2.2 The Urban Context of Resilience

Resilience, stormwater regulation, and social cohesion are each players in the efforts for sustaining the human enterprise. *Resilience* is best defined by Cutter et al. (2008, p. 599) as the “ability of a social system to respond and recover from disasters and includes those inherent conditions that allow the system to absorb impacts and cope with an event, as well as postevent, adaptive processes that facilitate the ability of the social system to reorganize, change, and learn in response to a threat.” Further, it should be noted how “in a resilient social-ecological system, disturbance has the potential to create opportunity for doing new things, for innovation and for development” (Folke, 2006, p. 253). Simply put, *stormwater regulation* is the “role of land cover in regulating runoff & river” (De Groot et al., 2002, p. 396). This role is commonly undertaken by a stormwater sewer system.

Social cohesion requires a presence of social capital which is, according to Health Canada, the resources attained through community networks that provide individuals and groups the means to meet their goals (2013). Through this, trust, a sense of belonging, and the willingness to participate and help can translate into action and grow the social cohesion of a group (Chan et al., 2005).

Because the three concepts—resilience, stormwater regulation, and social cohesion—coexist within the context of linked social and ecological or, socioecological, systems, the strength of their individual abilities is only as great as the level of interconnectedness between them. Water regulation and social cohesion are each means by which to address adverse forces, such as flooding from a 100-year storm, that act upon the resilience of community, or its ability to absorb and react to disrupting forces in a way that allows for learning and reorganization (Cutter et al., 2008). In this light, it is essential to first understand the theories and applications of resilience.
The concept of resilience is widely discussed throughout academia, and with every mention comes at least as many definitions per discipline context. It is commonly applied to economics, engineering, social science, psychology, and so on. This project focuses solely on the concept of resilience as applied to urban development.

The St. George Rainway is situated within an urban neighbourhood where its success will rely upon the interactions between water, plants, and soils and the interaction between residents and institutions and the Rainway. It is a project that aims to demonstrate the viability of developing sustainably with the pillars of ecology, society, and economy.

With a Venn diagram of three equal and overlapping circles, these pillars of sustainability have been widely conceptualized as a *three-legged stool*. This model implies that without one of the legs, the stool will collapse. Each are interdependent on one another in order to realize the success of sustainable development. The concept of this model, when given this explanation, could be applicable to the Rainway project. Visually however, this model is flawed. If each of the rings are to represent the three concepts—ecology, society, and economy—the viewer is left pondering: to what the non-overlapping parts of the diagram refer. A revised version of this diagram, where the rings are not overlapping, but rather are concentric, more closely relates to the reality of socioecological resilience and the challenge of sustainable urban development. (See Figure 2.1 on the following page for a comparison of these two models.) Planet Earth is a non-growing ecosphere, upon which humans are dependent residents. Meanwhile, culture and the economy are strictly human constructs. Economies rely upon the actions of humans who rely upon the health of the ecosphere—hence their nested disposition. A localized biophysical representation of this is the relationship between bioregion of Fraser Valley Basin, the Metro Vancouver region, and the neighbourhood of Mount Pleasant.

There is a synergy between the nesting of ecology, society, and economy and socioecological systems, or the “integrated concept of humans-in-nature” (Berkes, Folke & Colding, 2000). In their case, resilience must be considered for the entire system and not only its social and ecological subsystems. Further, if one is to use resilience as a benchmark for development, it is essential to identify the state of the system whose maintenance
is preferred—the resilience of what—as well as the outside forces that may act upon it—the resilience to what—that might transform its state into one altogether different (Carpenter, 2001). In the case of the Rainway, the

![Figure 2.1: A comparison between models of sustainable development](image)

proposed design in Chapter 5 utilizes the implementation and maintenance of green infrastructure by members of the community to establish a network of living organisms—plants and soil microorganisms—to provide the capacity for ecosystem services. This state of the local urban form is meant to be resilient to the perturbations brought by a changing climate. More directly, the design provides opportunities for increased social and ecosystem health to subsequently increase the robustness of the community to address future challenges.

Attention is given most to global climate change as it holds preeminent status as the top global challenge for creating a “safe operating space for humanity” (Rockström et al., 2009) and for the City of Vancouver’s plan to build adaptive capacity to its localized impacts (City of Vancouver, 2012a).
A review of the current body of literature analyzing socioecological resilience produces a series of common threads that can begin to help characterize its measure in the context of urban development. Ten in particular are most commonly represented throughout research literature (Bahadur, Ibrahim, & Tanner, 2013). The resulting list offers indicators that can provide insight into engagement opportunities between communities and the impacts from stressors such as climate change. Deeper insight into how these characteristics each relate to the St. George Rainway will be provided in Chapter 5, *Activating the Strategies for Design.*

The ten primary characteristics of resilient socioecological systems will not provide metrics for this thesis related to preferred quantities or combinations of green infrastructure strategies for instance, but they do provide a framework for where to begin to envision resilient communities. They are characterized by Bahadur, Ibrahim, & Tanner (2013) as:
1. **A High Degree of Diversity**  
   *KEY DESCRIPTORS*: heterogeneous, multidisciplinary, multifunctional

2. **Effective Governance & Institutions**  
   *KEY DESCRIPTORS*: decentralized, linked, accountable

3. **Acceptance of Change & Uncertainty**  
   *KEY DESCRIPTORS*: flexible, adaptive, testable

4. **Non-equilibrium System Dynamics**  
   *KEY DESCRIPTORS*: energy-conserving, ecologically-balanced

5. **Community Engagement & Participation**  
   *KEY DESCRIPTORS*: local, sense of ownership, place-based

6. **Capacity for Preparedness & Planning**  
   *KEY DESCRIPTORS*: redundant, yielding, projecting

7. **A High Degree of Equity**  
   *KEY DESCRIPTORS*: accessible, unbiased, egalitarian

8. **Presence of Social Capital**  
   *KEY DESCRIPTORS*: participating, supportive, trusting, welcoming, engaged, connected

9. **Capacity for Learning**  
   *KEY DESCRIPTORS*: creative, active learning, knowledge retention

10. **A Cross-scalar Perspective**  
    *KEY DESCRIPTORS*: cross-temporal, cross-spatial, cascading

Each characteristic can be applied to the St. George Rainway. The following begins to define each of the ten in the local context of the project:

**2.3 Characteristic #1: A High Degree of Diversity**

A *high degree of diversity* is cited as a key characteristic throughout the prominent academic literature focused on resilient socioecological systems (Berkes, 2007; Carpenter et al., 2001; Folke et al., 2002; Folke, 2006; Klein et al., 2004; Norris et al., 2007; Walker et al., 2002). In the case of a project that implements green infrastructure as a means to provide ecosystem services to a community, a high degree of diversity enhances
the stability and functionality of the ecosystem, thus contributing to its resilience (Holling, 1973; Klein et al., 2004). Regarding the social component of the system as it relates to building a team for decision making and adaptation around the potential impacts of climate change, it is important to “acknowledge the importance of heterogeneity of stakeholders” (Osbahr, 2007, p. 21). Maintaining this heterogeneity—this diversity—will help with adaptation to changes and effects upon the system as it will bring with it a multidisciplinary set of knowledge and expertise.

The application of these principles to the design of the St. George Rainway results in a project with a network of physical components that can act individually but enhance the overall functionality of the system when linked. For example, one block of one street can include elements such as permeable paving adjacent to filter strips that lead into rain gardens. These individual elements infiltrate, slow, and treat stormwater respectively. When linked, they accomplish all of this with the water that flows through the site they occupy. Additionally, components such as these when linked together lessen the burdens of function upon each component if they were to operate individually. Permeable paving and filter strips help to sift silt and slow water flows, that could otherwise inundate and erode the soils of a rain garden. Likewise, without the rain garden, the other two elements would lack a connection with the treatment of polluted runoff.

Linked green infrastructure components also help establish a diverse network of groups and individuals dedicated to its functionality (Benedict & McMahon, 2006). The roles for involvement would be phased to create opportunities for anyone throughout the life of the Rainway—from installation to maintenance—to contribute. One example lies with a proposed rainwater harvesting component to the design. The current model for the city accounts for only a handful of holding reservoirs within the city limits. In the event that lines from the primary reservoirs located within the north shore mountains are cut to the city’s holding reservoirs, the supply will quickly run out. Provisions for localized rainwater harvesting, treatment, and storage in neighbourhoods could anticipate complications from such an event. Further, providing a system with several redundancies, in the form of linked cisterns with UV treatment capabilities, for instance, would support a high
level of diversity characteristic and increase resilience to impacts to a potable water supply. Such a system, devoid of treatment needs, could also be envisioned as a supplement Vancouver’s dedicated fire protection system (DFPS) that currently exists in anticipation of a large earthquake event (City of Vancouver, 2012c).

Noted key words:

heterogeneous, multidisciplinary, multifunctional

2.4 Characteristic #2: Effective Governance & Institutions

The local scale of the Rainway project is aligned with a prevalence in the literature that calls for resilient socioecological systems to have a decentralized organizational structure (Berkes & Folke, 1998; Folke, 2006; Gunderson & Holling, 2001; Osbahr, 2007; Ostrom, 2009). Decentralization will allow for a multiplicity of voices when addressing adaptation challenges. The characterization of effective governance and institutions embodies this type of structure. The fact that governance and institutions are linked “by the context in which they operate” (Martin-Breen & Anderies, 2011, p. 17), could simultaneously pose synergies and discrepancies. The decentralized stakeholder groups will rely upon the City of Vancouver for help with materials, funding, and expertise, while the city will rely upon the engagement, creativity, labor, and local knowledge of the stakeholder groups and the Mount Pleasant community they represent.

In periods where forces, such as a severe summer water shortage from prolonged drought, threaten a “release” stage upon the Mount Pleasant community, decisions made about approaches to adaptation will inevitably be complex. Despite the resilient nature of its decentralized network structure, the governance and institutions involved will need to establish trust and accountability throughout in order to guarantee their effectiveness (Martin-Breen & Anderies, 2011). According to Mayunga (2007), the level of social capital and degree of equity and cooperation within and between groups is responsible for trust and accountability. Social capital is one of the ten characteristics of resilient socioecological systems, a subset of social cohesion, and will later be discussed further as the eighth characteristic.
2.5 Characteristic #3: Acceptance of Uncertainty & Change

A portion of the socioecological system resilience literature identifies the need for acceptance of uncertainty and change (Berkes & Folke, 1998; Berkes, Colding, & Folke, 2003; Folke, 2006; Holling, 2001; Norris et al., 2007). Necessary to enhancing community resilience, according to Norris et al. (2007, p. 143), “communities must plan, but they must also plan for not having a plan; this means that communities must exercise flexibility and focus on building effective and trusted information and communication resources that function in the face of unknowns.” The degree to which the community of Mount Pleasant is structured to address unknowns related to such known forces as global climate change is directly related to their levels of connectivity and engagement with one another. In Chapter 3, findings from the survey of Mount Pleasant will illustrate how they score against all of Metro Vancouver by providing insights into their strengths, weaknesses, opportunities, and constraints with connectivity and engagement.

The need for acceptance of uncertainty and change relates also to the concept of adaptive management—an iterative management practice that accounts for uncertainty with active system monitoring—as used when confronting uncertainty around natural resources (Holling, 1978). Adaptive management also relates to the resilient socioecological systems’ characteristics of effective governance and institutions, capacity for preparedness and planning, and capacity for learning in the sense that it helps prepare for inevitable surprises. It does this by acknowledging how “policies must satisfy social objectives, but also must be continually modified and flexible for adaptation to these surprises. Adaptive management therefore views policy as hypotheses; that is, most policies are really questions masquerading as answers. Because policies are questions, then management actions become treatments, in an experimental sense” (Gunderson, 1999, p. 2). In order for the Rainway to work and improve socioecological resilience, its design and guiding policies must utilize adaptive...
management and be considered as malleable from the start; if it does not embody flexibility and adaptability, it will likely fail (Norris et al., 2007).

Noted key words:

*flexible, adaptive, testable*

### 2.6 Characteristic #4: Non-equilibrium System Dynamics

With systems, the concept of equilibrium only exists in theory. Rather, the study of thermodynamics explains how systems naturally approach equilibrium, but never reach it. For instance, the equilibrium state of a human body would be akin to an amorphous blob, consisting of a diffused ray of its building blocks: oxygen, carbon, hydrogen, nitrogen, calcium, phosphorus, and a number of other trace elements (Harper, 1973). Like the human body, any system requires a constant input of high quality energy for it to maintain its organizational structure (Kay & Schneider, 1994; Prigogine, 1997; Schneider & Kay, 1995). The closer a system approaches equilibrium, the more susceptible it becomes to the perturbations that could force a “release” or collapse of that system (Berkes, Colding, & Folke, 2003; Holling, 1973; Holling, Gunderson, & Peterson, 2002).

The characteristic of *non-equilibrium system dynamics* is a characteristic of resilience in that it supports active participation of the players in a system to keep it from reaching a close-to-equilibrium state. In terms with socioecological systems, they “must adapt to eco-reality and learn to live within the eco-thermodynamic means of nature” in order to avoid catastrophic and cascading collapses within the system (Rees, 2012, p. 293). The St. George Rainway embraces the eco-realities of green infrastructure to transform and adapt the stormwater management component of the street into a system characterized by greater resilience. The result will allow natural processes to provide a share of the input of high quality energy to maintain the system and clean stormwater runoff, versus a city-owned and managed stormwater management system that utilizes only grey infrastructure. Currently the City of Vancouver and Metro Vancouver bear the costs of maintaining energy inputs into the stormwater infrastructure responsible for conveyance and treatment.
2.7 Characteristic #5: Community Engagement & Participation

Community engagement and participation, in these forms and others, such as ownership and local knowledge, is another prominent characteristic of socioecological system resilience (Berkes, 2007; Berkes, Folke, & Colding, 2000; Berkes, Colding, & Folke, 2003; Manyena, 2006; Mayunga, 2007; Nelson, Adger, & Brown, 2007; Norris et al., 2008; Osbahr, 2007; Ostrom, 2009). Engagement, participation, and a subsequent sense of ownership grow in direct relationship with the collective place attachment of individuals from a community (Manzo & Perkins, 2006; Cantrill & Senecah, 2001; Low & Altman, 1992). Place attachment refers to the bond individuals have with places, including the people with whom they coexist (Low & Altman, 1992). It is from this place attachment that localized and indigenous knowledge can provide identification of, and insights for adaption to, the slow and difficult-to-identify systemic changes that might arise from climate change (Berkes, 2007).

In the case of the place known as Mount Pleasant, the survey results and stakeholder interview findings published later in Chapter 3 will illustrate a method and measure of place attachment. Manzo and Perkins (2006, p. 347) clarify how “affective bonds to places can help inspire action because people are motivated to seek, stay in, protect, and improve places that are meaningful to them...[and how] processes of collective action work better when emotional ties to places and their inhabitants are cultivated.” The greater the ownership of and participation in the realization of the Rainway, the stronger the role this characteristic will play in strengthening resilience. Further, with greater diversity in the community comes a greater depth of input into the participation involved with the creation and maintenance of the Rainway.

Noted key words:

local, sense of ownership, place-based
2.8 Characteristic #6: Capacity For Preparedness & Planning

Having the capacity for preparedness and planning is another characteristic of resilient socioecological systems as related to disaster and post-disaster planning (Berke & Campanella, 2006; Bruneau et al., 2003; Burby, 2003; Burby et al., 2000; Cutter et al., 2008; Olshansky & Kartz, 1998). Embodying preparedness and planning for perturbations refers to the ability of a community to respond to a change with means to ensure avoidance of entire systemic collapse. Two of the methods to improve response are to prepare for collapse and plan with redundancy (Bahadur, Ibrahim, & Tanner, 2013). The practical application of these methods to urban development is exemplified in the following by Sanchez-Rodriguez (2009, p. 204):

'[It] is worth stressing the urgency of building adaptation strategies to climate change in urban areas. The life span of urban structures is at least 70 years. Those constructions built now will likely operate under different climatic conditions as those of today. Further delays incorporating climate change in the design of new urban constructions can reduce their functionality and aggravate the negative consequences of climate change. Efforts in this direction can make a difference in the livelihood of millions of present and future urban inhabitants.'

The City of Vancouver Climate Change Adaptation Strategy anticipates substantial climate change, in the form of temperature increases and precipitation decreases, to arrive within the next four decades (City of Vancouver, 2012a).

The primary adaptation action dictated by the strategy is to “increase the resilience of City infrastructure” by completing a comprehensive Integrated Stormwater Management Plan and continuing with the sewer separation plan (City of Vancouver, 2012a, p. 3, 7). Chapter 5 will illustrate the details of the strategies for design of the Rainway which will include built-in redundancies and preparations for the impacts of climate change with both the social and ecological components of the system. As previously noted, each of these characteristics of resilient socioecological systems have varying degrees of overlap with one another. Here, the decentralized organizational structure of the effective governance and institutions characteristic has synergy with designing
with redundancy to help plan for unknowns. The City of Vancouver has developed the strategy and plans; actions follow plans.

Noted key words:

redundant, yielding, projecting

2.9 Characteristic #7: A High Degree of Equity

Community resilience literature speaks to a high degree of equity also as a predominant characteristic (Adger, 2000; 2002; Cutter et al., 2010; Nelson et al., 2007; Twigg, 2007). However, its overview exclusively revolves around the social and socioecological components of systems, as the term equity is largely used in an anthropocentric sense. In nature, with a salmon run for instance, the river does not distribute safe passage throughout the school of returning fish. Likewise, the grizzly bears attempting to catch the salmon only have chance and skill on their side if they hope to have a meal. According to Pearce (1988), equity for humans with natural systems often refers to the degree of intragenerational and intergenerational access to natural capital and the ecosystem services that flow from them. Twigg (2007) clarifies this further to support an equitable distribution of property and social wealth in order to ensure community resilience. The degree to which ecosystem services—in such forms as access to nature and water regulation—are considered accessible to each member of the Mount Pleasant community, will be further highlighted by the survey and interview findings.

For the design of the Rainway to function with a high degree of equity, the ecosystem services and amenities it provides must be accessible regardless of economic or social class and sustainably regarded for the benefit of future generations. The nature of the Rainway existing within the public right-of-way should guarantee a level of democracy with its public accessibility (Mitchell, 2003). Management of individual components that provide such assets as food and harvested water will be contingent upon the strength of the effective governance and institutions characteristic. An instance of a food asset provisioned by the Rainway could take the form of cherry trees. While every visitor to the Rainway may be granted access to the trees’ fruits, a more equitable system
may involve a distribution of responsibilities, whereas some individuals may harvest hard-to-reach fruits and
manage pruning of the trees; while others may be responsible for canning and preservation; while still others
may take on delivery of the food asset to members of the community with less mobility. Such an equitable and
decentralized system would not be possible without effective governance and institutions in place.

Noted key words:

accessible, unbiased, egalitarian

2.10 Characteristic #8: Presence of Social Capital

Presence of social capital is another characteristic repeated in the literature applied to community resilience
(Adger, 2000; Adger, 2003; CPSSC, 2011; Martin-Breen & Anderies, 2011; Mayunga, 2007; Norris et al., 2008;
Pfefferbaum et al., 2007). The idea of social capital is one derived from the study of economics. As applied to
community resilience, it refers to assets from social networks, such as personal connections, that are accessed,
used, and further developed from their patterns of sharing (Lin, 2001). Health Canada has two classifications for
social capital. An individual’s social capital is referred to as “the social networks through which an individual
finds the resources he or she needs,” while a collective’s social capital refers to “the networks formed by social
groups within a community to achieve the resources needed to attain their goals” (Health Canada, 2013).

Social capital is therefore about relationships. Such relationships have signature psychological dimensions of a
“sense of community, place attachment, and citizen participation” where sense of community is characterized
by “high concern for community issues, respect for and service to others, sense of connection, and needs
fulfillment” (Norris et al., 2008, p. 139). The characterizations qualify citizen participation, which, in turn, is
specifically defined by its ability to “be sensitive to the diversity, ability, and interests of members” in
communities with “strong and responsive leadership; able teamwork; clear organizational structures; and well-
defined roles, responsibilities, and lines of authority...” (Pfefferbaum, 2007, p. 350-51).
Social capital is only as effective as its networks and the decision making manifested within (Adger, 2003), again calling attention to inter-characteristic synergies. Here the synergy is with effective governance and institutions and community engagement and participation and will be given context with the discussion of social cohesion in Mount Pleasant. The content and structure of the questioning for each the survey and interview phases, discussed at length in Chapter 3, attempts to measure social cohesion and identify opportunities for growth. The questions posed by the survey and interviews are built directly from the parent Vancouver Foundation survey, which identifies the need of strengthening both bonds within groups and bridges between groups to build social capital (DiPaula et al., 2012). It is through the collective endowment of social capital components that a community or society grows in cohesion.

Noted key words:

participating, supportive, trusting, welcoming, engaged, connected

2.11 Characteristic #9: Capacity for Learning

Complex Adaptive Systems, of which socioecological systems are a subset, are understood to be cyclical. This implies that eventual collapse or “release” is inevitable. However, it is understood that the practice of learning through such structures as policies may stall, temper, and/or reduce the costs of the eventual collapse and lessen the capital needed for the restructuring that follows (Carpenter et al., 2001). Learning is also discussed throughout the literature with similar capacity and as an integral component to adaptive management (Folke et al., 2002; Folke et al., 2003; Gunderson, 1999; Gunderson & Holling, 2001; Olsson et al., 2004; Tompkins & Adger, 2004). Adaptive management with resilient socioecological systems requires attention to the slowly-changing variables in the system by harnessing diversity and collective memory and creativity to build ability to adapt and respond to unexpected circumstances (Folke et al., 2002). Learning in this context is therefore more aptly referred to as active learning, as it requires continual revision, or adaptation, to keep pace with changes in the system to which it corresponds.
A challenge that is intrinsic to the notion of learning is the requirement for an action or state to learn from. With this framing, learning can be implied as a post-perturbation act. For example, possibilities for learning from a changing climate would require experiencing some aspect of the changes. Enhancing the ability of this characteristic would require paralleled precedence, and therefore would require help from those who have demonstrated resilience in the face of systemic challenges. Individuals most likely to embody this knowledge are our elders, namely those of local First Nations communities who have much uncolonized wisdom to share and insight into addressing the various face of great adversity (Cameron, 2012).

Learning can also imply the hypothetical, in the case access to post-trauma wisdom is unavailable. According to Carpenter et al. (2001, p. 778), one would need to “consider a range of plausible hypotheses about future changes in the system; to weigh a range of possible strategies against this wide set of potential futures; and to favor actions that are robust to uncertainties, reversible, and likely to reveal crucial new information about system function.” Further, and directly relating to the characteristic of effective governance and institutions, “learning is advanced by institutions that can experiment in safe ways, monitor results, update assessments, and modify policy as new knowledge is gained” (p. 778). With the Rainway, hypotheticals and the adaptive management approach will be the starting point for this characteristic.

Noted key words:

creative, active learning, knowledge retention

2.12 Characteristic #10: A Cross-scalar Perspective

The last of the ten characteristics is referred to by Bahadur (2010, 2013) as a cross-scalar perspective. This characteristic is best illustrated through the lens of ecosystem science. Like socioecological systems, ecosystems are complex adaptive systems. As such, they contain linkages that cross temporal and spacial realities (Levin 1998; Levin 2000). Consider again the water that flows through Vancouver. The forest ecosystems that help create the precipitation that feeds the Metro region’s three protected watersheds are systems that act at
different speeds and scales than the bodies of water below: False Creek, the Burrard Inlet, and ultimately the Pacific Ocean. Changes at any scale within any of these ecosystems, such as the change in water temperature, availability, or acidity, can impact the function of the others. Likewise, changes at the level of the regional hydrologic cycle, that result from global climate change, will also impact these linked systems.

The cross-scalar perspective is one that grew out of the work around theories of resilience and applications of adaptive management. To make sense of a cross-scalar perspective with complex adaptive systems, Holling proposed the theory of Panarchy (2001). Devised from the root prefix “pan-,” meaning “all” or “everything” as well as referring to the Greek god of nature, and the suffix “archy,” referring to the “rule,” this theory attempts to explain how all such systems (and thus all socioecological systems) function. The theory of Panarchy will be discussed with more detail in Chapter 5.

A panarchy is a nesting of subsystems within a complex adaptive systems, where each have linkages to one another, and where the collapse (during the release phase) of one can have cascading effects throughout the system. In a healthy system, each nested subsystem “is allowed to operate at its own pace, protected from above by slower, larger levels but invigorated from below by faster, smaller cycles of innovation. The whole panarchy is therefore both creative and conserving” (Holling, 2001, p. 390). The concept of sustainable development, Holling (2001, p. 390) continues, is where “sustainability is the capacity to create, test, and maintain adaptive capability [and] development is the process of creating, testing, and maintaining opportunity. The phrase...thus refers to the goal of fostering adaptive capabilities and creating opportunities.” The St. George Rainway may only be a nine-block long project, yet its constraints and equally its impact will inevitably be regionally cross-scalar. Because the Rainway and the water that will flow through it are a cog in the machine that is the regional hydrologic cycle, the water that it could clean, infiltrate, or transpire will in some way impact the cycle. Such a relationship therefore implies: with greater replication comes greater impact and cleaner waterways.
Noted key words:

cross-temporal, cross-spacial, cascading

2.13 The Case for Water in Vancouver

The biosphere in which all things on Earth are embedded, is a complex system (Levin, 1998). This type of system does not always respond to the mechanical thinking and rules by which cities are designed. The keystone cities of Cascadia—Portland, Oregon; Seattle, Washington; and Vancouver, British Columbia—intensely understand the incongruity of these systems, specifically regarding the challenges related to urban stormwater management. Climate science teaches us that for every degree Celsius rise in temperature, the concentration of water vapor in the atmosphere increases by approximately 7% (Shindell, 2001; Rosenlof et al., 2001). With storm intensities currently compounding issues with storm sewer capacity and CSOs, will also increase. The current rate of urban population growth further exacerbates the challenge of shifting the status quo of infrastructure design and execution.

Consider the water that flows through Vancouver. Countless trees transpiring as they grow taller and thicker provide some of the moisture that becomes the snow that falls upon Metro Vancouver’s north shore mountains. This snowpack is what feeds the Metro region’s three protected watersheds—Capilano, Coquitlam and Seymour—which provide all of its 2.5 million people the water to drink from their taps, to wash their whites and darks, and to irrigate their prized lawns (Metro Vancouver, 2011d). The same source of precipitation also falls upon every resident’s roof and runs off into each street, where this water, laden with that aforementioned deadly cocktail, is quickly diverted with the pipes of grey infrastructure away from human contact.

In Vancouver, storm sewer pipes that have already been disconnected from the combined sewer system flow directly into culverted streams and daylighted waterways, and then into larger collecting bodies such as False Creek. The City of Vancouver is currently working towards an entirely separated system (City of Vancouver, 2013d). Storm sewer separation is a key component to improving the health of waterways in the face of large
storm events—the increased capacity of the new separated storm sewer system enables the waste sewer to
direct flows to the waste treatment plant, without the risk of overflow present in a combined system.

Currently, the Vancouver neighbourhood of Mount Pleasant still functions with a combined system, where all
flows, storm and waste, are directed for treatment at the Iona Island Wastewater Treatment Plant. Not only
does this system place large demands upon the treatment plant, it risks CSO events during larger storms.
Separation is noble in this regard, but would pose a new challenge for the smaller events responsible for the
stormwater flows created by the majority of the rainfall (Sansalone & Buchberger, 1997; Watson & Adams,
2010). Heavy metals and hydrocarbons from vehicles, detergents washed into the street, and countless other
pollutants are picked up and carried downstream with each rainfall, despite its size. The runoff from these
smaller events, currently receiving primary treatment at Iona Island prior to its discharge into the Georgia
Straight, will, in a separated system, enter untreated directly into False Creek, the Burrard Inlet, and the Fraser
River.

This shift in flows would threaten the progress in improving the health of local waterways, exemplified by the
herring and juvenile salmon that have begun again to populate False Creek (Brauer, 2009). Instead, this water,
most recently drunk and transpired by the stands of the region’s vast temperate rainforest, will eventually flow
unclean and into False Creek, the Burrard Inlet, and ultimately the Pacific Ocean. Here the hydrologic cycle re-
cycles as clouds form over Earth’s largest body of water, make landfall, and soak rooted soils again. As the
allegory of the salmon and the squirrel demonstrated, green infrastructure can be used to intervene and help
filter and cleanse the water before it recycles again as it has since it was first formed millennia ago.

In the case of Vancouver the adoption of stormwater as a resource, not a waste product, has received some
policy attention, but little action by the municipality. The latest approach to this adoption comes in Section 4 of
the City of Vancouver’s Sewer Utility Long Range Plan with its asks of: “not only ‘What should the sewer take
away from the neighbourhood?’ but also ‘What can the sewer contribute to the neighbourhood?’” (City of
Vancouver Sewer Utility, 2010, p.28). However, the document does little to articulate the means by which to grow the City’s Integrated Rainwater Management Plans and promote green infrastructure practices.

The roots of the perception of rainwater as an invaluable resource could stem from the fact that it rains in this city for nearly nine months out of the year. It typically rains 4.5 times as much in November as it does in July. Summer lasts one-quarter of a year, accounts for only 8.6% of the annual rainfall in Vancouver (Environment Canada, 2013a). Because of this and the fact that the three summer months are time for peak residential water use, the city made the 1993 lawn watering regulations a ticketable offense during the summer of 2011 (City of Vancouver, 2012f). Residential water use accounts for 56% of consumption, so with this effort, Vancouver has grown incrementally closer to another Greenest City Goal: to reduce per capita water consumption by 33% from 2006 levels (City of Vancouver, 2012b). (See Figure 2.2 on the following page.) With such programs as this, mandated low-flow water fixtures for new construction, and a recently approved mandate to incrementally implement water metering in all new residential construction, 21% of the 33% reduction has, by all estimates, been accounted for (Welsh, 2011).

Accounting for the remaining 12% reduction can be achieved through the widespread use of rainwater harvesting and reuse techniques. If all residential structures were to implement rainwater harvesting to supplement their potable water use, it could account for an average monthly reduction of water consumption
by nearly 20%. As well as reaching this numbered goal, harvesting rainwater can achieve two important and practical goals:

1. The use of rainwater would divert a portion of the highest quality potable water in the world currently used to perform non-potable tasks as washing clothing, flushing toilets, and ground irrigation of lawns and gardens.

**Figure 2.2:** Vancouver water usage by sector (figure adapted from Welsh, 2011, p. 5)
2. The capture of rainwater would help divert a portion of the 41 billion litres of annual rainwater from becoming runoff and directly polluting streams and larger receiving bodies of water.

Work has been completed to bring Vancouver closer to regulation of harvested rainwater, but important guiding policies are not yet in place. In order regulate the use of rainwater and greywater for household purposes, Vancouver Coastal Health first needs to establish a non-potable water quality standard. Of the 18 policy recommendations in the Closing the Gap With Rainwater Harvesting report, this was to lay the groundwork for those to follow (Welsh, 2011).

Despite its annual rainfall and belief in the myth of infinite water by the general populace, droughts do plague Vancouver; they happen during summer when water is in highest demand (Metro Vancouver, 2011e). Due to the threats posed by climate change during this half of the century—the decreased snow melt and source of our water, longer dry periods, and water demand from the increased environmental refugee population it will bring to the region—the sooner the practices of conservation and reuse be activated, the greater their effectiveness (City of Vancouver, 2012a). Just 1mm of rainfall falling upon on a roof surface measuring 1m² in area yields 1L of harvested water (See Figure 2.3 on the following page for a graphic representation of this formula.) Vancouver receives approximately 1,158mm of rainfall each year (Environment Canada, 2013a). The average area of a single family dwelling rooftop in Mount Pleasant is roughly 100m². By this account, each dwelling could keep 115,800L from inundating the combined sewer system each year by redirecting their downspout flows.

There are over 50 dwellings alone that flank the 9-block St. George Street study site. By the time the system is fully separated, this captured water could know an array of uses instead of contributing to the polluted stormwater flows. What is not used by homeowners could: 1. be slowly released to recharge groundwater; 2. be stored in a linked system for emergency uses; or 3. be gradually released to feed a small stream that runs alongside a St. George Street converted into one lane of traffic and one linear greenway for all to enjoy.
The first target of the Greenest City 2020 Clean Water goal, to “meet or beat the strongest of British Columbian, Canadian, and appropriate international drinking water quality standards and guidelines” was met before it was set (Welsh, 2011, p.4). The locale of Vancouver affords its residents access to some of the cleanest drinking water in the world. It comes from snowmelt that is filtered by the protected forests and reservoirs of the mountains above North Vancouver. To guarantee its cleanliness, the Seymour-Capilano Filtration Plant processes all drinking water before it reaches homes. From here, a small amount of chlorine is added to the water to ensure its cleanliness during transport through pipes, and to date, this system has prevented any cases of waterborne disease or toxins (Metro Vancouver, 2011a).

In 2011, the annual average daily flows of water from the north shore reservoirs into Vancouver was 304 million litres. Its average flow during peak summer usage was 381 million litres per day (Metro Vancouver, 2011e). Residential water consumption account for 56% of Vancouver’s total water consumption, totaling over 2 billion
litres. Of this, single-family dwellings account for 30% while multi-unit dwellings make up the remaining 26%.

For the nine rainy months, residential water use is primarily limited to the indoor use. Of the total indoor use, 30% is used for toilet flushing. During the remaining three months of the year, 18% of the total residential use is for toilet flushing, while 30% is used for lawn and garden irrigation. Since toilet flushing and outdoor irrigation are the safest and easiest uses of harvested rainwater, citywide adoption of these options could account for offsetting over one-third of potable water use in residences, totaling over 1.2 billion litres (Welsh, 2011).

Despite its state of being some of the purest potable water in the world, its metered cost during peak usage remains extremely low at 1¢ for every 10 litres used (Metro Vancouver, 2011a). This is mostly due to its being supplied by a gravity fed-system. Such a cost, that is nearly one-third of what residents of Toronto are required to pay for water, does little to sway belief in the myth of infinite water (City of Toronto, 2013). The only current foreseeable change in this system is an increase in capacity. Plans for raising the height of the Coquitlam Reservoir walls have been considered by Metro Vancouver to address projected population increases and the potable water demand that will follow (Metro Vancouver, 2011a). Therefore, the second target of the Clean Water goal, to reduce per capita consumption, is the more the actionable pursuit.

The work of this thesis highlights the need for a third target. Similar to the initiatives put forth around Puget Sound and the Chesapeake Bay in the United States, the primary receiving bodies of water addressed their issues with pollution upstream and upland by looking at land use decisions as the root of the problem (WGBH Educational Foundation, 2009). The Burrard Inlet, the Georgia Strait, and the Fraser River are the three primary receiving bodies of water impacted by polluted stormwater runoff in Vancouver. The third target should propose a reduction of stormwater runoff to ensure the city’s waterways, essential to ecosystem integrity, tourism, and industrial uses, continue to improve in health. Aquatic life has returned to these waters to spawn. Decreasing pollution would improve the chances of spawning along the banks of Habitat Island, drawing more grey whales to feed on the school’s eggs (Wood, 2010). To begin to approach addressing such a target, all water, not just that which originates in the pristine mountains to the north, must be considered a resource. Water—
stormwater, grey water, black water, potable water, and so on—may have different uses based upon its definition, yet as the hydrologic cycle continually demonstrates, all water is one water. Its health directly benefits the health of the region. The Greenest City 2020 Action Plan could reflect this by calling for a revised clean water goal and include a target that impacts conveyed water as well.

2.14 The Urban Context of Ecosystem Services

Ecosystems in the urban context can be considered as a “set of interacting species and their local, non-biological environment functioning together to sustain life” (Moll & Petit, 1994). In consideration of the geographic locale of the City of Vancouver, with mountain wilderness to its north, ocean straits to its west, and the boundary of the rich Fraser River basin to its south, the level of ecosystem integrity by comparison is quite fragmented. Within its boundaries, there is greenspace—components of ecosystems—thriving as tree-lined streets, private property lawns, daylighted streams, beach ecotones, and parks. Taken in this context, the non-biological elements of its environment, including its buildings and right-of-ways, require incorporation if the City of Vancouver is to be considered an urban ecosystem.

Not including blueways, such as False Creek and the Burrard Inlet and the tributaries that feed them, the City of Vancouver is covered by over 1,300 hectares (11% of its landmass) of greenways and parkland (City of Vancouver, 2012e). While this coverage in area is the least of Canada’s major cities, its percentage in landmass remains the highest (Saccoccio, 2007). The nature of the impact of this percentage with regard to ecosystem integrity can only understood through the lenses of size, connectivity, and spacing (Collinge, 1998) (See Diagram 2.4 on the following page for a representation of this relationship.) The strength of the services that ecosystems provide is directly related to each of these components in the ways they impact the level of biodiversity (Haines-Young and Potschin, 2010; Walker, 1992). According to Collinge (1998), the size of habitat fragments effects the amount of species loss; corridors between fragments effect the ability of species recolonization; and how land is configured directly effects levels of species richness. Vancouver’s Greenest City 2020 Action Plan Access to Nature goal has two targets, each to take place by the year 2020 (City of Vancouver, 2012b):
1. All Vancouver residents are to live within a five minute walk of a park, greenway, or other green space.

2. Plant 150,000 new trees.

According to the document, greenspace is considered as “parks and fields, greenways, the seawall, street mini-parks, natural green spaces, as well as park-like spaces such as the grounds around institutional buildings like...
City Hall, hospitals, and schools. It also includes linear green space such as the extensive Champlain Heights walkway system.” Among the goal’s highest priority actions, the first is to “create four to six new mini-parks by converting street right-of-ways to parks” (City of Vancouver, 2012b, p.42). Such parks are to be developed in concert with the goals and wishes of the impacted community to determine use for such things as allotment gardens, orchards, public plazas or yards, or naturalized habitat.

Planting 150,000 trees more than doubles the city’s current tally of street trees. This challenge has proven to be difficult as the majority of city-owned land has nearly maximized the appropriate space for planting new trees, though the Vancouver Board of Parks and Recreation is still pushing to increase planting on this land by 15,000 trees. The deficit will have to take place on private land, in newly created parks, or on land, such as that of the Vancouver School Board, that currently does not have its tree planting tracked (City of Vancouver, 2012b).

Because of this siting challenge, capitalizing on synergies will be important to argue the case for new plantings. Such synergies include the increase in bird, insect, and small mammal habitat, the increase of food production with fruit and nut trees, and a mediation of stormwater runoff.

Access to nature is empirically proven to provide restorative qualities to humans. As a sampling of an array of findings during the past few decades, exposure to natural systems has been shown to lower stress, improves cognitive development and decreases attention deficit disorder in children, speed up healing times, and increase longevity amongst seniors (Frumkin, 2003; Kuo, 2011, Kaplan & Kaplan, 2005; Park et al., 2007; Taylor et al. 2006). In this, the Greenest City 2020 Action Plan is a noble pursuit.

In order to increase the substantive nature of Vancouver’s Greenest City 2020 Goals, and begin to quantify provisions for ecosystem services, much data is needed. To understand how Vancouver’s fragmented green space impacts wildlife, for instance, mapping the canopy of the city’s urban forest is needed. Simply locating green space within a five-minute walking distance from everyone’s home falls short of the potential of a green network that optimizes ecosystem health through the sizes, connectivity, and spacing of its fragments. To understand how the planting of additional trees might impact the storm sewer loads of a combined sewer
system in Mount Pleasant, the base flows of water through the site need to be known. At present, such keystone pieces of data do not exist. Without them, the level of “green” that Vancouver might achieve cannot be fully quantified. Further, without noted quantification, the ways by which initiatives may be built upon one another are greatly limited.

Ecosystem services are more nuanced than simplistic classification of: the benefits ecosystems provide humans (World Health Organization, 2005). Rather, the concept includes the “natural ecosystems, the services they provide, and the benefits that people get from those services...[as well as the] physical ‘stock’ of resources that provides a continuing ‘flow’ of services and benefits to people” (Brown and Mooney, 2013). Without the preservation or maintenance of the physical stock nature provides, otherwise known as natural capital, the ability for ecosystems to render services, and thus benefits, is compromised.

In the urban context, where humanity has dealt a heavy hand of intervention, the discussion of ecosystems is primarily related to mediation and regulation. Of the total groups outlined by the Common International Classification of Ecosystem Services (CICES) (2013), the most current system in use, eight can be considered to have great importance in urban areas (Bolund and Hunhammer, 1999):

1. Water Flow Regulation
2. Water Pollution Regulation
3. Water Provisioning
4. Biomass Provisioning
5. Air Flow Regulation
6. Erosion Control
7. Micro Climate Regulation
8. Physical & Intellectual Interaction
In the case of Vancouver, another cultural output that should be considered an addition to this list is the *spiritual & symbolic interaction* component. The presence of First Nation culture is prevalent throughout Vancouver and it bears strong spiritual ties to natural systems, in the forms of both terrestrial and aquatic life. The lessons embedded in these traditions are rich symbolism, meaning, and value and deserve inclusion.

Green infrastructure can contribute to establishing each of the nine urban-focused ecosystem services. By its attempts to work with the living elements of plants and soil, it provides several ecosystem services compared to the one—water regulation—that grey infrastructure only partially simulates. Of the ecosystem services provided by green infrastructure, as outlined by the University of Arkansas Community Design Center (2010), are the following:

1. Atmospheric Regulation
2. Climate Regulation
3. Disturbance Regulation
4. Water Regulation
5. Water Supply
6. Erosion Control & Sediment Retention
7. Soil Formation
8. Nutrient Cycling
9. Waste Treatment
10. Pollination
11. Species Control
12. Habitat Provision
13. Food Production
14. Raw Material Production
15. Genetic Resources
16. Recreation

17. Cultural Enrichment

As grouped in the accompanying table, many of these services fall under the noted eight broad CICES classifications. Those not directly associated with these, such as nutrient cycling and pollination, can be inferred with any system that utilizes living plant matter. (See Figure 2.5 on the following page for a that comparison between the list above, CICES, and from the Millennium Ecosystem Assessment). In a similar perspective, the very nature of ecosystem services requires that water be viewed as a resource and not a waste product. Ecosystems require water to perpetuate life. This simple reframing of the perception of water in the urban environment is where the discussion of resilience, framed by the use of green infrastructure and goals defined by ecosystem services, can begin.

2.15 Social Cohesion as an Ecosystem Service

Social isolation and social cohesion are ideas that contrast in the way a comparison might be made between Hartley Bay and Vancouver. One sits 145 km from the northernmost transportation hub of Prince Rupert and boasts a population of about 200. The other and its metropolitan region is approaching a population density of over 5,000 people per square kilometer and a total population of over 3 million (Statistics Canada, 2013b).

“Social isolation” refers strictly to the absence of a social network, namely one’s neighbours in the context of urban design and planning (Weiss, 1973). Social cohesion, a younger idea, cannot be summarized with such a succinct definition. As mentioned in Chapter 1, it is understood as “a state of affairs concerning both the vertical and the horizontal interactions among members of society as characterized by a set of attitudes and norms that includes trust, a sense of belonging and the willingness to participate and help, as well as their behavioural manifestations” (Chan et al., 2005).

In this light, the original comparison between remote Hartley Bay and the Vancouver metropolis grows a bit more grey. It may be that in a town of 200, most people know and trust one another, and thus willingly work together towards the betterment of their community. Likewise, higher population density does not
### Figure 2.5: Various categorizations of ecosystem services (data adapted from Bolund and Hunhammer, 1999; CICES, 2013; and University of Arkansas Community Design Center, 2010)
automatically equate to higher levels of social cohesion. Rather, as was found by the 2012 published Vancouver Foundation study “From Connections to Engagement: Pathways to a More Caring and Involved Citizenry,” Metro Vancouver suffers from a growing deficit of social cohesion and a need for both strengthening the social bonds within groups and bridges between groups in communities throughout the city (DiPaula et al., 2012).

Overall, the study, which is the parent survey for this thesis, confirmed the concerns from the original stakeholder consultations. It found how “most neighbourhood connections are weak, most residents do not participate in any form of community activity, and forging meaningful relationships is a challenge for many, particularly across barriers of difference such as ethnicity” (DiPaula et al., 2012, p.3). Another key finding from the survey highlights how nearly 75% of residents did not participate in community activities during the year before the survey was taken. The primary reason cited for this was not for a lack of time or access to activities, but was the sense that they had little to offer their neighbourhood. Further, one-third of those surveyed expressed difficulty in making friends throughout the region, while one-fourth stated how they were alone in life more than they wished to be (DiPaula et al., 2012, p.4).

Vancouver is a city with great cultural diversity but with little cross pollination between ethnic groups; it is a city of great monetary and ecological wealth but struggles to bridge a growing class divide, specifically with respect to access to housing (DiPaula et al., 2012). The reasons for the challenge of social isolation as highlighted by the original survey are complex and in some cases not entirely known. What is known is how social cohesion requires behavioural manifestations of a sense of belonging and a willingness to take part in community. The key finding that Metro Vancouver’s “neighbourhood connections are cordial, but weak,” has much to do with neighbours offering more than a “hello” to one another, not having opportunity to establish a sense of trust with one another, or simply harboring a preference to keep to themselves (DiPaula et al., 2012, p.3).

The Access to Nature goal of the Greenest City 2020 Action Plan calls attention to the deficit that not everyone in Vancouver has walking distance access to a public open space (City of Vancouver, 2012b). With its well-known challenge of being land-constrained while maintaining some of the highest cost of living and property values in
North America, the reality of creating parks in the most practiced means, where a parcel of private land or swath of denuded or underutilized public land is transformed into a park amenity, is not an easily-attained reality for Vancouver (Employment Conditions Abroad Limited, 2013). What this leaves in an established neighbourhood such as Mount Pleasant, are the public right-of-ways. These, as correlated by the Greenest City 2020 Access to Nature goal, are ripe for transformation.

At the core of developing a sense of belonging and the behavioural manifestations of willingness to participate with one’s community is the concept of social capital. Introduced as the eighth characteristic of resilient socioecological systems, social capital is about relationships (Health Canada, 2013; Lin, 2001; Norris et al., 2008). According to Forrest and Kearns (2001, p.2137), “social cohesion at the societal level may be derived from the forms and quality of social interaction at the local level. In this model of society, social cohesion is viewed as a bottom-up process founded upon local social capital, rather than as a top-down process.” Therefore, the limits to a city’s ability to improve social capital could lie with the contributions it makes to the setting—the public realm—in which social capital might flourish. This relationship can be further understood through the lenses of the eight domains of social capital (Forrest & Kearns, 2001). Figure 2.6 (on the following page) provides both a description of each of these as well as their application through local policy. From these domains grew the lines of questioning for both the parent survey as well as the focused survey and interviews for this thesis. Also from this grew the understanding of social capital as being, in essence, a subset of social cohesion. (See Figure 2.7 following the next page.)

The sidewalk and street, the community centre, the park—each of these spaces compose a shared public realm. Before the advent of digital communication and mass use of personal vehicles, versions of these spaces were solely the social territory where people connected and engaged (Lofland, 1998). They were and are where the patterns of everyday activity play out and help form personal identity (Eyles, 1989). These spaces are, still, in the digital age, where people convene when a face-to-face meeting is required. Public open spaces, such as parks or greenways, are shown to encourage “repeat visitation and thus an emotional attachment” (Vaske & Kobrin,
<table>
<thead>
<tr>
<th>DOMAIN</th>
<th>DESCRIPTION</th>
<th>SUPPORTING POLICY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empowerment</td>
<td>When people feel they have a voice which is listened to; are involved in processes that affect them; can themselves take action to initiate changes</td>
<td>Providing support to community groups; giving local people voice; helping to provide solutions to problems; giving local people a role in policy processes</td>
</tr>
<tr>
<td>Participation</td>
<td>When people take part in social and community activities; local events occur and are well attended</td>
<td>Establishing and/or supporting local activities and local organizations; publicizing local events</td>
</tr>
<tr>
<td>Associational Activity &amp; Common Purpose</td>
<td>When people cooperate with one another through the formation of formal and informal groups to further their interests</td>
<td>Developing and supporting networks between organizations in the area</td>
</tr>
<tr>
<td>Supporting Networks &amp; Reciprocity</td>
<td>When individuals and organizations cooperate to support one another for mutual or one-sided gain; an expectation that help would be given to or received from others when needed</td>
<td>Creating, developing, and/or supporting an ethos of cooperation between individuals and organizations which develop ideas of community support; good neighbour awards</td>
</tr>
<tr>
<td>Collective Norms &amp; Values</td>
<td>When people share common values and norms of behavior</td>
<td>Developing and promulgating an ethos which residents recognize and accept; securing harmonious social relations; promoting community interests</td>
</tr>
<tr>
<td>Trust</td>
<td>When people feel they can trust their co-residents and local organizations responsible for governing or serving their area</td>
<td>Encouraging trust in residents in their relationships with each other; delivering on policy promises; bringing conflicting groups together</td>
</tr>
<tr>
<td>Safety</td>
<td>When people feel safe in their neighbourhood and are not restricted in their use of public space by fear</td>
<td>Encouraging a sense of safety in residents; involvement in local crime prevention; providing visible evidence of security measures</td>
</tr>
<tr>
<td>Belonging</td>
<td>When people feel connected to their co-residents, their home area; have a sense of belonging to the place and its people</td>
<td>Creating, developing, and/or supporting a sense of belonging in residents; boosting the identity of a place via design, street furnishings, naming</td>
</tr>
</tbody>
</table>

**Figure 2.6:** The eight domains of social capital (figure adapted from Forrest & Kearns, 2001, p. 2140)
2001, p.20), where participation in this typology of space supports a greater propensity for environmentally-responsible behavior. Assuming use, public open space therefore supports its own existence. Building such spaces will not only attract users, it will strengthen the bonds users have with them over time. If one is to help achieve a greater commitment between residents and their communities, transformation of shared public spaces–right-of-ways–into public open spaces demand exploration.

![Diagram of Social Cohesion and Social Capital]

**Figure 2.7:** Social capital as a subset of social cohesion

The relationship of user to public open space and the benefits such spaces offer users in the North American context is well documented. The missing link in the discussion of social cohesion in Vancouver is rooted in how such spaces can improve relationships between people. Much work has shown how urban design typologies can inspire social activity (Alexander et al., 1977; Gehl, 2010; Gehl, 2011; Jacobs, 1961; Lynch, 1981; Whyte, 1980). There are groups throughout Vancouver, including the city itself with the VIVA Vancouver initiative and the
Mayor’s Engaged City Task Force, dedicated to the improvement of the public realm and fostering connections at the neighbourhood level (City of Vancouver, 2012d; City of Vancouver, 2013b). The one currently active in Mount Pleasant is Livable Laneways Vancouver, a non-profit organization “dedicated to transforming the overlooked laneways and alleys of Vancouver into pedestrian-friendly civic spaces” (Livable Laneways Vancouver, 2010). Currently, they are one of the community stakeholders consulting with the city to help craft the final Mount Pleasant Community Plan Implementation (City of Vancouver, 2013c).

The existence of public open space provides opportunity for fostering connections. Combined with the presence of natural systems that require tending and stewardship to ensure they can thrive in a natural setting, such spaces can offer opportunity for growing social cohesion. With this understanding, in combination with the 10 characteristics of resilient socioecological systems, the design and implementation of the St. George Rainway
begins to take shape. A provision for community involvement with the implementation and maintenance the
natural systems that make up the Rainway can offer an additional ecosystem service: social cohesion. The
strategies for design, proposed in Chapter 5 and informed by research within the community of Mount Pleasant,
will demonstrate how. Lastly, because communities are socioecological systems and the context for this project
has been wholly established, resilient socioecological systems will henceforth be referred to as resilient
communities. (See Figure 2.8 on the previous page.)
3 Quantifying Social Capital & Social Cohesion

The Surveys of Metro Vancouver & Mount Pleasant

3.1 A Synopsis

This chapter is focused on people from the community ultimately responsible for the life of the St. George’s Rainway. It establishes the baseline for understanding how social cohesion present in Mount Pleasant compares to the entire Metro Vancouver region. Together with the interviews outlined in the chapter to follow, the parameters and impacts of engagement of community with projects using green infrastructure as the development tool are shown.

The chapter begins with a framing of the survey administered for this thesis in concert with the parent survey from the Vancouver Foundation. Methods of distribution, sampling sizes, and justifications for each survey are explained in this section. Following this section is one that outlines the statistical methodology used to frame the validity for each the Mount Pleasant survey and the parent survey. The constructs described in this section correspond to the particular survey questions’ findings highlighted throughout the remainder of this chapter. (NOTE: The questions for each of the surveys can be located in Appendix A.)

The following three sections each provide a different lens that bridges three scales by which data was collected and compared between the Mount Pleasant and parent surveys. These sections are: 1. Personal Friendships; 2. Neighbours & Neighbourliness; and 3. A Connected Community. Each speak to a different aspect of how the neighbourhood compares to Metro Vancouver regarding the pathways to bonding and bridging within each. The analysis of these findings will show how Mount Pleasant is uniquely situated to activate themselves and strengthen their community by utilizing the social cohesion evident within the findings.

To close, the data that was unique to the Mount Pleasant survey is examined in Mount Pleasant & The Rainway. With references to outside precedence, the example of the mural painting completed along the St. George
Rainway is used to acknowledge the position Mount Pleasant holds within its metropolitan region, while demonstrating the potential for future involvement of community for shaping the public realm.

3.2 Framing The Surveys

3.2.1 The Parent Survey

Before one can determine the best paths to a Mount Pleasant that is more engaged and connected, it is necessary to establish a baseline of these indicators as they currently exist. The Vancouver Foundation, with its survey of 3,841 individuals, was able to identify a broad overview of the gaps in engagement and connection for the entire Metro Vancouver region (Vancouver Foundation, 2012). Each neighbourhood comes with its own unique demographic and set of challenges and the parent survey did not offer such a fine-grained view. How individual neighbourhoods stack up against the overall findings remains a relative unknown; the few data points gathered for Mount Pleasant were not numerous enough to speak to its context. Therefore, the finer grain of distribution of this survey was the first undertaking of the research portion of this thesis.

The need for the parent study of the relative levels of connections and engagement throughout Metro Vancouver grew from a previous consultation that took place between the Vancouver Foundation and 106 community leaders and 276 not-for-profit organizations. The result of the Foundation interviewing and surveying these individuals drew the most attention to the issue of “a growing sense of isolation and disconnection.” Those consulted stated how people in their communities “live increasingly in silos, separated by ethnicity, culture, language, income and even geography... [and] they lamented what they saw as a deepening civic malaise, a retreat from neighbourhood and community life, and a corrosion of caring that they said hurts them personally and hurts their community” (DiPaula et al., 2012, p.3).

3.2.2 The Mount Pleasant Survey

The sample size for the Vancouver Foundation survey was all of Metro Vancouver and all its residents, 2,313,328 per the 2011 Statistics Canada (2013a) report. Using this population count, the randomized parent survey
obtained 0.166% of the opinion of Metro Vancouver, 27% through phone interviews and remainder with an online survey. The results were deemed to be an adequate representation, with a margin of error at +/- 1.6% at a 95% level of confidence (Vancouver Foundation, 2012b).

![Figure 3.1: Door-to-door flier distribution](image)

According to the Planning and Development Services department of Vancouver, the 2011 population count of Mount Pleasant was 25,064 individuals. There were two sampling frames for the survey conducted for this thesis. The first was comprised of a collective email contacts list of the city community planner dedicated to Mount Pleasant (approximately 900 contacts), the Mount Pleasant Neighbourhood House (MPNH) (approximately 300 contacts), and the Vancouver Society of Storytelling (VSOS) (approximately 100 contacts), for a total approximation of 1,300 contacts. The second was determined by the hand-delivery of fliers to each residence within a one-block radius of the 9-blocks long St. George Street study area (approximately 300 contacts). (See Figure 3.2 on the following page for survey distribution techniques.) The purpose of the tighter
The sampling frame was to concentrate the outreach efforts within the study area and obtain as much data specific to this area as possible. The survey was administered digitally to the larger sampling frame generated by the collective 1,300 contacts. In addition, the survey was hand-delivered to the smaller 300 contacts sampling frame via paper fliers. Both the digital and paper submissions provided a website link to the online survey.

**Figure 3.2:** Mount Pleasant survey distribution techniques
Each of the groups accounting for the larger sampling frame have been involved in the direction of development initiatives throughout the study area of Mount Pleasant, including the Mount Pleasant Community Plan, the Weaving Policy, People and Place Together initiative, and the street mural between 7th and 8th streets. The goal in using these contact lists was to again focus the questioning on those within the vicinity of the study site. Each of these lists grew over time, through various means of public outreach, and reflect a cross-section of the population diverse enough to embody the randomness of the parent survey.

The Mount Pleasant survey was built using a Canadian online survey tool application hosted by the University of British Columbia (University of British Columbia, 2013). The survey consisted of a total of 86 questions. Nine of the questions did not appear on the parent survey due to their framing specific to the study site. Two from the parent survey were omitted due to their irrelevant nature—one for its request for the postal code of the neighbourhood in which the participants lived and the other related to the volunteering of the participants to perform for additional surveys or follow up questions. Beyond these additions and omissions, the Mount Pleasant survey mimics the parent survey to achieve a proper comparison of the data sets. The combination of the focused response, the response rate, and the line of questioning account for successful comparative analysis.

Question #1 of the Mount Pleasant survey was written to capture whether or not the participants lived between the streets of Fraser and Prince Edward to the east and west & and between Great Northern Way and Kingsway to the north and south was added to the demographics section of the Mount Pleasant survey to capture the effectiveness of the approach used. Of the 54 respondents, 32 were from the targeted catchment area, thus achieving a majority voice. Furthermore, the total response accounts for 0.215% of all of Mount Pleasant, or 3.375% of the two sample frames. Each of these percentages achieve a greater response rate to that of the model parent survey. (See Figure 3.3 on the following page for a bar graph comparison between response rates.)
One of the respondents to parent survey noted how “Getting people connected and engaged to their community underpins everything. Without that sense of responsibility, vast numbers of people will sit on the sidelines and we will not be able to tackle the serious problems facing our community” (Vancouver Foundation, 2012b, p. 41). This statement embodies the intention of the community research component to this thesis. As the following data analysis will show, the neighbours of Mount Pleasant are more connected and engaged than the average Metro Vancouver resident.

Figure 3.3: Response rate comparison between the parent survey and the Mount Pleasant survey
3.3 Statistical Methodology for The Surveys

A rich and sustained address of regional complex issues related to disparities in wealth and basic needs has been a goal of the Vancouver Foundation. However, it was identified that this could not be addressed without first identifying the underlying causes for disconnection and disengagement amongst residents, or, inversely, how to produce “caring and involved residents” (Vancouver Foundation, 2012a, p. 5). The parent survey, created by Sentis Market Research, Inc., was designed to use a collection of statistical techniques known as Structural Equation Modeling (SEM) to test the relationships between the independent variables noted as specific drivers of change (Ullman & Bentler, 2001). According to DiPaula et al., SEM “illustrates how one set of variables, or a construct, influences another and, in turn, how that construct influences yet another...[while providing] a roadmap of how change occurs and can help organizations prioritize investments in the community” (2012, p.6).

Because the parent survey was built upon past work by Sentis Market Research, Inc. and the Vancouver Foundation in the realm of social capital, the constructs of “bonds within groups” and “bridges between groups” helped to identify the two pathways used by the model (DiPaula et al., 2012, p.6).

That status of connections, or the bonding pathway, was determined by measuring the strength and breadth of relationships between friends and neighbours, of which broader community is comprised. The survey model measures the amount of conversation and sharing of thoughts and ideas with neighbours, which leads to measurement of deeper interaction and greater time spent with one another, which brings about an understanding of growth in trust between one another. Therefore, the bonding pathway was this: Conversation with Neighbours > Getting Together with Neighbours > Trust Between Neighbours (DiPaula et al., 2012; Vancouver Foundation, 2012a)

The other half of the focus, engagement, or the bridging pathway, was determined by first measuring how free individuals are from discrimination. Such discrimination, be it the result of race, disability, age, or economic status, had been identified as the primary barrier to beginning to develop a sense of belonging within a place. Only through the growth in a sense of belonging can growths in trust and connections across original boundaries
of discrimination take place. The combined ability to connect across boundaries while maintaining trust between neighbours, by the accounts of the model, results in residents who are both caring and involved within their communities. Therefore, the bridging pathway was this: Freedom from Discrimination > Sense of Belonging > Connecting across Boundaries (DiPaula et al., 2012; Vancouver Foundation, 2012a).

The combined bonding and bridging construct pathways can be seen in Figure 3.4 (on the following page). Along the pathways between each construct is a coefficient. Each coefficient represents “the relative strength of the causal relationship” (DiPaula et al., 2012, p.20) between each construct and was determined through testing of over 100 models with Amos statistical software. The iterative testing with this software was driven by the hypothesis of the parent survey, its findings and findings from other surveys, and a literature review of social capital. Many causal models were explored, though the model shown in Figure 3.4 was deemed to have the greatest potential for direct impacts upon increasing the potential for “Caring and Involved Residents” (DiPaula et al., 2012, p.18).

The three sections following this one each highlight various questions. These questions were chosen primarily for their direct relationship to the Caring and Involved Residents model described above. Each question represents a variable for one of the three constructs for the bonding pathway—Conversation with Neighbours, Getting Together with Neighbours, or Trust Between Neighbours—or one of the three constructs for the bridging pathway—Freedom from Discrimination, Sense of Belonging, or Connecting across Boundaries. The three scales by which these constructs and corresponding questions are examined are the following: 1. Personal Friendships; 2. Neighbours & Neighbourliness; and 3. A Connected Community.

3.4 Personal Friendships

As the parent survey found, Metro Vancouver suffers from high rates of social isolation and can be a hard place to foster new friendships (Vancouver Foundation, 2012b). Personal relationships are the foundation for social capital, and thus, indicative of social cohesion and are the foundation for both the bonding and bridging pathways (Chan et al., 2005; DiPaula et al., 2012; Health Canada, 2013; Forrest & Kearns, 2001; Lin, 2001). Of
those surveyed in Mount Pleasant, 84% were found to have 4 or more close friends when compared to the 66% from Metro Vancouver. (See Figure 3.5 for a comparison of responses.) Regarding the frequency of getting

Figure 3.4: Pathways to “Caring & Involved Residents” (diagram adapted from DiPaula et al., 2012, p.20)
Figure 3.5: “How many people would you count among your friends?” (from Mount Pleasant survey question #18)

Together with close friends, Mount Pleasant also ranked higher in a few indicative categories. Compared to the 26% throughout Metro Vancouver who visit with close friends 2-3 times per month, 35% of those in Mount Pleasant do. (See Figure 3.6 on the following page for a comparison of responses.) Meeting more frequently—once or more each week—did not vary much between residents of Mount Pleasant versus Metro Vancouver. As the reasons given for obstacles for getting together with close friends, the percentages for the top two from each survey ranked nearly identical: work or school obligations being the greatest, and family obligations being the next, accounting for nearly half the tallied reasons. Events that transcend the workplace, the school building, and the home, and involved volunteer service or educational experiences could help to forgo this obstacle.

The parent survey and legwork involved with forming its line of questioning found Vancouver a difficult place to make friends (Vancouver Foundation, 2012b). Mount Pleasant was found to be no different. A slightly higher percentage of respondents agreed with this statement, balanced out by an equal increase in those who
disagreed with this statement when compared to the findings for Metro Vancouver. (See Figure 3.7 on the following page for a comparison of responses.) These increases could be accounted for by a lesser percentage of individuals in Mount Pleasant feeling undecided about the question. Another correlation between this neighbourhood and the metro region was in the demographic most likely to agree with this statement: those aged 24 to 34.

Within the same realm of existence of finding it difficult to make friends is the sense of feeling alone. When asked if they felt alone more than they wished to be, nearly one-third of the respondents agreed with the
Those living in Mount Pleasant appear to have stronger, healthier social lives. This, in turn, correlates with having healthier physical lives as well (Cacioppo et al., 2002; Frandsen & Smith, 1996). The findings from the Mount Pleasant survey back this correlation with less than 4% relating how they are in fair health. No respondents were noted to be in a worse physical condition, while a majority of the remaining 96% noted how they are in very good health. The greatest room for improvement within the community of Mount Pleasant does not, therefore, point to its residents. Rather, the noted shortcomings relate to the effects the place has on
fostering new friendships and dispelling loneliness. These shortcomings do not embody the same correlation with housing typologies as understood in the parent survey. With extremely low representation from either ends of the housing spectrum—single detached house versus basement suite living—the typical markers of either positive or negative impacts upon personal friendships and loneliness were irrelevant. Aside from those aged 24 to 34 having a harder time making friends, none of the negative findings appeared to have any bias towards one demographic over another in comparison with a number of the parent survey findings. This supports evidence of a higher degree of equity in Mount Pleasant.

It does not rain any more in Mount Pleasant than elsewhere throughout Metro Vancouver. Likewise, the neighbourhood does not suffer from an access to nature deficit as defined by walking distance parameter of the city’s Greenest City 2020 Goal (City of Vancouver, 2012b). The aspect impacting the public realm could however, relate to its makeup of uses. At either end of the study area of the St. George Rainway sits two prominent parks: Robson and Guelph Parks. In between these two bookends is a sea of residential housing, bisected only once by the commercial corridor that is Broadway. However, this section of Broadway, known as “Broadway East” as outlined in the Mount Pleasant Public Realm Plan, lacks pedestrian scale, and thus, a pedestrian presence (City of Vancouver, 2013c).

Twenty blocks south, along another portion of St. George resting in a different sub-watershed, is a café-grocer that embodies what it means to be a cultural hub and supports the pedestrian presence lacking throughout Broadway East. Since its opening, it has become known as an essential piece to its neighbourhood’s potential for making new connections, building friendships, and ultimately dispelling loneliness. During one of the stakeholder interviews, which will be discussed further in this chapter, residents of Mount Pleasant spoke of Le Marché St. George in such a fashion: “Their story is incredible...they supposedly sent out an email to the neighbourhood the day before they opened and next day, 30 families with kids showed up. Talk about a sense of community...It has become a huge hub for the blocks around it.” Mount Pleasant has its parks, its community centre, family centre, and neighbourhood house, and bisecting commercial arteries such as Main Street.
most of Vancouver, it is well-zoned, but not well-mixed, and could benefit from an increased presence of nodes and connections, such as those a pedestrian greenway, or a rainway, could offer.

Figure 3.8: Le Marché St. George

3.5 Neighbours & Neighbourliness

As introduced in Chapter 2, the missing link in the discussion of social cohesion in Vancouver is rooted in how public spaces can improve relationships between people. The bonding pathway of the survey model manifests itself in the public realm. Its strength corresponds with the strengths of having Conversation with Neighbours, Getting Together with Neighbours, and having Trust Between Neighbours. Meeting one’s neighbour most often occurs as one is leaving or arriving home. Exchanges of ideas happens on either side of a fence or hedge, or from one porch to another, all in earshot of the public right-of-way. Meeting to shake hands or lend a cup of flour often takes place on the sidewalk in front of either neighbour’s home. In an urban neighbourhood, it is the sidewalk and the spaces within and around it where most social interactions take place (Alexander et al., 1977; Gehl, 2010; Gehl, 2011; Jacobs, 1961; Whyte, 1980). In Vancouver, it is in the street or in the lane, where community barbecues are held. Throughout North America, it is in one’s neighbourhood and home where the majority of our living happens.
Figure 3.9: The five benchmark parameters for growing neighbourhood connections (from Mount Pleasant survey questions #30-34)
The neighbourhood connections throughout Metro Vancouver were found by the parent study to be “cordial” but not “particularly deep” (Vancouver Foundation, 2012b, p. 17). The series of survey questions regarding the frequency of which neighbours engaged in barbecues with neighbours, performed favours such as collecting their mail and newspapers while the other was out of town, and lent them a spare key in case of emergency, were designed to build parameters for this characterization. In the case of Mount Pleasant, respondents scored higher in all categories, including simple knowledge of neighbours names, as well as the frequencies of saying hello and getting together to share a meal. See Figure 3.9 (on the previous page) for a comparison of the findings for five benchmark parameters, indicative of the familiarity that can lead to socializing, which can result in building a sense of trust between neighbours (DiPaula, et al., 2012).

If diversity has an impact upon connections within Mount Pleasant, the survey results deem it is one that is positive. Combinations of over thirty cultural origins were identified of the 54 respondents. Further, more than one-quarter identified with having been born in a country outside Canada, a number slightly less than 30% from the parent survey. To obtain a sense of the perceived diversity amongst the immediate neighbours of those surveyed within Mount Pleasant, which would statistically include individuals not surveyed for this research, respondents were asked how many people spoke languages different than their own? (see Figure 3.10 on the following page) as well as how many were of a different ethnic group than theirs? (see Figure 3.11 on the following page) It was identified that nearly 10% more individuals in Mount Pleasant than throughout Metro Vancouver believe that at least a few people that live on their street speak different languages, while 15% more perceived that at least a few of their neighbours were of a different ethnicity. While Mount Pleasant is represented by slightly more individuals who claim to have been born in Canada, this finding does not seem to have lessened its high degree of cultural diversity. Neighbourliness “can be defined as ‘the exchange of small services or support in an emergency against a background of routine convivial exchanges’ (such as greetings or brief chats over the garden fence or in the street)” (Pilch, 2006). When asked specifically, How comfortable do
Figure 3.10: “When you think about why you may not know some of these people very well... [how many] speak languages different from your own?” (from Mount Pleasant survey questions #36)

Figure 3.11: “When you think about why you may not know some of these people very well... [how many] are in a different ethnic group than you?” (from Mount Pleasant survey questions #37)
you think your neighbours would be if a shelter or group home for homeless people moved into your
neighbourhood? (see Figure 3.12 on the following page), more than twice as much of the participating body in
Mount Pleasant than that of the parent survey believed their neighbours would be comfortable. When asked,
How comfortable do you think your neighbours would be if a shelter or group home for people with alcohol or
drug addiction moved into your neighbourhood? (see Figure 3.13 on the following page), the percentage
expressing comfort on behalf of their neighbours was only slightly higher than those of the parent survey, yet
those expressing discomfort was half of that of the parent survey. Such a drastic discrepancy in the support of
the destitute and the recovering indicates the presence of something even greater than neighbourliness; it
indicates openness and a willingness to accept change in the community of Mount Pleasant.

Beyond the daily greeting or the small support given in times of distress, another indicator of neighbourhood
connections is the willingness to improve ties with one another and to work together to solve problems
revolving around such topics as safety (Vancouver Foundation, 2012b). The belief that ties among people in
Mount Pleasant are growing stronger is 60%, or are more than twice as positive as those of Metro Vancouver. In
addition, fewer respondents were likely to agree that it would be hard to get people to work together to solve
problems in their neighbourhood regarding such things as: cars driving too fast, people not taking care of their
property, or addressing larger issues such as pollution or water consumption. Schwartz (2000), in her account of
a series of surveys that followed up work to restore creeks within San Francisco’s East Bay, illustrated how
collaborations between residents and NGOs were successful in their restoration initiatives and as well with
raising local public awareness about runoff pollution by over 80% from 1991 to 1999.

Not only does the community appear to be building upon connections and trust and becoming engaged with
each other and local developments, the perception of this is that of an increasingly positive trajectory.

Additionally, when asked directly, an overwhelming 96% of those surveyed in Mount Pleasant felt welcome in
the neighbourhood and that they belong there. Having the willingness to participate, an existence of supporting
networks, a sense of trust, and a sense of belonging each satisfy one of the eight domains of social capital. How
Figure 3.12: “How comfortable do you think your neighbours would be if a shelter or group home for homeless people moved into your neighbourhood?” (from Mount Pleasant survey questions #38)

Figure 3.13: “How comfortable do you think your neighbours would be if shelter or group home for people with alcohol or drug addiction moved into your neighbourhood?” (from Mount Pleasant survey questions #39)
the neighbours within Mount Pleasant view themselves within their community demonstrates a sense of connection and a potential for citizen participation (Norris et al., 2008; Pfefferbaum, 2007).

### 3.6 A Connected Community

Systems in nature are nested within other systems, cascading their effects to those above and below themselves. Neighbourhoods exist in a similar paradigm. Beneath the neighbourhood are its streets, made up of various typologies of homes, and so on down to the individual resident. Likewise, neighbourhoods, such as Mount Pleasant, are nested within the city that is Vancouver. Above that, the city exists alongside the others that form Metro Vancouver. As Vancouver shares its source of water with the entire metro region, residents of Mount Pleasant share services with individuals from throughout the entire city. To realize positive and lasting connections across boundaries, groups and individuals must meet the first two constructs of the bridging pathway of the survey model: 1. Freedom from Discrimination, and 2. Sense of Belonging (DiPaula et al., 2012, p. 19). These in turn support individuals Connecting across Boundaries.

The lines of questioning highlighted in the previous section indicate how the residents of Mount Pleasant are accustomed to diversity. To understand how they perceive themselves and their place within the larger community, each were asked if they experience discrimination throughout their daily living. Three-quarters of the respondents expressed how they do not, while only two-thirds of the respondents to the parent survey expressed the same sentiment. (See Figure 3.14 on the following page for a comparison of responses.) When asked to respond to whether or not most people are tolerant of different ethnic groups, but most prefer to be with people in the same ethnic group as themselves (see Figure 3.15), 17% more within broader Metro Vancouver believe this to be true. Lastly, when posed with the statement that people who live here and do not speak English simply do not try hard enough to be part of the community (see Figure 3.16), two-thirds of Mount Pleasant residents, twice the number reported by the parent survey, disagreed with this statement. Taken together, these three indicators clearly demonstrate a strong prevalence of tolerance and freedom from discrimination.
Figure 3.14: “I do not experience discrimination in my day-to-day life.” (from Mount Pleasant survey question #47)

discrimination in the focus community. Discrimination can come in other more subjective forms such as obstacles that are a shortfall of earning or the feeling that one does not have much to offer. Vancouver is known to be the most expensive place to live in North America (Employment Conditions Abroad Limited, 2013). As a parallel, over half of the respondents from each survey believe that Vancouver is becoming a resort town for the wealthy. Therefore, one could understand how beliefs in such obstacles here are fueled. A more detailed understanding of which of these obstacles are prevalent in Mount Pleasant began with asking how well each are managing financially these days? The response for both surveys that they were just about getting by, or worse, hovered just above 40%. As long as communities such as this one maintain a characterization of mixed-income status, its low-income individuals may have a chance to avoid the social isolation and the breakdown of social cohesion that characterizes poor communities (Kawachi & Kennedy, 1997; Tigges, et al.,1998).
**Figure 3.15:** "Most people are tolerant of different ethnic groups, but most prefer to be with people in the same ethnic group as themselves." (from Mount Pleasant survey questions #50)

**Figure 3.16:** "People who live here and do not speak English simply do NOT try hard enough to be part of the community." (from Mount Pleasant survey questions #51)
There are several obstacles to becoming involved in one’s community, not just a lack of income. See Figure 3.17 (on the following page) for a comparison of the findings for six diverse obstacles specifically related to Mount Pleasant and drawn from a educated understanding of individual and community perceptions throughout Metro Vancouver (DiPaula, et al., 2012) Of all the obstacles to the respondents’ participation in activities that could make [their] neighbourhood a better place to live, was twice as great as the next ranking, not having enough time. Having any obstacle at all can be viewed as a negative in light of building community connections. However, such a reason is not one indicative of a lack of social capital, important to both the development of social cohesion and the characterization of resilient communities. The feeling that they did not have much to offer, ranked fourth in the list and accounted for only slightly greater than one-third of those throughout Metro Vancouver who found this to be an obstacle to improving one’s community. However, feeling unwelcome, the third reason behind not having enough money, ranked about 10% higher than it did for all of Metro Vancouver. Despite Mount Pleasant being a more welcome place for newcomers, it appears to have a deficit regarding inclusion.

The dynamic of having people who believe they have much to offer their community, but feel upheld for reasons of not feeling welcome is something that could be addressed through programming and outreach. As well, it could be addressed more passively through the provision of a shared amenity in the public realm. Kim and Kaplan (2004) in their study of two neighbouring North American communities, found the one with a greater network of public open spaces, which included such things as wetlands, trails, and playgrounds, to have a higher prevalence of social interaction and attachment to and identification with community. In a study closely related to the establishment of the St. George Rainway, Gooch (2003, p.9) found how “creating a ‘sense of place’ and fostering ecological identity can be one way of building on the existing positive impacts” of volunteer groups working towards watershed restoration and preservation.
**PARENT SURVEY**

A feeling that you do not have much to offer

A physical or mental health condition that makes it difficult to get involved

Not having enough time

Feeling unwelcomed

A concern that you do not speak the language well enough

Not having enough money

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**MOUNT PLEASANT SURVEY**

A feeling that you do not have much to offer

A physical or mental health condition that makes it difficult to get involved

Not having enough time

Feeling unwelcomed

A concern that you do not speak the language well enough

Not having enough money

---

**Figure 3.17:** “Is each of the following a major obstacle, a minor obstacle, or no obstacle at all to your participation in activities that could make your neighbourhood a better place to live?” (from Mount Pleasant survey questions #62-67)
Apart from the existing grid of right-of-ways, the extent to which its public space amenities are networked is nonexistent. A series of pocket wetlands or a visible watershed to collect and connect the evidential flows along curbs, into gutters, and through Mount Pleasant’s public open space and playgrounds. Specifically, laneways could receive ornamental planting and permeable surfacing to become trails or escape routes to destination green space. Sections of the grid could have their impermeable asphalt repurposed by volunteer groups and transformed into rain gardens and greenspace to create spines for social interaction and ecological benefit. Portions of larger swaths of low-lying grassland found within parks or on school grounds could become a network of pocket wetlands. Historically, such sites were considered less desirable land since they were low-lying and were often occupied by bogs or wetlands. Portions of these sites could revisit their historical ecological function and become dedicated to remediating polluted runoff.

3.7 Mount Pleasant & The Rainway

The nine questions that did not appear as part of the parent survey were designed specifically to gain insight into such foci as how the community might respond to a project like the St. George Rainway. One question from both surveys: *In the past 12 months, have you done any volunteer work for any organization or group?* solicited a response from those in Mount Pleasant that 77% had done so (as compared to 49% for Metro Vancouver). Of this number, nearly 80% claim to take part in such work at least once per month, while nearly one-third make this at least a weekly activity. If this volunteer work was focused in Mount Pleasant, 82% said they would participate regardless of the nature of the work, while no one offered an outright denial of participation. These findings from the Mount Pleasant survey therefore are indicative of a support of *community engagement and participation* and a *presence of social capital*.

The final section of the survey, titled *St. George Street*, built upon the noted broad questions about volunteering, and focused on past and future work for the Rainway. Using the mural painting between 7th and 8th, with which 78% of the participants stated they were already familiar, it was learned that such interventions could have a positive effect on such a community as Mount Pleasant. Besides the two individuals who were very
upset by the mural painting, it was shown to increase both the collective knowledge of local natural systems (for
68% of the respondents), as well as encourage interest in volunteering for future work with the Rainway (88%
said yes). Of those whose impressions of the project changed after the mural was painted (42% experienced no
change), only one individual had a negative response. In addition, the response profile was rather similar for the
body of respondents when asked how did their feelings change about the project after it was complete? (see
Figure 3.19 on the following page) and how it affected their level of engagement within the community? (see
Figure 3.20 on the following page).

The work of City Repair, a nonprofit group from Portland, Oregon, precedes that of the St. George Rainway
group and is a valuable precedent for both City Repair’s ideas and the proven potential of their projects.
Projects facilitated by them are focused on developing “artistic and ecologically-oriented placemaking through
projects that honor the interconnection of human communities and the natural world” (City Repair, 2013). They
work with community to design interventions within the public realm, including street murals, public furniture,
and gardens. (See Figure 3.18.) Indicators of such projects that took place in three different neighbourhoods in
**Figure 3.19:** “How did your feelings change about the project after it was complete?” (from Mount Pleasant survey questions #83)

**Figure 3.20:** “How did the mural project change your level of engagement within the community?” (from Mount Pleasant survey questions #84)
Portland demonstrate an increase in sense of community, improvement in mental health, and a growth in social capital (Semenza et al., 2007; Semenza & Krishnasamy, 2007; Semenza & March, 2009).

An important aspect to such projects that empower collective action within community is to sustain the social capital that it, in part, establishes. As will be highlighted by the summary of stakeholder and expert interviews, sustaining a volunteer base is proven to be a challenge of primary interest. The work of City Repair focuses on social capital to build strength into the core of each of their community-driven initiatives. “A community that has built social capital has a collective understanding that they themselves can affect change in their lives. Social capital will guide any neighbourhood through the process of realizing their vision” (City Repair, 2006, p. 35).

Figure 3.21 (on the following page) illustrates the social capital “sustainability cycle” for transforming the public realm into an expression of community collaboration and creativity. As diagrammed in the figure, the work of City Repair hypothesizes that Participation generates Social Capital (the bonding pathway) that is, in turn, responsible for Linking Social Capital (the bridging pathway). This ultimately leads to Collective Action that feeds into the collective awareness of a locality, thus feeding the potential promotion of the next project and phase of Participation (Semenza et al., 2006). Since 1996, this model has been used with repeat success by the organization.

By the sustainability cycle model, the community in Mount Pleasant working towards the realization of the Rainway has completed one full cycle. By all measures of the survey and from a portion of the qualitative evidence gathered through selected interviews, the mural painting has begun the processes of strengthening the bonding and bridging pathways within the community. By measures of the comparative study with the parent survey, Mount Pleasant better embodies a majority of the eight domains of social capital than does Metro Vancouver. This was determined by comparing the answers to the questions with the greatest weight as determined by the “Caring and Involved Residents” model. Each of the answers were tallied as “greater,”
Figure 3.21: “Sustainability Cycle” for health promotion and community development (diagram adapted from Semenza et al., 2006, p. 10)

“equal,” or “less than” with factorial scoring. The result was a simplified means to compare the results of each survey. (See Figure 3.22 on the following page.)

A finer grained examination of the survey results offers direct evidence of a greater existence of participation, supporting networks, trust, and belonging was highlighted in the survey. Further, the subset of individuals represented by the street mural implementation, and the additional questions present in the Mount Pleasant survey, illustrated the existence of collective norms and values, associational activity, and empowerment. Safety, the remaining domain, was not directly shown to exist, yet its existence was not disproven. One could also argue a greater presence of safety in Mount Pleasant by default of its interconnectedness with the other findings. Without a sense of safety, growing such things as trust and participation would be hindered and unable
to outrank findings from the parent survey. The embodiment of these domains bodes well for repetition of the sustainability cycle for social capital. The intention with the strategies for design is to phase its development and implementation, coupled with a community-managed maintenance program, to build upon the initial bonding and bridging cycle and exponentially grow social capital. Social cohesion is founded upon social capital. It manifests itself in community first, and not in a top-down fashion (Forrest and Kearns, 2001). Therefore, as discussed in Chapter 2, the public realm offers the best opportunity for a collaboration between city and community to improve social capital. However, in some cases, such as those where a neighbourhood block watch, grown from a strong presence of social capital, begins to grow distrust of other groups, the bottom-up approach could lead to an eventual decline in social capital (Fukuyama, 1999). Social capital should therefore be viewed as “important not for its own sake, but for what one does with it, or can attain by it, as with other forms of capital” (Forrest and Kearns, 2001, p.2141).
case of Mount Pleasant, it would benefit the City of Vancouver to harness the positive nature of the social
capital that exists within Mount Pleasant. It could do so by supporting the actions of St. George Rainway group
with policy and actions that offer opportunities for participation in the decision-making process, building
networks of organizations with common purpose, fostering new and existing synergies and connections
between individuals and groups, promoting interests of the community, and help with growing the community’s
sense of place through design intervention within the public realm (refer to Figure 2.6 in Chapter 2 for more).

It is within the public realm where people can grow their relationships with one another and with place. The
higher level of social cohesion in Mount Pleasant relative to Metro Vancouver could be rooted in the makeup of
individuals who reside there; it could be due to the predominant typology of residential buildings with porches
fronted by tree-lined sidewalk streets (Katz et al., 1994); or it could respond to the groups and institutions that
exist in Mount Pleasant and promote various domains of social capital. Additional research would produce
findings as to the relevancy of each of these drivers, but regardless of the driver of social cohesion, the setting
and people of Mount Pleasant offer a greater opportunity for success. The St. George Rainway is both the
desired outcome for members of the community and a vehicle of promise for the City of Vancouver to promote
growth of social capital and thus, social cohesion amongst its communities. It is a safer bet to start in Mount
Pleasant: after all, those with head starts have greater promise of success.
4 Qualifying Characteristics of Resilient Community

The Interviews of Experts & Stakeholders

4.1 A Synopsis

Where the previous chapter offered quantifiable results demonstrating the relative strength of social cohesion in the Mount Pleasant community, this chapter tackles qualification of perspectives through deeper inquiry and representative voices. Each of the eight interviews performed for this thesis embody an archetype, through which the ten characteristics of resilient communities (shown again below) have a voice.

1. **A High Degree of Diversity**
   KEY DESCRIPTORS: heterogeneous, multidisciplinary, multifunctional

2. **Effective Governance & Institutions**
   KEY DESCRIPTORS: decentralized, linked, accountable

3. **Acceptance of Change & Uncertainty**
   KEY DESCRIPTORS: flexible, adaptive, testable

4. **Non-equilibrium System Dynamics**
   KEY DESCRIPTORS: energy-conserving, ecologically-balanced

5. **Community Engagement & Participation**
   KEY DESCRIPTORS: local, sense of ownership, place-based

6. **Capacity for Preparedness & Planning**
   KEY DESCRIPTORS: redundant, yielding, projecting

7. **A High Degree of Equity**
   KEY DESCRIPTORS: accessible, unbiased, egalitarian

8. **Presence of Social Capital**
   KEY DESCRIPTORS: participating, supportive, trusting, welcoming, engaged, connected

9. **Capacity for Learning**
   KEY DESCRIPTORS: creative, active learning, knowledge retention

10. **A Cross-scalar Perspective**
    KEY DESCRIPTORS: cross-temporal, cross-spacial, cascading
The first section of this chapter provides the framing for the individuals chosen for interviews as well as the methods used for the interview process. Also included is a justification for the use of archetypes as a mode for transference of insight. The following eight sections correspond with each of the archetypes (interviewees) and the themes to which their interviews most apply. (See Appendix B for full transcripts of each interview.) Lastly, the concluding section calls attention to the Green Streets and Country Lanes programs discussed throughout several of the interviews and assesses their viability as precedence for the St. George Rainway.

4.2 The Interviews: Framing & Methods

4.2.1 Interview Framing

The survey results situate the neighbourhood of Mount Pleasant as one with evidence of stronger bonding and bridging pathways than that of broader Metro Vancouver. The data highlighted for analysis lays the foundational argument of a stronger presence of social cohesion within the neighbourhood. Such a presence offers a greater potential for success with the St. George Rainway: a pedestrian-focused infrastructural intervention within the public realm.

A deeper and more nuanced understanding of how to grow social cohesion is garnered through the voices of experts and stakeholders. Those chosen to be interviewed were an equal mix of perspectives originating in the community of Mount Pleasant, or from the City of Vancouver. The social realm addressed by the ten characteristics of resilient communities, is one that relies upon fruitful and healthy interaction between a metropolis and its neighbourhoods...between a bureaucrat and a citizen...or between a grassroots organizer and a city planner. A high degree of diversity is required with decision making, such that it comes from both stakeholders with local indigenous knowledge as much as it does from those with a data-driven planning perspective (Osbahr, 2007). Effective governance and institutions throughout a particular jurisdiction are inextricably linked through the local context in which they both exist and function. A decentralized decision making structure is key to adaptive practices (Martin-Breen & Anderies, 2011). The levels of attachment to place are directly related to the community engagement and participation that are inspired by that place.
Community members have as much responsibility to growing a place as city officials do with providing the freedoms and physical typologies through with such activity can flourish.

Though only three of the characteristics were just mentioned, each of the ten embody at some level a necessity for collaboration between the people and their governing body. For the interviews, a series of individuals were chosen to capture a perspective different from the next, with regard to the concept of social cohesion in the context of the neighbourhood of Mount Pleasant. Interviews of the following individuals were administered:

1. **Sara Orchard**  
   Member of Engineering Services Branch of the City of Vancouver  
   Manager of the Green Streets Program

2. **Mike Klassen**  
   Past Member of Vancouver City Planning Commission  
   Resident of Kensington-Cedar Cottage & caretaker for its Country Lane

3. **Sandra James**  
   Past Neighborhood Planner for City of Vancouver  
   Co-creator of such city-community collaborative programs as Country Lanes

4. **Joyce Lee Uyesugi**  
   Current Mount Pleasant Neighbourhood Planner for City of Vancouver

5. **Shahira Sakiyama**  
   Resident of Mount Pleasant  
   Community organizer for the St. George Rainway Project

6. **Teresa Comeau & Barry Calhoun**  
   Resident couple of Mount Pleasant who live along St. George Street

7. **Sue Stevenson**  
   Current Principal of Mount Pleasant Elementary School

8. **Naomi Steinberg**  
   Resident of Mount Pleasant  
   Community artist and organizer for the St. George Rainway Project
4.2.2 Interview Methods

The interview process involved meeting each interviewee on the day and at the time and location of their choosing. Each interview lasted from 30 to 50 minutes and were intentionally unstructured. This style of unstructured interviewing was chosen for two primary reasons: 1. It provided freedom for a line of questioning that was not rigid and offered opportunities for topic negotiation from the interviewees, thus inspiring potential for deeper inquiry and individual perspective, and 2. The individuals interviewed were chosen for their position and ability to represent perspectives broader than their own, thus offering a collective voice larger than the sum of the participants. In addition, the interviewing approach provided (Hammersley & Atkinson, 1995; Hollway & Jefferson, 1997; Miller & Crabtree, 1999).

The eight were chosen and characterized as archetypes to focus the discussion of resilient communities in the context of Mount Pleasant and greater Vancouver. Archetypes have been used in both ecological and socioecological applications of resilience (Bennett et al., 2005; Eisenack et al., 2006). They can act as surrogates or proxies that have been developed from a combination of theory and case studies to help test and hypothesize impacts of various scenarios. Eisenack et al. (2006, p.13) further qualifies this with:

...our understanding and design of institutions governing environmental conditions can substantially benefit from methods bridging the gap between case-specific and generalized reasoning. Archetypes are between these extremes. The approach has the further advantage that–depending on the needs of the study and the capacities of the involved teams–it can be expanded towards a formal as well as towards a qualitative analysis.

The ethnographic lens that each of the interviewees offers also exist between generalized and case-specific reasoning. In turn, they grow one’s understanding of the framing for this study and the potential form it will take. The shared perspectives through the lenses of archetypes allows for a transference of ideas and insightful correlation with the theoretical basis for resilient communities. Each interview began with a discussion of the interviewee’s perspective of social cohesion in the context of Mount Pleasant, but none traced an identical path.
of exploration and conviction. The archetypes grew from the detailed transcriptions and using qualitative analytic coding process for each interview. This process involved a word-by-word transcription, followed by a line-by-line analysis to develop the coding of the data. Otherwise known as grounded theory, this process did not begin with hypotheses, but rather enabled the development of themes and archetypes to grow from the coding itself (Charmaz, 2006; Emerson, Fretz & Shaw, 2011). In the same order they were introduced by name and title, the archetypes are that of:

1. The Exemplar  
   Sara Orchard
2. The Advocate  
   Mike Klassen
3. The Expert  
   Sandra James
4. The Manager  
   Joyce Lee Uyesugi
5. The Connector  
   Shahira Sakiyama
6. The Champions  
   Teresa Comeau & Barry Calhoun
7. The Longview  
   Sue Stevenson
8. The Visionary  
   Naomi Steinberg

The goal of creating these profiles was to provide a transferrable means for application of the ten characteristics of resilient communities. More than one characteristic will apply to each archetype. Following are the insights from each of the eight.
4.3 The Exemplar and Green Streets

Sara Orchard agreed to meet for coffee at a spot close enough to the Engineering Services offices to allow her adequate time to deliver more than the marketing sound bytes of Vancouver’s successful Green Streets program. The program uses volunteer labour to maintain aesthetic planting of traffic calming circles and boulevards (City of Vancouver, 2013a). The trade-off for sitting outside to enjoy the sun was having to manage the noise and exhaust of the bustling Broadway corridor. With more time to spare, perhaps a tour of one of the planted traffic circles would have taken place. Yet, with such a prevalence throughout the city, an introduction to their existence was hardly necessary.

Sara, a landscape architect by training, is the current Green Streets Program Coordinator. She and the program she manages act as the exemplar, or the best-suited active precedent, for demonstrating community engagement with a City of Vancouver initiative. By nature of the initiative, Sara and the Green Streets Program embody the fifth characteristic of resilient communities: community engagement & participation. This characteristic grows in direct relationship with the place attachment developed within the volunteers (Manzo & Perkins, 2006; Cantrill & Seneca, 2001; Low & Altman, 1992). Anecdotally, Sara provided the following that helps demonstrate this relationship:

This one woman I was interviewing who lived in a high-rise told me a story of how she one day noticed one of the green street signs and decided to call. Even though she was nervous about what it was going to entail, if people were going to judge her by what she planted...but once she started to volunteer, she was hooked instantly. There was something about being able to work on the ground and dig in the soil that captured her. Being connected to the earth was a much different sensation for her than what she experienced in her elevated home.

According to Sara, her program has the most success with volunteer recruitment in neighbourhoods with higher housing density. Her hypothesis for this is that “people who live in condos or multi-family residences have less access to greenspace, such as lawns, so they seek it out more.”
Figure 4.1: Green Street at 4th and Yukon (City of Vancouver, n.d.)

Figure 4.2: Green Street at 8th and Maple (City of Vancouver, n.d.)
With such a program as this, where a lack of volunteers would force it into nonexistence, the dynamics involved with recruiting and maintaining a volunteer base are given much attention. The frequency by which this was mentioned throughout the transcript—over two dozen times for a 40-minute interview—demonstrates this. Besides the mention of there being “high gardener turnaround in the areas where there is a high renter turnaround,” things such as project scale and duration also impact, and are impacted by, the volunteers. In Sara’s words: “A lot of volunteers are very ambitious and very excited about gardening, but don’t necessarily understand the ramifications of how that maintenance is ongoing. It’s not just one or two seasons; it’s about also considering what happens ten years down the road.” Sustaining this excitement and drive to volunteer will be a perpetual challenge for her program. She continues with:

Volunteering is great, but we all know how life can get busy sometimes. People are tied to their jobs and to their families and it is no fault of a volunteer’s if they cannot put as much effort into a garden as they have in the past...As we grow and change throughout the years, our life situation changes, so we may not have the same time to volunteer anymore. Volunteering is a very different type of commitment. It would be good to have a paid position involved...it’s a stronger pillar in the ground, so to speak, than just having a few neighbours.

Public-nonprofit partnerships would help. Sara identified groups like Evergreen, “a national not-for-profit that inspires action to green cities” (Evergreen, 2013) that have paid staff that could in various capacities become involved.

Public-private partnerships could also help. They offer the identified shortfall in city-budget funding, mentioned on more than one occasion over the duration of the interview. The original commitment of the program was how the City of Vancouver would “provide [volunteers] with the up-front costs to initiate all the work, while the community is responsible for maintaining it.” Because the city is at a “tipping point” with their budget, Sara stated how “with new projects, we try to get gardeners in ahead of time. If we don’t find a gardener, there is the chance we won’t install a garden there.”
In the cases volunteers are found up front, it has grown more customary to increase volunteers’ involvement and allow them to co-design the gardens. If one garden is found to be a vocalized eyesore by neighbours, the extent of enforcement used by Sara to help resolve the issue would have her saying something such as, “It would be nice if you weeded your garden, because your neighbour is not so happy with how it looks.” This malleability with the program exists despite the fact that, in Sara’s words, “at the end of the day we are ultimately responsible for the gardens and the people that need support.” The shift in how the program was originally conceived to one that is driven more by the volunteer base demonstrates, in a minor way, the second characteristic of resilient communities: effective governance and institutions. These noted instances of deferral on behalf of the city can be viewed as an act towards decentralization of the decision-making structure for this program and spreading accountability.

The Green Streets program can also be seen as an example of a presence of social capital, the eighth characteristic of resilient communities. The personal connections developed by volunteers between one another and with the broader community is known to further grow the patterns of sharing and relationship building (Lin, 2001). Sara claimed, “I have heard many times of how people did not know who their neighbours were until they began to volunteer for the Green Streets program, and how after starting, they all-of-a-sudden knew everyone.” In addition, she stated, “Many gardeners don’t at first realize how social their experiences will be. People walking by will often stop and give comments like, ‘great job!’ or ‘I have water free for you to use…’ or ‘I have these perennials that I divided in my backyard–would you like some for your traffic circle garden?’” Through her words, volunteer gardening has been identified to bring participation, common purpose, supporting networks, belonging…each integral domains to the presence of social capital (Forrest & Kearns, 2001).

Sara and the Green Streets program are an exemplar for the St. George Rainway if it is to support a growth of resilience in the community through which it runs. Her interview was primarily focused around the program’s functionality and logistics. Yet, she found time and opportunity to embellish the ways by which the program is
an ideal precedent. As such, a few additional selections from the transcript should be noted. Sara offered, how “in terms of gardens, it is best to start out small;” how “it is good to try and seek out the strongest connections with the neighbourhood and feed off of their energy;” how “every five to ten years, each garden needs a renovation;” and how “phasing is a good idea [and] monitoring...is a really good thing to build into any project.”

4.4 The Advocate and the Country Lane

From the means by which Mike Klassen was able to articulate the history and importance of the Kensington-Cedar Cottage country lane, one would have never known him to have moved in to his home along the lane six months after its installation. We met for coffee, then walked his frontage street, through his kempt yard, and into the alley, a country lane, to talk about its successes and opportunities for replication.

The country lane is located behind Mike’s home between Fraser and Prince Albert Streets. It sits mid-block, between 27th and 28th streets and is just shy of running the length of a full block. Because it terminates into a service lane for the businesses along Fraser to the west and into a lane for the garages and laneway homes of the houses along Prince Albert to the east, this country lane sees vehicular traffic almost exclusive to the residents whose properties abut it. [Insert aerial image locating this country lane.] When he and his family first traveled through the neighbourhood, he stated how they accidentally turned down the lane exclaimed, “We shouldn’t be here...this isn’t where cars should be!” He knelt down to show me some of the surfacing materials used in construction and continued: “At the time, there had been newly seeded grass on this grid. It looked very precious and like a place that we were supposed to be.” Mike, as both a caretaker of the lane and as a past member of the Vancouver City Planning Commission, is a vocal advocate for a revival of the Country Lanes program.

The Country Lanes program was a demonstration project unanimously approved by city council during the summer of 2002 (Transport Canada, 2004). The lane that runs behind his home was one of three produced. “This one, in my opinion, was the best and the most expensive. Of the money that they had allotted for the Country Lane program, I believe they spent half of it on this one in particular.” Mike continued: “With a lot of
Figure 4.3: Kensington-Cedar Cottage Country Lane (Michael Klassen, 2008)

Figure 4.4: Community barbecue in the lane (Michael Klassen, 2008)
these types of projects, you have to ask yourself: If you are going to spend a bit more money on something like this, what are the benefits? What are the social benefits? What are the environmental benefits? And what does it do for community?” As with the Green Streets program, this program embodies resilient communities’ characteristics of community engagement & participation and presence of social capital.

The community engagement and participation came primarily at the start of the work, using labour from local residents to help lay all the modular paving and plant all the plants. For the ten years since its original installation, the lane has required only a few caretakers, or champions, at a time, with no additional help necessary from the city. However, Mike explained, “if everyone didn’t care about it and considered it only to be a back lane where you throw your garbage cans once each week and that’s it, I don’t think it would be as successful.” Regarding social capital, the lane would not have been successful without neighbours feeling empowered to pick up trash, plant additional plants, and provide any needed upkeep. Such participation, as understood throughout the interview, is shared within the immediate community, and through this, has helped to transform and maintain the lane as a safe place where the community has traditionally congregated. In Mike’s words:

Communities tend to have their own geographical boundaries; people tend to centre around certain blocks; some streets tend to be more inviting or walkable...and these lanes have the ability to add that extra bit of desirability to the street. Laneways can create a centerpiece for community, and that is what this one has done. It allowed people to think of it as the centre, where people could gather.

Not only had the project inspired a continued stewardship effort from the surrounding neighbours, its sense of being a public open space in conjunction with its maintained aesthetic appeal has inspired respect and appreciation from the greater community. It has been home to nearly every annual neighbourhood barbecue since its transformation, and, Mike explained, “people consider it a nice detour on their way home, so you often see people walking through...[and] people tend to drive more slowly here.” He continued by adding: “I am not sure how many 3-1-1 calls go out for dumping in a typical lane, but there has never been any dumping take place
here. I’ve never seen a mattress or a pile of garbage left.” All of this comes with the simple replacement of impermeability with permeability. Several inches of asphalt were replaced by two concrete driving strips—all that is needed to manage vehicular through-traffic. Permeable paving units by Golpa, in conjunction with structural grass, was used to provide integrity to the surfacing connecting to each garage and driveway. Lastly, perennials, including grasses, sunflowers, and native shrubs, were planted to provide a softer transition from yard to lane.

No such Country Lane has been installed since. In this, it could be argued that the City of Vancouver did not demonstrate capacity for learning or effective governance, two other characteristics of resilient communities, to their fullest potentials. According to Mike, this country lane “was a reward for a neighbourhood that was pulling together in the face of social disease. This was a neighbourhood that was struggling a bit at the time this lane was installed.” If indeed this was the case, and it has proven to grow the engagement and spirit of the community, the city failed to apply active learning or adaptive management to the project. Instead, according to Mike, it discontinued the Country Lane initiative, citing budgetary constraints. Having the capacity for learning and an ability for effective governance should have instead have resulted in a monitoring of results to help grow policy as new knowledge was gained (Carpenter et al., 2001). Some knowledge was recorded, however it primarily involved information exclusively related to engineering details and performance (Transport Canada, 2004).

“We have here a gathering space for the central part of the neighbourhood. It’s a nice public space, and a nice place to walk through. You may not necessarily want to hang out in a lane, but if you decide you’d like to put up some barricades and roll out a barbecue, it’s a great place to do that. There aren’t many lanes in this city that you can say this about,” Mike concluded. It is true: there only are three lanes of this sort in the city, and this is considered the best example. The continuation of the Country Lane program has not yet reconvened, yet sustained learning can still take place. The pilots have long been completed and have grown the collective knowledge of the champions involved with their successes and failures. Advocacy from individuals like Mike
Klassen might indeed help to bring more of these lanes to Vancouver. However, his voice makes clear how it will take a sustained engagement from the city and a recognition that Country Lanes can do much more for community than improve stormwater runoff rates and quality. This will likely be necessary for them to become integrated into common practice Vancouver infrastructure.

4.5 The Expert and Harnessing Hindsight

Sandra James, once a neighbourhood planner for the City of Vancouver and one with the gift of hindsight, had much to share about the city and its various greening and sustainability programs, namely the Country Lanes initiative. Our talk commenced with this program and the Green Streets program, and she began: “First of all, the Green Streets project was misnamed.” Sandy went on to explain how it was often confused with the Blooming Boulevards program, another greening initiative in town that involved a “way of converting streets into greenways that were not already designated, [and] covered a certain square foot cost per plant with the help of a grant” that she helped to procure. During her tenure as a planner with the city, she helped develop several of the initiatives focused on both environmental and social sustainability. Of these, Sandy also worked closely with the Country Lanes program. For her depth of professional knowledge and position to speak candidly about the successes and failures associated with all projects with which she worked, she epitomizes the archetype of expert.

As a professional neighbourhood planner, Sandy and her words naturally embody the capacity for preparedness and planning. She sees the city’s role as one that should lead by example by offering the tools for building “the kind of city that we want.” Yet, this does not seem to be happening to its full potential. Sandy explained: “I personally have a quarter-acre of land that is all garden, but I don’t water it. I use city compost…it’s all about the practice. How can people know the practice though, if the city isn’t leading? There still is all the grass planted around City Hall as well as some invasives...part of the puzzle is to lead, but instead we have this restrictive benevolence.” In the case of Vancouver, this restrictive benevolence refers to an overbearance of zoning and bylaw in conflict with expressed ideals. For example, Vancouver aims to become the greenest city of
the developed world by 2020 and yet, its regulation of such green infrastructure technologies as rainwater harvesting and greywater reuse remain highly restrictive, as outlined in Chapter 2.

With the Country Lanes initiative, however, attempts were given to teach and empower community to manage their lanes at the same time crews were educated about techniques other than straight asphalt paving.
According to Sandy, “We created the main runs, but we didn’t do the runs to the personal garages. The reason for this was that we wanted to show the neighbours how to do it, so that when the blocks came loose, they could do it themselves without having to call City Hall.” As attested by Mike, the advocate, this proved to be the case and the lane to this day has required no assistance with upkeep.

Another benefit, explained by Sandy is how, “by them all getting to know us, having a great day, and sharing phone numbers, it built up a long-term connection with the community.” There are three country lanes, but not all were created equally. “The one off Yale was installed by city crews without the oversight from a landscape architect. The maintenance cost was higher in that case because the city crews were trying to figure out how to do it and failed to follow spec in a way that would not have happened if a landscape architect was overseeing the project.” The lane behind Mike’s home is the example that has worked the best, according to Sandy. “It’s not failing because it is well-built and is well-cared for by engaged residents. If we extended more of that kind of model to the project off Yale Street, it would have done better.”

Additionally, Sandy’s wisdom demonstrates the cross-scalar perspective characteristic of resilient communities. The City of Vancouver and its departments operate on a scale different to that of the residents nearby the successful country lane. Their workings are however, linked. Because the exemplary lane was built to spec and the community was successfully engaged and empowered to maintain its current thriving state, the actions of the community positively effect the resources of the city by not having an impact on their maintenance budget. Conversely, Sandy identified a problem with cooperatively working with the city on projects and how they “always seems to be a bit mushy about doing joint work.” She candidly speculated that this is because how “it is not clearly identifiable with regards to who gets the kudos in the end.” Because of ego, or perhaps a lack of interdepartmental collaboration that remains unknown, Country Lanes has remained but a pilot project from the past. Furthermore, Sandy explains how “everything about Country Lanes has been pulled offline [from vancouver.ca]. You have to remember why people did that…what were the reasons for doing Country Lanes…are there things we need to revisit?”
A cross-scalar perspective is one that requires adaptive management and a process of creating, testing, and creating opportunity across scales (Holling, 2001). The vision for the majority of projects under Sandy’s purview involved the space for testing to come from both the community and the city until an initiative was ready for greater permanence. Sandy and her colleagues “always thought the Country Lane program would go on and it would become part of the options you could get with Local Improvements initiative projects” or options for community to buy into public realm improvements through a nominal increase in property tax. In addition, she relayed how “the idea for greenways was originally to have them eventually turn into one-ways...or a closed street to become new public spaces as the city densifies in 40 to 60 years...but all of a sudden, that got lost.” Still, she maintains belief in the ability of such projects to build social cohesion: “I think there can be magic through urban design and involving people in projects. I found strong cohesion in the projects I was involved in...” Furthermore, she found how “the more you give to a community, the more they want to give back.”

Experts are commonly known for their knowledge of precedents. Indicatively, the interview with Sandy concluded on a note of inspiration for the Rainway project: “In Dinsmore, Saskatchewan, they don’t have any paved streets. They actually pulled all of their paved streets up. They were saying how since they get potholes that are really expensive to fix, that they decided to go back to dirt and gravel. It ended up being more affordable and is percolating! I always thought the incubators of change are not going to be the big cities, but the suburbs...”

4.6 The Manager and Bureaucratic Temperament

Per her tight schedule as a planner for the Community Planning department of Vancouver, Joyce Lee Uyesugi agreed to meet for tea at a café close to City Hall. We remained on-topic throughout the interview and began with the discussion of social cohesion in Mount Pleasant and ended with her posing the broader questions: “How do you get people to become engaged? How do you share information and get their response on these bigger issues when everyone is so busy with the day-to-day?” The position of manager requires practicality. It also requires a balance of work by addressing issues of budget, time, and resources. Built within effective
management is a high degree of equity to maintain appropriate balances with any problem at hand as well as with access to the capital enabling the involved groups to work on solution(s) (Pearce, 1988). However, a drawback to traditional management versus adaptive management is the struggle to realize a different characteristic of resilient communities: acceptance of change and uncertainty (Berkes, Colding & Folke, 2000). The struggle to find compromise between these two phenomena, or characteristics, can be seen throughout Joyce’s interview.

The balance that Joyce strikes is one that applauds community initiative and empowerment, but at the same time recognizes the roles and sometimes temperament that the city needs to play. When asked about the permanence of projects initiated through the city-run VIVA Vancouver program, Joyce stated: “I think that, in the public realm, this is what it takes...you just need to do it, figure out what works, and leave it.” Yet, during the same discussion, she explained how “any improvement in the public realm requires money, and when you are tied to a city program, there are rules you need to follow. This can be a drawback, but I see the benefits of the support staff’s knowledge and coordination really outweighing some of the costs.” Regarding projects initiated by groups independent from the city, she recognized how the pivotal the role of community can be. Because of bureaucratic hurdles and rules that need to be followed, she believes how “it is more likely for the community to be able to achieve something new and unique and progressive, versus waiting for the city to initiate anything like that.”

In the eyes of the city, “the public realm is often seen as a bonus or an extra...it has little to do with life safety for instance. The dollars often are not there. This is one thing that worry about with the [Mount Pleasant] Public Realm Plan. How is the city going to implement this?” Vancouver’s 2013 Capital and Operating Budget for both Utilities & Public Works and Civic Infrastructure was $128,843,000. Of this, $0 of the $14 million set aside in the 2012-2014 Capital Plan for “Emerging Priorities” is dedicated to anything but “City-Wide Overhead” (2013e), leaving one to ponder how the new ideas brought forth by the Greenest City 2020 Action Plan are to be funded. The budgeting and expenditures for this initiative were not outlined in this budget. Therefore, one can only
assume that unless a sewer separation upgrade in Mount Pleasant warrants implementation of such things as
greenways and improved pedestrian connections, the Public Realm Plan will remain just a plan. Budgets are
fixed entities and account for change and uncertainty only in a reactionary sense and corresponding with such
things as the political cycle. Until such concepts as access to nature or community resilience are seen also to be
life safety items by cities, projects such as the St. George Rainway will be hard-pressed to receive city-funding
beyond the typical allotted infrastructural budget.

Despite this reality, Joyce continued to offer ideas to straddle the city-community dichotomy. She wishes there
were more resources to build relationships and support community activities, and offers what she can by
stating: “I like to think that we can help through a coordinating role, or an education role in terms of what other
initiatives are happening. Certain projects might have relationships with others that the city could point out.”
Identifying and supporting synergies is one way she feels the city could help. Because the city has not budgeted
much “room for extras...it is really important to build relationships with communities and helping to make sure
they have the capacity.”

Still, there is only so much that a city can do to build capacity and social capital since it is known as a bottom-up
process (Forrest & Kearns, 2001). Joyce recognizes the common purpose and participation that have begun to
make the St. George Rainway a reality. She identified how “the fact that there is already a group existing, a
group formed around the singular interest of creating the rainway, is quite a feat unto itself. The ability of any
group to sustain itself is key...there often seems to be a champion who is involved at the front end. To the
extend they stay involved, the group will have a greater chance at success.”

Not only did our discussion about the city-community relationship touch upon the struggle to balance budget
realities with needs to be equitable and anticipatory of change and new ideas, it illustrated instances of other
characteristics. The need for a presence of social capital, effective governance and institutions, and community
engagement and participation all were echoed as necessary components to projects discussed under the
interview’s pretext: social cohesion. The synopses of the remaining four interviews and their archetypes will further exemplify these and more of the ten characteristics of resilient communities.

4.7 The Connector and Building Relationships

As a mother who lives and works Mount Pleasant, and as a community organizer who is currently involved with several initiatives, including the St. George Rainway, Shahira Sakiyama is someone who is very aware of the activities and relationships impacting her neighbourhood. She is someone who prefers dialogue to estrangement and seems to foster neighbourliness wherever she goes. We met for her interview at the Mount Pleasant Neighbourhood House, and sat amongst neighbours on a couch in the middle of the common area.

“Here,” she stated, “there is a cross-generational aspect of what they do. It’s not about just providing needs for children or families, but also for all cross-sections of society: youth, individuals, and seniors. I have been very grateful to be able to expose my family to that and become a part of those communities.” Her involvement here, at the Mount Pleasant Family Centre, and throughout the community as both an engaged mother and citizen has afforded her and her family many opportunities for connections and engagement with the public spaces and the people of Mount Pleasant. However, not all of this comes without some effort. Building social cohesion takes effort and the words of Shahira will help to demonstrate where best to place this effort to achieve successes.

The evolution of the unstructured interview grew into a discussion revolving primarily around means for growing the presence of social capital. The primary example and focus for this discussion was the street mural painting between 7th and 8th Avenues. The summer of 2012 saw the original painting of the mural. Shortly before this interview, the mural was repainted to sustain its presence and vibrancy. According to Shahira, 75% to 80% of the original team of painters returned to help again. To her it was “great to have such continuity. Previously it took two days to complete, while this year it only took one. The foundation was already in place and we were already familiar with the structure necessary for completing the mural, so it took less time.”
Figure 4.6: “Welcome to the St. George Rainway”

Figure 4.7: Detail image of the Rainway mural
Repeat participation in this case in just two cycles, one year apart, led to a streamlining and efficiency of the effort. Meanwhile, less organization of volunteers was necessary for the second year. Upwards of 50% of those who volunteered “were just people who were walking by and got caught up in the effort… ‘Let me go and change my clothes! I will be right back!’” She relayed how when others would say, “Oh no, I can’t help—I’ve never done this before!” or “I am not an artist…” the volunteer group would reply, “That’s okay, we haven’t either!” From such displays of openness grew a sense of empowerment from neighbours to voluntarily engage in such numbers. Additionally, from this grew a sense of belonging: “It was amazing seeing the pride people developed in themselves around having done something they originally never thought they could do. It helped to create a sense of ownership in those that participated…There is something to the experiential nature of this project that was able to draw people out.”

Before achieving successful volunteer efforts, the St. George Rainway Group gauged the interest of the community with their own survey. There were a few voices of opposition, as was evident in the findings from the survey portion of this thesis. One point of opposition holds a seat of power in one of the strata properties along St. George Street and prevented the Rainway Group from engaging with other residents from the building. As Shahira put it, “Eventually we found an in, who was very supportive of the project. From him, we found out that nearly all of the residents were totally in support of the project. To date, he has been our contact for communication with the residents…and was able to start a civil conversation with that gentleman.” In this case, only through persistence was a set of collective norms and values discovered. She went on to clarify the effectiveness such an approach to finding inroads to discussion with naysayers:

You can’t really change someone’s mind, unless it is something they wish to do. Fliers they don’t read and events that they don’t participate in is not going to change anything. One-on-one conversations, providing the space to allow people to vent, and finding common ground are ways to make some movement. But, if people aren’t even willing to have the conversation, what can one do? From my experience, one-on-one connection is the most powerful means.
If not through direct one-on-one contact, an indirect contact could prove a successful means to build trust and open dialogue as it did in this case.

After the initial surveying of the community by the Rainway Group, they decided a block party would be the next phase of engagement. Shahira stated how “it was able to bring together neighbours that might have never talked before out and in the street in support of this project. They were able to enjoy music and share food…” Neutral spaces like this where people can come together can provide a great opportunity for engagement.” Neutral spaces, spaces without agenda beyond sharing time for food, conversation, and relaxation in this case inspired a sense of safety that might not otherwise be present in a more formalized or private setting.

Whether it exists outside—a recognized challenge with Vancouver’s annual rainfall—or inside, Shahira concurred “physical space is very key when helping to foster community.” She continued by recognizing the efforts of the mural painting as a component to a cross-scalar perspective and effort to more sustainably manage local water as a precious resource and how “it all eventually flows to the False Creek Flats [and the Great Northern Way campus] before flushing out into False Creek. This is why my energy now is being focused on the visionary work to help complete St. George.” In conclusion, she shared: “When we start tearing up the mural to create bioswales, that will be great…But if at the end of the day, if this water ends up being flushed into pipes and culverts, it will be like not lighting the birthday candle.”

4.8 The Champions and Attachment to Place

Teresa Comeau and Barry Calhoun moved into the Mount Pleasant neighbourhood just six months prior to their interview that took place around the island in the kitchen of their bright new home. She, a real estate agent, and he, a professional photographer, moved from the neighbourhood of Kitsilano to Mount Pleasant “and for the first two months,” according to Barry, “every time someone saw me coming or going, they would say, ‘Welcome to the neighbourhood!’ or, ‘Wow! What a beautiful house!’ and they would start a dialogue.” To
them, this was a big change from their living experience across town. “I am a really friendly guy,” Barry explains, “but after a few months of living in a place like Kits and you’ve said hello to strangers who just give you weird looks, you stop doing it.” Six months into their new neighbourhood, they have sensed social cohesion is “five times stronger” in Mount Pleasant than in Kitsilano. To them, social cohesion is a place “where people know their neighbours...where, even if you don’t know your neighbours, people are friendly and say hello...it is what helps make up a community with churches, schools, and institutions that help bind the community together.”

Teresa and Barry believe they have found this in Mount Pleasant, which in turn has already inspired reciprocation, marking them each with the potential for embodying the champion archetype.

By one means or another, each of the other interviewees mention champions as being an integral component to realizing community work within the public realm. Without strong voices to defend the needs and visions of a community, change is hard to make. However, before one can become a champion, they must engage with the issues and individuals they represent. Through their words and actions, Teresa and Barry both demonstrate community engagement and participation. This characteristic of resilient communities requires emotional bonds to place to inspire action to maintain or improve that place (Manzo and Perkins, 2006). In the case of these two individuals, this place attachment became evident rather quickly.

At mention of the St. George Rainway, Barry inquired poignantly with: “The idea is to turn St. George into a one-way street, as opposed to a two-way, and to flip the closed lane into a stream/park and public green space, correct?” Upon simple verbal embellishment of the idea, he freely volunteered to “be one of those people who would be willing to be a steward and help with gathering trash, weeding rain gardens, and help take care of the space.” He clarified that he would have a “vested interest” because of the proximity of the Rainway to his home, but expressed how even if they “lived a half-block in, [he] would treat the amenity the same...” Only a comprehensive survey of community attitudes about the Rainway could produce whether a non-homeowner would feel the same way about volunteering. Regardless, such a reaction to the idea of the Rainway demonstrates his attachment to the place that is his locality within Mount Pleasant.
As the interview continued, so did their envisioning of the idea. Barry compared it to either Robson Park or Guelph Park, “a massive park where everyone can go into their own space and be in their own little green world...” To him, “creating the full vision of the Rainway, where half of the roadway is reclaimed and turned into a stream, walking path, benches, and so on...you would have one linear element that would attract everyone [and] put people in direct contact with neighbours than in the current configuration.” Teresa agreed and expressed the importance of engagement with the idea from community. Here, she stated, is “where phasing could be a good idea. Starting small...and growing from something similar to the city’s Green Streets program could work well.” Continuing with her voice of optimism tempered by realism, Teresa pointed out the challenge of engaging with neighbours who are not in favour of the Rainway, or have no intention to participate in its upkeep. “How do you involve the kinds of people you never see or meet in your neighbourhood? If they don’t want to be involved, inevitably someone else will have to steward their area.” Barry, in reply, believed such a thing is rather inevitable and that others would help in their stead. “Despite having only lived here for such a short period of time, I can confidently say how I don’t think the key element of stewardship would not be a problem to find here.”

As a means to meet her neighbours, Teresa inquired about obtaining a community allotment garden plot in Robson Park and organized a neighbourhood yard sale. With her garden inquiry, she was told that the wait list stood at 70 people. “70?! How long will it take us to have a small plot over there?!” With the yard sale, the response was more fruitful, but spoke just the same to the evidence of engaged neighbours. Even though “not as many people committed who spoke positively about it” and turnout was not what she hoped for, Teresa did believe neighbours were talking and sharing information. “I went door to door to tell people about it, and some people already knew about it by the time I got to their front door,” she said. Though not yet a reality, one story was found to be particularly inspiring by her: “We had some houses on Carolina Street get together to agree to spend the money they would earn from the yard sale would be directly put into street gardening...sadly though, the person who was spearheading it got called away to work, so the cohesion that she brought with her was removed and they had to promise to try again next year.”
Whether Teresa and Barry will rise to be of champions of the Rainway will be seen. What is evident is how the place they now call home has presence of social capital, inspiring them to become engaged in the ways they have in such a brief amount of time. Some research has shown place attachment to be a phenomena related more to connections with social networks than spacial networks (Hidalgo & Hernandez, 2001). Other findings give social and spacial connections equal weight (Low & Altman, 1992). In the case of Teresa and Barry, new residents of Mount Pleasant, the weight of the individual drivers of their investment in community is of no consequence to its existence. They are already engaged and building connections.

4.9 The Long View and the Role of Youth

Prior to the interview with Sue Stevenson, a young boy sick with nausea was gathered up by his consoling father moments before two mothers left Sue’s office in tears after what appeared to be a difficult meeting regarding their children. Sue bid them good day and greeted me with a smile and the strength unique to someone held responsible for so many budding youth. Sue, once the vice-principal and now principal of Mount Pleasant School, one of the two primary schools that flank St. George Street, has been working in the community for over 14 years. The nature of a position of service that involves a constant influx and turnover of individuals you are responsible for requires constant negotiation of needs for the present with needs for the future. This requires a constant flow of energy of many forms into the system that is the school. In her role as principal, one who needs to straddle a long view with immediate needs, Sue characterizes non-equilibrium system dynamics and is a role model for resilient communities. Further, she demonstrates support for high degrees of diversity and equity as integral components to the discussion.

Mount Pleasant Elementary is considered an inner city school. Understanding fully this designation, Sue sees her role as the school’s principal to “facilitate the three primary goals of urban schools.” She went on to explain how “youth and family workers, neighbourhood workers, staff...all of these people are focused on supporting these goals,” which are as follows:
The first is to infuse literacy and focus on it wherever we can...The second inner city goal is social responsibility. Improving self-esteem by bring students out into the community and teaching them responsibility provides opportunities for developing this more than they might be exposed to in their homes. The third is community engagement. This is at the heart of what we do. This is what Mount Pleasant, and Strathcona, and Nightingale, and the fourteen other inner city schools embrace.

Literacy, self-esteem, and engagement each are about instilling the foundations of healthy habits in youth, when the representational learning curve is not as steep as it is when reaching adulthood (Fischer, 1980). Less energy is therefore required to form healthy, more resilient habits in youth than adults. Of the three goals, Sue stressed the brevity of the community engagement goal, expressing its importance as “huge.” She continued: “We have team meetings almost every week, where the four of us: the Principal, the project teacher, the neighbourhood worker, and the family worker—the inner city team—meet to discuss how we can support our most needy and at-risk families. How are we engaging them? How are we getting them into our school? It’s a big piece of what we do.”

One very visible example of engagement with the broader community is represented by Celebrate Mount Pleasant Day, an annual event that transformed Mount Pleasant Elementary into “a bustling, diverse display of community spirit and celebration” (Mount Pleasant Business Improvement Area, 2013). In her own words, Sue explained how “it has trust, it has people chipping in; it has a real community sense. We have multicultural music and people from all over the world–different people coming together to celebrate what we consider to be our neighbourhood.” Every year, the event “keeps getting better and better.” Yet, The neighbourhood has not always been home to such engagement. Sue has noticed a change in the neighbourhood during the past decade, and expressed: “In 1999, we did not have these kinds of events and we didn’t have this kind of willingness to come together and do something altruistic for our community.”

The community is not without its problems, though, according to Sue, they “are growing farther and fewer between: we’ve not had needles on our playground like we used to; we don’t have condoms on our playground
like we used to...” A few days prior to the interview however, she was nearly chased by an intoxicated man who asked her to leave “so that the kids could play soccer on the field. He was passed out, so I had to go out there and try to get him to move.” Sue explained how this was not the first time (or second) that she had to inspect an unconscious intoxicated individual who found the school grounds an appropriate place to rest. For all such reasons, she believes the community she works in to be “an interesting community. It is what it is, and that is unique. There were crack houses across the street from the school in 2002 that are now multi-million dollar condos. It’s definitely a changing neighbourhood.” As with natural systems, communities like Mount Pleasant are in constant states of flux. Change itself is value-free and takes energy to steer it in the direction for those who state their preference.

The voice and actions of Sue support the St. George Rainway. According to her, the entire project “has inspired a few children who want to see it come to fruition in their lifetimes. They want to be involved and be able to make a difference in their community. We are calling them our ‘Creek Stewards.’” Despite the cyclical dynamic of schools, she still hopes to “stay involved to help these students take their message to City Hall and show why this project is important for their community.” She further clarified this with:

This is going above and beyond curriculum, yet it is also very highly connected to curriculum in many ways. I have a couple of teachers that really see the value in this and are really embracing this and inviting this project into the school because of its importance. This doesn’t happen overnight, takes slow small steps, but has so much potential and value and so I support it as much as I can. I also support the community artists involved with this because I see them as an important component to the life skills that we are teaching these kids.

To extend involvement after her students have graduated to high school, Sue and her faculty have been submitting applications for obtaining artists-in-residence. She believes “it would allow us to build relationships between these kids and artists in the community that are working on this, so the students no longer need the school to continue with their work with the broader community.” In the case of the Rainway, equilibrium could
be viewed as the state of apathy to restoring ecological functionality to the buried stream. If crafting the opposite—an environmental stewardship ethos—in youth requires time and energy, it is an apt move to solicit sustained help from the broader community.

Figure 4.8: A scene from 2013 Celebrate Mount Pleasant Days

4.10 The Visionary and Connecting Narrative to Place

With intention, the walking interview with Naomi Steinberg began at the Storyteller’s Bench in Robson Park: a functional, symbolic, and artful cob construction envisioned and realized by her for the community. Here at the “headwaters” of St. George Creek, we began our talk about social cohesion and with Naomi exclaiming, “My mind bubbles over with metaphors…” Naomi, the executive director of the Vancouver Society of Storytelling, is a professional storyteller herself, so metaphors are familiar territory. Her understanding of social cohesion is as “a network that is resilient, flexible, and malleable at will, and is made up of lots of drops of water” representing the community and its “many different voices and so many different needs…” Furthermore, it holds for her “a ‘safe’ space for conversation and dialogue to move forward with common understanding.” Throughout this the final interview, the discussion regularly came back to a mention of place in the context of change and uncertainty. Naomi’s ability to simultaneously and contextually connect history with the present with the future marks her with the archetype of visionary.
Acceptance of change and uncertainty, one of the ten characteristics of resilient communities, can be achieved by planning and well as planning for the absence of a plan. To do so, communities require an establishment of trusted sources for knowledge (Norris et al., 2007). To Naomi, these sources are landscapes and the stories associated with them. During a discussion about a program Naomi worked with to help reduce youth isolation and provide coping mechanisms for their pains through music, she explained how their “hurt often comes from a disassociation with the natural world. Because they are dislocated and not rooted anywhere, a project that is responsive to topography through such things as stories of the landscape can be very important. Memory triggers coming from physical space take much longer to erode than any public art intervention, even in this the Anthropocene Epoch.” Attachment to place can be advanced and help to enrich these experiences with and reliance upon landscape. She explained: “Having something such as a Storyteller’s Bench, a mural, fish that children have painted and are put up on school fences–these are little triggers, little mnemonic devices that bring about the: ‘oh yeah, I remember when…’ And not only this, but remembering being part of something, and that brings joy.”

**Figure 4.9:** Creek stewards exploring False Creek Flats (Naomi Steinberg, 2013)
Addressing change and uncertainty is central to the practice of adaptive management. Because of the need for adaptation, policy, in the city and neighbourhood planning realm, are hypotheses more than they are answers (Gunderson, 1999). Answers are useful only within a set of parameters that are static. In this light, Naomi articulated how planners must “always live the question to find answers that are responsive to the ever-changing present moment.” To find additional hope coping with unknowns, she shared: “We use all kinds of words to try and encapsulate this, such as ‘resilience,’ and ‘cohesion’...Take the story of the big old oak next to a blade of grass: which one survives the windstorm? The blade of grass, because it can bend, right?” The severity of a windstorm is only as great as the inflexibility of those things affected. One can take this into the realm of climate change and measure the preparedness of a community or a city by its infrastructural redundancies. In the face of flooding, maximized conveyance coupled with maximized permeability is ideal. Likewise, in the face of drought or fire, diversified water sources are essential.

Landscape can function on levels greater than the ecosystem services–the water regulation or fire suppression–it could provide. For Naomi, as one who works in storytelling, “an ephemeral art,” she stated how she often thinks: “How does one give that a concrete form when one recognizes how it is helpful to have a memory trigger?” She feels “it’s helpful to have a place to come back to...It’s helpful to have a forum, space, container...something to help bring those stories out and to be heard.” As to the importance of the Rainway as this place to come back to or as a form of physical intervention, Naomi relayed: “It is extremely important. Whether it is a physical legacy or a walking tour...I think of the desire line, I think of lay lines and dousing rods...all of this being related to that magnetic pull. How is it that the salmon have returned to Still Creek after 75 years? It wasn’t born there. How did it know how to come back?” The Rainway has already become a destination. A mural created by the community marks its flow and tells its story. The broad vision of the group working to bring a stream back to the surface along St. George Street embodies a cross-scalar perspective, like that of the Still Creek daylighting project, to someday have salmon return to spawn.
Figure 4.10: Storytellers’ Bench in use (Flick Harrison, 2012)

Figure 4.11: The mural and the fence fishes
Naomi came back to the headwaters of Te Statlew, the little creek now known as the St. George Rainway, and spoke of the Storyteller’s Bench and how Squamish Elder Wendy Charbonneau was present at the project’s design charrette. Naomi continued:

...After the bench was built, a bunch of us gathered on the site and I invited Wendy to come because she had been a part of the process. We all met up at the bench and she had brought a bit of tobacco, and totally unselfconsciously did her thing, said thanks with song...As I am speaking of this now, it is reminding me of my commitment to represent that aspect of spirit as well. This is part of what brings us together, holds us, offers that something greater than the sum of our egos...

To Vancouver’s first peoples, streams are providers of life. To our modern city and those who keep it running as such, streams are mostly seen as things to bury and remove from eyesight and sunlight. The rain that feeds these streams is still considered by them as a waste product. Stories are better told of things known and seen and cherished. Characteristics of resilient communities can be better realized if its underivative landscapes are exposed and restored. The archetype of visionary, as well as each of the other seven, have spoken this tale. The role of the St. George Rainway is to realize it and, in the ways it can, recall Te Statlew.

4.11 Insights into Resilience Characteristics

As metaphors and symbols are used to imbue a sense of universality to stories, archetypes have been used for their similar functionality. The ten primary characteristics of resilient communities outlined in Chapter 2 are devised in a fashion that promotes similar universality to each of the ideas. Each could be applied to a range of challenges, people, and locales, regardless of the context. Relating the stories from each of the chosen interviewees through the lenses of archetypes offers similar transference. Viewing each insight through the eyes of the individual interviewed offers a local context to the characteristics, while offering a broader transference when viewed through the lens of their corresponding archetype. To offer an applied understanding of the ten characteristics in the context of Mount Pleasant, the following insights have been drawn from the interviews.
4.11.1 A High Degree of Diversity

In Sue Stevenson’s archetypal role as The Long View, she embodied heterogeneity with the routine of her position as school principal. As a principal, Sue engages with groups inside and outside Mount Pleasant Elementary that consist of local business people, neighbours, parents of students, social workers, teachers, fellow principals, and so on. She does this to gain the full spectrum of perspective to best honour the three primary goals of urban schools: literacy, social responsibility, and community engagement. This is one example of the multidisciplinary approach she takes to her position that represents a high degree of diversity. It prepares her for the continuous influx of unique and diverse students she interacts with on a daily basis, as well as the equally unique challenges each of them bring. A similar embodiment of diversity could be brought to the Rainway through both a diversification in vested stakeholders as well as in functional components of green infrastructure.

4.11.2 Effective Governance & Institutions

Sara Orchard, the archetype of Exemplar, was interviewed for her offerings of professional insight into one of the two primary Vancouver precedents for the construction and maintenance of the St. George Rainway. The Green Streets program, which utilizes volunteer labour from community members to maintain planted traffic circles and boulevards, has shifted during her two years as Program Coordinator. Originally limited to maintenance only, the program’s structure now allows for co-design and a portion of the decision-making role to be played on behalf of communities. Bringing the user group into the realm of planning and design particularly demonstrates flexibility and decentralization and therefore effective governance on behalf of the City of Vancouver. Decentralizing responsibilities that are linked through a common goal distribute and promote accountability throughout partnering groups and support their effectiveness. Just as it is important to maintain a diversity of stakeholders invested in growth of the St. George Rainway, it is important that these stakeholders maintain linkages of accountability.
4.11.3 Acceptance of Change & Uncertainty

This characteristic is achieved through planning efforts as well as planning for the absence of a plan. In order to achieve this, one requires trusted sources for knowledge. To Naomi Steinberg, the archetype of Visionary, these sources were expressed to be local landscape typologies. Through the stories associated with them, attachment to place can be advanced to enrich the experiences one has with landscapes. In turn, this can help to grow their reliance upon them and the systems that run through them as sources of knowledge valuable for planning for unknowns. The effectiveness of the St. George Rainway to offer this would be directly related to its ability to offer various landscape typologies, each with the presence of healthy natural and human-made systems.

As understood by Ms. Steinberg, someone who works with community groups and members on a daily basis, local sources of knowledge begin as “memory triggers” and grow into means for measuring and understanding the localized effects of changes in a broader system such as climate. To maintain the flexibility that is also central to this characteristic, local sources of knowledge are only as strong as they are redundant. In other words, several “memory triggers” from different landscape typologies broadens one’s base of trusted knowledge sources, thus supporting one’s ability to accept change and uncertainty.

4.11.4 Non-equilibrium System Dynamics

As described, the principal of Mount Pleasant Elementary, Sue Stevenson, is an individual who continually is participating within her school and throughout the greater community to help maintain engagement and learning across groups. Because of the constant states of flux present in the realms she navigates, engagement and continued negotiation is required of her to meet both present and future needs of her school. This type of demand requires a focused attention and active participation to maintain the structure and performance of the systems within she works.

Ecologically-speaking, the characterization of non-equilibrium system dynamics requires a similarly focused attention. There are ecological realities facing every city. These include the increasing volume of energy and capital inputs needed by systems that are entirely human-made. Methods such as green infrastructure
recognize the reality that all systems break down without constant flows of energy by better aligning processes with nature and allowing it to bear a portion of the inputs needed to maintain the system.

4.11.5 Community Engagement & Participation

This characteristic was exemplified by three of the eight archetypes: The Champions, The Advocate, and The Exemplar. Through her act to organize a community yard sale and his expression of interest to steward a portion of the Rainway, The Champions, Teresa Comeau and Barry Calhoun, demonstrated the emotional bonds they have to the place that is Mount Pleasant. For them, fostering engagement and participation with their community came easy, which, as expressed by them, was partly due to the characteristics of neighbourhood they currently call home.

The other two insights came from the two precedents for the construction and maintenance of the St. George Rainway. In the case of Country Lane in Kensington-Cedar Cottage, the first of the precedents, its success in part was shown to come from the sense of ownership and dedication in stewardship from its various champions. Since its installation, the laneway has embodied meaning for its stewards, among them being Mike Klassen, The Advocate archetype. Its meaning in turn motivated individuals like Mr. Klassen to protect and improve upon it.

In the case of the Green Streets program, the second precedent for the Rainway, volunteer participation illustrated how this characteristic can grow in direct relationship with the development of place attachment amongst active community. Participation with the program has been shown to develop concern for and understanding of the location of the participation. The greater the attachment, the more likely someone is to be a repeat volunteer.

4.11.6 Capacity for Preparedness & Planning

For the City of Vancouver to fully embody this characteristic, it needs to lead by example with such things as the activation of the Greenest City Goals. Sandra James, The Expert archetype, expressed this sentiment and explained how programs such as Green Streets and Blooming Boulevards achieved this in the past. They did this by utilizing more sustainable means to institute infrastructure that enabled community members to
autonomously maintain the greening of adjacent right-of-ways. Since then however, the city has been shown to embody restrictive benevolence throughout many of its policy actions where, despite its progressive intentions, the bylaws in place do not allow for ideas such as rainwater harvesting to flourish. Capacity for preparedness and planning is in part about leading by example is to create the atmosphere that not only promotes progressive action, but is yielding to its activation. The City of Vancouver could embody this characteristic by helping to plan the Rainway and providing the freedoms for it to grow and ultimately sustain itself.

4.11.7 A High Degree of Equity

Egalitarianism is innate to Sue Stevenson and the role of The Long View. It is fundamental to her position as principal to provide unbiased access to resources that help realize the three expressed goals of Vancouver’s urban schools. Similarly, the success of the Rainway through the lens of a high degree of equity is dependent upon its ability to provide equal access to the natural capital that flows from its ecosystem services. To ensure an equitable distribution access needs to not only transcend current cultural, racial, demographic, and social boundaries, its provision should be sustainable. Access should be granted for all, including future groups and individuals. Ms. Stevenson demonstrates this with her ability to care for her current student body while simultaneously sustaining access to the same quality of education and guidance to future students and their families. This same spirit and care would benefit the stewardship and maintenance component to the Rainway to help retain volunteers and maintain the benefits they would receive from its implementation.

4.11.8 Presence of Social Capital

This characteristic was the one most represented throughout the interviews. As the characteristic most responsible for the voluntary engagement of individuals with their community, the findings from the Mount Pleasant survey support the potential for successful stewardship of the Rainway. Four of the archetypes specifically called attention to its presence with the Green Streets program, the Country Lanes program, the St. George Rainway Mural, as well as throughout the community of Mount Pleasant.
Presence of social capital was specifically demonstrated by the volunteers of both the Green Streets and Country Lanes programs. According to The Exemplar archetype, the friendships and connections developed by volunteers between one another and with the broader community, through their acts of volunteering, was shown to be reciprocal in its growth in the patterns of sharing and building more supporting networks and reciprocity. According to The Advocate archetype, the volunteers and champions of the country lane demonstrated empowerment to maintain the laneway, associational activity and common purpose by using the laneway for such things as block parties.

Several other domains of social capital were deemed present by various interviews. From its first year to the second, The Connector archetype described how the mural implementation was shown to grow in effectiveness of completion and in overall participation, empowerment in new participants, and a sense of belonging amongst the majority of those who were aware and/or participated in its painting. During the interview with The Champions archetype, a comparison between the neighbourhood of Kitsilano and that of Mount Pleasant. Despite residing in Mount Pleasant for a far shorter time than they did in their prior neighbourhood, each expressed a far greater presence in access to social networks. These networks provided a sense of belonging and a willingness to participate with the community of Mount Pleasant as well as with a hypothetical projection of the St. George Rainway running adjacent to their property.

4.11.9 Capacity for Learning

This characteristic was showcased, similarly to capacity for preparedness and planning, not in its presence but in its lacking. As discussed by The Advocate archetype, the Country Lanes program on behalf of the City of Vancouver failed to realize the potential of this characteristic. Despite the evidence in growth in engagement and spirit of the community inspired by the country lane running behind his home, and despite his community’s ability to maintain the lane, the City failed to harness this and apply active learning or adaptive management to continue the project. Insight gleaned from this and the two other country lane pilots, which were each unique in their approaches, was instead abandoned with the termination of the project. Improvement in a capacity for
learning would be supported by practices of adaptive management where collective learning and creativity within a community are valuable assets for planning for an unpredictable future. In the event the Country Lanes program was brought back online as a component to the Rainway, the practice of adaptive management would contribute to its success.

4.11.10 A Cross-scalar Perspective

This characteristic was embodied by three of the archetypes. The first, The Expert, exemplified a cross-scalar perspective as a community planner. Much the work of Sandy James while with the City of Vancouver made provisions for testing of pilot projects to come from both the community and the city until a particular initiative was ready for permanent adoption. Not only did her work allow for creating and testing across spacial scales, her visions of staging that spanned decades offered this across temporal scales as well.

Both The Connector and The Visionary focused on the example of the St. George Rainway and its recognition of and respect for the ubiquitous nature of water. Shahira Sakiyama expressed how the success of the Rainway is only contingent upon its ability to positively impact water ecologies downstream and outside the sub-basin catchment area and the Mount Pleasant neighbourhood. Naomi Steinberg echoed this and as well gave the example of the Still Creek daylighting project to reference potential beyond mural paintings and rain garden plantings. Due to the cascading effects systems can have upon one another, both positive and negative, adoption of a cross-scalar perspective can create opportunities unforeseen at the start of an initiative like the St. George Rainway. Still Creek began with bringing water out of pipes and back to the surface of the land and today has the unplanned benefit of salmon returning to spawn within the city limits of Vancouver.

4.12 Lessons from Green Streets and Country Lanes

The Green Streets and Country Lanes programs were introduced in Chapter 1. Here, they were each given voices. Both can be used as precedents for the St. George Rainway, but will find greater success if only insight gifted by hindsight is considered. Community involvement with each initiative was key to its successes, but similarly to the dynamic of working with living systems, a volunteer base cannot be taken for granted.
Inevitably, people’s lives change. Inevitably, the replenished stewardship of volunteers cannot be expected to maintain itself.

The Green Streets program continues to demonstrate the successes of working at the small scale. A singular roundabout-turned-garden requires the work of one autonomous volunteer. If this person abandons their post for whatever the reason, it is not hard to find another to take up the gardening call. Transitioning from this to a group dynamic is where the successes of Green Streets become less prevalent. The interview with Sara Orchard, the manager of the program, provided evidence of Community Engagement and Participation, of Effective Governance and Institutions, and of the Presence of Social Capital. Yet, when the scope of the program grows to the scale of a greenway, it has been shown to struggle. She eluded to reasons for this having to deal with such things as volunteer fatigue and scopes that were too great for the engaged groups. Combine these challenges with the straightforward challenge of matching everyone’s schedules to organize a volunteer day of invasive plant removal, and one can begin to understand the potential for exacerbation.

In a similar light, one could examine the reasoning for a discontinuation of the Country Lanes program. If a greater Capacity For Learning and a Cross-Scalar Perspective were more present with this program, the adaptive capacity of the program would have been able to actively learn and adjust to challenges that arose only through testing of the program and responding to new ideas as they arose through the processes and adaptation. If it was too expensive to continue, perhaps the scope of the laneway retrofitting could have been scaled back. Likewise, other funding sources and in-kind labour could have been sought through a public-private partnership. With the Green Streets program, if the model set with roundabout stewardship and maintenance lacks success when scaled upward, a new model should be introduced.

When the broader scale of city budget constraints threatened the Country Lanes program, perhaps an answer could have been found in a more decentralized and localized call for support. If it is sustained organizational support that is required to keep the volunteer base of the larger Green Streets initiatives, perhaps outreach to broaden the stewardship base is needed. Partnerships with organizations with paid staff, as Sara recommended,
could be all that is needed to maintain effort to match inspiration. Partnering organizations with vested interests in the community they reside, such as the St. George Rainway Group, with the people who also reside there and are connected and engaged, begins to represent a series of characteristics of resilient communities.

The strategies for the design of the Rainway, unveiled in the following chapter, identifies similar synergies, or trans-characteristic relationships, to give it definition and meaning, both spatially and temporally. Furthermore, the strategies will apply the findings from the survey comparison and interview analysis to provide a positive answer to the guiding question to this thesis: Could green infrastructure provide both a resilient option for physical land development as well as opportunity for social cohesion within communities?

Figure 4.12: “Flows to St. George Creek”
5 Activating the Strategies for Design

The Community’s Role with Green Infrastructure

5.1 A Synopsis

This chapter contains the schematic design of the St. George Rainway. Two principles guide the strategies for design: 1. Produce the foundations for the provision of urban ecosystem services using green infrastructure technologies; and 2. Propose the Rainway to support opportunities for direct community involvement with labour, maintenance, and stewardship that engage each of the ten characteristics of resilient communities. In response to these principles, the schematic design is structured by: goals, phases, and strategies for design. The goals are defined by a list of eight ecosystem services; the design is split into three suggested phases; the phases are comprised of six strategies actualized through projects in the public realm.

The measure of flows of water through the site and how they are impacted by the various strategies is accomplished with the aid of an online application called the Water Balance Model. Datum gathered for precipitation and projected changes in climate, as well as datum collected from manual site analysis, are incorporated to help run the calculations needed for the sub-basin catchment area of the St. George Rainway project. Subsequently, the modeling helps determine feasibility of various green infrastructure techniques. Each strategy for design includes Intentions for Design, Goals Met, and Characteristics Emulated to build a framework for measurement and success. To start, this chapter revisits the context for the Rainway.

5.2 A Synopsis

The Lower Mainland of British Columbia knows alluvial flows and bedrock cuts. It knows fast channels and slow rivulets. It knows the flooded banks of fast glacial rivers and the meanders of quiet brooks hidden by a canopy of salal and fern. As the Salish Nation have over two dozen words for water in the environment (Tachini Pete, 2006), this region is rich with the types of freshwater flows that shape its land and define its character. In the case of Mount Pleasant, the small stream that is known to the land’s current inhabitants as St. George Creek, was known to the Salish for centuries as Te Statlew. Before the modest ravine carved by this creek was filled
and replaced with a storm sewer culvert, its flows likely came from a freshwater spring and not directly from snowmelt as many streams of mountains north of Vancouver flow (Whitfield et al., 2002). Currently, during late summer and when the rains have not fallen for weeks, one can still hear water running through the manhole covers that dot the landscape of St. George Street. The assumption that this water is a sign that the spring of Te Statlew still runs, is a rallying call for the groups and individuals throughout Mt. Pleasant to try and daylight this creek by bringing it back to the surface so that fish might once again swim its waters.

Daylighting St. George Creek to try and bring back the salmon that once spawned in this region of Vancouver is a noble pursuit. The benefits of a healthy salmon-spawning stream would run the gamut of ecosystem service categories as shown in Figure 5.1 (on the following page) (Holmlund & Hammer, 1999). Despite the wealth of benefits—from its ability to support ecosystem resilience to it being a provision for food—a healthy stream would provide riparian habitat, contribute to the regional nutrient and hydrologic cycles, and create a place to learn, and connect with the ecological history of the region and the stories embedded in its landscape typologies. The St. George Rainway, envisioned as a network of green infrastructure elements, could provide many of these services (Bolund & Hunhammar, 1999).

Daylighting the creek would require a costly engineering feat; currently the stream runs through a pipe over 4m beneath the surface of the street. With an average width of 12m, the entire St. George right-of-way would require, at best, a 1:1 slope if it was to be daylighted while retaining half the street as functional roadway. If it is to be more than walled channel, much like portions of Still Creek before it was daylighted (City of Vancouver Community Services, 2002), such a slope would make a stream inaccessible by both humans and the sun, thus defeating many of the goals for the Rainway. Further, such an intervention would require the decommissioning of St. George Street in its entirety to account for the top-of-bank width that would be necessary for a true daylighting project. (See Figure 5.2 for a diagram of these constraints.) When the day comes when personal vehicles are no longer a feasible mode of urban transportation or a necessary amenity for the residents of
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<th><strong>REGULATING SERVICES</strong></th>
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<td>Regulation of food web dynamics</td>
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<td><strong>Provision of scientific and educational information</strong></td>
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**Figure 5.1:** Major fundamental and demand-driven ecosystem services generated by marine and freshwater fish populations (chart adapted from Holmlund & Hammer, 1999, p. 255)
Figure 5.2: Space required for a traditional daylighting of St. George Creek

Vancouver, daylighting St. George by removing all of the earth and asphalt above it may become a reality. Until then, the St. George Rainway must find life through alternative steps in that direction. The St. George Rainway as a demonstration project assumes from the research findings of this thesis that Mount Pleasant has a higher prevalence of social cohesion. By these findings, coupled with those illustrated by the stakeholder and professional interviews, the community of Mount Pleasant is better suited to implement and maintain projects parallel to the two Vancouver green infrastructure precedents: Country Lanes & Green Streets Programs. In particular, the archetypes of Exemplar and Advocate marked Community Engagement and Participation and Presence of Social Capital as the two characteristics of resilient communities most integral to the success of such programs. The guiding question for this research—Could green infrastructure provide both a resilient option
for physical land development as well as opportunity for social cohesion within communities?—could therefore be written in reverse. Green infrastructure built and maintained with community involvement not only has been shown to present existence of social cohesion, the presence of social cohesion could, reciprocally, improve such projects’ chances for success. (See Figure 5.3.)

**Figure 5.3:** The reciprocal relationship between social cohesion and green infrastructure

**5.3 Water Balance Modeling**

The tool used to test different scenarios for rainwater management and determine the viability of the six strategies for design is the Water Balance Model powered by QUALHYMO. The web-based tool is an initiative of the British Columbian nonprofit, Partnership for Water Sustainability. They describe it as “a decision support tool that bridges engineering and planning” to “help communities create neighbourhoods that integrate both good planning and innovative engineering designs, for overall objectives of greater sustainability.” In addition,
they claim the tool is for “promoting improved land use planning practices and to influence the greening of the built environment so that stream health is protected” (PWSBC, 2013).

The Water Balance Model is able to be applied at the site, neighbourhood and watershed scales. Due to the catchment size of the Rainway, the modeling for this thesis falls into the ‘Site’ category. The first step following this identification is to configure the site’s drainage area. The length was measured from Kingsway to Great Northern Way and inputted as: 1000m. Using the City’s public Vanmap tool as the source for site elevation information, the high and low elevations were determined to be 53m and 10m, respectively (City of Vancouver, 2013f). This resulted in a median slope of 0.043m/m. Description of the modeled area’s layers were then required. To determine the native soil types across 11 test sites, a soil auger, marked off at 10cm increments, was used to determine profiles up to 50cm deep. Each site exhibited a profile of loamy sand topsoil of at least 30cm deep. (See Figure 5.4 on the following page for soil testing locations and results.) From here, the land uses for the site were determined though a study of zoning maps provided by Vanmap (City of Vancouver, 2013f). The study site contains a mix of Residential Level 1, Residential Level 2, Residential Level 5, and Commercial zoning. The area for each of these zones was measured and inputted into the water balance model tool and an output of the surface conditions related to this type of zoning was provided. This output offered area calculations (in hectares) and coverage percentages of impervious paving, pervious cover, and building rooftops.

The second step was to configure the tree canopy of the study site to account for rainfall interception. Because the City of Vancouver had not yet completed mapping of their urban forest at the time of this thesis, estimations were made to meet the criteria required by the water balance model tool. Using a combination of aerial imagery provided by Vanmap, the tree canopy for the study site was determined to cover roughly 25% of the surface area (City of Vancouver, 2013f). It consisted of a mix of large (accounting for 7%) and small broadleaf (accounting for 15%) trees as well as coniferous (accounting for 3%) species.

The third step was to choose the source controls used to manage stormwater. Options for these controls included versions with and without storage capacity. For each chosen, additional data was required, including
such things as soil definition, design soil, rooting depth, infiltration rate, depth of reservoir, and average voidspace ratio. The source controls used for testing strategies were as follows: Lawn, Pervious Paving, Rain
Figure 5.4: Soil testing locations and a table of results
Gardens (with and without underdrain pipes), Infiltration Swales, Green Roofs, and Infiltration Ponds. These controls were then made available for application to the site in the following step.

The fourth step involved applying any of the defined source controls are applied to the surface conditions configured in the first step. Here they can be applied as a source control, where they manage the water at the site of landfall, or they can be applied as a connected treatment area. Once these source controls and connected treatment areas are chosen, input of their area in hectares or as a percentage is required to help calculate their contribution to the overall hydrologic system.

The final step was the configuration of the manmade channel for the site. Because the ultimate goal of the Rainway is to offer an expression of the stream that once flowed across its surface, this step was integral in determining the viability of this pursuit. The channel parameters were determined by a study of constructed streams suitable for spawning salmon (Department of Fisheries and Oceans Canada, 1991). The channel parameters included a bank slope of 1.5m/m, a bed width of 3m, a channel depth of 0.5m, a slope reach of 0.024m/m, and the type of channel determined to be irregular with a bed with a presence of grasses and slopes with a presence of brush.

The results of all of this input included two primary outputs. The first output was an Exceedance Summary, which refers to the rate at which stormwater runoff would move through the site. The second output was a volume calculation of Rainfall Mass Balance. This included measures of source control infiltration, catchment infiltration, total losses (due to such things as evaporation, and total discharge (otherwise known as surface runoff). In order to develop an understanding of the baseline hydrology of the site and how it would be impacted by various measures of green infrastructure, many scenarios were tested. To understand the impact green infrastructure can have on the flows of stormwater through this site, refer to Figure 5.5 (on the following page). This figure includes a measure of increase in permeability by 25%, 50%, and to 100% of the surface area,
Figure 5.5: Stormwater volume summary for area increases of green infrastructure (GI) strategies
using a combination of source controls and connected treatment areas (to account for land taken up by building footprints) offered by the strategies for design. Some specific approaches will be highlighted throughout this chapter to provide parameters and rationale for meeting the eight goals of the design.

### 5.4 Shortfalls of Using The Ten Characteristics

Prior to outlining the incorporation of each of the ten characteristics for resilient communities, there are shortfalls regarding quantity and combination of them that should be noted. The first shortfall relates to the issue with quantification and is characterized by the question: *How much of each component of a system is needed to support resilience?* In the case of urban development, social and ecological systems and the socioecological manifestations of them are in play. Because it is impossible to predict the exact tipping point at which a system enters its *release* phase of the Panarchy Model (see Figure 5.6 on the following page) and takes on a different state of existence, adaptive management can only respond to the feedback loops observed in the system (Gunderson and Holling, 2001). Forces cascading from above or below the system can produce effects that help with this anticipation. However, the extent by which to manage outcomes remains a dynamic challenge, since variables impacting the system are constantly changing and at various speeds and scales (Holling, 2004).

Predicting resilience of socioecological systems is not as formulaic as the production of a rain garden, for instance. Soil type and depth will dictate the speed and volume of flows of water through a site. Meanwhile, plant type is often chosen on a regionally-contextual basis for its hardiness and moisture tolerance. Combined with proper design and maintenance, one can produce a functional rain garden. To date, there is no such quantifiable prescription for producing resilient socioecological systems. Therefore, a physical project is required for contextually testing their characteristics.

Beyond the question of quantity, there also exists the question of combination. *What combination of elements can produce a preferred systemic state? and, are all necessary?* Further, *how does one determine the elements with the greatest cost benefit for this preferred state to enable its conservation?* Socioecological systems are
identified in the literature as complex adaptive systems (Walker et al., 2004). Such systems are dynamic and able to adapt in and evolve with the larger (or smaller) systems to which they are linked. In other words, they are systems “in which macroscopic system properties...emerge from interactions among components, and may feed back to influence the subsequent development of those interactions” (Levin, 1998, p. 431). Complex adaptive systems are cyclical, not linear, and pass through the four phases of: 1) exploitation, 2) conservation, 3) release, and 4) reorganization (Holling, 2004). As a socioecological system inevitably enters into its release and subsequent reorganization phases, it could reorganize into an adapted system with a state similar to the one it started in if it maintains a presence of each characteristic of resilience. If not, the system has a greater chance of reorganizing into one entirely different than its predecessor. (Again, refer to Figure 5.6 for the Panarchy Model.)
The case of the 1992 collapse of the Northwest Atlantic cod fishery demonstrated how continual overfishing of the stock led to a new, entirely different, state. The reorganized system is one that prevents the fishery to this day from reverting to the state fishermen knew since the waters were fished. For years, the aquatic ecosystem was able to self-organize to the state preferred by its human counterpart despite the perturbations placed upon it. However, these repeated actions led to a gradual “fishing down the food web” (Frank et al., 2005, p. 1623) where the removal of too many top predators lessened its high degree of diversity and reorganized its structure altogether. The gradual speed of the variables responsible for the regime change of the ecosystem—the systematic removal of too many breeding cod from the food web for human consumption—went unnoticed until it was too late (Frank et al., 2005). The resulting “adapted system” was one that did not continue to produce the biomass of fish necessary to continue to deem the fishery viable.

The difficulties of identifying large systemic changes in time to prevent a release phase with an undesirable outcome, such as the collapse of a fishery, are well-documented (Berkes, 2007; Folke et al., 2002; Holling, 2001). Global climate change embodies a similar dynamic. The specific characteristics necessary for communities to be resilient to such challenges and identify changes in systems in time to prepare and adapt are a Capacity for Learning, a Cross-scalable Perspective, and the place attachment that arises from Community Engagement and Participation. Working with these and the other seven characteristics is, unfortunately, not a task set by definitive metrics. Taken together, however, the list provides a framework for how to work within the ever-changing dynamics of socioecological systems. With the St. George Rainway, the 10 characteristics help to build parameters for success in meeting the strategies’ goals and intentions for design. The strategies for design proposed later in this chapter will each highlight the characteristics that could be met upon the hypothetical implementation of each strategy.

5.5 Ecosystem Services as Goals

In hierarchical succession, the schematic design is structured by: goals, phases, and strategies. The eight goals are written for a socioecological system—an urban neighbourhood—and are therefore both socially- and
ecologically-centered. They take into account the discussion of ecosystem services from Chapter 2 and utilize the CICES classification system for their titles. *Erosion Control* was removed and *Spiritual & Symbolic Interaction* was added, resulting in the following list:

1. **Water Flow Regulation**  
   *(AS MEDIATED BY BIOTA)*

2. **Water Pollution Regulation**  
   *(AS MEDIATED BY ECOSYSTEMS)*

3. **Water Provisioning**  
   *(FOR BOTH FUNCTIONAL AND NUTRITIONAL VALUES)*

4. **Biomass Provisioning**  
   *(AS FOOD FOR ITS NUTRITIONAL VALUE)*

5. **Air Flow Regulation**  
   *(AS MEDIATION OF NOISE POLLUTION)*

6. **Micro Climate Regulation**  
   *(AS MEDIATION OF HEAT ISLAND EFFECT)*

7. **Physical & Intellectual Interaction**  
   *(AS PHYSICAL AND SOCIAL HEALTH OUTPUTS)*

8. **Spiritual & Symbolic Interaction**  
   *(AS CULTURAL AND EDUCATIONAL OUTPUTS)*

Just as social cohesion relies upon a stock of social capital, ecosystem services rely upon a stock of natural capital. A large component of the natural capital needed with green infrastructure relies upon treating water as a resource, not a waste product. When water is treated as a resource, its focus is no longer to convey it beyond city limits, but to capture, slow, divert, infiltrate, filter, and treat it. The core of each of the strategies for design therefore is centered on water.

Once green infrastructure is constructed, the natural capital of water, soil, and biota perform its functionality (US EPA, 2012a). The construction itself requires investments in the forms of design hours, living and nonliving
materials, and labour hours. Maintenance—in the forms of such things as watering, weeding out invasive plants, sediment removal, and maintenance of utilized technologies—is required for the life of the green infrastructure.

As with the direct relationship of a tree’s maturity to its biomass production, the natural systems embodied within green infrastructure grow in maturity and diversity, they also grow in functionality (Brauman, 2007; Turner, et al., 2008; Walsh et al., 2005). However, the capital in the form of labour does not follow this same curve. For instance, once they are established, native or adapted non-invasive plants can compete with various invasive species and no longer require watering. Other maintenance of the various technologies used remains constant at various intervals. For example, consider a cistern or a rain barrel. Inflow spouts might require seasonal checks for blockages from such things as leaf litter, while the integrity of other components such as its seals or a water pump have lifespans of 20 to 50 years (City of Portland Environmental Services, 2006).

The native geological and soil conditions challenge infiltration as the primary driver for the use of green infrastructure throughout Mount Pleasant. A high water table with shallow loamy sand topsoil results in high rates of interflow and lower rates of groundwater recharge (Chamberlin, 1972; Wynn & Oke, 1992). Using a combination of the Water Balance Model tool and zoning information from the City of Vancouver’s Vanmap tool, it was learned that the exiting site is approximately 24% permeable (PWSBC, 2013; City of Vancouver, 2013f), thus compounding the challenges for infiltration with the native geology. To quantify this challenge, water balance modeling tests run for the study site of this thesis. It demonstrated in Figure 5.5 how if the entire study site was to implement green infrastructure measures to become 100% permeable at or near the source of rainfall (using connected treatment areas to account for land taken up by building footprints), the total discharge (runoff) would be reduced by approximately 65%.

Offering the component of water flow regulation by increasing permeability of the study site is just one goal for the strategies for design. Soil testing performed for this thesis throughout the study site offers a glimpse of what else could be implemented. Wetlands, filter strips, rain gardens, and permeable paving each would be feasible means to capture, slow, divert, infiltrate, filter, and treat stormwater runoff (Ellis et al., 2004).
However, the depth of the loamy sand soil profile of the topsoil for each of the 11 testing sites is not uniform. The maximum depths obtained before hitting clean fill and clay subsoils ranged from 30cm to 50cm. Per measures set by Source Control Drainage Systems (SUDS), the United Kingdom equivalent of stormwater green infrastructure, determining the technique for managing water flows for a particular catchment area corresponds directly to a particular soil type and infiltration rate (Ellis et al., 2004). Refer to Figure 5.7 (on the following page) for a detailed view of this relationship.

While the entire catchment area of the St. George Rainway site measures roughly 54Ha, the majority of the strategies for design are decentralized and take on small portions of the stormwater runoff at a time. For instance, a rain garden installed along the eastern perimeter of the Mount Pleasant Elementary School property would only manage a catchment area from St. George Street measuring approximately 0.08Ha. In this case, the soil profile would only need to be amended with a loamy sand soil beyond the depth of 200mm. Figure 5.4 illustrated the soil testing results with their mapped locations. Referral to this reference will clarify needs for soil remediation for each strategy for design.

Aside from the essential task of green infrastructure to regulate flows of water, it creates opportunities to create the foundation for increasing ecosystem services outlined by the eight goals for the design of the Rainway. Furthermore, the application of each satisfy at least one characteristic of resilient communities. As an example, the fourth goal: Biomass Provisioning, could involve both characteristics of a high degree of equity and effective governance and institutions. The ecosystem service goal in this case could refer to the production of food. As discussed in Chapter Two, an instance of a food asset provisioned by the Rainway could take the form of cherry trees. A system for food provision with proper distribution of responsibilities and accountability would be indicative of a high degree of equity as well as effective governance and institutions. Further, a potential synergy to help realize this goal could involve a collaboration between groups such as the Vancouver Food Policy Council (City of Vancouver, 2012g) and an urban farming organization like Fresh Roots Urban Farm Society.
Figure 5.7: Green infrastructure systems and catchment area measurements with their corresponding suitability to soil types and minimum infiltration rates (chart adapted from Ellis et al., 2004, p. 249). (NOTE: to read the diagram, choose a target catchment area first, then review the relationships to green infrastructure, soil types, and infiltration rates.)
(2013) to advance the Greenest City 2020 Access To Nature and Local Food goals simply through the planting of fruit trees on land repurposed by the Rainway (City of Vancouver, 2012b).

5.6 Implementation

Chapter 1 of this thesis introduced the global realities of resource depletion. In Chapter 4, points of view direct from the City of Vancouver expressed similar austere issues with the city budget. Projects involving green infrastructure and a neighbourhood-scale landscape require capital in the form of budgeted tax revenue that currently does not exist (City of Vancouver, 2013e). However, a breakdown of the capital required for such a project as the St. George Rainway can be viewed in terms of design hours, materials (living and nonliving), and labour hours originating in part from sources outside the scope of the City’s budget. When viewed through this lens, feasibility and viability of the project become more aligned. With the time needed to do such things as build awareness and consensus, fundraise, and harness in-kind expertise and labour, phasing of the schematic design becomes integral. By the sustainability cycle model of City Repair introduced in Chapter 3, the painting and re-painting of the street mural is indicative of a successful completion of one full cycle. (See Figure 5.8 on the following page.) Growing from this are the following three suggested phases for the design, which could each run through several sustainability cycles:

1. Phase One: Work with pilot projects

2. Phase Two: Strengthen people & water connections

3. Phase Three: Re-establish natural systems

The aim of Phase One is to work within pockets in the catchment area of the St. George Rainway to begin to punch holes in the imperviousness of the St. George Street and its flanking lanes, while increasing the habitat value of the planted areas that already exist. The intent of Phase Two is to build upon the social connections and engagement established in Phase One. Furthermore, it is designed to connect the pockets of initial
interventions with projects that begin to give shape to the Rainway as one continuous zone. Lastly, Phase Three aims to re-establish conditions that were systematically removed from the site when Vancouver was urbanized. It would do this through the optimization of natural system functionality by managing and expressing all stormwater aboveground, linking all the green infrastructural elements that achieve this, and reclaiming the corridor as a realm foremost for the health of pedestrians and ecosystems. Meanwhile, this approach would produce a graduated reduction of flows of untreated stormwater to False Creek. (See Figure 5.9 on the following page for a diagrammatic representation of the proposed phasing.) At the completion of this stage, the Rainway will have transformed St. George Street into a one-way traffic-calmed local street with half of the street dedicated to an expression of a shallow stream planted with native sedges and woody shrubs. Along its bank furthest from traffic would be a walkway mimicking the meander of the stream and marked by

**Figure 5.8:** Applied “Sustainability Cycle” for health promotion and community development (diagram adapted from Semenza et al., 2006, p. 10)
Figure 5.9: Diagrams of possible phasing correlated with the increase in surface management and treatment of stormwater, resulting a graduated reduction of flows of untreated stormwater to False Creek.

Intermittent places to stop, sit, and rest while taking in the view or engaging in conversation with a neighbour (See Figure 5.10 on the following page for an illustration of the Rainway.)

The time frame for the phasing borrows from regional climate projections and local precedence. By 2050, Vancouver is projected to have an average rise in annual temperature by 2.2° Celsius, coupled with precipitation changes that make winter wetter and summer drier (City of Vancouver, 2012a). The primary stream daylighting precedent in Vancouver—the Still Creek Enhancement Project—was built off a 50-year timeline, with phases corresponding with ten-year allotments (City of Vancouver Community Services, 2002). A similar framing could provide a series of initial benchmarks for the Rainway. However, it is important to note that any benchmarks set should remain adaptive and flexible to any new information that arises during planning, implementation, and maintenance of the Rainway.
In the case of phasing, one can look to the Panarchy model again for insight. Because complex adaptive systems do not exist in vacuums or independent from one another, there exist linkages that are key to establishing and sustaining capacity for adaptation. A change in a cycle can cause it to cascade upward to a slower, larger cycle, or downward to a smaller, quicker cycle. (See Figure 5.11 on the following page.) It is important attention be given to each cycle and the interaction between them throughout the life of the Rainway to ensure successful learning and adaptive management (Holling, 2001). As an example of these three cycles, one can look to governance at the local and internal operational level of the Rainway group, the bylaws of the City of Vancouver and of British Columbia, and lastly the federal government and the prevailing Charter of Rights and Freedoms.

While each strategy for design of the Rainway is designed to build upon those that took place prior to itself, attempts to abide by strict linearity do not reflect the makeup of complex adaptive systems. A less linear, more adaptive approach to phasing would involve freedoms to simultaneously run several strategies at once. However, to ensure stakeholders, residents, and volunteers are maintaining a unified vision through their
Figure 5.11: Scales, speeds, and linkages between “Panarchy” cycles (diagram adapted from Holling, 2001, p. 398).
It is essential that public visioning charrettes be held, at annual or bi-annual intervals, to retain solidarity and cohesiveness with vision.

5.7 The Strategies

The phases are composed of six overlapping strategies to help realize the eight overarching goals. Each proposed project is meant to be implementable and maintainable with minimal involvement from city crews. The aim would be to use their labour during installation and in a demonstrational capacity, as was done with the Country Lanes initiative and still is with the Green Streets program. Synergies, such as the cherry tree scenario described in The Goals section, may arise throughout the projects that allow for greater collaboration between city and community. Realization of potential like this will depend upon timing and effective communication between both parties. As the needs of the Rainway and the neighbourhood evolve, so can the details, the direction, and/or the quantities of the strategies. The six strategies proposed by this thesis are as follows:

1. **Rain Gardens & Food Provisioning**  
   (A DE-PAVING AND PLANTING EFFORT PUT FORTH BY THE COMMUNITY)

2. **Laneways & Permeable Paving**  
   (A REINVIGORATION OF THE CITY’S COUNTRY LANE INITIATIVE)

3. **Downspout Disconnection & Rainwater Harvesting**  
   (TAPPING THE POTENTIAL FOR CONTRIBUTIONS FROM THE PRIVATE REALM)

4. **Community Cisterns & Dedicated Fire Protection**  
   (JOINING GREEN INFRASTRUCTURE WITH DISASTER PLANNING & PREPARATION)

5. **Traffic Calming, Pocket Wetlands, & Woonerfs**  
   (EFFORTS TO REPRIORITIZE THE STREET FOR PEOPLE & NATURAL SYSTEMS)

6. **A Constructed Stream**  
   (REALIZING THE FULL POTENTIAL OF THE ST. GEORGE RAINWAY)
5.8 **Strategy 1: Rain Gardens & Food Provisioning**

5.8.1 **Intentions for Design**

1. Install a pilot rain garden program to build knowledge and set precedence for direct community involvement with labour, maintenance, and stewardship for following strategies

2. Begin to build the characteristics of *Community Engagement and Participation* and *Presence of Social Capital*

3. Offer food provisioning in the form of fruit-bearing shrubs and trees in the public realm

5.8.2 **The Strategy**

This strategy consists of a de-paving and rain garden installation initiative. The project is meant to activate the community, grow their knowledge, and run pilot projects that will lay the groundwork for future strategies.

Using initiatives from Portland, Oregon as primary sources of inspiration, these designated strips of land will have asphalt removed, curbs with inlets and filter strips installed, and native flora planted to become the first in a series of rain gardens along St. George Street.

The first precedent, known as the NE Siskiyou Green Street retrofit, is an initiative that converted 590 square feet of pavement along a residential street into landscape to manage street runoff. (See Figure 5.12 on the following page.) The result treated and infiltrated the runoff from roughly 9,300 square feet of paved surfaces at $1.83 per square foot of managed surface area. The success of the project was largely due to the involvement beyond the original installation. Rain gauges and flow monitors were implemented to create flow testing reports which led to subsequent design modifications. Furthermore, the monitoring of the hydrologic performance, maintenance requirements, and success of the project’s planting regime provided sufficient insight into the ability of these rain gardens to reduce peak flows and flow volume while improving water quality to enable subsequent growth of Portland’s Green Streets program (City of Portland Environmental Services, 2004; City of Portland Environmental Services, 2005).
The NE Siskiyou Green Street retrofit involved the public in two ways. Neighbours adjacent to the curb extensions “voluntarily modified their home irrigation systems” to provide watering and help establish the

**Figure 5.12:** NE Siskiyou Green Street retrofit (Kevin Robert Perry, 2007)

**Figure 5.13:** Nonprofit organization Depave in action (Meriwether Lewis Elementary School, 2013)
initial planting (City of Portland Environmental Services, 2005, p.8). In addition, they provided insight into public
impressions of the project through questionnaires. Beyond, this, the initiative fell entirely under the purview of
the city’s Environmental Services Department (City of Portland Environmental Services, 2005). The second
precedent for Strategy #1 provides additional insight into how to involve community beyond a consultation
capacity. The Portland-based organization Depave is a nonprofit organization that focuses on pavement as the
culprit central to the issue of polluted runoff (Depave, 2012). (See Figure 5.13 on the previous page.) Specifically,
their mission includes the following:

> Depave promotes the removal of unnecessary pavement from urban areas to create community green
spaces and mitigate stormwater runoff. Through community partnerships and volunteer engagement,
Depave strives to overcome the social and environmental impacts of pavement with the use of action-
oriented educational events, community stewardship, and advocacy to reconnect people with nature and
inspire others (Depave, 2012).

From 2007 to 2012, the organization engaged 1,460 volunteers to successfully transform 9,430 square metres of
asphalt into permeable greenspace. Subsequently, they estimate their work diverts 8,407,835 litres of
stormwater from the storm sewer system on an annual basis (Depave, 2012). The entirety of St. George Street,
from Kingsway to its intersection terminus at 5th Avenue is approximately 9,300 square metres of asphalt. If
half of this is eventually transformed into permeable features, it will divert roughly 5,384,700 litres of water in
its polluted state from reaching False Creek on an annual basis (Environment Canada, 2013a).

The proposed locations for the initial rain gardens along St. George Street have been chosen respective to their
relationship with the adjacent properties as well as the existing conditions of their sites. Because programs
within Florence Nightingale and Mount Pleasant Elementary schools, including the “Creek Stewards” program
identified by Principal Stevenson, these two institutions have been established as invested stakeholders. The
two recommended locations for the first rain gardens along St. George Street are along the peripheries of these two schools. Specifically, the rain gardens would be best located along: the edges of Florence Nightingale

Figure 5.14: Native salmonberry (*R. spectabilis*) (Keith Daly, 2009)

Figure 5.15: Common fig tree (*Ficus carica*) (Piers Nye, 2007)
Elementary’s property along St. George Street (80m in length) and along E 11th Avenue (120m in length); and the northern edge of St. George Street, measured from one-half block north of Broadway to the edge of Mount Pleasant Elementary property (177m in combined length).

There are two community allotment gardens within the vicinity of St. George Street: Robson and Guelph Parks. The waiting lists for each run long. As identified by the Champion archetype, Teresa Comeau, the list for the Robson Park garden currently is 70 people deep. To offer another opportunity for a food asset within the public realm, this strategy also proposes that the Rainway become home to one of the pilot projects involving planting of fruit trees in the public realm as proposed by the City of Vancouver Board of Parks and Recreation in its Local Food Action Plan (2013). Fruit trees, ranging from the Hyslop crab apple (*Malus*) to the common fig tree (*Ficus carica*) (see Figure 5.15 on the previous page) would be best planted adjacent to Mount Pleasant Elementary. Currently this location is lacking a tree canopy. However, since the canopy adjacent to Florence Nightingale Elementary is established, its rain gardens should receive an alternative food asset along its edges such as native and adapted berry bushes like thimbleberry (*R. odoratus, R. parviflorus*), salmonberry (*R. spectabilis*) (see Figure 5.14 on the previous page), salal (*Gaultheria shallon*), and gooseberry (*Ribes grossularia*). The work completed with this strategy is meant to create the foundation for direct community involvement with labour, maintenance, and stewardship when moving forward with the remaining five strategies. (See Figures 5.16, 5.17, and 5.18 on the following pages for proposed locations, selected details, and goals met for Strategy #1.)

### 5.8.3 Goals Met

- **(Goal 1)** Water Flow Regulation (as managed by the infiltration and evapotranspiration of rain gardens)

- **(Goal 2)** Water Pollution Regulation (as managed by the plants, soils, and filter strips of the rain gardens to regulate sediment and treat flows of polluted runoff)
(Goal 3) *Water Provisioning* (as provided through the harvesting and redirection of rainwater to be used to propagate gardens)

(Goal 4) Biomass Provisioning (as provided by the fruit trees and native berry shrubs planted throughout the rain gardens)

(Goal 6) Micro Climate Regulation (as provided by additional tree canopy to regulate sound and air pollution)

(Goal 7) Physical & Intellectual Interaction (as incorporated through public involvement with installation and maintenance of rain gardens, shrubs, and trees)

(Goal 8) Spiritual & Symbolic Interaction (as providing a forum for teaching ecological and indigenous heritage through native plants)
Figure 5.16: Recommended locations for Strategy #1
Figure 5.17: Selected details for Strategy #1
1. WATER FLOW REGULATION
2. WATER POLLUTION REGULATION
3. WATER PROVISIONING
4. BIOMASS PROVISIONING
5. AIR FLOW REGULATION
6. MICRO CLIMATE REGULATION
7. PHYSICAL & INTELLECTUAL INTERACTION
8. SPIRITUAL & SYMBOLIC INTERACTION

Figure 5.18: Goals met for Strategy #1
5.9 **Strategy 2: Laneways & Permeable Paving**

5.9.1 **Intentions for Design**

1. Install a revitalized Country Lane program to build knowledge and set precedence for direct community involvement with labour, maintenance, and stewardship for following strategies

2. Establish opportunities to grow relationships and establish synergies with the City of Vancouver and local stakeholder groups

3. Re-invigorate the life of the laneway and showcase its opportunity as a public amenity and its functionality as a green infrastructure feature

5.9.2 **The Strategy**

This strategy involves an installation of a series of country lanes amongst the streets that frame Robson Park—the *headwaters* of the St. George Rainway. The two-block lane that travels between St. George Street to Fraser Street between E 12th and E 13th Avenues, as well as the lane one block in length that connects Carolina and Fraser Streets between 13th and 14th Avenues, are ideal sites for a revitalization of the Country Lanes initiative. These sites have been chosen for their proximity to a relatively high density of single-family property owners (City of Vancouver, 2013f), which increases the potential for success, as learned from the interviews with The Advocate and The Expert. Furthermore, these locations would as well offer a triangulation of three primary pedestrian thoroughfares: St. George Street, Robson Park, and Fraser Street. Lastly, the siting of these tools for infiltration near the headwaters of the Rainway would have a stronger impact upon the cumulation of polluted runoff for the site.

The right-of-way for each lane measures roughly 620m². By reversing the impermeability of these three surfaces, approximately 2,153,880 litres of stormwater could be removed from the system on an annual basis simply through building permeability into 2.7% of the catchment area (Environment Canada, 2013a; PWSBC, 2013). Instead, some would infiltrate through the permeable paving and into the soils below the lane, while
some would become surface runoff that would feed the rain gardens that flank and beautify the edges of the lanes. The 2002 budget of the three pilot Country Lanes was $225,000, funded through General Revenues of the City of Vancouver. Originally, this project was meant to be funded through the City’s Local Improvements program, where the adjacent property owners would subsidize the project through a temporary increase in property tax. The two-thirds majority needed to pass this initiative did not succeed, and the city covered the costs (Transport Canada, 2004). Unfortunately for this strategy, per the 2012-2014 Capital Plan, the City is no longer offering Local Improvements dollars for street, lane, or sidewalk initiatives (2013e).

The primary reason given for the termination of the Country Lane program was its costs to the City. However, knowledge exists from the original three installations that could contribute to an adaptation to the design and the streamlining of a second round of installations (Transport Canada, 2004). Furthermore, the group responsible for the de-paving that took place with the Strategy #1 could also be tapped for in-kind contributions. According to a follow-up questionnaire to residents within the vicinity of the three pilot Country Lanes, "52% of respondents stated that they would be prepared to pay an extra 50% to have a Country Lane rather than a full

**Figure 5.19:** Kensington-Cedar Cottage Country Lane (Michael Klassen, 2008)
width asphalt lane. Another 33% were undecided” (Transport Canada, 2004, p.3). With this type of evidence from the success of past projects, combined with groundswell of actions from communities like Mount Pleasant, a move could be taken to petition the renewal of Local Improvements offerings with the 2015-2017 Capital Plan.

The three original Country Lane pilot installations were staggered and used different techniques and materials in order to improve upon each successive installation. As learned from the archetypes of Advocate and Expert, the Kensington-Cedar Cottage Country Lane has been most successful to date. This success, however, is deemed by how well it has been maintained and sustained by its stewards since its installation. Evidence of continued monitoring of its functionality with regard to managing stormwater flows is nonexistent. The success of the NE Siskiyou Green Street retrofit precedent mentioned in the previous strategy had less to do with its performance as it had to do with informing modifications to its design and informing future Portland Green Street projects. This strategy, *Laneways & Permeable Paving*, would increase its chance of success if its *capacity for learning* was increased and connections and adaptations were made from the pilot installation and transmitted to the St. George Rainway strategies to follow.

A potential synergy and partnership for this strategy for design is to work with the Livable Laneways Society. They are a Mount Pleasant-based nonprofit group working towards the animation of laneways throughout all of Vancouver (Mount Pleasant Neighbourhood House, 2013). They have partnered with several groups, including VIVA Vancouver and the Mount Pleasant Business Improvement Area (MPBIA), to offer night markets, musical and visual performances, cook-off fundraisers between local restaurants, and arts festivals. Part of the success of the Kensington-Cedar Cottage Country Lane was learned in Chapter 4 to be due to its use as an annual or bi-annual community gathering space. The Livable Laneways Society could offer help to expound upon this use, while the new laneways could offer the long-term physical enhancements advocated for by the group. Moving forward throughout each of the strategies for design, identifying stakeholder synergies will be essential for successful implementation and sustained functionality and use. (See Figures 5.20, 5.21, and 5.22 on the following pages for proposed locations, selected details, and goals met for Strategy #2.)
5.9.3 Goals Met

(Goal 1) Water Flow Regulation (as managed by the infiltration from the permeable paving and infiltration and evapotranspiration of the flanking rain gardens)

(Goal 2) Water Pollution Regulation (as managed by the soils beneath the paving and the rain gardens provide treatment of polluted stormwater flows)

(Goal 5) Air Flow Regulation (as provided by the increased planting to regulate sound pollution)

(Goal 7) Physical & Intellectual Interaction (as incorporated through public involvement with installation and maintenance of the lanes, as well as through the creation of a new public space for community gathering and recreation)
Figure 5.20: Recommended locations for Strategy #2
Figure 5.21: Selected details for Strategy #2
Figure 5.22: Goals met for Strategy #2
5.10 **Strategy 3: Downspout Disconnection & Rainwater Harvesting**

5.10.1 **Intentions for Design**

1. Establish opportunities for stewardship to take place within the private realm of Mount Pleasant

2. Use the program to build natural capital, in the form of native flora, to help provision following strategies

3. Utilize the growth in knowledge and prevalence of rainwater harvesting to raise awareness and expand opportunities for use with stormwater and greywater to help the City achieve its Clean Water Greenest City 2020 goal

5.10.2 **The Strategy**

This strategy involves work to be undertaken in the private realm and on private properties within the study site. Though they do not harbor the pollution that plagues urban stormwater flows, rooftops account for the majority of impervious surface area in Mount Pleasant. Using a combination of the Water Balance Model tool and zoning information from the City of Vancouver’s Vanmap tool, it was learned that rooftops account for roughly 206,500m² of surface area, or 38% of the entire study site (PWSBC, 2013; City of Vancouver, 2013f). Until the storm sewer system running beneath Mount Pleasant is separated, runoff from rooftops will continue to be the greatest single contributor to the CSO events described in Chapter 1. To combat this, while providing opportunities for growth in connections and engagement amongst neighbourhood residents, this strategy consists of a rooftop downspout disconnection program throughout the test site.

Those structures adjacent to the rain gardens along St. George Street and installed in Strategy #1 would direct their flows to feed the gardens. The remainder of the disconnections within the sub-basin catchment area would be primarily responsible for avoiding CSO events before a sewer separation takes place. After this takes place, they would additionally provide an opportunity for evapotranspiration and infiltration of stormwater that would otherwise be conveyed after sewer separation directly into False Creek. Landscape features as rain gardens would be the preferred method for capturing, slowing, infiltrating, filtering, and treating the rooftop
runoff, though other features such as vegetated swales or rock-filled infiltration trenches could also be used. During larger storm events, overflow from here would be directed into the street where it would make its way into the storm sewer or be picked up by one of the rain gardens that flank St. George Street.

The preferred green infrastructure method for receiving roof runoff are rain gardens not only due to their combined treatment and infiltration abilities (National Research Council, 2009; ETC.), but also for their opportunities with aesthetics and growing local knowledge. An increase of native yard planting on private property would offer visual appeal and opportunities for learning about native plants, habitat creation, and watershed management. Sourcing of plant matter would be the primary material cost, but could come from a collection of donation sources including such partners as the City of Vancouver Board of Parks and Recreation, various environmental advocacy groups, or neighbours willing to use their property as miniature nurseries. Organizations within the Gulf Islands, such as Mayne Island Conservancy Society, offer native plant propagation workshops to extend nature into residents’ backyards and “create a living environment where plants and other organisms will interact” (Mayne Island Conservation Society, 2013). Because native plants are adapted to the local climate, they require less insulation and watering and would be simple care for until they find a home in a neighbour’s rain garden or in one along the Rainway.

Though downspout disconnection programs have been widely successful in such sister-cities to Vancouver as Toronto and Seattle (City of Toronto, 2013; Seattle Public Utilities, 2011), the primary precedent for this strategy comes from Pittsburgh, Pennsylvania. Nine Mile Run is home to a unique brownfield restoration project that transformed a culverted stream and industrial slag heap into a thriving community and an ecological success. The 20-story high mountain of slag left over from the city’s industrial days had its slopes stabilized with native grass, shrub, and tree species to provide the foundation for a mixed-income 96.3Ha housing development known as Summerset at Frick Park. (See Figures 5.25 and 5.26 on the following page.) Most relevant to the St. George Rainway is what took place upstream in two existing residential neighbourhoods surrounding what essentially are the headwaters of the of the project site’s watershed (Pinkham et al., 2002).
Figure 5.23: Example of a disconnected downspout (Morgan, K., 2008)

Figure 5.24: The Nine Mile Run Watershed rain barrel (LaQuatra Bonci Associates, n.d.)
Each household within these two neighbourhoods was approached by the Nine Mile Run Watershed Association, the nonprofit incorporated under the vision to involve citizens in the restoration and protection of the watershed. The downspout disconnection and rain barrel program was designed to reduce CSO events and the discharges into the one of the few remaining unburied streams in the Pittsburgh urban watershed, as well as to improve overall watershed hydrology. (See Figure 5.24 on the previous page.) The first phase of the project was successful, with 500 households each receiving a free 500L rain barrel manufactured locally from recycled plastic. The resulting participation rate of the program’s initial phase was 40% and was deemed the best management practice for a rain barrel initiative for the entire watershed. The projection of this rate set the bar for the ultimate goal of the program, extended to 40% of residential and non-residential structures, to produce a basin-wide reduction of 16% of the total annual stormwater runoff (Nine Mile Run Watershed Association, 2005).

The City of Vancouver currently offers a 341L rain barrel for $75 to any city resident. Half of the fabrication cost is subsidized by the city, yet its initial cost is still high in comparison to the less-than-1¢ per litre cost of water for each unmetered Vancouver residence (City of Vancouver, 2013g, City of Vancouver, 2013h). Furthermore, the challenge with rain barrels in Vancouver lies in the dilemma of how water is needed most for irrigation purposes when no rain falls for weeks at a time. In fact, households throughout Metro Vancouver use, on average, 340L of water each day. The majority of this–30% on average–goes to toilet flushing (Metro Vancouver, 2011f). During summer months, lawn sprinkling becomes the greater culprit. According to Metro Vancouver, “one hour of lawn sprinkling uses as much water as 25 toilet flushes, 5 loads of laundry and 5 dishwasher loads, combined” (Metro Vancouver, 2011g).

The simplest solution to this dilemma is an increase in capacity. Rain barrels could be replaced by cisterns that feed greywater systems housed within homes to provide alternatives to using potable water for non-potable tasks. The adoption of rainwater harvesting and greywater reuse for the two safest options for these forms of
**Figure 5.25**: Historic image of 20-story steel slag pile (Bourke-White, M., 1936)

**Figure 5.26**: *Summerset*, a new use for the slag pile (LaQuatra Bonci Associates, n.d.)
water–toilet flushing and outdoor irrigation throughout single-family residences in Vancouver would account for an average monthly reduction of potable water consumption by over 10%. This alone would be a desirable synergy as it would account for the remaining gap in per capita consumption sought after by the Clean Water goal of the Greenest City 2020 Action Plan (City of Vancouver, 2012b; Welsh, 2011). Regardless, the overflows of a system using a rain barrel, a cistern, or simply a disconnected downspout, would feed the rain gardens in this strategy. The overflow of the technology used would then need to run to one of three locations. In order of preference, these would be: 1. Into the nearest lane where the water could be further regulated and treated (see Strategy #2); 2. Into the nearest street where the water would flow past disconnected storm sewers to the constructed stream along St. George Street (see Strategy #6); or simply into the existing storm sewer system. Of the lessons for design gleaned from the Nine Mile Run precedent was the following insight: “Drainage that is ‘disconnected’ from sewers in these ways is ‘reconnected’ with its natural path in contact with soil and vegetation. The reconnection with natural processes reduces the volume of surface runoff, filters the pollutants, [and] replenishes the groundwater...The volume of stormwater, which once seemed a hazard and a nuisance, is turned into a resource and a productive public benefit” (Pinkham et al., 2002, p. 27) (See Figures 5.27, 5.28, 5.29, and 5.30 on the following pages for proposed locations, selected details, and goals met for Strategy #3.)

5.10.3 Goals Met

(Goal 1) *Water Flow Regulation* (as intercepted from the storm sewer by the downspout disconnections and infiltrated and evapotranspired by the rain gardens)

(Goal 2) *Water Pollution Regulation* (as managed by the plants and soils of the rain gardens to provide treatment of polluted stormwater flows)

(Goal 3) *Water Provisioning* (as offered by the capture and reuse of greywater within private households)

(Goal 7) *Physical & Intellectual Interaction* (as incorporated through public involvement with installation and maintenance of rain gardens and other implemented technologies)
Figure 5.27: Recommended locations for Strategy #3
Figure 5.28: Selected details for Strategy #3 (downspout disconnection only)
Figure 5.29: Selected details for Strategy #3 (downspout disconnection, including a cistern & greywater reuse system)
1. WATER FLOW REGULATION
2. WATER POLLUTION REGULATION
3. WATER Provisioning
4. BIOMASS Provisioning
5. AIR FLOW REGULATION
6. MICRO CLIMATE REGULATION
7. PHYSICAL & INTELLECTUAL INTERACTION
8. SPIRITUAL & SYMBOLIC INTERACTION

Figure 5.30: Goals met for Strategy #3
5.11  Strategy 4: Community Cisterns & Dedicated Fire Protection

5.11.1  Intentions for Design

1. Slow, reduce, and repurpose the stormwater flows impacting the Rainway

2. Build upon the rainwater harvesting efforts put forth in Strategy #3 and offer opportunities for leadership and involvement from the City of Vancouver and the Vancouver School Board

3. Establish method for provision of source waters for the Rainway

5.11.2  The Strategy

As highlighted in the previous strategy, the solution to aligning rainwater harvesting with the climate of Vancouver is to increase capacity. Strategy #4 achieves this by building an initiative that locates three large subsurface cisterns on any or all three suggested properties within the pipe shed of the Rainway–Robson Park, Florence Nightingale Elementary, and Mount Pleasant Elementary. Again, a primary role of this strategy would be to capture flows that would otherwise be diverted to the storm sewer main that runs underneath St. George Street. A project like this would provide an opportunity for the City of Vancouver and the Vancouver School Board to lead by example, offering the tools, in the words of the archetype of expert, for building “the kind of city that we want.”

Under this strategy, Robson Park, Florence Nightingale Elementary, and Mount Pleasant Elementary each would receive a large cistern beneath a portion of their grounds. A recommended material for the cisterns would be steel reinforced polyethylene (SRPE) for its longevity, durability, and relative cost (Kowalsky & Thomason, 2011). (See Figure 5.31 on the following page.) These cisterns would receive their flows from the rooftops and impervious surfaces located on each of their sites. Their sizing would be determined by their function as reservoirs for a localized fire suppression system. In the case of an earthquake or other major fire-causing event, each cistern could provide a backup source of water, as is the designed intent with the City’s current dedicated fire protection system (DFPS). (See Figure 5.32 on the following page.) The existing system connects
Figure 5.31: Example of an underground SRPE cistern (Contech Engineered Solutions, 2013)

Figure 5.32: Vancouver’s DFPS on False Creek (City of Vancouver, n.d.)
two saltwater pumping stations to False Creek for supply of water for fighting fires in the areas of the downtown peninsula, Kitsilano, and Fairview Slopes (City of Vancouver, 2012c).

To determine appropriate sizes for the cisterns, the formula, $Q=KVS^{TOT}$, should be used (Office of the Ontario Fire Marshal, 1999). Where $Q$ stands for the total water volume in litres necessary for fire suppression, the other half of the formula accounts for the structures in play. $K$ accounts for a coefficient related to the type of building construction; $V$ accounts for volume of the structure(s) in cubic metres; and $S$ accounts for the total number of property line exposures on all sides of the structure(s). The catchment for Robson Park could be the roof surface of the Mount Pleasant Family Centre and the adjacent tennis and ball hockey courts; the catchment for Florence Nightingale Elementary would be the entire roof of the school; and the catchment for Mount Pleasant Elementary would also be its entire roof. Accounting for a 25% deficit in harvested volume, known as initial abstraction, due to such inevitabilities as evaporation and leakage (Regional District of Nanaimo, 2012; Watson & Adams, 2010), these three sites as configured could capture a total annual volume of 5,528,347 litres.

Application of the formula would help to determine the sizing needs of the cisterns. If they were not built to full capacity, their overflow could extend to provision for such features as the rain gardens or pocket wetlands along the Rainway or the community allotment gardens and public food assets scattered throughout the neighbourhood.

The future planning component of this project, with regard to projected increases of summer droughts, is to utilize this as a pilot for a community-shared cistern program. Because the highest levels of water consumption coincide with the months that are the driest, storage capacity is key to any effective rainwater harvesting initiative. Where the capacity of rain barrels does not suffice, larger linked units could sufficiently bridge summer water needs, which are projected to be compounded by longer droughts and a rising population (City of Vancouver, 2012a; Welsh, 2011).

Though Vancouver is currently not challenged by water shortages, one can look to low-lying island nations across the globe for examples of community cisterns being a response to shifting climate patterns and growing
Figure 5.33: Residential cistern in water-starved Tuvalu (Oxfam Australia, 2011)

Figure 5.34: Sign for Tuvalu's community cistern (Lola Tausi, 2013)
populations. Early in 2013, aid was given by the Pacific Adaptation to Climate Change (PACC) to the Lofeagai community on the Polynesian island nation of Tuvalu to install a 700,000-litre community cistern. The project was designed to help citizens on a local level address impacts of global climate change. In 2012, the nation had the driest season on record. Little rain fell for eight months, requiring residents to cut their water consumption to 20 litres per person per day (SPREP, 2013a; SPREP, 2013b). The average Canadian consumes 14-times this amount on a daily basis, per 2009 statistics (Environment Canada, 2013b). In September of 2013, Christopher Loeak, the President of the Republic of the Marshall Islands, one of the 13 additional nations included in the PACC, said of the climate change adaptation efforts such as this community cistern: “In the Pacific, we are doing more than waving our hands in distress. These actions send a clear message to the rest of the world that: ‘if we can do it, you can too’” (SPREP, 2013b). (See Figures 5.35, 5.36, and 5.37 on the following pages for proposed locations, selected details, and goals met for Strategy #4.)

5.11.3 Goals Met

(Goal 1) Water Flow Regulation (as removal and/or slow release back into the system by large cistern source control elements)

(Goal 3) Water Provisioning (as provided through the harvesting of rainwater from the adjacent dedicated impermeable surface areas)

(Goal 7) Physical & Intellectual Interaction (as a safety output for fire suppression as well as a social health output with the potential uses of cistern overflows)
Figure 5.35: Recommended locations for Strategy #4
Figure 5.36: Selected details for Strategy #4
1. WATER FLOW REGULATION
2. WATER POLLUTION REGULATION
3. WATER PROVISIONING
4. BIOMASS PROVISIONING
5. AIR FLOW REGULATION
6. MICRO CLIMATE REGULATION
7. PHYSICAL & INTELLECTUAL INTERACTION
8. SPIRITUAL & SYMBOLIC INTERACTION

Figure 5.37: Goals met for Strategy #4
5.12 Strategy 5: Traffic Calming, Pocket Wetlands, & Woonerfs

5.12.1 Intentions for Design

1. Slow, reduce, and clean the stormwater flows impacting the Rainway

2. Create new public open space between Robson and Guelph Parks

3. Change the prioritization of the street for vehicles to one to benefit people and natural systems first

5.12.2 The Strategy

The intersections of Kingsway, 12th Avenue, and Broadway with St. George Street likely receive the most polluted street runoff along the Rainway, per the volume of vehicular traffic that daily occupies these arterial streets (US EPA Development, Community, and Environment Division, 2001). In addition, a portion of the flows that shed from the surface of Fraser Avenue will also contribute to the pollution of the Rainway. For these reasons, as well as the reason that these streets act as thoroughfares and do not require optimized access every city block, this strategy recommends one of two approaches. Either, the northern point of egress for these intersections becomes closed to vehicular traffic, or it receives chicanes or bumpouts that transform pockets of pavement into planted area for treating polluted runoff. (See Figure 5.39 on the following page.)These areas could be series of connected pocket wetlands that would provide optional functionality if designed to treat the runoff from catchment areas ranging from 0.4Ha to 4Ha (US EPA, 1995).

Strategically, these locations are also home to portions of both the Rain Gardens & Food Provisioning and Community Cisterns & Dedicated Fire Protection strategies proposed by this thesis. The growth in knowledge and engagement from the de-paving and rain garden installation would be transferrable to such an installation, and the roles of monitoring and maintenance could be offered to partner stakeholder groups. Further, the overflow from the nearest cistern, or from another source, could be pumped via a gravity- or solar-powered water pump to maintain the hydrology in the pocket wetlands. A potential synergy for a road closure taking place between Kingsway and 13th Avenue involves the proposed re-zoning of the Northern side of the 400 block
Figure 5.38: Constructed wetland in Salmo, BC (BC Wildlife Federation's WEP, 2013)

Figure 5.39: Chicanes used for traffic calming in Seattle, WA (Justin Martin, 2009)
of Kingsway to become hi-rise condominium housing. Rainwater falling on this building could be harvested and fed into the pocket wetlands to further support their hydrology.

A strategic means to phase the implementation of the pocket wetlands, in case the closure of a block or half-block was too extreme a measure, would be to break up the wetlands into a series of chicanes. Bump-outs are common to the Green Streets program and take a similar form and function as a traffic calming measure. Chicanes are different primarily in that they alternate, creating a roadway that winds rather than runs straight and is narrowed at the point of a pair of mirrored bump-outs. Drivers are forced to slow down or stop to negotiate who is to pass first (London Department of Transport, 2006).

The pocket wetlands linked by underground pipes could be installed first and later decommission and transform an entire section of an underutilized street. Stormwater wetlands are best designed specifically to treat runoff and therefore take on different forms and have lower rates of biodiversity than to natural wetlands. Further, they often require a modular design with areas of dry storage, shallow water, and deep water. Chicanes could take on this staged functionality, or one could look to the precedent of Waitangi Park in Wellington, New Zealand. Here, this type of system of staged ponds and a minimal plant palette is used to simultaneously create a functioning stormwater wetland and a popular urban park feature with a modern aesthetic. (See Figure 5.40 on the following page.) In addition, this award-winning project was responsible for daylighting Waitangi Stream and achieving a zero net increase of pollution in the linked water systems, namely the adjacent harbour (Cook, 2007; Wraight and Associates Limited, 2012).

Another global precedent important to Strategy #5 is the Dutch street configuration known as the woonerf. Woon- in Dutch means “residential” while -erf means “yard” and refers to a street where pedestrians have the right-of-way and the where space is safely shared with automobiles, cyclists, and even children playing (Beatley, 1999, p.142). (See Figure 5.41 on the following page.) To achieve such a space, road widths are narrowed, the surface of the street is raised to curb height and often consists of cobble or brick, and bollards are used to create boundaries for vehicles. Further, when not in use, parking space becomes a public amenity for
Figure 5.40: Waitangi Park in Wellington, New Zealand (Steve Sigley, 2006)

Figure 5.41: Woonerf in Southwest Montreal (Arrondissement du Sud-Ouest, 2012)
pedestrians (Beatley, 1999). To optimize the design for people, the primary stakeholder group, a public participation process, beginning with the first phase of the project, is essential.

In the case of this design strategy for the Rainway, woonerfs could be used on portions of St. George Street or on selected flanking streets as traffic calming measures and measures to achieve one-way status and limit vehicular egress to and from the street. As an example, the portion of St. George Street one block north of 12th could involve a full transformation of the block, though only half would be closed permanently. The southern half would be closed to disconnect it to the busy connector street of 12th Avenue and become the space for one of the pocket wetlands. Furthermore, it would act as a buffer for the northern end of the block to become a woonerf and act as an additional drop-off/pickup zone for Florence Nightingale Elementary. To enhance the entire surrounding area to a more pedestrian-centric space additional considerations could be given to also transforming the portions of Guelph Street and E 11th Avenue that flank the school, as well as the lane that connects to to Carolina Street to the east, into woonerfs as well.

The combination of pocket wetlands, in the forms of chicanes or permanent block closure transformations, with the addition of flanking woonerfs, could be utilized between Broadway and Mount Pleasant Elementary as well. The northwest corner of St. George Street and 8th Avenue marks the historic headwaters of St. George Stream, of Te Statlew. Cleaning the stormwater entering from the south and providing more space for pedestrians to meet and greet and host annual events like Mount Pleasant Days are to only name a few of the benefits of a third component to Strategy #5. This strategy pays homage to the namesake and reason for this project by taking measures that definitively prioritize the shared public space of St. George Street for people and natural systems. This prioritization will reach its full potential with the final strategy for design proposed by this thesis. (See Figures 5.42, 5.43, and 5.44 on the following pages for proposed locations, selected details, and goals met for Strategy #5.)
5.12.3 Goals Met

(Goal 1) *Water Flow Regulation* (as managed by the infiltration and evapotranspiration of the pocket wetlands)

(Goal 2) *Water Pollution Regulation* (as managed by filtration and treatment provided by the plants and soils of the pocket wetlands)

(Goal 4) Biomass Provisioning (as provided by the fruit trees and native berry shrubs planted along the periphery of pocket wetlands)

(Goal 5) *Air Flow Regulation* (as provided by the increased planting along vehicular arterials to regulate sound pollution)

(Goal 7) *Physical & Intellectual Interaction* (as incorporated through creation of safe public space congregation and recreation amenities in the form of wooners)

(Goal 8) *Spiritual & Symbolic Interaction* (as providing a forum for teaching ecological and indigenous heritage through the location of various elements of this strategy)
Figure 5.42: Recommended locations for Strategy #5
**Figure 5.43:** Selected details for Strategy #5
1. WATER FLOW REGULATION
2. WATER POLLUTION REGULATION
3. WATER PROVISIONING
4. BIOMASS PROVISIONING
5. AIR FLOW REGULATION
6. MICRO CLIMATE REGULATION
7. PHYSICAL & INTELLECTUAL INTERACTION
8. SPIRITUAL & SYMBOLIC INTERACTION

Figure 5.44: Goals met for Strategy #5
5.13 Strategy 6: A Constructed Stream

5.13.1 Intentions for Design

1. Focus flows of stormwater not infiltrated, evaporated or harvested to the surface of the Rainway

2. Create additional methods to clean stormwater flows

3. Establish an additional method for provision of source waters for the Rainway

5.13.2 The Strategy

Each strategy preceding this is designed to offer any or all the means of capturing, slowing, diverting, infiltrating, filtering, or treating stormwater runoff. Every one of these mechanical and chemical processes occur throughout nature to maintain balance with hydrologic systems (National Research Council, 2009), though the current storm sewer system that manages the runoff from the sub pipe-shed of the Rainway accomplishes none of them. The rain that falls on Mount Pleasant and is conveyed northward within the sewer main that runs beneath St. George Street is still treated as a waste product. This final strategy for design is structured to realize the full resource potential of all stormwater.

Studies performed by the U.S. Department of Agriculture (USDA) demonstrate how the health of a watershed begins to decline when its net surface area reaches 10% imperviousness (USDA-NRCS, 1986). Calculations performed using data provided by the Water Balance Model and Vanmap estimate the impervious surface area of the Mount Pleasant study site at 63% (PWSBC, 2013; City of Vancouver, 2013f). This percentage situates the neighbourhood between the ranking of “dense residential” and “urban” by the USDA, projecting runoff to reach between 30% and 55% (USDA-NRCS, 1986). As mentioned in the Goals section of this chapter, water balance modeling tests demonstrated how, if the entire study site was to implement permeability source control measures to cover the entire surface area, the approximate reduction in total runoff would be no lower than 50% (PWSBC, 2013). As viewed through this lens, regardless of the source controls applied to it, the Rainway would retain its relative urban condition. Other measures, such as rates of evaporation and deep infiltration,
**Figure 5.45:** Daylighted Cheonggyecheon in Seoul (Carlos Felipe Pardo, 2013)

**Figure 5.46:** Daylighted Kid’s Creek, Traverse City, MI (Traverse City Rotary Club, 2013)
and the impacts upon them from green infrastructure might be quantified, were not accounted for by this thesis.

With the realization that Mount Pleasant will remain a dense urban neighbourhood and not be returned to its original forested state, a constructed stream is a suitable expression. A stream, whether it is perennial or maintains constant flows throughout the year, would maintain the spirit of the existing stormwater infrastructure by capturing a maximum of surface water and directing its flows atop the surface of the ground. Suggested techniques for achieving this include series of disconnections and reconnections. First, storm sewer inlets within the pipe-shed could be disconnected to allow any flows that make it to the curb run downhill to St. George Street where a shallow stream could receive them. (See Figure 5.48 for locations of each inlet.)

To avoid erosion of the stream banks from the inflow from side streets, conveyance could be achieved by installing miniature culverts that would run from the intersection of curbs from the side streets, beneath the retained paving of St. George Street, and into the receiving stream. The impervious surfaces that do not shed towards St. George Street, such as laneways that shed towards a central drain could become part of the Country Lanes initiative, revitalized by Strategy #2, and receive permeable paving and flanking rain gardens. Downspout disconnection managed the impermeability of rooftops with Strategy #3, so the remaining surface area consisting of impervious surfacing are the lanes not yet transformed into Country Lanes as well as the flanking streets to St. George without rain garden treatments initiated in Strategy #1. An option to disconnecting storm sewer inlets along these streets would be to expand the program of the first two strategies.

Water balance modeling demonstrated how a shallow stream 0.5m deep and 6m wide could be viable. Such a stream, planted with native sedge and grasses throughout its bed, with woody shrubs along its slopes, could maintain a 0.5m/sec flow velocity regardless of the source controls placed throughout the study site (PWSBC, 2013). (See Figure 5.49.) Such a depth and velocity would accommodate salmon to lay their eggs if ever they, as they have at Still Creek, eventually come home to spawn (Department of Fisheries and Oceans Canada, 1991).
This profile would be the case for the stream from its headwaters to around E 6th Avenue, where the slope of the Rainway steepens. To slow flows and avoid erosion from here until the water reaches the site of the new Emily Carr University campus on the False Creek Flats, a series of check dams, or naturalized riffles, will be necessary. Additionally, the design of these check dams should also be accommodating to the potential of returning salmon and double as salmon ladders.

Salmon have indeed come back to Vancouver’s Still Creek. (See Figure 5.47.) However, the challenge for the Rainway is a steeper one. Still Creek was not entirely buried at the start of the project. In fact, 30% of its original channels and tributaries remained open, with portions such as the Renfrew Ravine still “providing valuable habitat” (City of Vancouver Community Services, 2002, p.5). Locations such as this were tasked with protection and preservation, not rehabilitation as was required for other sections of the stream. In other areas of the project site, an array of best management practices (BMPs) were proposed to manage stormwater including: constructed wetlands, rain gardens, green roofs, parking lot detention, permeable paving, downspout disconnection, increased street cleaning, and deep well infiltration. It was proposed that each BMP be tested.
Figure 5.48: Existing condition of the Rainway sub-basin including storm sewer inlet locations
Figure 5.49: Resulting condition for the Rainway sub-basin illustrating the proposed reduction in storm sewer inlet flows leading to greater prevalence of surface treatment and cleaner flows for the St. George Rainway
with a trial run to determine effectiveness of frequency and configuration when moving forward with the project. The pilot projects were commonly built into the short-term scope (the first 10 years) of the project, for which the total budget was estimated at $1,230,000. The costs for the 10 to 50-year action plan for the Still Creek Rehabilitation project were projected to approach $9 million (City of Vancouver Community Services, 2002).

Several of the BMPs mentioned in the Still Creek Rehabilitation and Enhancement Study have been proposed for the St. George Rainway in the earlier strategies for design. The two that have not been proposed, but could benefit this strategy in particular, are increased street cleaning and deep well infiltration. According to the report:

For optimum effectiveness in reducing contaminants in stormwater runoff and improving water quality in Still Creek, streets and parking lots...should be cleaned every week or at least 2 times per month. A pilot project should be implemented to sweep streets bi-weekly for one year to assess improvements in the stormwater. This will require a monitoring program for sediments, heavy metals, nutrients and oxygen demand (City of Vancouver Community Services, 2002, p.28).

Rain gardens and pocket wetlands implemented along the Rainway will help to remove excess toxins and nutrients and improve levels of dissolved oxygen to support aquatic life (Davis, 1975), however an increased rate of street sweeping will provide resilience in offering redundancy and a high degree of diversity.

Deep well infiltration could also provide resilience with redundancy in the provision of a water source for the constructed stream. Despite the ever-presence of flows of water beneath St. George Street, even during summer droughts, no actions have been taken to determine what portion of these flows are originating from an
aquifer. As cities build imperviousness into their surfaces, rates of infiltration decrease and interrupt the natural processes of aquifer recharge (USDA-NRCS, 1986). Without this recharge, the flows from freshwater springs that are responsible for streams throughout this part of Vancouver, become greatly compromised (Whitfield et al., 2002). Deep well infiltration is a means to supplement this recharge by “drilling down to porous geologic formations and directing stormwater runoff through wells into these formations where the water recharges the underground aquifers” (City of Vancouver Community Services, 2002, p.103). A study performed in 1997 demonstrated the viability of “Underground Percolation of Stormwater” as a way to reduce the demands on storm sewers in South Vancouver (Metro Vancouver, 1997). Testing of the geology of the site around the headwaters of the Rainway, in places less prone to polluted stormwater runoff like Robson Park, would determine the viability of this technique for Strategy #5.

**Figure 5.50:** Space required for a constructed stream along St. George Street
Much has been written about the methods to daylight and construct urban streams (Apostol, 2006; National Research Council, 2009; Riley, 1998; Thompson & Sorvig, 2007; etc.). There are numerous ways to approach the goal of this final strategy for design. Central to any approach should be the history of the approach. Its goal, beginning with the first de-paved portion of St. George Street transformed into rain gardens, is the expression of stormwater aboveground. Figure 5.49 demonstrates the approach to minimize flows into storm sewer inlets so to offer as much surface treatment of stormwater as possible. As the strategies are completed and the natural and social capital within this community of Mount Pleasant grows, the linkages between each element of green infrastructure should also grow. What began as a mural and inspired action to punch holes in the impermeability of a street, eventually is to reclaim the St. George Street corridor as a realm foremost for the health of pedestrians and ecosystems. Whatever form it takes, the completion of Strategy #6 should find its street transformed into a one-way traffic-calmed local street with half of the street repurposed for people and natural systems—dedicated to an expression of a shallow stream. (See Figures 5.52, 5.53, and 5.54 on the following pages for proposed locations, selected details, and goals met for Strategy #6.)
5.13.3 The Goals

(Goal 1) Water Flow Regulation (as managed by the constructed stream including its nonliving structure and living elements to control volume and speed of water flows)

(Goal 2) Water Pollution Regulation (as managed by the soils and plants, including trees, that populate the constructed stream to treat flows of polluted runoff)

(Goal 3) Water Provisioning (as provided by the flows of stormwater collected by the constructed stream)

(Goal 4) Biomass Provisioning (as provided by the fruit trees and native berry shrubs planted along the constructed stream’s banks)

(Goal 5) Air Flow Regulation (as provided by additional tree canopy to regulate sound and air pollution)

(Goal 6) Micro Climate Regulation (as provided by additional tree canopy to regulate temperature, precipitation, and air flow)

(Goal 7) Physical & Intellectual Interaction (as incorporated through public involvement with installation and maintenance stream, as well as through the creation of a new public amenity for learning, recreation, inspiration, aesthetic appeal, etc.)

(Goal 8) Spiritual & Symbolic Interaction (as providing a forum for teaching ecological and indigenous heritage through the flows of a stream and the potential return of the salmon)
Figure 5.52: Recommended locations for Strategy #6
Figure 5.53: Selected details for Strategy #6
1. WATER FLOW REGULATION
2. WATER POLLUTION REGULATION
3. WATER PROVISIONING
4. BIOMASS PROVISIONING
5. AIR FLOW REGULATION
6. MICRO CLIMATE REGULATION
7. PHYSICAL & INTELLECTUAL INTERACTION
8. SPIRITUAL & SYMBOLIC INTERACTION

Figure 5.54: Goals met for Strategy #6
5.14 A Note About Trees

To help ensure the health of a stream, human-made technology is not always necessary. A BMP recommended for each of the six strategies for design is simply to plant trees. To help with water flow regulation, trees have the ability to intercept rainfall, store stormwater within their root systems, and release moisture back into the air through the process of evapotranspiration (Nowak & Dwyer, 2007). A study illustrated the potential for an increase in an urban forest canopy to have an exponential effect upon its ability to reduce runoff. By increasing its existing tree canopy from 22% to 29%, the city was able to increase interception of runoff from 7% to 12% (Sanders, 1986). The tree canopy of the sub-basin catchment area of the St. George Rainway project is estimated to currently be 25% coverage (PWSBC, 2013). To aid with air flow regulation, trees not only provide buffers to noise pollution, they remove particulate matter, sulfur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide (CO), and carbon dioxide (CO2) from the atmosphere that would otherwise add to the air and water pollution typical of urban environments. Further, the ability to achieve these measures exponentially improve as trees mature and canopies grow more dense (Nowak & Dwyer, 2007).

To offer micro-climate regulation and reduce urban heat island effect, trees are the most effective tool (US EPA, 2009). They do not only offer shade to people and structures that otherwise use energy-intensive mechanical cooling methods; studies have shown the ability of trees to reduce incoming solar radiation by 90% or more, resulting in the evapotranspiration that counteracts the solar radiation trapped by the human-made surfaces of an urban environment (Heisler, 1986). Trees reduce runoff, they reduce pollution, and they reduce needs for energy consumption. Their value is so widespread, various tools have been developed to measure their worth. In New York City, a study performed using the program Stratum, developed by researchers at the University of California at Davis and the United States Forest Service, concluded how for every $1 spent on trees, the city receives $5.60 in benefits (Randall, 2007).

The Access to Nature goal of Vancouver’s Greenest City 2020 Action Plan calls for the planting of 150,000 new trees before this decade is up (City of Vancouver, 2012b). The Board of Parks and Recreation has assessed...
locations for new trees throughout parks and along streets, yet opportunities remain within the private realm and within the pockets of new greenspace created by the implementation of the Rainway. Whether they are the rain gardens of Strategy #1, the backyards of Strategy #3, or the planted banks of the constructed stream of Strategy #6, the St. George Rainway would benefit generously from the planting of trees and the care given to help them each reach a highly productive maturity.

5.15 Needs for Implementation

Could green infrastructure provide both a resilient option for physical land development as well as opportunity for social cohesion within communities? The short answer to the question guiding this entire thesis is: yes. Its ability to do this, however, is entirely contingent upon the structure of the strategies for its design, implementation, and maintenance. At the core of this ability is to involve two players: people and natural systems. With participation from each, the strategies for the St. George Rainway project have each demonstrated the means to involve these players with the provision of ecosystem services and characteristics of resilient communities.

In order to successfully realize each of the six proposed strategies for design, or any to augment or replace these, attention must be given to the details of the relationship with the community of Mount Pleasant. Moving forward, there are many needs that would help increase the success of the Rainway. Realizing the Rainway will the natural capital gained through the ecosystem service-based goals and the living components of the realized design. Further, it will require social capital in the forms of such things as hours put to visioning, design, and labour. The work completed for this thesis to this point has highlighted several aspects of the needs related to visioning, design, and labour. The following list contains seven examples:

5.15.1 Formation of a parent oversight group

This group could be the acting St. George Rainway group or another created for this purpose. Due to the nature of this project involving a city-community partnership, as well as partnerships with peer groups, it is essential
that a parent group provide oversight and management of the relationships, goals, phases, and strategies for the Rainway.

5.15.2 Partnerships with the City

Establishing such partnerships would help those managing and activating the Rainway to identify important synergies with planning and policy as well as with identifying outside groups to help plan and realize the Rainway. Important to this need is the ability of a parent group to establish numerous diverse partnerships to provide a redundancy in perspective, political clout, and availability to donate time.

5.15.3 Partnerships with stakeholder groups

Establishing this type of partnership would provide the managing parent group with access to organizations with pools of labour and localized leadership abilities essential to realizing the Rainway. Again, a diversity in partnerships would be important to provide redundancy in perspective, localized political clout, and availability of various forms of social capital.

5.15.4 Champions for each project

As highlighted primarily in Chapter 4, the need for a champion with each component to each strategy for design is essential. Examples of such champions could be similar to Vancouver’s Green Streets program and identify a homeowner living adjacent to a proposed rain garden. Other champions could include professors and students from universities seeking research opportunities, or groups such as the showcased Livable Laneways Society whose mission statement(s) directly align with the Rainway’s goals and strategies.

5.15.5 Charrettes with the community

In the case of the St. George Rainway, a charrette is a public design and planning intensive, where the visioning is driven by the community. These would be structured to coincide with each strategy and phase proposed for the Rainway to enable active learning and adaptive management of the vision of the Rainway. Goals and strategies will change as time passes and the needs and players of the project change. Constant referral to the
decisions made at each charrette, and the approaches subsequently tested, will help to produce and end product that is diverse, dynamic, and equitable.

5.15.6 In-kind design and engineering services

Much of the work needed to realize the Rainway in the fashion it has been proposed will require professional expertise. Landscape architects, civil engineers, water ecologists, and construction managers are a few of the types of professionals that will need to be tapped for their knowledge and time to see that the Rainway meets its ecosystem service-based goals. These individuals might already exists in Mount Pleasant as residents or as adjacent local businesses. Regardless of how they are identified and secured, the current state of the City budget and Capital Plan make in-kind service an essential component to the success of the Rainway.

5.15.7 Dialogue around past initiatives

Vancouver has seen its host of pilot projects and continues to push itself towards Greenest City status by 2020. The retention of knowledge embedded in hindsight and tested initiatives is valuable to future progress. Making contacts and engaging in dialogue and learning around knowledge from past projects in Vancouver and in its sister cities of Cascadia would be a valuable tool for streamlining the success and speed of the Rainway’s implementation.
6 Thesis Conclusion

Planning for A Resilient Future

6.1 Revisiting the Rationale

This thesis, guided by the question—Could green infrastructure provide both a sustainable option for physical land development as well as opportunity for social cohesion within communities?—has demonstrated the potential for this duality. The path of this thesis was multi-scalar, offering a global perspective to start, and concluding with the 54Ha site of the St. George Rainway, where activation of resilience for community takes place. The essence of this work is represented in Figure 6.1 on the following page.

The exceedence of planetary boundaries, namely the levels of atmospheric CO2 responsible for Global Climate Change, is exacerbating the quality of life for all humans (Rockström et al., 2009). Due to the impacts resulting from a quality of life that has been artificially inflated by vast amounts of buried sunlight, or petrocarbons, human population has been able to live beyond the carrying capacity of the planet (Folke et al., 1997; World Wildlife Fund, 2012). To correct this overextension and address the side-effects of overpopulation and overconsumption, the planet requires a more resilient means of human existence, which is best understood and emulated at the community level (Cutter et al., 2008). Currently, the global standard for simultaneously planning for human and ecological health are ecosystem services (World Health Organization, 2005). However, the provision of ecosystem services to not only provide a means for sustainable development, but development that is resilient to such things as Global Climate Change, requires an understanding of the 10 primary characteristics of socioecological resilience (Bahadur, Ibrahim, & Tanner, 2010). Because communities exist within the realm of socioecological systems, these characteristics are transferrable to communities (Holling, 2001), consequently arriving at the chosen model: the Vancouver community of Mount Pleasant.

In the case of Vancouver, the work of this thesis temporally coincided with the work of the Vancouver Foundation to better understand the existence of social cohesion throughout the greater Metro Vancouver region (DiPaula et
al., 2012). It achieved this by measuring bonding and bridging within communities. This lens offered a vehicle by which to theoretically activate the 10 characteristics of socioecological resilience, two of which—community
EXCEEDENCE OF PLANETARY BOUNDARIES
(CAUSING GLOBAL CLIMATE CHANGE AMONGST OTHER CHALLENGES)

NEED FOR RESILIENT COMMUNITIES

REQUIRING A HEALTHY SOCIETY + REQUIRING A HEALTHY BIOSPHERE

FOSTERED BY 10 CHARACTERISTICS OF SOCIOECOLOGICAL RESILIENCE

REALIZED THROUGH GREEN INFRASTRUCTURE
BUILT & MAINTAINED BY THE COMMUNITIES

Figure 6.1: The rationale for the work undertaken by this thesis
engagement and participation & presence of social capital—play a central role in improving the bonding and bridging the Vancouver Foundation identified in 2012 to be weak in key areas (Vancouver Foundation, 2012b).

This thesis demonstrated how green infrastructure, when realized via voluntary engagement within community, can simultaneously provide opportunity for increasing the social cohesion present within it. Through a review of applied precedents, applied theory, and original research, social cohesion was found to create a positive feedback loop in its ability to reciprocally improve the establishment and success of the green infrastructure from where it grew. For the resulting green infrastructure to withstand systemic changes, such as climate change, it requires an embodiment of the primary characteristics of resilient communities; For it to be constructed in this way, it requires natural & social capital: material, design, and labour. Such labour requires social cohesion.

6.2 Lessons from Theory

Socioecological resilience was introduced as the type of resilience most aligned with community development, and subsequently: resilient communities. Therefore, it was deemed to be foundational to the St. George Rainway project. A review of the most relevant and recent literature established the 10 characteristics most prominent throughout theory and applications of socioecological resilience. The examination of each characteristic offered insight into the synergistic nature of each and how definitions and boundaries can be shared between two or more, given various circumstances. This particular insight laid the groundwork for theory transference through the lenses of archetypes in Chapter 4, as well as the framework for the strategies for design in Chapter 5.

Theory has demonstrated how the strength of community resilience is directly related to the interplays of social and ecological health. Measuring this interplay however, remains a challenge. A shortfall learned through the examination of socioecological resilience literature, but offered in Chapter 5, dealt with the quantification and combination of the 10 characteristics. How much of each component of a system is needed to support resilience? and What combination of elements can produce a preferred systemic state? are two questions in particular that offer opportunity for future exploration. The approach this thesis took provided systemic optimization for the
St. George Rainway and its immediate community through maximized collective combinations of the pool of characteristics. (See Figure 6.3.)

The depth of synergies that exist between characteristics offer insight into the complexity of building resilient communities. A reason the questions posed in the Chapter 5 section titled, *Shortfalls of Using The Ten Characteristics*, is due to the interconnectedness of the characteristics. Similarly to complex adaptive systems, quantifiable associations between characteristics are difficult to achieve due to their nonlinear natures. For instance, the characteristic of *acceptance of uncertainty and change* relies upon an ability to practice adaptive management. According to the literature, adaptive management also relates to the characteristics of *effective governance and institutions, capacity for preparedness and planning, and capacity for learning* in the ways that each help to prepare for known unknowns and adapt to them as changes in systems arise.

Also learned, and confirmed by selected stakeholder and professional interviews, were shortfalls in the embodiment of particular characteristics. The two were from the standpoint of the City of Vancouver. Both the *capacity for preparedness and planning* as well as the *capacity for learning* fell short of the defined characteristics. As a noted synergy between several characteristics, the practice of adaptive management would help to improve the track record of the City of Vancouver to be yielding to projects with community in the public realm, while learning and applying lessons from past and current initiatives.

This thesis was written pre-catastrophe and pre-construction, as is the case in most visioning and planning initiatives, leaving the study of applied theory in the context of site and community conditions as the foundations for the work. Since quantification and combination of the 10 characteristics existed in neither a theoretical or contextual foundation, a practical maximization was the default pursuit. Viewed individually, no one strategy for design achieved a tally of each of the 10 characteristics. However, just as any system relies upon the collective health of its parts, when viewed as a collective strategy, a comprehensive emulation of the full set of characteristics could be achieved.
6.3 Lessons from Panarchy

The theory of Panarchy describes the behaviour of complex adaptive systems. This, in turn, provides insight into the complex workings of ecological, social, and economic pillars of sustainability (Holling, 2001). In Chapter 5, clarification was given to the interrelated nature of different scales and speeds of the cycles of a panarchy. This relationship offers insight into how development might approach sustainability. According to the creator of the theory of Panarchy, sustainability is “the capacity to create, test, and maintain adaptive capability. Development is the process of creating, testing, and maintaining opportunity. The phrase that combines the two, “sustainable development”, therefore refers to the goal of fostering adaptive capabilities while simultaneously creating opportunities. It is therefore not an oxymoron but a term that describes a logical partnership” (Holling, 2001, p. 398).

It is the ability to cascade between scales that enables adaptive management. Figure 6.2 (on the following page) offers additional insight into various interconnected aspects of the St. George Rainway project. The three panarchy cycles pictured can be understood as one large and slow (1), one intermediate (2), and one small and fast (3), as described in Chapter 5. According to Holling, “each level is allowed to operate at its own pace, protected from above by slower, larger levels but invigorated from below by faster, smaller cycles of innovation. The whole panarchy is therefore both creative and conserving” (2001, p. 390).

The levels could be understood as local, city, and regional scales with regard to anything ranging from social norms, to governance, to the hydrologic cycle. They also can be seen as representational of the Rainway itself. Each strategy has components that can build a panarchy, while the Rainway as a whole could be similarly articulated. For instance, Strategy #4 utilizes captured rainwater to achieve its goals. The storms that bring the rainfall (3) impact the annual harvest of rainwater available to residents and the Rainway (2). Meanwhile, the intermittent and hopefully rare event that requires use of the cisterns for dedicated fire protection, will fall along intervals of not seasons or years, but decades or longer (3). A prolonged drought, a cistern leak, or more frequent fire events would have cascading effects that impact each of the other scales. Adaptive management
Figure 6.2: Scales, speeds, and linkages between “Panarchy” cycles (diagram adapted from Holling, 2001, p. 398).
enables the ability to view each level of the panarchy, system, or Rainway simultaneously so adequate adaptations can be made to ensure the resiliency of the overall system.

6.4 Lessons from Water

Water is present in all earthly living systems. It is water that is also the element most common to discussed impacts of a changing climate. For its central role in what cities need to be more resilient to, its central role in green infrastructure, and its central role in the characterization of Vancouver and the region of Cascadia, water has been the medium throughout the research and discussion with this work.

A portion of Chapter 2 highlighted the need for an update to the Clean Water goal of Vancouver’s Greenest City 2020 Action Plan. The additional third target would propose a reduction of stormwater runoff to ensure the city’s waterways continue to improve in health. As evident with Still Creek, aquatic life can return to waters buried by the practices of building cities. The St. George Rainway has similar potential to be a precedent for the city to further explore a shift in how infrastructure is built.

The proposed storm sewer separation that is slated to take place in Mount Pleasant, would redirect untreated runoff from all median storm events directly into False Creek, the Burrard Inlet, and the Fraser River. To begin to approach addressing a target that ensures the health of all waterways, water must be considered a resource, regardless of its definition. Subsequently, it is treated as such with elements of green infrastructure and throughout each strategy for design of the Rainway proposed in Chapter 5. The Greenest City 2020 Action Plan could reflect this by calling for a revised clean water goal and include a target that decreases the flows and increases on-site treatment of conveyed water.

6.5 Lessons from Ecosystem Services

The final component to the second chapter addresses the concept of ecosystem services. More than simply the benefits ecosystems provide to people, research offered that ecosystem services are “natural ecosystems, the
services they provide, and the benefits that people get from those services...[as well as the] physical ‘stock’ of resources that provides a continuing ‘flow’ of services and benefits to people” (Brown and Mooney, 2013, p.14).

The quantity and quality of these services was shown to be directly related to the health of the ecosystems from where they are provisioned. Rooted in this understanding and in the relationship of size, connectivity, and spacing of the habitat patches of ecosystems, the phasing and strategies for design of the Rainway proposed in Chapter 5 reflect this. The ultimate strategy is to connect all patches of green infrastructure designed to treat stormwater as a resource along with the public open space to ultimately produce a continuous linear element expressed as a constructed stream. What now occupies a storm sewer is envisioned to eventually flow aboveground and along St. George Street.

Each goal for the Rainway is an ecosystem service. The second most common goal to each of the six strategies for design was *water pollution regulation* as a means to ensure sustained health of the connected urban ecosystem. To achieve this, the most common goal to each of the strategies was *physical and intellectual interaction*, and in essence: a provision for social cohesion. The strategies for design propose how with a greater existence of a natural ecosystem—the Rainway—a higher prevalence of social cohesion in Mount Pleasant will prevail. There is, however, a reciprocality to this relationship. Theory has also demonstrated how the provision of ecosystem services is directly related to the social and natural capital to which it has access. Both community and nature are therefore needed to actualize the Rainway.

### 6.6 Lessons from The Surveys

The redistribution of the Vancouver Foundation survey offered insight into the prevailing existence of social cohesion in the community of Mount Pleasant. Though the relative factorial scoring of the “Caring and Involved Residents” model between the two surveys showed no difference in the category of *Personal Friendships*, the connections with neighbours and throughout the broader community were both greater by at least 250%. A review of each question from the survey demonstrated how for every one question Metro Vancouver was superior, Mount Pleasant answered favorably with nearly three questions. The purpose of a comparative
analysis of the two surveys was to provide a baseline of rationale to support or disagree with an implementation
of the St. George Rainway based upon its location. By this measure, the Mount Pleasant survey was successful.

The Mount Pleasant survey was lacking in its depth specific to the site of the Rainway. The length of the parent
survey was prohibitive to adding any more questions than were to gain the insight into impressions of the
mural. Anecdotally, comments were made by some individuals that the survey was too long to be worth their
time. This could have likely been the impression of more individuals, contributing to the acceptable, but low
response rate.

Moving forward, additional methods to gain the knowledge and insight of residents of Mount Pleasant should
be sought. This can take many forms, such as a survey with a multivariate analysis of proposed schematic
directions for the Rainway. Or instead, additional knowledge could be gained simply as feedback garnered
through a series of community visioning and design charrettes, where goals and agendas are set by the
participants. Regardless, the results from the Mount Pleasant survey, administered and contributing to original
research for this thesis, have demonstrated the rationale for using this site for a series of pilot projects. If the
effectiveness of their implementation and maintenance is to be contingent upon levels of social cohesion, the
Rainway and its pilot projects have a stronger chance at success in Mount Pleasant than in a typical Metro
Vancouver community.

6.7 Lessons from The Interviews

The framing of the interviewees as archetypes offered both strengths and weaknesses. Archetypes can act as
surrogates or proxies to help test and hypothesize impacts of various scenarios, and therefore can act as
vehicles of transference. In this, they offered insight into each of the 10 characteristics of resilient communities
that was not available otherwise due to the pre-catastrophe/pre-construction state of the Rainway. Each
archetype provided a lens not only in viewing, but in application of theory that was contextually local. The
archetypes grew from the coding analysis of the interviews, which in turn begs the questions: What other
archetypes exist? and Would other archetypes provide additional and valuable insights not gleaned from this research? Herein lies another opportunity for research or the continuation of research.

As with the quantification issue related to measuring the 10 characteristics of socioecological resilience, the work of this thesis did not provide the answer to the two questions above. An exhaustive ethnographic approach could potentially conduct enough interviews to develop a more thorough model for canvassing and choosing interview subjects. It would offer opportunities to develop themes and strengthen characterizations through the repetition of archetypes. The challenge innate to this approach, however, is related to timing and scope. The rate at which the community of Mount Pleasant is changing could have the potential to outpace an approach other than the one that was taken: the reliance upon a thorough understanding of the project’s context to determine the best candidates for interviews. Regardless, the insights gleaned from Chapter 4 sufficed in the development of the goals, phases, and strategies for design proposed in Chapter 5.

Lastly, another realm for future exploration could involve the framing of unstructured interviews. It is of no surprise that a review of the characteristics of resilient communities emulated by the archetypes illustrated how social capital was most represented. Each interview began with a question that explored the interviewees’ understanding of the concept of social cohesion. This concept is central to this thesis and to the comparative study with the parent survey, thus justifying the approach. However, a more extensive study that structures a set of interviews around each of the ten characteristics could offer insight into additional synergies and hierarchies innate to their interconnectedness.

6.8 Resilience Characteristics Emulated

Where the archetypes from Chapter 4 offered a locally contextual understanding and a broader transference of the ten characteristics of resilient communities, the strategies for design of the Rainway demonstrate their potential through activation. To offer an understanding of how each characteristic is activated by the strategies, refer to the following list:
6.8.1 A High Degree of Diversity

*A high degree of diversity* was emulated through each of the strategies by offering additional stormwater management and treatment tools to establish a more heterogenous system. This and a provision of food assets, each offered through the diversity of green infrastructure mechanisms, provide identical functioning for the Rainway and its stewards. Maintaining a high degree of diversity amongst stakeholders will help with adaptation to changes and effects upon social systems, as it will bring with it a multidisciplinary set of knowledge and expertise. Regarding the physical Rainway, this characteristic can provide a network of physical components like rain gardens that can act individually, while enhancing the overall functionality of green infrastructure in Mount Pleasant when linked together.

6.8.2 Effective Governance & Institutions

Though necessary for each strategy, *effective governance and institutions* has yet to be fully demonstrated on behalf of the City of Vancouver. It needs to lead through example and allow for shared accountability with projects in the public realm for the Rainway to be realized. This could be achieved by decentralizing decision-making and governance for the Rainway, while holding partner stakeholders accountable through the monitoring and maintenance of each of its components. Lastly, it is essential to this characteristic to maintain a network of stakeholders that are connected by heterogenous and autonomous enough to avoid cascading failures throughout the project.

6.8.3 Acceptance of Change & Uncertainty

*Acceptance of change and uncertainty* is a characteristic particularly evident in Strategies #2, #4, and #6. However, it offers transferability to any of the strategies as long as they maintain malleability and flexibility and are able to adapt to needs and challenges as they shift. In the spirit of the ability of pilot initiatives to adapt their implementation with greater feasibility and viability for future conditions, the framing of the Rainway as a pilot project would enable the City to embrace adaptive management and test alternative methods of
stormwater management at a larger scale. In the spirit of this characteristic, policy should be viewed as questions, not answers, and where the strategies are the means to test adaptive solutions.

6.8.4 Non-equilibrium System Dynamics

The characteristic of *non-equilibrium system dynamics*, though most evident in strategies #3, #5, and #6, can be achieved through harnessing natural system processes to provide sources of capital that in turn drive ecologically-balanced strategies. As an example, the Rainway proposes more ecologically-balanced approaches to water consumption, treatment of stormwater runoff, and to stormwater regulation by borrowing processes and assets from nature to complete the work. The greater the share of green over grey infrastructure can embody, the stronger it exemplifies this characteristic.

6.8.5 Community Engagement & Participation

As a characteristic directly related to the presence and of social cohesion and growing a sense of ownership and a sense of place, *community engagement and participation* is evident in each of the strategies and the localized stewardship opportunities they have to offer. Each offers potential for community involvement with installation, monitoring, and maintenance of aspects to several strategy components. Additionally, they offer the potential for collaborative design of any element that exists in the public realm. For the Rainway to embody this characteristic, community engagement and participation and the sense of ownership it can deliver is essential.

6.8.6 Capacity for Preparedness & Planning

The characteristic of the *capacity for preparedness and planning* is best characterized by the ability to embrace the longview and give weight to preparing for greatest risk with a redundancy in strategies. This therefore requires actions to speak louder than words and for plans to exist strictly to lay the groundwork for activation of strategies. For each strategy to embody preparedness, they need to offer redundancies. These redundancies should be inter-strategical in that strategies should consist of several linked components, such as rain gardens
or pocket wetlands, that could maintain functionality even when one component fails or is brought offline. Additionally, the redundancies should include linkages between strategies that increase during the growth of Rainway until the ultimate constructed stream is realized.

6.8.7 A High Degree of Equity

Equity is characterized by allowing the social and natural capital of strategies to flow without bias. A high degree of equity is directly evident only in Strategies #1 and #5. In these, it is emulated through the democratic access to the social and natural capital provided through construction and maintenance of rain gardens and food assets as well as through the construction and maintenance of pocket wetlands and a prioritization of selected streets for people over motorized vehicles. Additionally, an insurance of equally distribution access to natural and social capital needs to not only transcend current cultural, racial, demographic, and social boundaries, its provision should be sustained across generations and for the life of the Rainway.

6.8.8 Presence of Social Capital

Social cohesion is built upon the presence of social capital, which, by the measures of the survey results outlined in Chapter 3, has a strong presence in Mount Pleasant. The eight domains of social capital, outlined in Chapter 2, offer the means by which residents can build bonds and bridges to establish relationships that in turn satisfy their needs. Closely related to characteristics associated with participation and decision making, social capital is only as strong as the networks that foster it. Therefore, every strategy for design of the Rainway requires elements of empowerment, participation, associational activity, and sense of belonging that can be gleaned through community participation with construction, maintenance, and stewardship.

6.8.9 Capacity for Learning

Having the capacity for learning requires the ability to practice adaptive management and to constantly be able to project current information to future scenarios. Most evident with strategies #1, #2, #5, and #6, this can be established through the provision of feedback loops so that active learning can thrive and aid in avoiding
systemic failures. One method to create the necessary positive feedback loops is through the retention of collective knowledge gained from past projects, such as the Still Creek Enhancement. Retained recirculated knowledge, when viewed critically, can create a foundation for the future strategy of creating a constructed stream and for other such projects throughout the City.

6.8.10 A Cross-scalar Perspective

A cross-scalar perspective is demonstrated by the ability of strategies #3, #4, and #6 to recognize scales that transcend size and time and provide the reminder that all actions within systems can have cascading effects. Socially, the cross-spacial and cascading impact this strategy could have is directly linked to the levels of participation and replication that exist within the components of each strategy. Ecologically, the impacts of the noted strategies would be cross-temporal, cross-spacial, and would be potentially cascading. The combination of cisterns, pocket wetlands, a constructed stream, and so on–would impact water supply and stormwater loads (water provisioning and water regulation) and would cascade to impact the larger hydrologic systems to which the Rainway is linked. What began with a street mural could become a constructed stream that could inspire a growth of green infrastructure City-wide.

For a charts illustrating the presence of the Eight Goals of The Rainway throughout the Six Strategies for Design, as well as the presence of the 10 Characteristics of Resilient Communities throughout the Six Strategies for Design, refer to Figures 6.3 & 6.4 on the following pages.

6.9 Lessons from The Rainway

As one walks or rides the streets of the Vancouver in the section of town that faces the glass and steel downtown core and its backdrop of the deep green north shore mountains, one encounters a seemingly endless grid of residential streets. The east-west axis is interrupted every six to eight blocks by arterial streets that would be, by many North American city’s standards, considered collector streets for their four-lane size and prevalence of stoplights. Throughout its heyday in the latter half of the last century, the residents and city councils of Vancouver have successfully fought several attempts to replace neighbourhood land with highways
### Figure 6.3: The presence of the Eight Goals of The Rainway throughout the Six Strategies for Design

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Figure 6.4: The presence of the 10 Characteristics of Resilient Communities throughout the Six Strategies for Design
and freeways. In each fight, the pedestrian was put before the car and today Vancouver is known as the only
North American city without such a road within its city limits (Boddy, 2004; Punter, 2003). Consequently, a
focus on building housing density versus bypass roads has made the city a representative model for the
developing world.

Currently, the city is crafting its global reputation in a green light as well. With hopes of becoming the world’s
greenest city by the year 2020, it has put forth a series of goals and targets beyond the Clean Water goal. A
struggle with regard to some of the goals is the need for policy to reflect the level of ambition embodied in the
goals. For instance, how can one reduce per capita consumption if existing bylaws do not support a
conservationist ethos? Of the ten characteristics of resilient communities, Acceptance of Uncertainty and
Change best demonstrates how we might look at the role of policy differently in this case.

Adaptive management considers policy as hypotheses, not answers (Gunderson, 1999). If policy could instead be
viewed as questions, then testing solutions might more readily be accepted. The interview with Joyce Lee
Uyesugi, the Manager archetype, shed light on how of the $14 million set aside for “Emerging Priorities” in the
2012-2014 Capital Plan for items such as the Greenest City 2020 Action Plan, none was applied (City of
Vancouver, 2013e). Yet, the recently formed Mayor’s Engaged City Task Force is dedicated to the improvement
of the public realm and fostering connections at the neighbourhood level (City of Vancouver, 2013b). The
impacts of this Task Force are yet unknown, as is how the 2015-2017 Capital Plan will be written. Still, the work
of this thesis demonstrates how the mission of these pursuits of the City of Vancouver could be achieved
simultaneously through the implementation of green infrastructure along a 9-block residential street.

The St. George Creek still lies beneath this residential street. However, if expressions of it are to be brought to
the surface, its water could be transformed from waste product to resource, enabling the St. George Rainway
project to bisect the three pillars of sustainable development. (See Figure 6.5 on the following page.) St. George
Street could be transformed from just a residential street to a demonstration of how any number of
Vancouver’s lost streams could become assets worth restoring. (See Figure 6.6.)
Figure 6.5: The bisection of the St. George Rainway

Te Stetlew, otherwise known as St. George Creek, is but one of dozens of streams lost to the great paving and creation of the modern city of Vancouver. (See Figure 6.7 on the following page for map of the lost streams of Vancouver, with Te Stetlew being the short stream in the middle of the photograph.) However, there recently has been a shift in this extinction. Where there recently was just two salmon-bearing streams left in Vancouver–Musqueam and Cutthroat Creeks–there are now three. Thanks to the efforts to daylight portions of Still Creek, the salmon have returned to Vancouver’s East neighbourhoods as well. The St. George Rainway was originally
**Figure 6.6:** The “Lost Streams of Vancouver”

**Figure 6.7:** Exponential projection of the positive feedback loop of the St. George Rainway
envisioned by its founding group as a means for “renew[ing] the greenway, strengthening our resilience, reducing burden on the sewers” (Viva Vancouver, 2012). Greenways and rainways are for people, not vehicles. Likewise, green infrastructure in its various forms can strengthen socioecological resilience and not only reduce the burden on the storm sewers of Vancouver, but return some of its water to the surface to be cleaned, celebrated, and cherished as a resource for all types of life.

The creation of the Rainway would call attention to the potential for expressions of other such lost streams existing elsewhere throughout the city. Heeding the allegory from Chapter 1 could help produce strategies for design for other projects complementary to the Rainway in public realms of other cities. The salmon, a coho of the Northern Pacific, representing the concept of ecosystem services, and the Steller’s Jay, representing the concept of resilience, together help to provide a framework for emulation of each of the 10 characteristics of resilient communities. The third creature needed to complete the story of healthy communities is us.

What began with the idea of celebrating a lost stream has the potential to inspire voluntary engagement from its community, which, in turn has the potential to create a positive feedback loop. What might be a mural today, could become a salmon stream within decades. What might take place in Mount Pleasant could similarly inspire replication of similar green infrastructure interventions throughout Vancouver’s neighborhoods to create the vibrant communities responsible for rich connections and for neighbourliness. Building bonds and bridges within community is a pivotal initial step to creating such places for the life, work, and play we desire. Resilient cities are built upon collections of resilient communities. Such places are what is needed to help plan for the inevitable, yet unpredictable challenges of our future.
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Appendices

Appendix A: The Mount Pleasant Survey

Hello and thank you for visiting this website.

We are asking residents of Mount Pleasant who are 18 years or older to help us understand the bonds and bridges between the people and the groups of your community. As part of this survey, we are also looking for some feedback regarding a particular project in the community known as the St. George Rainway.

Our team consists of an educator and a student from the Graduate School of Landscape Architecture at UBC. Our goal is to help build upon the survey work completed last year by the Vancouver Foundation titled, “From Connections to Engagement: Pathways to a More Caring and Involved Citizenry”.

If you are 18 or older and living between Clark and Cambie to the east and west and Great Northern Way and 16th Avenue to the north and south, please continue. If not, thank you for your interest, but we cannot use your input at this time.

For those of you continuing, you will have a 3 week window to take part in the survey. Completing the ten total sections of the survey should take 15 to 20 minutes of your time.
Section 1: Demographics, Part One

Q1. First, we would like to learn more about where exactly you live. Do you live between the streets of Fraser and Prince Edward to the east and west & and between Great Northern Way and Kingsway to the north and south?

- Yes
- No
- Don’t know
- Prefer not to answer

Q2. Do you think most people in your neighbourhood trust each other?

- Yes
- No
- Don’t know
- Prefer not to answer

Q3. What is your gender?

- Female
- Male
- Prefer not to answer

Q4. Into which of the following categories does your age fall?

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 64 to 74
- 75 or older
- Prefer not to answer

Q5. What were the ethnic or cultural origins of your ancestors? Please choose all that apply.

- Aboriginal
- American
- Canadian
- Chinese
- Dutch
- East Indian
- English
- Filipino
- French
- German
- Iranian
- Irish
- Italian
- Japanese
- Korean
- Norwegian
- Polish
- Portuguese
- Russian
- Scottish
- Spanish
- Swedish
- Ukrainian
- Vietnamese
- Welsh
- Other __________________
- Prefer not to answer
Section 2: Neighbourhood & Community Participation

Thinking about the past 12 months, please tell us if you have done any of the following:

Q6. Participated in a neighbourhood or community project, such as neighbourhood clean-up or community gardening?
☐ Yes
☐ No
☐ Don’t know
☐ Prefer not to answer

Q7. Attended a neighbourhood or community meeting?
☐ Yes
☐ No
☐ Don’t know
☐ Prefer not to answer

Q8. Visited your local library, community centre or recreation centre?
☐ Yes
☐ No
☐ Don’t know
☐ Prefer not to answer

Q9. Attended a cultural or ethnic event put on by a cultural or ethnic group different than yours?
☐ Yes
☐ No
☐ Don’t know
☐ Prefer not to answer

Q10. Signed a petition?
☐ Yes
☐ No
☐ Don’t know
☐ Prefer not to answer

Q11. Attended a political rally or political meeting?
☐ Yes
☐ No
☐ Don’t know
☐ Prefer not to answer
Q12. Attended a city council or school board meeting?
- Yes
- No
- Don’t know
- Prefer not to answer

Q13. Attended religious services?
- Yes
- No
- Don’t know
- Prefer not to answer

Q14. Voted in the last municipal election?
- Yes
- No
- Don’t know
- Prefer not to answer
**Section 3: Volunteering**

Q15. In the past 12 months, have you done any volunteer work for any organization or group?

- Yes (If chosen, continue to question #16)
- No (If chosen, skip to Section 4 by clicking ‘Next Page’)
- Don’t know (If chosen, skip to Section 4 by clicking ‘Next Page’)
- Prefer not to answer (If chosen, skip to Section 4 by clicking ‘Next Page’)

Q16. How regularly do you take part in this volunteer work?

- Once a week or more frequently
- A few times a month
- Once a month
- Once or twice a year
- Don’t know
- Prefer not to answer

Q17. Would you take part in volunteer work if it took place within Mount Pleasant?

- Yes
- No
- Don’t know
- Prefer not to answer
Section 4: Friendships

Q18. First of all, thinking about your friends (the people you know and like, and socialize with but are not your relatives or family members), how many people would you count among your friends? If you are unsure of an exact number, an estimate is fine.

   Specify with a number _______
   (If answer is 0, skip to Section 5 by clicking ‘Next Page’)

Q19. Of these friends, how many would you say are really close friends—people who you can confide in, tell your problems to, or call when you really need help?

   Specify with a number _______
   ○ Don’t know
   ○ Prefer not to answer

Now, thinking of your really close friends how many:

Q20. Live in your neighbourhood?

   Specify with a number _______
   ○ Don’t know
   ○ Prefer not to answer

Still thinking of your really close friends how many:

Q21. Are in a different ethnic group than your own?

   Specify with a number _______
   ○ Don’t know
   ○ Prefer not to answer

Q22. How often do you get together with your really close friends?

   ○ Every day
   ○ A few times a week
   ○ Once a week
   ○ 2 or 3 times a month
   ○ Once a month
   ○ A few times a year
   ○ Once a year or less
   ○ Never
   ○ Don’t know
   ○ Prefer not to answer
Q23. When you do get together with your really close friends, do you usually get together at someone’s house or apartment, or do you usually get together somewhere else?

○ Usually get together at someone’s house or apartment
○ Usually get together somewhere else
○ Don’t know/It depends
○ Prefer not to answer

Q24. If you “usually get together somewhere else,” do you usually get together in a public, community space like a community centre or park?

○ Yes
○ No
○ Don’t know
○ Prefer not to answer

Q25. When you have problems getting together with your really close friends, which of the following most often gets in the way of you seeing them? Please choose only one answer.

○ Work or school obligations
○ Family obligations
○ Being too far away
○ Health issues
○ Inadequate transportation
○ Never have a problem getting together with close friends
○ None of these reasons/Other reason
○ Don’t know
○ Prefer not to answer
Section 5: The Neighbourhood

Now we’d like to know about Mount Pleasant, the neighbourhood you live in.

Q26. First, roughly how many years have you lived in Mount Pleasant?

- Specify with a number _______ (If less than 1 year, record as 0)
- Don’t know
- Prefer not to answer

Q27. Which of the following best describes the type of place you are living in now?

- A Single detached house
- A Duplex, townhouse, or row home
- A low rise apartment—less than 5 stories
- A high rise apartment—more than 5 stories
- A separate suite in a house, such as a basement suite
- If something else, please specify ________________
- Don’t know
- Prefer not to answer

Q28. Do you or your family currently own this home, or do you rent it?

- Own
- Rent
- Don’t know
- Prefer not to answer

Q29. Now we’d like to know more about your neighbours. First, we’d like to know about your immediate neighbours—the three or four households closest to you. About how often do you have a conversation (something more than just a casual hello) with any of these neighbours?

- Every day
- A few times a week
- Once a week
- 2 or 3 times a month
- Once a month
- A few times a year
- Once a year or less
- Never
- Don’t know
- Prefer not to answer
Q30. Do you know the first names of at least two of your immediate neighbours?

- Yes
- No
- Don’t know
- Prefer not to answer

Q31. In the past 12 months, have any of these neighbours had you over for dinner, a barbeque or some other kind of get together?

- Yes
- No
- Don’t know
- Prefer not to answer

Q32. And, in the past 12 months, have you had any of these neighbours over for dinner, a barbeque or some other kind of get together?

- Yes
- No
- Don’t know
- Prefer not to answer

Q33. Have you taken care of the mail for one of these neighbours, or picked up their newspapers while they have been out of town?

- Yes
- No
- Don’t know
- Prefer not to answer

Q34. Have any of these neighbours left you with a spare key for their home, or told you where they keep a spare key in case of emergency?

- Yes
- No
- Don’t know
- Prefer not to answer

Now we’d like to know more about all the people that live on your street or in your building.

Q35. When you think about why you may not know some of these people very well, which of the following would you say is the main reason for that:

- You seldom see them
- There is a language barrier
You or your family prefer to keep to yourselves
They are not interested in getting to know you
You have very little or nothing in common with them
Not applicable—know all of these people very well
None of these reasons/Other reason
Don’t know
Prefer not to answer

Still considering all the people that live on your street or in your building, about how many would you say...

Q36. Speak languages different from your own?

All
Most
About half
A few
None
Don’t know
Prefer not to answer

Still considering all the people that live on your street or in your building, about how many would you say...

Q37. Are in a different ethnic group than you?

All
Most
About half
A few
None
Don’t know
Prefer not to answer

We’d now like know how you think most people in your neighbourhood would feel about different groups moving into your neighbourhood.

Q38. How comfortable do you think your neighbours would be if a shelter or group home for homeless people moved into your neighbourhood?

Very comfortable
Comfortable
Neither comfortable or uncomfortable
Uncomfortable
Very uncomfortable
Don’t know
Prefer not to answer
Q39. How comfortable do you think your neighbours would be if shelter or group home for people with alcohol or drug addiction moved into your neighbourhood?

- Very comfortable
- Comfortable
- Neither comfortable or uncomfortable
- Uncomfortable
- Very uncomfortable
- Don’t know
- Prefer not to answer

Q40. Thinking about your neighbours and neighbourhood, if recent immigrants or refugees from the following places moved into your neighbourhood, which group do you think would be the most welcomed by residents?

- Europeans
- Asians
- South Asians (including people from India, Pakistan and Sri Lanka)
- Africans
- People from the Middle East (Including people from Iran or Iraq, for example)
- Don’t know
- All groups would be equally welcomed
- All groups would be equally unwelcomed
- Prefer not to answer

Q41. Still thinking about your neighbours and neighbourhood, and if recent immigrants or refugees from the following places moved into your neighbourhood, which group do you think would be least welcomed?

- Europeans
- Asians
- South Asians (including people from India, Pakistan and Sri Lanka)
- Africans
- People from the Middle East (Including people from Iran or Iraq, for example)
- Don’t know
- All groups would be equally welcomed
- All groups would be equally unwelcomed
- Prefer not to answer

Please tell us whether you strongly agree, agree, neither agree nor disagree, disagree or strongly disagree with each of the following statements:

Q42. The ties among people in my neighbourhood are growing stronger.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
Q43. If there were problems in my neighbourhood, like cars driving too fast or people not taking care of their property, it would be hard to get people to work together to solve them.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don’t know
- Prefer not to answer

Q44. If there were challenges in my neighbourhood, like a lack of awareness around pollution or water consumption, it would be hard to get people to work together to address them.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don’t know
- Prefer not to answer

Q45. I feel welcome in my neighbourhood and feel like I belong here.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don’t know
- Prefer not to answer

Q46. Do you think most people in your neighbourhood trust each other?

- Yes
- No
- Don’t know
- Prefer not to answer
**Section 6: The Broader Community**

We’d now like you to think about your experience not just in your neighbourhood but in metro Vancouver as a whole.

Please tell us whether you strongly agree, agree, neither agree nor disagree, disagree or strongly disagree with each of the following statements:

Q47. I do not experience discrimination in my day-to-day life.

- [ ] Strongly agree
- [ ] Agree
- [ ] Neither agree nor disagree
- [ ] Disagree
- [ ] Strongly disagree
- [ ] Don’t know
- [ ] Prefer not to answer

Q48. It is difficult to make new friends here.

- [ ] Strongly agree
- [ ] Agree
- [ ] Neither agree nor disagree
- [ ] Disagree
- [ ] Strongly disagree
- [ ] Don’t know
- [ ] Prefer not to answer

Q49. I find myself alone more often than I would like to be.

- [ ] Strongly agree
- [ ] Agree
- [ ] Neither agree nor disagree
- [ ] Disagree
- [ ] Strongly disagree
- [ ] Don’t know
- [ ] Prefer not to answer

Q50. Most people are tolerant of different ethnic groups, but most prefer to be with people in the same ethnic group as themselves.

- [ ] Strongly agree
- [ ] Agree
- [ ] Neither agree nor disagree
- [ ] Disagree
- [ ] Strongly disagree
- [ ] Don’t know
Q51. People who live here and do not speak English simply do NOT try hard enough to be part of the community.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don’t know
- Prefer not to answer

Q52. The younger and older generations do NOT make an effort to get to know and understand each other.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don’t know
- Prefer not to answer

Q53. Vancouver is becoming a resort town for the wealthy.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don’t know
- Prefer not to answer

Q54. There is too much foreign ownership of real estate here.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don’t know
- Prefer not to answer
Q55. I feel welcome in metro Vancouver and feel like I belong here.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know
- Prefer not to answer

Now, consider if you lost a wallet or purse containing 100 dollars. How likely do you think it would be returned to you, with the money inside, if it was by found by the following person:

Q56. One of your neighbours

- Definitely would be returned
- Probably would be returned
- Might be returned
- Probably would not be returned
- Definitely would not be returned
- Don't know
- Prefer not to answer

Q57. A stranger

- Definitely would be returned
- Probably would be returned
- Might be returned
- Probably would not be returned
- Definitely would not be returned
- Don’t know
- Prefer not to answer
Section 7: Involvement

Please tell us approximately how many hours per week do you spend doing the following things:

Q58. Looking after family members
   Specify with a number _______

Q59. At work or at school, not counting your commute time
   Specify with a number _______

Q60. Commuting to work or school
   Specify with a number _______

Q61. If you answered with a number greater than 0 for the previous question, please specify how you commute by choosing one of the following:
   - Car
   - Public transit
   - Walking
   - Cycling
   - Some other way
   - Don’t know
   - Prefer not to answer

Many obstacles keep people from becoming as involved with their community as they would like. Thinking about your own life, please tell us whether each of the following is a major obstacle, a minor obstacle or no obstacle at all to your participation in activities that could make your neighbourhood a better place to live.

Q62. Not having enough time
   - Major obstacle
   - Minor obstacle
   - No obstacle at all
   - Don’t know
   - Prefer not to answer

Q63. Feeling unwelcome
   - Major obstacle
   - Minor obstacle
   - No obstacle at all
   - Don’t know
Q64. A physical or mental health condition that makes it difficult for you to get involved

- Major obstacle
- Minor obstacle
- No obstacle at all
- Don’t know
- Prefer not to answer

Q65. Not having enough money

- Major obstacle
- Minor obstacle
- No obstacle at all
- Don’t know
- Prefer not to answer

Q66. A concern that you do not speak the language well enough

- Major obstacle
- Minor obstacle
- No obstacle at all
- Don’t know
- Prefer not to answer

Q67. A feeling that you do not have much to offer

- Major obstacle
- Minor obstacle
- No obstacle at all
- Don’t know
- Prefer not to answer
Section 8: Stressors

Q68. In general, would you say that your overall health is:

- Excellent
- Very good
- Good
- Fair
- Poor
- Don’t know
- Prefer not to answer

Q69. How well would you say you are managing financially these days?

- Living very comfortably
- Living comfortably
- Just about getting by
- Finding it difficult
- Finding it very difficult
- Don’t know
- Prefer not to answer

Q70. If you find yourself “Just about getting by,” “Finding it difficult,” or “Finding it very difficult,” in the previous question, how much of that is because of mortgage or rent payments you have to make?

- All or most it
- Some of it
- Very little of it
- None of it
- Don’t know
- Prefer not to answer


Section 9: Demographics, Part Two

Next, we have a few questions to make sure we have a good representation of all adults who live in Mount Pleasant.

Q71. Which are you currently?
- Employed for wages
- Self-employed
- Out of work for less than 1 year
- Out of work for more than 1 year
- Taking care of family
- Student
- Retired
- Unable to work (includes people on disability)
- Don’t know
- Prefer not to answer

Q72. What is the highest level of education you have obtained?
- Grade school or some high school
- Completed high school
- Post-secondary technical school
- Some university or college
- Completed college diploma
- Completed university degree
- Post-graduate degree (e.g., Master’s, PhD, MD)
- Don’t know
- Prefer not to answer

Q73. What language do you speak most often at home?

Specify with a language ____________________

Q74. Were you born in Canada?
- Yes
- No
- Don’t know
- Prefer not to answer

Q75. If you were not born here, how many years have you lived in Canada?
- Specify with a number ________
- Don’t know
- Prefer not to answer
Q76. Are you eligible to vote in Canada?

- Yes
- No
- Don’t know
- Prefer not to answer

Q77. In total, including yourself, how many people currently live in your household?

Specify with a number _______

Q78. If more than just yourself live in your household, please specify how many of these people are:

- 12 or under: _______
- 13-17 years old: _______
- 18-64: _______
- 65 or older: _______

- Don’t know
- Prefer not to answer

Q79. If more than just yourself live in your household, please specify which of the following best describes you:

- Married or common-law living with your spouse or partner
- A single-parent
- An adult aged 18 or older living with family
- An adult aged 18 or older living with others not related to you
- Don’t know
- Prefer not to answer

Q80. The average annual family income in metro Vancouver is 68 thousand dollars. In 2011, was your income:

- Less than $20,000
- $20,000 to less than $30,000
- $30,000 to less than $40,000
- $40,000 to less than $50,000
- $50,000 to less than $60,000
- $60,000 to less than $68,000
- $68,000 to less than $80,000
- $80,000 to less than $100,000
- $100,000 to less than $150,000
- $150,000 or higher
- Don’t know
- Prefer not to answer
**Section 10: St. George Street**

For this last section of the survey, we would like to learn what you know and how you feel towards the initiatives surrounding St. George Street.

Q81. Are you familiar with the mural that was painted on the street surface between 7th and 8th avenues, next to Mount Pleasant Elementary School?

- Yes (If chosen, move on to question #82)
- NO (If chosen, skip to question #86)

Q82. How did you feel about the idea before the mural was painted?

- Very happy
- Happy
- No feeling
- Upset
- Very upset
- Don’t know
- Prefer not to answer

Q83. How did your feelings change about the project after it was complete?

- Very much for the better
- Slightly for the better
- No change
- Slightly for the worse
- Very much for the worse
- Don’t know
- Prefer not to answer

Q84. How did the mural project change your level of engagement within the community?

- Greatly increased it
- Slightly increased it
- No change
- Slightly decreased it
- Very much decreased it
- Don’t know
- Prefer not to answer

Q85. Did the creation of the mural increase your awareness about nature or the natural systems (such as flows of water) present in Mount Pleasant?

- Yes
- No
Q86. Would you have any interest in participating in community events related to further transformation of St. George Street?

- Yes
- No
- Don’t know
- Prefer not to answer
  
  It depends (Please explain____________________________________________________)
Appendix B: The Interviews

Transcript of Sara Orchard Interview

[Sitting outside Elysian Coffee along noisy Broadway Street, we began this interview...]

[Joshua]

It is great that you were able to take some time today to chat. Thanks for agreeing to meet. Let’s start with you telling me your impression of the Green Streets Program...

[Sara]

The Green Streets Program started in the early 90s. There were a lot of traffic circles at the time and we would plant junipers in them because they were so low maintenance...

Legend has it that after a new traffic bulge was installed somewhere in Mount Pleasant. A neighbour went on holiday, but before he left he dumped out his birdseed into the freshly soiled bulge. Sunflowers soon after sprouted. Everyone was enamored by the sunflowers and asked that we start changing our planting scheme to reflect this.

People began to express interest in gardening in these spaces, so a pilot project began soon after this. Since then, it has spiraled. There have been more and more traffic circles and traffic bulges as a result of traffic calming efforts. Most of the locations have been determined by whether or not they are on a greenway. Sometimes they are for spot improvements. In this case, a neighbourhood commonly gets together to request a traffic calming circle for their community.

We do a lot of the initial planting and design. Then a volunteer or a neighbourhood takes it over. They are allowed to add to the design as long as they stay within our guidelines primarily for sitelines and safety issues.

We’ve done this for quite a long time. Before we had a larger budget, we often install gardens with the hopes that someone would come and take care of them. In the last two years, we’ve had quite a substantial cut in our maintenance budget, so we are having to be more strategic where we place the gardens. For example, with the new Comox-Helmcken Greenway, we tried to get volunteers ahead of time to commit to the garden. With this, they will be involved with the planting design process; they won’t have free reign, but will be able to contribute mostly to plant choices, etc.

This is our new way of approaching this program. We have quite a lot of available locations for gardens, but there just isn’t any interest in the community. Any garden that is installed but not volunteered for is maintained by the Park Board.

The unfortunate thing that happens when we start a garden without first having volunteers lined up, is how medians and grass-cutting take precedence over traffic circles. So, if there isn’t a volunteer, it often
isn’t as nicely maintained, or maintained at all for a long period of time. Then, it just doesn’t look as great as it could.

What is interesting about the program is how there are so many different types of people that volunteer. There can also be a varying scale between projects. We have our Neighbourhood Greenways program. With this, a community typically comes together typically to identify a street that has been closed down for many years and express interest to enhance it. We have capital money available to help fund it.

[Joshua]

Can you name some examples?

[Sara]

Two examples are besides schools. In these cases, you have a road separating a park from a school, which is obviously not the best place to have a road. Another example would be on Napier near the community centre. In a case such at this, it was decided that because of the high concentration of pedestrians, a road was not as necessary there. These are examples of larger landscaped areas that the communities maintain. The commitment with the city is that we will provide them with the up front costs to initiate all the work while the community is responsible for maintaining it, with support if needed.

[Joshua]

Is there an instance where the initial installation is also helped by the community?

[Sara]

Yes, I am actually developing a project right now where the community is going to handle all of the planting while painting some murals on the roadway.

I should mention that we’ve had mixed success with the Neighbourhood Greenways program. Working with a larger scale can be very overwhelming, especially when people move away and a neighbourhood changes. To keep the enthusiasm to take care of a large landscaped space can be overwhelming.

[Joshua]

Would it help to think of a larger landscaped area in terms of nodes?

[Sara]

In terms of gardens, it is best to start out small. With the Greenways program, those that tend to succeed are often smaller. A lot of volunteers are very ambitious and very excited about gardening, but don’t necessarily understand the ramifications of how that maintenance is ongoing. It’s not just one or two seasons; it’s about also considering what happens ten years down the road.
We do have a couple of greenways that basically have been abandoned. This is after we did put a lot of capital money into them—there are art installations and many other nice things—but they are being overtaken by brambles. The Park Board will go to each maybe once each year, to try and help maintain them.

With the new greenway that we are developing, we are trying to think of different ways to use the existing streetscape since there is some value in having some hardscape. In this instance, there is a lot of green that is happening throughout the area, so we are going to maintain a majority of the street, have pockets of gardening, but try to enliven the street mostly through things like murals.

This is a new approach for us. For example the street that was removed next to Tupper Secondary School was quite an undertaking. It is still being well-maintained, but a lot of the volunteers are growing tired. It’s only four people left that organize everything. The one thing that is helpful with this location is the adjacent school. It has been helpful for helping out with large planting parties. However, since gardening mostly happens in the summer, labour from the school does not always coincide when work needs to be done.

[Joshua]

*When we talk about “gardening” or a “maintained boulevard,” people seem to expect a prim, manicured stretch. Have there been any instances where a more naturalized or native aesthetic is deemed acceptable?*

[Sara]

Tupper is interesting because they have a lot of swales, with large swaths of grasses. It looks very naturalized, but they put a lot of work into it to keep it looking that way. If you want the plants to stay healthy, it requires a lot of weeding, separation, and adding compost. They do have areas that are more manicured and garden-like in the traditional sense...The swales this spring looked amazing.

The nature of the climate that we are in means there are a lot of invasives that come in that threaten the native plants and habitat, so you need to stay on top of that. If they are seen to be invading, the easiest thing to do is get at them quickly. That is a challenge as well.

To get back to your question, everyone does have a different idea of what looks nice. So, with most of our projects, we try to stay away from aesthetics. If its about weeds, that is one thing...

We’ve found that most people’s complaints have to do with aesthetics, but we don’t enforce on this. We enforce on safety. To help the issue, we might say something like: “It would be nice if you weeded your garden, because your neighbour is not so happy with how it looks.”

[Joshua]
What about the idea of ownership? You mentioned how there can be challenges that come about because a community grows tired of maintenance, or how people involved in a project might die or move on. Do you see a difference in how a community organizes around a garden depending upon what types of plants grow there? For instance, would planting food assets over ornamentals encourage or discourage ownership?

[Sara]

With regards to food in public places, for one thing, a traditional community garden setting has stronger defined lines of ownership even though it is still deemed public. It usually has a fence, and beds are often clearly defined. So, I think there is a different mindset with such spaces as opposed to gardening out in the street, for example.

Unfortunately what happens a lot in this city is theft. Also a lot of food crops are more labour and water intensive, so it can be easier to get discouraged with regards to yield.

Projects in the public realm are challenging—as much as one might be putting in the time and effort, these projects are still public, where dogs can urinate on them and people can walk over them. Also, people can take what they feel is theirs, because they own it in a sense.

I hear a lot about these things, which make volunteers really upset.

[Joshua]

Tell me about an instance, or instances where you found this program to be successful...

[Sara]

I think it’s very successful throughout a lot of neighbourhoods. I’ve found that it’s more successful in neighbourhoods with higher housing density. My hypothesis for this is that people who live in condos or multi-family residences have less access to greenspace, such as lawns, so they seek it out more.

There is a newsletter that I produce every couple of months, where I interview a volunteer and do a writeup on them. This one woman I was interviewing who lived in a high-rise told me a story of how she one day noticed one of the green street signs and decided to call. Even though she was nervous about what it was going to entail, if people were going to judge her by what she planted…but once she started to volunteer, she was hooked instantly. There was something about being able to work on the ground and dig in the soil that captured her. Being connected to the earth was a much different sensation for her than what she experienced in her elevated home.

Many gardeners don’t at first realize how social their experiences will be. People walking by will often stop and give comments like, “great job!” or “I have water free for you to use...” or “I have these perennials that I divided in my backyard—would you like some for your traffic circle garden?”
I have heard many times of how people did not know who their neighbours were until they began to volunteer for the Green Streets program, and how after starting, they all-of-a-sudden knew everyone.

The primary source of anyone being disgruntled has to do with safety issues. This is totally understandable and we try to keep on top of it. Then, there are always people who complain because they want more, but you can’t ever seem to give that type of person enough. The last source of complaints comes from when we have to rip up a garden for one reason or another...Generally speaking though, we have good feedback.

I also see this as a well-functioning program. I have worked on other initiatives as well between Ontario and here. Often, to get participants can sometimes be difficult. This program basically runs itself...due to the popularity of gardening, it attracts a lot of participants.

I’ve done a lot of research into social marketing and about attracting people to your program. I never thought our signs—which are quite small and without much contrast—would catch anyone’s attention. Yet, people call all the time. Again, this depends upon the neighbourhood, but people are generally excited about gardening. During these past few years it seems to have grown more in popularity.

[Joshua]

Let’s think about neighbourhoods. I am curious about where some of the successes continually happen and perhaps why...

[Sara]

Mount Pleasant is a pretty strong area for finding volunteers. Grandview-Woodlands and around Commercial Drive also tend to be very good...What is neat about the Green Streets program is how you can see the differences in the neighbourhoods reflected in the gardens. You can also get a sense of the types of people who garden in each place. This is the type of design that I really like. I might not necessarily appreciate all the little trinkets, from my own aesthetic point-of-view, but I can really appreciate the eccentric nature of it.

[Joshua]

What about garden gnomes?

[Sara]

I do actually really like garden gnomes. [Laughs.]

The eccentric gardens actually become landmarks in their own sense. I’ve heard things like: “Turn right at Mary’s garden...” used to give directions.
To get back to your original question, in general I believe the area between Alma and Commercial Drive, and between 16th and Hastings, is really easy to find volunteers in. It cuts off where you start to get more single-family homes. Perhaps this is because of a different culture existing there...or this could be a fault of our advertising. There isn’t so much volunteering coming from Dunbar. But there is quite the group along Blenheim Street, but that could be mainly because the garden is right beside the houses—they lobbied to have those gardens there.

Another thing to mention is the high gardener turnaround in the areas where there is a high renter turnaround. People moving around a lot can become an issue too.

[Joshua]

*How do you foresee making the program’s results more favorable?*

[Sara]

I think we have to target our marketing a bit more. My numbers keep going up though, so I have not been too taxed with this. With new projects, we try to get gardeners in ahead of time. If we don’t find a gardener, there is the chance we won’t install a garden there. We are also at a tipping point with our budget—we cannot support any more at the moment without the help of volunteers.

[Joshua]

*Do you have any idea of what that argument is?*

[Sara]

It’s that they are a great benefit to the public. Perhaps they have a maintenance budget...

Volunteers provide a lot of assistance, but they also require help from the City. With a cut in maintenance budgets this is becoming increasingly harder to do. The understanding with the gardens is that volunteers are maintaining them, but at the end of the day we are ultimately responsible for the gardens and the people that need support. I have a lot of elderly people who volunteer for me and they physically cannot maintain some of the shrubs, for instance, so we do need someone in there for the support. It isn’t all on the volunteers.

[Joshua]

*In terms of budget is it common for plant matter to be brought in or a water hookup supplied to a new project? What are the detailed aspects of a garden’s budget?*

[Sara]

City crews do the initial planting, and we also pay for the plants.
The thing about a street is how it can be a very dry and desolate environment. You have to be very hardy as a plant to survive there, so we do have a lot of instances where things don’t survive. Every five to ten years, each garden needs a renovation.

We also provide compost to for the gardeners, while mulch is something I am considering adding into next year’s budget. We don’t install water connections for any of the Green Streets gardens, but with community gardens we do.

We do not water the gardens, so they basically survive by themselves, unless one of the volunteers takes on watering. Most of the gardens, especially the medians, are just planted and we hope it survives. For these areas, our plant palette is pretty limited due to them needing to be hardy.

[Joshua]

*The Vancouver Foundation released results from the From Connections to Engagement survey last summer. That is now getting traction with the mayor’s office who has started the Engaged City Task Force to determine ways to get more people engaged...Have you been contacted regarding your program? Has there been any learning or looking to what you have done to help with their initiative?*

[Sara]

No, there hasn’t. Everyone likes my program, but I am very small in a sea of a lot of other initiatives. I assume they see that it is functioning very well and so leave it alone. Even with things as CityStudio projects, which, a lot of the time, impact what I do, requires that I insert myself into things.

My program is seen to be very cost effective since I have volunteers doing quite a bit of the work...The mayor actually comes to our volunteer appreciation gathering every year to give his thanks.

[Joshua]

*Let’s talk a bit outside of the box that exists right now...*

[Sara]

Maybe I will turn this on to you: Tell me again what you are you proposing for the scope of your project?

[Joshua]

*[Gives project pitch.]*

[Sara]

I think phasing is a good idea. On a daily basis, I talk with people who are very enthusiastic about a great number of projects. I really enjoy this enthusiasm, but with knowing where it can go sometimes means it is good to have a defined scale that is manageable depending upon how many people you have.
Of course I believe you would still need some sort of city support.

I do my best to try and respond specifically to things, but in the case of larger groups taking care of larger spaces, the city could provide them with more support. At the same time, I think it is good if the community takes things on themselves and tries to secure their own funding...

[Joshua]

What is also happening right now is the public realm plan for Mount Pleasant. The St. George Street in the plan is noted as a new greenway to move people north to the proposed Great Northern Way Emily Carr campus. There is a lot of synergy right now...

[Sara]

I think the project is definitely doable. There is a lot of precedent for that in the city. To attach it to a school could give it greater longevity and programming opportunities within the school...Even if certain teachers leave, there is still something built into the curriculum.

Ultimately you can only prepare so much for these kinds of things, and just have to wait and see what happens. If it is on a street, it still is considered a city asset so we will ultimately have to be responsible for it in the long run.

It is good to try and seek out the strongest connections with the neighbourhood and feed off of their energy. Also, partnering with a larger non-profit is a good idea. Groups like Evergreen will have paid staff that will be involved, which is also helpful. Volunteering is great, but we all know how life can get busy sometimes. People are tied to their jobs and to their families and it is no fault of a volunteer’s if they cannot put as much effort into a garden as they have in the past.

As we grow and change throughout the years, our life situation changes, so we may not have the same time to volunteer anymore. Volunteering is a very different type of commitment. It would be good to have a paid position involved...It’s a stronger pillar in the ground, so to speak, than just having a few neighbours.

[Joshua]

The Green Streets program and the Country Lanes program are the two strongest precedents that I have found in this town regarding the maintenance and installation components of a project in the public right of way. Can you think of any others?

[Sara]

In terms of landscaping public space, yes these two are the strongest. The Vancouver Public Space Network also comes to mind. In a lesser sense, and not necessarily relating to urban space, the Food Policy Council is a really good example of a group influencing, or helping out City Hall. I am a community
garden person as well for Engineering, so I sit on a working committee and steering committee. From what I can see, their interaction with City Hall is very positive.

The difference with the Green Streets program is how it is made up of individual gardeners. I try to bring them together and get them to rely upon each other for things, but it is not necessarily successful in every place. Some people just want to go garden on their own. I connect people if they are interested, but it is more of an individual pursuit in this sense.

Crown Street would be a good precedent to look at. I wasn’t involved in that project, but did a tour of it recently. There are a lot of invasives. There are swales that were integrated in people’s properties that they’ve gotten rid of...I get the sense that there wasn’t an ongoing maintenance plan and I think that is a very important thing. The long-term stewardship of a space is key to think about ahead of time.

Monitoring too...this is a really good thing to build into any project. From what I see, the city is very good at installing new things and doing that really quickly, but they aren’t necessarily good at monitoring their successes afterwards. It would be ideal if that’s built into the project...
Transcript of Mike Klassen Interview

[Walking from Mike’s backyard and into the middle of the rainway, we began this interview...]

Joshua

Hello Mike. Could you tell me a bit about the Country Lane program?

Mike

The Country Lane program was a demonstration project approved by city council in the summer of 2002. They went to work and produced three lanes. This one, in my opinion, was the best and the most expensive. Of the money that they had allotted for the Country Lane program, I believe they spent half of it on this one in particular.

I didn’t realize it until I spoke with a city engineer later on that they actually took up ten inches of surface and trucked it out of here. This explains somewhat why they haven’t done this again since. I am not sure they need to necessarily take that approach, but they wanted to lay concrete strips down. What used to be here was your typical rough-looking gravel lane, with some patchwork of asphalt here and there, but it wasn’t a paved lane.

When we first came to this neighbourhood...we were looking for real estate near Douglas Park originally. We had to look further east, which is where I am from, and got lucky with this place.

When we were first traveling through the neighbourhood, we accidentally turned down this lane and thought, “We shouldn’t be here...this isn’t where cars should be!” At the time, there had been newly seeded grass on this grid [kneels down to show Geogrid]. It looked very precious and like a place that we were supposed to be. Then, when we moved in later on, it was in a bit rougher shape because they had not planted the middle grid very well...

[A couple walks by and says hello and comments on our coffee cups not being wine glasses.]

...What I think happened is that they put the grid down about an inch or so below the level of the concrete, backfilled with soil, and then seeded it. Naturally, as one would drive over it, the grass would be shredded.

Now, for the 11 years that this Country Lane has been around, there only has been on time I’ve ever seen an engineering crew from the city come back—This is a testament to how successful this lane has been—They came back to replant the grid the way it was supposed to be done according to the specs.

I came to learn later, because we moved in after the lane was installed, that there was a lot of hostility from the engineering department at the time. The culture has perhaps changed since then, but since this wasn’t made from asphalt, it wasn’t what they were used to...I heard one anecdotal story of a garbage truck once driving through and stopping to spin its wheels just to mess things up. Since then, it’s been fairly harmonious.
The nice things about this lane from a variety of reasons is: 1. It’s really nice public space. People consider it a nice detour on their way home, so you often see people walking through here. 2. People tend to drive more slowly here. Cars are meant to drive down the lane, but people never seem to gun it...

I used to have my office in the back of my house, and I was able to look out here for all these years. I was able to keep my eye on things and I never saw issues or any problems. Perhaps we are outside the radius where you might find a lot of homeless, but I’ve only seen someone pushing a shopping cart maybe once or twice in ten years.

By in large, people take care of the lane. However, the thing that I have learned about this lane is you need at least one or two people on the block to take care of it. If everyone didn’t care about it and considered it only to be a back lane where you throw your garbage cans once each week and that’s it, I don’t think it would be as successful.

This year, I decided to take rock and build this small swale [shows swale] at the low point of this whole block. This is where the water tends to build up during winter, so this was a way of dealing with that.

We’ve also had in our possession since the lane was launched, the City of Vancouver sign that says, Country Lane, 700 block. We’ve always coveted this sign, but never knew where to put it. I had this old basketball stanchion that I couldn’t figure out to do with. It weighs about 300 pounds, so I buried it in concrete here [next to swale] and we are going to hang the sign from it this summer...The sunflower garden over here [walks to garden] is a key feature that I have always had here because of the amount of sun exposure...

The lane is a nice place. People come here because it is an inviting place, but we’ve also made sure that we can keep an eye on it. In these regards, it has generally taken care of itself over these past several years.

[Joshua]

Were you in any way part of the initial installation?

[Mike]

No, I was not. We moved in about six months after it was installed, so we were simply the beneficiaries of it.

I’ve seen the photos of people down on their knees, setting the bricks...that said, I had to reset some bricks and do a bit of maintenance work. I am one of two caretakers that take on things like cutting grass or picking up bits of paper or garbage that might get left behind, but that’s not needed so often.

[Joshua]
I am most interested in the aspect of a community taking care of a public-right-of-way, and how that works. I know that this was a pilot project and it hasn’t seen replication since the original three were built. I am curious why, because it seems to be a really strong model...

[Mike]

At one point, I was doing a bit of lobbying of city council. I would speak with a few of my friends there about these lanes and a lot of push-back came from them. They had clearly been told by particular staff—other than Sandy James who has always been a vocal proponent of the laneways—that this was going to be very expensive to keep doing.

I was a commissioner with the Vancouver City Planning Commission a few years ago, and I created a presentation to show why we should replicate the Country Lane program. I explained that they could not be done everywhere, because it would financially not make sense. Yet, communities need centerpieces...

Communities tend to have their own geographical boundaries; people tend to centre around certain blocks; some streets tend to be more inviting or walkable...and these lanes have the ability to add that extra bit of desirability to the street. Laneways can create a centerpiece for community, and that is what this one has done. It allowed people to think of it as the centre, where people could gather.

It’s only required a few people to feel responsible for maintaining it, but is still a space that is coveted by the whole neighbourhood. When I was advocating for more of them, I offered the idea of having a neighbourhood contest where neighborhoods might demonstrate their community spirit and as a reward, so to speak, they would be granted a country lane. To keep this sustainable, you might only produce one or two each year, perhaps one on the north end of the city and one to the south. I can imagine this would spark healthy competitiveness and excitement amongst residents, and could offer a nice outcome to all the pride and work.

I feel strongly that this type of lane has to be a measure of community spirit. This lane here, at the time was a reward for a neighbourhood that was pulling together in the face of social disease. This was a neighbourhood that was struggling a bit at the time this lane was installed.

[Joshua]

The other interesting thing is the interface with the laneways houses...

[Mike]

I know there is a young man just moved into to the laneway home on the end of the lane. This past weekend, he had some friends over and they threw a little party in the lane here—they actually used the bricks here as a patio. They set up some chairs, had a barbecue, and were here all afternoon, looking as though they were having a great time. This is exactly what I hoped it would be...
Even just the placement of a bit of green in laneways, so that it was not tip-to-toe asphalt, would help. A bit of gardening on the lane-side of fences would add some desirability to place by softening it.

[Joshua]

What have your neighbours said about the need for a stronger aesthetic on the lane? Because it is already more manicured than most, do homeowners feel like they need to invest in the backsides of their houses more?

[Mike]

It varies from home to home. I cut the grass for a few of these homes...

To reiterate, it is important to have one or two people dedicated to the lane. Even if someone pays attention to landscaping of the front of their home, it does not mean they will do the same for the back. I also have the feeling, regarding laneway homes, that it depends upon the tenant, because the lane is their front yard.

[Joshua]

Do you know much about the other two lanes?

[Mike]

Some...I know there was a lot of objection from city staff to creating another.

I gently advocated for them. I explained why they are great, and even though we could not replicate them everywhere, we could create more of them...if your raw materials are rough and your lane is not completely paved with asphalt, and you are going to see housing along the lane, this is what you should want to have. You want something softer and more inviting than just asphalt and garbage can storage.

[Joshua]

What could you expect from the city to help with maintenance?

[Mike]

The city has never maintained this. That is the beauty of it.

[Joshua]

Perhaps they might need to maintain typical lanes more?

[Mike]
They might...or they might have to ask homeowners to be more vigilant in taking care of things. I am not sure how many 3-1-1 calls go out for dumping in a typical lane, but there has never been any dumping take place here. I’ve never seen a mattress or a pile of garbage left.

I think it would be more challenging to advocate for this type of lane if it required higher maintenance. You can depend upon typical asphalt lanes eventually having a pothole...something like this may be needed, but generally they are somewhat durable.

This lane, in ten years, has only required one instance of major upkeep. When the building of a new home and laneway home was going on, a lot of the building materials, in the form of clay and concrete, ruined a portion of the Geogrid. I worked an entire weekend to take it up and reinstall it, re-place the soil, and heavily reseeded it. After a few weeks, the grass came back.

The appeal of this lane is that it is softer, aesthetically pleasing, and can offer greenery and quiet. It would be harder for the city to get behind such a project if it was to be high maintenance. This one was unnecessarily costly in the beginning because it was a trial project. If there was a more cookie-cutter approach to them...perhaps they could use cheaper materials...

[Joshua]

You could consider this a new venue for the neighbourhood in which neighbours to gather and converse...do you have any examples of how this lane might work in that way?

[Mike]

We’ve had our community barbecue here now for several years. We recently moved it on to a main street to accommodate a neighbour’s needs. Because we were holding the barbecue on an annual basis, the numbers began to dwindle a bit. Also, such events depend upon volunteers...at some point, others need to step in to host. It now is held about a block from here on a main street, which gives it more visibility.

I can show you dozens of photographs from successive barbecues that we held here. In fact, we are planning to have another here on July 14th. It would be a 10th anniversary party of this lane, even though it is a bit past the age of 10...

Things may be changing within the city: I ran into Peter Judd, City Engineer, just the other day. He lives in the neighbourhood. I asked him what he thought of the lane and he replied by saying he loves it. I am led to believe that his predecessor was not a big fan of the project. Even though the current City Engineer does not have the power to make more Country Lanes happen, it is nice to know he prefers them and would potentially cooperate of more projects like this were to happen.

With a lot of these types of projects, you have to ask yourself: If you are going to spend a bit more money on something like this, what are the benefits? What are the social benefits? What are the environmental benefits? And what does it do for community?
We have here a gathering space for the central part of the neighbourhood. It’s a nice public space, and a nice place to walk through. You may not necessarily want to hang out in a lane, but if you decide you’d like to put up some barricades and roll out a barbecue, it’s a great place to do that. There aren’t many lanes in this city that you can say this about.
Transcript of Sandra James Interview

[Sitting outside Bean Around The World on Main Street, we began this interview...]

[Joshua]

If you would not mind speaking about it, I would love to learn from you more about the synergies that helped to make the Country Lane project possible [explains a bit more about his background and why he is looking into this project and the Green Streets project in particular]...

[Sandra]

First of all, the Green Streets project was misnamed. The model was great, however, what we called it limited the use of the term elsewhere. We also had a program called Blooming Boulevards where we let people garden between the curb and the sidewalk in all single-family areas. We did this as part of a planning project called City Plan. I was the implementation planner for this. The guidelines helped to set plant palette and configuration and it really took off.

The problem that arose was how it became confused with Green Streets. Green Streets are about traffic circles and boulevard bulges at the corners that we allowed people to garden. The difference was the funding. The Blooming Boulevard demonstration project, which was our way of converting streets into greenways that were not already designated, covered a certain square foot cost per plant with the help of a grant that I found. With Green Streets, people had to provide their own plants. We give them a plant palette list and a big party once per year. I think it was a great idea that we did not take far enough.

For the Country Lanes, it was a bit different. I was also a planner in that area. We know how every forty years, we have to replace paving on a lane. There were a lot of creative engineers with the city at the time... we wanted to look at doing things differently, but it is hard for a city to do change. They can’t do change unless they educate their crews about new construction techniques.

In the case of Country Lanes, the crews needed to know there was more time and money for them than with straight paving, because you are in the process of changing people's mindsets. It also required involving the neighbours. The blocks that lead up to each of the garages was laid out by each neighbour. So, the city staff and crew came out, the community came out, and we built the lanes together.

[Joshua]

That’s what I thought...

[Sandra]

Right...So what we did is we created the two concrete wheel runs, but we had to customize some equipment to facilitate that. We also used Geogrid and structural soil. We created the main runs, but we didn’t do the runs to the personal garages. The reason for this was that we wanted to show the neighbours
how to do it, so that when the blocks came loose, they could do it themselves without having to call City Hall. It also started to create a public space...

Also, by them all getting to know us, having a great day, and sharing phone numbers, it built up a long-term connection with the community.

When the World Urban Forum was here in 2006, I had a tour where I took about 40 mayors and international planners out on bikes with police riding shotgun, and we had a barbecue in the Kensington-Cedar Cottage lane as part of the festivities. The idea caught on and the community still uses the space these types of gatherings...They would put up a sheet at one end of the lane and project movies that everyone could watch onto it...so during these times, the space really turned into something different. I think this was because of the different attitude that we took to it. We tried to make it a community space.

When we did it, we always thought the Country Lane program would go on and it would become part of the options you could get with Local Improvements initiative projects. A local improvement project means that if you wanted to pave your lane, for example, you need to get 55-60% signatures of residents approving the petition for paving, I believe, and the city goes ahead and covers a portion of the paving cost while the other portion goes on your property taxes for a length of 15 years. So, for a cost to each homeowner of say, $1500 per property, you would be paying $100 each year for fifteen years.

[Joshua]

*There were more Country Lanes implemented. The others had varying degrees of success...*

[Sandra]

Yes, there were two others that were built. One was a high-density lane behind City Farmer, while the other was off of Yale Street. They were built differently. Those in Mountainview and in Kits behind City Farmer were designed by Park Board landscape architect, David Yurkovich, who worked in greenways at the time. The one off Yale was installed by city crews without the oversight from a landscape architect. The maintenance cost was higher in that case because the city crews were trying to figure out how to do it and failed to follow spec in a way that would not have happened if a landscape architect was overseeing the project.

[Joshua]

*So that was key? Was it key to have someone manage it or to detail it thoroughly?*

[Sandra]

I think it took a bit of both, but I don’t think he managed it as much as he detailed it. This became really important, but I also think troubleshooting a project also can lead to success. The one off of Fraser is probably the one that has worked the best. It’s not failing because it is well-built and is well-cared for by
engaged residents. If we extended more of that kind of model to the project off Yale Street, it would have done better.

[Joshua]

Moving forward to a larger scale, nine-block gradually-phased implementation, which is the St. George Rainway, I have learned from the Green Streets program how there is a cutoff regarding where you can rely upon neighbours to help maintain the right-of-way. Do you have anything to share here?

[Sandra]

I think the problem with engineering has to do with their bureaucracy and how they envision projects. I do not mean to be disrespectful in any way of the staff that are involved with the work. Sometimes it is okay with someone as yourself, with your background, to manage a project, but Engineering has not wanted anyone in neighbourhoods to touch rain gardens.

On Blenheim Street, with the crocuses and daffodils, they were trying hard to have a theme, generally from 41st Avenue down to King Edward...the community wanted to take over the rain gardens on their street and city said, “No you can’t...” but they just went ahead and did it anyway.

Part of it is understanding that residents have as much interest in taking care of where the water is going as well as who is dumping polluted water as the city. Part of this is an education process for the city, as well as for the residents. As counter to what I have found in my experience: the more you give to a community, the more they want to give back.

I think, again, if Engineering would work more with Planning, specifically regarding implementation, tremendous projects like the St. George Rainway would benefit.

[Joshua]

It was mentioned in the Public Realm Plan as the new North-South spine down to the new Emily Carr campus...

[Sandra]

That’s the way of the future. To talk about spines, and to talk about these memories of pathways will help keep people walking. Watson Street used to be an open stream where people used to fish. You can still go down Watson and see bits of that...there were two old cottages that were just burnt down during a rave a couple years ago. These actually were cottages that once faced 12th and Watson...it was an absolute shame.

This is what we have tried to do with creeks...we tried to find memories of them. When we dug up the intersection of Kingsway at Broadway, I was called down because of the massive amount of water that was flowing through...the water through here used to power a flume all the way down to Gastown.
There were flumes from Trout Lake that ran down to the flats...

That’s right...It’s really important to have that memory. You’ve seen those copper plaqued cairns honouring the memory of Brewery Creek, right? That was a case of the province giving funding and wanting things, such as kiosks...at the time it was done, it was right before computers and web page histories. Even though it was cool at the time, there was no connectivity, no attachment. A portion of Brewery Creek was supposed to be daylighted at that time with one of the developments, but that didn’t happen.

We’ve been talking about synergistic connections with the past...to foster them, you have to have that connection with the residents and the city right now. It’s in my humble opinion that I think the city is getting too noble. They don’t realize that residents want to do this.

Every seven years, people in neighbourhoods change. During that seven-year process, you always need to have a way to let people know why things happen in the ways that they do. There are are still things online about Blooming Boulevards, but everything about Country Lanes has been pulled offline. You have to remember why people did that...what were the reasons for doing Country Lanes...are there things we need to revisit?

I am going to switch gears a bit. When I was performing research for the city around rainwater harvesting, I learned how Vancouver Coastal Health was holding the trump card, so to speak, around the issue since they had not yet set a non-potable water quality standard. Why this is, I surmised, is because the city is not ready to hand over an element of trust to its residents. I am wondering if this attitude was evident in any of the examples you gave, such as at 49th and Blenheim?

Yes, and I would call it “restrictive benevolence.”

The water component you spoke of is really interesting. One of my friends who was the water engineer with the City of Vancouver, mentioned how after 9/11 they performed a big analysis because there was concern around our water supply. They performed a big risk-management study, hired a top consultant, and they determined that since there was so much water up there in the mountains, even if you added the largest amount of chemicals you could get your hands on, you couldn’t threaten that water supply.

When I was at City Hall, we did change the law to keep people from being allowed to tap into the aquifer for their water. It’s not a good idea.
For us, it’s not about preserving water, but is about conserving. And it’s not the residents who are the problem, it’s the industry. We are seeing some change in behaviour now based on how people are watering lawns...but I laugh at how places like Shaughnessy keep watering but no one pays a fine because there is no enforcement around the sprinkling bylaw.

I personally have a quarter-acre of land that is all garden, but I don’t water it. I use city compost...it’s all about the practice. How can people know the practice though, if the city isn’t leading? There still is all the grass planted around City Hall as well as some invasives...part of the puzzle is to lead, but instead we have this restrictive benevolence.

[Joshua]

The progressive nature of cities like Portland or Seattle have an earlier cutoff for where they hand over trust to the residents with sufficient knowledge, where they then say, “it’s now your responsibility...” That doesn’t seem to happen here, where the hand is held the entire way, so to speak.

[Sandra]

The city likes to think that they are very good with things like public participation, but they are not. This is probably one of the most restrictive cities for that. The problem lies with how we perceive ourselves. The city also needs to be more accessible...

[Joshua]

How do you get over the hurdles with public participatory projects where this city is transient? Mount Pleasant might not be the best model to look at...

[Sandra]

Mount Pleasant is a good one to look at. You always have champions, and the champions in Mount Pleasant live in the 100 block of West 10th Avenue. They are the Davis family. Are you familiar with all the heritage houses in a row there? They live there. I wrote my masters thesis on those houses.

I got a call once from BC Hydro. They said, “You’ve got to come and help us because Mrs. Davis just kicked one of our workers in the crotch!” Well, she wouldn’t do that. What they had done was that they were trying to drop-crotch cut the trees for the electrical lines and Mrs. Davis had kicked the guy, took the keys to his vehicle and threw them away. Because she did that, we did a report to council to work with BC Hydro and we got the lines lifted so that the trees have a normal canopy on West 10th.

You need those kinds of champions. You have to be kind and tease them out.

The Davis family actually has a plaque outside their house that says, “These houses have been restored with absolutely no help from the City of Vancouver.” The renovated each house one at a time and rented them out to make money. Pat Davis’ husband did that before he died from cancer and their sons have
continued the work. In the end it turns out that these properties are worth lots of money, but when they were doing it, they weren’t. One of them actually worked as a caretaker for a three-story walkup across the street to make enough money at the time.

It’s looking for those types of people and championing them. That kind of stewardship we don’t do well at the city.

[Joshua]

Identifying these champions would require someone from the city to build rapport with them...

[Sandra]

Exactly. We used to have that in terms with development. We actually had a negotiator/mediator that did that kind of work. We need that at the city too...someone like an ombudsman. We don’t have that.

That perhaps was my position when I worked with the city. I worked with the Parks Board, Planning, and Engineering...but you are talking about synergistic work which requires a particular platform. The truth is that the person who does this kind of work is never loved by anybody, and is never really following through with what they are supposed to be doing, but in the end they are left with a legacy of what communities can do...It’s not about doing things right, but doing the right work.

They don’t have that person, and they need that person. Politically, they’ve not gotten the push to have this. It would have to be someone “outside” enough so they wouldn’t be dragged in one direction over another. Right now, I think what you see at the city is a chasm between the Parks Board, Planning, and Engineering—similar to what it was like when I started working in the early eighties—that has them not working well together.

Working together is where the magic happens and enables them to do synergistic work.

[Sandra]

What other questions do you have for me?

[Joshua]

The Vancouver Foundation published their Connections & Engagement survey last summer. It illustrated how Metro Vancouver is disengaged and disconnected with regard to neighbourhoods and being neighbourly. I am trying to determine the interface between design and the public realm and how it might build social cohesion. This is why I wanted to speak with you regarding the Country Lanes project, as it is an example for how you might engage neighbours...

[Sandra]
I would like to start with the Vancouver Foundation survey. I found some real problems with questions that they asked, such as, “How many council meetings have you attended?” or “How many school board meetings have you gone to?” All of this stuff is online, so you aren’t going to attend.

From my experience, things on the ground appear to not be as bad. But the nice thing for the Vancouver Foundation is how this put them on the map.

In terms of social cohesion, I think there can be magic through urban design and involving people in projects. I found strong cohesion in the projects I was involved in…the problem with the work for the city is how it is not clearly identifiable with regards to who gets the kudos in the end.

[Joshua]

What do you mean, “kudos?” Are you referring to who gets the credit?

[Sandra]

Yes…The city always seems to be a bit mushy about doing joint work and I don’t know why. I think it is the way of the future, and I think people are hungry for actively participating in things.

[Joshua]

I think it comes back to this need of the city to control all elements. Perhaps this could be due to having such large departments, or this could again have something to do with there being no trust put into the community.

[Sandra]

If you are looking to city structure, we originally had an older model where the city manager was not political and leadership was able to come from Engineering and adopted policies. This allowed for a separation between council and mayor and the running of the city. When the Robertson regime came in, they fired Judy Rogers who came up from working years in the city with creating innovative policy and brought in Penny Ballem. She’s a great lady and highly regarded…the difference is that we are now like any other municipality in Canada, where what they decide to do is political. Because of that, a lot of things related to policy were let go.

For me, from a policy perspective, the idea for greenways was originally to have them eventually turn into one-ways, as you are proposing for St. George, or a closed street to become new public spaces as the city densifies in 40 to 60 years…but all of a sudden, that got lost.

If you speak with seniors, the number one thing they want are fountains and benches along the places they walk. These are simple things, but they all got lost.

[Joshua]
I also found when I came to Vancouver that things felt to be over-planned: zoning might become too specific, or things might be too compartmentalized...you know where to go for your sporting goods, you know where to go for your pet healthcare. Mixing doesn’t quite happen.

[Sandra]

That’s a very American model—the mixing of uses. We’ve been really strong along the seawalls to not allow a lot of commercialization happen...to keep it very pedestrian and very residential. But, yeah, your observation is right.

Even the neighbourhood that I live in, where we all have quarter-acre lots that are 110’x100’, we can’t put a laneway house on the side of our lots because we don’t have lanes. Sometimes it really does get prescriptive.

We’re not good at grey, though grey is the way of the future.

For example, on Dunbar Street there is an existing nonconforming auto body shop right in the middle of the retail section. If you look at it you say, “well, you know, it’s McDermott’s. They’ve been here since, like, 1950...” You wouldn’t believe the number of residents who call and ask, “Why is that there?!”

What I am learning as I am talking with you Joshua is where the city could have a challenge in the future...

[Joshua]

That, ultimately, is what I am looking at. I am framing the need for a more resilient way of living by the context of a changing climate and depleting resources. Nothing is going to get cheaper; maintaining a city is not going to become more affordable; raw materials are disappearing; commodities are becoming more expensive...So, what are the other models and how can you use these other models to do more than one thing?

[Sandra]

That’s going to be the key.

I think the city dabbles their toe on it, but then they let go of CityPlan. CityPlan was supposed to start doing this. They had 21 plans for 21 neighbourhoods. There were to use these plans as templates for looking at growth...

[Joshua]

What will it take to bring about and use new models such as green infrastructure?

[Sandra]
I’m a bit despondent about it actually. This feels like how the City of San Francisco felt in the 80s. They had a tremendous reputation at the time; it was what everyone talked about; it was the model...then, all of a sudden, they did nothing. They couldn’t get any more propositions through...they had more renters than owners. There is much written about the subject and how it went down before it came back.

This is what Vancouver feels like...We’ve done a bit of work, but we didn’t really connect what we did with the future, and I feel as though a lot got let go.

I am not sure how you do synergy, but we need to start thinking through things and doing them a different way.

[Joshua]

_I think some of this has to do with measurement. In moving forward, how do you check back to see what’s going on?_

[Sandra]

Yes...and how do you not forget some of the history...

The city does not seem to value public process even though they say the do. They seem to be more about internet connectivity and the quick glimpses you can get. When I went to look for Country Lane materials online the other day, if I hadn’t worked for the city, I wouldn’t have known how to find them.

I don’t want to appear like a negative person, but you need to have an informed community who can find stuff and understand stuff to make a great city. I don’t see that here.

[Joshua]

Correct me if my perception is wrong, but I also see the collaborative model...or charrette model...or whatever you wish to call it...that the city uses is a bit shallow. It feels as though communities are brought in only after decisions have been made. Communities see this and understand that their voices aren’t really being heard. This is where some frustrations might be...

[Sandra]

Absolutely...

[Joshua]

There aren’t many models that involve a project that is allowed to grow over the span of several years or even decades. Yet, this might be the way of the future when city budgets are even more strapped and
they are unable to create clean slates for large capital projects. Could we talk a bit about the future and how such projects might be envisioned?

[Sandra]

I think we have to start looking more at policy. What we are doing downtown at Comox and Helmcken is a bit late in the game, and it’s curious for me to watch the amount of money we are spending. We spent a million dollars per block doing Carroll Street, but that was done intentionally. I felt okay about that because it was the Downtown Eastside and we were providing a walking spine for people who already walk and use the streets a lot.

It has to be a part of city policy to design and create the kind of city that we want. The same goes for rain gardens. They shouldn’t be restricted, but rather be given guidelines on how to build them, and provide other examples that folks can go and visit and talk with you about them.

There needs to be more of an active legacy.

[Joshua]

You need to know where to go for examples...

[Sandra]

In Dinsmore, Saskatchewan, they don’t have any paved streets. They actually pulled all of their paved streets up. They were saying how since they get potholes that are really expensive to fix, that they decided to go back to dirt and gravel. It ended up being more affordable and is percolating! I always thought the incubators of change are not going to be the big cities, but the suburbs...
Transcript of Joyce Lee Uyesugi Interview

[Sitting outside the Edge Café on Yukon Street, we began this interview...]

[Joshua]

First off, could you give me your impression of social cohesion and how it currently exists in Mount Pleasant?

[Joyce]

The community itself does have cohesion and I say that because of the projects that have been realized there from their own energy and initiatives, regardless of city involvement...Such as the traffic circle at St. George and 10th. A couple of residents that live a couple of doors down were awarded some grant money to turn it into a meeting place.

Livable Laneways is a group that’s held a few activities in lanes in Mount Pleasant. They are an example of a nonprofit doing their own thing...

[Joshua]

What is the goal of Livable Laneways?

[Joyce]

It’s simply to improve the public realm. They are a group of artists and really engaged citizens who want to do something good for their community. I think Mount Pleasant has a lot of that. I believe it has a lot of capacity in terms of artists and engaged folk.

I would say there is definitely a good foundation there. The St. George Rainway is an example of a project that is driven by the community without very much help needed from the city to have things realized on the ground...

From my perspective, regarding development that happens over a period of time as a community is changing, I would say some of our processes, policies, and regulations have effected social cohesion to some degree.

I was just out in Mount Pleasant on Saturday where I had some conversations about what we are doing regarding implementation of the plan...and there is still some resentment about how the process with The Rize project unfolded and the confusions around how policy was interpreted. When something like that happens, it can effect social cohesion at the broader scale.
When your majority resident is curious about their community but is not closely involved with a specific initiative, they will come out to learn about development or how the community is changing. Then again, when something goes sideways, their trust can become eroded…Their relations or collaborations with the city is eroded.

I would say this effects the capacity for furthering social cohesion.

[Joshua]

In the case of your current work in Mount Pleasant, has The Rize been one of the major sticking points?

[Joyce]

The current work has a number of pieces, including the public realm plan. The issue with The Rize is mainly around form: height and density. There is an opportunity to improve the public realm through development, but the concern over the building form masks that. This is just another example of where you don’t really get to that conversation about how it can really improve the public realm. Rather, you are still dealing with the resentment around the project...

I see Mount Pleasant as having a lot of potential. I don’t know if I would call it cohesion, but there are interesting groups working on making where they live a better place.

From the City’s perspective, or from my perspective as one working within city government, I can see how trust can be effected.

[Joshua]

In the instances where there needs to be collaboration between community and city, can you speak to some common hangups? Or, to some instances where things seem to run smoothly with regard to engagement and participation among community members?

[Joyce]

I would like to speak more to the opportunities. I’ve seen, for example, an older program—the graffiti management program—become recently resurrected in the city. That program includes murals, which provides an opportunity for a community like Mount Pleasant who wants to improve the streetscape to use murals as one tool. Having this program staffed helps facilitate the process.

We know that communities could all use a bit of support, I think that is something the city can provide.

The Parklet and VIVA Vancouver programs also come to mind. These are examples of programs within the city can, with support staff, knowledge, and connections, really help further ideas that come from the community and help realize it on the ground.

[Joshua]
Let’s talk about VIVA for a bit. It is an interesting model for the city where projects seem to partner with a particular private interest...Is this unique to all its projects?

[Joyce]

I believe that is determined by location.

Any improvement in the public realm requires money, and when you are tied to a city program, there are rules you need to follow. This an be a drawback, but I see the benefits of the support staff’s knowledge and coordination really outweighing some of the costs.

Projects that involve VIVA inherently are bigger, because of the costs involved.

[Joshua]

Are all the projects with VIVA seen as temporary?

[Joyce]

I think it is more of a let’s-wait-and-see approach given to their projects. I would not be surprised if many of them do become permanent. I think that, in the public realm, this is what it takes...you just need to do it, figure out what works, and leave it.

[Joshua]

Can we gauge the success of a future project, such as the St. George Rainway, by assessing the levels of social cohesion within the community? Could we possibly assume that heightened social cohesion would guarantee there being champions for the project?

[Joyce]

The fact that there is already a group existing, a group formed around the singular interest of creating the rainway, is quite a feat unto itself. The ability of any group to sustain itself is key. I don’t have an obvious answer for how that is done...but there often seems to be a champion who is involved at the front end. To the extend they stay involved, the group will have a greater chance at success.

The St. George Rainway group seem to manage themselves well. For example, the ability to organize to touch up the mural they painted is a big deal. This is more than the simple task it seems to be. It was done without any city support and was done solely with volunteer time. Hopefully, the capacity of the group–to originally obtain permitting for the mural and to know who to contact at city hall and build those relationships–can be sustained.

Also, there needs to be ongoing communication with the city around what the intent and objectives are with a particular project. Yet, how that aligns with city objectives can change, depending upon who is in government or depending upon the interests of the day.
For new projects to happen in the public realm, the community has a very key role to play. It is more likely for the community to be able to achieve something new and unique and progressive, versus waiting for the city to initiate anything like that. Because of the bureaucracy involved...

[Joshua]

Right...the city has been set up to do things, for the most part, in the same way it has done for 100 years.

[Joyce]

Right...and change tends to come very, very slowly in the city in all aspects.

The public realm is often seen as a bonus or an extra...it has little to do with life safety for instance. The dollars often are not there. This is one thing that worry about with the public realm plan. How is the city going to implement this?

[Joshua]

But isn’t the public realm related to issues of mental and physical health?

[Joyce]

Yes...but it’s a constant challenge for planners especially to make that point.

[Joshua]

I have come to learn that there is quite the need for more data throughout the city. Without such data, it is difficult to measure the effectiveness of infrastructure systems and projects. From a city employee’s perspective, is Vancouver actively looking towards growing such measurement? In the case of the Rainway, this could help it become set up to be something more than just another park...

[Joyce]

Again, change is really slow to come by in the city. Also, this comes down to cost. If we are talking about parks or the public realm, the city has been doing things a certain way for a long time and the costs related to the work and materials used are set and hard to shift.

There are so many needs within a city, you have to balance the amenities provided by a park improvement. Does this mean: play equipment? benches? water features? rain gardens? They all have a price tag attached to them. In the grand scheme of things, it is hard for these items to be brought to the top.

[Joshua]
In the case a new project requires monitoring, it would require partnership with an institution such as a university...

[Joyce]

This is a good point. In the city, there is not a lot of room for extras. We are actually just trying to get by day to day...then again, every field is encountering that crutch. This is why it is really important to build relationships with communities and helping to make sure they have the capacity.

It is up to the community to pitch their idea, and it often requires an internal champion, or a politician, to give the idea traction...it’s very hard to effect change internally. Cities are generally focused on the day-to-day and in the ways they need to run the city...it’s really hard to effect change.

Sometimes it does take a politician to bring about change.

[Joshua]

We don’t need to get into politics...

[Joyce]

Okay...Great! [Laughs.]

[Joshua]

I won’t take up too much more of your time...I am curious if you have any anecdotal stories for me related to your work in Mount Pleasant that have given you encouragement around increasing bonds between individuals...

[Joyce]

The Weaving Initiative has had its ups and downs with regards to organization and management, but at the end of the day, things are happening. I see a community forming itself around the issue of revitalizing Broadway East and coming up with some really good ideas about how to do that with very little City support.

For instance, the organized and implemented the Art Walk, which is really exciting and can be seen as a small step in the right direction. It demonstrates to me that there is a capacity in the community to do things with passion and willingness to try new and different things. These are things the City would never take on, nor would one expect them to.

I wish, from the City’s standpoint, that community planning had more time and resources to develop those relationships and to support that kind of activity within communities. I like to think that we can help through a coordinating role, or an education role in terms of what other initiatives are happening. Certain projects might have relationships with others that the City could point out.
I don’t have a lot of time or extra resources to take on this kind of work…

[Joshua]

...So would you say that it has helped to have Mount Pleasant Neighbourhood House so involved with your work?

[Joyce]

Yes, I think there is value in a body or a group organizing different community initiatives. This is particularly true in the public realm where everything is linked. Their being able to connect me with individuals in the community has helped.

The City also has the ability to do this, but only if we are given the time and resources to take it on.

[Joshua]

Is there anything else you would like to add?

[Joyce]

I do feel that Mount Pleasant is an exciting place because of all the things that are happening there. Although, sustainability is a really tricky thing. How do you sustain groups’ interests and initiatives? You have to manage the maintenance aspect too. With murals or the Rainway…you will always need someone to monitor the list of challenges that are involved.

[Joshua]

I am curious of how this translates into larger challenges such as a changing climate…things that would require really strong community bonds to resiliently get through...

[Joyce]

In planning work, that is something that we are always up against as well. How do you get people to become engaged? How do you share information and get their response on these bigger issues when everyone is so busy with the day-to-day? This includes me...

What does it take? Politicians? A heavy hand? Leadership is key...
Transcript of Shahira Sakiyama Interview

[Sitting together in the common area of the Mount Pleasant Neighbourhood House, we began this interview...]

[Joshua]

Are you familiar with the meaning social cohesion?

[Shahira]

I can assume what it means, but I am not aware of an official definition...

[Joshua]

I will let you read the definition that I have been citing in my research... [Offers up sheet with definition printed on it...] Considering this term and the neighbourhood of Mount Pleasant, what comes to mind for you?

[Shahira]

My experience in Mount Pleasant is somewhat broad due to the family that I am a part of. We are able to participate in many aspects of it, that alone as an individual, I may not have been afforded such opportunities.

As a mother, my awareness and familiarity with Mount Pleasant has come from simply walking around and becoming aware of all the greenspaces. No matter which direction I would walk in, inevitably, I would run into a park, so with my kids, that was great! [Laughs.]

When they became of age where they began to need some sort of educational services or children’s programming, I started becoming networked to things like the Mount Pleasant Family Centre at Robson Park, or here at the Neighbourhood House where both of my children go to school.

From these things, I have been able to learn of and become a part of other networks in the community. As with through the Family Centre, all five of the family centres and family places in Vancouver are networked in some shape or form. As a parent, you run into other parents at these various places...I love it here at the Neighbourhood House because there is a cross-generational aspect of what they do. It’s not about just providing needs for children or families, but also for all cross-sections of society: youth, individuals, and seniors. I have been very grateful to be able to expose my family to that and become a part of those communities.

[Joshua]
In what ways are these physical places, such as the Neighbourhood House, essential to the ways in which community exists in Mount Pleasant?

[Shahira]

That’s very interesting you ask that. During these past few days, I have been at various events covering cultural art spaces in Vancouver and how they are disappearing...in some aspects they are disappearing, but depending upon what lens you are looking through, people can say that some are reemerging. At these events, we discussed the importance of literal space to house community.

The fact that the Family Centre and the Neighbourhood House are physical structures that can accommodate these different communities is special. Because it rains here nine months out of the year, it’s hard to create that kind of space outside, versus, say, if you were in Southern California, where strong beach and desert communities exist.

Physical space is very key when helping to foster community.

[Joshua]

To take this point a bit further, could you speak more to specific events, that could have happened at either of these centres or elsewhere, that have improved social cohesion?

[Shahira]

Here at the Neighbourhood House, every other month a cultural dinner is hosted. Depending upon which culture is represented, it can be a very different crowd, but at the same time is overlapped with the regulars who always tend to show up to events.

A similar thing happens at the Family Centre. They have two annual free events which are important for bringing people together: they have both a holiday party and a Canada Day party. They have other events throughout the year, but because of the various price tags associated with each, it can limit attendance and therefore opportunity for growing community.

[Joshua]

So depending upon whether or not it is free can limit particular demographics from attending?

[Shahira]

For sure it does. I was just speaking with a friend about a youth conference where she was invited to speak, but then was still expected to pay a subsidized rate of $40. Such an amount is a lot to pay for youth artists, especially if it was unsubsidized. In such cases, the outcome can be homogenized because it is not pulling from as many sources as it can.
Let’s talk about an event that requires participation, such as the mural painting...

This is the second year that we have done this, and we are blown away by the community support and enthusiasm towards it. For the first year, we focused on our core team that helped with the application and we were able to recruit an amazing team! One person was familiar with large murals but had never painted on the street. The other person painted on the street professionally, but never had done so artistically. It was an amazing marriage of talent.

We reflected on how everyone worked really hard, fourteen hours straight, for two days in a row, and enjoyed it all. They had smiles on their faces the entire time. We marveled at how, even after we had completed the job, we still wanted to linger and hang around with each other. [Laughs.]

How did this summer compare with last year’s painting of the mural?

We had about 75% to 80% of the original team return to help out. That was great to have such continuity. Previously it took two days to complete, while this year it only took one. The foundation was already in place and we were already familiar with the structure necessary for completing the mural, so it took less time. We also had a lot of help from the kids from Mount Pleasant Elementary. The weather was nice, so many of them came back out after school to continue helping.

In comparison to last year, where we tried to organize more people to come, this year, 40% to 50% of those that helped out were just people who were walking by and got caught up in the effort... “Let me go and change my clothes! I will be right back!”

Were there any instances of the opposite with the mural? Were there any challenges from people that you had to overcome?

We distributed announcements all throughout the neighbourhood adjacent to St. George Street, to let them know that the road would be closed for four days. We asked that if anyone had any problems or issues with this closing that they should call or email us. In conjunction with this, we offered the opportunity to fill out an anonymous survey to express themselves.
If anything, we heard some dissent there, but I think that is par for the course. There was one incident at the very end of the day, where one of the residents drove through our barricade, pulled a big u-turn in the middle of the mural, and parked and watched us for a bit. Being a resident, he had a right to park there on the side of the street, but his considerate communication was totally lacking. He was very aggressive, so we were taken aback since the whole event was otherwise a smooth-flowing amazing day. His actions were like a slap in the face to everyone there...

[Joshua]

How was this responded to?

[Shahira]

Some people tried to talk with him, but he was not conducive to a civil conversation. He kept blowing people off...he was very frustrated and agitated.

[Joshua]

So that air never cleared?

[Shahira]

This sheds light on the only complex in the neighbourhood which has expressed concern over the project, but not very constructively. When we first started the conversation around this project nearly two years ago, there was some opposition. It came from a few individuals that had a lot of influence. This one individual that happened to not like the idea was the president of a strata along St. George. He prevented us from engaging with anyone from the building.

Eventually we found an in, who was very supportive of the project. From him, we found out that nearly all of the residents were totally in support of the project. To date, he has been our contact for communication with the residents. Also, with that situation that I just spoke of, he was there and was able to start a civil conversation with that gentleman. The fact that they were neighbours, or of the same gender or background, it was no matter...we were happy common ground was found.

[Joshua]

Sticking with the mural project, tell me about some of the insight that has come from others...

[Shahira]

Some of the comment on the survey included things like: “This is a really amazing project!” and “This should happen all over the City of Vancouver because it really puts Vancouver on the map as a first class city...” so obviously there were individuals who like public art. [Laughs.]

The quality of the piece speaks to the latter comment. The mural really does tell a story.
People that I know and see in the neighbourhood always have lots of appreciation and a new sense of pride about their neighbourhood.

There also is some misunderstanding in regards to funding for the project. Some wanted to know where the funding came from...some commented on how the school has a lot of needs and wondered why they weren’t spending money on books for the library versus putting paint on the street.

This may come from people simply not being aware of how funds are distributed. Or, as a parent, I can attest that this might come from the shifting demographic within the community. Some people seem more willing to send their children to a different school that is perceived to have more resources rather than contributing to the community in which they live. Then again, as a parent, I struggle with these issues as well.

[Joshua]

How might we speak to people about the importance of such projects and give importance to involvement in and learning from physical space versus simply learning about it in a book?

[Shahira]

There are several ways to do this, but I tend to rely upon what I know from my history of canvassing and grassroots organizing.

You can’t really change someone’s mind, unless it is something they wish to do. Fliers they don’t read and events that they don’t participate in is not going to change anything. One-on-one conversations, providing the space to allow people to vent, and finding common ground are ways to make some movement. But, if people aren’t even willing to have the conversation, what can one do?

From my experience, one-on-one connection is the most powerful means.

In the case of the building where the strata president didn’t want us to come, we offered on many occasions to speak with the strata council and the disgruntled neighbours to address the issues. Yet, he was very hesitant to have that conversation. So, we found a resident who had an established relationship and he was our liason.

Information is also is key. As we are intending with the Creek Forum, the kids will be providing information...It’s one thing to get a pamphlet from the city. It’s another when you come across information put together by youth in the community that has been compiled in some artistic way. I am not sure how individuals cannot be engaged with this...

[Joshua]

Let’s go back to what you said about one-on-one conversation. Is there a space, physically or metaphorically, that is required to allow this to happen?
[Shahira]

This actually brings me to the next point I was going to bring up.

We've had street parties in the past, back when the Rainway was called the Blueway. After we engaged in that initial conversation, we decided to have a block party. It was able to bring together neighbours that might have never talked before out and in the street in support of this project. They were able to enjoy music and share food...Neutral spaces like this where people can come together can provide a great opportunity for engagement.

[Joshua]

Don’t underestimate the block parties...

[Shahira]

No! Not at all...When people have food and are happy and satiated, many things can happen! [Laughs.]

Those two things: block parties, which are safe because they don’t fall under some sort of umbrella...and door knocking and canvassing.

Often getting people to sign a petition can be the doorway to getting people to have that larger conversation, getting people’s opinions, and determining how you might move forward with the project. While canvassing, you are able to identify the obstacles while you are also able to identify the leaders and champions. Maybe individuals might not see themselves as leaders, but you are able to identify their skills and help mold them or encourage leadership from them.

[Joshua]

The Vancouver Foundation survey, which I am building some of my research off of, identified one of the major roadblocks to community involvement amongst residents is their feeling that they didn’t have anything to offer. It would be interesting to have insight into identifying how one might help bring about this awareness of worth...

[Shahira]

I actually think the mural did a bit of that. People would say: “Oh no, I can’t help–I’ve never done this before!” or “I am not an artist...” to which we would reply, “That’s okay, we haven’t either!”

It was amazing seeing the pride people developed in themselves around having done something they originally never thought they could do. It helped to create a sense of ownership in those that participated...There is something to the experiential nature of this project that was able to draw people out.

[Joshua]
With your understanding of the momentum that is evident throughout an array of projects in this part of the city, could you provide me with your insight into how the Rainway might become more of a success?

[Shahira]

The Rainway is in the midst of its first shedding, so to speak. We have been in a chrysalis, but now we are coming to the next stage and trying to figure that out, shake off the cocoon and figure out what it looks like now.

I know that some of the key players in the project have to move on to other aspects of their lives because they are more demanding. So, with that challenge, we have to figure out how to grow the core to pass on the work to the next members of the community. In talking with Mount Pleasant Elementary about how we've led planning initiatives, we have asked them to take on a piece to ensure such things as the Rainway parade that takes place every other year at Mount Pleasant Days might continue under their leadership...

We are trying to identify groups such as this to carry the torch of facilitating working parties related to the Rainway. There are projects such as the new playground and the Brewery Creek garden...We are working towards keeping the initial concept of the Rainway alive in these projects versus them becoming two separate things.

Aside from the Rainway, there are phenomenal opportunities that are taking place around Vancouver and Mount Pleasant that can contribute to daylighting, which subsequently supports what the Rainway is and can become.

There are projects taking a look at Trout Lake and at Gibby’s Field, as well as the daylighting of China Creek...There are not only synergies between each of these projects, they are all physically connected...And the culmination is the Great Northern Way Campus. This is where all the water from these places runs to. The St. George Rainway is the example by reviving what naturally existed there...but whether it originates from St. George, or China Creek, or Trout Lake...it all eventually flows to the false creek flats before flushing out into False Creek. This is why my energy now is being focused on the visionary work to help complete St. George.

The Storyteller’s Bench is great...When we have a water feature at the headwaters, it will be phenomenal...When we start tearing up the mural to create bioswales, that will be great...But if at the end of the day, if this water ends up being flushed into pipes and culverts, it will be like not lighting the birthday candle.

[Joshua]

That’s really great...Is there anything else you would like to add?

[Shahira]
Another thing that is carried by this project is the involvement with the kids. Half of the creek stewards are the kids that we worked with two years ago explaining the creek under the street who were also just recently at the Vancouver Foundation speaking to why this project is important to them and what they want to see happen.

Whether these kids go on to focus on the Rainway or other community enhancements projects, they are key to helping things move forward. When they go on to high school, they will carry these experiences with them.

I know Carolyn [Drugge] speaks a lot to how when she was in school, she had a similar program that ended up inspiring her to be where she is today... If we had half a dozen of youth like her, we would be very lucky and I think we are.

We are really lucky here in Vancouver because of how accessible nature is. But, if your family is busy working and isn’t able to get out to these places that are available to us, to have it so immediate to your neighbourhood is one of the key things the creek stewards are excited about.

[Joshua]

They won't have to travel to the North Shore...

[Shahira]

Right! Maybe they can’t always get to Stanley Park... I think they want to play with frogs. [Laughs.]
Transcript of Teresa Comeau and Barry Calhoun Interview

[Sitting together in the kitchen of the newly built home of Teresa and Barry along St. George Street, we began this interview...]

[Joshua]

*What I am hoping to start with today is this idea of social cohesion, which in part refers to members of a community such as Mount Pleasant having a stronger sense of trust, belonging, and a willingness to help their neighbour. I am curious what comes to mind when you think of this neighbourhood and social cohesion...*

[Teresa]

I would like to preface this by stating how we are new to the neighbourhood. We only built this home six months ago, so answering questions such as those posed by your survey were challenging for us...

[Barry]

Outside of that preface, I can answer the question. Social cohesion to me is a place where there is a real sense of community...where people know their neighbours...where, even if you don’t know your neighbours, people are friendly and say hello. It’s an idea that supports different groups and activities. Within a small area, it is what helps make up a community with churches, schools, and institutions that help bind the community together.

I see this here. We moved from Kits Beach, where we were really good friends with our neighbours there. Yet, as far as a sense of community, just after six months, we have gotten the sense that it is five times stronger here in Mount Pleasant.

[Joshua]

*What would make you think that, or say that?*

[Barry]

I come from the East Coast originally, just above Maine in the Maritimes. People there are very friendly. When I moved to Vancouver, and lived in Kits, I realized exactly how unfriendly people in Vancouver could be. They do not talk with one another, and so on.

You can break down this barrier, but as a rule, Vancouver isn’t a very friendly city. I’ve heard this from people all over the world who moved here...and people from the East Coast who’ve moved here.
We moved into this little hood here, and for the first two months, every time someone saw me coming or going, they would say, “Welcome to the neighbourhood!” or, “Wow! What a beautiful house!” and they would start a dialogue. To me, that’s big.

For Teresa, even though we have only been here six months, she just organized a community yard sale that she hopes to put on every year.

[Joshua]

How did it go?

[Teresa]

Good...It was the first year, so it may take a little time for everyone to trust it.

[Barry]

She was a little worked up because not everyone who said they were participate showed up...

[Teresa]

Well, it rained that morning...

[Barry]

...and it was a success.

[Teresa]

We are not there yet, but think we will grow comfortable enough to ask a neighbour to borrow an egg, for instance, rather than having to walk to the store.

[Joshua]

Where are you from Teresa?

[Teresa]

I am from Vancouver Island and grew up for part of my life on Denman Island. There was a population of 1,000 where everyone knew each other. So, coming to Vancouver was very different. This is why we grew really close with our neighbours in Kits...they were our social network.

[Barry]

We became best friends with our neighbours...As far a sense of community the three houses in a row, where we and all of our friends lived, it was amazing. Yet, for a decade, I really didn’t meet anyone else.
[Joshua]

What do you think some of the reasons were for things not being very friendly? You’ve already experienced Mount Pleasant in a positive light...comparing this locale with Kits, could you dive a bit into this cross-section?

[Barry]

Sure...Money. Money and status is the driving factor here. Kits and the greater west side is affluent, very affluent.

It’s hard to paint things with such a broad brush, but as a rule, I don’t find affluent communities to be as community-oriented or as friendly as mixed communities. When you are affluent, you don’t need your neighbour’s help.

Part of it is a class thing for sure. Part of it is behaviour perpetuating behaviour. I am a really friendly guy...but after a few months of living in a place like Kits and you’ve said hello to strangers who just give you weird looks, you stop doing it.

Intrinsically, people are more standoff-ish and cooler. Once you crack a barrier like this, there are great people everywhere...

[Joshua]

So, would you say that your outgoing nature is more reciprocated here in Mount Pleasant?

[Barry]

I wouldn’t use the term ‘reciprocated’...I was astonished at how friendly strangers were to me first.

[Joshua]

I should ask: When I say “Rainway,” do you understand what I am referring to?

[Teresa]

Yes.

[Barry]

The idea is to turn St. George into a one-way street, as opposed to a two-way, and to flip the closed lane into a stream/park and public green space, correct?

[Joshua]
Yes, and the ultimate result of the rainway could range from simply installing rain gardens alongside various portions of the street to actually de-paving half of the street and building a stream as you envision...even events like yards sales, can help. They provide opportunities for neighbours to meet and speak with one another and build trust. Can you tell me a bit more about how your yard sale event went?

[Teresa]

First off, it enable me to meet a lot of new people. In other cases, if people mentioned how they could not make it, they would spread the word and speak with their neighbours or their tenants about it. We had some houses on Carolina Street get together to agree to spend the money they would earn from the yard sale would be directly put into street gardening. I thought this was a really great initiative...sadly though, the person who was spearheading it got called away to work, so the cohesion that she brought with her was removed and they had to promise to try again next year.

There was certainly a very positive response about the idea. Not as many people committed who spoke positively about it, but I did feel that people were talking about it. I went door to door to tell people about it, and some people already knew about it by the time I got to their front door. There were 500 that I knocked on, so it did take me a while...

Most people at least listened to me and took the information. Very few people just said “no.” Ultimately, there was a good response and energy with the idea.

The last thing I would say is how since half the area I canvassed is made up of renters, many of them seemed not willing to commit, perhaps because of my status as a realtor causing them to feel disassociated. Whereas, the event was mostly made up of homeowners who have been living here for a number of years.

[Joshua]

Lets envision the future and how the street might change...speaking with your sets of unique experiences, how do you think this project might change interactions between people or your experiences in this neighbourhood?

[Barry]

As far as it being a convenience or detractor–all of a sudden, this will have been turned into one lane. Parking would become harder for us, since we live right on St. George Street...I am not personally worried about this, but as far as the street goes, that could cause concern for other residents and lead to a rejection.

I am in love with the idea though...
I see it becoming a gathering place...a place where people could interact with one another...

Exactly! I think it could totally provide for social cohesion...You'd be creating a park-like setting in such a condensed environment where you already have people walking the streets, people dropping their kids off at school, people walking their dogs.

One can head to a park, like the one we live near, but it's a massive park where everyone can go into their own space and be in their own little green world, so to speak. Whereas, creating the full vision of the Rainway, where half of the roadway is reclaimed and turned into a stream, walking path, benches, and so on...you would have one linear element that would attract everyone. Some residents might not want this increase or concentration of pedestrian traffic, but I think that it could create social cohesion since it would put people in direct contact with neighbours than in the current configuration.

The community does have to own it though...otherwise it could turn into somewhat of a trash receptacle and an attractor for drug use. The community would have to be behind it, which is where phasing could be a good idea. Starting small...and growing from something similar to the city's Green Streets program could work well.

Part of my opinion comes from the fact that I live right on the site of the Rainway, and I believe in community and supporting such efforts. I would be one of those people who would be willing to be a steward and help with gathering trash, weeding rain gardens, and help take care of the space. Of course I have a vested interest because I live right here...yet, even if I lived a half-block in, I would treat the amenity the same...

Just recently, we inquired about joining the community garden at Robson Park and we were told how there was a wait list of 70 people! 70?! How long will it take us to have a small plot over there?!

Eventually we will plant our own garden here and turn in the long strip of grass required by the city on the west side of our house into a garden—we did not want grass.

I would love to eventually run lavender there, and probably place a bench...
There was another community initiative that I would like to talk about [explains Country Lane initiative]. The Rainway would also look to ideas such at this one. Moving along St. George, there could be fingers that lead to the space...Let’s envision how this might make your lives different...

[Teresa]
Parking.

[Barry]
Agreed. But I also would say that it could create a change in an auditory sense. Hearing water and nature from an open window would be fantastic.

I believe there are communities in North Van that have such an amenity. Yet, North Vancouver is a much less urban environment than Mount Pleasant, for instance. Yards are bigger...there are more streams...people are connected more to nature trails. We are more in the middle of a city.

I think this idea would help to increase pedestrian traffic, with more dogs.

[Teresa]
Sometimes we don’t have a lot of privacy, so with regard to that, it could decrease this even more. The opposite side of this is how it would provide greater opportunities for people to have social interactions with others, and not be strictly confined to your house and yard...the opportunity for more interaction with people is why we wanted to be on a corner lot.

[Barry]
The other benefit in my mind is the visuals–it would be beautiful.

I would love to see if you have renderings, but I already have a picture in my mind of how it could look...the cherry blossoms in springtime are already unbelievable. I can picture them with a stream running by with moss and ferns and a path, and I know it would be very idyllic as long as its maintained.

I am a visual person–I am a photographer–and I believe that a lot of the people who like Vancouver are drawn to it because, as far as the big city goes, it is remarkably connected to nature. It’s west coast style nature versus the east, which is subtle with rolling hills and winding rivers. It’s softer. Here, everything is big and severe.

[Teresa]
The challenge would be to involve the neighbours who don’t want something like the Rainway. How do you involve the kinds of people you never see or meet in your neighbourhood? If they don’t want to be involved, inevitably someone else will have to steward their area.
I think that is almost to be expected. It’s going to be a particular group of people who care for it. Despite having only lived here for such a short period of time, I can confidently say how I don’t think the key element of stewardship would not be a problem to find here.

...It would be nice if a residential or commercial property along this street turned into something like Le Marché St. George at 28th. There are places similar up near Fraser, but it would be good to have something like that down here and along the future Rainway.

Their story is incredible...they supposedly sent out an email to the neighbourhood the day before they opened and next day, 30 families with kids showed up. Talk about a sense of community...everyone seems to love the place...except for the neighbour that’s right beside them. I can understand this point of view only because of how this was a quiet corner before and now is slammed with customers, every day, and all the time. It has become a huge hub for the blocks around it.

That is what I would love to see here! Or, even Broadway could be used for this type of place...

This would be great, but not everyone is always into such places. Take that neighbour I mentioned for instance...some do not want any added noise to their neighbourhood. However, I’ve had at least thirty conversations with other people from the neighbourhood and they love it! They go there every day.
Transcript of Susan Stevenson Interview

[Sitting in her office at Mount Pleasant Elementary School, we began this interview...]

[Joshua]

*Thank you for agreeing to meet with me today. I hoping we could talk a bit about this idea of social cohesion. Are you familiar with that term?*

[Susan]

I could guess what that means, but, no, I am not familiar with the term, per se.

[Joshua]

*Okay. I will read the primary definition used with my thesis... [reads definition]. So, I was wondering in your words if you could explain your impression of social cohesion that exists currently in Mount Pleasant?*

[Susan]

Well, I have been a part of this community since 1999, when I started here as a teacher. So, I’ve really seen what you are talking about–this social cohesion–I’ve seen it change in the last 13 to 14 years. Celebrate Mount Pleasant Days is a perfect example of this, right: It was an amazing community event that has all of these things. It has trust, it has people chipping in; it has a real community sense. We have multicultural music and people from all over the world–different people coming together to celebrate what we consider to be our neighbourhood.

Yeah, there is the whole aspect of fundraising thrown in there, but that is another aspect to having a common goal. Take, for instance, our parents and their going door to door about fundraising for this new playground. They see this as not just for our school, but for our community, so I see this project as another thing that could help with building social cohesion.

This rainway project is amazing regarding what it’s doing for our community and our students. I am working with Naomi [Steinberg] who is coming here tomorrow to work with five kids so that they can prepare. They are planning to take the whole school outside where, using a bullhorn, they are going to explain the project, explain why they are involved, and explain why they are doing this. They are going to show this to their fellow students and the superintendent of our school board.

So, yes, it’s happening. Our kids are learning skills, and these kids are the future. These are the kids that are living here. They are part of multigenerational families living here and they will probably remain here too. This is their home. All of these little things that are happening are bringing us together.
I started by saying how I have noticed a change in the neighbourhood. In 1999, we did not have these kinds of events and we didn’t have this kind of willingness to come together and do something altruistic for our community.

[Joshua]

Would you say that this act to want to do something in the community is related to a physical place or physical thing? You’ve mentioned the playground and you’ve mentioned the rainway…are those the strongest instances of seeing the community galvanized. Do we see that we need a place or a thing to get people to act? Or, can you think of instances of people organizing around an idea, that’s not yet a tangible thing such as a swing-set of the street?

[Susan]

I have a very skewed view of this, because I am a Principal of an elementary school where we have a common interest. We come together for different things—sometimes we come together to eat a meal because we’ve had a great year together. There is always some sort of theme.

I have a group of a parents that I work with who are typically organizing these kinds of events, who say, “yes we need a welcome barbecue, and yes, we need a potluck.” One of our school goals is to celebrate diversity. So, this year our year-end potluck is going to celebrate this theme. We have parents that are going to bring in food and wear clothing indicative of their cultures while their kids are going to be performing something from their cultures.

Like I said, I have somewhat of a skewed view, because we are all here because of our children, because of THE children. So, we are sort of captive audience...

[Joshua]

It does seem from my background and my research that when people have something they see or can hold on to physically, that it helps...

[Susan]

For sure... I absolutely do see that. One or two years ago, when I found out about this initiative for a new playground, I thought, “Wow, look at all these people participating!” Concerning Mount Pleasant Days, this was my third year as the administrator, though I was also involved with it years ago when I was a project teacher here. It used be organized by the Mount Pleasant Community Centre, which used to be off of Ontario and 16th. Even though it was over there near Simon Fraser Elementary, they still held Mount Pleasant Days here. But when the built the new building, they hosted one of the Mount Pleasant Days at their new site, but it didn’t work well. That’s when our parents took over, which was about five years ago.
Now that our parents are taking this on, they are branding it and ramping it up. Every year it keeps getting better and better. This year, they brought in ponies and the dunk tank...and the parents on the PAC deserve the credit for this. This year they hoped to make five grand; next year they hope to make ten. This is all because they are really coming together.

[Joshua]

I am curious about the idea that the success of these types of projects is contingent upon the strength of a PAC or the interest of a Principal. I've worked with schools in the past and it can be night and day between schools--where one school be very strong with its groundswell and its grassroots moves to improve community, where another might be very insular and they don't reach out. I wonder how much of this has to do with these two groups?

[Susan]

I would say a lot. I would absolutely say a lot. When I first became an administrator, I was a Vice Principal at another school. Even though there was a similar demographic with a very similar capacity to Mount Pleasant--it had that diversity piece, it had multicultural families, it had the full spectrum of families in poverty to higher income families--it didn’t have the same community feel. I was a Vice Principal and not a Principal yet, but tried to get a few things like that started...but these things take time, and energy, and trust, and relationships. When I came back here as an administrator, I already had a sense of the community and the parents knew me from before. This made it sort of seamless to step back in and be a part of this.

From here it snowballed, in this unique little place in the city.

[Joshua]

For my work, I am hoping to use Mount Pleasant as a case to follow...

[Susan]

It’s not without its problems too though. Yet, they are growing farther and fewer between: we’ve not had needles on our playground like we used to; we don’t have condoms on our playground like we used to...but I have gotten chased actually. Just the other day, I almost phoned the police about a drunk man who became mad at me when I asked him to move so that the kids could play soccer on the field. He was passed out, so I had to go out there and try to get him to move.

I am going to put it on the table--the Nightingale Elementary Principal and I have been talking about this--the drug rehab centre that is going in above the Biltmore is a big concern. This is especially true for Nightingale because of their location. There is literally one building between them and the centre. Look, I am having to deal with the alcohol homeless guys, while she’ll have to deal with the drug addicts.
On the other hand, I understand that social facilities have to be somewhere in the city, but next to an elementary school? There have been issues related to this at my school. For instance, there will be swearing that the kids overhear. Or, they will be passed out and the kids will think there is a “dead guy” on the playground. I get this at least two or three times each year.

It’s an interesting community. It is what it is, and that is unique. There were crack houses across the street from the school in 2002 that are now multi-million dollar condos. It’s definitely a changing neighbourhood.

[Joshua]

Have you spoken with the Nightingale Principal about some of this work? For instance, the playground or the rainway...I am curious how you talk about it.

[Susan]

Not the playground, because they’ve got their playground and we’ve got our playground...even though we cross some boundaries, Broadway is quite a huge divider. Regarding Celebrate Mount Pleasant Days and the Rainway, we absolutely talk. With the rainway, we’ve done things together, such as parades. This is something that will effect both of our schools and is part of our conversation.

For Celebrate Mount Pleasant Days, I printed 250 handbills for her to distribute to all of her families. The result was that there were Nightingale kids here during the event too. We support each other’s communities.

We also work together with a group called Arts in Our Hearts. They are a philanthropy group that raises money to bring world-class artists, if they are traveling through Vancouver, to come and do a talk or day performance at either of our schools. When it is at Nightingale Elementary, our students will walk up there. If it is at Mount Pleasant Elementary, their kids will join us down here. Because we only have 500 students between the two of us, we can all fit into one of our gyms.

We do this with Arts in Our Hearts several times each year and that is free for us. They fundraise and in return we have a pianist or a trio come. It is really amazing. When we bring in other events that require some funding we will split the cost between the two of us: if it costs $600, we will pay $300 and they will pay $300.

We do a lot together to build community. Interestingly, Nightingale’s kids end up moving on to Tupper, while our kids end up going to Van Tech. The fact that they end up going to these different high schools is a bit unfortunate, because they become so close because these kids live in the same community. A lot of them do remain friends though—they end up doing sports together, for instance.

[Joshua]
I am going to shift gears now and talk about future prospects and things that will require a bit of foresight...Given the current circumstances related to a strong PAC and the level of community engagement that appears to be improving, could you possibly project for me how you see things going?

[Susan]

Are you referring to the community or the school?

[Joshua]

I would say both. The idea behind the rainway is to create an amenity for everyone, and have their be cross-pollination, for instance. This appears to already be happening, so could you speak more about this and how you foresee it continuing?

[Susan]

This whole project has inspired a few children who want to see it come to fruition in their lifetimes. They want to be involved and be able to make a difference in their community. We are calling them our “stewards.” I am working with Naomi tomorrow to work on how we are going to present information to our superintendent. We want him to understand how important this is to the students.

A couple of the stewards are in grade seven now, so they are going to be leaving our school and going on to Van Tech. Yet, they will still live here, and still will want to be involved. We need to figure out how to facilitate this, while they need to build trust with individuals outside the school. This is where projects, such as artist-in-residence program that we just submitted an application to, are important. It would allow us to build relationships between these kids and artists in the community that are working on this so the students no longer need the school to continue with their work with the broader community.

These children understand that this is the type of thing that cannot happen overnight. They want to be there at the Creek Forum in September, even though they will then be in high school. It is the community artists that are going to be advocating for them and communicating with them and their parents to, for instance, help organize their having the day off from school at Van Tech so that they can be there and be a part of what’s important for their community.

We want to stay involved to help these students take their message to City Hall and show why this project is important for their community. This is going above and beyond curriculum, yet it is also very highly connected to curriculum in many ways. I have a couple of teachers that really see the value in this and are really embracing this and inviting this project into the school because of its importance.

This doesn’t happen overnight, takes slow small steps, but has so much potential and value and so I support it as much as I can. I also support the community artists involved with this because I see them as an important component to the life skills that we are teaching these kids.
[Joshua]

It feels as though artists play a really strong role, with such projects as the Rainway...

[Susan]

Well, we have the mural on the street, which we recently brought into the school’s front hallway. I commissioned Melanie to paint fish along a blank white wall and up the stairs. I am not sure if this begins to answer your question...

[Joshua]

It’s okay. I understand that art provides the aesthetic, the oral narrative...how about you speak more to these two things?

[Susan]

Another reason that I am supporting this project so strongly is because of how it is intertwined with our school goals. This year we have added an aboriginal piece to our school goals, and I see the support of that within the Rainway project. At this year’s Celebrate Mount Pleasant Days, we began the event for the first time by honouring the peoples who were here first. I feel bad about not doing this until now.

The positive is how the aboriginal piece is about connecting art with storytelling. Oral language is a focus in this year’s curriculum, so we included the Rainway in a few of the classes. We brought in Naomi Steinberg and Shahira Sakiyama to help the students write a nonfiction piece about what they want for their community. For next year, our staff and our parents have decided that oral language is going to be the focus. An artist-in-residence could help with this work...

[Joshua]

...This seems as though it would enrich both pursuits, and give work in the classroom and with the Rainway each some more momentum.

[Susan]

Our oral language curriculum will have a focus on global fine art. We want to expose our students to as many opportunities as we can to see art, community art, gallery art, aboriginal art...so that they can have richer experiences to build their oral language skills. Celebrating the oral tradition by inviting our superintendent to come and hear kids talk about this Rainway is what this is about. Inviting an aboriginal person to come and talk about their oral tradition and about the land and how important the creek and the water were for the people that lived here first is also what this is about.

[Joshua]
Can you think of instances in Mount Pleasant or in other communities throughout your history as a teacher and administrator where social cohesion has been prevalent?

[Susan]

I’ve been here for a long time. I can go back to my previous experiences...I could talk about my own personal community with such things that bring people together as block parties can, but the main thing in the Mount Pleasant Community have been the Rainway, Celebrate Mount Pleasant Days, and the new playground initiative.

Kingsgate Mall highlights another community connection piece. We support them and they support us in many, many ways. Little things like: the Kingsgate Mall manager will buy every kid in our school a pumpkin at Halloween. The kids decorate the pumpkins and we march, with parents and a police escort, the pumpkins to the mall where they are put on display. This is social cohesion, right? This is people coming together. This is them supporting us and us supporting our community.

Because we are an inner city school, I see my role as the Principal to facilitate the three primary goals of urban schools. The first is to infuse literacy and focus on it wherever we can. Youth and family workers, neighbourhood workers, staff...all of these people are focused on supporting these goals. The second inner city goal is social responsibility. Improving self-esteem by bring students out into the community and teaching them responsibility provides opportunities for developing this more than they might be exposed to in their homes. The third is community engagement. This is at the heart of what we do. This is what Mount Pleasant, and Strathcona, and Nightingale, and the fourteen other inner city schools embrace.

We have a neighbourhood worker who brings in nurses to do presentations with parents. She works with community agencies to give our most needy families gifts around Christmas time. She gets all the snacks for our students that have to stay after school for homework club or band club. Every kid is given food...that’s what a neighbourhood worker does. Often, we are talking with our community partners about supporting such programs as free tutoring.

Community engagement is huge. It’s what we are always thinking about; it’s what we are always talking about. We have team meetings almost every week, where the four of us–the Principal, the project teacher, the neighbourhood worker, and the family worker– the “inner city team,” meet to discuss how we can support our most needy and at-risk families. How are we engaging them? How are we getting them into our school? It’s a big piece of what we do.

[Joshua]

I would like to finish by hearing an anecdotal story from you about something relayed to you from a student, a member of the PAC, related to the Rainway in the theme of what we’ve been discussing.

[Susan]
I’m thinking of a family that just lives a few houses away on seventh avenue. They would get up on their roof to take photographs of the whole process, then would show that at the parents’ meetings. They would get their kids out there on the weekend to help sweep, or have them be involved physically in some way. I hear the buzz from parents; I hear the excitement; and I hear people talking about it when they come together. It’s one of those things, like you said, that is a focus for us that brings people together in conversation.

We had a “town hall” type of meeting here a couple of years ago where people who live in the neighbourhood and wanted to be part of it got together. It was quite exciting to feel the buzz that they had then as they imagined the possibilities for the Rainway.

A lot has happened. Two years ago at Celebrate Mount Pleasant Days we had a workshop where they were doing a similar thing, where participants were drawing what they wanted to have part of the Rainway.

If I had to come up with only one story, I think it would be watching the development of the kids that are involved as creek stewards. They have already met with Vancouver Foundation to share their visions and speak on behalf of their community. These kids, from nine to twelve years old talking about why this buried creek is so important to them...This is something that is going to continue. They hope to next speak in front of an audience at City Hall.
Transcript of Naomi Steinberg Interview

[Starting at the Storyteller’s Bench in Robson Park, next to the Mount Pleasant Family Centre, we began this interview while walking...]

[Joshua]

I would like to start with this idea of social cohesion. I would like to hear from you what comes to mind when you think of the Rainway or Mount Pleasant in its entirety, with regards to this idea...

[Naomi]

My mind bubbles over with metaphors... If we are talking about social cohesion, it’s a network that is resilient, flexible, and malleable at will, and is made up of lots of drops of water. This community has so many different voices and so many different needs...here at the headwaters, this is quite obvious: we’ve got co-op housing; we’ve got the Family Centre; we’ve got the oldest Boys & Girls Club; we’ve got a car dealership; we’ve got Odyssey; and we’ve got this pending opportunity.

If we can find a way to have a container for all of these kinds of voices, and figure out what this is going to look like, it becomes a great example of “cohesion” or what the result would be of something cohesive.

[Joshua]

Let’s talk about social cohesion with regard to an event in Mount Pleasant that might highlight what you’ve begun to talk about...

[Naomi]

This thing, that is about bringing people together and holding a “safe” space for conversation and dialogue to move forward with common understanding...Are you talking about this sort of thing?

[Joshua]

Yes. What kind of an event has provided this?

[Naomi]

There are all kinds of things that I have been involved in...There have been parades with costuming and involvement with elementary schools through drumming and bringing in outside artists. I have such a strong memory of crossing Broadway, fully costumed myself, with classes of children who had just walked along the Rainway. We didn’t have permits or anything like this—we just went for a walk that was highly visible and joyous. That’s the kind of thing that helps to build cohesion.
Involving artists, community members, and cultural leaders within the community means there is facial recognition. When you are working with children, this is important. This is also important in a neighbourly sense.

There are so many initiatives here...it’s such a rich neighbourhood, it’s important we represent one another within our conversations and share our spheres of influence.

One of the things that I love about the Rainway project is how we are deferring to something greater than all of our combined egos, namely: topography. Having this happen during the Anthropocene Epoch is very exciting!

Events that speak to that are part of what really helps bring about social cohesion...

[Joshua]

How do you think that events that manifest themselves in terms of a physical space or thing is valuable to galvanizing community?

[Naomi]

I think people need an embodied experience...we need practice being in relationships with one another...we need practice being able to see each other for who we are...and we also need practice with our memory. There’s a lot of dumbing down that can take place in society–people often talk of things being schooled out of them. With this, our memories can be eroded.

Having something such as a Storyteller’s Bench, a mural, fish that children have painted and are put up on school fences–these are little triggers, little mnemonic devices that bring about the: “oh yeah, I remember when...” And not only this, but remembering being part of something, and that brings joy.

That helps to galvanize community. Bringing critical reflection to an idea also helps. Having workshops where people are reflecting on something that has occurred and are able to link it back to something like topography...to something like culture-making...so something like neighbourliness...then, I think metaphors, in whatever the form, become much sharper in focus.

[Stop in the round-about, the “gather round” to continue the interview...]

[Joshua]

What experiences have you had outside this community that might help to shed light on perhaps what’s next with the Rainway project and how it might pan out?

[Naomi]
I worked with the Vancouver Society of Storytelling on a project known as Elemental. This project took place in five communities—one was here, Elemental: Earth, and took form as the cob Storyteller’s Bench. I would like to speak to Elemental: Fire, which took place in the Moberly community.

[Joshua]

Tell me about the impact the project had upon that community...

[Naomi]

I finished working with the grade 5/6 class in June 2011. In September of that year, I went to find them in their class...after the workshop had ended...after they had planted their onions in the Moberly Gardens...after they had told their food-security stories at the storytelling festival...

September rolled around, and when I went to check on the onions, we found out that all had died. We had thoughts that such a thing could happen...so, I immediately went to check on the students in their classroom. Without an appointment, I went to Trudeau Elementary and found them in their grade 6/7 classrooms and asked, about what had happened. How they responded was so delightful. They all retold their stories, shouted their slogans, and remembered the work that we had done.

This speaks to the continuity that existed here. A lot of young artists already feel creativity but often do not know how to express it, so they can feel weird. Some of their acting out that happens, happens because they feel ostracized. To have someone as myself to come in and validate their intuition and feelings and expressions helps to shape them.

[Joshua]

Are you saying that you helped to give some individuals an opportunity to feel as though they had a role to play?

[Naomi]

That’s right. It helped to break down some of the barriers that might otherwise lead to feelings of isolation. In this way, because there was refinement of their expressions, it is easier for this type of individual, myself included, to be understood.

[Begin to talk and stroll again...]

[Joshua]

How have you seen this play out in adults?

[Naomi]

It’s the same scenario really...
If we are talking about cohesion, contemporary society is a mixed bag. We are currently standing on Coast Salish territory. Before that, this was a land of trees and salmonberries and crows...getting along...the truth of our current situation is how we have people of all nations figuring it out right here. So, if we are going to be talking about social cohesion, we have to speak to this.

I am just starting a storytelling workshop in Burnaby. The Intercultural Planning Table, who work with immigrant and refugee communities, is who I have been working with. I really enjoy this kind of workshop, working with people with those sorts of experiences. Everything I spoke of regarding the work I have done with the children, is true also with this kind of adult community.

I’ve worked with the Suzuki Elders. These are folks—all grandparents—who work to represent David Suzuki’s work in the community.

For me, as one who works with storytelling, an ephemeral art, I often think: How does one give that a concrete form when one recognizes how it is helpful to have a memory trigger? It’s helpful to have a place to come back to...It’s helpful to have a forum, space, container...something to help bring those stories out and to be heard.

The listening space is not that easy to achieve. The place where it is quiet enough, people are warm enough, well-fed enough, focused enough, not anxious...all of this...where one is willing to share their voice, isn’t always easy to come by.

I don’t mean to complain about the lack of performance spaces in the City of Vancouver...

[Joshua]

I am curious about the idea of perpetuity, of having these triggers that you speak of...this is one of the reasons I am in the profession of working with public space. I am curious of your impression of needing to have such spaces last so that one can have these triggers for an indefinite period of time...

[Naomi]

Language is not static. We know this. And, everything erodes...

The invitation to engagement is important. Sometimes when I work with young adults, I have to remember these things. I think that it is not a “this or that” situation, but rather a “this and that” one. Having our built environment be responsive to the conversation and the amenities to allow for that kind of flexibility is important. Inevitably, voices will drop in and out of this conversation. It will happen through death, natural cause...so, one must factor in the mystery.

There are ways of being able to cope with the unknowns. We use all kinds of words to try and encapsulate this, such as “resilience,” and “cohesion”...Take the story of the big old oak next to a blade of grass: which one survives the windstorm? The blade of grass, because it can bend, right?
Some texts on the topic of resilience speak to the idea of policy as simply a question. Acting on policy is therefore, a test, or a way to feel one’s way through uncertainties...

That’s beautiful! The notion of having to live the question...Am I going to win the race? Well, I won’t know unless I run. That notion of policy being the question could help planners to always live the question to find answers that are responsive to the ever-changing present moment.

I think artists can be helpful with this. There is a culture somewhere where carpets are woven but never finished. Or, there is always a mistake in them that is a part of it...

To go much deeper on this subject, I should say that the more we get in touch with this type of thing, the more we’ll get in touch with death, which will make us healthier as a society.

This speaks really well to the idea of phasing, for instance, the implementation of the Rainway. There could be a whole series of steps that could potentially arrive at a set result, but perhaps its also about something that keeps growing...maybe it’s about the process and allowing, at some point, allowing the community to fully take over with the crafting of it...

And what would that mean in terms of building trust? Now, that’s amazing.

There’s a successful program that comes out of Portland called City Repair where this is somewhat the premise. Art is a huge component of their work. It promotes the idea that everyone has creativity...

You would drive yourself nuts otherwise. How can you quantify something that is not quantifiable? You could drive yourself nuts until you become one of those ingenious, creative mathematicians that uncovers radical big ideas that are totally elegant. What you are talking about in this case is art...and artifice.
Let’s talk about the “what next?” and how we continue to build this groundswell of connection and engagement within Mount Pleasant with this type of a project. We don’t have to specifically discuss the Rainway in this context unless you wish to...

[Naomi]

There’s a number of workshops already booked and a number of other events that we are already plugged into. For example, the Vancouver Draw Down has one of its venues as the Mount Pleasant Neighbourhood House. They are an important ally as a group doing so much important work with the Broadway East Revitalization. On June 15th, one of the artists who have been very involved with the Rainway, will be facilitating drawing on fish forms that can then be suspended from trees.

We thought through, in such cases as this, the application of the event into the future. Such workshops that do not think into the future often create a good deal of garbage that has no use outside the event. We are trying to embody sustainability with our practice and process.

We also have the street workshops with youth at the Neighbourhood House. We are working with three different age groups. The older age group, which is made up of 13 to 18 year-olds, is going to create silkscreens with imagery of local flora, fauna, indigenous wisdoms and practices, contemporary culture, youth expressions, the Rainway, the importance of water...whatever. These will then be used to decorate the public piano that happened through CityStudio which could be housed throughout Mount Pleasant. One option would be to house it at Odyssey to accompany their programs around reducing youth isolation and help them deal with whatever is hurting them through music.

This hurt often comes from a disassociation with the natural world. Because they are dislocated and not rooted anywhere, a project that is responsive to topography through such things as stories of the landscape can be very important. Memory triggers coming from physical space take much longer to erode than any public art intervention, even in this the Anthropocene Epoch.

If we are really trying to re-skill, in terms of storytelling and story-listening, then we are less at risk of suffering the triple loss of: landscape, stories associated with landscape, and the teaching that is inherent in these stories. The fact that there is a cedar tree on the lot of the Destination Auto car lot is exciting to me because of how much of what I know is possible to learn from a cedar tree...weaving...the first Gore-Tex...and on and on and on...

Thinking back to the meeting we had in their parking lot still gets me excited. It helped me to understand a little bit more the complex, yet possible, traffic flow that could happen with the redevelopment of their property...and what could happen with the back alley...the street...the street closure...

You asked me how important is it to have physical intervention. It is extremely important, whether it is a physical legacy or a walking tour...I think of the desire line, I think of lay lines and dousing rods...all of
this being related to that magnetic pull. How is that the salmon have returned to Still Creek after 75 years? It wasn’t born there. How did it know how to come back?

So, having a bird’s eye view would help us make some of the very concrete, hardscape changes in a way that met the needs of the car dealership, Odyssey, the Boys & Girls Club, parents picking up their children, the co-op, the Family Centre...because it is one of those blocks where the city’s two grids meet.

[Joshua]

It’s all because of the diagonal road...

[Naomi]

...that beautiful, historic transportation corridor from New Westminster and termination right here. It would be bad form to not incorporate all of this history as well. We should celebrate Vancouver’s heritage despite it not seeming to be the habit currently.

[Joshua]

I would like to conclude by hearing a story from you or from someone you have worked with that relates in some way to what we’ve discussed today...

[Naomi]

First off, I am squealed at a lot by the neighbourhood kids... “Hi Naomi!” which says a lot and is awesome...I’ve had people talk about learning how to make cob benches in other neighbourhoods for the same kinds of reasons that the Vancouver Society of Storytelling had for theirs...it’s hard to say because there has been so much support...

[Joshua]

Tell me something that comes to mind that might not be directly from you, but something that instead flows through you, or something profound that was relayed to you...

[Naomi]

Squamish Elder Wendy Charbonneau told stories as part of our “design” process for the Storyteller’s Bench. When she saw the location before we even opened up the ground to build that bench, she looked at the cedar I mentioned earlier and said, “Oh, there is a lot of medicine in that tree...”

Sometime later, after the bench was built, a bunch of us gathered on the site and I invited Wendy to come because she had been a part of the process. We all met up at the bench and she had brought a bit of tobacco, and totally unselfconsciously did her thing, said thanks with song...One of the neighbours in the co-op right there is Metis—I didn’t know she was—and was proud to be asked to hold Wendy’s drum while this went on.
As I am speaking of this now, it is reminding me of my commitment to represent that aspect of spirit as well. This is part of what brings us together, holds us, offers that something greater than the sum of our egos...while still maintaining its ephemeral nature too.

[Joshua]

For the sake of audio, could you tell me what Wendy’s “thing” was?

[Naomi]

Right...she brought tobacco that she offered to the four cardinal directions. She said a prayer that was so unassuming. We arrived, engaged in some conversation, and she all-of-a-sudden went and offered her blessing. That woman knows so much...