Laneway Revitalization Through The Lens Of Community Capital

by

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Abstract

This project explores whether and how laneway revitalization is contributing to sustainable community development (SCD). Analysis of six laneway revitalization programs is undertaken using the Community Capital Scan, a tool developed to aid planning for sustainable community development through a collaboration between researchers at Telos: The Brabant Centre for Sustainable Development at Tilburg University in the Netherlands, and the Centre for Sustainable Community Development at Simon Fraser University, Vancouver, Canada. Results show that thoughtful laneway revitalization can and does contribute to growth of natural, physical, economic, social, cultural and human capital as these are defined by the Community Capital Framework. Analysis produces a set of transferable tools and strategies that planners can use to advance a range of SCD goals through laneway revitalization, recommendations for strengthening laneway revitalization as an SCD tool, and suggestions for increasing the functionality of the Community Capital Scan for comparison and measurement.

Keywords: Laneway revitalization; alley greening; laneway activation; laneway animation; sustainable community development, Community Capital

I dedicate this to Hector, my love, hero, and best friend; and to Raine, Valerie, and Walter, whose love is my foundation.

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List of Abbreviations

CBD	Central Business District (Melbourne, Australia)
CC Scan	Community Capital Scan
CCF	Community Capital Framework
CSCD	Centre for Sustainable Community Development
LWR	Laneway revitalization
NGO	Non-governmental organization
PPP Scan	People-Planet-Profit Scan
SBS	Sustainability Balance Sheet
SCD	Sustainable Community Development
SFU	Simon Fraser University
UHI	Urban Heat Island

Chapter 1. Introduction

1.1. Background and Context

The term *sustainable development* first entered the public consciousness in 1987, when the Brundtland Commission's UN report *Our Common Future* called for "development that meets the needs of the present without compromising the ability of future generations to meet their own needs"[1]. This definition is continually refined and redefined to reflect a more nuanced understanding of its meaning. For example, Agyeman et al. have identified a critical social justice component of sustainability, calling for "the need to ensure a better quality of life for all, now and into the future, in a just and equitable manner, whilst living within the limits of supporting ecosystems".[2] The definition's basic premises have also been questioned: For example, Beckerman[3] points out that "needs" is a subjective concept that provides no clear guidance, as needs will be regarded differently by people at different points in time, at different income levels, and with different cultural and national backgrounds. The definition's anthropocentric focus has been contested by Arne Naess, whose "Deep Ecology" school of thought argues that species and ecosystems are valuable in their own right, independent of its utility to the human species. Ecological economists like Rees and Jackson question whether never-ending economic growth is even possible on a planet where "the human enterprise is exploiting natural systems faster than they can regenerate" and the "wealthiest 20 percent of the human family appropriates almost 80 percent of the world's resources and generates most of its carbon emissions from fossil fuels".[4] Instead, they argue, our focus ought to be on creating a new paradigm of sufficiency, a planned

[1] United Nations World Commission on Environment and Development (1987).
[2] Agyeman, Bullard, and Evans (2003), p. 5.
[3] Beckerman (1994).
[4] Quotation is from Moore and Rees (2013), p. 42; see also Jackson (2009).

contraction of the world economy to stem ecological decline, and redistribution of wealth to alleviate poverty[5].

While these lofty debates continue and the world's most powerful nations continue to hamstring real progress of meaningful action on our most pressing sustainability challenge of all—climate change—it is increasingly clear that, even though action at multiple scales remains critical, the most promising field for action to achieve even "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" is at the level of the community[6]. The key question that forward-thinking planners wrestle with—how to operationalize sustainable development at the community level—is the central concern of sustainable community development (SCD)[7].

Meanwhile, the past decade has seen many communities start to reconsider the possibilities of an element of urban form that are regarded by many people as non-places at best and maintenance liabilities at worst: laneways. Also known as alleys, rear lanes, right-of-ways, and in French, as *ruelles*, laneways are the typically unnamed, narrower, secondary-access streets found between or behind homes and businesses in communities ranging from small towns to great cities. Laneway revitalization (LWR) programs are being devised to make them more appealing places and to derive additional social, economic, environmental uses from them. As with almost any new city initiative (and not surprisingly) proponents of LWR emphasize the contributions these programs make to the advancement of SCD.

1.2. Research Questions

This project is designed to answer the following research questions:

- What is laneway revitalization, and how is it being applied?

[5] Moore and Rees (2013); Jackson (2009).
[6] Roseland (2012).
[7] SCD as defined by the Community Capital Framework will be explored more fully in Chapter 2.

- Is it contributing to SCD, and if so, how? What transferable tools and strategies does it offer?
- How might laneway revitalization be strengthened as a tool for SCD?

To carry out this analysis, this project will examine six laneway revitalization programs using the Community Capital Scan, a web-based tool that is the product of a recent collaboration by the Centre for Sustainable Community Development (CSCD) in Canada and Telos: The Brabant Centre for Sustainable Development in the Netherlands. Although based on Roseland's Community Capital Framework that has been long been a core component of the CSCD's teaching and research program and closely modelled after its Telos progenitor, the People-Planet-Profit Scan, the Community Capital Scan tool is still new—which provides a good opportunity to consider the following additional research question:

- What does this project's use of the Community Capital Scan as a tool for analysis suggest about the Scan itself, and how it might be built upon in future versions?

1.3. Research Objectives

The products of this study will include an evaluation of the SCD contributions of six diverse and well-publicized laneway revitalization programs, a package of transferable tools and strategies that citizens and local government can use to advance specific SCD objectives, a set of recommendations for strengthening LWR as a tool for SCD, and some concrete suggestions for future versions of the Community Capital Scan.

1.4. Project Organization

Subsequent sections of this paper are organized as follows. **Chapter 1: Introduction** will close with a brief history of laneways, as a constant but continually evolving element of urban form as revealed in the academic literature, from their origins in ancient cities to their presence in Western human settlements today. It also discusses the evolution of attitudes toward laneways, and how these are manifesting in laneway

revitalization projects. **Chapter 2: Method** will explicate the methodology used for this analysis; introduce my sample of six laneway revitalization programs; introduce the Community Capital Scan as a means of analysis and explain its origins, purpose and prior use; and explain some methodological decisions I made in order to apply it in this context. **Chapter 3: Community Capital Scan Results** presents the results obtained by subjecting the six LWR programs to the Community Capital Scan. Each case is introduced with some critical contextual information. **Chapter 4: Analysis** returns to this study's laneway revitalization-related research questions by looking at all of the examined programs in tandem. It presents a package of transferable tools and strategies extracted from the Community Capital Scan Analysis, reflects on LWR as a means for advancing SCD, and offers some recommendations for strengthening it as such. **Chapter 5: Conclusions and Discussion** contains my reflections on the performance and suitability of this tool for this type of analysis, and offers suggestions for possible enhancements to the Scan's user-friendliness and functionality in future versions. It also recaps the main findings of this study, acknowledges its limitations, and highlights areas where LWR could benefit from further research.

1.5. Our Long Relationship With Laneways

We turn now to an examination of the origins, function and evolution of laneways in Western[8] settlements and culture.

Ancient Origins

Differentiated from streets by their width, intensity of use, and purpose, laneways have been a common element in urban form for more than four millennia. As early as 2500 BCE, narrow lanes connected the housing blocks of symmetrical, walled Chinese

[8] This paper restricts its survey of laneway history to those that precede and influence the development of Western community planning. This is both to keep this project manageable and because to some extent, laneways in non-Western cities served and serve different purposes and are imbued with different cultural meanings. Laneways and their uses and meanings in non-Western contexts (e.g. Islamic, Japanese) are discussed in Mortada (2003) and Kennedy (2012). Also to note: Although I realize that North America includes Mexico, I will be using the term "North America" and "North American" in this paper as a shorthand to refer to Canada and the United States of America.

cities.[9] Lanes are also evident in the large urban centers of the highly advanced Indus Valley Civilization, which flourished around 2600–1900 BCE in what is now Pakistan, parts of India, Afghanistan and Iran. For example, laneways branched off main streets at right angles, leading to courtyards and home entrances, in the 35,000-strong city of Mohenjo-Daro.[10]

Laneways are also found in ancient Egyptian, Indonesian, Greek, and Roman communities,[11] albeit in some different forms than we know today. In the highly planned, grid-like streets of the ancient Greek city of Piraeus, for example, laneways were constructed as steps to accommodate its very rugged terrain.[12] In the more organically developing street networks of ancient Rome, pedestrian-only laneways known as *itinera* offered welcome respite from the ceaseless conflict with vehicle traffic that choked larger roads and that ultimately prompted Julius Caesar to ban most transport carts from the city during daylight hours.[13]

Medieval Period

Following the 5th Century collapse of the western Roman empire, the country patterns of many village settlements' paths, trails and lanes became the organic street networks of medieval communities.[14] But as the primarily agricultural economy of Western Europe became urbanized under the influence of medieval feudalism, planned communities re-emerged – as newly planted towns, as communities that had previously served as military bases (burgs), and as new, heavily fortified bastide towns of France, England and Wales.[15] Whether communities developed organically, were planned, or resulted from a fusion of both types, laneways were as common as walled perimeters, towers, gates, streets, churches, administrative buildings, residences, private gardens,

[9] Hodge & Gordon (2007).
[10] Morris (1993).
[11] Martin (2002).
[12] Hodge & Gordon (2007). For an example of stepped lanes in Piraeus, see http://tinyurl.com/nmmq4jx
[13] Morris (1993).
[14] Kostof (2005), Morris (1993).
[15] Morris (1993).

and market places. They often formed as narrow passageways off main streets to allow access to new minor streets and back gardens. Navigated entirely on foot and by pack animal until the late Middle Ages, lanes and larger streets alike were continually subject to gradual encroachment by the upper floors of private buildings and deterioriation from increasing use by pedestrians, horseback riders, and horse-drawn traffic.[16]

Renaissance Influence

As the Renaissance re-ignited interest in classical art forms, scientists and explorers expanded knowledge of the physical world, cities swelled, and urbanists rejected asymmetrical informality and sought balance and beauty. In Continental Europe, planners of new or made-over districts created grand avenues (e.g. Berlin's Unter den Linden and Paris's Champs Elysees), punctuated by fountains, obelisks, arches and monuments. They experimented with creative variations on grid layouts (e.g. Charleville, France, 1608) and radial alternatives (e.g. the 5-pointed radial star-shaped layout of Phillippeville, Belgium).[17] Many laneways of old survived these civic space makeovers to become cherished elements of contemporary European cities.

The British Mews

Laneways took a slightly different turn in England. By the mid-1600s, London laneways were typical of many medieval cities—narrow, meandering and sometimes treacherous for horses and wheeled traffic.[18] But the infamous Great Fire consumed much of London in 1666. During the reconstruction effort, new standards were established for widths, construction, and building heights on laneways and streets. The city's West End was redrawn into large estates, which became occupied by mansions of the wealthy during the Industrial Revolution. Out of sight of the mansions' graceful, street-facing facades were placed the essential but messy functions—servants' living quarters, stables, bird coops, and the like. These were accessed from narrow laneways known as *mews*. [19] This British term dates from at least the 17th Century, and which

[16] Morris (1993).
[17] Morris (1993).
[18] Morris (1993).
[19] Morris (1993).

came from the French *muer,* which refers to birds' cyclical loss of feathers, recalls the siting of falconry birds in backstreet coops since at least the 14th Century.

By 1805, mews had come to mean "street of former stables converted to human habitations," and the advent of mass production, the rise of the automobile, and the emergence of a middle class went on to produce sea changes in the way land was used. Today, mews host some of the most desirable addresses in London and have become a tourist attraction in and of themselves. Their narrowness and limited parking prevent the incursion of intense traffic that characterizes adjacent streets. Human-scaled housing is interspersed with the odd small business, and street lighting is less harsh and institutional. Kids play in the street, and residents enhance their mews with flower-filled pots in spring. In contrast to the dressed-to-impress building facades of grander adjacent streets, these streets are now renowned for their charm, intimacy, greenery and walkability.

A North American Fusion

Laneways are commonly found in the oldest commercial and mixed-use districts of early North American towns. Examples include St. John's, Newfoundland (founded in 1583); Quebec City (1608); New Castle, Delaware (1651); Detroit (1701); and New Orleans (1718).[20] Laneways in the residential areas of North American communities date from the 19th-Century, and result from the emerging planning practice of separating residential areas from cities' business and manufacturing districts.[21]

Not all cities embraced them equally. For example, the city of Chicago has about 3,058 linear kilometers (1,900 miles)[22] of them; the City of Los Angeles, more than 1,448 (900 miles)[23]; the City of Vancouver, about 650 kilometers (404 miles)[24]; City of

[20] Source: entries for "Alley" and "List of North American settlements by year of foundation" in Wikipedia, Jan. 29, 2014.

[21] Duany & Plater-Zyberk (1992).

[22] City of Chicago (2010).

[23] Newell et. al (2013); Seymour et al. (2010); Wolch et al. (2010).

[24] Personal communication, Doug Manarin, Asset Manager for Streets / Transportation Infrastructure, City of Vancouver Engineering Department, Feb. 4, 2014.

Montreal, at least 450 (280 miles)[25]; the amalgamated City of Toronto, about 312 kilometers (194 miles)[26]; the municipality of Hamilton, Ontario, about 72 (45 miles)[27]; and Manhattan, almost none.[28]

Laneways were incorporated into North American planning in slightly different ways. They are a common element in the rectilinear, grid-like plans that applied to most pre-1930s North American communities, such as those drafted in 1859 for a mixed-use downtown New Westminster, B.C.[29] and 1882 plans for the residential West End (today's downtown) of the still tiny and unincorporated Vancouver.[30] In Toronto, laneways provided access to long, narrow lots that comprised the town's original plan; they multiplied as these were repeatedly subdivided.[31] In Montreal, planners turned to generous use of laneways not only as service streets but as firebreaks after a huge 1852 fire levelled much of that city's compact buildings. Laneways also found their way into some Renaissance-inspired alternatives to grid layouts: the hexagonal honeycomb street pattern of old Detroit; the concentric streets and circular alleys behind them in Circleville, Ohio; and the elaborate but confusing layout of Ladd's Addition in Portland, Oregon.[32] Even within rectilinear city blocks, they assumed different shapes: some were T-shaped, H-shaped, C-shaped, two-pronged like a tuning fork, diagonal, or deliberately bent to inhibit straight-through visibility.

Regardless of shape or location, laneways have functioned, and were designed to function, much like the historical British mews: separate the public façades of homes and businesses from their more private, utilitarian functions, like of stables; servant

[25] Plourde-Archer's (2013) discussion of Montreal's Ruelles Vertes program puts the total of laneways in the city of Montreal at more than 450 kilometers ("more than 280 miles"). Wise (2004) indicates the City of Montreal has about 460 kilometers (286 miles) of laneways; a news report by Bruemmer (2013) suggests the city has 475 kilometers (295 miles).

[26] This figure is sourced from Welsh (2006), a City of Toronto inventory of laneways in post-amalgmation Toronto (i.e. community council areas Toronto & East York, Etobicoke York, North York and Scarborough).

[27] Cubitt (2008).

[28] Pollack (2011).

[29] Hayes (2005).

[30] Villegas (2011).

[31] Shim, Chong, & Adams (2004)

[32] Martin (2001).

accommodation; utility wiring; deliveries of coal, oil, and ice; and back yards. And so they did: nineteenth-century North American laneways were "frequently filled with ashes and garbage piles … Herds of scavengers--swine and chickens--commonly roamed the streets to feed on food remains."[33] In rapidly growing cities, laneways also housed people with the fewest options—typically the urban poor and recently immigrated.[34]

Laneways Decline

Laneways seemed headed for oblivion as technological advancement and new standards of urban cleanliness put their messiness under the magnifying glass of the City Beautiful movement, which identified beautification with social order and moral reform[35],. Planners, builders and an emerging class of developers sought to cut costs of development and maintenance, and better meet lending institutions' requirements.[36] And as automobile ownership skyrocketed, planners of new development began to reject grid-based street networks in favour of dendritic street networks that served new, laneway-free "superblocks",[37] where houses with generous yards clustered around cul-de-sacs and incorporated garages that were adjoined or accessed from the front.[38] By the end of World War II, laneways had been virtually eliminated from new street plans, and increasingly regarded as anachronistic maintenance liabilities. Their elimination from planning was described in 1960 by the Urban Land Institute's *Community Builder's Handbook* as "one of the advances which has been made in planning during the motor age."[39] In 1978, former American Planning Association president Grady Clay described laneways as "the academic, geographic and social outcast of the built environment for at least a half-century."[40]

[33] Engler (1997), 64.
[34] Martin (2001), Hess (2008).
[35] Engler (1997), Bluestone (1988).
[36] Martin (2001), Ford (2001).
[37] Ben-Joseph & Szold (2005).
[38] Ford (2001).
[39] Quoted in Bain, Gray, & Rodgers (2012), 140.
[40] Clay (1978), 7.

Rethinking Laneways

Not everyone agreed that the laneway's phase-out was, as Recognizing that laneways can make front streets more pleasant to walk by storing parked cars and utility service out of public view, New Urbanists seeking to recreate the walkability and charm of pre-1930s neighbourhoods have incorporated them into greenfield developments embodying Traditional Neighborhood Design principles.[41]

And even though laneways left to us from pre-World War II planning are often regarded by residents as dirty or dangerous (when they are thought of at all)[42], in other settings they host positive social, cultural, and recreational activity—especially in residential areas. Martin, who describes residential laneways as an "ecologically diverse" element of urban form that too frequently overlooked by planners as a "unique cultural landscape and as a vital, block-scale neighborhood social realm,"[43] found that laneways are often valued by adjacent residents as "theirs" even though they are public space.[44] Research has also shown that in some residential areas, neighbours are more inclined to meet and interact over their rear lanes than across wider, traffic-ridden front streets.[45] Study of laneways in three Toronto neighbourhoods revealed that they were used for socializing with neighbours, active recreation like street hockey and basketball, and children's play,[46] a theme that is well reinforced by other studies and anecdotal reports.[47] In Montreal, block parties and cultural events are not uncommon in residential laneways,[48] and parents are known to negotiate arrangements with their neighbours and the City to allow kids to turn under-used rear lanes into block-level hockey rinks.[49]

[41] Duany & Plater-Zyberk (1992); Hess (2008).
[42] Seymour, Wolch, Reynolds & Bradbury (2010)
[43] Martin (2001), 76.
[44] Martin (2002)
[45] Martin (1996).
[46] Hess (2008).
[47] For example, see Martin (1996), Ford (2001), and general and specialist media reports by Semenak (2009) and O'Shea (2012).
[48] Plourde-Archer (2013).
[49] Bruemmer (2013).

In the past decade, planners and local governments in Canadian, American and Australian cities have begun to rethink pre-World War II laneways—a smart move to maximize value from existing infrastructure, considering that laneways already occupy as much as a third of the linear length of city streets,[50] consume substantial portions of municipal street maintenance budgets, and are often under-used.[51] The term *laneway revitalization* has thus entered the planner's lexicon to describe initiatives designed to imbue them with a sense of place and derive greater functionality from them. Similar (and largely interchangeable) terms like *laneway* [or *alley*] *activation, laneway animation,* and *alley greening* have also emerged to describe programs that emphasize social, economic or ecological improvements to varying degrees. The use of these terms also vary regionally, as my case studies in **Chapter 3** will show: for example, *greening* in the Chicago LWR program refers primarily to replacement of conventional pavements with permeable ones, whereas in the Baltimore program it refers to any alterations (including beautification measures) that newly restrict vehicle access to an alley[52]--which to date have not involved removal or replacement of conventional pavements. But all of these terms fit comfortably under the definition we will use for laneway revitalization throughout this paper: policies and initiatives designed to make laneways carry more of their weight—that is, to offer something other than, or perhaps in addition to, traditional functions of parking and garage access, waste management, and utility service. Laneway revitalization (LWR) programs are the intersecting sets of policies applied to specifically identified group of laneways. These are the primary focus of this paper.

[50] Chicago's alleys account for about 32% of the total linear distance of its streets.
[51] Seymour et al. (2010).
[52] Herrod (2011).

Chapter 2. Method

This chapter introduces my sample, sampling process, and choice of method. It also explains some methodological decisions made during its application.

2.1. The Sample: Six Laneway Revitalization Efforts

In this paper I will analyze six LWR programs from three countries: the U.S. (Chicago, Los Angeles, and Baltimore), Canada (Vancouver and Montreal), and Australia (Melbourne). By “programs”, I mean a set of city-defined objectives, actions, and allocated resources to upgrade “legacy” laneways—publicly owned minor streets designed more than 50 years ago to offer secondary access to buildings and residences—for social, economic, and/or environmental purposes.

This selection was anything but random, so I make no claim that they are scientifically representative of all LWR efforts. The academic literature in English on laneway revitalization (also referred to by academics and municipalities as “alley greening”, “laneway animation”, and “laneway activation”) in the literature) is emergent and uneven, with the result that readily available documentation of the Montreal program is limited to municipal documents, media reports, and graduate student research. Some of these programs are still so new that little or no in-depth, peer-reviewed research about them has been published, such as the Baltimore program—which nonetheless has been the subject of media reports, NGO publications, and city documents.

Each one of these programs bears characteristics that make them well suited for this analysis. All of them:

- Have generated significant discussion in academic literature, municipal documents, trade publications (such as non-academic planning and landscape architecture journals), and the media;

- Include a prominent role for local government in terms of management and funding;
- Include components that involve adjacent residents or businesses in their planning, management, and/or maintenance;
- Claim to be contributing to community sustainability in some way;
- Offer potentially useful lessons for any community considering LWR.

The programs vary widely in terms of primary purpose, scope, duration, neighbourhood type and density level, stage of completion. These differences are apparent in Table 2.1 below, which offers a quick summary of their primary characteristics—each of which will be discussed more detail in the case studies in **Chapter 3**.

Table 2.1 Overview of Six Laneway Revitalization Programs

	Vancouver's Country Lanes	Chicago's Green Alleys	Montreal's Ruelles Vertes	Melbourne's Activated Laneways	Baltimore's Gated & Greened Alleys	Los Angeles Avalon Green
Primary purpose	Stormwater management & urban greening	Stormwater management & flood risk mitigation	Urban greening, enhancement of public space	Economic revitalization of Central Business District	Creation of safe outdoor space for residents	Enhancement of park-poor, low-income neighbourhoods , ecological goals
Scope (approx. # of laneways involved to date)	3 completed	100+ completed	50+ completed	30+ completed	15 completed	To upgrade 10 proximate alley segments
Started	2002	2004	1997	1980s	2007	2009 (community outreach & design)
Current state	Design undergoing re-evaluation.	Expanding; grown into broader Sustainable Streets program	Expanding, in high citizen demand	Ongoing and actively managed	Expanding, driven by citizen applications	In very early stages of implementation: Community engagement well underway. Most design and some tree planting completed.
Costs primarily borne by	City (+ adjacent residents in future)	City	City	City	Adjacent residents	City
Density*	Low	All	High	High	Med	High
Type of neighbourhood	Residential	Residential / Mixed-use	Mixed-use / Residential	Mixed-use / Commercial	Residential	Residential

*Characterizations of neighbourhood density were determined from project descriptions (Chicago, Melbourne) and descriptions from professionals knowledgeable about the project (Vancouver, Montreal, Baltimore, Los Angeles)

2.2. Means of Analysis: The Community Capital Scan

Because we are looking at how LWR can operationalize SCD, I will examine each LWR program using the Community Capital Scan (CC Scan). This tool is based on the planning framework developed by Dr. Mark Roseland and fully explicated in Roseland (2012): the Community Capital Framework (CCF). This section will introduce the CCF, describe the origins, purpose, and previous use of the tools now associated with it, and explain how it will be used in this project.

The Community Capital Framework

The CCF defines sustainable community development as the concurrent and balanced development of six forms of community capital: natural, physical, economic, human, social and cultural. According to the Framework[53], natural capital is "any stock of natural assets that yields a flow of valuable goods and services into the future", including landscape, soil, ground- and surfacewater, and minerals and nonrenewable resources. Physical capital is "the infrastructure that helps people obtain their basic needs", and includes infrastructure, land, transportation, housing and living conditions, and public facilities. Economic capital is "the ways in which we allocate resources and make decisions about our material lives", and includes labour, financial resources, and economic structure. Social capital is "community cohesion, connectedness, reciprocity, tolerance, compassion, patience, forbearance, fellowship, love, commonly accepted standards of honesty, discipline and ethics; and commonly shared rules, laws, and information". It comprises citizenship, safety, and equity. Human Capital is the "knowledge, skills, competencies and other attributes embodied in individuals that facilitate the creation of personal, social and economic well-being". As such, it comprises education, health and wellbeing. Last but not least, cultural capital is "the product of shared experience through traditions, customs, values, heritage, identity and history", and therefore includes cultural heritage, identity and diversity.

[53] All quotations and definitions in this paragraph have been sourced from the CC Scan tool web page at http://www.ccscan-ca.cscd.sfu.ca/stocks/, accessed April 2, 2014.

In addition to defining the six capitals, the CCF posits that the state of each form of capital [hereafter referred to in plural as "capitals"] has a specific relationship with the state of each of the other capitals. It thus emphasizes the imperative that citizens, planners and decision-makers be mindful of how change in one capital plays out in changes in all of the other capitals.

Although many useful sustainability frameworks exist[54], this project is based upon the CCF because it has long been the theoretical basis of research and courses at SFU's Centre for Sustainable Community Development and because it has recently been retooled from a PC-based spreadsheet-like utility that helped SCD students consider plans and initiatives through the lens of this six-capital framework into a comparatively sophisticated web-based utility that is aimed at planners and facilitators of stakeholder groups.

Origins and Use Of The Community Capital Tool

The Community Capital Tool is the result of a recent pairing of the Community Capital Framework with a planning methodology developed and used by the Dutch sustainable community development agency known as Telos: The Brabant Centre for Sustainable Development,[55] established in 2000 and co-headed by John Dagevos. Its sustainability framework differs somewhat from that of the Community Capital Framework, in that it emphasizes three forms of capital (Social, Ecological and Economic) rather than six. In the Telos framework, Social-Cultural Capital encompasses the Human, Cultural, Social, and parts of the Physical Capital categories of the CCF; Economic Capital encompasses Economic and parts of Physical Capital; and Ecological Capital is consonant with the CCF's Natural Capital. But while these two frameworks

[54] For example, see Dekker & Singer 2011;
[55] For more information about Telos, visit www.telos.nl

assign slightly different weight to each category of capital, they agree that the capitals collectively comprise 20 defining properties (or stocks) that are actually very similar.[56]

Telos's method uses two closely related instruments for SCD: its Sustainability Balance Sheet (SBS) and the People-Planet-Profit Scan. Refined through more than a decade of use in the context of Western European municipal and regional planning, these instruments are described at length in Hermans, Dagevos and Haarman (2011), Knippenberg et al. (2007), Dagevos and Lamoen (2009), and Telos (2010, 2009, 2006, and 2002). Briefly, however, the Sustainability Balance Sheet is a template that helps communities to:

- Develop a snapshot of the current state of the key components of sustainability in a given community,
- Select realistic and meaningful goals and indicators of progress toward sustainable community development, and
- Record the progress over time toward those goals (through successive iterations of completing the SBS).

In the European context, the SBS is typically completed by Telos consulting with a local or regional government and stakeholders to ensure that the snapshot is accepted as accurate and that the selected goals and indicators are both socially acceptable and scientifically defensible.[57] Completion of the SBS is very much the result of facilitated discussion and negotiation among stakeholders. That discussion is typically aided by the complement to the SBS: Telos's People-Planet-Profit (PPP) Scan. Unlike the SBS, which establishes a deep knowledge of a community or region and shared agenda for change, the PPP Scan comprises a series of prompts or questions whose purpose is to:

[56] Compare Telos's conceptualization of capitals and stocks can be viewed at http://www.pppscan.org/stocks/ with the CCF's conceptualization of capitals and stocks at http://www.ccscan-ca.cscd.sfu.ca/stocks/ Although the types of stocks in the two frameworks are almost identical, there are a few minor differences. For example, the PPP Scan stocks mention the knowledge economy and national and international competitiveness of the regional economy, which the CC Scan does not. The CC Scan specifically mentions freedom of expression, which the PPP Scan does not.

[57] Note, however, that the SBS is an open-source project in that its methods are transparent and theoretically can be used by any community, with or without participation of Telos.

- Facilitate early-stage or ex-ante discussion among planners, officials, citizens and stakeholders about the anticipated effects on SCD of any proposed plan or initiative; and
- Reveal the range and distribution of stakeholder expectations about of project effects on each capital, allowing facilitators and planners to quickly pinpoint (and ideally, resolve) areas of concern before projects progress too far.
- Solicit participant reasoning for their expectations and suggestions for improvement
- Identify areas of agreement among stakeholders about a proposed project or initiative

The PPP Scan is also used after the SBS has been completed, to facilitate ongoing discussions among stakeholders about new project proposals. Telos made it available as a web-based questionnaire that can be completed for free by individuals or by members of a facilitated group. Completion of the Scan online generates a printable report which includes graphs that display the frequency, range, and medians of participant responses along with anonymized comments and suggestions for improvement that participants offer on each stock as it relates to the project. Telos's People-Planet-Profit Scan and Sustainability Balance Sheet have been used by municipal and regional governments, consultants, stakeholder groups, and nonprofit organizations throughout the Netherlands, and to evaluate a European Commission-funded program.

In 2011, Telos and the Centre for Sustainable Community Development collaborated to produce a Community Capital Framework version of both its SBS and the web-based version of Telos's PPP scan. The result is the Community Capital Tool, which now comprises the two complementary instruments: the Community Capital Sustainability Balance Sheet, described at length in Roseland (2012), and the web-based Community Capital Scan.

The Community Capital Sustainability Balance Sheet has since been piloted by Lowry (2012) in the community of Sechelt, B.C. and by Lowery (2013) to analyze the impacts of sustainability entrepreneurship in New Orleans. The Community Capital Scan has been piloted in a group setting (independently of the SBS) by Hernandez and Mollinedo (2012) with a group of community members in two comparatively remote

indigenous villages in Bolivia and also by Lowery (2013) as a framework for analysis of impacts of sustainability entrepreneurship in New Orleans. As far as we know, this project's use of the Community Capital Scan to analyze LWR programs will be the first time it has been applied in Canada as well as the first time it is being used for the purpose of analyzing several initiatives from different countries in tandem. As such, this project offers a useful opportunity to reflect on the experience of using the Community Capital Scan and to further develop it for a somewhat different purpose from that for which it is designed.

The Scan offers an appropriate tool analysis for this project because, like its Dutch counterpart, it can guide a focused, high-level inquiry into whether and how LWR is contributing to sustainable community development. Because the programs are so disparate in terms of purposes, scope, and complexity, examining each program through the lens of the Scan will not attempt to offer hard-and-fast Highlight areas of Community Capital that these LWR programs are not attending to (by design, or by omission), with a view to suggesting possible improvements quantifications of the contributions of each one to SCD or provide in-depth comparisons of the programs to each other. Although it will not substitute for comprehensive sustainability impact assessments on each of these projects, this type of analysis should be able to:

- Offer a preliminary, evidence-based read on how and whether each program is contributing to six forms of Community Capital and their associated stocks
- Highlight areas of Community Capital that these LWR programs are not attending to, with a view to suggesting possible improvements
- Produce a collection of tools and strategies (illustrated by actual precedents) that any community could consider and apply as they design and invest in LWR programs.

This use of the Scan will also produce:

- Reflections on the experience of using the Scan that could help others
- Practical suggestions on how the Scan can be built upon, both for general use as a communication tool but also for ex-post cross-project analysis as I have undertaken it here.

2.3. Applying the Scan

To apply the Scan to the six LWR programs, I first familiarized myself with the Community Capital Framework capitals, stocks, and requirements for the health of these stocks by reading Roseland (2012) and the CC Scan manual at http://www.ccscan-ca.cscd.sfu.ca. I also looked at other documented uses of the Community Capital Tool by Hernandez & Mollinedo (2012), Lowry (2012), Lowery (2013). I then set out to gather information that would speak to how each LWR program might affect each stock. For this, I turned to (appearing in order of the approximate order of importance I accorded to each type of source):

- Peer-reviewed literature, using terms like “laneway”, “alley”, “rear lane”, “green alley” in combination with commonly used terms such as “revitalization”, “activation”, “animation”, “greening”
- Technical and program reports and project proposals prepared by and for local governments; official community plans, legislation, and policies
- Reports in specialist (e.g. planning, landscape architecture) media
- Graduate research reports (published and unpublished) on laneway revitalization in other jurisdictions and aspects of laneways such as laneway homes
- Reports in popular media, such as newspapers, magazines, and relevant blogs

When I needed to address gaps in the literature above or to resolve ambiguity in published facts, I also conducted semi-structured interviews with people knowledgeable about LWR projects, such as staff in planning and architectural firms, research institutes, NGOs, and municipalities (e.g. Toronto, Seattle, Melbourne, Chicago, Los Angeles, Vancouver, Montreal, Baltimore) involved with some aspect of LWR.[58]

With this information in hand, I began to scrutinize each LWR program to a CC Scan at http://www.ccscan-ca.cscd.sfu.ca. For purposes of analysis, I decided to define a LWR program as the collection of City policies and initiatives that specifically identify a common set of laneways for improvements that are intended to further goals consistent

[58] All interviews for this project complied with the format prescribed by SFU’s ethics policy. For a copy of the interview consent form, please see the Appendix.

with SCD. The idea was to isolate interventions that were consciously applied to revitalization of laneways from those that are more generally aimed at streets, homes, parks, or businesses and which simply have incidental effects on laneways. For example, if a city's sustainable city lighting strategy addresses the unique properties of its revitalized downtown laneways, I would include it in my analysis; whereas a municipal strategy that addresses a public health issue like injection drug use in the downtown core but doesn't specifically mention laneways would not be included. This necessarily eliminated some policies and initiatives that have incidental and possibly even significant (if unintended) effects on laneways—but it helped keep the scope of this project manageable.

Completing the Scan walks users through a consideration of all six capitals, each of which is broken down into a number of stocks. Each stock is in turn described by a set of requirements. For example, Human Capital comprises the stocks Education and Health & Wellbeing. Under the Education stock, we find two requirements: "Education meets the needs of both society and individuals", and "Education is of high quality and easily accessible"[59]. This task required me to think carefully about how I could interpret the Scan stock requirements to LWR programs in a reasonably consistent manner. Table 2.2 on the following page shows how I did this.

[59] Complete CC Scan capitals, stocks and requirements can be viewed at http://www.ccscan-ca.cscd.sfu.ca/stocks/

Table 2.2 How CC Scan Requirements Were Interpreted For This Project

Capitals *Stocks*	Community Capital Scan Requirement	My Interpretation: "This LWR program…"
Natural		
Land	Ensure protection of biodiversity Increase preservation of natural areas and sensitive ecosystems by parks or conservation areas Preserve scenic and attractive views	Creates or preserves habitat for birds, insects, small critters, and plants—especially vulnerable or threatened species Increases preservation of natural areas and sensitive ecosystems by extending or creating new park space or conservation area Preserves scenic and attractive views of nature
Soil	Eliminate all pollutants and contaminants Expand the preservation of fertile agricultural land Eliminate soil erosion or instability	Eliminates soil pollutants and contaminants Creates new opportunities for organic urban agriculture Eliminates erosion of topsoil and risk of slides
Groundwater	Eliminate all pollutants and contaminants Preservation of existing reservoirs and replenishment through natural processes	Eliminates groundwater pollutants and contaminants Preserves and replenishes existing reservoirs through natural processes
Surfacewater	Eliminate all pollutants and contaminants Ensure that surface water quality is suitable for human and agricultural use	Eliminates sources of surfacewater pollutants and contaminants Ensures that surface water quality is suitable for use by humans and as habitat
Air	Eliminate all pollutants and contaminants Reduce greenhouse gas emissions	Eliminates sources of air pollutants and contaminants Reduces greenhouse gas emissions
Minerals & Non-Renewables	Reduce the extraction rate of nonrenewable resources Use only environmentally safe extraction practices	Reduces the extraction rate of nonrenewable resources Uses only sustainably sourced energy and materials

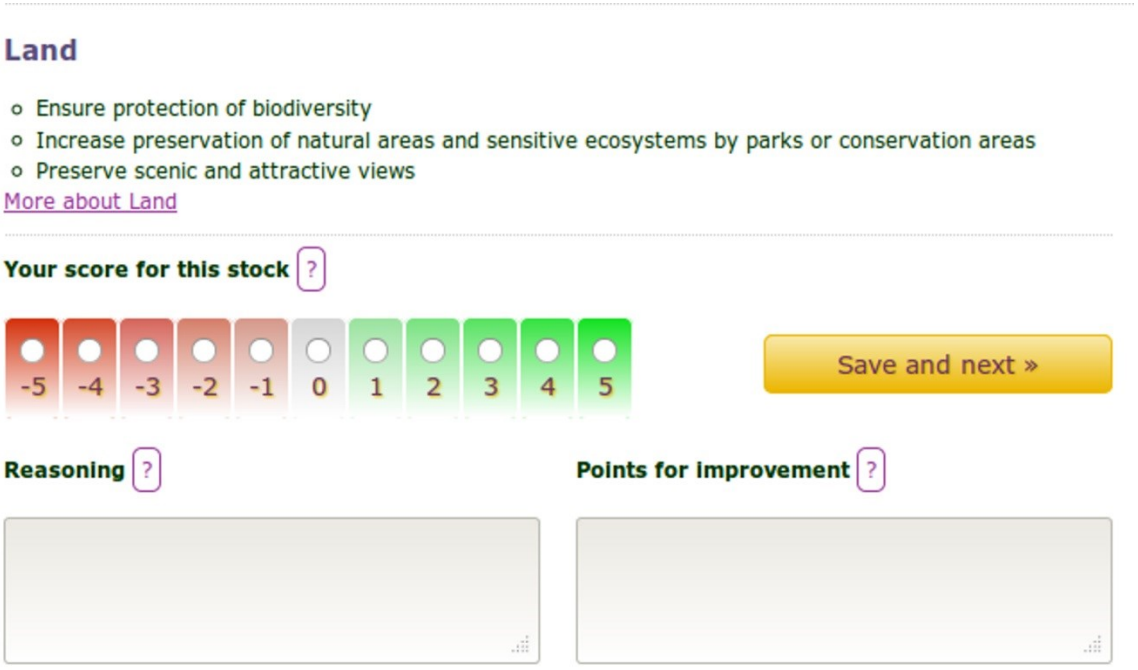
Capitals *Stocks*	Community Capital Scan Requirement	My Interpretation: "This LWR program…"
Physical		
Infrastructure	Provide safe and reliable water to all citizens	Provides safe and reliable water to all citizens
	Ensure that waste management systems are clean and efficient	Ensures waste management systems are clean and efficient
	Ensure that energy is transmitted through a safe, efficient, and reliable system	Uses energy efficiently
		Increases connectivity for citizens
	Provide adequate access to reliable telecommunications systems for all citizens	
Land	Ensure that suitable land is available for different uses, e.g., industry, agriculture, housing, etc.	Maximizes compatible uses of already developed land
Transportation	Create a robust and reliable public transportation system	Supports a robust and reliable public transportation system
	Provide safe, efficient, and well-maintained rail and road infrastructure	Ensures safe, efficient, and well-maintained roads for all users
Housing & Living Conditions	Ensure adequate access to housing, food and clothing for every citizen	Ensures adequate access to housing and food for every citizen
Public Facilities	Ensure adequate facilities for schools, hospitals, community centers, etc.	Enhances the quality of public space outdoors
Economic		
Labour	Balanced labor market that includes a variety of job types and salary ranges	Creates jobs that help balance the labour market in terms of job types and salary ranges
	Adequate training for workforce	Provides job training opportunities
	Work is safe, healthy and allows for appropriate work-life balance	Creates work with decent working conditions
		Creates work that pays decent wages
	Wages are adequate to provide decent livelihoods	
Financial Resources	Public bodies have adequate financial capacity to ensure the availability and accessibility of public goods and services	Is affordable for local governments
		Creates opportunities for local companies
	Local companies are able to make sufficient profit and investment	
Economic Structure	A good mix of productive and service industries	Helps diversify the local economy
	Constant economic regeneration through innovation, new enterprise development and relocation to the community	Spurs entrepreneurial innovation, new business startups, and/or attracts businesses to the community
	Companies are investing in emissions and pollution prevention and reducing the use of non-renewable resources	Supports entrepreneurial investment in emissions and pollution prevention and reduced use of non-renewable resources

Capitals *Stocks*	Community Capital Scan Requirement	My Interpretation: "This LWR program…"
Human		
Education	Education meets the needs of both society and individuals Education is of high quality and easily accessible	Provides educational opportunities Enriches quality and accessibility of education
Health & Wellbeing	Citizens are physically, mentally and spiritually healthy All citizens have access to healthcare services for illness prevention and treatment	Supports enhancement of citizens' physical and mental health Enhances access to healthcare for illness prevention and treatment
Social		
Citizenship	Community has social cohesion Social solidarity between citizens Opportunity for citizens to build strong networks between each other No poverty or exclusion	Promotes social cohesion and social solidarity Enhances opportunities for citizens to build networks among each other Reduces poverty and exclusion
Safety	Citizens feel safe and have access to support systems which encourage safety No violence and crime	Helps citizens feel safe Supports access to support systems that encourage safety Reduces violence and crime
Cultural		
Cultural Heritage	Art is encouraged and celebrated Community acknowledges traditions and celebrations A diversity of culture and tradition is present Cultural heritage is preserved	Encourages and celebrates art Acknowledges traditions and celebrations Promotes cultural diversity Preserves cultural heritage
Identity & Diversity	Citizens are encouraged to express individual identity while not restricting others' freedom of expression The community has a defined identity	Fosters freedom of expression and mutual respect Strengthens a unique sense of place

I took care not to adapt the requirements too much, reasoning that I ought to retain their essence to see how the Scan works and because it seems obvious that if a Scan requirement doesn't necessarily apply, it is not evidence that the requirement (or stock) is flawed; it may simply mean that the project under evaluation doesn't affect that stock or requirement.

Once I had finetuned Scan requirements for my purposes, I began evaluating them. As shown in the screenshot in Figure 2.1 below of requirements under the Land stock of Natural Capital, Scan users are offered a scale of values ranging from -5 to 5 to rate the status, or the expected effect on the status, of each requirement, and to offer their reasoning for applying this rating as well as to suggest points for improvement.

Figure 2.1 Screenshot of Data Entry on CC Scan



To select values for each requirement, I decided from the outset of this exercise that the lowest value of -5 would mean "I strongly disagree agree that…", followed by the adapted CC Scan requirement, such as "this LWR program encourages and celebrates art." Conversely, selecting the highest value would mean "I strongly agree that…" I also

decided that selecting zero would mean “I found no evidence to agree or disagree that…”

While completing the Scan on each LWR effort, I entered all of the values into the Scan to generate illustrative graphs for each program and made notes on my reasonings and points for improvement. The results of this exercise comprise the six LWR program case studies reported in **Chapter 3: Community Capital Scan Results**. Scan scores and reasonings are presented in tabular form alongside illustrative graphs produced by the Scan, alongside some brief remarks to provide necessary context.

Throughout the process, I took careful note of tools and strategies from each program that could be applied to LWR in other jurisdictions and gathered them into a toolbox organized according to community capitals and stocks. I also noted the challenges that each program seemed to be grappling with, tried to extract general principles for strengthening LWR as a tool for SCD, and recorded my impressions about the process of using the Scan. These insights will also be shared in **Chapter 4: Analysis**.

Chapter 3. Community Capital Scan Results

In this chapter, I offer the results of the CC Scan as applied to LWR efforts in six communities: Vancouver, Chicago, Montreal, Melbourne, Baltimore, and Los Angeles.

Each case study is introduced with a brief profile of how the LWR program came into being, its goals as identified in planning documents, some distinguishing features, and its current status. I then analyze each one in terms of the capitals, stocks and requirements of the CC Scan, following the methodology outlined in Section 2.3: Applying the Scan. The tables that follow each profile display my rating from -5 to 5 on each capital's stock, alongside evidence for my reasoning. Each program analysis also includes six circle charts and Sustainability Hexagon generated by the CC Scan. The circle charts display score for each capital stock. Positive values are shaded green, negative values red, and neutral values grey. More intense reds and greens register values that are farther from the neutral baseline. The Sustainability Hexagon displays per-capital averages for each of the six capitals, both in numbers at the end of each axis and through the tan shape that expands or contracts from the grey dotted line which is also meant to suggest a neutral baseline.[60]

The Scan prompts users to offer "points for improvement" on each project being evaluated. I made notes on where I thought these projects could be strengthened, but have not presented these here—because these will drive the higher-level discussion in Chapter 4 of how LWR can be strengthened as a tool for SCD.

[60] The CC Scan web page http://www.ccscan-ca.cscd.sfu.ca/example-of-a-ccscan/ offers a detailed description of how to interpret its graphic output.

3.1. Vancouver's Country Lanes

Vancouver's Country Lanes pilot project was the result of a partnership in 2002 between the City of Vancouver's Streets Design and Greenways[61] branches. Funded entirely by the City through General Revenues and with considerable support and participation from adjacent residents, the $225,000 pilot project refurbished a total of three laneways in different low- to medium-density residential neighbourhoods (Kensington, Sunrise, and Kitsilano). The redesigned laneways incorporated three different combinations of concrete driving strips, structural grass or confined gravel, concrete pavers, and recycled concrete sidewalks.

The project's goals were to:

- Design and evaluate a more sustainable alternative to traditional lane and street designs, incorporating natural stormwater drainage and filtration
- Reduce discharge into the sewer system, recharge groundwater and reduce peak flows into local streams and rivers
- Improve local air quality by increasing local greenspace
- Upgrade laneway aesthetics to "encourage residents to take more ownership of the lane" [62] and help create a more livable community
- Provide environmental education
- Contribute to a greener, more rural aesthetic[63]

The project met many of its ecological and social goals and offered useful learning, and went on to win an award for technical innovation in road design. Unfortunately, the treatments have not proven to be as durable as hoped: maintenance issues are surfacing earlier than with conventional designs. That said, the City continues to evaluate the long-term performance of the refurbished laneways and is currently evaluating a tweaked design.

[61] Greenways is responsible for greening pedestrian routes across the city.
[62] Transport Canada (2010).
[63] City of Vancouver, B.C. Engineering Services (2002);Transport Canada (2010).

According to project documents, construction of new Country Lanes was expected to go forward on a cost-shared basis, with adjacent homeowners absorbing about $5,000 each spread out over 10 to 15 years of property tax bills under a local improvements process. Evaluations have shown that the completed Lanes are appreciated by adjacent residents and the project generated many inquiries from residents. But 10 years after implementation, no new Country Lanes have been constructed. City staff suggest cost as a factor.

Table 3.1. CC Scan Analysis of Vancouver's Country Lanes

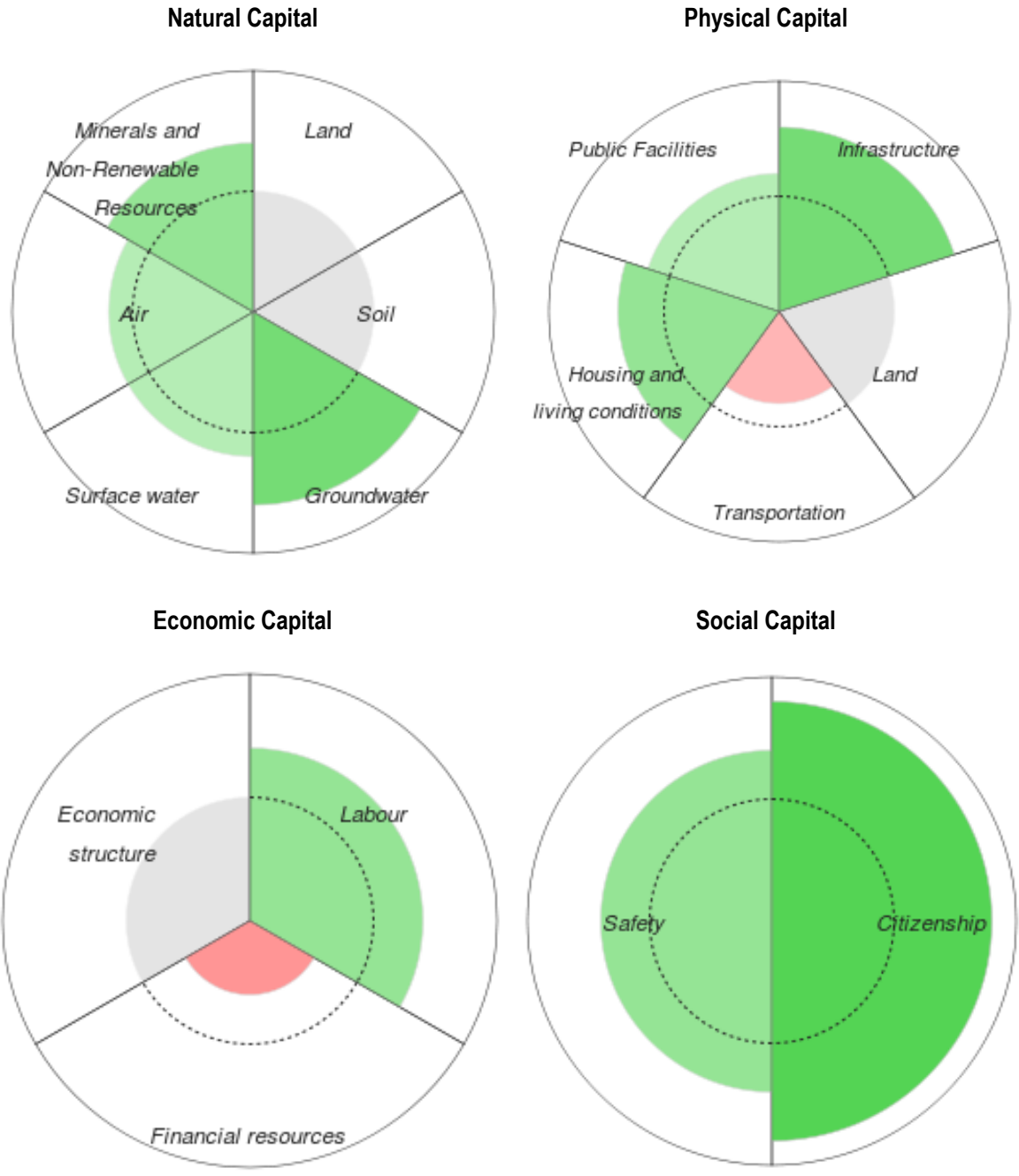
Capitals & Stocks	Score	Reasoning
Natural		
Land	0	Nothing in the project documentation I reviewed[64] indicates that plantings or any other element was selected to promote or protect biodiversity. Although the project made three laneways greener and more attractive in appearance, they were created to be driving surfaces. No new protections were afforded to natural areas or scenic or attractive views.
Soil	0	The project doesn't increase the amount of land used for agriculture or do anything to stem erosion of land that hosts vulnerable ecosystems or agriculturally productive topsoil. It does not actually help reduce any source of soil pollutants.
Groundwater	3	The project gets high marks for laneway design that helps recharge groundwater by using natural filtration methods to treat stormwater onsite and keep it from running into the sewer system.
Surfacewater	1	Country lane design could potentially decrease flow of stormwater into local waterways (and associated adverse impacts on aquatic habitat).
Air	1	Nothing in this project serves to reduce driving, or the city's overall driving surface. but the project intended for additional plants around laneway to improve air quality and lower urban heat island effect.
Minerals & Non-Renewables	2	This project could be reducing the draw on non-renewable energy to treat water, but because British Columbia relies heavily on hydro-electric energy, it is not clear that this is the case. Greening road surfaces helps reduce the urban heat island effect, which can reduce energy use. The project incorporated concrete pieces that were salvaged from City operations, which reduces the use of non-renewable resources. The greened road surfaces were considered less suitable for walking and cycling--which could have a negative effect on emissions reduction.

[64] Transport Canada (2010); Transport Canada (2004); City of Vancouver, B.C. Engineering Services (2008); City of Vancouver, B.C. Engineering Services (2002); City of Vancouver Engineering Services Country Lanes flyer (2002); general and specialist media reports by MacDonald, K. (2004); O'Brian (2004), and Hutchinson (2013); personal communications with D. Manarin, Asset Manager for Streets / Transportation Infrastructure, City of Vancouver Engineering Department, Feb. 2014.

Capitals & Stocks	Score	Reasoning
Physical		
Infrastructure	3	Permeable surfaces in these lanes are estimated to have reduced amount of stormwater entering sewers by 90%. This reduces pressure on existing wastewater treatment infrastructure and thus helps provide safe and reliable drinking water. Diverting stormwater from the sewage treatment system and treating it onsite helps keep wastewater treatment clean and efficient. But efficiency is somewhat reduced because according to a 2008 evaluation by the City, "significant ponding has not been observed in any of the lanes …maintenance issues have appeared much earlier than in conventional lane designs."
Land	0	By making these laneways greener and thus more attractive to look at, this project may have increased the attractiveness of these laneways as sites for laneway homes. But treated laneway surfaces were found to be less suitable for walking, cycling and play than before.
Transportation	-1	While the project preserves driving surface for adjacent residents, a City of Vancouver assessment found the surface treatment actually reduced suitability of these laneways for active transportation such as walking and cycling.
Housing & Living Conditions	2	These revitalized laneways may be more attractive environments for laneway homes, which could in turn increase housing diversity. Media reports suggest property values adjacent to at least one of the revitalized laneways have increased as a result of this new public amenity. This would likely benefit homeowners (but not necessarily affordable housing).
Public Facilities	1	Two City of Vancouver evaluations found that residents enjoy their revitalized laneways and consider them to be amenities, holding block parties in them.
Economic		
Labour	2	The project involved a learning curve for everyone involved, and won a professional award for technical innovation. It thus imparted new green-economy skills to workers. Working conditions or wages of people involved in the project were not discussed by documentation of this project.
Financial Resources	-2	The project went well over its original budget. Implementation costs about three to four times the cost of standard treatment (however, this was expected to decrease once the learning curve was cleared). Maintenance costs have been higher than anticipated. Several reports confirm that Country Lanes have not been taken up by the public since this pilot project was concluded. This has been attributed to fact that it would cost about $5,000 per adjacent homeowner, spread out over 10-15 years of tax bills. Available documentation doesn't reveal whether companies involved (if there were any) made sufficient profit on this project.
Economic Structure	0	Found no evidence that the project created opportunities for local companies, or contributed to diversification, innovation, new business start-ups, businesses moving to the community or greening production processes.

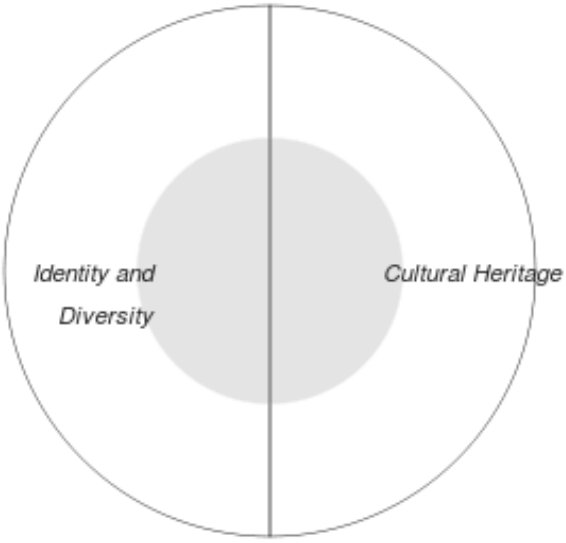
Capitals & Stocks	Score	Reasoning
Human		
Education	3	This project included a research component which aimed to explore and evaluate more sustainable ways of improving laneways. Results of the project were shared widely; evaluation continues, and the City continues to refine its design as a result of this project. It also had explicit goals to deliver environmental education on stormwater management, and arguably did that by including residents in design and construction. Some interpretive signage offers information on native species planted.
Health & Wellbeing	2	Surface treatments were found to have reduced the suitability of the laneway for a popular use: street hockey. Although this project did nothing to promote active transportation, it could have a least a marginally positive impact on citizens' physical, mental and spiritual health by helping to greening and cooling the surrounding environment. It also gets at least a few residents outside to maintain plantings.
Social		
Citizenship	4	The process of designing the laneways with residents' help involved people in neighbourhood improvement and taught about sustainability. Working together to design and construct the laneways offered opportunities to deepen neighbor relationships. It may have strengthened the relationship between the City, residents and the very supportive local community garden which is adjacent to one of the laneways. Some residents volunteer to help maintain laneways. Residents around at least one of the three lanes hold annual block parties in the laneway. But the plan for this LWR going forward was to have residents pick up the majority of the costs (about $5,000 per homeowner), which may serve to limit this type of LWR to wealthier neighbourhoods.
Safety	2	One media report cited anecdotal evidence that prostitution, which had been observed in one of the three laneways, had ceased as a result of the project. Whether or not this is a safety improvement is debatable. A City of Vancouver evaluation in 2008 indicates that residents perceive reduced driving speeds in the laneway as a result of the project.
Cultural		
Cultural Heritage	0	The project wasn't designed to celebrate culture or local history.
Identity & Diversity	0	The project wasn't designed to have an impact on the community's identity, expression of individual identity or freedom of expression. Laneways don't have unique names, and were given signs proclaiming them as a "Country Lane".

Figure 3.1. Vancouver Country Lanes CC Scan Graphs

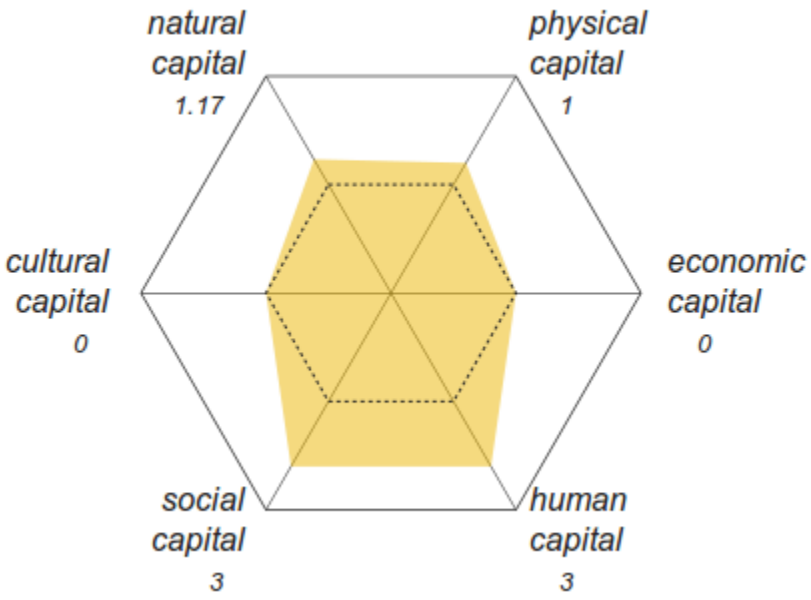


Human Capital

Cultural Capital



The Sustainability Hexagon: Vancouver



3.2. Chicago's Greened Alleys

Chicago's Green Alley program began in 2004, when the City of Chicago looked for more sustainable alternatives to repaving and expanding the sewer system to chronic flooding in its more than 3,000 linear kilometers of alleys.

The project's goals were to:

- Manage stormwater to alleviate flooding
- Reduce pressure on aging sewage system and overflow of untreated water into water bodies
- Recharge groundwater through natural filtration

In the absence of state standards, the City undertook a concerted research effort which led to development, testing and use of permeable and reflective pavements and innovation within the regional pavement industry.

Public support has been critical for program success. Adjacent residents receive the Chicago Green Alley Handbook,[65] which explains how green alleys work and the simple but powerful things people can do (green roofs, downspout disconnection, rain barrels, and rain gardens) to get the most out of them, reduce flood risk, recharge their groundwater and make Chicago more sustainable.[66]

Today, every reconstructed alley in Chicago gets the green-alley treatment, and the city's award-winning program is widely studied by planners around the world. As of March 2012, more than 100 completed alley greening projects had been completed,[67]

[65] City of Chicago (2010).

[66] Attarian (2010). For analysis of the impressive economic and water savings benefits of green infrastructure in general and Chicago's green alleys in particular (pp. 15-20), see Foster, Lowe, and Winkelman (2011).

[67] Newell et al. (2013).

but much remains to be done: as of early 2013, the number of completed alleys represented only about 1% of Chicago alleys.[68]

The City is experimenting with other applications for porous paving materials, such as parkways, parking lots, parking lanes, and plazas. It has grown into a much larger vision of greener infrastructure that includes green roofs and water systems, as well as the City's ambitious Streetscapes and Sustainable Design Program, which also emphasizes social and beautification goals, and its Sustainable Backyards program.[69]

[68] Hawthorne (2013).

[69] The City of Chicago's (2014) Sustainable Backyards Program offers up to 50% rebates to citizens who add composters, rainbarrels, and indigenous plants to their backyards. The City's (2014) Streetscapes and Sustainable Design program applies green infrastructure to streetscapes.

Table 3.2. CC Scan Analysis of Chicago's Green Alleys

Capitals & Stocks	Score	Reasoning
Natural		
Land	0	I found no evidence in sources I consulted[70] that greening of alleys includes any plantings, let alone plantings that might promote or protect biodiversity. No new protections were afforded to natural areas or scenic or attractive views..
Soil	0	The project doesn't aim to increase the amount of land used for agriculture or stem erosion of land that hosts vulnerable ecosystems or agriculturally productive topsoil. It does not actually help reduce any source of soil pollutants.
Groundwater	5	This initiative helps replenish the city's groundwater through natural filtration processes.
Surfacewater	5	Improved pitching and grading directs excess stormwater better. Natural filtration helps protect Chicago's drinking water by reducing the incidence of sewer infrastructure being overwhelmed by stormwater.
Air	2	The project does nothing to reduce the sources of air pollutants and emissions (for example, by reducing driving or driving space in the city). However, the use of high-albedo pavements helps to reduce the urban heat island effect,[71] which in turn can help to reduce use of appliances for cooling (and the emissions generated by producing and using them those appliances). The Green Alley Handbook also urges residents to augment vegetation in yards adjacent to alleys, which could improve air quality.

[70] Sources include technical report by Attarian (2010); the Green Alley Handbook by City of Chicago (2010); Foster, Lowe, and Winkelman (2011, esp. analysis of economic and water savings benefits of green infrastructure in general and Chicago's green alleys in particular on pp. 15-20); general and specialist media reports by Saulny (2007); Hawthorne (2013); Buranen (2008); Newell et al. (2013).

[71] According to the Center for Clean Air Policy, "each 10% increase in total reflective surface present in an urban area lowers the urban heat island (UHI) surface temperature by 4°C. A study in Los Angeles showed that by increasing pavement reflectivity alone by 10 to 35% across the city could lead to a 0.8°C decrease in UHI temperature and an estimated savings of $90 million per year from lower energy use and reduced ozone levels. Reduced pavement area and natural vegetation in Davis, California helped reduce home energy bills by 33 to 50% compared to surrounding neighborhoods (Foster, Lowe, and Winkelman 2011, 15)." The potential global impact of reflective pavement is considerable. The Environmental Protection Agency (2008) cites research (Akbari and Menon 2007) that increasing pavement reflectivity in cities worldwide to an average of 35 to 39% could result in global CO_2 reductions worth about $400 billion.

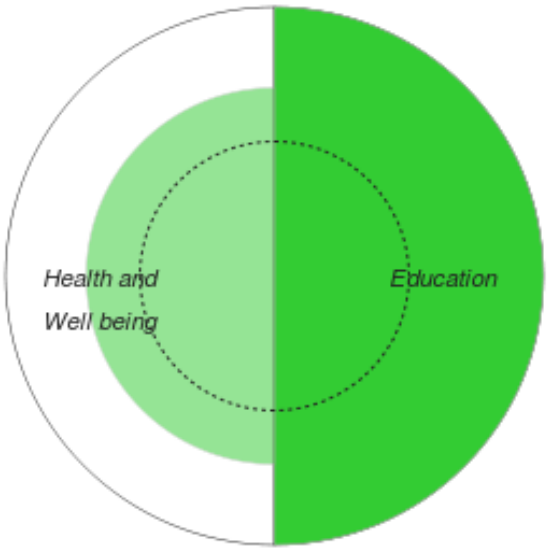
Capitals & Stocks	Score	Reasoning
Minerals & Non-Renewables	3	The new surface treatments are more resistant to freeze-thaw cycles and are expected to last longer than conventional pavement. Use of high-albedo pavements helps to reduce the urban heat island effect, which in turn can help to reduce use of appliances for cooling (and the energy to power those appliances). Permeable pavements have been found to be less prone to icing up in winter, which reduces the energy required for de-icing. They are also using some industrial byproducts (e.g. recycled concrete aggregate, slag) in its new paving mixes. Both of these suggest the new treatments help reduce the draw on non-renewable resources.
Physical		
Infrastructure	5	The project gets top marks for developing comparatively durable infrastructure innovations. As a result of its success, the City is experimenting with other applications for porous paving materials, such as parkways, parking lots, parking lanes, and plazas. It has helped produce a much larger vision of greener infrastructure that includes green roofs and water systems, as well as the City's ambitious Sustainable Streets program (which also emphasizes social and beautification goals).
Land	1	By reducing puddles, ice and heat in laneways, this program increases potential suitability of laneways for walking and cycling.
Transportation	2	By reducing puddling and ice in alleys and making them cooler through the use of high-albedo pavements, the program may make alleys more pleasant places to walk, cycle or play—which could increase uses of already developed land.
Housing & Living Conditions	1	The program is not designed to address equity concerns or "adequate access to housing, food and clothing for every citizen." But it definitely helps insulate some residents' homes from damage due to chronic flooding – an increasing danger due to climate change.
Public Facilities	0	This program does not seek to improve public space.
Economic		
Labour	3	While the number of jobs created by this program has not, to my knowledge, been quantified, this program has surely created work in the private sector and thus imparted green-economy skills among workers. Project information reviewed did not offer information on working conditions.
Financial Resources	4	Costs of reconstructing alleys are now offset by what it would have paid for maintenance and sewer improvements for the old alleys; even with required maintenance (sweeping twice per year), the new treatments have been found to be price-competitive with conventional treatments. By reducing damage associated with chronic flooding, it improves the City's bottom line and makes it more resilient to climate change.

Capitals & Stocks	Score	Reasoning
Economic Structure	3	We can presume the program has created profit-making opportunities for the private sector because the regional paving industry has invested in developing new products and services to serve the City's need. The program has definitely spurred innovation within the regional paving industry by creating new processes and markets for permeable paving.
Human		
Education	5	The program has contributed to a social learning about stormwater management. Its research insights are being sought out and adapted by municipalities around the world. All residents adjacent to greened alleys get a copy of the highly City's Green Alley Handbook, which how green alleys work and the simple but powerful things people can do (green roofs, downspout disconnection, rain barrels, and rain gardens) to get the most out of them, reduce flood risk, recharge their groundwater and make Chicago more sustainable. It has been widely publicized. It has helped coalesce a larger green infrastructure program.
Health & Wellbeing	2	Although the program doesn't relate to health services, it promotes health indirectly by protecting sources of drinking water and reducing risk of flood (and the diseases this entails). New paving treatments have also been found to reduce road noise by "up to 10 decibels."[72] To the extent that it does this, reduces the urban heat island effect, and replaces harsh institutional lighting in alleys with dark-sky compliant lighting (project information doesn't make clear how much this actually occurs), it also supports human health.
Social		
Citizenship	0	This program does not appear to build citizenship skills, social solidarity and networks among citizens, or alleviate poverty.
Safety	0	I could not find any data that suggests connections between Chicago alley improvements and violence and crime. Some residents have actually complained that dark-sky compliant lighting has reduced lighting, which makes them feel less safe.
Cultural		
Cultural Heritage	0	Nothing about this program is designed to promote art or culture.
Identity & Diversity	0	Nothing about this program is designed to promote freedom of expression, individual identity, or sense of place.

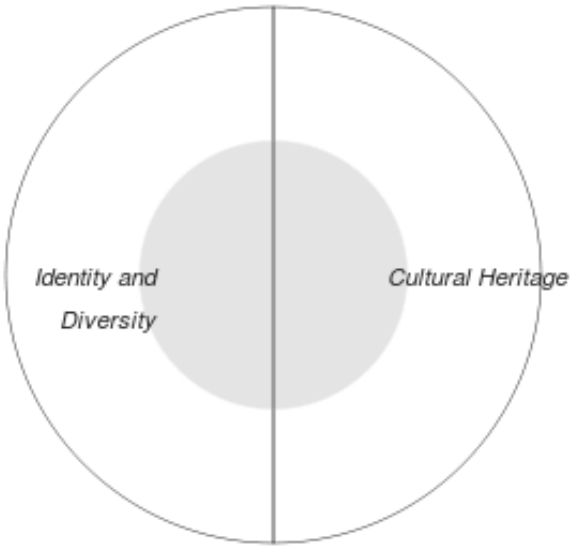
[72] Foster, Lowe, and Winkelman (2011).

Figure 3.2. Chicago Green Alleys CC Scan Graphs

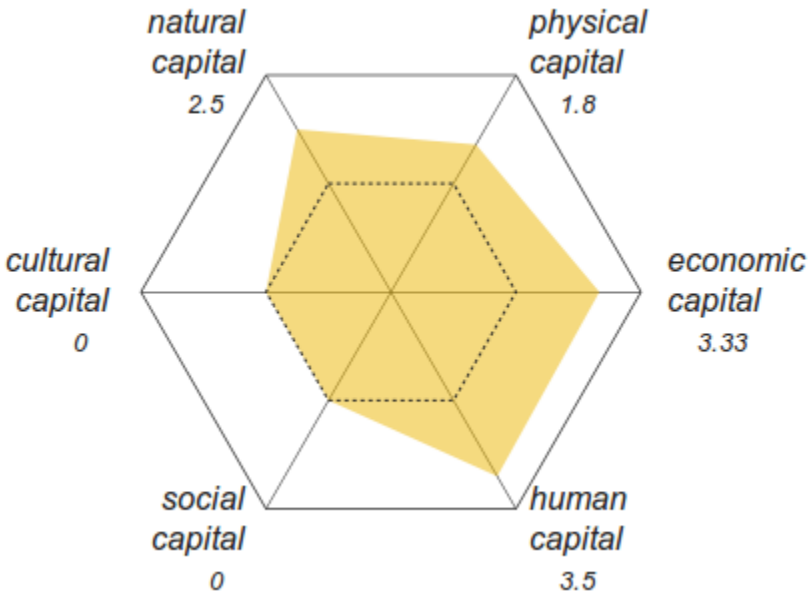
Human Capital



Cultural Capital



Chicago Sustainability Hexagon



3.3. Montreal's Ruelles Vertes

Montreal's Ruelles Vertes—which literally translates to "green lanes"—are laneways in primarily residential, high-density urban areas that have been transformed by citizens with assistance from the city into cooler, verdant spaces that host gardening, active play, block parties, and a slower pace of vehicle traffic. Spearheaded initially by citizens, the Ruelles Vertes program is now largely funded by the City of Montreal's Eco-Quartier program. The first Ruelle Verte was inaugurated in 1997. The program aims to:

- Improve quality of urban life
- Reduce urban heat island effect
- Improve air quality
- Manage stormwater
- Promote biodiversity
- Reduce noise pollution
- Augment city greenspace

To get a Ruelle Verte, citizens must apply to their local Eco-Quartier and engage in a block-level planning process. In return for cooperating with the City to develop a plan for the laneway which includes volunteer maintenance, traffic management, snow removal and governance, the citizens get help from the City to design and implement the first round of plantings. Although traffic-calming mechanisms are used, such as heavy planters that serve to block traffic on one end of the laneway, motor vehicle access is strictly maintained.

The idea of Ruelles Vertes had in fact been in public discourse since the 1970s but was initially hamstrung by lack of funding, opposition from neighbours, and insufficient public support. At least four factors converged to make the program feasible: growing pressure to address the problems created by lack of maintenance of laneways, a new focus on ruelles as old structures along them became derelict and torn down, increasing environmental sensibility and a "green"-thinking mayor. That said, organizers report that a substantial segment of the population seems to be weary of perceived

infringements on their rights by environmental measures; the result is that many expensive planters get stolen.[73]

Still, Ruelles Vertes are very popular and the program is expanding rapidly. Eco-Quartiers receive dozens of new applications every year and there are now more than 140 greened laneways in the City of Montreal. About 46 of these are found in its most densely populated borough, the Plateau-Mont-Royal. The longest greened laneway to date is the 363-m (397-yard) L'Échappée Belle (roughly translates to "The Great Escape"), in Montreal's Sainte-Marie borough. In an effort to "share the joy" a little more widely, some Eco-Quartiers are beginning to prioritize applications in poorer neighbourhoods where there are very few ruelles vertes, and/or on blocks where this evidence of many families.

[73] Personal communication with Annie Choquette, Adjointe – Coordination, Éco-quartier du Plateau-Mont-Royal, Nov. 20, 2013.

Table 3.3. CC Scan Analysis of Montreal's Ruelles Vertes

Capitals & Stocks	Score	Reasoning[74]
Natural		
Land	5	Enhancement of urban biodiversity is an explicit goal of the project. Public education materials actually specify that plantings should be at least 60% indigenous species.[75] Many of the ruelles boast dozens of trees and climbing vines and hundreds of diverse perennials. The Cartierville ruelle is an outstanding example: in this 150 m (417 feet)-long ruelle, 345 woody plants were added, including 5 native trees, 6 fruit trees, 50 berry bushes, 284 native shrubs and more than 2000 native perennials.
Soil	3	Many resident-maintained planter boxes and gardens in and along laneway edges are present. At least some of the Ruelles Vertes host community compost sites, which could improve the condition of soil.[76]
Groundwater	3	Some Ruelles Vertes have undergone modifications to enhance stormwater management, such as part or complete replacement of pavement with vegetated surfaces, permeable pavers, trenches, and bands of reflective concrete. Outstanding examples include ruelles Pente Douce, St. Amant, and Cartierville. Use of hardy native plant species reduces the draw on water supplies.
Surfacewater	3	See discussion above.
Air	4	Air quality is improved by the increase in plantings in the Ruelles and retention of trees. City participation in the first round of plantings helps ensure that suitable species are used. Eco-Quartier landscape architects plan and supervise the first round of plantings, ensuring suitable species are used. Thereafter, the professional team at the eco-quartier is available for horticultural advice, some assistance with maintenance, and specialized gardening equipment.[77]The City has a strategy to increase Forest Canopy, which includes Ruelles Vertes. Composting in Ruelles reduces methane emissions of improperly treated organic waste.

[74] Information for this case study from personal communication with Annie Choquette, Adjointe – Coordination, Éco-quartier du Plateau-Mont-Royal, Nov. 20, 2013. Eco-Quartier du Plateau Mont-Royal and Le Plateau Mont-Royal (2013) have published an exemplary guide (in French) for initiating and managing a Ruelle Verte. See Bolay (2013) to read about an independent effort to map ecological services in Ruelles Vertes. This analysis also draws on Plourde-Archer (2013) Locations of Ruelles Vertes can be found at https://maps.google.com/maps/ms?msid=204618975739155791712.0004733ee14eacb11dbcf&msa=0.

[75] Eco-Quartier du Plateau Mont-Royal and Le Plateau Mont-Royal (2013).

[76] There is nothing in the program that restricts use of pesticides in laneways, but Quebec has already effectively banned its use for residential lawns and gardens.

[77] Eco-Quartier du Plateau Mont-Royal and Le Plateau Mont-Royal (2013).

Capitals & Stocks	Score	Reasoning[74]
Minerals & Non-Renewables	4	Ruelles Vertes plantings explicitly seek to address the urban heat island effect, which should reduce the draw on non-renewable energy to power air conditioners, etc. Making walking and cycling more pleasant and safe in Ruelles can also reduce energy use associated with driving.
Physical		
Infrastructure	2	This program doesn't directly address delivery of drinking water, energy transmission, or telecommunications. But promotion of community composting in Ruelles Vertes aids waste management (and emissions) by helping to divert organic waste from the waste stream. Rain barrels in some green alleys reduce the demand for water for plantings.
Land	4	This program increases efficiency of land-use by making laneways suitable for a broader variety of purposes (e.g. play, walking, cycling, gardening, socializing).
Transportation	5	Ruelles Vertes traverse densely populated mixed-use and residential areas. Although they slow traffic, eliminating through-traffic or vehicle access altogether is not an option. Many of the Ruelles Vertes projects have been sited with connectivity concerns, and an eye toward building networks of greened laneways and supporting ecotourism, in mind. They definitely make active transportation more attractive options in Montreal.
Housing & Living Conditions	4	The program does not address housing directly but likely enhances food security for residents who maintain food garden beds in the Ruelles and, in some lanes, through plantings of berry bushes. Preserving and planting trees (with their natural cooling functions) improves conditions of adjacent housing in Montreal's notoriously hot summers.
Public Facilities	4	Most Ruelles Vertes include some kind of traffic-slowing mechanism, which enhances public space. Many provide public seating and play facilities (such as hopscotch patterns on pavement). By providing safer and more beautiful places to play, sit outside, garden, and have block parties Ruelles Vertes are enhancing public space.
Economic		
Labour	0	It is not clear what, if any, effects this program has on the local job market or training. The City helps with the first round of plantings but there is no new construction work. Initial plantings and maintenance work is largely undertaken by residents themselves on a volunteer basis.
Financial Resources	5	Judging by the durability of the program (running since 1997) and its ongoing expansion, the program is affordable to the City. Although the program is overseen by the City of Montreal's Eco-Quartier program, which funds each Ruelle's first round of plantings, costs are kept down because adjacent residents agree to maintain the Ruelles.

Capitals & Stocks	Score	Reasoning[74]
Economic Structure	0	This project is primarily based upon volunteer labour. I found no evidence that it is creating new business opportunities, diversifying the economy, or promoting business innovation.
Human		
Education	3	This program doesn't directly address education opportunities, but residents tend to come to the Ruelles Vertes program with the understanding that it is primarily for beautification purposes but through the process of working with the City to develop a plan, emerge with a greater understanding of their environmental benefits.[78]
Health & Wellbeing	5	The greened laneways promote walking and cycling and also help reduce noise and air pollution. Additional greenspace is especially appreciated here in one of the most densely populated communities in Canada. The fact that they are not gated means everyone can enjoy them regardless of income. Residents derive health benefits from participating in maintenance of plants in Ruelles Vertes, in a region of the city where comparatively few have access to private outdoor garden space because neighbourhood density is so high. Some Eco-Quartiers are now prioritizing Ruelles Vertes applications from poorer neighbourhoods.
Social		
Citizenship	5	The program explicitly seeks to improve the quality of urban life. Citizens must (and do) work and plan together to win the City's help in establishing a Ruelle Verte. This cultivates neighbourly relationships and supports community-building by creating free public gathering spaces. Some citizens are very active with their Ruelles Vertes, such as those adjacent to the Rushbrooke Wellington ruelle which have created a website[79] to showcase laneway activities and plans. The program's guide to establishing and managing a Ruelle Verte is exemplary.

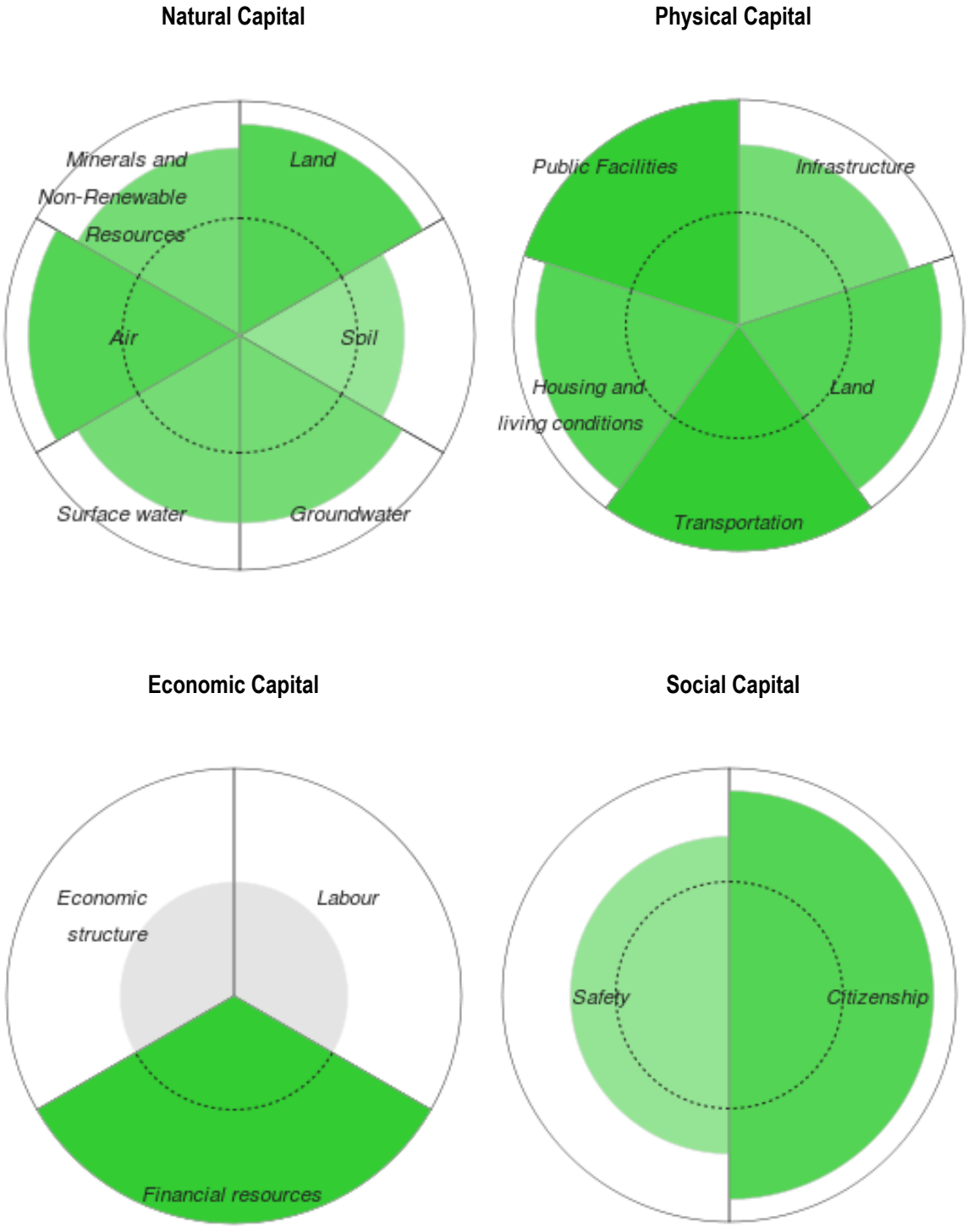
[78] Personal communication, A. Choquette, Nov. 20, 2013.

[79] See http://ruellerushbrookewellington.wordpress.com

Capitals & Stocks	Score	Reasoning[74]
Safety	2	Statistics are not available on what, if any, impact the Ruelles have on violent crime in the City (which is about average for sizable Canadian cities). The program does not actually enhance night lighting in the Ruelles, but I found no evidence that citizens are calling for this. Citizen-initiated lighting (e.g. strings of lights on adjacent properties) would be welcomed if they do not obstruct police and emergency response, but the lack of surfaces to install them (because so many are brick) and their vulnerability to theft is seen as a deterrent to citizen action on this.[80] Crime Prevention Through Environmental Design principles suggest that more activities in laneways is likely making them safer, at least during the day, because more people in them activates a form of natural surveillance.
Cultural		
Cultural Heritage	3	The guide for establishing and maintaining a Ruelle Verte prompts citizens to think about including murals and children's art. Many laneways host community-made murals and public art.
Identity & Diversity	5	Signage with both the Ruelles Vertes brand and unique laneway names (not always visible) helps create a sense of place. The fact that Eco-Quartiers receive dozens of applications annually suggest that residents see them as an improvement to neighbourhood quality of life. In general, Ruelles Vertes are a point of pride among many Montrealers. Their locations are promoted online (see www.eco-quartiers.org) and they are regarded as an amenity and tourist attraction.

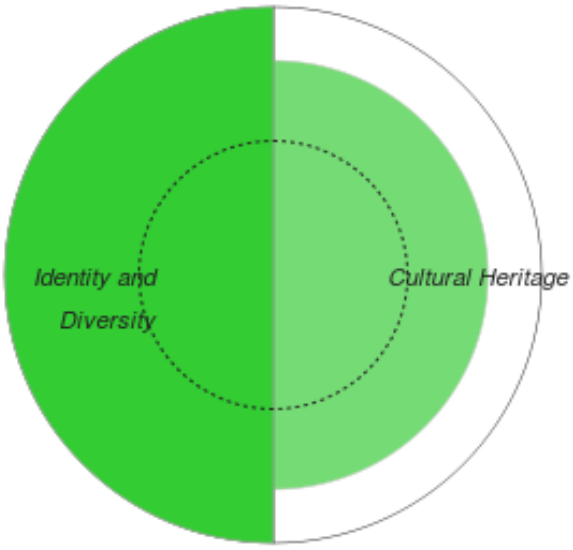
[80] Personal communication, A. Choquette, Nov. 20, 2013.

Figure 3.3. Montreal Ruelles Vertes CC Scan Graphs

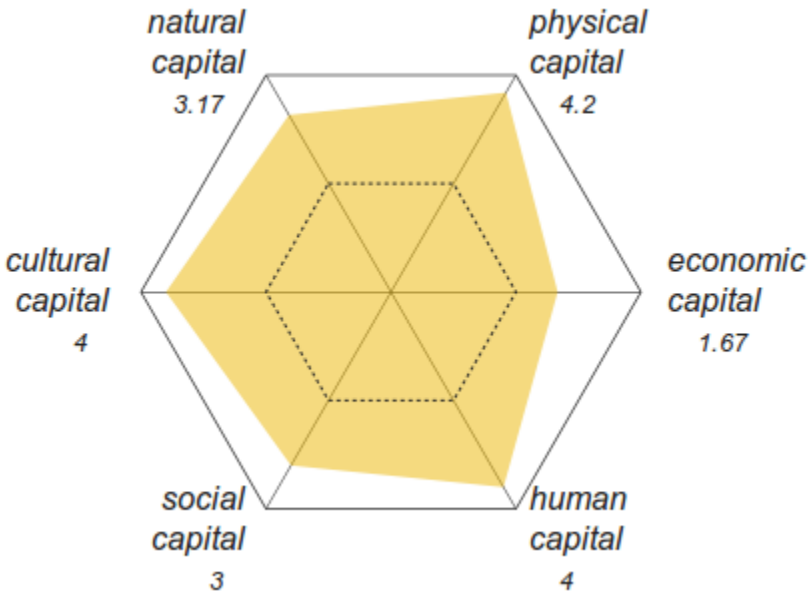


Human Capital

Cultural Capital



Montreal Sustainability Hexagon



3.4. Melbourne's Animated Laneways

Melbourne laneways have been utterly transformed thanks to a visionary effort begun by this Australian city in the 1980s. The City's revitalization effort aimed to:

- Promote economic revitalization of the central business district
- Enhance the form and character of laneways through sensitive and innovative design
- Encourage activity, vitality and interaction between public laneways and adjacent private ground-level adjacent uses
- Enhance laneways' pedestrian, service and access functions in the central city[81]

Heavily influenced by Danish urban design consultant Jan Gehl, the program obliged new and refurbished buildings along central business district laneways to include active frontages. The City also offered attractive incentives to existing developments to open laneway-oriented facades to retail activity. Three decades later, Melbourne's laneways have become a top cultural attraction that inspires similar programs around the world. Architect/designer William Feuerman described revitalized Melbourne laneways as "not quite a London mews, not quite a Paris arcade, but a sort of city-within-a-city that provides an inner layer of urban experience."[82]

Melbourne's LWR effort is very interesting in that, in addition to its obvious enhancements to public amenities and contribution to a kind of cultural and economic renaissance in the city's Central Business District (CBD), the City has made impressive strides in melding its LWR program into its internationally recognized effort to make the city more environmentally sustainable.

[81] See Ferreter, Lewis, and Pickford (2008) for a great student case study of Melbourne laneway revitalization.

[82] Feuerman (2010).

Table 3.4. CC Scan Analysis of Melbourne's Animated Laneways

Capitals & Stocks	Score	Reasoning
Natural		
Land	3	This program does not offer any new protections to natural areas or to scenic or attractive views of nature as it is sited in the city's built-out Central Business District. The City is trialling raingardens in some laneways (e.g. Davison Place[83]), which have been linked by researchers[84] to increasing biodiversity in Melbourne. Planter boxes have been installed on at least two laneways. Tree planting, façade greening, kerb extensions are also being planned for specific sites. Biodiversity in laneways could be supported by an initiative that encourages residents and businesses located on laneways to start container gardens, green roofs and green walls on private space adjacent to laneways and it provides limited funding for groups undertaking greening projects in public space (including laneways).[85]. Greening of laneways to promote biodiversity is actually mentioned as a goal in the City's Urban Forest Strategy[86], which has genetic, species, and species abundance biodiversity targets.[87] Laneways are also discussed in the City's new sustainable lighting strategy[88], which take biodiversity into account in lighting design.
Soil	2	Melbourne's Central Business District LWR effort does not increase the amount of land used for agriculture or seek to stem erosion of productive topsoil. However, it recently instituted a composting program which is promoted among laneway businesses, which will help improve soil. A litter reduction campaign in Chinatown laneways[89] also promises to improve soils in laneways.

[83] Personal communication, Gail Hall, Urban Landscapes Project Coordinator, City of Melbourne, Mar. 11, 2014.

[84] Kazemi, Beecham, and Gibbs (2009).

[85] See the *Growing Green Guide* from the State of Victoria (2014) and City of Melbourne (2013). "Greening Melbourne's Laneways".

[86] See City of Melbourne (2012) *Urban Forest Strategy*.

[87] City of Melbourne (2012) *Urban Forest Strategy.*

[88] City of Melbourne (2013) *Public Lighting Strategy*.

[89] Melbourne Water (2009) *Better Bays and Waterways*.

Capitals & Stocks	Score	Reasoning
Groundwater	4	The City has a comprehensive water management program to conserve and replenish groundwater[90] through street-level actions. This program includes a litter reduction campaign in Chinatown laneways.[91] The City's United Nations-awarded Urban Landscapes Adaptation program cites CBD laneways as a target for greening efforts, and emphasizes emphasizes water-sensitive design, which will help preserve and replenish groundwater. Water-sensitive innovations in laneways include tree-planting, kerb extensions, rain gardens, and structural cells below trees to provide irrigation and stormwater flow reduction (e.g. Godfrey Street)[92]. The City's recent moves to increase recycling and improve waste collection in laneways may help reduce the amount of pollutants that enter groundwater.
Surfacewater	4	The same programs that protect groundwater (see above) also help protect surface water in Melbourne. The laneway litter reduction campaign, the water management strategies of its Urban Landscapes Program, and waterwise innovations like structural cells below trees, kerb extensions, tree planting and rain gardens help manage stormwater. New recycling and composting programs should also reduce the amount of pollutants that enter surfacewater.
Air	4	By increasing the area of downtown space that is more amenable to walking than driving, Melbourne's LWR project may be contributing to reduced driving, and therefore reduced emissions. Officially encouraging laneway residents to use laneways for container gardening, roof gardens and green walls through guides and limited funding for citizen-initiated greening projects could also have a positive effect on air quality. The City's Urban Forest Strategy,[93] which specifically makes laneway greening an official goal, will also improve air quality. The City's new sustainable lighting strategy, which includes goals for laneways, is expected to save the City about $1.8 million per year and reduce annual greenhouse gas emissions by 8,000 tonnes. What is not clear whether these would be offset by emissions generated by promotion of consumer goods in laneways.

[90] The City's major water policy documents are available at Melbourne Water (2014) "Key Strategy Documents".

[91] Melbourne Water (2009) *Better Bays and Waterways*.

[92] Personal communication, G. Hall, Mar. 11, 2014.

[93] Air quality in laneways will also be improved by City of Melbourne's (2012) *Urban Forest Strategy*. See also the State of Victoria's 2014 *Growing Green Guide* and City of Melbourne (2013) "Greening Melbourne's Laneways".

Capitals & Stocks	Score	Reasoning
Minerals & Non-Renewables	2	Although Melbourne's animated laneways make walking more attractive than driving, it is not at all clear whether the net effect of them is to reduce driving in Melbourne or the draw on non-renewable energy through other means of consumption. But the City's new 5-year, $20.3 million program[94] to make lighting more energy-efficient specifically mentions Central Business District laneways as a target for energy-efficient lighting upgrades will hopefully reduce the draw on non-renewable energy sources. The strategy also works with local businesses in CBD laneways (among other businesses in the CBD).
Physical		
Infrastructure	3	The City's LWR effort is starting to emphasize energy efficiency through its sustainable lighting strategy (see above). Businesses in laneways are also required to store waste in designated areas during designated times. Fines are levied for unsightly storage of waste. It increases connectivity for citizens by making the CBD more accessible to walkers. The City is now piloting trash bin screens and has recently installed two compacters downtown, accessed by residents and businesses using security cards. Each holds the volume of 10 waste trucks, reducing their number, noise, and emissions in the downtown. A community recycling centre is also being piloted, with a dehydrator that turns food waste into soil conditioner for city parks and gardens, a cardboard baler, and recycling bins. Already it has cut the number of organic waste bins in the laneway by more than 75%, which also reduces need for garbage trucks. [95] The city aims to expand this program to the entire CBD. [96] A new Love Your Laneways program[97] encourages better coordination of waste management, supports cultural and community events, and trains Laneway Champions to work with local businesses to keep laneways tidier. I would give this effort higher marks if "reduce waste" messages and incentives were more prominent.
Land	5	This program has excelled at extracting more compatible uses (e.g. walking, business, tourism, cultural expression, housing, and to some extent greening) at all times of day, from already developed, previously neglected laneways.

[94] City of Melbourne (2013).

[95] Masanauskas (2013).

[96] Personal communication with Rebecca Hughes, Program Coordinator, Engineering Services, City of Melbourne, Dec. 3, 2013.

[97] The Love Your Laneways program, which began in 2011, identified 11 laneways for improvement (e.g. paving and road resurfacing, better lighting, graffiti removal, street art and the installation of bollards and bin screens). See City of Melbourne (2014) "Love Your Laneway."

Capitals & Stocks	Score	Reasoning
Transportation	5	These "activated" populous laneways make walking and cycling attractive alternatives to access amenities like entertainment and shopping. Bike and tram routes allow ready access to laneways, and locations of laneways and their connections to transit are well promoted on maps.[98]
Housing & Living Conditions	2	Melbourne's LWR does not directly address housing, but it coincided with and benefitted from a 1992 City initiative (Postcode 3000) to create new housing for 3,000 people in the Central Business District. LWR and Postcode 3000 enhanced housing and living conditions by bringing housing, jobs and amenities closer together. But rapid population growth in the central city (almost doubled since 2001)[99] plus CBD housing that is highly skewed towards 1-bedroom apartments and higher-than-average rents serves to exclude families and lower income earners.[100] So while the LWR, including all of the more recent greening efforts described above, has helped enhance living conditions, a possible second-order effect is that this is happening at the expense of housing diversity.
Public Facilities	5	These laneways can now be enjoyed by everyone to at least some extent, thanks to public seating, art installations, festivals and some free events. Passive recreation area has been integrated into Godfrey St. Laneway.[101] Activated laneways create more performance spaces for artists. They are in highly trafficked locations. Laneways also host social innovation spaces.
Economic		
Labour	3	Increased business activity in laneways has surely created welcome jobs. Most of the businesses in revitalized laneways appear to be service industry (e.g. restaurants and bars) and retail (boutiques and shops).[102] Australian income data indicates that these types of jobs pay lower than median wages. Information about Melbourne LWR doesn't discuss wages and working conditions or whether workers are learning green-economy skills.
Financial Resources	5	Increased tourism and business in central business district laneways generates more tax income for the city. The fact that the program is being emulated around the world The program's energizing effects on local business, culture and community pride has inspired programs as far afield as San Francisco and Seattle, which is creating a network of redesigned city-center laneways and numerous laneway-oriented arts events. This suggests it is financially successful for the city as well.

[98] The map at this link shows Melbourne laneways in the context of tram, bus and bike routes: https://www.spillcon.com/2010/images/melbourne_map.jpg

[99] Enterprise Melbourne (2014), "Central City".

[100] Martel et al. (2013).

[101] Personal communication, Gail Hall, Mar. 11, 2014.

[102] Australian Bureau of Statistics (2012) Employee Earnings, Benefits and Trade Union Membership, Australia, August 2012.

Capitals & Stocks	Score	Reasoning
Economic Structure	3	The success of this LWR project is widely attributed to the "fine-grain" (small and medium-sized) character of businesses in CBD[103]; other cities are trying to emulate this.[104] This composition of the business community suggests it will be more resilient to business cycles and economic shocks than if it were composed of a few monolithic businesses. What is not clear is how the City's laneway program supports or coincides with greener production and design processes, or whether these businesses reinvest their profits in the local economy.
Human		
Education	1	The LWR effort here is not designed to increase access to education. Some City-funded laneway projects have involved youth (including at-risk youth) in laneway art projects with a mentoring or work experience component.[105]
Health & Wellbeing	2	Although the LWR effort isn't specifically designed to create opportunities for fitness, active play, or improvement of mental health, it indirectly supports health to the extent that it entices people to approach laneways by walking instead of driving and provides more opportunity to socialize. Greening of laneways also promotes mental and physical health through air quality, beautification of urban environments and stress relief. On the other hand, it's not clear that the activities available in laneways (bars, restaurants, shopping) necessarily promote physical and mental health.
Social		
Citizenship	4	Through freely available public seating LWR has created new spaces for people to relax and convene. The City's Love Your Laneways involves locals in maintenance of laneways by training Laneway Champions to work with local businesses to keep laneways tidier. The City encourages business behavior that promotes laneway ambience with shopfront window stickers that communicate the City's appreciation.

[103] Woodhouse (2011).

[104] See City of Sydney (2013) "Fine Grain Matching Grants".

[105] For example, in 2007, the City of Melbourne hosted a mentoring program that paired young people with professional artists to create vast murals along the city's Union Lane.

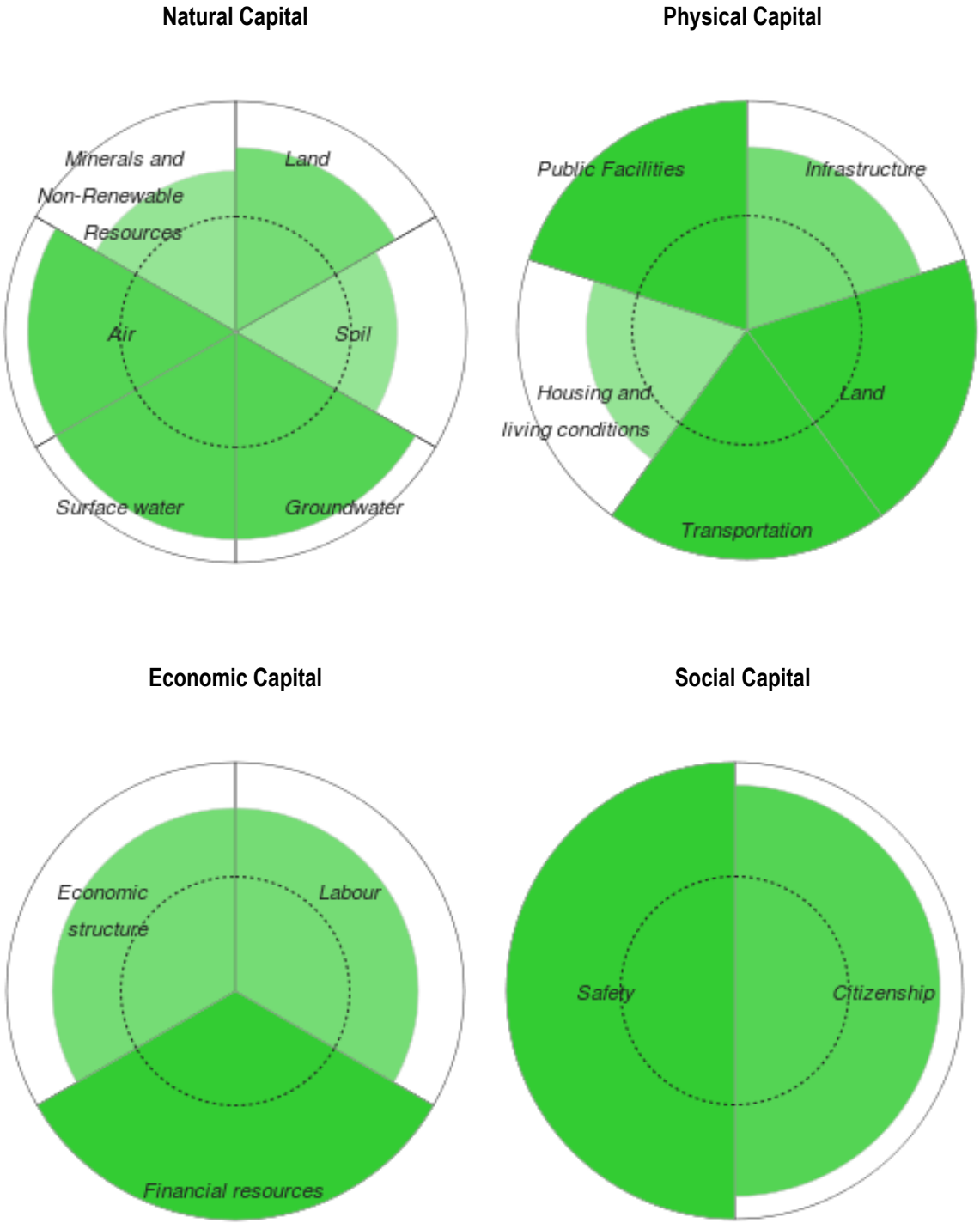
Capitals & Stocks	Score	Reasoning
Safety	5	In line with Crime Prevention Through Effective Design principles, getting more people (and fewer vehicles) into Melbourne laneways is thought to have made them safer.[106] CBD laneways are also the subject of a new city strategy to improve lighting in them for safety and ambience.
Cultural		
Cultural Heritage	5	This LWR sought to transform laneway wall space into a public art gallery. The Love Your Laneways program supports cultural and community events[107] which make a lot of room for emerging artists, like the St. Jerome's Laneway Festival, which draws some 5,000 people into laneways for live independent music.[108] The City's heritage policies determine the nature of development in laneways.
Identity & Diversity	5	Melbourne's laneways are considered a top cultural attraction in Australia. Directional signage, unique laneway names, and activity-appropriate, pedestrian-scale lighting help create ambience and a sense of place. The City embraces a permissive attitude toward street art, which helps support diverse expression. The program has clearly had energizing effects on local business, culture and community pride.

[106] According to the city's Mayor, the city's effort to turn alleys into contemporary art galleries "has become so popular that these artworks attract thousands of additional people into the darker, quieter areas of the city, making [Melbourne] even safer." Ferreter, Lewis, and Pickford (2008), p. 4.

[107] The Love Your Laneways program, which began in 2011, identified 11 laneways for improvement (e.g. paving and road resurfacing, better lighting, graffiti removal, street art and the installation of bollards and bin screens).

[108] Ferreter, Lewis & Pickford (2008).

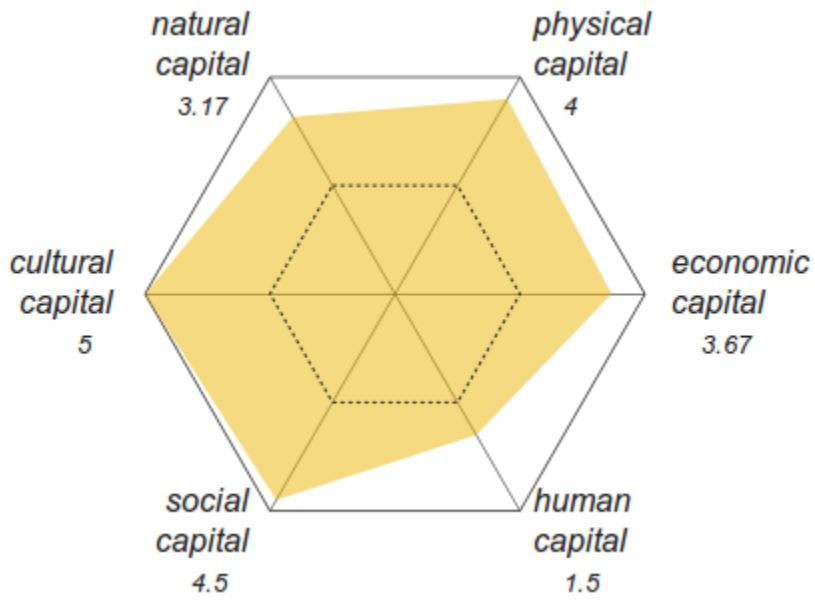
Figure 3.4. Melbourne Animated Laneways CC Scan Graphs



Human Capital

Cultural Capital

Melbourne Sustainability Hexagon



3.5. Baltimore's Gated Alleys

Baltimore's Greened & Gated Alleys program officially began in 2007 in the American city of Baltimore, Maryland, when the City of Baltimore passed its Alley Gating and Greening ordinance. This ordinance specifies a process[109] that allows groups of citizens in residential areas to close their back alleys to through-traffic by means of gates that lock from the inside ("gating"), and, where all adjacent residents agree to do this, to all non-emergency vehicles. In this program,"greening" refers to any alterations (including beautification measures) that newly restrict vehicle access to an alley.[110] The exacting process[111] requires approvals from several City departments (e.g. solid waste, transportation, fire, police, and public works); written consent from adjacent residents; a public hearing; and an agreement to lease the alley from the City. According to the ordinance, residents are to bear all costs related to the preparation of alley gating plans; purchase, installation, and maintenance of gates; landscaping, including pavement removal if this happens; alley maintenance, including any fees for building, fire, or related permits; and any cost involved in returning the alley to general use if this ever happens.[112] Successful applicants may then gate their alleys; add social amenities, such as seating, play equipment, murals, potted plants, and garden boxes; remove fences that separate their properties to create one larger yard-like space. With sufficient consents from neighbours, residents can also remove all or part of the pavement.[113]

[109] The process and its goals are described in Herrod (2011) and Baltimore's Alley Greening and Gating Toolkit, by Nathanson and Emmet (2008).

[110] Herrod (2011).

[111] The city sets a very high bar for approval: Only 80% of neighbours' signatures are required for gating and greening activities that still allow vehicles in the alley, but applicants must document their sustained attempts to obtain 100% of neighbor approval. 100% of adjacent neighbours must consent in writing to any changes that would eliminate access to parking. Even with sufficient adjacent neighbor consent, applications can still be denied if there is significant opposition at a public hearing. Gates must be taken down at adjacent residents' expense if a simple majority of adjacent owners later decide they want this, if the City decides the alley no longer supports public health, safety, or welfare, or if the City determines the laneway is needed for pedestrian or vehicle throughfare.

[112] Herrod (2011).

[113] Personal communication, David G. Willemain, Alley Gating Office, City of Baltimore, Mar. 3, 2014.

Baltimore's Alley Gating and Greening program is the result of a sustained community lobbying effort of several community interests led by the social entrepreneurship organization Ashoka: Innovators for the Public.[114] The program aims to:

- Eliminate illegal dumping, vandalism and crime in alleys to create safer neighbourhoods
- Create new spaces for play, gathering, and repose; enhance social cohesion
- Contribute to cleaner air, habitat for birds and insects, stormwater management, and urban heat island reduction

Unlike the other programs studied in this paper, residents bear the direct costs of LWR (gating, amenities), and the gated spaces become semi-private spaces, accessible to only to adjacent neighbours and their guests and to service and emergency vehicles via special keys. Most of the applications are from medium-density residential neighbourhoods undergoing "concentrated gentrification"[115].

About 15 alleys have been gated to date.[116] According to City of Baltimore staff, only about one gating is completed of every eight inquiries to the City from people interested in gating their alleys. Failure to get sufficient written consents from neighbours explains why most applications stall. None of the projects to date have involved removal or replacement of conventional pavements. Nevertheless, proponents say gating has been transformational [117], creating safe spaces for people and their children to gather, relax and recreate outside. This is understandably important to residents of a city that repeatedly makes the FBI's list of the most dangerous 10 large cities in the US,[118] and which recent international research names as one of the world's most violent cities.[119] According to Dave Willemain of City's Alley Gating Office, the program was conceptualized as a greening project, but it is a *de facto* crime deterrence program and

[114] Herrod (2011).
[115] Shapiro (2010).
[116] Personal communication, D. Willemain, Mar. 3, 2014.
[117] See Herrod (2011), Nathanson & Emmet (2008).
[118] Goff (2014).
[119] Engel, Sterbenz and Lubin (2013).

is having greatest success in typically more affluent neighbourhoods that don't have a desperate need for it. Willemain has proposed gating alleys at no cost to residents (following public notices and hearings) where crime statistics are sufficiently high. Although his plan has support among some high-ranking police, the proposal has yet to go anywhere[120]. Willemain is hoping to find a foundation willing to fund up to half of the cost.

As the program is still very new, independent peer-reviewed evaluation of program impacts on neighbours or the community at large are scarce. But evaluation of the quantitative and qualitative changes that alley gating offers to adjacent residents is underway now by Ashoka and researchers from University of Maryland and College of William and Mary.

Table 3.5. CC Scan Analysis of Baltimore's Gated Alleys

Capitals & Stocks	Score	Reasoning
Natural		
Land	0	The program does not increase preservation of, or promote the increased preservation of, natural areas, sensitive ecosystems, or scenic views of nature. Although the program promotes the potential for pavement to be removed and converted to greenspace and gardens, which could support biodiversity and reduce the urban heat island effect, the City reports that none of the gated alleys to date have done this.[121] There is no mechanism to ensure this happens.
Soil	0	I found no evidence that the program seeks to reduce the sources of soil pollutants and contaminants or address erosion of soil used by agriculture or vulnerable ecosystems. The program could expand opportunities for organic container gardening to produce food, but I found no evidence that this is happening in many or any alleys.

[120] Personal communication, D. Willemain, Mar. 3, 2014.
[121] Personal communication, D. Willemain, Mar. 3, 2014.

Capitals & Stocks	Score	Reasoning
Groundwater	0	By reducing or eliminating the amount of driving in these gated alleys, the program could potentially reduce the amount of driving and thus the pollutants that find their way to groundwater through that soil. But there is no evidence that the program is reducing driving generally. Nor does the program doesn't require collection or consideration of data about groundwater quality and abundance before or after gating.[122]
Surfacewater	0	This program doesn't promote the reduction of, or measurably reduce or eliminate sources of, surfacewater pollutants. Stormwater management measures and replacement of pavement are options the program promotes to residents (to be undertaken at their expense), but these are not required and reportedly aren't happening to any appreciable extent.[123]
Air	1	Plantings of trees (even potted ones) and shrubs would enhance the City's air quality. The City reports that about half of successfully gated alleys have been enhanced with potted plants.
Minerals & Non-Renewables	0	To the extent that the program encourages people to stay home rather than drive to parks, it could be contributing to lower use of fossil fuels. I did not find any relevant data on this.
Physical		
Infrastructure	1	Alley gating eliminates illegal dumping in these alleys, which is an improvement. However, it is not designed to reduce sources of waste. This program doesn't relate to delivery of energy, water, or telecommunications.
Land	1	This program appears to be taking land out of the public realm and creating semi-private backyards rather than adding more compatible public uses to it. On the other hand, to the extent that the program gates unused alleys, it could be seen as increasing use of the land.
Transportation	-1	By limiting access to some formerly public alleys for through-travel and active transportation, the program is reducing connectivity.

[122] Personal communication, K. Herrod, Dec. 4, 2013.

[123] Note that Baltimore is also beginning a separate Blue Alleys program that is comparable in purpose and method to Chicago's Green Alley program. I am looking at this Gating and Greening program in isolation as it is quite a separate program, focused on a different set of alleys.

Capitals & Stocks	Score	Reasoning
Housing & Living Conditions	1	The program definitely improves housing conditions for those who can afford gating and greening. Proponents claim it raises property values and creates more stable neighbourhoods by making home ownership more attractive. But its user-pay, property owner-focused format may exclude those who are in greatest need of improved housing conditions—renters in the most dense and dangerous neighbourhoods. City staff report that the program is most successful in neighbourhoods that least need it.[124]
Public Facilities	0	The program creates attractive new spaces for repose, gathering and active play, but because they are not accessible to the public they do not really qualify as public spaces.
Economic		
Labour	0	The program probably creates some paid work opportunities, but I found no data that that discusses working conditions, pay, or contribution to a balanced labour market.
Financial Resources	5	Although the program exacts some cost to the City in terms of staff time to assess applications, the user-pay format of this program ensures that it is affordable for the City. The Gating & Greening ordinance makes the process transparent and protects the City from frivolous lawsuits. The process of applying for a gated laneway certainly creates work for lawyers and site assessment professionals, and may also provide profit-making opportunities for local companies (for example, in gate installation or garden maintenance).
Economic Structure	0	This program does not appear to be designed to provide opportunities for new businesses and local entrepreneurs.
Human		
Education	3	The program isn't designed to provide educational opportunities, but at least some citizens developing applications to gate alleys may be developing organizational skills. The non-profit Ashoka (which helps facilitate many alley gating projects) emphasizes capacity-building (e.g. leadership training) among participating residents.[125]

[124] Personal communication, D. Willemain, Mar. 3, 2014.

[125] See Ashoka: Innovators for the Public (2008). For a detailed case study plus a copy of the ordinance, see Herrod (2011). She observes on p. 1: "Baltimore's program rests at a unique intersection of grass-roots responsibility (residents must undertake the process primarily on their own including gaining their neighbors' consents and raising funds for improvements) and top-down, municipal authority (a city wide ordinance and application process that must function in order for the program to spread city-wide)."

Capitals & Stocks	Score	Reasoning
Health & Wellbeing	1	Gated alleys likely contribute to the physical and mental health of the adjacent residents by creating new green spaces and spaces to for active outdoor play and relaxation. But these benefits are not widely available.
Social		
Citizenship	4	Some see gating as a step towards gentrification and exclusion.[126] Proponents say the process of developing a block-level application helps build social capital as neighbours have to work together to achieve an acceptable level of consensus, come up with funding, and work out governance schemes for long-term maintenance.[127] Residents are meaningfully involved in LWR design, construction and maintenance. The program has been helped by, and helped strengthen, connections between citizens and civil society organizations.
Safety	4	According to Ashoka's preliminary research, residents' sense of safety and community has increased as a result of gating.[128] Gating alleys defines "new", safer places for some residents, their children, and presumably their friends to actively play, relax, and gather. Reduction or elimination of driving in the alleys makes them safer. Increasing the number of people in these spaces probably increases the number of eyes on them, which also makes them safer. Emergency vehicles still have access to gated alleys through special keys. Installation of lighting is encouraged but not required; ultimately it is citizens who determine the level of additional night-time lighting required to address their needs (reports suggest additional lighting is not a common addition[129]). Unfortunately the gating of these spaces creates privatized spaces that serve to exclude many law-abiding residents.
Cultural		
Cultural Heritage	1	The program doesn't increase public art or emphasize incorporation of elements that celebrate local history, culture and tradition and local artists, but some residents adorn their gated alleys by painting walls. Gate design provides some opportunity for cultural expression: at least one gating project hired local art students to design an artful gate[130].

[126] Shapiro (2010). Note that incipient gating of laneways in Los Angeles was challenged by a citizens' group, with the result that it has since been made illegal there.

[127] Herrod (2011).

[128] Herrod (2011).

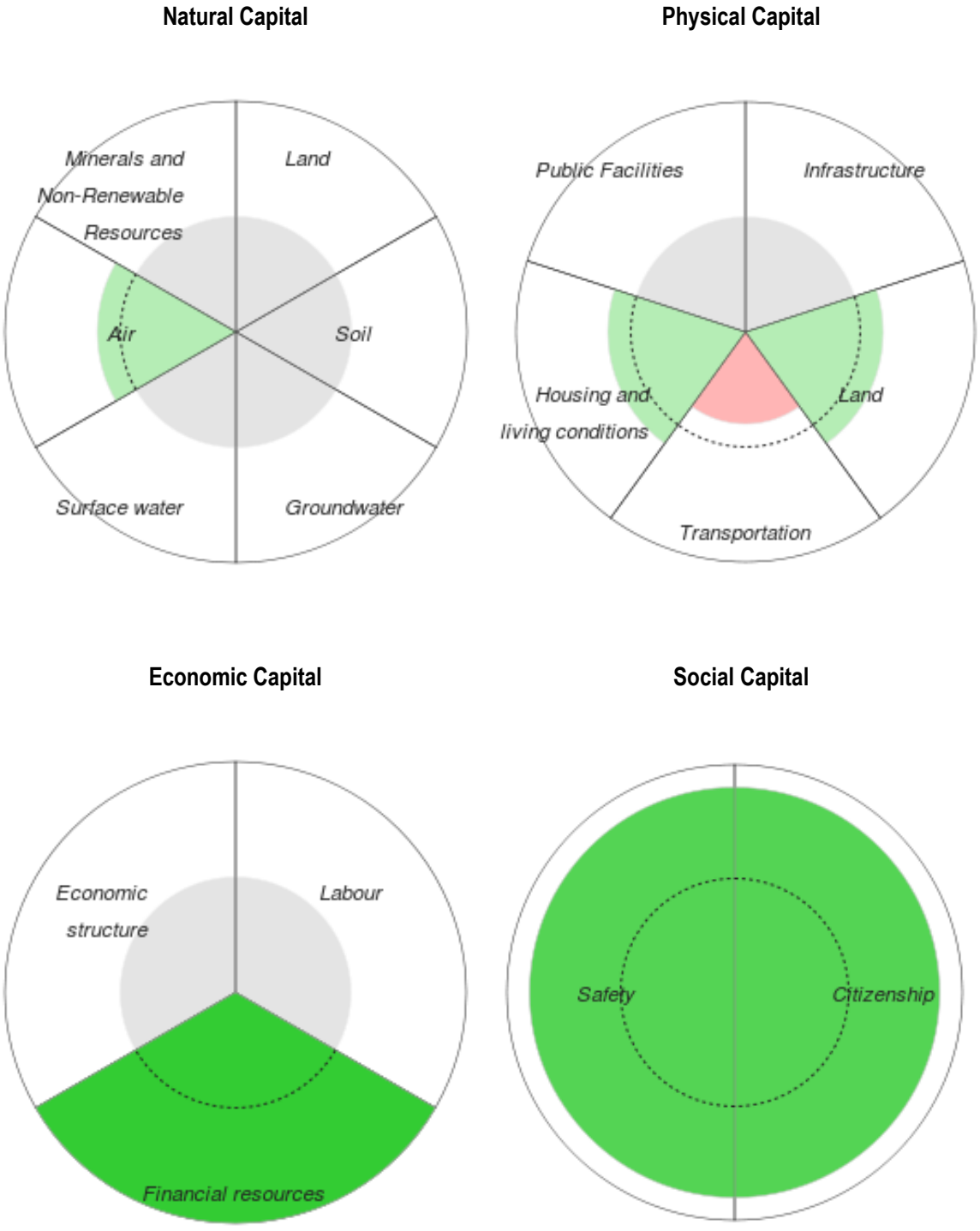
[129] Personal communication, K. Herrod, Dec. 4, 2013. Also Seymour, Wolch, Reynolds and Bradbury (2010).

[130] Shapiro (2010).

Capitals & Stocks	Score	Reasoning
Identity & Diversity	0	The gated alleys would enhance the neighbourhood's unique sense of place for adjacent residents at least. But naming and signing of gated alleys—measures which would also increase an area's sense of place—is not recommended by the City's Alley Gating Office because it "may lead some to believe that the spaces are open to all." [131]

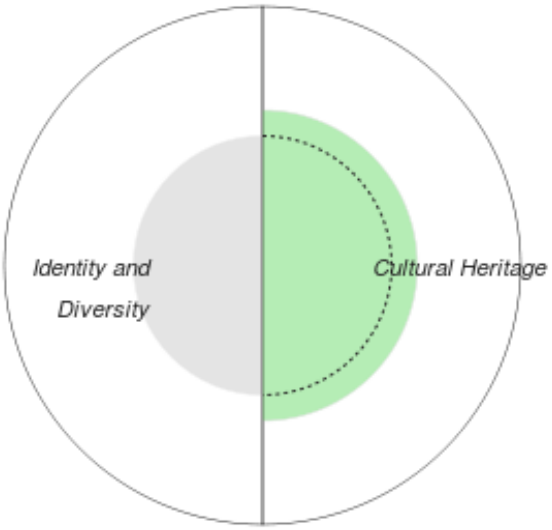
[131] Personal communication, D. Willemain, Jan. 2, 2014.

Figure 3.5. Baltimore Gated Alleys CC Scan Graphs

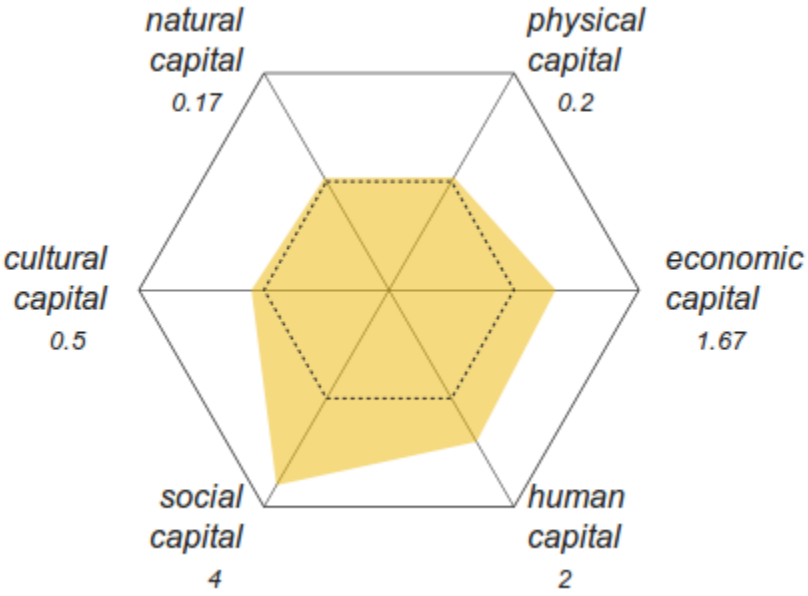


Human Capital

Cultural Capital



Baltimore Sustainability Hexagon



3.6. Los Angeles's Avalon Green Project

Los Angeles is home to a unique LWR program known as The Avalon Green Alley Network project. It aims to transform about 10 proximate alley segments and streets in a 14-hectare area of a high-density South Los Angeles residential neighbourhood into "green, connective tissue" between two parks and two school sites.[132] Two of these segments will get permeable pavements, plants, fruit trees and public arts; one will be transformed into a pedestrian mall; all will be cleaned up and beautified with vines and artwork.[133]

It is hard to compare this project to the other five LWR projects in this paper. Although it has been in the works since at least 2009, it is still in the planning stage—so we have yet to see implementation, let alone impacts. For this reason I am subjecting its intentions, rather than its results, to the CC Scan.

I am including it in this paper because I think its consciously holistic approach to LWR is inspiring and instructive. Also noteworthy is the organizers' vision of incorporating the Avalon Green project into a much larger network of three to five similar projects. A South LA Green Alley Master Plan for this is in the works now, and will be complete by the end of summer 2014. Researchers who compared Avalon Green with LWR programs in seven US cities through the lens of sustainability planning described it as "the most robust model of sustainability planning among contemporary alley greening programs in the United States."[134] The project aims to achieve the following goals:

- Enhance health, wellbeing, safety, and sense of community
- Promote active transportation and connectivity
- Reduce urban heat island effect and light pollution
- Augment habitat for native species and greenspace in underserved areas
- Improve water management
- Deliver environmental education

[132] Newell et al. (2013).
[133] Bergren (2014).
[134] Newell et al. (2013) p. 154.

Proponents hope to achieve the above goals through community involvement in design, a block-watch program to augment safety, use of the network for cultural events and installation of student art projects, the latest techniques in water-savvy street redesign and urban heat management, waterwise plantings, reflective pavement, closure of one segment to vehicle access, and beautification measures.

Project organizers have been carefully laying groundwork through broad partnerships, political support, and resident engagement. This has included organizing laneway cleanups with residents and developing a neighbourhood watch program. The City's creation of a Green Alleys Subcommittee (now subsumed in its Green Streets Committee) has helped shore up political support; encourage collaborative thinking; and cost out viable options that maintain access to properties, enhance safety and achieve environmental goals.[135]

Funding for tree planting and maintenance and one of the two major ally retrofits in the project, as well as for the development of a master plan for three to five alley networks in South LA, has been secured, and organizers are optimistic that grant applications for more complete funding for project design, and implementation will be successful. If all goes according to plan, construction will be complete in 2016. Broadening perceptions about what alleys can be[136] is expected to take time. Media reports suggest it has been tricky to get the community's input because the surrounding community is somewhat "ill-defined."[137] Furthermore, involving residents can be difficult due to high residential turnover (many are renters). [138]

[135] Newell et al. (2013); City of Los Angeles Rainwater Harvesting Program (2009).
[136] Cassidy, Newell, and Wolch (2008).
[137] Martinez (2012).
[138] Newell et al. (2013).

Table 3.6. CC Scan Analysis of L.A.'s Planned Avalon Green Alley Network

Capitals & Stocks	Score	Reasoning[139]
Natural		
Land	2	This project explicitly seeks to augment habitat for native, drought-tolerant species.
Soil	1	Neighbourhood alley clean-ups plus measures that reduce illegal dumping may help reduce the entrance of pollutants into soil.
Groundwater	3	Plans for two major alley retrofits include use of permeable pavements that aid biofiltration and groundwater recharge.
Surfacewater	4	Proposed stormwater management features include permeable pavements with drywells (subsurface infiltration galleries) for some of the alley segments, rainwater harvesting, and infiltration or flow-through planters. The site's proximity to the Los Angeles River also suggests that any reduction in stormwater runoff will improve the local ecosystem.[140]
Air	4	More than 150 new street trees are being planted in the project area. Their natural cooling features could help reduce the emissions associated with use of air conditioners. Trees plus the use of vines, greenwalls and drought-tolerant plantings should help improve air quality.
Minerals & Non-Renewables	3	By augmenting greenspace in the community, planting trees, and using high-albedo materials, this project explicitly seeks to mitigate the urban heat island effect–which should have the effect of reducing use of air conditioners and the energy these use. By promoting active transportation, the project should support reduced draw on non-renewables.
Physical		
Infrastructure	4	This program is not designed to address accessibility of telecommunications or energy transmission, but reducing illegal dumping through signage and a report line can help clean up waste management. Also, siting the project in the second highest "flood complaint density" region of the city[141] magnifies the impact of its green infrastructure elements (see above discussion of stormwater management).

[139] Newell et al. (2013); City of Los Angeles Rainwater Harvesting Program (2009); Cassidy, Newell, and Wolch (2008); City of Los Angeles Community Redevelopment Agency (2010); Wolch et al. (2010); and personal communication with Laura Ballock, Project Manager, Parks for People, Trust for Public Land, Los Angeles, Mar. 21 and 27, 2014.

[140] Bergren (2014).

[141] Wolch et al. (2010).

Capitals & Stocks	Score	Reasoning[139]
Land	3	This program seeks to increase compatible uses of land by increasing use of existing infrastructure by more people and for more purposes (e.g. walking, cycling, play) and, if residents respond to encouragement to contribute their own low-cost lighting solutions, at more times of day.
Transportation	5	The project explicitly seeks to enhance connectivity and active transportation between parks, shopping and school sites. Access for drivers will be preserved in all but one segment of the network. The City has recently commissioned its Community Redevelopment Agency to integrate Avalon Green into a larger South Los Angeles Green Alley Master Plan that will include design guidelines and policy recommendations for three to five networks of green alleys in at least a 41-km^2 (15.8 square miles) area.[142]
Housing & Living Conditions	1	This program is not designed to augment diversity and affordability in housing, but espaliered fruit trees and edible landscaping are expected to enhance the community's food security.
Public Facilities	4	This program definitely seeks to enhance public space, and for non-consumptive uses like relaxing, gathering, and active play through decorative pavings, play equipment, and (project organizers hope) resident-installed lighting. Particularly noteworthy is the project's aim to increase greenspace in the city's poorest areas (in terms of parks and income[143]) in one of the USA's most park-poor cities.[144]

Economic

[142] The plan's guidelines and recommendations will emphasize "how to create green alley networks that promote infill development, improve community walkability (thereby reducing Vehicle Miles Traveled), develop new and attractive spaces for outdoor exercise and promote multi-benefit infrastructure improvements with a focus on stormwater capture and infiltration." City of Los Angeles Community Redevelopment Agency (2010), 2.

[143] Most Los Angeles laneways are concentrated in dense, single-family residential neighborhoods, and most of these are in crime-ridden, primarily low-income South Los Angeles where residents are disproportionately affected by poor air quality, have high rates of obesity, diabetes and heart disease, and have few or limited places to play outdoors. South Los Angeles (site of Avalon Green) has just .17 hectare of park space per 1,000 people. Newell et al. (2013).

[144] With only 7.8% of its area devoted to parks and open space, Los Angeles is one of the most park-poor cities in the United States. The combined area of LA's 12,309 alley segments is about 808 hectares—more than twice the area of New York's Central Park. Cassidy, Newell, and Wolch (2008).

Capitals & Stocks	Score	Reasoning[139]
Labour	1	The project does not directly address green jobs or working conditions, but one of the project partners (the Los Angeles Conservation Corps) involved employs young adults and at-risk youth in skill-building, landscape maintenance and construction projects.[145]
Financial Resources	2	The City's creation of a Green Alleys Subcommittee shows that it is already prepared to allocate resources towards LWR. Funding has been secured for the planting of about 150 trees which will be planted by 2016, and for the development of the South Los Angeles Green Alley Master Plan which will be done by late summer 2014. Organizers are optimistic that remaining funding will come through soon.
Economic Structure	2	It is not clear yet how or whether this project will help diversify the local economy attract businesses to the community, or create opportunities for new business startups or companies that are greening. But proponents point to involvement of two companies that are using innovative green technologies (a dry well system and permeable unit pavers) and "competitively improving products for the greener building supplies".[146]
Human		
Education	5	Some environmental education about trees, local ecosystem and watershed, and green infrastructure will be provided through interpretive signage.[147] Environmental education is being imparted through community outreach meetings and workshops to solicit residents' visions and opinions on laneway redesigns.[148] The project has also created an Avalon Green Alley Green Team (local residents) who are learning about tree care, tree maintenance, tree planting, and watersheds. Much of the learning here is by doing: local students are engaged in alley clean-ups and events, led by teachers making green connections in the classroom. Young adults and at-risk youth are also learning about the environment through the Los Angeles Conservation Corps, whose crews also provide clean-up of the alley network alongside the Green Team, students and other residents.[149]

[145] Personal communication, Laura Ballock, Project Manager, Parks for People, Trust for Public Land, Los Angeles, Mar. 27, 2014.

[146] Personal communication, L. Ballock, Trust for Public Land Project Manager, Los Angeles, March 27, 2014.

[147] Newell et al. (2013).

[148] Newell et al. (2013).

[149] Personal communication, L. Ballock, March 27, 2014.

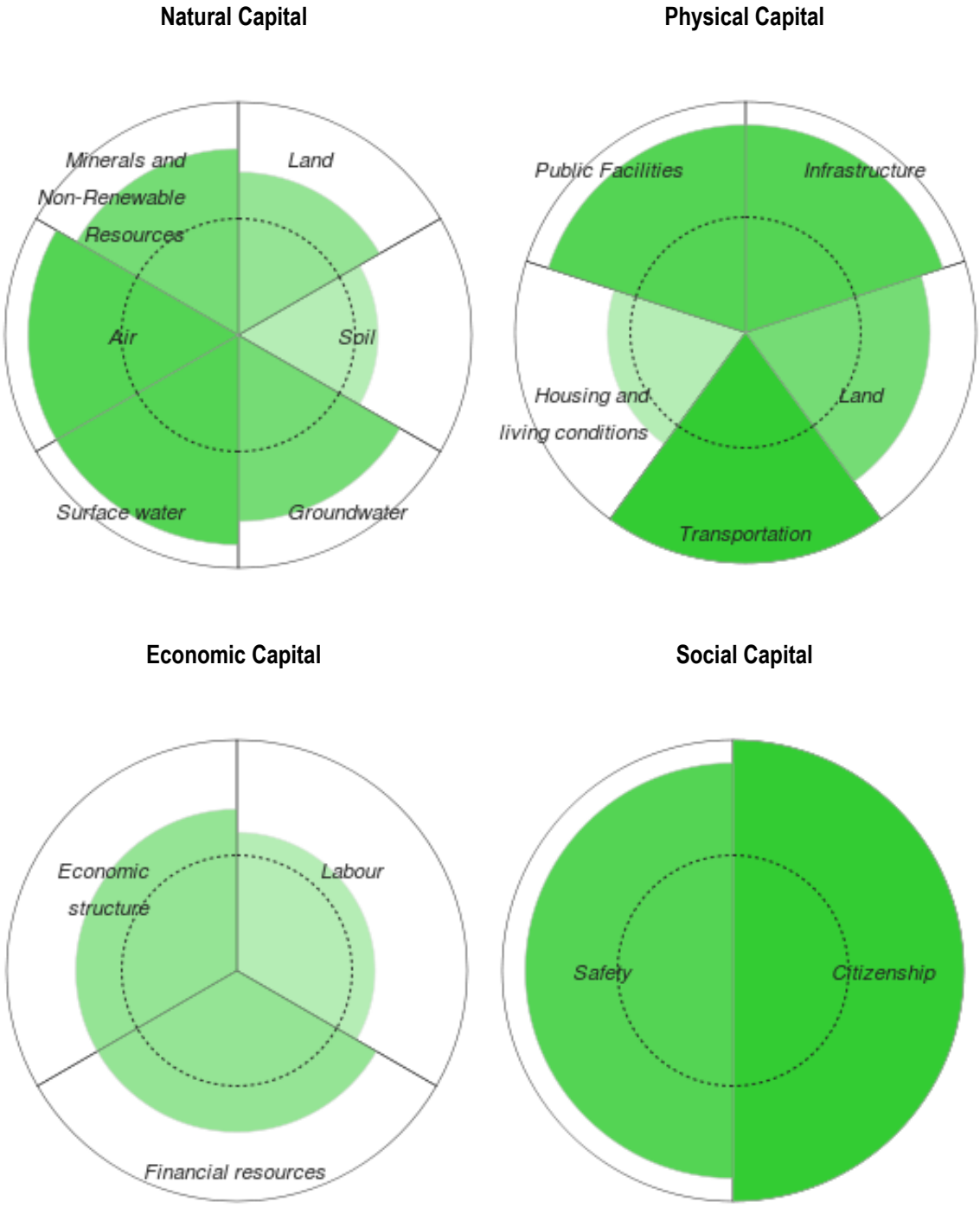
Capitals & Stocks	Score	Reasoning[139]
Health & Wellbeing	5	Through enhancement of active transportation and outdoor play, increase of walkable and cyclable space in the community, and creation of new greenspace and places for people to gather, this project promises to contribute to public health and wellbeing. Planting of trees increases health and wellbeing by reducing urban heat island effect. Measures that improve groundwater (see above) should also contribute to public health by preserving drinking water supplies.
Social		
Citizenship	5	The project aims to address social inequity by siting the alley network in neighbourhoods that most need it. Providing safer places outdoors for children to play and people to gather in will enhance a sense of community. The project explicitly recognizes the critical role of NGOs, researchers, and citizens (including and especially renters). It brings together a wide variety of civil society organizations, including the Trust for Public Land, the City of Los Angeles Community Redevelopment Agency, City of Los Angeles Bureau of Sanitation, Los Angeles Conservation Corps, local police, local elementary and high schools, and others. The program has already established Green Alley Teams for neighbourhood clean-ups and monthly meetings. Project organizers are preparing residents for a realistic time-frame with opportunities to get involved at many stages. It also has the support and involvement of at least a few elected officials.
Safety	4	Community outreach meetings helps neighbours get to know each other, which improves safety. Responding to community input during outreach meetings, organizers have made safety improvements a project priority. Proponents have helped establish a neighbourhood watch program and increase residents' investment in the place through Green Teams which meet monthly.[150] Organizers will encourage residents to augment safety by contributing economic, pedestrian-scale lighting (hopefully they respond!). Outdoor activity will be safer thanks to closure of least one alley segment to vehicle traffic.[151]
Cultural		
Cultural Heritage	3	Proponents expect the site will host cultural events like annual Christmas Posadas (traditional in Mexico, Guatemala, and the Southwestern US) and an end-of-school Art Walk[152].
Identity & Diversity	4	The project will contribute to the neighbourhood's a sense of place through directional signage, attention to aesthetic elements, and pavement designs that help set it apart as a public amenity. Branding the area as the Avalon Green Alley Network also helps define its public sense of place.

[150] Personal communication, L. Ballock, Mar. 27, 2014; Bergren Miller (2013).

[151] Newell et al. (2013).

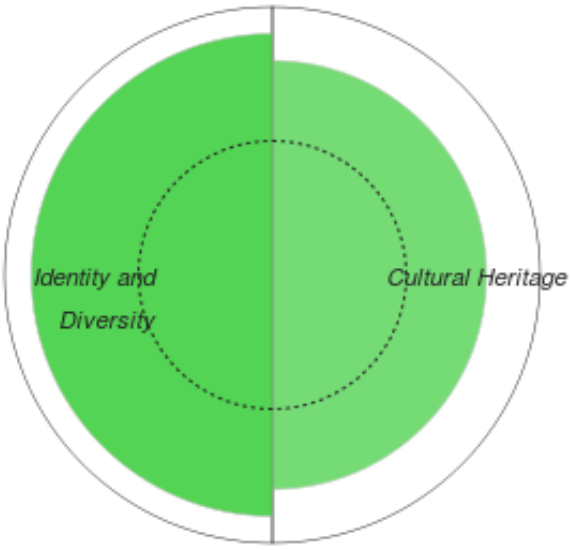
[152] Alduenda, Ballock, Rottle, and Hill (2013).

Figure 3.6. Los Angeles Avalon Green Alley Network CC Scan Graphs

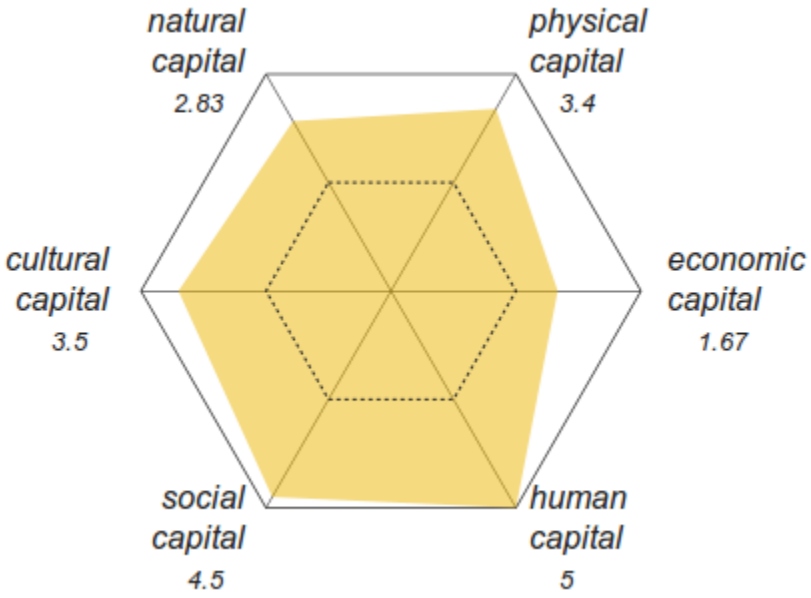


Human Capital

Cultural Capital



Los Angeles Sustainability Hexagon



Chapter 4. Analysis

4.1. Laneway Revitalization as a Tool for SCD

The case studies in the previous chapter effectively addressed the question, *What is laneway revitalization, and how is it being applied?,* by examining unique characteristics of six LWR programs in isolation from each other. In this section, we will look the six programs in tandem to address my remaining primary research questions:

- Is LWR contributing to SCD, and if so, how?
- What transferable tools and strategies does it offer?
- How might laneway revitalization be strengthened as a tool for SCD?

The first two of these questions will be addressed below in Section 4.1.1, which offers a brief overview of how LWR is contributing to each capital, followed by a capital-specific package of tools and strategies that have been "road-tested" by the six communities under study, as revealed by the CC Scan analysis. The third question will be addressed in Section 4.1.2, which open with a brief discussion of elements that seemed to be weak or missing among this sample of six programs, and offer several recommendations for strengthening LWR as a tool for SCD.

4.1.1. LWR and SCD: Contributions, Strategies, and Tools

Our Community Capital Scan of six LWR programs in the previous chapter unequivocally showed that thoughtful LWR can and does contribute to SCD. Let us briefly review the benefits that, to greater or lesser degrees, these programs are bringing to their respective communities in terms of the six community capitals of the Scan. We begin with Social and Human Capital, which—based on my limited sample of six

programs—these programs made the strongest contributions toward; follow with Physical and Economic Capital, which vied for third place in terms of contribution importance; and conclude with Cultural and Natural Capital, where LWR made its weakest contributions.

Social Capital

The physical outcomes of LWR suggest it can provide a considerable boost to social capital, providing new places for citizens to meet, gather, share, celebrate, reflect, play and relax. By giving people more good reasons to observe and be in laneways, LWR can activate the crime prevention principle of placing more eyes on the street—which helps people feel safer. To the extent that LWR increases housing options, like laneway homes in residential neighbourhoods, it brings more age-in-place opportunities, which benefits social capital by enriching our communities' diversity and inclusiveness. LWR can also enhance social capital because, in coming together to design, implement and maintain a LWR project, neighbours can build trust among neighbours and forge new relationships among citizens, civil society organizations, and local governments.

Our case study communities used the following tools and strategies to increase these Social Capital stocks:

Citizenship

- Use LWR to create new, free spaces for people to gather and socialize. Where space and traffic considerations permit, include amenities like public seating, picnic tables, play areas, awnings, garden space, and covered book exchanges. (Melbourne[153])
- Prioritize LWR with social amenities (e.g. play space, green space) for the areas of the city that need it most. These are likely have high densities of families, lower incomes, and/or lower per-capita levels of walk-to parks (Los Angeles[154]).
- Meaningfully involve residents in LWR design, construction and maintenance (see Vancouver, Montreal, Baltimore, Los Angeles case studies)[155].

[153] Ferreter, Lewis and Pickford (2008). See also Cai et al. (2012).

[154] Read more about this at City of Los Angeles Community Redevelopment Agency (2013).

[155] See also Bain, Gray and Rodgers (2012).

- Encourage cross-sectoral collaborations, such as ecological, research, planning, gardening groups, schools, etc. (Los Angeles). Actively cultivate partnerships with civil society organizations that would have a stake in planning and managing LWR, such as Vancouver's Livable Lanes Society (Vancouver).
- Convene laneway Green Teams for laneway cleanups, training in plant maintenance, watershed education (Los Angeles[156], Montreal).
- Strengthen connections between these teams, local schools, and conservation corps that promote green job skills (Los Angeles).
- Create a program that recognizes and publicizes pro-laneway behaviour, like Melbourne's Love Your Laneways program with its "Laneway Champions" and stickers communicating recognition from the City which businesses can place in their windows.[157] the Toronto Cabbagetown South Residents' Association also offers informal online recognition of "guerilla gardening" efforts in laneways.[158]
- Offer funding and technical assistance with first round of LWR plantings in return for neighbour cooperation on planning and maintaining LWR projects (Montreal, Baltimore case studies).
- Develop locally relevant, resident-oriented guides for launching a LWR event. Suggested components include templates for letters that invite neighbours to take part, draft maintenance plans, assignment of responsibilities, governance scenarios, realistic timelines (Los Angeles, Portland, Montreal).[159]
- Specify clear processes by which laneway-adjacent neighbours can re-orient their laneway as pedestrian-priority "shared space"[160], through traffic-calming measures (Montreal[161]), or, if residents choose this, to close it to non-emergency vehicle use altogether (Baltimore)[162].

[156] Personal communication with L. Ballock, Mar. 27, 2014.

[157] Cai et al. 2012.

[158] See http://www.cabbagetownsouth.ca.

[159] Excellent examples in Cassidy, Newell, and Wolch (2008), especially Policy Reform and Appendix A: How to Lead an Alley Revitalization Event; see also Mill Street Planning Toolkit and Plan documents (2013); and Eco-Quartier du Plateau Mont-Royal and Le Plateau Mont-Royal (2013).

[160] Design specifications can be found in National Association of City Transportation Officials (2013).

[161] Eco-Quartier du Plateau Mont-Royal and Le Plateau Mont-Royal (2013)

[162] Herrod (2011); Nathanson & Emmet (2008).

- Create more age-in-place and young-family housing options by allowing residential property owners to create laneway-facing secondary dwellings where lots are large enough to permit this (Vancouver).[163]
- Where illegal dumping is a problem, include signage that prohibits it and that offers a reporting number for witnesses to illegal dumping (Los Angeles[164]).

Safety

- Target LWR projects to areas and blocks that have greatest need in terms of safety (Los Angeles).
- Promote (and suggest) scale-appropriate species of plantings (Vancouver[165]) to avoid creating dark, concealing spaces.
- Increase social amenities in laneways to bring more people into them for positive reasons, thereby increasing 'eyes on the street'. (Melbourne, Vancouver, Seattle, Baltimore).
- Increase eyes on the street via laneway building guidelines that specify minimum areas for windows on walls that front laneways, regulations and planning policies that promote laneway-facing decks, entrances, and/or windows of active rooms, incentives for businesses to open out onto medium- and high-density laneways (Vancouver[166]).

Human Capital

LWR can support the wellbeing stock of human capital by cleaning up neglected, hazardous and dirty laneways and helping to beautify our communities, and offering safer, quieter, and greener passage. In creating more walkable communities that entice people out of their cars, and by creating safer streets for drivers and pedestrians alike, citizens are likely to enjoy longer, healthier lives. LWR can also support health and wellbeing by creating more diverse housing options that allow young people and seniors to live closer to supportive family members. Done well, LWR can also support education—from the environmental education imparted during the planning phase of a new LWR project through to the promotion of important ecological services provided by

[163] City of Vancouver (2013) *Building Your Laneway House* guidelines.
[164] Personal communication with L. Ballock, Mar. 27, 2014.
[165] City of Vancouver (2013) *Laneway Housing How-To Guide*, p. 29.
[166] See City of Vancouver (2013) *Building Your Laneway House* guidelines.

revitalized laneways, as attractions for locals and visitors alike. Finally, LWR can promote personal development by offering individuals involved in planning opportunities to develop new skills for leadership and community organization.

Our case study communities used the following tools and strategies to increase these Human Capital stocks:

Education

- Impart environmental education through city-led planning activities with residents (Vancouver Country Lanes, Montreal Ruelles Vertes residents' committees, Los Angeles Green Team).
- Create accessible, well- illustrated educational materials for adjacent residents about purpose of LWR and how they can benefit most from it, like Chicago's Green Alley Handbook. Include interpretive signage with an environmental education component (Vancouver Country Lanes). As revitalized laneways multiply, promote revitalized laneways to create interest in seeking them out (Melbourne) and use them as sources of environmental education (Montreal[167]).
- Link LWR communications to those about programs that complement LWR, like Chicago's Sustainable Backyards and Sustainable Streets programs.
- Involve schools in LWR activities, from elementary to post-secondary (Los Angeles).
- Share learnings with peers and continue to study other communities' experiences with such projects (Vancouver Country Lanes); engage graduate students in disciplines like urban planning or community development in this effort (Baltimore). [168]

Health & Wellbeing

- Use greenwalls, vegetation, tree canopy, and absorptive surfaces in LWR to purify air and reduce the urban heat island effect (Melbourne).
- Demarcate play areas in traffic-calmed laneways with pavement markings, e.g. hopscotch patterns, and play equipment (Montreal).

[167] See project in the works: Bolay (2013).

[168] See excellent group graduate student project on Toronto laneways by Cai et al. 2012, and about Portland: Mill Street Planning 2013. In Baltimore, Ashoka Community Greens is currently conducting laneway research with post-secondary educational institutions.

- Use LWR to create critically needed outdoor recreation space, using an adapted version of LA's toolkit for identifying regions of the community with the greatest need for park space[169] (Los Angeles).
- Promote laneway homes in suitable laneways (Vancouver).
- Link laneways to active transportation networks (Melbourne).

Physical Capital

LWR is primarily about rendering changes to other capitals via investments in physical capital. A wide range of LWR interventions can improve physical infrastructure, making laneways safer and more efficient places to live, recreate, work, and do business. Thoughtful LWR can include measures from surface-grading to traffic-calming, to protect pedestrians, cyclists, kids, and residents from speeding drivers, while allowing residents continued, reliable access to their properties and vehicles and essential services to proceed. By connecting bikeways and greenways, revitalized laneways also can make for a more connected, efficient city. LWR that creates new housing undoubtedly enhances housing and living conditions. In bringing jobs, homes and amenities closer together, LWR can make for more compact, walkable cities, increasing density to levels that support improved public transit. It can also help absorb urban growth in a more incremental and community-friendly fashion than big-box or skyscraper development. LWR does not directly improve what the Community Capital Framework refers to as public facilities—schools, hospitals, or community centers—but it can certainly extend and complement their functions by raising the quality of outdoor public gathering places.

Our case study communities used the following tools and strategies to augment Physical Capital stocks:

Housing & Living Conditions

- Permit urban infill housing in residential laneways to support diversification of housing types, including more age-in-place options for seniors (Vancouver).
- Develop laneway housing guidelines that protect greenspace, sunlight access, privacy, noise levels (Vancouver).

[169] Newell et al. 2007

- Improve living conditions for laneway- adjacent residents by addressing the urban heat island effect with natural cooling methods (e.g. trees, green walls, green roofs), and through use of reflective pavements (light-coloured aggregates or white toppings) (Chicago).
- Make housing in laneways more feasible by managing stormwater better (Chicago, Vancouver, Melbourne).
- Make laneways more attractive places for homes by improving waste management (Melbourne; see also see 'Infrastructure').
- Look for opportunities to include fruit or nut trees in laneway plantings to increase local food security. Espaliered trees may be an option in narrow laneways (Los Angeles).

Infrastructure

- Site LWR with groundwater recharge measures in areas where it will have the largest impact on drinking water supplies (Los Angeles).
- Consider laneways in a city-wide sustainable public lighting strategy (Melbourne).
- Use retractable or removable bollards to allow service trucks into traffic-calmed or car-free laneways (Vancouver).
- Reduce garbage odors by maximizing opportunities for green infrastructure (e.g. green walls), increasing shade through trees and awnings, and instituting a community-wide composting system (Melbourne).
- Increase efficiency of waste pickup wherever feasible by consolidating waste pickup locations, preferably behind screens (Melbourne).
- Increase property owner accountability for state of waste storage by requiring use of city-supplied labels on garbage bins; fine those who fail to meet minimum standards for waste storage (Melbourne).
- Reduce presence of garbage in laneways by providing key-controlled, solar-powered trash compacters (Melbourne).

Land Use

- Make LWR and, where appropriate, laneway housing a component of official community plans (Vancouver)[170]. Ensure that these consider and protect future potentials of laneways even in low-density neighbourhoods where LWR is less feasible.

[170] See for example City of Vancouver, B.C. Planning & Development Services (2012) Chinatown Neighbourhood Plan and Economic Revitalization Strategy, (2013) Laneways 2.0: Laneway Opportunities in the West End.

- Adapt LA's toolkit for identifying regions of the community with the greatest need for park space[171]; use this as a factor in siting and funding LWR projects.

Transportation

- Prioritize LWR in locations where it can maximize walkable connections between social amenities (Los Angeles).
- Promote locations of revitalized laneways, and connections to community greenways and bikeways, for pedestrians and cyclists on maps. Use static or interactive online maps to highlight laneway amenities (Montreal, Melbourne).
- Plan to create networks of revitalized laneways (Los Angeles).
- Create an ordinance that specifies how car-free, park-like zones can be feasibly established in laneways where residents want this (Baltimore).
- Use permeable paving strategies where traffic and soil conditions permit to improve mobility for all and active transportation more attractive by mitigating puddling, slippery ice, frost heaves, and pitted roads (Chicago).
- Incorporate ground rubber tires into paving mixes to reduce noise pollution (Chicago).[172]

Public Facilities

- Install theft-proof, graffiti-resistant street furniture that promotes socializing and relaxing (Melbourne).
- Beautify, through plantings, greenwalls, murals, pavement paintings, public art (Montreal, Melbourne).
- Activate laneways, by encouraging local events, gardening, active play, book exchanges and shopping (Melbourne, Montreal).

Economic Capital

In bringing jobs, homes and amenities closer together, LWR can improve both our productivity and quality of life by reducing commute times. LWR can provide attractive settings for businesses to set up shop, which in turn can stimulate the organic growth and networking of related businesses and by providing new social amenities, attract existing businesses to the community. LWR also allows communities to extract more out of existing infrastructure that is already being maintained. It provides more

[171] Newell et al. (2007).

[172] Foster, Lowe, and Winkelman (2011).

reasons and opportunities to reap the considerable economic benefits of greening community infrastructure.

Our case study communities used the following tools and strategies to increase these Economic Capital stocks:

Financial Resources

- Start with small, well-defined pilot projects with clearly defined goals, time frames, and a monitoring and evaluation component (Vancouver Country Lanes).
- Forge partnerships between local governments and sustainability researchers (Los Angeles case study).
- Make LWR a citizen-driven process, in which citizens decide where they want these amenities and demonstrate commitment to plan and maintain in return for technical and financial assistance from local government. Positive results help sell the idea to other citizens. (Montreal, Baltimore case studies).
- In some situations, it may be appropriate to make revitalization of laneways a special status that could be revoked (and the laneway returned to general use) if maintenance promises are not kept. This could provide sufficient incentive to stay on top of this (Baltimore[173]).
- Include and discuss LWR in official community plans (Vancouver).[174]
- Maximize efficiencies by designating a point-person (or committee) with LWR portfolio, with authority to consult across departments (Baltimore[175]).
- Provide incentives for laneway residents to make significant greening improvements to property edges that abut laneways (Vancouver[176]).
- Provide incentives for laneway-fronting businesses to open facades onto laneways (Melbourne[177])

[173] Under the Baltimore gating and greening ordinance, laneways can be returned to general use if they are found to no longer serve purposes of improving health and welfare.

[174] See for example City of Vancouver, B.C. Planning & Development Services (2012) Chinatown Neighbourhood Plan and Economic Revitalization Strategy, 2012 and (2013) Laneways 2.0: Laneway Opportunities in the West End.

[175] Herrod (2011)).

[176] Laneway home proposals are more likely to win approval from the City of Vancouver if they include appropriate landscaping.

[177] Cai et al. (2012)

Local Economy

- Partner with local professionals (e.g. pavement industry, landscape architects) to develop economic, locally relevant best practices (Chicago).
- Create new markets for these products by promoting success (Chicago).
- Make laneways more attractive places for new and relocated businesses to set up shop by getting more people into them (Melbourne street art program[178]).
- Require new laneway businesses to create laneway-facing storefronts (Melbourne).
- Create attractive incentives for existing laneway businesses to create laneway-facing storefronts (Melbourne).

Natural Capital

More intensive use of laneways (for housing, jobs, and amenities) can help mitigate urban sprawl, which is costly to service and destructive to agricultural lands and wild spaces. By improving urban environments, LWR can give us more reasons to walk or cycle instead of drive, which in turn reduces emissions. Trees, shrubs and greenwalls in LWR can help purify our air and absorb emissions. To the extent that it increases tree canopy, heat-absorptive surfaces, and reflective surfaces, it can help nmitigate the urban heat island effect. This not only cools the environment for humans directly; it also translates to reduced use of appliances like air conditioners and consequent reductions in emissions. Increasing or retaining vegetation in LWR can also promote biodiversity by providing habitat for birds and small critters in green spaces. LWR can offer significant stormwater management benefits, which in many cases reduces the degradation of drinking water by overflowing sewage systems. Treating stormwater through natural infiltration processes also promises to reduce emissions associated with unnecessary treatment of stormwater. All of the above will also help communities adapt to the more intense weather—heat and storms—that are expected from climate change.

Our case study communities used the following tools and strategies to enhance Natural Capital stocks:

[178] See City of Melbourne (2014) regarding its Street Art program.

Air

- Establish, or fund establishment of, greenwalls in laneways to help purify air and absorb emissions (Melbourne)
- Develop targets to increase urban tree canopy to absorb emissions, purify air and increase natural cooling and ensure that laneways are considered part of the strategy to reach those targets (Montreal, Melbourne).
- Reduce methane emissions from food waste rotting in landfills by instituting a city-wide composting system (Vancouver).
- Develop a process by which laneway-adjacent neighbours can choose to close their laneway to vehicle traffic if it is not needed, and turn it into a car-free, park-like space (Baltimore).
- Employ permeable paving techniques (pavers, permeable paving for entire width of pavement, sidewalks only, center-strips) where traffic and soil conditions permit to reduce emissions associated with unnecessary treatment of stormwater that would otherwise run into sewers and road de-icing (Chicago, Vancouver).
- Employ permeable paving techniques where conditions permit and where these provide more durable than the status quo paving treatment, to reduce emissions associated with earlier replacement (Chicago).
- Use high-albedo (reflective) paving techniques to reduce emissions associated with over-use of air conditioners to combat UHI effect (Chicago).
- Consider shade-creating archways or canopies in laneways where there is limited tree cover for shade and where stormwater can be collected and suitably directed (Melbourne).
- Use lower- or no-emissions energy sources (e.g. solar, wind, hydro-electric) to power laneway lighting, as appropriate to the local context (Chicago).

Groundwater

- Situate LWR where it will have greatest impact on groundwater and drinking water supplies (Los Angeles).
- Promote use of desirable water-wise, indigenous species instead of highly irrigated non-indigenous species (Melbourne[179]).
- Plant or retain trees that aid stormwater management in laneways, as mature trees they can absorb hundreds of gallons of water per day (Melbourne, Los Angeles).

[179] See State of Victoria (2014) Growing Green Guide and City of Melbourne (2013) Greening Melbourne's Laneways.

- Support groundwater recharge by increasing surfaces that detain and provide part of full filtration for stormwater, such as infiltration planters, rain gardens, structural cells below trees, and stormwater curb extensions that extend pedestrian crossings while absorbing water (Vancouver, Melbourne).[180]
- Consider LWR as a component of a larger green infrastructure effort (Chicago).

Surface Water

- Improve pitching and grading of laneway surface to direct stormwater to the right places (Chicago).
- Run concrete swales / channels lengthwise down the center of the laneway, possibly with grease interceptors (Chicago).
- Combine conventionally paved driving strips flanked with structural grass or contained gravel, possibly in combination with subsurface drainage systems like pipe underdrains or stormwater infiltration trenches (Vancouver).
- Increase absorptive surfaces by replacing full-width pavement with center-strip paving with pervious strips and waterwise landscaping along laneway edges (Vancouver).
- Use permeable paving strategies where appropriate (see above) to improve drainage and thus reduce flooding (Chicago).
- Use permeable paving strategies where appropriate (see above) to improve drainage and thus reduce occurrence of ice on laneway surface (Chicago).
- Harvest rainwater (e.g. rain barrels) from laneway structures for irrigation of laneway landscaping, trees (Los Angeles).
- Encourage laneway-adjacent residents to disconnect downspouts from sewer systems and redirect them towards rainbarrels and/or rain gardens or flow-through planters on resident property, placed at a safe distance from buildings and sewer laterals on the property (Chicago).
- Reduce production of surfacewater pollutants by reusing inert industrial waste into paving mixes (Chicago).

Minerals & Non-Renewables

- Use LWR to bring jobs, amenities, housing and transit closer together, to reduce the number of single-occupant vehicle trips (Melbourne).

[180] Explanations of a wide range of stormwater management techniques are found in City of Los Angeles Rainwater Harvesting Program (2009).

- Repurpose inert industrial waste in pavement mixes and laneway structures to lower the draw on minerals and non-renewables required to produce these (Chicago).

Soil

- Encourage container gardening in laneways and provide suggestions for appropriate species (Melbourne, Vancouver).
- Opt for waterwise, indigenous species and irrigation via greywater re-use or rainwater harvesting rather than thirsty, pesticide-dependent non-indigenous species (Los Angeles, Melbourne).
- Establish community composting programs and site composting bins in laneways (Melbourne, Vancouver).
- Support establishment (by citizens, or by local governments) of green walls in laneways with how-to information and funding (Melbourne).

Landscape

- Set targets for the percentage of city-funded laneway plantings that must be indigenous species (Montreal).
- When formulating a sustainable lighting strategy, consider implications of different types of lighting for local biodiversity (Melbourne Public Lighting Strategy 2013)[181].
- Opt for dark-sky compliant lighting to reduce effects of light pollution on humans and support appreciation of the night sky (Melbourne, Chicago).
- Consider LWR into urban forest strategies (Melbourne).
- Use bioretention basins (instead of lawn or traditional gardens) (Melbourne).[182]

Cultural Capital

As Melbourne has shown so well, cleaning up neglected streets and bringing more people into them, LWR can support cultural capital by creating new venues for cultural expression, public events, and spaces to showcase local histories. LWR can imbue nameless non-places with a new sense of place.

These are some of the tools and strategies our sample communities used to support these Cultural Capital stocks:

[181] See also Davies, Bennie and Gaston (2012).

[182] Kazemi, Beecham and Gibbs (2009).

Cultural Heritage

- Develop a program to increase presence of permanent public art, temporary art installations and performance in laneways (Melbourne[183]).
- Promote revitalized laneways and laneway art as tourism assets (Melbourne).
- Solicit ideas from community members about the kinds of cultural events that can activate laneways (Los Angeles case study[184]).
- Develop a cultural heritage policy that defines what desirable development in laneways fronted by heritage buildings (Melbourne).
- Develop guidelines for new laneway buildings that emphasize elements that preserve neighbourhood character while enhancing laneway aesthetics, such as landscaped setbacks, architectural elements that distinguish them from utility buildings (e.g. canopy, colours, window trim, window size) (Vancouver[185]).
- Develop guidelines to promote buildings that help create a sense of place in laneways. For example, Vancouver's guidelines require upper level decks, upper level windows and overall orientation to face laneways.
- Get developers of new laneway structures to provide things like lighting, public seating, bike racks, accessibility features, water-efficient landscaping as community amenity contributions.
- Require new laneway structures (or existing ones over a certain dimension) in laneways to display civic addresses.

Identity and Diversity

- As revitalized laneways multiply, promote revitalized laneways to create interest in seeking them out (Melbourne).
- Mitigate persistent graffiti problems with a city-run street art program that highlights diverse, quality murals (Melbourne Street Art program[186])
- Fund a program that pairs professional mural artists in mentoring relationship with young people (Melbourne 2007 program[187])
- Partner with community-based organizations that see the value in promoting cultural expression in LWR, such as neighbourhood associations, local schools, business improvement associations, art schools (Los Angeles).

[183] City of Melbourne (2013) Street Art.

[184] See also Seattle's Alley Activation effort, profiled by Fialko and Hampton (2011).

[185] See City of Vancouver's (2013) Laneway Housing How-To Guide.

[186] City of Melbourne (2013) Street Art.

[187] In 2007, the City of Melbourne hosted a mentoring program that paired young people with professional artists to create vast murals along the city's Union Lane.

- Name laneways and post visible, durable signage with those names. This should include unique names (e.g. Melbourne) and could also include city branding of revitalized laneways (Montreal's Ruelles Vertes, Chicago's stamped Green Alleys).
- Use laneway names to celebrate local history and culture (Melbourne).
- Ensure lighting in laneways is pedestrian-scale and helps to reinforce a sense of place (Melbourne, Portland Alley Allies kit).
- Promote revitalized laneways as the greener, more social, more creative alternative to main thoroughfares, through maps and a communications campaign (Melbourne, Montreal).
- Create maps (static or interactive online) to promote laneway amenities; reveal connections to community greenways and bikeways (Melbourne, Montreal).
- Hold, contribute to, permit, encourage, or subsidize cultural events in laneways, like Melbourne's St. Jerome laneway music festival, LA's Avalon Green plans to host Christmas Posadas, Montreal block parties. Read also about Portland's fashion shows and also Seattle's film screenings in laneways[188]).
- Share residents' excitement about newly launched LWR efforts by asking to be invited to their block-party events (Montreal).

4.1.2. Strengthening LWR as a Tool for SCD

As shown above, LWR as practiced in our case study communities comprises an impressive range of tools and strategies to advance all six forms of community capital. We turn now to the last of my primary research questions: *How might laneway revitalization be strengthened as a tool for SCD?* I will start with some general observations about elements that seemed to be weak or missing and then offer a set of recommendations, arranged by capital, for pushing LWR to do more for SCD.

Weak or Missing in LWR

The foregoing discussion has shown that a social learning process about LWR—what it is, why do it, and how to do it well—is well underway. Each one of the six

[188] Fialko and Hampton (2011) and Mill Street Planning (2013).

programs studied here reflects unique local circumstances, and even if some of them are primarily social, economic or environmental in nature, and every one offers valuable learning. Nevertheless, some elements seemed to be missing, or at least, weak.

For example, most of the LWR projects emerged from the need to solve one pressing problem or another (such as persistent flooding, a flagging downtown, deteriorating laneways, or formidable crime). With the notable exception of Los Angeles and to some extent Vancouver's Country Lanes, none of the six programs appear to have been conceived of or sited from the outset with clear mechanisms to address SCD challenges across a wide range of capitals at once. It is understandable that any one capital might be the primary focus of any project; after all, "balanced" development is about the cumulative effects of many projects rather than any one in isolation. And as cities like Melbourne have shown, to some extent it is possible to retroactively right the balance, as it is now doing by complementing its program of primarily economic capital interventions, begun decades ago, with a comprehensive program of natural capital interventions. New or incipient LWR programs could take a cue from LA's approach and make a conscious effort to weave all of the strands of SCD together from the outset.

Also, the distribution of social benefits of LWR deserves more consideration. Both Vancouver and Baltimore have employed models where residents are expected pay most or all of the costs of LWR of "their" lane. The user-pay model of Vancouver's Country Lanes (a demonstration project paid for wholly by the City) effectively limited it to wealthier neighbourhoods from the get-go (and although it generated much interest, there have been no takers to date). Baltimore's model may indeed build some civic skills, generate social capital, and deter dumping and crime in participating city blocks, and in my view, consolidation of back yards should be encouraged among residents who want this. But its LWR occurs at the cost of public space—and so far, its projects are limited to relatively affluent neighbourhoods where crime deterrence, according to City staff, is less critically needed.[189] Even if cost of gating were not a factor, the spread of LWR in crime-ridden neighbourhoods characterized by low incomes and higher proportions of renters may be limited by the lack of time or capacity to self-organize.

[189] Personal communication with D. Willemain, Mar. 3, 2014.

We must ask: Is it enough to evaluate the effects of LWR only at the level of the city block? Does privatizing the benefits of LWR (for example, by making users pay for reconstruction of lanes that they then regard as theirs, and/or removing the revitalized laneways from the public realm) promote the values (e.g. inclusiveness, equity) that go hand-in-hand with SCD or foreclose on opportunities to grow Community Capital more widely? I commend Montreal's Eco-Quartiers for already recognizing this, and beginning to prioritize LWR applications from poorer neighbourhoods to spread their benefits around more evenly.

Many programs estimate the costs and benefits of LWR, after and to some extent before the fact, but baseline data is often missing.

Pushing LWR to Do More

Communities could approach LWR more pro-actively, holistically, and equitably by first identifying priority zones or candidates for LWR, selected with a set of previously identified SCD goals in mind. From there, it could promote LWR as an option in those zones, secure meaningful citizen participation, and set projects up for success by inviting them to come forward and identify themselves as keen to work with local government to help design, implement and maximize LWR on their block in exchange for assistance from the City.

To meaningfully quantify the full range of LWR effects, LWR could also start with the collection of baseline data on things like water quality, drainage capacity, flood damage, urban heat island effect, incidence of crime or undesirable behavior in alleys, residential turnover, adjacent property values, social capital among neighbours, and transport mode share. Careful consideration of what baseline data would be most useful would contribute much to the selection of indicators that could also be used to monitor LWR progress with a Community Capital Sustainability Balance Sheet.

Finally, LWR should look for opportunities to implement a *woonerf* or shared-space approach that accords legal right of way to pedestrians, in laneways with suitable

levels of vehicle and pedestrian traffic.[190] The mechanics of these will be discussed in greater detail below under Physical Capital, but I would just like to note here that shared-space / woonerf [Dutch term, whose plural is *woonerven*] approaches rely primarily on design cues to slow traffic to speeds compatible with walking. Although not as familiar to people here as in Europe, shared-space approaches to street design are neither new nor untried in the North American context. They have used widely in the Netherlands since the 1970s, have spread to other European countries, and even applied to large portions of central business districts.[191] Many cherished public spaces have long functioned as shared-spaces before they were thought of as such, such as Vancouver's Granville Island; Wall St. (a former service alley) in Asheville, North Carolina; and Pike Place in Seattle.[192] Woonerf-like, shared-space approaches are already making their way into North American residential realms,[193] and some planners argue that residential-area laneways already function somewhat like woonerven.[194] While they may not be suitable for every laneway[195], shared-space approaches will work in many laneways simply by tweaking what is already there.

The following recommendations extrapolate from sources other than the six programs above to offer additional means of strengthening LWR as a tool for SCD. I have organized these by capital.

[190] Bain, Gray, and Rodgers (2012).

[191] For example, in St. Gallen Switzerland (Bain, Gray, and Rodgers 2012). In Germany they are known as *wohnstrasse* ('living street'), in Japan as *doro* ('community street'), in Israel as *rehov meshulav* ('integrated street').

[192] Bain, Gray, and Rodgers (2012).

[193] For Montreal example, see Heffez (2011); for Washington example see Snohomish County Residential Design Manual (2010).

[194] Bain, Gray, and Rodgers (2012).

[195] Among others, Bain, Gray, and Rodgers (2012), Brideau (2006), and Cai et al. (2012) suggest woonerf-like approaches work best in neighbourhoods where there are already a significant pool of potential pedestrian users. Without this, drivers tend to speed up to pre-intervention levels. On the other hand, they will not work where traffic levels are too high. Standards for woonerf-like streets in the US range from 150 trips or less per day for woonerfs in residential areas (Snohomish County Residential Design Manual 2010), 10.1 trips per adjacent dwelling (Southworth and Ben-Joseph, 2003) to less than 100 vehicles per peak-hour on woonerf-like streets (Appleyard and Cox 2006).

Natural Capital

- In choosing LWR sites, ask: where are our greatest opportunities to relieve the UHI effect, increase plantings that prioritize locally vulnerable or threatened species (plants, birds and insects), remove pollutants from sensitive ecosystems (like salmon-bearing streams), purify air and water, address stormwater problems, increase tree canopy, provide habitat for birds, and increase walkability, preserve or create viewpoints of nature, or even daylight a previously culverted stream)?
- Think about natural capital effects of interventions at longer and larger scales, beyond those that are immediately and locally visible. Examples include looking at the life-cycle (including the emissions implications of production and disposal) of LWR interventions like permeable paving and different options for lighting[196] and comparing them to alternatives[197]. Projects that use soil as a natural filtration medium should consider the soil's ultimate destination: When, where, and how will it be disposed of or treated once it has become saturated to the point that it no longer filters adequately? How will this be monitored? Where do the accumulated contaminants ultimately end up? Can LWR landscaping and structural grass components be produced without pesticides? Considering technology available to us today, will the emissions generated by future soil remediation processes outweigh those that are reduced by directing stormwater into natural filtration treatments?
- Think about any Jevon's Effect that is triggered by the use of LWR stategies, as when cheaply produced energy results in higher uses of it, and consider: are there ways to mitigate this?
- Much of the interventions that relate to waste in laneways is focused on how to hide garbage, compact it using solar energy, keep it from attracting rodents, recycle parts of it, and correct people who store it untidily. In communications about LWR, we should place higher emphasis on the 'consume (and waste) less' message and put that into action with unit-priced waste collection schemes[198] to financially reward those who produce less waste. Such programs could be made revenue-neutral to increase their political feasibility. Strategies to enhance the development of the sharing economy, in which goods and services are more efficiently shared, are also called for.
- Develop tree retention policies to protect trees from removal and impart flexibility for siting of buildings and parking to maximize tree cover. These should include recommendations or requirements of what species to use to

[196] Zehner (2012) highlights some life-cycle analysis implications of solar energy; Menet (2012) analyzes life-cycle of conventional and alternative street lighting systems.

[197] It is possible, of course, that this is being done and but is not discussed in the academic literature regarding LWR.

[198] Roseland (2012).

replace trees that must be removed plus siting guidelines to ensure roots do not interfere with subsurface infrastructure.[199]

- Offer excavation, amended soil, plants, technical assistance and a package of raingarden designs to laneway adjacent property owners. The designs could emphasize climate resilience, aesthetics, and easy maintenance. Precedent for this (in yards adjacent to streets, not laneways) is in Maplewood, Minnesota[200].
- Refine building codes, where necessary to promote safe greywater re-use in laneway (and other) structures and landscaping.

Economic Capital

- Find resources for LWR through allocations for sustainable development, street maintenance, water management, infrastructure greening, climate change adaptation, conservation & biodiversity, public health, cultural heritage (e.g. for naming of laneways), active transportation, community arts programs, developers' community amenity contributions, development cost charges, gas taxes, local improvement agreements, and partnerships with non-profit organizations, research institutes, neighbourhood associations.
- Factor in social and environmental returns on LWR investments into cost-benefit analyses.
- Emulate the economic vitality of the diverse, "fine-grained" businesses in Melbourne laneways by providing incentives that foster this, as does Sydney[201]. A variety of unique small businesses will provide more varied job opportunities, attract skilled professionals, and prove be more resistant to business cycles than a few large businesses.[202]
- Programs seeking to recreate the economic boost of Melbourne's LWR should think about branding laneways as sustainable business zones. Provide incentives for businesses that strive for a zero-waste profile, create green-economy training opportunities, use renewable energy, sell experiences

[199] See Appleyard & Cox (2006).

[200] Wise (2008).

[201] Inspired by the characteristics of Melbourne's laneway success, City of Sydney (2013) has a matching grants program to encourage "fine-grain businesses" in laneways. According to McNeill (2011), "the popularity of laneways policies [for economic diversification and street life animation] in Melbourne, Sydney and other Australian cities marks a significant phase of CBD design that embraces civic heritage. Combined with a grants strategy that encourages creative and bohemian uses, with fragmentation into multiple tenancies, these emerging policy frameworks respond to a more sophisticated CBD workforce, as well as the return of a high density residential population, which in turn contributes to a micro-economy with a vitality unseen in the city since the first half of the 20th century."

[202] Woodhouse (2011) shows that there is a relationship between laneway vitality and finegrain businesses.

rather than stuff, integrate cradle-to-cradle design into their production processes and last but not least, pay living wages.

Physical Capital

- Include laneways not only in community plans but in regional growth strategies, as a means to usher in the level and quality of densification that supports high-quality public transit while enhancing neighbourhood character. Pro-actively consider how to guide their development or safeguard alternative futures for them (such as housing or active transportation), because not thinking about them is tantamount to letting them revert to an inefficient, exclusive and ultimately expensive function of storing cars.
- Incentivize private development of laneway homes by creating a mechanism that schedules city blocks that have shown to be receptive to it (e.g. by hosting at least two laneway homes) as high priorities for LWR.
- Because LWR often raises property values, it can also raise rents and home values. Help ensure that new laneway homes provide a stock of affordable housing by providing low-interest loans toward the construction of laneway homes that provide affordable housing for a period of 10 years, or loans that are forgivable after 10 years of providing affordable housing (Brick Township, New Jersey[203]). One "accessory dwelling unit" development program in Santa Cruz offers loans of up to $100,000 at 4.5 percent interest. To qualify, the homeowner must live at the same address as the unit; have equity in their homes of at least 50 percent of the loan amount; and agree to restrict rents to levels affordable to households at or below 80 percent of the area median income for a minimum of 15 years.
- Waive impact fees or grant variances in return for creation of affordable housing. The City of Santa Cruz offers impact fee waivers to homeowners who agree to rent the units at affordable levels in perpetuity, partial fee waivers are offered for a commitment to rent to low-income households; and full impact fee waivers for rent to very low-income households. However, homeowners can later opt out of affordability restrictions by paying the waived impact fees. Kelowna, B.C. has created a housing agreement to ensure new laneway homes ensure affordable rentals in return for significant variances to zoning bylaws and development guidelines. Maple Ridge, B.C. simply requires homeowners wanting to construct laneway homes to sign a housing agreement to provide affordable rental housing.[204]
- Re-evaluate community parking requirements in light of actual need[205] and sustainability goals.[206] Should limits on all-day casual parking by non-

[203] Burnett, Khadduri and Lindenmayer (2008).

[204] City of West Vancouver (2012) discussion paper on the potential for coach houses in West Vancouver.

[205] Amos (2013) offers a methodology for this.

residents be changed? Santa Cruz, California revised its zoning ordinance in 2002 to end a covered parking requirement for single-family houses, which made more space available for accessory units.[207]

- Decide which values are more important: housing, connectivity and economic uses of laneways or accommodating current systems of waste management, snow removal, and emergency response, and plan accordingly.
- Review whether fire access regulations are preventing construction of laneway homes in areas that can be readily accessed from a front street. In many cases, access from outside of the laneway is sufficient.[208] Modify zoning bylaws to allow two adjacent properties to share fire access to laneway structures.[209]
- Clarify the implications of laneway naming and civic addresses for fire and emergency response.[210]
- Reduce the amount of waste generated and stored in laneways by charging for waste collection on a per-unit basis.[211]
- Inventory the community's laneway resource, its current state and its potential, using typologies adapted from researchers in Seattle, Toronto, Portland and Los Angeles. [212]
- Prioritize LWR where it enhances connections between greenways, bikeways, and public transit connections. Note: narrow laneways with intersections (e.g.

[206] Vancouver City Planning Commission, the Simon Fraser University City Program and Smart Growth BC (2006) Affordability by Design report.

[207] Burnett, Khadduri and Lindenmayer (2008).

[208] Brideau 2006; Vancouver City Planning Commission, the Simon Fraser University City Program and Smart Growth BC (2006).

[209] HB Lanarc Consulting Ltd. (2009).

[210] Anecdotal evidence suggests that there is some confusion on whether civic addresses and street names in laneways would inhibit, aid, or have no effect on fire and emergency response. A news report Baluja (2010) quotes contradictory views on this from residents, police and fire response on this, including Toronto city staff that cites cost as a major reason for not naming laneways. Cameron (2012) reports that City of Vancouver staff see the lack of addresses as justification for not allowing laneway-orientated construction because this is seen to slow fire response. Brideau (2006) indicates that ambulances do access laneways, that parked cars are a primary factor inhibiting fire response in laneways, and that many laneway structures can still be accessed from a front or adjoining street. Appreciating that laneways have different dimensions throughout Canadian cities and that narrowness can pose a real challenge to fire response in at least some laneways, is it possible that there is more room than we think to allow civic addressing in laneways where it serves other purposes? Would civic addressing and street naming of laneways actually inhibit emergency response?

[211] Many cities have been collecting garbage on this basis for years. Roseland (2012).

[212] Seattle: Fialko and Hampton (2011). Portland: Mill Street Planning Alley Allies Background Report (2013). Toronto: Cai et al. (2012) Part 1; Wolch et al. (2009).

garages) are not typically good candidates for bikeways used by cyclists at high speeds.[213]

- Add bike parking facilities where suitable. Note that some traffic-calming bollards are designed to double as bike parking.
- Extract more uses out of laneways and make them more hospitable to walkers, cyclists and playing children by calming traffic in them. Traffic-calming measures like speed tables, chicanes, intermittent parking, elevated pedestrian crossings, one-way orientation, and bollards[214]. Note that bollards can also be made collapsible to accommodate service vehicles or incorporate pedestrian-scale lighting elements, which in some situations could draw on solar power.
- Where laneway redesigns are called for and width and traffic levels permit, implement shared-space or woonerf approaches that accord legal right-of-way to pedestrians.[215] In addition to traffic-calming elements to lower speeds to those compatible with walking (7-15 km/h[216]), these include flat or rolled-edge sidewalks (permitting emergency vehicles to use them as necessary[217]), lower speed limits, and visual cues such as different pavement treatments and entry-point branding and signage to demarcate these spaces as areas with different driving rules[218].
- Where shared-space / woonerf-like approaches are used, include "acessibility zones" that help the sight-impaired and physically challenged navigate sidewalk-free, shared space laneways. [219]
- Ensure lighting designs respond to community-identified need, in terms of levels and types. [220] To benefit other LWR projects, share learnings on pedestrian-scaled lighting systems that successfully balance considerations like local micro-climate (because not all of these are suitable for solar- and wind-powered lights!); aesthetics; energy efficiency; maintenance requirements; crime prevention needs; light pollution prevention; durability; resistance to vandalism and theft; and cost.

[213] National Association of City Transportation Officials (2013).

[214] A wide range of traffic-calming strategies is summarized in Transportation Alternatives (2004).

[215] In shared space treatments where pedestrians and drivers are on an equal legal footing, driver speeds can creep up sufficient to overwhelm those of other users.

[216] Appleyard and Cox (2006); Bain, Gray, and Rodgers (2012).

[217] Bain, Gray, and Rodgers (2012); Transportation Alternatives (2004).

[218] Bain, Gray, and Rodgers (2012).

[219] This has been tried in New Zealand. More information at http://en.wikipedia.org/wiki/Shared_space

[220] Clark (2008).

Social Capital

- Target a good portion of LWR resources where they will have maximum social impact. This suggests medium- to high-density neighbourhoods, where conditions make this feasible, and areas that are most vulnerable to the impacts of climate change. Social benefit will be magnified in neighbourhoods with high proportions of families, lower incomes, and/or lowest per-capita access to quality parks and outdoor space.
- Make LWR available, and promote it, in zones already identified for SCD goals, on a user-participate basis rather than a user-pay basis, as does Montreal. Achieve a meaningful level of involvement, understanding and consent of adjacent residents, which is critical where LWR involves changes to ingress/egress for abutting properties,[221] by inviting residents to nominate their own laneways for LWR. This approach is also a strategic one, as residents and businesses that are happy with LWR will be the most effective promoters of it to other neighbourhoods.
- Engage residents in discussion of laneway future by inviting them to participate in the process of naming laneways. (Alley Atlas project, Minneapolis[222])
- Create excitement about engaging in that discussion by creating visual, and ideally interactive, materials that help people visualize futures of their laneways. (Examples: Portland Alley Allies kit[223], Seattle Integrated Alley Handbook[224])
- Use online community mapping tools to solicit ideas and concerns about LWR. Several of these are usefully profiled by Spencer (2012)[225].
- Opt for measures that eliminate illegal dumping without restricting passage altogether, like traffic-calming bollards, unlocked fences and gates, and signs with a phone number to report illegal dumping.
- When reconfiguring laneways as higher-quality public space, avoid using them exclusively as shopping malls. Make them spaces that can be enjoyed without needing to purchase.

[221] Bain, Gray, and Rodgers (2012).

[222] The Alley Atlas project initiated by Minneapolis Institute of Arts student Andy Sturdevant in Oct. 2013 invites people who live and work on Minneapolis laneways to suggest unofficial names for every city laneway, drawing on their own experiences, memories and stories. Names were to be added to a floor-to-ceiling map of the city's laneways in an Institute gallery, with all the accompanying origin stories to be compiled in a catalogue. Read about it in Longfellow Community Council (2013). In Toronto, a neighbourhood residents' association has been engaged in suggesting names for laneways: see Baluja (2010).

[223] Mill Street Planning (2013).

[224] Fialko and Hampton (2011).

[225] Spencer (2012) offers a useful introduction to online public engagement tools, including the Community Capital Scan.

- Work with citizens and police to identify opportunities to enhance feelings of safety by developing context-appropriate, theft- and damage-resistant, energy-efficient pedestrian-scale night lighting.[226]
- See more safety-related recommendations related access to laneways for fire, emergency, and by physically challenged under Physical Capital, above.

Human Capital

- Promote activity in laneways for adults as well as kids. Use wider, traffic-calmed laneways to create a public outdoor fitness park with theft-, weather- and graffiti-resistant fitness equipment (or individual stations), as the Trust for Public Land is doing in parks across North America. [227] Permit basketball and hockey nets in sufficiently traffic-calmed laneways.
- Add layers to dynamic online maps of revitalized laneways to show their ecological services, too.[228]
- Recommendations I've made above under Natural Capital that relate to urban heat island effect, stormwater management, and extension of natural spaces also augment human capital by contributing to health and wellbeing.
- See recommendations about environmental education messages under Natural Capital as well as my more general remarks about baseline research.

Cultural Capital

- Cultural expression in laneways need not be limited to the pros. Fund programs in which local artists work with community members to create pavement murals and mosaics, like the Paint the Pavement project in St. Paul, Minnesota (see paintthepavement.org) and Vancouver's Mosaic Park project[229]). Activities like these invite people to invest in their neighbourhoods, claim space for the community without necessarily excluding others. Pavement murals could also help demarcate shared-space laneways as pedestrian-priority spaces where a different set of driving rules applies.
- Invite residents to celebrate local culture and history by participating in the selection of names for laneways, as in Minneapolis's Alley Atlas project).

[226] See Kostic and Djokic (2009) and The Center for Problem-Oriented Policing's guide to context-sensitive, community-informed street lighting improvement: Clark (2008).

[227] El Nasser (2012); see also the work of the Trust for Public Land, which has helped create fitness zones in locations mapped by https://maps.google.com/maps/ms?hl=en&ie=UTF8&source=embed&msa=0&msid=217260820700678585944.00046aff0257debd65d8f&ll=34.020795,-118.156586&spn=0.392119,0.878906&z=11

[228] See Bolay (2013).

[229] See paintthepavement.org; read about Mosaic Park in Roseland (2012).

- Ensure that physical traffic-calming devices (unlocked gates, bollards) remain visually permeable while enhancing the laneway's aesthetics and sense of place. Lighting should also reinforce laneways' sense of place.

Chapter 5. Conclusions and Discussion

In this final chapter, I will reflect on using the CC Scan and offer some suggestions to make an already great tool even more powerful and adaptable. I will first offer some necessary context for my suggestions, and then explore what my analysis of LWR reveals about the Scan's suitability for this purpose. Next, I will consider how the Scan performed as an SCD checklist and offer some related thoughts about the underlying framework. Then I will explore how the Scan could be further adapted to serve as a tool for purposes of comparison and measurement as well as communication, and offer suggestions to accomplish this. Finally, I will close by acknowledging the limitations of this project and indicate how this topic could benefit from future researcher attention.

5.1. Context

As discussed in Section 2.2, the CC Scan is the slightly modified version of the Telos People-Planet-Profit (PPP) Scan, a tool that was designed to stimulate early-stage communication, create awareness of what sustainability is, promote broad and creative thinking about how proposals can be improved, reveal distribution of opinion, identify areas of agreement, flag neglected items before projects have progressed too far, and make decision-making more transparent.[230] The visual language of the PPP scan was also created to align with its companion tool, the Sustainability Balance Sheet. John Dagevos indicates that the PPP Scan was designed to emphasize quick collection of top-of-mind opinion from (not necessarily expert) stakeholders, insights about the general tenor and distribution of opinion and participant reasoning and suggestions rather than statistically rigorous measurement of opinion. For Dagevos, quantifications of

[230] Dagevos & Van Lamoen (2009); Dagevos (2012).

balance among capitals are interesting, but because balanced development is more about the cumulative effects of many projects than of any one, and because per-capital averages like -1.23 or +2.0 are highly derivative averages of groupings of stocks under categories that vary from one useful framework to another, such statistics are less useful than the insights provided by the Scan on how stakeholders expect a given project affect individual stocks. Use of the PPP Scan in the Netherlands is ongoing and expanding among governments, consultants, stakeholder groups and nonprofit organizations like the Brabant Environmental Organization, which uses it as its main tool for assessing spatial investments. It has also been used to evaluate a European Commission-funded program. All of these suggest the Scan serves its intended purpose very well.

In this project, I have clearly departed from established Telos practice and used the Scan in a way that it was not designed to be used: I am not a stakeholder in a project or a facilitator of a group of stakeholders, but a researcher looking at these programs from a distant vantage point. I have not used it for communication purposes but more as a checklist with which to evaluate six different programs. In a sense, I have used the Scan as a tool of cross-project evaluation of LWR and ex-poste measurement than as an ex-ante[231] tool of communication. Complicating matters further is that, as discussed in **Chapter 2**, the programs I have looked at are very, very different in location, scale, purpose, duration, stage of completion, and level and type of documentation, which makes them difficult to compare. Approaching it this way raises questions: Is the tool suitable for this purpose? And if not, could it be made more suitable?

5.2. The Scan For Cross-Project LWR Analysis

Chapter 4 has already demonstrated that, even if we accept that it is problematic to draw hard-and-fast comparisons between these very divergent programs, using the Scan in this unorthodox way can be very useful to guide and focus inquiry into whether and how they support SCD. Up until this point in this paper, I have only discussed Scan results in terms of its results for individual programs, and the tools and strategies that

[231] The Los Angeles case is an exception, as it has barely begun in a physical sense.

can be extracted from it. Here, I discuss what we can learn by using the Scan to look at all of the programs in tandem.

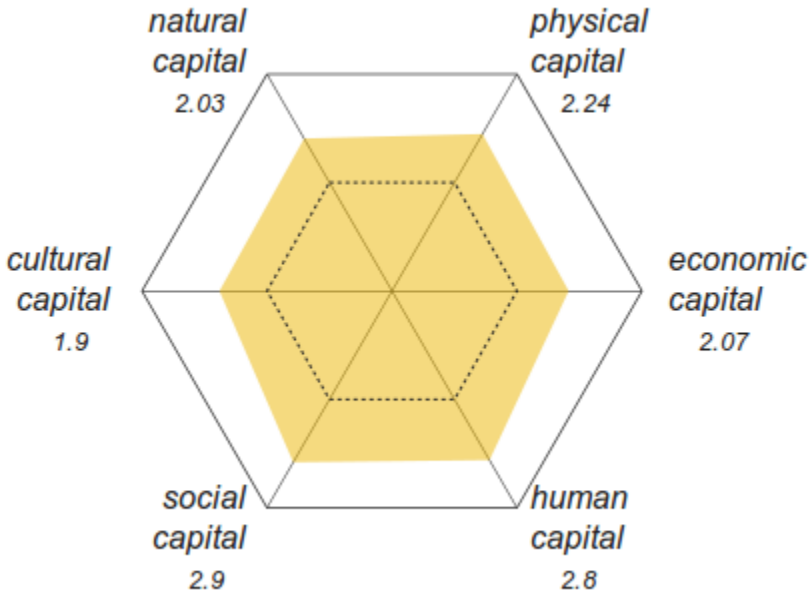
To do this, I initiated a group CC Scan using a different email address to enter my ratings, on each of the stocks, for each program.[232] I did this for each of the programs except Los Angeles—reasoning that it wouldn't make sense for this component to include a program that is, in a physical sense, barely underway. Having done this, I selected the option to generate a Scan report. This produced three types of illustrations:

- a Sustainability Hexagon, with each sector showing an average of my scores for all of the stocks for each of the capitals (see Figure 5.1)
- Circle charts for each of the six capitals, using colour to illustrate averages of my opinions on each stock (see Figure 5.2)
- 20 Scatter Diagrams, which show the shape, spread, and average of my opinions on each stock (see Figure 5.3)

What insights can be derived from this output?

[232] Usually, participants in the Scan access it from different email addresses to register different opinions on one program or initiative.

Figure 5.1. Sustainability Hexagon Overview of Five LWR Programs



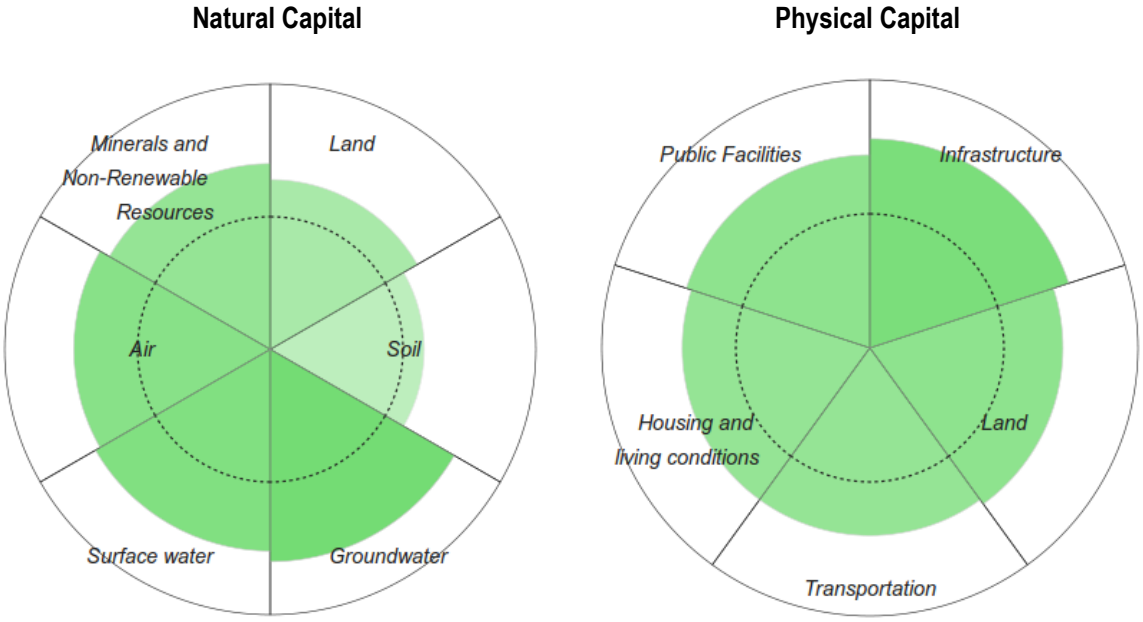
The CC Scan website[233] indicates that to interpret this diagram, we should be looking at the coloured hexagon and comparing it with the dotted outline of the equilateral hexagon, which represents a neutral baseline, and asking: Is it growing? And is the growth balanced among the six capitals?[234] The Hexagon in Figure 5.1 above reveals that I was, on average, somewhere between moderate agreement and agreement that LWR as formulated by these five programs is having positive effects on each of the six capitals. Averages of my evidence-based opinions also suggest they are collectively attending to (in order of importance) Social, Human, Physical, Natural and Cultural Capital in a reasonably balanced way: there is no more than a one-point spread between any of these averages.

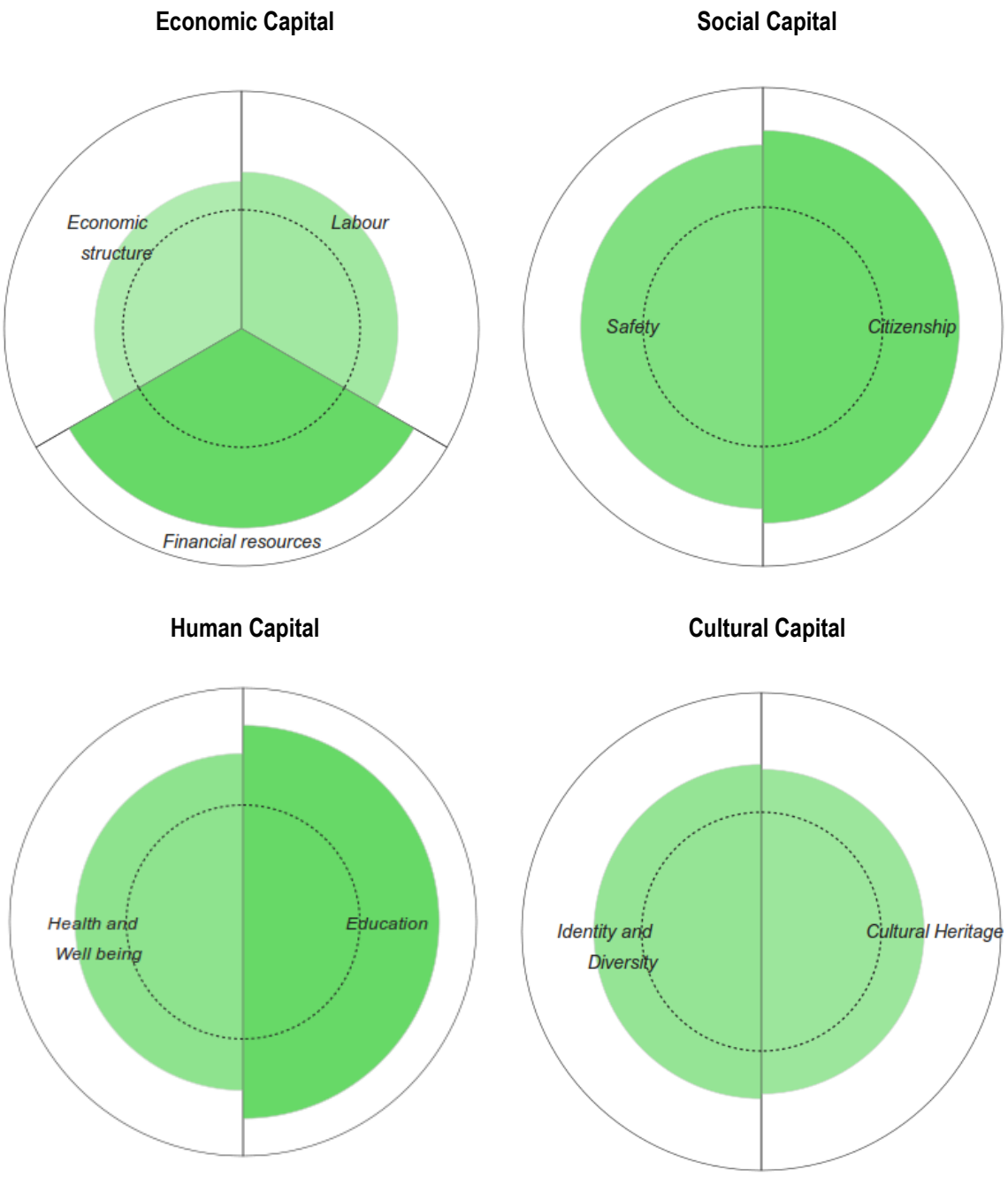
[233] http://www.ccscan-ca.cscd.sfu.ca/example-of-a-ccscan/

[234] Recall that I already decided that in this project, a selection of 5 would mean "I strongly agree that [fill in stock requirement here]…" while -5 would mean "I strongly disagree that…". My selections of zero would have indicated that I'd found no evidence to agree or disagree that…"; these would have registered as zero, which on this chart would be the grey dotted outline.

The circular charts in Figure 5.2 below tell more of the story. In these charts, all of the sectors are green, as opposed to red (negative) or grey (neutral), which reflects the fact that, on average, my entries showed some level of agreement on my part that these LWR programs are having positive effects on each of these stocks—and thus are moving their communities farther along the trajectory toward sustainability.

Figure 5.2. Circle Chart Overview of Five LWR Programs





The darkest green sectors should show where, on average, I registered strongest agreement that the LWR programs were exerting positive effects on capital stocks; conversely, the lightest green sectors show where my agreement was weakest that the

programs were exerting positive effects. Without the aid of numbers and faced with changing sector sizes from one circle chart to another, I found it challenging to quickly discern, based on the intensity of green, where my agreement was strongest and weakest on the positive effects on specific stocks. So I turned to a spreadsheet where I had already entered all of the data and simply created a table showing the average per-stock for the five programs, and sorted these from highest to lowest. Table 5.1 shows the results:

Table 5.1. Mean Level of Agreement on Positive Effects on Each Stock in Five LWR Programs

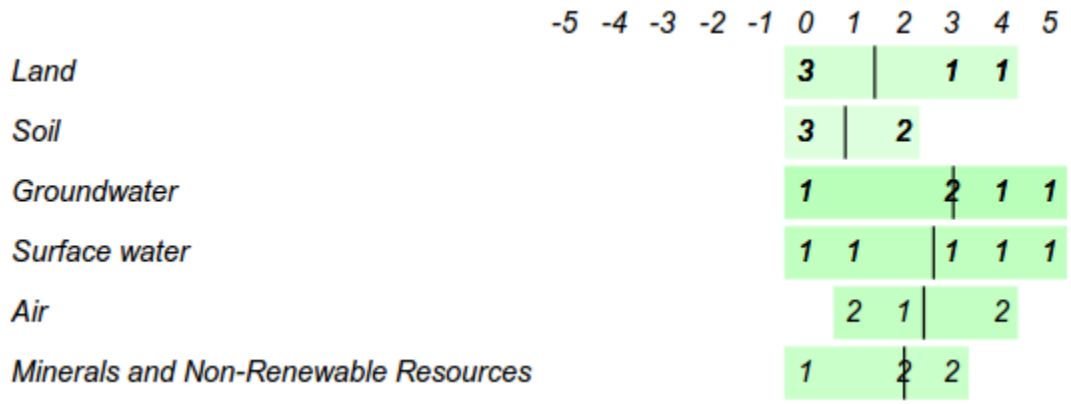
Capitals	Stocks	Mean
Economic	Financial Resources	3.4
Human	Education	3.4
Social	Citizenship	3.2
Natural	Groundwater	3.0
Physical	Infrastructure	2.8
Natural	Surfacewater	2.6
Social	Safety	2.6
Natural	Air	2.4
Physical	Land	2.2
Physical	Public Facilities	2.2
Human	Health & Wellbeing	2.2
Natural	Minerals & Non-Renewables	2.0
Physical	Transportation	2.0
Physical	Housing & Living Conditions	2.0
Cultural	Identity & Diversity	2.0
Cultural	Cultural Heritage	1.8
Economic	Labour	1.6
Natural	Land	1.4
Economic	Economic structure	1.2
Natural	Soil	0.8

The results show that I more than agree that these programs have collectively identified solutions to make LWR affordable for local governments, deliver environmental education, promote civic engagement, improve groundwater, infrastructure, and surfacewater, and support safety goals. I was least inclined to agree that the programs

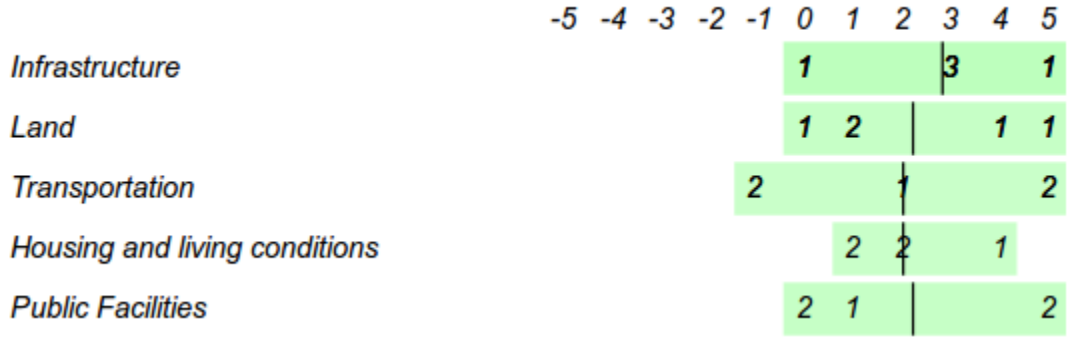
were doing much to preserve soils, which is not surprising considering that LWR is about improving paved environments and—where permeable pavements are used to green infrastructure—soil under the pavement and even to some extent in raingardens becomes a filtration medium that will ultimately end up polluted. But I also registered only weak agreement that these five programs had positive impacts on the structure of local economies (in terms of greening of production processes and creating quality jobs), promoting biodiversity, or supporting cultural capital. I registered only moderate agreement that LWR is contributing positively to physical capital stocks like housing and living conditions; transportation; minerals & non-renewables, health and wellbeing, land use, and public facilities, and air quality. All findings discussed here simply confirm and illustrate those I have already discussed in **Chapter 3**.

Still more of the story is told by the Scatter Diagrams, which show the distribution and spread of my opinions. Figure 5.3 shows the Scatter Diagrams produced by the report.

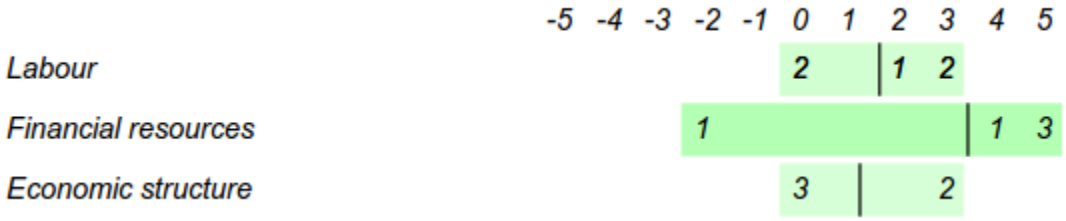
Figure 5.3. Scatter Diagrams Overview of Five LWR Programs

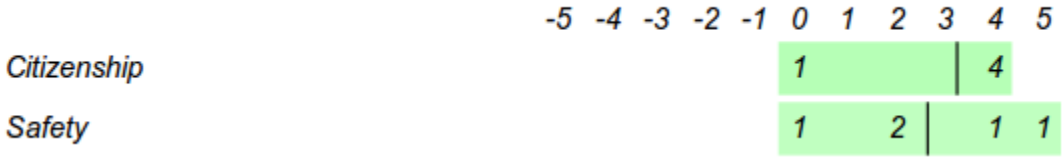


Physical Capital Stocks

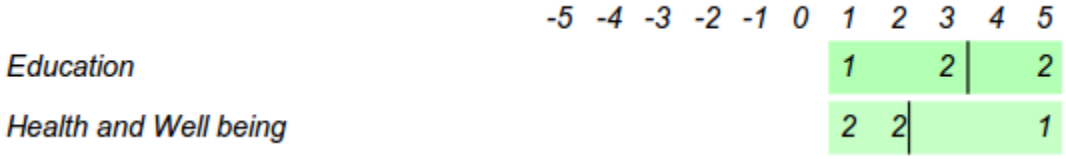


Economic Capital Stocks

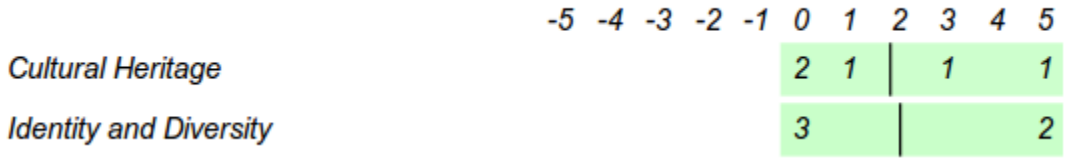




Human Capital Stocks



Cultural Capital Stocks



Like the circle charts, they are all shaded green, emphasizing that the averages (shown by the vertical black bars) are all positive. But they also show the spread (dispersion) of my opinions on the effect of the programs on each stock, as indicated by the width of the green shaded bars. Wider green bars show where my opinions ranged more widely; narrower green bars show where my convictions, one way or another, are strongest.

To derive the take-home messages from these scatter diagrams, I found it easiest to go back to my spreadsheet and put the mean for each stock plus the magnitude of spread into a sortable table. This is shown below as Table 5.2, below.

Table 5.2. Capital Stocks, Ordered by Spread

Capitals	Stocks	Spread	Mean
Natural	Soil	3	0.8
Natural	Air	4	2.4
Natural	Minerals & Non-Renewables	4	2.0
Physical	Housing & Living Conditions	4	2.0
Economic	Labour	4	1.6
Economic	Economic structure	4	1.2
Human	Education	5	3.4
Social	Citizenship	5	3.2
Human	Health & Wellbeing	5	2.2
Natural	Land	5	1.4

Capitals	Stocks	Spread	Mean
Natural	Groundwater	6	3.0
Physical	Infrastructure	6	2.8
Natural	Surfacewater	6	2.6
Social	Safety	6	2.6
Physical	Land	6	2.2
Physical	Public Facilities	6	2.2
Cultural	Identity & Diversity	6	2.0
Cultural	Cultural Heritage	6	1.8
Physical	Transportation	7	2.0
Economic	Financial Resources	8	3.4

This exercise revealed that my convictions about the effects of LWR on specific stocks were strongest as they related to soil, followed by air, minerals & non-renewables, housing and living conditions, labour, and economic structure. This reflects my impressions from evidence about these five programs that they are not contributing a great deal in terms of lowering emissions, reducing our dependence on fossil fuels, creating affordable housing, providing jobs with good working conditions, greening production processes, or diversifying local economies. This is because LWR, even if it creates more greened, walkable space and stimulates economic activity, offers no guarantee that the gains of greening and walking will not be outpaced by excessive consumption in new laneway shopping districts, or that new laneway amenities won't raise prices of adjacent housing, or that new businesses in laneways are necessarily greener businesses that pay livable wages.

Table 5.2 also reflects my opinions (revealed in the Scatter Diagrams) that despite the positive averages shown in the circle charts in Figure 5.2, these five programs actually vary widely—up to 8 points on an 11-point scale—in terms of their impacts on financial resources, transportation, groundwater, infrastructure, safety, surfacewater, public facilities, land use, identity and diversity, and cultural heritage. My (small!) sample of five programs suggests that while LWR can positively impact these things, it likely won't unless we consciously think them through during the design stage. The effects on financial resources and transportation deserve special attention, as this study shows that LWR can negatively affect these by going over-budget and by actually reducing walkability and connectivity, as was shown in Vancouver and Baltimore. The

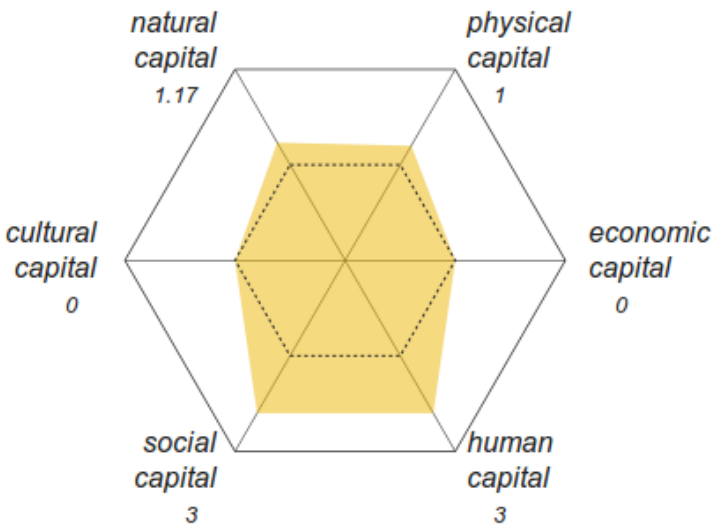
Scatter Diagrams and Table 5.2 also suggest that, based on a combination of high means and low spread, education (mean=3.4 / spread=5) and citizenship (3.2, 5) are the stocks that I am most sure are benefitting the most from these programs. This also squares with my impression that all of the five programs contributed to these stocks in some way by creatively involving people in LWR design and maintenance.

The above discussion shows that, even where units of analysis are not—strictly speaking—comparable due to vast differences in scope, purpose, and complexity, the Scan can be used even by one person to analyze several things at once. It also suggests that, of the three types of graphs produced by the Report, it is the Scatter Diagrams that offer the most useful information for this type of analysis because averages alone conceal spread and polarization of opinion. That said, however, my inclination to look for patterns and take-away messages made me wish they were in some more manipulable format—or even just closer together on the page—so that all of the stocks could be more readily compared in terms of spread.

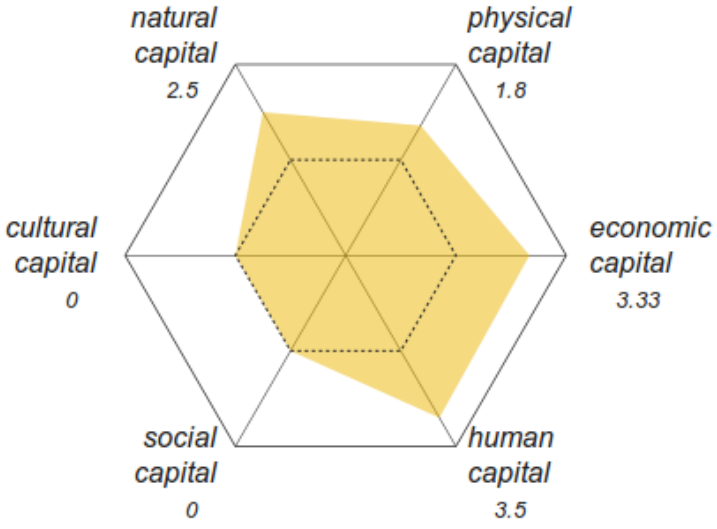
Using the Scan for cross-project analysis prompted questions about whether the Scan could suggest which of several comparable initiatives might be contributing most to SCD, and which might be taking the most “balanced” approach. Understanding that such a comparison is perilous in a sample such as mine but reasoning that anyone using the Scan for cross-project analysis would arrive at questions like these, I examined the Scan output for clues. Unfortunately, it does not make these answers obvious, as is shown by the challenge of extracting this information from a side-by-side comparison of Sustainability Hexagons in Figure 5.4, below.

Figure 5.4. Comparison of Six Sustainability Hexagons

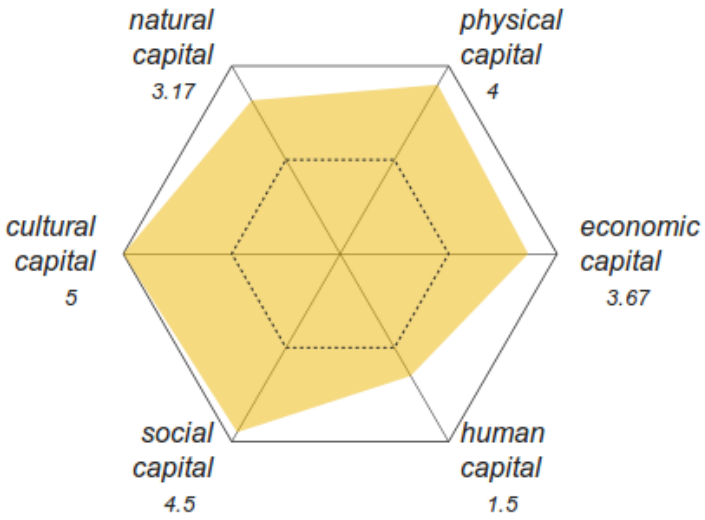
Vancouver Country Lanes



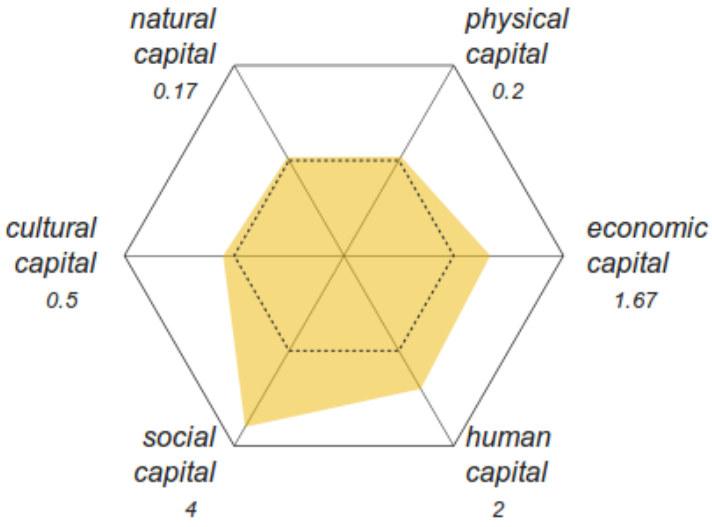
Chicago Green Alleys



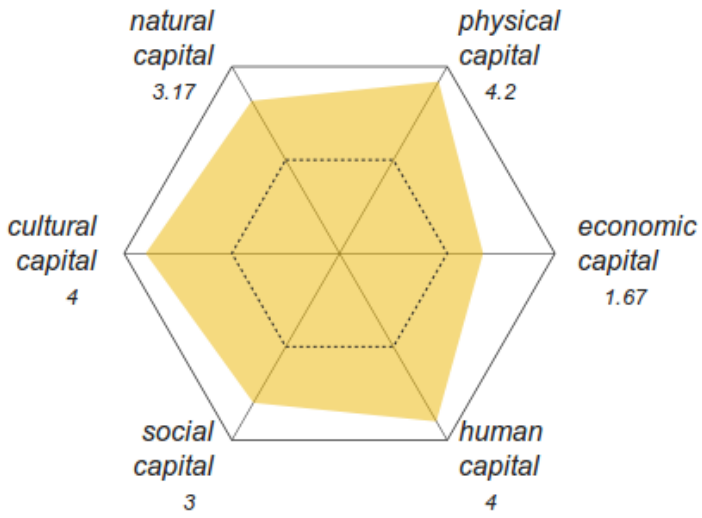
Melbourne Animated Laneways



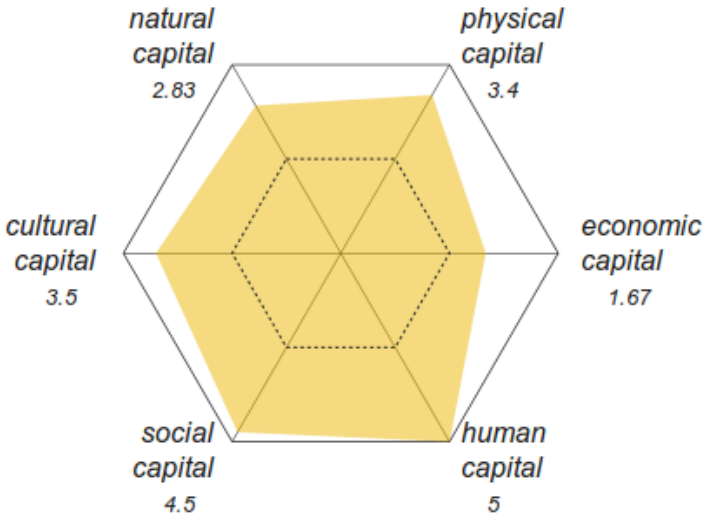
Baltimore Gated Alleys



Montreal Ruelles Vertes



L.A. Avalon Green Network



Clearly, the Scan was not designed for this type of analysis. And as data visualization experts[235] have argued, radar charts are useful for illustrating symmetry or balance within a single chart but tend to complicate comparison of changes on non-adjacent axes. Turning instead to a spreadsheet, I summed per-stock scores and per-capital and per-stock averages for each of the six programs. I then calculated standard deviations of average per-capital scores for each program, as a rough measure of "balance". The results are displayed below in Table 5.3. I highlighted highest and lowest averages and standard deviations in green and red respectively.

[235] Few (2005), Pelter (2008, 2009), and Kosara (2008).

Capitals	Stocks	Average, 5 programs (not LA)	Average, all 6 programs	Vancouver	Chicago	Melbourne	Baltimore	Montreal	Los Angeles
Natural	Land	1.40	1.50	0.00	0.00	3.00	0.00	4.00	2.00
Natural	Soil	0.80	0.83	0.00	0.00	2.00	0.00	2.00	1.00
Natural	Groundwater	3.00	3.00	3.00	5.00	4.00	0.00	3.00	3.00
Natural	Surfacewater	2.60	2.83	1.00	5.00	4.00	0.00	3.00	4.00
Natural	Air	2.40	2.67	1.00	2.00	4.00	1.00	4.00	4.00
Natural	Minerals & Non-Renewables	2.00	2.17	2.00	3.00	2.00	0.00	3.00	3.00
Average		***2.03***	***2.17***	***1.17***	***2.50***	***3.17***	***0.17***	***3.17***	***2.83***
Physical	Infrastructure	2.80	3.00	3.00	5.00	3.00	0.00	3.00	4.00
Physical	Land	2.20	2.33	0.00	1.00	5.00	1.00	4.00	3.00
Physical	Transportation	2.00	2.50	-1.00	2.00	5.00	-1.00	5.00	5.00
Physical	Housing & Living Conditions	2.00	1.83	2.00	1.00	2.00	1.00	4.00	1.00
Physical	Public Facilities	2.20	2.50	1.00	0.00	5.00	0.00	5.00	4.00
Average		***2.24***	***2.43***	***1.00***	***1.80***	***4.00***	***0.20***	***4.20***	***3.40***
Economic	Labour	1.60	1.50	2.00	3.00	3.00	0.00	0.00	1.00
Economic	Financial Resources	3.40	3.17	-2.00	4.00	5.00	5.00	5.00	2.00
Economic	Economic structure	1.20	1.33	0.00	3.00	3.00	0.00	0.00	2.00
Average		***2.07***	***2.00***	***0.00***	***3.33***	***3.67***	***1.67***	***1.67***	***1.67***
Human	Education	3.40	3.67	5.00	5.00	1.00	3.00	3.00	5.00
Human	Health & Wellbeing	2.20	2.67	1.00	2.00	2.00	1.00	5.00	5.00
Average		***2.80***	***3.17***	***3.00***	***3.50***	***1.50***	***2.00***	***4.00***	***5.00***
Social	Citizenship	3.20	3.50	4.00	0.00	4.00	4.00	4.00	5.00
Social	Safety	2.60	2.83	2.00	0.00	5.00	4.00	2.00	4.00
Average		***2.90***	***3.17***	***3.00***	***0.00***	***4.50***	***4.00***	***3.00***	***4.50***
Cultural	Cultural Heritage	1.80	2.00	0.00	0.00	5.00	1.00	3.00	3.00
Cultural	Identity & Diversity	2.00	2.33	0.00	0.00	5.00	0.00	5.00	4.00
Average		***1.90***	***2.17***	***0.00***	***0.00***	***5.00***	***0.50***	***4.00***	***3.50***

Capitals	Stocks	Average, 5 programs (not LA)	Average, all 6 programs	Vancouver	Chicago	Melbourne	Baltimore	Montreal	Los Angeles
SUMMARY									
Average per-stock score				1.20	2.05	**3.60**	**1.00**	3.35	3.25
Sum of Scores on All Stocks				24.00	41.00	**72.00**	**20.00**	67.00	65.00
Average per-capital score		2.32	2.52	**1.36**	1.86	**3.64**	1.42	3.34	3.48
Standard Deviation of Per-Capital Scores (Lowest SD = Greatest "Balance")		0.39	0.48	1.24	**1.43**	1.12	1.35	**0.87**	1.09

The results suggest that if my opinions are sufficiently informed by evidence and comparisons of these programs are even tenable, Melbourne's LWR program promises the greatest impact on sustainability, followed by Montreal, and then (based on its plans if not results) Los Angeles. My calculations of standard deviation suggest that Montreal's model is the most effective compromise between impact and balance among the six capitals, followed by Los Angeles and, closely after that, Melbourne. Assuming that a set of programs are alike enough (in dimensions like scope, purpose, complexity, duration) to compare and that none of the capitals are showing a loss, results like this could provoke some interesting discussions among planners: Which is more desirable, the model whose lowest standard deviation suggests the most "balanced" approach, or the model that is less balanced but has a greater overall impact? Questions like these are probably best debated by people in local contexts than approached in the abstract, but I raise them here only to suggest that it would be interesting if the Scan output could somehow aid this type of cross-project analysis with readily available quantifications like these.

5.3. The Scan As An SCD Checklist

Considered as a checklist for SCD, the Scan was quite useful. Even though these programs were quite disparate, examining them through this lens led me to ask questions that I might not have thought of had I approached each one in isolation. This produced a comprehensive collection of tools and strategies that can be used in LWR to accomplish goals that relate to each stock, and even better, helped to identify strategies that would accomplish more than SCD one goal at once.

At times during completion of the Scan there was the sense of evaluating the same property more than once—as both an end and as a means of reaching the same

end, or from slightly different angles[236]. But further reflection plus a review of other commonly used sustainability frameworks [237] suggested this is neither counterproductive nor uncommon. Measuring things from different angles, and as both an end and as a means to other ends, effectively assigns it a higher relative weight in the CCF itself, and is defensible because any definition of SCD is the result of a negotiated process that weighs values and philosophical positions as well as scientifically determined thresholds[238] —the important thing is that the values are clearly articulated and resonate widely, and that the science is transparent and sound.

The breadth and comprehensiveness of the 20 stocks, grounded as they are in research[239], corresponds closely to my still-developing personal definition of SCD. It is also clear that stocks identified as critical for sustainability vary somewhat from one useful sustainability framework to another.[240] Nevertheless, my experience with the Scan leads me to suggest some relatively minor changes to the stocks, requirements and text in the Scan pre-amble:

- Cut 'spiritual health', as this is outside of the domain of government and project analysis, inappropriate to try to measure for anyone else, and arguably a subset of mental health in any case.
- Cut the highly subjective, anthropocentric 'scenic and attractive views of nature' as this is not a robust measure of the state of natural capital: appearances can be deceiving, as many critical natural processes are invisible to the naked eye (like pollination), or comprise valuable species and ecosystems (like swamps) that are unlikely to win beauty contests. If preservation of attractive views or ready access to nature is included, this could be under stocks that relate to health, sense of place, or perceived quality of public spaces.

[236] For example, the entire category of Physical Capital measures means (e.g. housing, hospitals) to accomplish ends (e.g. eradication of poverty, health) discussed in other capitals, which made me wonder if it were necessary at all. The quality of energy efficiency is alluded to in waste management, transportation, and transmission of energy.

[237] Many examples of this are found among the sustainability frameworks reviewed by Dekker and Singer (2011).

[238] Robinson (2004).

[239] Roseland (2012).

[240] See for example frameworks reviewed by Dekker and Singer (2011) as well as Telos and Community Capital frameworks.

- Clarify the vague 'Ensure that suitable land is available for different uses, e.g. agriculture, housing, etc.' and 'Community has a defined identity'.
- Include a requirement that speaks to need to displace non-renewable energy sources with renewable.
- Incorporate language (into the pre-amble, or perhaps stocks themselves) that makes clearer the need to reduce the absolute throughput of materials and resources (as well as the relative intensity of resource and energy use), because energy efficiency alone is typically outpaced by the Jevon's Effect.[241]
- Incorporate language, into the pre-amble if not the energy-related stocks themselves, that highlights urgency of deep reductions in emissions, and credible baselines and reporting methods, because simply "reducing emissions" or "investing in emissions reduction" invites greenwashing via meaningless measurements of progress[242].
- Include language into the pre-amble that raises awareness that our ecological footprints are not limited to our own communities: SCD requires us to think of the impacts of our actions at broader spatial scales as well as in longer time frames.

5.4. The Scan as Tool of Measurement or Comparison

Although the CC Scan is no doubt useful at gaining "an advance insight in a simple way" and structuring a qualitative conversation about stakeholders' expectations of how a given project will play out[243], prominent use of graphs, scales, boxplot-like tables and decimal numbers on the CC Scan website and in its graphic output creates the impression that it is also a very quantitative tool. But as a tool of measurement or comparison, the Scan had some limitations. As I discussed in Section 2.3, defining a common unit of analysis is challenging—but as Section 5.2 showed, this does not mean that the Scan cannot be useful even where this cannot be done. There is no manual to

[241] Moore and Rees (2013).

[242] John Dagevos notes that because the Scan is typically used in conjunction with the Sustainability Balance Sheet (SBS) in the Netherlands, the urgency of emissions reduction and meaningful levels of investment are made clear in a process of selecting norms and targets for the SBS. I am highlighting this issue as one worth considering for the Scan here in Canada because the Scan is presented online as a stand-alone tool that can be used independently of the SBS. Personal communication, April 2014.

[243] The Dutch version has been well used in this way to generate the rough blueprint for conversation among stakeholders; the CC Scan has also been used in a similar way by Hernandez & Mollinedo (2012), who reported success in this regard in two rural indigenous communities in Bolivia.

guide users in this type of use of the Scan—which is perfectly understandable, as it was not meant for this.

To enhance the Scan's user-friendliness and rigour as a tool for comparison, measurement and communication, future versions of the Scan could include a number of changes to its user interface and output. The changes I am about to suggest could serve these purposes as well as make it more adaptable and scalable for use in more ambitious applications, such as deliberative democracy or citizens' assembly exercises that involve more than 100 people making complex decisions.[244]

5.4.1. Data Collection

- Program the Scan so that users must enter all contextual information necessary to generate credible reports from the Scan, with missing elements flagged in final output.
- Provide a component that makes any adaptations of CC Scan stock requirements more straightforward than links with titles like "More about land".
- Use phrases, such as "strongly agree" or "very positive", or phrases plus numbers, to specify points on scales.[245] Clarify what the midpoint means. [246]
- Use consistent sentence structures and complete sentences that conform to Likert-scale formats and clearly relate stocks to the initiative being scanned, e.g. *This [project/plan] will help achieve a good mix of productive and service industries*. Alternatively, these could be questions, like *How do you expect Project X to affect our community's mix of productive and service industries?* Either way, make that sentence format consistent throughout the questionnaire.
- Use only one response set, such as strongly agree/strongly disagree *or* extremely positive/extremely negative (not both), throughout the entire questionnaire, and ensure these match the sentences that users are asked to respond to. Consistency in sentence structure and response set provides the necessary common denominator to generate graph titles and make summary

[244] I recently took part in a City of Vancouver-hosted citizens' assembly exercise and, amid what felt like a chaotic and muddy process that involved about 140 people, was really wishing they had a CC Scan-like tool at hand.

[245] Brill (2008); see also Kennedy (2008) p. 64-65: "Data quality [from bipolar scales] tends to be higher when all of the gradients are assigned verbal labels than when some or all gradients have only numeric labels or are unlabeled."

[246] Kennedy (2008); Hodge and Gillespie (2007).

statements like “Most responses indicated that Project X would improve Human Capital stocks.”

- Shave the scale down to seven or nine points to facilitate use of phrases as scale point labels, like “somewhat agree”, “agree”, “strongly agree”, without losing much if anything in the way of data richness.[247]
- Continue to avoid a forced-choice format, but consider adding a “don’t know” or “need more information” option, because this is useful data for communication and measurement.
- Simplify barreled[248] statements so that responses are actually useful even in the absence of a later discussion with participants.

5.4.2. Report and Graphs

- Program the Scan so it generates professional-looking reports (maximum 3 pages) with a much higher data-ink ratio[249]. Page 1 could include all necessary contextual information, such as date, project name, sample type, sample process, graph titles and legends, web references for further information, and summary graphs. Page 2 could offer a table, showing the capitals in order of most positive to most negative, followed by the stocks in order of most positive to most negative, followed by opinion distributions for each stock. Ideally these could be sortable, interactive, and available in a non-proprietary format for download and further examination by users.[250]. Page 3 could consolidate reasoning and suggestions for improvement, and perhaps more detail about capitals and stocks.
- Be clear on the website, manuals and output about what the CC Scan graphs represent: opinion or expectation of effects upon stocks, rather than *actual* effects or *probability* of effects.

[247] According to Kennedy (2008) pp.64-64, “Research suggests that 7-point scales tend to be optimal in terms of reliability (test-retest) and the percentage of undecided respondents. Thus, 7-point scales plus or minus 2 points are the most widely used in practice.”

[248] Barrelling is the practice of asking respondents to rate two or more variables in a single item, and according to Phillips, Phillips, and Aaron (2013) is “the most common problem with most survey questions”.. Most CC Scan questions ask about more than one variable. In the CC Scan, the Physical Capital / Infrastructure requirements ask respondents to evaluate 10 properties.

[249] Data visualization expert Edward Tufte (2001) defines data-ink ratio as the share of ink that carries critical data-information relative to the share of ink that carries information that could be erased without losing the graph’s message. Tufte argues that everyday data displays and infographics commonly found in any sports or financial pages demonstrate that general readers appreciate high data-ink ratios and low levels of decoration.

[250] See an example of a sortable bar chart is at http://www.logeeka.com/sortable_bars.html and of a more interactive, hierarchical drill-down bar chart at http://www.logeeka.com/hierarchical_bars.html

- If skipping questions is allowed, tune graphic output to register these in a straightforward way.
- Use deviation bar charts instead of circular charts and radar-chart hexagons, both to respect the graphing fundamental known as the area principle[251], make the baseline clearer[252], highlight magnitude of baseline deviations, permit easier comparison from sector to sector, and to order the data in an intuitive way (e.g. most positive to most negative) so that the take-home messages are more readily discernible.[253] Compare (or ask anyone not already familiar with the Scan to compare) how readily the story behind the data emerges from the Scan's current graph versus the deviation bar chart in Figure 5.5 below.

[251] De Veaux, Velleman, and Bock (2009); Tufte (2001) p. 56: "The representation of numbers, as physically measured on the surface of the graphic itself, should be directly proportional to the numerical quantities represented."

[252] Right now, the baseline appears to demarcate less than half of the area of each sector and the area principle is violated by the fact that negative effects occupy a much smaller area of the chart than positive effects of the same magnitude.

[253] Tufte argues that experiments have proven that people are very challenged to accurately perceive changes in the area of circles—especially when there are more than a few sectors and when some of those sectors are similar in size. To Tufte, "the only worse design than a pie chart is several of them, for then the viewer is asked to compare quantities located in spatial disarray both within and between pies … Given their low data-density and failure to order numbers along a visual dimension, pie charts should never be used" (p. 178, Tufte 2001). Spence (2005, pp 363-364) calls the pie chart a "simple information graphic whose principal purpose is to show the relationship of a part to the whole. It is, by and large, the wrong choice as an exploratory device, and it is certainly not the correct choice when the graph maker or graph reader has a complicated purpose in mind, such as displaying small changes in proportion over time, a task that would require several pies." Few's (2007) review of research on pie charts concludes that pie charts are useful for displaying simple part-to-whole relationships, but that multiple pie charts are "an ineffective way to compare multiple part-to-whole relationships" (p. 11). The effectiveness of radar (also known as spider, Kiviat) charts relative to bar charts has also been questioned by the likes of Few (2005) and Peltier (2008, 2009), who claim it complicates comparison of changes on non-adjacent axes, imposes arbitrary relationships between sectors on non-sequential data, and gives more emphasis to values on the outside of the charts. Kosara (2008) highlights the problem of charts (like both the CC Scan pie chart and the hexagon radar chart) that scale area up at quadratic rates. While Few concedes (2005) that radar charts lend themselves to displaying symmetry between values (a goal consistent with evaluating the "balance" of capital development), he also argues that bar charts are still better at displaying symmetry for several values at once.

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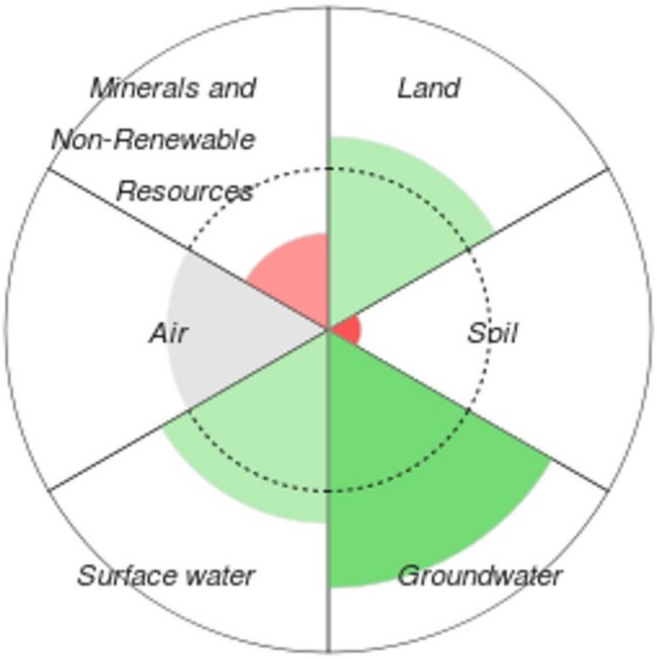
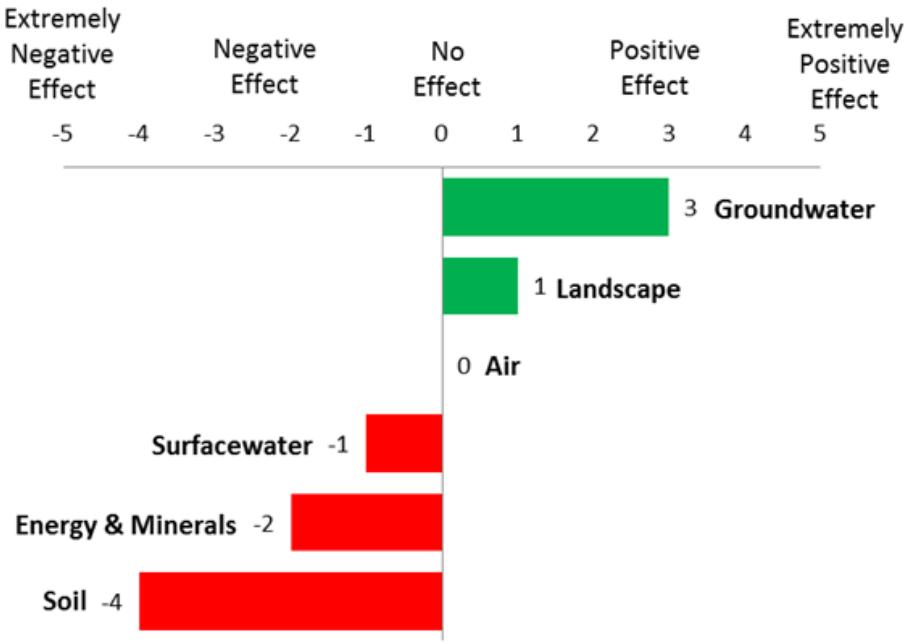
Figure 5.5. CC Scan Circle Chart and and Suggested Alternative: A Deviation Bar Chart





- If bar graphs are being used, reduce complexity by eliminating the colour gradations within sectors ; let the area (e.g. bar length) do the talking instead.[254]
- If the CC Scan's pie charts must be used, do not call them pie charts ("circle charts" might be a better option), because they are not pie charts.[255]
- Consider using small relative frequency histograms[256] to better illustrate distribution of opinion, as these may scale better than Scatter Diagrams. In keeping with standard practice of reporting data in research, report *N*s of completed responses.
- If the CC Scan's scatter diagrams continue to be used, call them something like "opinion distributions" or "opinion detail", because they are not scatter diagrams.[257]
- Use medians, not means, to summarize central tendency of opinion distributions, because this is ordinal rather than quantitative data and because medians offer a more appropriate, robust measure of center in distributions that are subject to skew and asymmetry.[258]
- Include a component that allows users to generate graphs that compare projects, or aspects of projects, side-by-side (e.g. bar graphs of all capitals, or of stocks for each capital, in some order, such as most positive to most negative).

5.4.3. General Improvements

Finally, these more general additions would take the Scan to the next level of utility:

- Include an online manual (possibly including video components) that guides individual and group users in alternative uses of the Scan, including principles

[254] Colour gradations simply add additional dimensions that viewers must interpret, and using them unnecessarily runs counter to Tufte's (2001, p. 71) design principle that "the number of information-carrying (variable) dimensions depicted should not exceed the number of dimensions in the data".

[255] De Veaux, Velleman, and Bock (2009) indicate that pie charts are used to show proportionate relationships of parts of a whole. They are not used to show negative numbers.

[256] These can be generated using the Sparklines feature in 2010 and later versions of Microsoft Excel, among other programs. Note that histograms are common enough to be found in many popular news sources and on websites like Amazon.com, where they show distributions of opinions on books.

[257] De Veaux, Velleman, and Bock (2009).

[258] Sullivan and Artino (2013).

for adaptation of requirements, defining units of analysis for comparison, and identifying stakeholders.

- Explain the Scan's relationship to the Sustainability Balance Sheet, and link it to a site / resources for that, too.
- Consider adding a (well moderated!) CC Scan Community component on the site, in which users can share experiences and help each other, to crowdsource material and insights that help improve the Scan.
- Consider making the CC Scan source code open-source so that people can build on it.

5.5. Conclusions and Discussion

This study of six LWR programs offered evidence that thoughtful LWR can and does contribute to the development of social, cultural, human, physical, economic and natural capital. It extracted more than 150 transferable strategies and tools from these programs and others encountered during the research process, and consolidated them into an ordered Community Capital Laneway Revitalization Toolbox which planners can select from to accomplish specific SCD goals and, ideally, to accomplish more than one SCD goal at once.

But this study also showed that there is much room to strengthen LWR as a tool for SCD. A more deliberately holistic and pro-active approach could help site LWR in zones where it will have the greatest impact, while engaging residents through a user-participates model (as in Montreal's exemplary program) rather than a user-pays approach. It also highlights the fact, illustrated by Melbourne's successful grafting on of environmental concerns to its primarily economic and social LWR program, that communities can make impressive strides toward righting the balance of SCD by identifying and addressing gaps in initial efforts. Finally, shared-space street redesign strategies hold great potential for laneways, even in residential areas, but have yet to be fully explored by North American planners.

Strengthening LWR as a tool for SCD requires that we think about it not as a patch for a single problem but as an instrument to address several SCD concerns across many forms of capital at once, to think about the effects of our interventions at broader and longer scales, to maximize opportunities build a greener economy, and to involve

citizens in efforts that support inclusiveness, health and creativity. This more integral way of thinking is at the heart of SCD. And as with any sustainability initiative, a well-designed research component with complete baseline data will help make more informed assessments of what is working and why.

Finally, this study also documents a novel use of the CC Scan: cross-project analysis of geographically and culturally disparate programs in order to extract a package of best practice tools and strategies and identify principles that could strengthen their contributions to SCD. In test-driving it as a tool for structured inquiry, creative thinking, and ex-poste analysis of several projects in tandem, it builds on the work of Hernandez & Mollinedo (2012), Lowry (2012) and Lowery (2013) in the ongoing project of developing and using the Community Capital Tool for communication and measurement purposes.

5.5.1. Limitations of Research

Time and resources have necessarily limited the scope and depth of this research. As acknowledged in **Chapter 2**, the programs selected for analysis here are by no means representative of the breadth and depth of all LWR programs because this is not a random selection. It is very possible that, in drawing my line around what constitutes laneway revitalization 'program' in each city, some municipal initiatives that aim to effect change in the same set of laneways were missed. The toolbox of LWR strategies in **Chapter 4** offers an overview of tools and strategies I encountered in (primarily web-based) documentation of the six laneway programs under review. It is not intended to serve as a substitute for site-specific assessments or detailed technical knowledge on the full range of LWR options, such as hydrological assessment, stormwater management techniques, socio-economic impact assessments, evaluation of accessibility for physically challenged citizens, or road reconstruction.

Also, in this paper I have looked at LWR, found (based on my sample of six programs) that it can and does contribute to SCD, and described how. However, I am not promoting LWR as a critical component of any SCD plan. As we have seen, LWR can take many forms; not every form of LWR aligns with what I understand to be SCD;

and each one will have both legitimate proponents and detractors. In my view, LWR should not be pursued simply because other communities have shown that it can be done. Citizens, planners and elected leaders should be looking at LWR in light of their own communities' unique, local challenges, assets, priorities and resources and asking: What SCD goals are most important in our community, and is LWR in general, and this LWR program in particular, our most strategic action to serve those goals?

5.5.2. Further Research

Future research could consider questions like: How does LWR compare to other investments in terms of its ability to address communities' most pressing sustainability challenges? Is it benefitting the populations and ecosystems most at risk of ecological degradation and climate change? What are the impacts of LWR projects not just locally, but globally and over time?

Although this paper touches on the social implications of gating laneways and locating revitalized laneways in park-poor neighbourhoods, it has not fully considered the implications of these six programs for environmental justice.

Viewing these six LWR programs through lens of Community Capital sparked my curiosity about numerous topics that could benefit from further research. These are the ones I find most compelling.

- Some of the most interesting LWR efforts are those that creative citizens make happen with little or no help from government and yet remain open to everyone, like the transformative grassroots effort in McElhone Place[259] in Sydney, Australia. There are probably many more McElhone Places, treasured by the locals but next to invisible in the literature about LWR unless they are noticed by planners and architects or promoted by their fans. It would be interesting to study these to determine: What catalyzing factors do they share? What replicable lessons, if any, can be drawn from them?
- Is there a relationship between neighbourhood density, neighbourhood type (e.g. residential, commercial or mixed-use), income levels, and success at resident engagement in LWR?

[259] See Feuerman (2010)'s blog post about McElhone Place, titled "A Real Urban Garden".

- Which LWR governance models are the most effective at achieving positive participation from local residents, organizations and businesses? Which LWR maintenance models are the most robust and economic over the long term?
- Are LWR benefits being evenly distributed among all sectors of the population? If not, how could they be more equitably distributed, and/or targeted where they are most needed in terms of park space and safety?
- How to can under-used urban spaces like laneways be upgraded without impacting housing type diversity and housing affordability?
- What are the critical conditions required (for example, level of existing demand of pedestrians) for LWR to make a laneway into a vital and well-used urban space?
- Do gated laneways need to be lockable to have crime-deterrence benefits? To what extent could latchable gates achieve the same benefit?
- How could life-cycle analysis be used to estimate the net contribution of a proposed LWR to emissions reduction?
- How do narrower center-strips with conventional paving and vegetated shoulders compare for stormwater management, maintenance, durability and emissions reduction in laneways to full-width permeable pavements?
- What green-accounting frameworks would be most appropriate for determining the costs and benefits of LWR to municipalities and why?
- To what extent is LWR actually addressing the UHI effect and effecting lower energy use among adjacent residents?
- How can the effects of LWR on the incidence of single-occupant vehicle trips be empirically measured?
- Under what conditions are residents most likely to want to establish revitalized laneways as car-free zones?
- What is the maximum amount of vehicle traffic per day, minimum amount of pedestrian traffic, and ideal density for successful application of woonerf strategies in residential neighbourhood laneways?
- What laneway lighting strategies achieve the best combination of energy efficiency, dark-sky compliance, safety enhancement, economic production and maintenance, and cradle-to-cradle design?
- What are the most promising strategies for funding LWR?
- Are there opportunity costs, in terms of achieving densification required for sustainable land use, associated with single-story laneway housing in residential areas? If so, how might those be visualized and communicated?
- Would civic addressing help or hinder emergency response in laneways?

Additional research on the CC Scan itself would also be useful:

- Who is using it, for what purposes, and in what contexts? How was their experience, and what would they recommend to make it more useful to them?
- What does the literature on web usability suggest for future versions of the Scan?

5.5.3. In Closing

With their long history and rich array of possible futures, laneways definitely deserve more thought. As we have seen, laneway revitalization is a potentially powerful tool for SCD. But like any tool, it should be used with care. This project has shown that, with the aid of a guide like the Community Capital Framework and a utility like the Community Capital Scan, we can think these projects through, identify opportunities to accomplish several SCD goals at once, and reap greatest local benefit for our sustainability investment. All we need to do is start.

Bibliography

Agyeman, J., R. D. Bullard, and B. Evans, eds. *Just Sustainabilities: Development in an Unequal World*. Cambridge, Massechussetts: Massechussetts Institute of Technology Press, 2003.

Akbari, H., S. Menon, and A. Rosenfeld. "Global Cooling: Effect of Urban Albedo on Global Temperature. Proceedings of the International Seminar on Planetary Emergencies." Erice, Sicily, August, 2007.

Alduenda, E., L. Ballock, N. Rottle, and K. Hill. "The Tale of Three Alleys: Integrating Green Infrastructure in Diverse Neighbourhoods." Boston, American Society of Landscape Architects, Nov. 15, 2013.

Amos, David. "Wider than Necessary: On-Street Parking in Residential Areas." Master of Community and Regional Planning, University of Oregon, 2013.

Appleyard, Bruce, and Lindsey Cox. "At Home in the Zone: Creating Livable Streets in the U.S." *Planning* 72, no. 9 (Oct., 2006): 30-35.

Ashoka: Innovators for the Public. *Community Greens, One Alley at A Time* 2008.

Attarian, Janet L. "Greener Alleys." *Public Roads* 73, no. 6 (May/June, 2010).

Australian Bureau of Statistics. *6310.0 Employee Earnings, Benefits and Trade Union Membership, Australia, August 2012* 2012.

Bain, Lesley, Barbara Gray, and Dave Rodgers. *Living Streets: Strategies for Crafting Public Space.* Hoboken, New Jersey: John Wiley & Sons, 2012.

Baluja, Tamara. "Tired of Living Where Lanes have no Name." *The Toronto Star,* Jan. 25, 2010.

Beckerman, Wilfred. "'Sustainable Development': Is it A Useful Concept?" *Environmental Values* 3, no. 3 (Autumn, 1994): 191-209.

Benfield, Kaid. "'Pocket Neighborhoods' for Sustainable Suburbs." The Atlantic Cities, accessed Dec. 1, 2013, http://www.theatlanticcities.com/neighborhoods/2012/01/pocket-neighborhoods-suburbs-sustainable/864/.

Ben-Joseph, Eran and Szold, Terry S. *Regulating Place: Standards and the Shaping of Urban America*. New York: Routledge, 2005.

Biddulph, Mike. *Home Zones: A Planning and Design Handbook*. Bristol, U.K.: Policy Press, 2001.

Blissett, Rebecca. "City Living: Livable Laneways Group Transforms Vancouver Alleys." *Vancouver Courier,* Sept. 17, 2013.

Bluestone, D. M. "Detroit's City Beautiful and the Problem of Commerce." *Journal of the Society of Architectural Historians* 47, no. 3 (Sept., 1988): 245-262.

Bolay, Anne-France. "Ruelles Vertes (Green Alleys) (Blog Post)." EcoHack Montreal, accessed Mar. 5, 2014, http://www.ecohackmtl.org/en/2013/06/20/ruelles-vertes/;.

Brideau, Lisa D. "Transforming Commercial-Residential Alleys: From Neglected Spaces to People Places." Master of Science (Planning), University of British Columbia, 2006.

Brideau, Lisa, Joaquin Karakas, and Karen Trzaska*. Small Footprints, Big Steps: A Study on Untapped Housing Potential in Vancouver.* Vancouver, 2005.

Brill, J. E. "Likert Scale." In , edited by Lavrakas, P. J. Vol. Encyclopedia of Survey Research Methods, 428-430. Thousand Oaks, California: Sage Publications, 2008.

Brown and Caldwell, HNTB, and Tetra Tech, Inc. *Determining the Potential of Green Infrastructure to Reduce Overflows in Milwaukee*. Milwaukee, Wisconsin: Milwaukee Metropolitan Sewerage District, 2011.

Bruemmer, Ren. "'White Alleys' Offer Play Area for Urban Families in Winter; Councillors to Present Motion to Council Permitting Private Rinks in Laneways." *The Gazette,* Feb. 5, 2013, sec. A.

Buranen, M. "Chicago's Green Alleys: A Large-Scale Project to Reduce Impervious Surface." *Stormwater: The Journal for Surface Water Quality Professionals* (Sept. 30, 2008).

Burnett, K., J. Khadduri, and J. Lindenmayer*. Research on State and Local Means of Increasing Affordable Housing*. Washington, D.C.: National Association of Home Builders, 2008.

Cabbagetown South Residents' Association. "Unsung Heroes." , http://www.cabbagetownsouth.ca/Default.aspx?pageId=1651810.

Cai, Chi Chi, Dan FitzGerald, Jasmine Frolick, Melissa Gasic, Jimmy Greenfield, Teresa Rittemann, Evan Truong, and Jennifer Wardl. "Prospects for Animated Laneways in Downtown Toronto." Master of Planning in Urban Development collaborative student project, Toronto Public Space Initiative, Toronto.

Cameron, Samuel Owen. "Activating Vancouver's Laneways: Re:Imagining the Downtown Eastside's Under-Utilised Public Spaces." Master of Urban and Regional Planning, School of Architecture and the Built Environment, Royal Institute of Technology, Stockholm, Sweden, 2012.

Cassidy, A., J. Newell, and J. Wolch. *Transforming Alleys into Green Infrastructure for Los Angeles*. Los Angeles: USC Center for Sustainable Cities, 2008.

Center for Neighborhood Technology. "Green Values Stormwater Management Calculator." Center for Neighborhood Technology, Chicago, accessed Nov. 20, 2013, http://greenvalues.cnt.org/calculator/calculator.php.

City of Chicago. *The Chicago Green Alley Handbook: An Action Guide to Create a Greener, Environmentally Sustainable Chicago* 2010.

———. "City of Chicago Sustainable Backyards Program: Green Your Yard, Green Your Wallet." City of Chicago, accessed Apr. 10, 2014, http://www.sustainablebackyards.org/.

———. "Streetscapes and Sustainable Design." City of Chicago, accessed Apr. 10, 2014, http://www.cityofchicago.org/city/en/depts/cdot/supp_info/streetscapes_andsustainabledesign.html.

City of Chicago, Pedestrian and Bicycle Information Center, and Chicagoland Bicycle Federation. *Bike Lane Design Guide*, 2002.

City of Edmonton. *Low Impact Development: Best Management Practices Design Guide Edition 1.0*. Edmonton, Alberta, 2011.

City of Los Angeles Community Redevelopment Agency. "Sustainable Communities Planning Grant and Incentives Program: South Los Angeles Green Alley Master Plan Proposal Summary." , accessed Nov. 15, 2013, http://www.sgc.ca.gov/docs/funding/grantee_3010/3010-516_Los_Angeles.pdf.

City of Los Angeles Rainwater Harvesting Program. *Green Streets & Green Alleys: Design Guidelines Standards.*: City of Los Angeles, 2009.

City of Melbourne. *City of Melbourne Water-Sensitive Urban Design Guidelines*. Melbourne, Australia: City of Melbourne, 2009.

———. "Environmental Considerations and Suggested Species." City of Melbourne, accessed Mar. 1, 2014, http://www.melbourne.vic.gov.au/Sustainability/WhatCanIDo/Pages/SuggestedSpecies.aspx.

———. "Greening Melbourne's Laneways." City of Melbourne, Australia, accessed Nov. 15, 2013, http://www.melbourne.vic.gov.au/Sustainability/WhatCanIDo/Pages/GreeningLaneways.aspx.

———. "Love Your Laneway." City of Melbourne, accessed Mar. 15, 2014, https://www.melbourne.vic.gov.au/FORRESIDENTS/STREETCLEANINGANDGRAFFITI/Pages/LoveYourLaneway.aspx.

———. . *Public Lighting Strategy 2013*. Melbourne, Australia, 2013.

———. "Street Art." , accessed Apr. 3, 2014, http://www.melbourne.vic.gov.au/ForResidents/StreetCleaningandGraffiti/GraffitiStreetArt/Pages/Whatisstreetart.aspx.

———. "Street Art." , accessed Mar. 15, 2014, http://www.thatsmelbourne.com.au/Placestogo/PublicArt/Pages/StreetArt.aspx.

———. "The Benefits of Laneway Greening." City of Melbourne, accessed Apr. 2, 2014, https://www.melbourne.vic.gov.au/Sustainability/WhatCanIDo/Pages/BenefitsLanewayGreening.aspx.

———. . *Urban Forest Strategy 2012-2032: Making a Great City Greener*. Melbourne, Australia, 2012.

City of Montreal. "Improve Montréal's Green Infrastructures." City of Montreal, accessed Mar. 15, 2014, http://ville.montreal.qc.ca/portal/page?_pageid=7137,79233654&_dad=portal&_schema=PORTAL.

———. . *Le Plan De Développement Durable De La Collectivité Montréalaise 2010-2015*. Montreal, Quebec: City of Montreal, 2010.

City of Montreal and SOVERDI (Société De Verdissement Du Montréal Métropolitain). *Plan d'Action Canopée: Direction Des Grands Parcs Et Du Verdissement*: City of Montreal, Quebec, 2012.

City of Seattle. Seattle Public Utilities. "Street Edge Alternatives." City of Seattle2013, http://www.seattle.gov/util/MyServices/DrainageSewer/Projects/GreenStormwaterInfrastructure/CompletedGSIProjects/StreetEdgeAlternatives/index.htm.

City of Spokane. Department of Engineering Services*. Design Standards*. Spokane, Washington, U.S., 2007.

City of Sydney. "Finegrain Matching Grants." , accessed Apr. 3, 2014, http://www.cityofsydney.nsw.gov.au/business/business-support/grants-and-sponsorship/finegrain-matching-grants.

City of Vancouver, B. C. "Building Your Laneway House." City of Vancouver, B.C., accessed Nov. 15, 2013, http://vancouver.ca/home-property-development/building-your-laneway-house.aspx.

———. "Laneway Housing how-to Guide." City of Vancouver, B.C., http://vancouver.ca/files/cov/laneway-housing-howto-guide.pdf.

———. "Section 11: Additional Regulations. City of Vancouver Zoning and Development Bylaw." City of Vancouver, B.C., http://former.vancouver.ca/commsvcs/BYLAWS/zoning/sec11.pdf.

City of Vancouver, B.C. Engineering Services*. Administrative Report to Standing Committee on Planning and Environment Oct. 14, 2008 RTS no. 05784 Van RIMS no. 08-2000-20.* Vancouver, B.C.: City of Vancouver, 2008.

———. *. Administrative Report to Vancouver City Council July 9, 2002 RTS no. 02782 CC File no. 5809, 2002*. Vancouver, B.C.: City of Vancouver, 2002.

———. *Country Lanes (Flyer)*. Vancouver, BC.: City of Vancouver, 2002.

City of Vancouver, B.C. Planning & Development Services. *Chinatown Neighbourhood Plan and Economic Revitalization Strategy*. Vancouver, B.C., 2012.

———. *. Laneways 2.0: Laneway Opportunities in the West End*. Vancouver, B.C.: City of Vancouver, 2013.

City of West Vancouver*. The Potential for 'Coach Houses' in West Vancouver: A Discussion Paper*. West Vancouver, B.C., 2012.

Clarke, Ronald V. *Improving Street Lighting to Reduce Crime in Residential Areas. Response Guide no. 8*: Center for Problem-Oriented Policing, 2008.

Clay, Grady. *Being a Disquisition upon the Origins, Natural Disposition and Occurrences in the American Scene of Alleys: A Hidden Resource*. Louisville, Kentucky: G. Clay & Co., 1978.

Condon, P. M. "
Seven Rules for Sustainable Communities: How City Design can Help Save the Planet." *TheTyee.Ca* (Sept. 15, 2010).

———. *Seven Rules for Sustainable Communities: How City Design can Help Save the Planet.* Washington, D.C.: Island Press, 2010.

Cozens, Paul Michael. "New Urbanism, Crime and the Suburbs: A Review of the Evidence." *Urban Policy and Research* 26, no. 4 (2008): 429-444. doi:DOI: 10.1080/08111140802084759.

Cubitt, Emma L. "Laneway Infill: Re-Creating an Urban Housing Typology." Master of Architecture, University of Waterloo, Ontario, 2008.

Dagevos, J. "Community Capital: A Framework and Tool." Presentation at ICLEI World Congress, Belo Horizonte, Brazil, June 14, 2012.

Dagevos, J. and F. Van Lamoen. *Handboek Toetsingskader Duurzame Ontwikkeling*. Tilburg, The Netherlands: Telos, 2009.

Davies, Thomas W., Jonathan Bennie, and Kevin J. and Gaston. "Street Lighting Changes the Composition of Invertebrate Communities " *Biology Letters* 8, no. 5 (October, 2012): 764-767.

De Veaux, R. D., P. F. Velleman, and D. E. Bock. *Intro Stats*. Boston: Pearson Education, 2009.

Dekker, S. and J. Singer. *Integrated Community Sustainability Plans: Monitoring & Evaluating Success.* Vancouver, B.C.: Sustainable Cities International, 2011.

Duany, Andres & Elizabeth Plater-Zyberk. " the Second Coming of the American Small Town " *The Wilson Quarterly* 16, no. 1 (Winter, 1992): 19-48.

Dunn, Alexandra Dapolito. "Siting Green Infrastructure: Legal and Policy Solutions to Alleviate Urban Poverty and Promote Healthy Communities." *Boston College Environmental Affairs Law Review* 37, no. 1 (2010): 41-66.

Eco-Quartier du Plateau Mont-Royal and Le Plateau Mont-Royal. "Guide D'Aménagement D'Une Ruelle Verte." , accessed Jan. 20, 2014, http://ville.montreal.qc.ca/pls/portal/docs/PAGE/ARROND_PMR_FR/MEDIA/DOCUMENTS/GUIDE_RUELLES%20VERTES_2013_VF.PDF.

El Nasser, Haya. "'Fitness Parks' Catch on in Cities." *USA Today,* Dec. 14, 2012.

Engel, Pamela, Christina Sterbenz and Gus Lubin. "The 50 most Violent Cities in the World." Business Insider, accessed Apr. 5, 2014, http://www.businessinsider.com/the-most-violent-cities-in-the-world-2013-11?op=1.

Engler, Mia. "Repulsive Matter: Landscapes of Waste in the American Middle-Class Residential Domain." *Landscape Journal* 16, no. 1 (Spring, 1997): 60-79.

Enterprise Melbourne. "Central City." , accessed Apr. 7, 2014, http://www.melbourne.vic.gov.au/enterprisemelbourne/WhyMelbourne/Pages/Central.aspx.

Environmental Protection Agency (U.S.). "Pay-as-You-Throw Programs." , accessed Nov. 15, 2013, http://www.epa.gov/solidwaste/conserve/tools/payt/index.htm.

———. "Reducing Urban Heat Islands. Compendium of Strategies: Cool Pavements." , accessed Nov. 1, 2013, http://www.epa.gov/heatisland/resources/pdf/CoolPavesCompendium.pdf.

Environmental Protection Agency (U.S.), Region 3. Environmental Assessment and Innovation Division. "Street Edge Alternatives (SEA Streets) Project." , accessed Nov. 1, 2013, http://www.epa.gov/greenkit/stormwater_studies/SEA_Streets_WA.pdf;.

Farrington, David P. and Brandon C. Welsh. "Improved Street Lighting and Crime Prevention." *Justice Quarterly* 19, no. 2 (2002): 313-342.

Ferreter, Sarah, Mike Lewis, and Mike Pickford*. Melbourne's Revitalized Laneways*. Seattle, Washington: University of Washington, 2008.

Festa, Elizabeth. "D.C.'s Gessford Court is a Little Alley Oasis." *Washington Post,* Mar. 20, 2010.

Feuerman, William. *Off the Grid, Exploring the Sydney Laneway.* Untapped Cities: Urban Discovery from A New York Perspective. 2010.

———. "A Real Urban Garden (Blog Post)." Delirious Without New York Blog, accessed Mar. 15, 2014, http://deliriouswithoutnyc.blogspot.ca/2010/12/real-urban-garden.html.

Few, S. "Keep Radar Charts Below the Radar--Far Below." *Information Management Magazine* (May 1, 2005).

———. "Save the Pie Charts for Dessert." *Visual Business Intelligence Newsletter* (Aug., 2007).

Fialko, Mary and Jennifer Hampton in collaboration with UW Green Futures Lab, Scan Design Foundation, and Gehl Architects*. Seattle Integrated Alley Handbook: Activating Alleys for a Lively City*. Seattle, Washington: Green Futures Lab, 2011.

Ford, Larry R. "Alleys and Urban Form: Testing the Tenets of New Urbanism." *Urban Geography* 22, no. 3 (2001): 268-286. doi:10.2747/0272-3638.22.3.268.

Foster, Josh, Ashley Lowe, and Steve Winkelman. "The Value of Green Infrastructure for Urban Climate Adaptation." Center for Clean Air Policy, accessed Nov. 15, 2013, http://dev.cakex.org/sites/default/files/Green_Infrastructure_FINAL.pdf.

Goff, Chelsey. "New FBI Data shows Crime Dropping; Some Top 10 Dangerous Defy Trend." Law | Street (blog), http://lawstreetmedia.com/blogs/crime/crime-dropping-in-the-us-how-do-the-top-10-most-dangerous-fare/.

Haans, Antal and Yvonne A.W. de Kort. "Light Distribution in Dynamic Street Lighting: Two Experimental Studies on its Effects on Perceived Safety, Prospect, Concealment, and Escape." *Journal of Environmental Psychology* 32, no. 4 (Dec., 2012): 342-352.

Harper, D. "Online Etymological Dictionary: Alley." , accessed Nov. 1, 2013, http://www.etymonline.com/index.php?\allowed_in_frame=0&search=alley&searchmode=none.

———. "Online Etymological Dictionary: Mews." , accessed Nov. 1, 2013, http://www.etymonline.com/index.php?allowed_in_frame=0&search=mews&searchmode.

Hawthorne, M. "Deep Tunnel, Shallow Thinking? Experts Say Massive Stormwater System Inadequate, Fixing Flooding Requires Green Projects to Cut Runoff." *Chicago Tribune,* June 12, 2013.

Hayes, Derek. *Historical Atlas of Vancouver and the Lower Fraser Valley*. Vancouver: Douglas & McIntyre, 2005.

HB Lanarc Consulting Ltd. *Liveable Lanes: A Study of Laneway Infill Housing in Vancouver and Other Growing B.C. Communities*. Ottawa, Ontario: Canada Mortgage and Housing Corporation, 2009.

Heard, Hamish. "Have Your Say: CBD Garbage Stench Clean-Up." *Melbourne Leader,* Apr. 26, 2010.

Heffez, Alanah. "Saint-Pierre River Site to Become Montreal's First Woonerf." *Spacing Montreal* (May 1, 2011).

Hermans, F. L., W. Haarmann, and J. F. Dagevos. "Evaluation of Stakeholder Participation in Monitoring Regional Sustainable Development." *Regional Environmental Change* 11, (2011): 805-815.

Herrod, Kate A. "Creating New Urban Commons: A Baltimore Case Study. Proceedings of Sustaining Commons: Sustaining our Future, Thirteenth Biennial Conference of the International Association for the Study of the Commons." Hyderabad, India, Jan. 10-14, 2011.

Hess, Paul M. "Fronts and Backs: The use of Streets, Yards, and Alleys in Toronto-Area New Urbanist Neighborhoods." *Journal of Planning Education and Research* 28, no. 2 (2008): 196-212.

Hodge, D. R. and D. F. Gillespie. "Phrase Completion Scales." *Journal of Social Science Research* 33, no. 4 (2007): 1-12.

Hodge, Gerald and David L. A. Gordon. *Planning Canadian Communities: An Introduction to the Principles, Practice and Participants*. 5th ed. Toronto: Nelson Thomson, 2007.

Hutchinson, Brian. "Forgotten 'Country Lane' Experiment could be Answer to Vancouver's Desire for More Green Space." *National Post* (July 2, 2013).

Jackson, Tim. *Prosperity without Growth: Economics for A Finite Planet*. Sterling, Virginia; London: Earthscan, 2009.

Jacobs, Jane. *The Death and Life of Great American Cities*. New York: Modern Library, 1961.

Kazemi, F., S. Beecham, and J. Gibbs. "Streetscale Bioretention Basins in Melbourne and their Effect on Local Biodiversity." *Ecological Engineering* 35, (Oct., 2009): 1454-1465.

Kennedy, C. "Bipolar Scale." In *Encyclopedia of Survey Research Methods*, edited by Lavrakas, P. J., 64-65. Thousand Oaks, California: Sage Publications, 2008.

Kennedy, M. "Compact Living: Rethinking Calgary's Laneways." Master of Architecture, Dalhousie University, Halifax, Nova Scotia, 2012.

Knippenberg, L., W. Haarmann, F. L. Hermans, T. A. Beckers, J. Dagevos, and I. Overeem. "Developing Tools for the Assessment of Sustainable Development in the Province of Brabant, the Netherlands." In *Sustainability Indicators: A Scientific Assessment*, edited by Hak, T., B. Moldan and A. Lyon Dahl. Scope ed. Vol. 67. Washington, D.C.: Island Press, 2007.

Kosara, R. "Linear Vs. Quadratic Change" (Blog Post). Eager Eyes: Visualization and Visual Communication, accessed Mar. 15, 2014, http://eagereyes.org/blog/2008/linear-vs-quadratic-change.

Kostic, Miomir and Lidija Djokic. "Recommendations for Energy Efficient and Visually Acceptable Street Lighting." *Energy* 34, no. 10 (Oct., 2009): 1565-1572.

Kostof, Spiro and Greg Castillo. *The City Assembled: The Elements of Urban Form through History.* New York: Thames & Hudson, 2005.

Longfellow Community Council. "Alley Atlas Project: Name Your Alley." , accessed Dec. 1, 2013, http://www.longfellow.org/2013/09/alley-atlas-project-name-your-alley/.

MacDonald, K. "Turning Alleys into Assets." *Plan Canada* 44, (: 48-51.

Martel, Andrew, Carolyn with Whitzman, Ruth Fincher, Peter Lawther, Ian Woodcock, and Danita Tucker.
Getting to Yes: Overcoming Barriers to Affordable Family Friendly Housing in Inner Melbourne. Literature Review.
. Melbourne, Australia: 2013.

Martin, Michael D. "Back-Alley as Community Landscape." *Landscape Journal* 15, no. 2 (Fall, 1996): 138-153.

———. "The Case for Residential Back-Alleys: A North American Perspective." *Journal of Housing and the Built Environment* 17, no. 2 (2002): 145-171.

———. "The Question of Alleys, Revisited." *Urban Design International* 6, no. 2 (2001): 76-92. doi:doi:10.1057/palgrave.udi.9000041.

Martin, Ron. "Regional Economic Resilience, Hysteresis and Recessionary Shocks (Plenary Paper)

." Newcastle, England, Annual International Conference of the Regional Studies Association, Apr. 17-20, 2011.

Martinez, José. "On Central: Plan Looks to Cure South LA Alleys of Ugliness, Lack of Accessibility." Southern California Public Radio, accessed Dec. 1, 2013, http://www.oncentral.org/news/2012/07/05/initiative-looks-cure-south-la-alleys-ugliness-ina/.

Masanauskas, John. "Rubbish no Longer A Waste of Space in City Laneway." *Herald Sun,* Aug. 14, 2013.

McNeill, Donald. "Fine Grain, Global City: Jan Gehl, Public Space and Commercial Culture in Central Sydney." *Journal of Urban Design* 16, no. 2 (05/01; 2014/04, 2011): 161-178. doi:10.1080/13574809.2011.548977.

Melbourne Heritage Action. "Save our Laneways Petition Update." , accessed Apr. 5, 2014, http://melbourneheritage.org.au/2012/08/09/save-our-laneways-petition-update/.

Melbourne Water*. Better Bays and Waterways: A Water Quality Improvement Plan for Port Phillip Bay and Western Port*, 2009.

———. "Key Strategies and Plans." , accessed April 7, 2014.

———. "STORM Calculator." , accessed Apr. 15, 2014, http://www.storm.melbournewater.com.au/.

Melbourne Water Corporation. *Healthy Waterways: Raingardens*. Melbourne, Australia: Melbourne Water Corporation, 2009.

Menet, J. -L. "A Simplified Life Cycle Assessment Applied to a Coupled Solar and Eolic Street Light. Proceedings of the International Conference on Renewable Energies and Power Quality." Santiago de Compostela, Spain, Mar. 28-30, 2012.

Merriam-Webster Dictionary. "Lane." , accessed Sept. 1, 2013, http://www.merriam-webster.com/dictionary/lane.

Mill Street Planning. *Alley Allies: Connecting Neighbours, Reimagining Alleys. Background Report*. Portland, Oregon, 2013.

———. . *Alley Allies: Connecting Neighbours, Reimagining Alleys. Plan*. Portland, Oregon, 2013.

———. . *Alley Allies: Connecting Neighbours, Reimagining Alleys. Toolkit*. Portland, Oregon, 2013.

Moore, J. and W. E. Rees. *Getting to One-Planet Living*: Worldwatch Institute, 2013.

Morris, A. E. J. *The History of Urban Form before the Industrial Revolutions*. New York: John Wiley & Sons, 1993.

Mortada, H. *Traditional Islamic Principles of Built Environment*. London, New York: RoutledgeCurzon, 2003.

Nathanson, B. and Danielle Emmet. *Alley Gating & Greening Toolkit Baltimore*. Baltimore, Maryland: Ashoka: Innovators for the Public, 2008.

National Association of City Transportation Officials. *Urban Street Design Guide*. Washington, D.C.: Island Press/Center for Resource Economics, 2013.

Newell, J., C. Sister, J. Wolch, J. Swift, P. Ghaemi, J. Wilson, and T. Longcore. *The Green Visions Plan for 21st Century Southern California: Creating Parks & Open Space using Green Visions Planning Toolkit 1.0*. Los Angeles: University of Southern California GIS Research Laboratory and Center for Sustainable Cities, 2007.

Newell, J., M. Seymour, T. Yee, JRenteria, T. Longcore, J. R. Wolch, and A.Shishkovsky. "Green Alley Programs: Planning for a Sustainable Urban Infrastructure?" *Cities* 31, (April, 2013): 144-155. doi:http://dx.doi.org/10.1016/j.cities.2012.07.004.

Newman, Peter and Jeffrey Kenworthy. *Sustainability and Cities: Overcoming Automobile Dependence.* Washington, D.C.: Island Press, 1999.

Nino Gheciu, Alex. "Can Living in Laneways Fix Toronto's Density Issues?" *Toronto Star,* Dec. 26, 2012.

O'Brian, Amy. "Lane Change Gets Green Light: Innovative Paving Option Approved by Vancouver City Council." *Vancouver Sun,* Dec. 20, 2004, sec. B.

O'Shea, Michael. "Build it and they Will Come: Alleyway Hockey Rink." *Spacing Montreal* (Apr. 21, 2012).

Paint the Pavement. "What is Paint the Pavement?" , accessed Apr. 3, 2014, http://www.paintthepavement.org/about.

Peltier, J. "Radar Charts are Ineffective (Blog Post)." Peltier Tech Blog, accessed Mar. 15, 2014, http://peltiertech.com/WordPress/radar-charts-are-ineffective/.

———. "Spider Chart Alternatives (Blog Post)." Peltier Tech Blog, accessed Apr. 16, 2014, http://peltiertech.com/WordPress/spider-chart-alternatives/.

Phillips, P. P., J. J. Phillips, and B. Aaron. *Survey Basics.* ASTD, 2013.

Plourde-Archer, Léa. "Montreal's Ruelles Vertes: Green Alleyways Help the Environment and Create a Sense of Community." , http://untappedcities.com/2013/08/07/montreals-ruelles-vertes-green-alleyways-help-the-environment-and-create-a-sense-of-community/.

Poklembová, Veronika, Tatiana Kluvánková-Oravská, and Maroš Finka. "Sustainable Management of Urban Public Spaces? Lessons from Commons Governance. Proceedings of the Association of European Schools of Planning 26th Annual Congress." Ankara, Turkey, 2012.

Pollack, M. "Cache that Trash." *New York Times,* Dec. 25, 2011.

Reed, Mark S., Anil Graves, Norman Dandy, Helena Posthumus, Klaus Hubacek, Joe Morris, Christina Prell, Claire H. Quinn, and Lindsay C. Stringer. "Who's in and Why? A Typology of Stakeholder Analysis Methods for Natural Resource Management." *Journal of Environmental Management* 90, no. 5 (4, 2009): 1933-1949. doi:http://dx.doi.org.proxy.lib.sfu.ca/10.1016/j.jenvman.2009.01.001.

Robinson, John. "Squaring the Circle? some Thoughts on the Idea of Sustainable Development." *Ecological Economics* 48, no. 4 (4/20, 2004): 369-384. doi:http://dx.doi.org.proxy.lib.sfu.ca/10.1016/j.ecolecon.2003.10.017.

Roseland, M. *Towards Sustainable Communities: Solutions for Citizens & their Governments*. 4th ed. Gabriola Island, British Columbia: New Society Press, 2012.

Saulny, Susan. "In Miles of Alleys, Chicago Finds its Next Environmental Frontier." *New York Times,* Nov. 26, 2007, sec. A.

Semenak, Susan. "Hidden Neighbourhoods: Montreal's Intimate Urban Laneways." *The Gazette,* July 25, 2009, sec. G.

Seymour, Mona, Jennifer Wolch, Kim D. Reynolds, and Hilary Bradbury. "Resident Perceptions of Urban Alleys and Alley Greening." *Applied Geography* 30, no. 3 (July, 2010): 380-393. doi:10.1016/j.apgeog.2009.11.002.

Shapiro, Stephanie. "A Haven on the Block: Gated Alleys have Transformed Urban Eyesores into Communal Oases. but some Say the Closed Gates Send a Mixed Message." *Washington Post,* May 30, 2010, sec. W.

Sheppard, S. R. J. (Stephen Richard John). *Visualizing Climate Change: A Guide to Visual Communication of Climate Change and Developing Local Solutions*. Abingdon, Oxon: Routledge, 2012.

Shim, Brigitte, Donald Chong, and Steffanie Adams. *Site Unseen: Laneway Architecture and Urbanism in Toronto*
. Toronto: University of Toronto Press, 2004.

Smith, Charlie. "Laneway Homes, Garden Suites, and Carriage Houses Sprouting Up Across Lower Mainland." *Georgia Straight,* Oct. 16, 2013.

Snohomish County. "Snohomish County Residential Design Manual." Snohomish County, Washington, U.S., accessed Dec. 1, 2013, http://www.co.snohomish.wa.us/documents/Departments/PDS/Code_Development/Rules/URDSDesignManual-FinalDraft.pdf;.

Southworth, Michael and Eran Ben-Joseph. *Streets and the Shaping of Towns and Cities*. Washington, D.C.: Island Press, 2003.

Spence, I. "No Humble Pie: The Origins and Usage of a Statistical Chart ." *Journal of Educational and Behavioral Statistics* 30, no. 4 (Winter, 2005): 353-368.

Spencer, R. "The Online Public Engagement Tools: What's Out there and what to use." *Plan Canada* 54, no. 4 (2012): 24-26.

State of Victoria, Australia. *Growing Green Guide: A Guide to Green Roofs, Walls and Facades in Melbourne and Victoria, Australia* 2014.

Stewart, B. M. "An Examination of Cleveland and McGill's Hierarchy of Graphical Elements ." Master of Arts, University of New Brunswick, 2009.

Sullivan, G. M. and A. R. Artino. "Analyzing and Interpreting Data from Likert-Type Scales." *Journal of Graduate Medical Education* 5, no. 4 (Dec., 2013): 541-542.

Telos--The Brabant Centre for Sustainable Development. *Duurzaamheidbalans Van Brabant 2010.* Tilburg, Netherlands: Telos, 2010.

———. *Duurzaamheidbalans Van Brabant 2006. De Verantwoording.* Tilburg, Netherlands: Telos, 2006.

———. *Duurzaamheidbalans Van Brabant 2002. De Verantwoording.* Tilburg, Netherlands: Telos, 2002.

Transport Canada. "Country Lanes: Greening Local Transportation." , accessed Dec. 1, 2013, http://data.tc.gc.ca/archive/eng/programs/environment-utsp-greeninglocaltransportation-237.htm.

———. . *Urban Transportation Showcase Program. Case Studies in Sustainable Transportation. Case Study 23: Country Lanes: Greening Local Transportation.*, 2004.

Transport Canada. *Active Transportation in Canada: A Resource and Planning Guide*. Ottawa, Ontario: Canada, 2011.

Transportation Alternatives. *Streets for People: Your Guide to Winning Safer, Quieter Streets*. New York: Transportation Alternatives, 2004.

Tufte, E. R. *The Visual Display of Quantitative Information*. 2nd ed. Cheshire, Connecticut: Graphics Press, 2001.

United Nations World Commission on Environment and Development. *Our Common Future: Report of the World Commission on Environment and Development*. New York: Oxford University Press, 1987.

Vancouver City Planning Commission, the Simon Fraser University City Program and Smart Growth BC. *Affordability by Design: Affordability for all. A Summary of what the City can do to Create Affordable Housing*. Vancouver, B.C.: Vancouver City Planning Commission, the Simon Fraser University City Program and Smart Growth BC, 2006.

Victoria Transport Policy Institute. "Transit Oriented Development: Using Public Transit to Create More Accessible and Livable Neighborhoods. TDM Encyclopedia." , accessed Dec. 1, 2013, http://www.vtpi.org/tdm/tdm45.htm.

Villegas, Lewis N. "Early Subdivisions & Platting." , accessed Nov. 28, 2013, http://sunnvancouver.wordpress.com/2011/09/28/the-vancouver-plat/.

Welsh, B.P. and D.C. Farrington. "Effects of Improved Street Lighting on Crime." *Campbell Systematic Reviews* 13, (2008).

Welsh, Brandon C. and David P. Farrington. *Making Public Places Safer: Surveillance and Crime Prevention*. New York: Oxford University Press, 2010.

Welsh, G.
Inventory of City Laneways and Level of Service Provided: All Wards. City of Toronto Staff Report. Toronto, Ontario: City of Toronto: Transportation Services, 2006.

Wikipedia. "Alley." , accessed Dec. 1, 2013, http://en.wikipedia.org/wiki/Alley.

———. "Mews (Falconry)." , accessed Sept. 15, 2013, http://en.wikipedia.org/wiki/Mews_%28falconry%29.

———. "Washington_mews." , accessed Dec. 5, 2013, http://en.wikipedia.org/wiki/Washington_Mews.

Wise, D. "The Physical Design of Alleys: An Evaluation of Alleys in the Montreal Plateau." Master of Urban Planning, McGill University, 2004.

Wise, Steve. "Green Infrastructure Rising: Best Practices in Stormwater Management." *Planning* 74, no. 8 (August/September, 2008): 14-19.

Wolch, J., J. Newell, M. Seymour, H.B. Huang, K. Reynolds, and J. Mapes. "The Forgotten and the Future: Reclaiming Back Alleys for a Sustainable City." *Environment and Planning* 42, no. 12 (Sept., 2010): 2874-2896. doi:10.1068/a42259.

Woodhouse, Andrew. "Factors Influencing the Development of Brisbane's Laneways as Successful
Urban Spaces." *Australlian Planner* 48, no. 4 (2011): 292-304.

Zehner, Ozzie. "Solar Cells and Other Fairy Tales." In *Green Illusions: The Dirty Secrets of Clean Energy and the Future of Environmentalism*, 3-30. Lincoln, Nebraska: University of Nebraska Press, 2012.

Appendix

Informed Consent Form

Laneway Revitalization:
Possibilities, Challenges & Solutions

Who is conducting the study?

Principal Investigator: Larissa Ardis, Candidate for Master of Resource Management, School of Resource & Environmental Management, Faculty of Environment, Simon Fraser University: [redacted] or [redacted]

Supervising Instructor: Dr. Mark Roseland, School of Resource & Environmental Management, Faculty of Environment, Simon Fraser University: [redacted] or [redacted]

Why is Larissa doing this study?

This research is being conducted for Larissa's final project, a requirement for the degree of Master of Resource Management. This project aims to produce a compendium of tools that the public, stakeholders and municipalities can use to reconsider laneways as an under-utilized public asset with possibilities to advance sustainable community development. Findings from this paper will also inform a shorter paper on laneway revitalization that will be written for a Vancouver-based architectural design firm.

Why would Larissa like to talk with you?

You have professional experience and expertise that relates to laneway revitalization, greening, or animation. Your participation will help answer Larissa's research questions, which include: *What are the possibilities of laneway revitalization, as demonstrated in laneway revitalization projects around the world? What challenges are involved in doing so? How are municipalities surmounting these challenges? What tools are available?*

What does participation in this study involve?

More than likely, a brief (i.e, ~ 10 min.) phone conversation. Larissa will be soliciting your top-of-mind responses to questions that relate to your knowledge on this topic. Questions will probe your professional opinion and experience on social, economic, environmental, political, legal, and technical aspects of laneway revitalization. With your advance permission, Larissa may record conversations and generate rough transcriptions of them.

Your participation is voluntary

Your participation is entirely voluntary. You have the right to refuse to participate in this study, choose not to answer questions you prefer not to answer, or withdraw your participation at any time without giving reasons, and without any negative personal or

professional consequences to you. If you choose to terminate your involvement in this project, all notes, recordings and transcripts of conversation(s) with Larissa will be destroyed.

What are the benefits of participating?

Unfortunately, Larissa cannot pay you for your time for this research. Larissa hopes this work will prove useful to you, your colleagues, and other professionals considering laneway revitalization initiatives.

Is there any way being in this study could pose risks for you?

Larissa would like to speak with you entirely "on the record," that is, with anything said by you to be considered attributable to you. Considering the subject matter here and the fact that you would not be asked to disclose anything to me that Larissa would not be prepared put on the public record in your professional role, Larissa does not foresee any risks to you of participating in the study. If you insist on telling Larissa something that she can use in her paper but do not want that statement attributed to you, please tell Larissa in advance that you are going to say something that is "not for attribution." For simplicity's sake, however, Larissa strongly prefers to limit your disclosures to what you can say "on the record" and requests that you not talk about anything at all that is "off the record" (disclosures that cannot even be used by Larissa as "on the record" or "not for attribution"). Please assume that your decisions about what was "on the record", "not for attribution", or "off the record" will not be revisited afterward.

Future use of participant data

It is possible that printed data or results from this study will be incorporated into materials for publication in the academic, trade-related, or popular press, and/or into conference presentations. Sound recordings of conversations with Larissa for the purpose of this project will not be made public for any reason.

Confidentiality

Larissa plans to disclose your identity, role and organizational affiliation in the products of this research, and to attribute your comments to you. However, the questions Larissa would like to ask you will not ask you to share any personal or other information that would fall outside the domain of what you would be comfortable sharing in your professional role.

That said, Larissa will take notes from conversation(s) with you. With your advance permission, she may record conversations with you for note-taking purposes and in that case would generate rough transcriptions of such recordings.

Larissa will retain all notes and any transcripts of recorded interviews in password-protected files on her password-protected personal storage space on SFU's servers until the date of her graduation. Up to one week before her access to SFU server space expires, she will download the password-protected data onto a USB stick that will be stored in a locked cabinet that only she has access to, on her property. Larissa may share these files with her supervising instructor until Dec. 31, 2015. Should it be necessary to email these files to her supervisor, Larissa will email them in an encrypted format.

Attributable quotations and sound clips from recorded or transcribed interviews will not be used for any purpose other those specified in this Informed Consent Form unless Larissa has obtained express written permission stating the purpose and use of the material in advance. All files related to this project will be destroyed by Larissa on Dec. 31, 2015.

Does your organization approve of your participation?

For this project Larissa is assuming all of her adult, professional interviewees understand what they are permitted to talk about with researchers, and have therefore not sought permission for their participation from any relevant organization(s) they are affiliated with. By agreeing to participate in this research, you signify that you are implicitly or explicitly authorized by your organization(s) to speak to Larissa on this topic, and that you are aware of, and consent to assume, any possible risks to you or your organization of doing so.

Sharing of study results

As mentioned above, Larissa will assemble her conclusions in a final project paper that will be complete by the end of April 2014. Larissa would be happy to email you that paper and/or any works derived from it if you indicate by signing below that you would like to receive them.

Who can you contact if you have complaints or concerns about the study?

If you have any further questions about this study, please contact the principal investigator Larissa Ardis at [redacted] (now until Apr. 31, 2014) or [redacted] (now and after Apr. 31, 2014), or [redacted].

Who can you contact if you have complaints or concerns about the study?

If you have any concerns about your rights as a research participant and/or your experiences while participating in this study, you may contact Dr. Dina Shafey, Associate Director, Office of Research Ethics at [redacted] or [redacted].

YOUR INFORMED CONSENT

Your signature below indicates that you have received a copy of this consent form for your own records, read and understood it, and consent to participate in this study.

_____

Participant Signature Date (Month, day, year)

_____

Printed Name of the Participant signing above

Future contact

It is possible that, during future research projects, I may wish to contact you again.
Please indicate here if you are willing to be contacted: __ Yes __ No

If you would like to receive a copy of the completed study, please provide one or more email addresses below:

_____

_____