MEASURING SOCIAL SUSTAINABILITY OF THE PUBLIC REALM: DESIGN OF STREET FRONTAGES AS A PRECONDITION FOR SOCIAL SUSTAINABILITY

by

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Abstract

Recently sustainability has become a common consideration for urban development and design. However, its social dimension has been relatively neglected thus far (Vallanc, Perkins, and Dixon 2011; J. Robinson 2004, 378). This issue is especially significant when it comes to the development of the public realm of a city. Various elements of the public realm, including streets, are places where people meet, interact, and socialize. For this reason, the social aspect of sustainability should be one of the essential criteria when designing and developing public spaces.

The focus of this study is the street as an element of the public realm and the relationship between the design of street frontages and the social sustainability of a street. From the complex spectrum of features of social sustainability, only those that are directly related to the design of street frontages were analyzed. The study was conducted at four locations in Vancouver. The results show that even though a particular area might be perceived as the one with high social qualities, it might still miss some of the critical elements of social sustainability. Additionally, it was concluded that certain features automatically induce many other qualities, promoting the development of social sustainability. The goal of this study was to generate information that could be used as a framework for future urban developments, so that cities can achieve social sustainability of the public realm.
Lay summary

Social sustainability of a neighborhood is based on the set of qualities and processes that are tightly related to the social structure of the corresponding community. For each community with its characteristics and specific structure, these parameters differ to a certain level, reflecting the uniqueness of that community.

This study argues that some design qualities of the public realm create a precondition for social sustainability in a more general way, applicable to different neighborhoods. However, both of these aspects, the universal design and specific local conditions, have to be included in order to have a socially sustainable public realm.

Streets with their horizontal and vertical planes create a network of spaces that either support and enhance or discourage social connections and relations.

This case study project will analyze how can the design of street frontages create a positive precondition for achieving and preserving social sustainability?
Preface

This dissertation is an original intellectual product of the author, S. Atanackovic-Puzovic. The fieldwork reported in Chapters 4 and 5 was covered by UBC Ethics Certificate number H16-01332.

All images and figures presented in this dissertation are original intellectual product of the author, S. Atanackovic-Puzovic.
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1. Introduction

Sustainability is coming to be considered as an essential element in the ongoing urban development of cities around the World, including Vancouver. The Greenest City Action Plan is an urban sustainability initiative, created by the City of Vancouver, which upholds one primary goal: for Vancouver to become the greenest city in the world by the year 2020 (vancouver.ca/green-vancouver). Although this initiative contains many positive goals and aspects, it focuses mainly on the environmental and economic aspects of sustainability. At the same time, the City of Vancouver is developing community plans, which should serve as a framework for the livability and sustainable development of neighbourhoods. However, out of twenty-two neighbourhoods in the city, only six community plans have been completed and are currently in the process of being implemented (vancouver.ca/home-property-development). The question arises: should the City be focusing on the social aspects of sustainability? This thesis intends to establish universal design criteria for street frontages that will foster the social sustainability of streets, and that could be applied throughout the city while supporting the various cultural and social characteristics of each neighbourhood.

Many scholars argue that various public spaces, including streets, as more specific elements of the broader public realm, are essential elements of a liveable city (Cattell et al. 2008; Urban Task Force 1999). However, during the last few decades, different practices in urban planning (Setti 2012; Porta 1999; Alexander, Ishikawa, and Silverstein 1977; Gehl 2011) and rapid economic and political changes in the world (Ellin 2006; Zukin 2010; Harvey 2003), have led to an overall degradation of the public realm in general. In the response to the decreasing quality of public spaces, many scholars (Gehl 2011; J. Jacobs 2011; Cullen1971) have suggested various design strategies that could improve the current condition, help revitalize the public realm, and lead towards socially sustainable public spaces.

Social sustainability is a complex concept that includes many different aspects
related to equity and equality, design, health and wellbeing, culture, and governance. This study focuses only on those elements of social sustainability that are directly linked to the design of street frontages, and therefore, explores the impact that buildings and their architectural design have on the life of the street. Two blocks of a commercial street from four different neighbourhoods were analyzed in this case study. The study consisted of two segments: a comparative analysis of the context, and a comparative analysis of five elements of social sustainability (dynamism, diversity, social interactions, walkability, and safety). The elements of social sustainability were explored as follows: dynamism through gradualism of change, diversity through diversity of use, diversity of users and diversity of design, social interactions through transparency of street frontages and dialog between inside and outside, and through potential points for social interaction, walkability through weather protection and complexity of street frontages, and finally safety through hours of operation.

The intention of the study is to explore the relationship between various design elements of street frontages and accompanying elements of social sustainability, and by doing so to create a framework for design criteria for future urban developments.
2. Literature overview

2.1. Public realm

Many argue that public spaces are fundamental parts of cities, "(t)hey represent sites of sociability and face-to-face interaction, and at the same time their quality is commonly perceived to be a measure of the quality of urban life" (Cattell et al. 2008, 544). A group of authors called "Urban Task Force" (1999, 57) defines public space as "an outdoor room within the neighbourhood, somewhere to relax and enjoy the urban experience, a venue for a range of different activities, from outdoor eating to street entertainment; from sport and play areas to a venue for civic or political functions; and most importantly of all as a place for walking or sitting out."

Even though it has been an essential component of a city's life since ancient times, public space gradually lost its meaning and qualities during the Modern Movement when it was "severed by infrastructure and crossed by cars, it (became) the space between skyscrapers that removes the condition of square as a meeting place" (Setti 2012, 2). Spaces that were primarily intended for people gradually were reorganized to become most convenient for vehicular use. Additionally, mixed-use urban areas were transformed and separated from single use neighbourhoods, whereas the public and collective life of a community was shifted to detached suburban areas.

With their tendency towards simplification and separation, the distortion in Descartes' machine-world interpretations unconsciously triumphed in these models: here you have space for circulation but not for residence, there space for residence but not for socialization, farther on you can socialize but you cannot work, somewhere else you can work but you cannot consume. There is space for the car and for the bicycle, space for walking and for playing, but only up to a certain age, because after that there are other spaces, specifically "equipped" in another neighbourhood, in another satellite city. (Porta 1999, 444)

This kind of separation between residential and employment areas "creates
intolerable rifts in people's inner lives" (Alexander, Ishikawa, and Silverstein 1977, 52).

Similarly, Gehl argues that:

(i)nTEGRATION implies that various activities and categories of people are permitted to function together or side by side. Segregation implies a separation of functions and groups that differ from one another. Integration of various activities and functions in and around public spaces allows the people involved to function together and to stimulate and inspire one another. (Gehl 2011, 101)

Furthermore, rapid change and globalization have produced new obstacles for public space to thrive. Nan Ellin claims that fear emerged as one of the consequences of those changes and that:

(t)he rising tide of fear has led people to stay at home more. Activities that once occurred in the public realm are increasingly satisfied now in the private one via television or computer. Venturing out is increasingly restricted to the controlled setting of the shopping mall, theme park, or sports arena. Going out without a plan but merely to partake in the unpredictable and spontaneous public pageant, a characterizing feature of urban life, has grown increasingly rare. Rather, we tend to go out for specific purposes, with specific destinations in mind, and with knowledge of where we will park and whom we shall meet. (Ellin 2006, 102)

In addition, other scholars argue that public spaces have been "reconstructed, remodeled, aestheticized, privatized, and commercialized" in order to support "consumption rather than other forms of public life" (Voronkova and Pachenkov 2011, 199).

The increasing demand for safety and the need to satisfy the rising trend of consumption have led to the privatization of public spaces. Public spaces became privatized in various ways; one of them is, as Sharon Zukin (2010, 27) suggests, by hiring private organizations to carry out public functions of financing, maintaining, and governing public space. On the one hand, having public spaces under private supervision could seem to be a good solution since these organizations are providing clean, safe, and maintained public spaces, "discretely manicured spaces" as Zukin calls them (2010, 27). On the other hand, these control strategies very often involve exclusions of certain "undesirable" social
groups (usually homeless people, pushcart vendors, street artists, and the young) (Zukin 2010, 128). This issue is also present in writings about the right to the city. As David Harvey argues, the right to the city is "(...) a collective rather than an individual right since changing the city inevitably depends upon the exercise of a collective power over the processes of urbanization" (2003, 1). This process of changing the city is in direct correlation with the question of "what kind of people we want to be, what kinds of social relations we seek, what relations to nature we cherish, what style of daily life we desire, what kinds of technologies we deem appropriate, what aesthetic values we hold. The right to the city is, therefore, (...) a right to change ourselves by changing the city more after our heart's desire" (Harvey 2003, 1). Peter Marcuse also sees the right to the city as collective rather than individual, describing it as a "unitary right", a right to social justice, which "includes but far exceeds the right to individual justice" (Brenner, Marcuse, and Mayer 2012, 34). However, he emphasizes that this right does not mean "all rights for all people", since, if understood in that sense, it could include "the right to dispossess others, to exploit, to dominate, to suppress, to manipulate the conduct of others" (Brenner, Marcuse, and Mayer 2012, 35). It is "a single right that makes claim to a city in which all of the separate and individual rights so often cited in characters and agendas and platforms are implemented" (Brenner, Marcuse, and Mayer 2012, 36). Similarly, Zukin (2010, 128) argues that privatized public spaces tend to reinforce social inequality since the "(e)xclusion of some social groups from public space weakens the diversity of experiences and contacts that define urban life".

Christian Schmidt explains that "(...) the specific quality of urban space arises from the simultaneous presence of very different worlds and value-systems, of ethnic, cultural, and social groups, activities, and knowledge. Urban space creates the possibility of bringing together these different elements and making them productive" (Brenner, Marcuse, and Mayer 2012, 48). In his book, Jan Gehl states that life between buildings is:

potentially a self-reinforcing process. When someone begins to do something, there is a clear tendency for others to join in, either to participate themselves or just to experience what the others are doing. In this manner, individuals and events can influence and stimulate one another...In public domain...
are many people, or if something is going on, more people and more events tend to join in, and the activities grow both in scope and duration" (Gehl 2011, 73)

On the other hand, Gehl (2011, 75) argues that many new housing developments and newly renovated old city districts "seem so lifeless and empty", because people and events are so distant from each other that it becomes almost impossible to develop "larger, more meaningful and inspiring sequences of events" (Gehl 2011, 75). Hence, life on the street (and between buildings) deteriorates significantly and since the street gets the character "of a deserted no-man's-land, where nobody wants to be" (Gehl 2011, 76), the safety of the street emerges as a new problem to be solved.

According to Jane Jacobs, the solution to the issue of the safety of streets, and public spaces in general, lies in designing public spaces in a way that would support the "sidewalk ballet". This "ballet" of constant users, both strangers and locals, helps in maintaining the safety of the streets (and public spaces in general) by providing continuous surveillance. In Jacobs' opinion, "eyes upon the streets" and fairly continuous use of the streets are among the main qualities of a safe street. This busyness that is essential for successful neighbourhoods and their public spaces, according to Jacobs, could be supported by preserving the authenticity of a neighbourhood, including its old buildings, locally owned shops and businesses (J. Jacobs 2011, 66). However, Zukin (2010, 26) warns that it is important to be careful when defining the authenticity of the city. Authenticity is a socially constructed concept that, in order to be rightful and socially sustainable, needs to represent "poor, ethnic, and democratic", apart from "historic, local and cool". "Authenticity speaks for the right of the city, and a neighbourhood, to offer residents, workers, store owners, and street vendors the opportunity to put down roots - to represent, paradoxically, both origins and new beginnings" (Zukin 2010, 26)

If we are to return public spaces to people and local communities, there are certain elements that need to be considered, as they could significantly improve the quality of public spaces and enhance social interactions.
One of the ways to raise the quality of open public spaces is to provide a range of public-private spaces of a different scale. This would provide possibilities for different activities and different levels of participation in the public life of a neighbourhood.

At one end of the scale is the private residence with private outdoor space such as a garden or a balcony. The public spaces in the residential group are, it is true, publicly accessible, but have - because of close connection to a limited number of residencies - a semipublic character. The communal spaces in the neighbourhood are somewhat more public, while the city’s town hall square is a totally public space (Gehl 2011, 58).

Additionally, Jan Gehl argues that people and human activities attract most attention by saying that "(e)ven the modest form of contact of merely seeing and hearing or being near to others is apparently more rewarding and more in demand than the majority of other attractions offered in the public spaces of cities and residential areas" (Gehl 2011, 29).

Cattell et al. (2008, 551) name a few basic properties related to places perceived as beneficial to well-being. Firstly, they argue that it is important that people feel comfortable and at ease in these spaces. Secondly, the area needs to be perceived as a pleasant place to be, even though ideas about what constitutes a 'pleasant place' can differ greatly. Lastly, it is important that these areas have the special or unique elements of everyday spaces that are not always readily perceptible to an outsider and might not necessarily be determined by aesthetic criteria. In addition, they have concluded that public spaces can foster inter-ethnic understanding and connections since they provide the opportunity for people to meet casually, "which might not happen in a more organised setting" (Cattell et al. 2008, 554).

Going into more detail, Jan Gehl (2011, 151) argues that street furniture can raise the quality of open public spaces. Especially in cities with a warmer climate "(c)olonnades, awnings, and sunshades along the facades in city spaces provide comparably attractive possibilities for people to linger and to observe while remaining unobserved" (Gehl 2011, 151). Similarly, Gordon Cullen (1971, 23) suggests that, in order to create spaces where
people would stay and spend time in, it is important to provide "(s)hade, shelter, amenity and convenience". "The emphasizing of such places by some permanent indication serves to create an image of the various kinds of occupation in the town, so that instead of a completely streamlined and fluid out-of –doors, a more static and occupied environment is created" (Cullen1971, 23).

Urban furniture plays an important role in encouraging people to spend time in a public space, whether standing or sitting: "Only when opportunities for sitting exist can there be stays of any duration. If these opportunities are few or bad, people just walk by. This means not only that stays in public are brief, but also that many attractive and worthwhile outdoor activities are precluded" (Gehl 2011, 155). "Places for sitting along facades and spatial boundaries are preferred to sitting areas in the middle of a space, and as in standing, people tend to seek support from the details of the physical environment" (Gehl 2011, 157). Similarly, people choose places to stand "in recesses, on corners, in gateways, or near columns, trees, street lamps, or comparable physical supports, which define resting places on the small scale" (Gehl 2011, 151). Apart from urban furniture, orientation and view are also important elements of a high quality open public space. "When people choose to sit in a public environment, it is almost always to enjoy the advantages the place offers - the particular place, space, weather, view of whatever is going on, and preferably all at once" (Gehl 2011, 159).

Combining various physical and social elements seems to be necessary for creating high quality open public spaces. Unfortunately, many plans for contemporary public spaces, although designed as sustainable "seem to follow design recipes - generic strategies that present, largely, a blatant spatial and figurative standardization. Moreover, these guidelines entail a simplification or outright dismissal of urbanistic and architectural morphologies and criteria, which were historically held as fundamental to the conception of public space" (Coelho 2014, 43). Furthermore, Christopher Alexander (1977, 166) argues that in order to create successful public spaces it is important to "identify those existing spots in the community where action seems to concentrate itself", and then to adjust the network of
paths within the community so that as many as possible go through those spots. In this way, each of the identified spots becomes "a 'node' in the path network". These "nodes" are places within the community where "a combination of community facilities and shops which are mutually supportive" should be organized around a small public square (Alexander, Ishikawa, and Silverstein 1977, 166). There are two important ideas incorporated in this concept. Firstly, this concept implies that a certain level of urban design is left for the community to reshape the neighbourhood according to its needs and aspirations. This kind of a neighbourhood would provide a higher level of social integration, by offering spaces adaptable to different users (variety of groups of different age, income, cultural background etc.). Instead of trying to control every single element of a neighbourhood, it is more desirable to provide a certain level of flexibility and incompletion, which is also an important component of the procedural dimension of sustainability. Secondly, as Christopher Alexander (1977, 164) also argues, a combination of multiple community facilities creates an active and busy environment, whereas "community facilities scattered individually through the city do nothing for the life of the city". It could be argued that if we want to live in sustainable cities, it is crucial to have socially sustainable public spaces. Closed public spaces (such as museums, libraries, community centers) have certain limitations of use, such as working hours, use of food and beverages, pets etc. On the other hand, open public spaces should represent true public spaces, exempt from limitations and restrictions of use of any kind. Therefore, open public spaces represent the essence of social sustainability in cities. However, in order to create a sustainable neighbourhood, it is important to combine quality open public spaces with a variety of closed public spaces, which can support certain activities of a community.

Stanley et al. (2012, 1093) argue that there are seven major types of open public spaces: food production areas, parks and gardens, recreational space, plazas, streets, transport facilities and incidental space. A number of researchers have concluded that for the healthy social life of a community, the network of pedestrian streets, squares and markets is required, besides parks and recreational public spaces. For instance, Cattell et
al. (2008, 551), in their study about people's everyday relationships with mundane public spaces in the East London borough of Newham, UK, have revealed that even though the benefits of parks are directly related to the well-being of participants of the study, many people named streets and markets as places "which made them feel good", emphasizing "the shared and social elements of public space".

For the purpose of this study, a street as a component of a neighbourhood's network of open public spaces will be analyzed, since open public spaces are considered not to have an explicit or a well-defined way in which they are used. Moreover, very often today they lack many, if not all, aspects of social sustainability. Enclosed public spaces, however, will be the integral part of this analysis, in order to provide a more accurate understanding of the way in which community activities and gatherings happen.
2.2 Discussion about sustainability and its social dimension

A well known definition of sustainability, and probably the only one that is widely recognized, is the one from the Report of the World Commission on Environment and Development, commonly known as the Brundtland Report. This Report states: "[s]ustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (UN World Commission 1987, 41).

Many discussions have arisen regarding the wording of this definition, and one of them is focused on the expression "sustainable development". There are some concerns that, in order to steer the discussion in the right direction, the term sustainability should be used rather than sustainable development. According to Robinson, government and the private sector are more prone to use the term sustainable development, whereas academic sector and NGO's more often use the term sustainability "in similar contexts" (J. Robinson 2004, 370). The problem that arises from using the term sustainable development is that "the development is seen as synonymous with growth, and therefore that sustainable development means ameliorating, but not challenging, continued economic growth. In his view, the preferred term ‘sustainability’ focuses attention where it should be placed, on the ability of humans to continue to live within environmental constraints" (J. Robinson 2004, 370). In terms of the social dimension of sustainability, the problem behind the term sustainable development is that it presumes, as mentioned, preservation of current economic growth, which tends to protect and preserve the existing division of power and privileges and just softens social inequalities without significant change. For this reason, the term sustainability will be used throughout this thesis as a term that does not primarily rely on the process of further development, but assumes the openness to change as a main parameter of the analysis.

There are three topics related to the concept of sustainability that are very important for deeper and successful understanding of its social dimension. Firstly, sustainability
is often said to be a contested and socially constructed concept, significantly shaped by the social and cultural values of a community. Similarly to other contested concepts (democracy, liberty, social justice, truth, happiness) sustainability has "two levels of meaning" (M. Jacobs 1999, 26). The first level is "unitary but vague", and on this level these concepts are defined by "a number of core ideas" (M. Jacobs 1999, 26). For sustainability, Michael Jacobs (1999, 26) argues that the meaning of its first level is given, and core ideas are "fixed and cannot now be changed through rational argument." For contested concepts, including sustainability, the second level is the one that requires further debate: this level represents a "political argument over how the concept should be interpreted in practice" (M. Jacobs 1999, 26). According to Jacobs (M. Jacobs 1999, 26), this is the level where "the meaning" of sustainability is discussed. However, the author argues that "there is no point in trying to secure universal agreement on a unitary meaning for the term" (M. Jacobs 1999, 26). In addition, after analyzing sustainability and especially its social dimension at the neighbourhood level, I would argue that the neighbourhood level is where local features add to and complement what is a general, global understanding of sustainability. Consequently, this leads to a conclusion that sustainability needs to be altered and reframed according to the needs of each community.

Secondly, there is a strong belief that sustainability as a concept could never be completely achieved and that it loses its significance if set as a desired end-state. On the contrary, sustainability needs to be regarded as a constantly changing and evolving process. This attribute of sustainability is defined as its procedural dimension. Robinson (2004, 381) argues that sustainability must be "constructed through an essentially social process whereby scientific and other 'expert' information is combined with the values, preferences and beliefs of affected communities, to give rise to an emergent, 'co-produced' understanding of possibilities and preferred outcomes". The procedural dimension of sustainability also acknowledges "the need for integration of different perspectives" (J. Robinson 2004, 381). According to Robinson and Cole (2015, 9), "more consistent and effective ways of incorporating processes of stakeholder engagement" are necessary,
which at a neighbourhood level means engaging citizens and private, public and non-governmental organization (NGO) sector into the discussion about the desired future of neighbourhoods, through participatory planning processes. As they further argue, there are two key goals of these processes: "To create buildings and neighbourhoods that might be said to exhibit forms of interactive adaptability; (and) [t]o enhance human and environmental well-being through processes of reflection, feedback and dialogue" (Robinson and Cole 2015, 9).

Especially in today's globalized world, where cities have become a colourful mixture of different social and cultural groups, it seems even more important to approach sustainability in an appropriate way. Backcasting, the term used by Robinson “to describe an approach to future studies which involved the development of normative scenarios aimed at exploring the feasibility and implications of achieving certain desired end-points” (J. Robinson 2003, 841), uses a series of scenario analysis that include many different stakeholders and the general public in the process of analyzing alternative futures. In backcasting studies there are two approaches to research. One of those includes the involvement of "various stakeholder groups or the public at large directly in the process of defining and evaluating the desirability of the scenarios that are developed" (J. Robinson 2003, 844). The ideas behind backcasting provide a fruitful foundation for the analysis intended for this thesis. In order to explore the existence of social sustainability within different neighbourhoods in Vancouver, I would argue that the involvement of local community members as well as local authorities and businesses, will be necessary for achieving a comprehensive picture and better understanding of the local situation. Similarly, Ehrenfeld (2012, 10) emphasizes two very important facts: firstly, that the knowledge of local stakeholders should be part of the inquiry process, and, secondly, "in addition to continuous inquiry to promote understanding, continuous adaptation is always needed to maintain resilience and approach to the flourishing (and another normative target) attractors".
Lastly, the discussion around sustainability is very often focused on the wrong agenda, such as a net-zero approach that puts a narrow focus only on the environmental side of the problem. The most commonly accepted understanding of sustainability is focused on emphasizing the ways to achieve a "less bad" situation reflected in many policies and practices of the "net-zero" goal. This notion is often defined as unsustainability. As Ehrenfeld (2008, 7) argues: "[a]lmost everything being done in the name of sustainable development addresses and attempts to reduce unsustainability. But reducing unsustainability, although critical, does not and will not create sustainability". Hence, Ehrenfeld (2008, 6) introduces the term 'flourishing', defining sustainability as "the possibility that human and other life will flourish on the planet forever". Ehrenfeld (2008, 33) puts the current mechanistic world at the core of the problem, in which we seek the solution to all problems in technology, believing that "greening" our way of living will have a positive outcome. However, he argues, "[a]ll such actions are quick fixes" (2008, 33). On the other hand, "the flourishing metaphor captures a wide range of culturally and historically well recognized social goods. This single distinction incorporates a wide range of arguably good individual and collective conditions" (Ehrenfeld 2012, 3). Another important attribute of the net-positive approach is the question of value. Besides the intention to consume less and generate more, it is becoming important to identify the purpose and design how to deploy excess resources (Cole 2015, 1). This is also reflected in the ideas behind the regenerative sustainability approach, which can be "expressed in the form of a question: To what degree can human activities lead to improvement of both ecological integrity and human quality of life as emergent properties" (Waldron, Cayuela, and Miller 2013, 2).
2.3 Social sustainability

Social sustainability is a wide-ranging multi-dimensional concept, with the underlying question 'what are the social goals of sustainable development?', which is open to a multitude of answers, with no consensus on how these goals are defined (Dempsey et al. 2011, 290).

Although even the Brundtland report from early 1987 calls for both environmental and social issues to be addressed simultaneously (UN World Commission 1987), the majority of attention has been given to environmental and economic issues so far. There have been many attempts to define social sustainability within the complex framework of sustainability together with environmental and economic aspects. However, some authors believe that it is necessary to define social sustainability as "distinct from environmental or economic sustainability, in order for it to develop its own models of best practice" (McKenzie 2004, 11). In that way, the parameters for measuring "the effect of equitable social policies and institutions on environmental outcomes" can be established after the definition process is completed, and consequently "this will result in a truly interdisciplinary model of sustainability" (McKenzie 2004, 11). Since social sustainability has been mostly set aside within the current Design Guidelines in the city of Vancouver, for the purpose of this study I will observe social sustainability as a distinct characteristic of open public spaces.

Apart from this issue, which is probably the most significant, there are some other problems related to social sustainability that need to be addressed as well. Dempsey et al. (2011, 290) argue that a limited number of writings are focused on social sustainability, and instead most of the literature is focused on concepts such as social capital, social cohesion, social inclusion and social exclusion. Similarly, McKenzie (2004, 13) states that social sustainability is sometimes seen only through the lens of the social capital of a society, that is seen as "an asset, occurring naturally and to varying degrees within societies,
which allows them to maintain coherence and overcome change and hardship". Moreover, the recent European policy is mostly focused on "sustainable communities" and social cohesion. One example is the "Bristol Accord", signed by EU member states.

Sustainable communities are here defined as 'places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all (Dempsey et al. 2011, 290).

Some other scholars specify two concepts that have a strong relation to social sustainability: social equity and sustainability of a community. Bramley et al. (2009, 2126) believe that social equity implies access to local services and opportunities, such as: essential local services such as shops, schools, health centers, recreational opportunities, public transport, job opportunities, and affordable housing. On the other hand, Dempsey et al. (2011, 294) argue that the "sustainability of community relates to the collective aspects of social life". For the analysis of social life at the neighbourhood level they propose certain "inter-related measurable aspects of community sustainability, such as: social interaction / social networks in the community, participation in collective groups and networks in the community, community stability, pride / sense of place, and safety and security" (Dempsey et al. 2011, 294).
2.4 Problems with defining and measuring social sustainability

Some authors argue that "[m]any current discussions of social sustainability are structured around a definition of the condition, a measurement framework and/or a series of case studies" (McKenzie 2004, 13). Furthermore, "[t]he measurement framework for the defined condition is often a series of indicators by which the strength of the stated condition can be measured" (McKenzie 2004, 14). Analyzing the study done by the Academy of Social Sciences in Australia, McKenzie (2004, 14) explains that for this particular study of six rural centres, "the social capital" of a community was composed of five subsets designed to create a framework for measuring, categorizing and assessing communities. The problem with this approach that includes "both definition of sustainability as a condition, and indicators to measure it", according to McKenzie, is that it becomes impossible "to define a condition without reference to some of its features... This can create a sense of indeterminacy in precisely what is being measured" (McKenzie 2004, 15). In this way, study results are based on a "pre-established series of indicators" and, furthermore, some important questions may remain unanswered (McKenzie 2004, 14).

Shen et al. (2011) have analyzed nine sustainable development plans at city level, from nine different countries in the World: Melbourne, Hong Kong, Iskandar, Barcelona, Mexico City, Taipei, Singapore, Chandigarh and Pune, and to compare these nine plans they have used the "International Urban Sustainability Indicators List" (IUSIL). On one hand, I agree with their argument that supports the use of urban sustainability indicators saying that urban sustainability indicators "have the role of measuring performance, and in the process of urban sustainability assessment there is a need of measurable indicators" (Shen et al. 2011, 9). However, the question is to what extent one unique list is adequate for cities so different in size, with such distinct historical, cultural and geographical backgrounds. Even with the use of many technological inventions, and the constant globalization of the world, it is not always possible, or even desirable, to apply the same criteria for such measurement.
Even the authors of the study agree on this by concluding that "(t)he differences between practices also reveal the difficulties in applying a set of common urbanization indicators" (Shen et al. 2011, 24).

According to McKenzie (2004, 18), one of the models of social sustainability that attempts to "cover all potential factors as well as the interrelationships between them" is The Model of Social Sustainability created by the Western Australian Council of Social Services (Barron and Gauntlett). In this model, social sustainability is defined as: The impact of formal and informal systems, structures, processes and relationships on the current and future liveability and health of communities. According to this model, there are five principles of social sustainability:

- Equity — the community provides equitable opportunities and outcomes for all its members, particularly the poorest and most vulnerable members. While equity is listed as a separate principle, it is such a fundamental component that it is really an artificial separation. Equity in fact operates like a filter through which all other principles are viewed. For example, while quality of life includes people’s sense of connection with nature, this needs to be understood in terms of the extent to which all people have access to a positive environment.

- Diversity — the community promotes and encourages diversity.

- Quality of life — the community ensures that basic needs are met and fosters a good quality of life for all members at the individual, group and community level.

- Interconnectedness — the community provides processes, systems and structures that promote connectedness within and outside the community at the formal, informal and institutional level.

- Democracy and governance — the community provides democratic processes and open and accountable governance structures (Barron and Gauntlett).

Each of the principles incorporates a number of different elements. Equity includes equal opportunity, Indigenous rights, human rights and overcoming disadvantage. Diversity is achieved through inclusiveness and valuing difference. Quality of life includes subjective
well being (including things like people’s sense of belonging, their sense of self worth); objective living conditions (such as levels of education, health, housing); and opportunities for personal and social development. Interconnectedness covers the quantity of social processes (participation and links with organisations and systems); the quality of social processes (the extent to which interactions are based on trust, shared norms); structures governing social processes (leadership and mechanisms for resolving conflict); and community infrastructure (including public and civic institutions, planning and physical infrastructure and community services amongst other things). Democracy and governance covers people’s ability to access information, knowledge and expertise and their ability to participate in decisions that affect their lives as well as the effectiveness, integrity and accountability of processes and structures. It also incorporates justice and legal rights components (Barron and Gauntlett).

The problem with this definition and framework lies in its complexity and versatility (McKenzie 2004, 20). In an attempt to overcome the problems that arise around defining and measuring social sustainability, McKenzie (2004, 16) suggests a couple of solutions. Firstly he argues that the social sustainability definition and the set of indicators need to be developed at a local level since "(d)efinitions broad enough to encompass all factors in all situations tend to be too broad for use in specific situations" (McKenzie 2004, 16). Moreover, by referring to the UNSECO’s MOST (Management of Social Transformations) project, McKenzie (2004, 17) argues that "(s)ocieties cannot be studied, sustained or altered through policy or institutional change without reference to the space (local region) they occupy, an observation that brings into play such things as the allocation of recreational and civic space, street design, the location of services in relation to population, and so on". Secondly, definition and indicator set need to be developed with the consultation of community members, and in this way they will "vary according to the needs and interests of the community" (McKenzie 2004, 17). Lastly, the definition and the set of indicators need to be useful in an interdisciplinary context (McKenzie 2004, 20). Based on numerous arguments that (social) sustainability is a contested concept inherently integrated
in societies, in order to create a better understanding of social sustainability McKenzie (2004, 12) argues that "a range of approaches should be adopted". Firstly, he argues that it could be useful to develop a "series of research questions around which discussion of social sustainability can be conducted" (McKenzie 2004, 21). Secondly, McKenzie (2014, 22) states social sustainability needs to be viewed as a process, as well as a condition. Furthermore, Dempsey et al. (2011, 292) point out that "[s]ocial sustainability has to be argued as a dynamic concept, which will change over time (from year to year / decade to decade) in a place".

According to McKenzie (2004, 22), there are two levels of understanding social sustainability as a process. On one level, it involves just rephrasing the indicator into "a series of mechanisms for a community to collectively identify its strengths and needs" (McKenzie 2004, 22). Another level indicates placing emphasis on the process "by which such a state may be obtained" (McKenzie 2004, 22) leading to the following questions that might be considered even before any data is collected:

- What are the main mechanisms by which the community collectively identifies its own needs?
- How have these mechanisms developed?
- Is the community satisfied with these mechanisms, and what are some ways in which they think these might be improved?
- Does this community's means to identify its needs provide a suitable model for consideration by other communities?" (McKenzie 2004, 22).

Despite all the issues mentioned, defining social sustainability is still important in order to "explain precisely what is being discussed, to provide a framework for measuring the results within a particular collaborative research project, and to describe a current series of interests and capabilities" (McKenzie 2004, 20). McKenzie (2004, 12) defines social sustainability as: A life-enhancing condition within communities, and a process within communities that can achieve that condition. According to him, indicators of the life-enhancing condition are as follows: equity of access to key services (including health,
education, transport, housing and recreation); equity between generations, meaning that future generations will not be disadvantaged by the activities of the current generation; a system of cultural relations in which the positive aspects of disparate cultures are valued and protected, and in which cultural integration is supported and promoted when it is desired by individuals and groups; the widespread political participation of citizens not only in electoral procedures but also in other areas of political activity, particularly at a local level; a system for transmitting awareness of social sustainability from one generation to the next (through generations); a sense of community responsibility for maintaining that system of transmission; mechanisms for a community to collectively identify its strengths and needs; mechanisms for a community to fulfill its own needs where possible through community action; mechanisms for political advocacy to meet needs that cannot be met by community action (McKenzie 2004, 12). Additionally, steps towards the establishment and implementation of these indicators are considered as aspects of the procedural dimension of social sustainability. Focusing on urban environment and analyzing existing literature, Dempsey et al. (2011, 291) have identified "contributing factors" for "urban social sustainability" divided into two groups: Non-physical and Predominantly physical factors: Non-physical factors:

- Education and training
- Social justice: inter- and intra-generational
- Participation and local democracy
- Health, quality of life and well-being
- Social inclusion (and eradication of social exclusion)
- Social capital
- Community
- Safety
- Mixed tenure
- Fair distribution of income
- Social order
Social cohesion

Community cohesion (i.e. cohesion between and among different groups)

Social networks

Social interaction

Sense of community and belonging

Employment

Residential stability (vs turnover)

Active community organizations

Cultural traditions

Predominantly physical factors

Urbanity

Attractive public realm

Decent housing

Local environmental quality and amenity

Accessibility (e.g. to local services and facilities/employment/green space)

Sustainable urban design

Neighbourhood

Walkable neighbourhood: pedestrian friendly (Dempsey et al. 2011, 291).
2.5 Adopted definition and parameters

Relying on the previously mentioned definitions and frameworks, for the purpose of this study, the following definition has been adopted: Social sustainability represents a set of constant and variable qualities and processes that characterize a certain (urban) area in order to provide quality, equitable, inclusive and diverse living for all members of the related community.

Figure 1. - Social Sustainability
In this study, the following elements are considered as crucial for social sustainability: equity, diversity, urban design, democracy and governance, and community stability. Each of these elements comprises a number of sub-elements.

1. **EQUITY** with reference to access to key services and opportunities such as:
   1.1 Transportation including different types of public transit, the frequency of public transit stops, the quality of connections to important parts of a city, the proximity of public transit stops to residential/working/leisure areas
   1.2 Housing. A variety of housing helps to improve the residential stability of a community
   1.3 Health. The availability of different types of medical services to a community
   1.4 Education including elementary and secondary schools, child care for younger children, after school care, a variety of classes for children and adults
   1.5 Recreation including open and closed areas such as: parks, playgrounds, sport facilities, a network of bicycle paths, and pedestrian only areas
   1.6 Employment proximity to a variety of jobs, work incorporated in residential areas

2. **DIVERSITY**

   Diversity is reflected in flexibility and adaptability of a neighbourhood to support needs of different social groups

3. **DEMOCRACY AND GOVERNANCE**

   This refers to active participation of local community in all decisions that influence different aspects and levels of life of that community.

4. **COMMUNITY STABILITY** includes:
   4.1 Community cohesion (between and among different groups)
   4.2 Social networks and interaction in community (participation in collective groups and networks in a community)
   4.3 Sense of community and belonging
4.4. Cultural Traditions

4.5. Safety and security

5. PHYSICAL FACTORS - URBAN DESIGN THAT SUPPORTS SOCIAL CONNECTIONS AND RELATIONS

5.1. Cultural Facilities and Community Facilities (local theatre, open air stage, galleries, cinema etc.)

5.2. Shops and services (corner shop, grocery shop, local boutiques, bakery, bank, post office, key makers etc.)

5.3. Restaurants and Cafes with outdoor sitting space

5.4. Farmers Market and Community Gardens

5.5. Urban furniture for:
   - sitting
   - standing
   - announcements of local communities and other important notices
   - statues
   - street clock

5.6. Public Art

5.7. Landscaping (water feature, greenery, pavement treatment)

5.8. Pedestrian only areas

5.9. Facade design - borders, frontiers, entrances, ground floor facade treatment; semi private spaces)
However, as it was previously argued, social sustainability is not a fixed term, and it cannot simply be expressed only through a few numbers or percentages. Social sustainability is a dynamic concept, which means that specific characteristics based on social, cultural, regional, economic, and other contextual parameters have to be considered in conjunction with the listed elements. Moreover, these special characteristics of the context could potentially alter existing or add new elements of social sustainability.
3. Research areas and research methodology

3.1 Research areas – context

Contextually, this case study analyzes a commercial street in a North American city of over 600,000 residents (Wikipedia.org), that is part of a larger metropolitan area of almost 2.5 million residents (Wikipedia.org) in the twenty-first century.

The commercial street that is analyzed is very typical of North American cities. It is a vehicle-oriented street with no pedestrian only area. The use of personal passenger vehicles as the main means of transportation is still significant, with a car, truck or a van being the main mode of commuting for forty-nine percent of respondents in the 2016 Census Profile (Statistics Canada). However, the transition to other ways of commuting, such as the use of public transit or cycling, is increasing as per most recent data from Statistics Canada compared to those collected in 2011. The most recent data showed that in 2016 29% of respondents use public transit and 6% ride a bicycle as the main mode of transportation, while in 2011 only 19.7% of respondents listed public transit and only 1.8% of respondents listed bicycles as the main mean of commuting (Statistics Canada). Additionally, this type of commercial street found in North American cities generally does not include and is not connected to a larger open public space such as a plaza or square, intended for staying. That is why the main activity on these streets is generally walking, that is moving, not staying. Moreover, except for the walls of the buildings, typically there is no space intended for public art nor for community gatherings in the open. Such activities are typically located inside the nearby community centers and similar enclosed spaces. Because of that, walls very often become the main place for public art and community expressiveness.

The majority of the literature that was reviewed for this research was published during the period between 1990 and 2010, and is mostly focused on the urban design and development of the North American cites.
Four locations within the city of Vancouver were chosen for this study as research areas – Dunbar Street, West Broadway, Main Street, and Commercial Drive. All locations represent a commercial section of a street, with various commercial units forming street frontages. The analysis includes two blocks on each side of a street at each location with a similar overall length: 700 ft of Dunbar Street, 1400 ft of West Broadway, 980 ft of Main Street, and 660 ft of Commercial Drive.

Figure 3. - Case Study Locations
3.2 Research methodology

As defined by Mark Francis:

A case study is a well-documented and systematic examination of the process, decision-making and outcomes of a project, which is undertaken for the purpose of informing future practice, policy, theory, and/or education. (Francis 2001, 16)

A case study was selected as the most appropriate method of analysis because social sustainability is still a vaguely defined concept and highly related to specific cultural and social qualities. Case studies “are useful in participatory planning, for culturally sensitive design, and for studies trying to refine or test emerging concepts and ideas.” (Francis 2001, 17)

This case study analysis consists of two segments: comparison of the context, and a comparison of the selection of independent variables of social sustainability directly related to the design of street frontages.

To contextually compare four selected locations, the following features were analysed: housing type, number and type of community/public buildings, green areas, public art and community expressiveness, the quality of pedestrian crosswalks and the connectedness of two sides of a street, and public transit.

Social sustainability was explored through the following set of independent variables: dynamism, diversity, social interactions, walkability and safety. Given that these are still fairly broad characteristics of social sustainability, they were analysed through a more specific applied analysis closely related to the design of street frontages, in the following way:

- dynamism through gradualism of change;
- diversity through diversity of design, diversity of use, and diversity of users;
- social interactions through the transparency of street frontages and dialogue between inside and outside, and through potential points of social interaction;
- walkability through weather protection and complexity of street frontages;
- safety through hours of operation.

The data for all variables, except for the gradualism of change and diversity of users, was collected by personal observation of the selected areas which included photographing, measuring, counting.

For gradualism of change, publicly available data was collected through the internet. A survey questionnaire was used to obtain data for the diversity of users.

In order to examine the context, one additional block on each side was included in the analysis. Housing type analysis was used to determine the ratio between single unit detached houses, mixed use buildings, and multi unit residential buildings.

The quality of pedestrian crosswalks and the connectedness between two sides of a street were defined by analysing the number and quality of crosswalks and traffic lights, as well as whether the traffic lights are controlled by pedestrians.

The variety of details and textures along the frontages were criteria used to determine the complexity of street frontages. Additionally, the width of the frontages was analysed, because frontages of separate units contribute to the overall complexity of the street.

The quantity of public transit was determined by the number of bus lines operating either down the street or passing right next to the analysed area. Attention was also placed on whether the lines are operating during the day or during the night.

To analyse the gradualism of change, the percentage of old buildings (the 1900s-1940s), medium age buildings (the 1950s-1990s) and new buildings (the 2000s-2010s) was compared.

The diversity of use is a measure of the number of user groups present at the analysed locations. The diversity of design was based on the overall number of buildings at the examined location. In order to collect the data needed to examine the diversity of users, a survey was submitted to commercial units found at the examined locations.
The transparency of street frontages was defined by the type of building walls adjacent to the street, as well as through mapping areas where the private realm of commercial units extends onto the public realm of the street.

The number of potential points of social interaction was determined by the number of doors located on the building frontages, and the number of pedestrian passageways located between buildings facing the street.

To determine the quality of weather protection the following elements were analysed: continuity of canopies or awnings, obstacles found at the street below canopies, the material of the canopies, the existence and continuity of trees.

The complexity of street frontages was explored through the analysis of texture and details found on the street frontages, as well as through the comparison of the length of the units.

Lastly, the hours of operation were analyzed for all commercial units and residential entrances. The data was obtained on Wednesday for all units. Residential units were treated as always open since there is a potential of someone coming or leaving at any time of the day.
4. Socially sustainable public realm – case study

4.1 Study overview

One among many debates around sustainability is focused on the question of whether the fundamental change to predominant attitudes and expectations about sustainable environments should be implemented on an individual or a collective level (J. Robinson 2004; Ehrenfeld 2008). Environmental and economic components of sustainability include many individual choices, such as recycling, composting, electrical cars, renewable energy, locally grown and sold food etc. On the other hand, social sustainability, is often related to social equity, access to key services and resources, social capital, community participation, the inclusion/exclusion and opportunity for achieving human rights in general. This leads me to the conclusion that social sustainability highly reflects the life of a community, and is influenced more by collective rather than by individual choices and decisions.

Furthermore, the public realm represents an irreplaceable environment for many collective activities that stimulate diversity, social interactions, and a sense of belonging to a community. Festivals and many other events (like exhibitions, concerts, fairs), as well as spontaneous meetings and gatherings that take place within the public realm contribute to a better quality of our leisure time, and it could be said that public spaces encourage the skills and talents of local dwellers, represent local communities and could be used for sharing ideas, information and knowledge with a wider range of people. This collective attribute of the public realm, openness and universal accessibility, in return promotes the feeling of collective responsibility, which is also an essential element of sustainability. In order to link architectural and urban design with social sustainability, the study question of this thesis was formulated as follows: How can the design of the public realm create a precondition for social sustainability; and more specifically: How can the design of street frontages promote social sustainability of a street?
As discussed in previous chapters social sustainability of a neighbourhood is based on the set of qualities and processes, which are tightly related to the social structure of the corresponding community. These qualities and processes were organized in five groups of parameters: equity, diversity, governance and democracy, community stability, and quality of living. These parameters will differ for each community, reflecting the uniqueness of that community. Specific characteristics and needs of a local community, and a genius loci of a neighbourhood provide the additional criteria for defining the neighbourhood as socially sustainable. However, some design qualities of the public realm are related to social sustainability in a more general way. These qualities are found in each neighbourhood with only slight dissimilarities, and they generally relate to the design and organization of streets. I believe that both of these aspects, the universal design and specific local conditions, have to be included in order to have a truly socially sustainable public realm.

Figure 4. - Relationship between Social Sustainability and Public Spaces

Streets with their horizontal and vertical planes form a network of spaces that could either support and enhance, or discourage social connections and activities. This case study will analyze how the design of street frontages can create a positive precondition for achieving and preserving social sustainability of a street.

The unit of analysis of this case study are street frontages, from four commercial streets in four neighbourhoods in the city of Vancouver (Dunbar, West Broadway, Main
Street and Commercial Drive). At each location, two blocks were chosen. Firstly, this study was done to verify the argument that social sustainability is a complex concept and that many different features contribute to the quality of the public realm. Secondly, the study aimed to show that the presence of certain qualities related to social sustainability does not imply that the space is actually socially sustainable.
4.2 Study propositions

Social sustainability implies many parameters and qualities, and some of them are more directly related to the design and organization of streets. Some of these elements that were analyzed in this study include the following independent variables: dynamism, diversity, social interactions, walkability and the safety of a street.

Dynamism

In general "societies cannot be studied, sustained or altered through policy or institutional change without reference to the space (local region) they occupy, an observation that brings into play such things as the allocation of recreational and civic space, street design, the location of services in relation to population, and so on” (McKenzie 2004, 38). Other scholars also share the view that social sustainability as a dynamic concept that changes over the years (Dempsey et al. 2011, 294). This dynamic feature of social sustainability corresponds to the social structure of a community. In the design of street frontages, this quality of social sustainability is reflected in the greater number of buildings and, therefore, greater number of owners. "More buildings are likely to mean more building owners, each with an economic stake in and responsibility for the street... With more buildings and owners, change is more likely to come incrementally rather than all at once, and that, too, adds visual interest as well as a sense of continuity" (A. B. Jacobs 1995, 297).

In addition, Jane Jacobs argues that one of the most important elements of a neighbourhood is the variation in age between buildings. She claims that "[t]he district must mingle buildings that vary in age and condition, including a good proportion of old ones so that they vary in the economic yield they must produce. This mingling must be fairly close-grained" (J. Jacobs 2011, 197).
Diversity

Another important feature of social sustainability is that it represents "a system of cultural relations in which the positive aspects of disparate cultures are valued and protected, and in which cultural integration is supported and promoted when it is desired by individuals and groups" (McKenzie 2004, 50). This quality is closely related to the idea of sustaining diversity, which is, according to the WACOSS model, one of the five principles of social sustainability. In this model "the community promotes and encourages diversity" and "diversity is achieved through inclusiveness and valuing difference" (Barron and Gauntlett).

In other words, Jan Gehl argues that:

* democratically managed city space provides access and opportunities for all groups of society to express themselves and latitude for non-mainstream activities.
* The spectrum of activities and actors demonstrates the opportunities for public city space generally to strengthen social sustainability. It is a significant quality that all groups of society, regardless of age, income, status, religion or ethnic background, can meet face to face in city space as they go about their daily business. (Gehl 2010, 28)

For Salvador Rueda "social mix" is as one of the "main objectives of Ecological Urban Planning". As he argues, social mix implies:

- Create[ing] an urban context that promotes cohabitation between groups of people with different incomes, cultures, ages and professions. The diversity of citizenship is the guarantee to avoid a tendency to ghettoization, formed by homogeneous groups of inhabitants.
- Encouraging diversity and mix of activity providing a compact and complex city model. Closeness or compactness encourages contact between groups of people. Diversity brings the likelihood of exchanges and relationships between information carrying components within the city. (Rueda 2014, 127)

According to Jane Jacobs, apart from the variety of buildings in age, there are three additional conditions that "generate exuberant diversity in a city's streets and districts". The first one is the variety of functions that one district performs, which should create opportunities for various purposes for people to be present. The second one, as Jacobs argues, is the frequency of corners. The third important element is the dense concentration
of people, present for various reasons including residency (J. Jacobs 2011, 196). In the
design of street frontages this is reflected through the greater number of buildings. "The
relationship between more buildings and the likelihood of greater diversity should be no
mystery. With more buildings there are likely to be more architects, and they will not all
design alike. There are more contributors to the street, more and different participants, all
of whom add interest" (A.B. Jacobs 1995, 297). Moreover, diverse uses also contribute to
a higher diversity of users. "Diverse uses enliven the area and the street, bring different
people for different purposes, help to keep it going" (A.B. Jacobs 1995, 304).

Social interactions and walkability

As Dempsey (2011, 51) notes some of the "contributing factors" for "urban social
sustainability" are: social networks, social interaction, and a walkable neighbourhood.
Walkability of the street is a highly important feature because the way we perceive other
people is by walking next to or past them. This means that while on foot people most
easily interact and socialize with other people (A.B. Jacobs 1995, 272). There are two
main activities that happen on foot on the street level and those are walking and staying.
Proper weather protection is one of the building frontage design elements that supports the
previously mentioned factors that contribute to social sustainability. "The best streets are
comfortable, at least as comfortable as they can be in their settings... They offer reasonable
protection from the elements without trying to avoid or negate the natural environment"

Complex building frontages also add to the quality of walking. More complex building
frontages, with a variety of materials, textures and details, improve the visual interest of
the street, provide a more playful environment, and bring the street frontage closer to the
pedestrian scale (A.B. Jacobs 1995, 282; Gehl 2010, 74; NYC Department of City Planning
2013, 60). In addition, complexity affects how the length of the path is experienced since
"[a] stretch of 500 meters (1,600 ft.) viewed as a straight, unprotected, and dull path is
experienced as a very long and tiring, while the same length can be experienced as a very
short distance if the route is perceived in stages” (Gehl 2011, 137). NYC Department of City Planning defines 25 feet (or 7 meters) as the scale “at which the senses are most engaged with the complexities of facade articulation, active entries, transparency, textures, awnings, signage, and architectural details” (NYC Department of City Planning 2013, 34).

Another quality of building frontages that contribute to more walkable street space and enhance social networks and interaction is the transparency of street frontages. As Allan B. Jacobs (1995, 285) argues "[t]he best streets have about them a quality of transparency at their edges, where the public realm of the street and the less public, often private realm of property and buildings meet. One can see or have a sense of what is behind whatever it is that defines the street; one senses an invitation to view or know, if only in the mind, what is behind the street wall". Transparent frontages, in conjunction with narrow units and many doors create better opportunities for both those who sell and those who buy goods to interact and exchange experience (Gehl 2010, 77).

Safety

Lastly, streets that provide the feeling of safety are the ones we enjoy visiting. The best way to “handle strangers” and make streets safe, according to Jacobs, is by applying “three main qualities”. The first one is to provide a “clear distinction between private and public space”. The second one is to have “eyes upon the street”, by having buildings oriented towards the street, and the third one is to continuously have users of the sidewalk present, “both to add to the number of effective eyes on the street and to induce the people in buildings along the street to watch the sidewalk in sufficient number” (J. Jacobs 2011, 45).

For the purpose of this study social sustainability was analyzed in two parts: context elements and independent variables. In addition to the independent variables described above, to contextually compare the four selected locations the following parameters were examined: housing type, community/public buildings, green areas, public art and community presence, pedestrian crosswalks /connection between two sides, and public
### Social Sustainability

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<td>Number of units</td>
<td>Hours of operation</td>
<td></td>
</tr>
</tbody>
</table>

Figure 5. - DV - IV Matrix and Applied Analysis
4.3 Case study analysis

4.3.1. Location no. 1 – Dunbar Street

The analysis of the context of Dunbar Street shows the least variety of housing types among all four locations, with 97% of all housing being single unit detached houses and only 3% of both mixed use buildings and multi unit detached buildings (Figure 6). The number and variety of public and community buildings is also very limited at this location; there are only two school/preschool buildings and one religious building.

There was no public art found, and just a couple of distinctive details that identify the neighbourhood (Figure 7).

With respect to public transit, there are two bus lines operating down Dunbar Street in the North-South direction (Figure 8).

Even though the street is not very wide (one lane in each direction), the sides of the street are very poorly connected. Crosswalks are vaguely marked, and even though traffic lights are typically controlled by pedestrians, the street in very much car oriented.

The analysis of social sustainability elements shows, first of all, very low diversity of use and users. Most of users belong to two groups – adults...
and seniors, with only 14% youth and 6% children. As for diversity of use, most of the commercial units are occupied by banks or offices and beauty salons, and a few retail stores and medical units. These types of use generally do not have transparent frontages, so visually they are not particularly attractive (Figure 9). Also, most of these uses close earlier in the evening, so at 6 pm already more than half of the units are closed (Figure 10).

In addition, a couple of new or medium age buildings are covering either a whole block or a considerable portion of one, and have fairly large commercial units. This has a negative impact on the gradualism of change, and diversity of design and reduces the number of potential points for social interaction.

Many frontages are either translucent or opaque, and have no or very few overhangs. Additionally, the greenery is very sparse, with only a few trees per block.

All the characteristics described create a very unpleasant environment, with very little activity and almost nothing to observe. People typically come to this commercial street by car with a very specific purpose.
4.3.2. Location no. 2 – West Broadway

At location no. 2 housing is also quite uniform, with 88% being single unit detached houses, only 12% being mixed use and without any multi unit residential buildings (Figure 11). There are only two public/community buildings: a public library branch and a fire station.

There was no public art found at this location, but there are many characteristic neighbourhood details, such as very specific manhole covers and planters, and some notes left by the local community (Figure 12). There are a lot of trees and greenery in general planted along the street, making the street very pleasant to visit in various weather conditions (Figure 14). Crosswalks are typically very well marked, slightly raised, with traffic lights controlled by pedestrians. All of this gives a very clear message that pedestrians have the right of way, even though this is a street with very busy traffic. In addition to many cars, there are three bus lines operating in two directions making this street the best connected one among the four.
that were analyzed (Figure 13). The analysis of social sustainability indicators shows that almost half of the users belong to the group of adults, but with a significant percentage of both youth and seniors group, 17% and 29% respectively.

Besides many retail units, there are a lot of restaurants, coffee shops/bakeries and grocery stores at this location. Despite the fact that a significant number of commercial units are occupied by banks, offices or beauty salons, almost all units have transparent frontages making this street visually very interesting (Figure 15). A great number of smaller buildings provide a variety of design, and the small units behind the frontages create many potential points for social interaction.

The overall impression is that this is an interesting, busy street to visit, which is reflected in many people being present at almost any time of day. However, the activities available are still mostly limited to shopping and dining, with no other contents found.
4.3.3. Location no.3 – Main Street

Only two types of housing are found at this location – single unit detached houses and mixed use buildings, with almost 90% belonging to a single unit detached houses (Figure 17). There is only one public building at this location, a school. A very limited indication of community expression has been found at this location, and almost no public art (Figure 19). Also, there is only one bus line operating in the North-South direction (Figure 18).

As is the case with Dunbar Street, crosswalks are very poorly marked. Even though traffic lights are generally controlled by pedestrians, it is still very clear that cars are the primary means of transportation.

The analysis of social sustainability indicators shows that the highest percentage of users belongs to adults, 68%, with around 15% found in both youth and seniors group, and only 2% of children. This shows the lowest diversity of users.

![Pie chart showing housing types at Location no.3: 89% single unit detached houses, 11% mixed-use buildings.](image1)

![Map showing public transit map for Location no.3: Main Street](image2)

![Images of Main Street public art and community expressiveness](image3)
among all four locations.

Most of the units are retail units, with a very high ratio of residential units as well. Besides these two groups, the rest of the units belong to beauty salons, bank/offices and medical units, which also shows a very low diversity of use at this location (Figure 20).

Because of a very high percentage of residential entrances that were considered open at all times, there is a considerably high percentage of open units at later hours, with 40% of units open at 6 pm, and 30% of units open at 10 pm (Figure 21).

Apart from a couple of large buildings, there are a significant number of smaller buildings, so there is a noticeable variety of design, materials, details and textures present. One of the four analyzed blocks has a great number of smaller buildings with transparent frontages and smaller units, so many doors create many potential points for social interaction. However, the rest of the street is divided in large units with often opaque or
translucent frontages and only a few doors. In addition, a large car dealership takes over more than half of two blocks, making most of the street very tiring to walk on. As with Dunbar street, besides a few locally owned retail units, there is almost nothing visually attractive at this location. People also typically drive to this location with a particular purpose in mind.
4.3.4. Location no. 4 – Commercial Drive

This location has the greatest variety of housing types with the majority still being in single unit detached houses – 84%, but also with a significant 10% of mixed use buildings and 6% of multi unit residential buildings (Figure 22).

A great number of various public and community buildings are located at this location including educational and community/family buildings, recreational facilities, park and local greenway/plaza. There was a lot of street art found at this location, mostly on walls, but also in the form of various contributions from local community (Figure 24).

Crosswalks are not very well marked, but the cars are not as dominant as on Dunbar Street and Main Street. This location shows the biggest diversity of users among the four analyzed locations, with almost half belonging to adults, but with the other half almost equally divided between the other three groups.

As for diversity of use, most of units are retail and restaurants, with also a significant number of residential entrances (Figure 25). This reflects on the number of units open at a later time of day, with 62% open at 6 pm and 28% of units open at 10 pm (Figure 26).

A great number of small buildings creates an environment with a quite diverse design and a fine distribution between old, medium and new buildings. Many small units inside these buildings create many potential points for social interaction together with a few
passageways and the Napier greenway.

Most of the frontages are transparent with many restaurants and coffee shops having temporary or permanent sitting located on the street.

All these features together create a very diverse, vibrant environment, with many different things to do and many things to see.
5. Conclusion

5.1 Overview

In the conclusion of this case study analysis, it seems important to emphasize once again the complexity and wide-ranging quality of social sustainability. The combination of various elements, all equally important, creates an environment that could be called socially sustainable.

Buildings form and define the space of a street, so the design of building frontages has a strong impact on the life of the street. Among many elements of social sustainability only some of them are directly related to the design of building frontages. However, it was shown in this case study that many of those elements of social sustainability could be promoted or diminished, prompted or hindered, raised or lowered, by different building designs.

To summarize the previous chapters of this study, a socially sustainable street meets the following criteria:
- supports different ages, different financial capabilities, different marital and family status, different nationalities, different social backgrounds;
- meets the needs of the local community and supports the local community;
- is pleasant, interesting, and safe to walk on;
- has a variety of commercial uses;
- besides commercial, also has public/community buildings nearby;
- has space for public art;
- is well connected by public transit;
- is surrounded by various types of housing.

One of the design features that positively influences the pedestrian use of a street is a better quality of pedestrian crosswalks. This is an important quality in a street especially in North America, where streets are typically car-oriented and designed to support heavy traffic. There are various characteristics of crosswalks that improve the connectedness of
the two sides of a street, such as properly marked crosswalks, traffic lights controlled by pedestrians, crosswalks raised to the level of the sidewalk. These design features send a message that pedestrians are the primary occupants of the street, and not cars, they slow down the traffic and provide a safer and more comfortable environment for pedestrians.

As discussed previously, commercial units along the commercial street benefit a lot from people moving on foot. This is how and when people notice things and interact more directly. The use of public transit and various car sharing options support a commercial street since the use of these means of transportation generally involves moving on foot as well. Data collected in 2016 in Metro Vancouver show that there is an increase in the use of the public transit and car sharing options, and a decrease in the use of cars in the city of Vancouver (Statistics Canada 2016). Additionally, higher density, achieved with more apartment buildings and other multi-family dwelling options, and fewer single-detached houses, also supports car sharing options (M. Robinson, 2016).

Besides density, a variety of housing options has a positive impact on the diversity of people that live in the neighbourhood (singles, couples, families, either nuclear or extended, groups of students or working people, retired singles or couples etc.)

Community and public buildings also add to the diversity of people visiting the area. These buildings provide programs at different times of the day for different social groups. Some of these programs support the local community and provide various activities for local residents, some may attract people from other parts of the city, or even tourists from different parts of the world, thus adding a new layer of diversity and social richness to the neighbourhood.

Similarly, public art and different ways of community expressiveness add to the identity of the neighbourhood. These are generally found on building walls or in the form of smaller urban furniture. When done by local artists, public art represents a unique way for a local community to identify and represent itself. This is why it is very important that the urban and architectural design that shapes the neighbourhood includes either spaces or surfaces that could eventually be transformed through public art and community
It was shown in this study that diversity of use of the units facing the street has a significant impact on the life of the street. Firstly, greater diversity of use could potentially have a positive influence on the diversity of users as well, by offering different options to various social groups. Additionally, diversity of use has a significant impact on the safety of the street if commercial and residential units are accessed directly from the street. For instance, having more residential entrances facing the street potentially contributes to the greater number of people that use the street at various times. As previously discussed, residential units on upper floors facing the street positively influence the safety of the street. This is another reason to combine commercial and residential uses in buildings that are located on commercial streets.

In conjunction with the transparency of frontages, the analysis of the diversity of use shows that some of the commercial uses are less suitable for ground floors. These are the uses that are typically closed towards the street, including, but not limited to offices, banks, medical facilities, wellness centers etc. One of the ways to resolve this issue is to provide the mixture of commercial spaces and residential units on upper floors. Some other types of use that typically extend onto the street and create more direct connections between inside and outside are more appropriate for ground floors. Restaurants, cafes, grocery stores and some retail spaces would be good examples of such facilities, as they add more dynamism to the commercial street.

The transparency of building frontages is another feature that significantly influences the walkability of the street. Transparent frontages provide the insight into the activities inside of the buildings, create more connectedness between inside and outside, and add to the visual interest of the street. By contrast, opaque or translucent walls block the view, creating blank and dull surfaces, making walking boring and tiring.

Another design feature of street frontages that improves the visual interest of a street is the number of buildings per street block. This greater number of buildings implies more incremental change over time, which creates a better sense of continuity, and helps build
the identity of the space. Besides, a mixture of older and newer buildings provides a good background for the economic diversity of business owners, by allowing a range of rents. New buildings often occupy the whole block or a large portion of it, and usually contain only one or at best a couple of commercial units. Due to the large size of the floor area, these commercial spaces are more likely to be occupied only by a few types of use, such as offices or banks, or big chain stores, and less likely by locally owned small businesses. Therefore, the size of a building or at least the length of its frontage facing the street directly influences the size of commercial units and diversity of use.

Moreover, the size of commercial units has an impact on the walkability of the street, as more frequent transition from one commercial unit to another adds to the visual interest of the street. Also, more units means more doors, which increases the potential points for social interaction. Besides, the greater number of buildings implies greater diversity of design, including a variety of materials, texture and details, which also adds to the visual interest of the street. New buildings very often destroy the gradualism of change by replacing a number of old buildings that usually are well known local landmarks crucial for the identity of the neighbourhood. Even though buildings with a larger footprint are sometimes financially more justifiable, the design and regulations could be defined in a way that would preserve narrower street frontage, by allowing buildings to expend either deeper behind into the block or a few stories higher. As a result, many old, but high quality buildings and landmarks could be preserved.

Lastly, walkability of a street is highly affected by the transparency of street frontages and weather protection, both natural and artificial, which greatly affect the walkability of the street. Apart from offering weather protection, trees and greenery in general improve the microclimate of the surrounding area, making streets more pleasant and comfortable. In addition, various awnings and overhangs in cities with climate similar to Vancouver’s are extremely important for improving the quality of the street space. Considering the number of rainy days, it is often challenging to enjoy a walk without any protection. Canopies are often designed only above the entrances to the buildings, leaving most of the street space
uncovered. Strict design guidelines in Vancouver do not provide a lot of space for diversity, details, flexibility or variations. If carefully designed, canopies could be an interesting architectural detail, a symbol unique to the building. Another important feature to consider is the material canopies are made of. Glass is the most used material for canopies on new buildings across the city but they provide only partial protection from the weather. Additionally, very often many obstacles are found on streets below canopies, like sandwich boards or chairs and shelves with goods, so the area covered by canopies is often significantly reduced. If canopies are too short, then the major area of the street is still left uncovered. Therefore, apart from the material and height, continuity and larger projection of canopies represent very important elements of canopy design.

This case study analysis shows that none of the four analyzed locations contains all elements of social sustainability as discussed in previous chapters. However, despite the lack of many elements of social sustainability, location no. 4 – Commercial Drive represents the most vibrant, diverse, and socially rich and complex environment.
5.2 Why is that?

Among the four analyzed locations, as it was previously shown, location no.4 – Commercial Drive is the closest to a socially sustainable street. Why is that?

All four analyzed blocks still consist of several smaller buildings. This urban pattern allows for a wide range of building ages, dating from 1900s to buildings that have just been finished (see Appendix B), it helps preserve the historical development of this area, and enriches the design diversity of the street (see Appendix A).

Smaller buildings are generally filled with smaller commercial units, allowing for greater diversity of use and owners, since small units are affordable for small locally owned businesses. As shown in this case study, many new developments that took over the whole block or a major portion of it, generally have one or just a couple of larger units, typically occupied either by banks or large chain store and corporate businesses. The frontages of these units are typically closed to the street space, with often only a single point of entry, and they are often closed early in the evening. These are the frontages that provide almost no visual interest for people walking down the street especially in the evening hours. On the other side, a greater number of small units provide constant transition from one frontage to another, something new to see with every few steps. Secondly, they provide more points of entry, and therefore, more potential points for social interaction (see Appendix B). Additionally, these small businesses, in order to attract customers, typically bring their content outside to the street space, which makes the street even more visually interesting.

Furthermore, there is one interesting characteristic of this location that adds largely to the overall activity and social diversity of the street. On one side of the street, building frontages are intermittently cut by passageways that lead to various public and community buildings behind. Together with the small greenway – green plaza, these passageways extend the space of the street deeper into the block connecting this commercial street to spaces and buildings with different types of activities (see Appendix B). The analyzed portion of Commercial Drive has a significant number and variety of public and community
buildings in the close proximity.

This feature, together with the high diversity of use and the walkability of the street seem to create a space with a great diversity of users as well.

Finally, public and community art, and community expressiveness is very much

Figure 27. - Public/Community Buildings at four analyzed locations

Figure 28. - Diversity of Users at four analyzed locations
present at this location, becoming a symbol of this particular neighbourhood, and giving it a special signature by which this neighbourhood differs from any other.

However, one important feature missing at this location is proper weather protection. Even though most of the canopies found along the street are typically connected to the commercial space behind, they are not continuous, and often are too short. Taking into consideration Vancouver’s climate, some future research can explore the height and appropriate materialization of canopies.

For the other three locations two components could substantially improve their current condition, and those are housing type and public/community buildings. These two contextual features seem to have a great influence on the diversity of users, and therefore, the diversity of use, social interactions and community expressiveness.

Additionally, West Broadway is a very busy street, with a lot of trees and greenery, crosswalks that are designed for pedestrians, many small and locally owned commercial units. Most of the units are open to the street. However, except dining and shopping, there is no other activity provided for local residents and visitors.

On the other hand, in addition to the problems that West Broadway is facing, at Dunbar Street and Main Street smaller, older and locally owned units and buildings are being replaced rapidly by large new developments. These new buildings are typically designed in a manner that further reduces any potential for social sustainability. It is clear that the future development of these two locations has to be very carefully reconsidered in order to move these streets closer to socially sustainable spaces.
5.3 Where do we go from here?

The information collected in this research, as well as the data found through some future research, could be used to understand how the applicable Design Guidelines can be adjusted to help achieve socially sustainable streets and neighbourhoods. The results of this study are intended to raise the awareness of both architectural and urban designers, and local authorities. The findings related to the width of frontages and units, weather protection and potential space for public art and community expressiveness provide significant information for architectural and urban designers.

However, the most important thing that the results show is that more careful attention needs to be given to the formulation of the Design Guidelines. Changes need to be applied at two levels: building level and context-neighbourhood level. For the building level the following parameters are relevant: width of building frontage, width of units located on the street level, access to residential units from the street, designated use of commercial units (units that communicate with the street space and units that are closed to the street), passageways through and between buildings leading to public/community buildings, space/surface for public art and community expressiveness, and weather protection. At the context/neighbourhood level attention needs to be placed on: the variety of public/community buildings in the close proximity (preferably connected to the street space through passageways and lanes), diversity of housing types, quality of the street space, including crosswalks, landscaping and street furniture, and public transit.

Since the results of this study were not validated, that could be the starting point for some future research. In addition, some of the elements of social sustainability were not analyzed, and they can potentially have either a positive or a negative impact on the results of this study. These elements are more related to the neighbourhood level, and they include but are not limited to employment opportunities, medical services, housing types and cost, the social background of a community etc.

Additionally, some components of the building and street design were not evaluated,
and there is a possibility that these elements could also have a significant impact on the
social sustainability of the street. Some of these elements are street profile, building height,
building setbacks, street furniture etc.

Finally, all four locations are missing some of the analyzed elements to a varying
degree. Another direction for the future research could be to investigate the extent of those
missing elements and how they influence social sustainability.

To conclude, this research shows how complex the concept of social sustainability
is, and that there is a real need for a more considerate understanding of all components
that comprise contemporary urban settlement. If we desire to have socially sustainable
cities, we need to approach the design of buildings and public realm from a slightly different
angle, and to include all social and contextual aspects that shape our cities. Moreover, we
need to leave some space unfinished and flexible for cities to change and evolve, and for
communities to thrive.
References


Appendix A: Diversity of Design and Variety of Textures and Details - Images

Location no.1 - Dunbar Street (700 ft)

SW Corner

NW Corner

DUNBAR STREET

NE Corner

SE Corner

SW Corner
Location no.2 - West Broadway (1400 ft)

SE Corner

SW Corner
Location no.3 - Main Street (980 ft)

SW Corner

NW Corner

NE Corner

SE Corner
Location no.4 - Commercial Drive (660 ft)
Appendix B: Comparative Analysis

Location No. 1 - Dunbar Street (700 ft)
- Gradualism of Change: Uniformity of Building Age
- Transparency of Street Frontages: Transparent Frontages
- Fronatges: Single New Building Taking Over the Whole Block
- Points for Social Interaction: Only Couple of Points
- Complexity of Street Fronatges: Uniformity of Building Age

Location No. 2 - West Broadway (1400 ft)
- Gradualism of Change: Uniformity of Building Age
- Transparency of Street Frontages: Transparent Frontages
- Fronatges: Taking Over the Whole Block
- Points for Social Interaction: Only Couple of Points
- Complexity of Street Fronatges: Uniformity of Building Age

Location No. 3 - Main Street (980 ft)
- Gradualism of Change: Uniformity of Building Age
- Transparency of Street Frontages: Transparent Frontages
- Fronatges: Taking Over the Whole Block
- Points for Social Interaction: Only Couple of Points
- Complexity of Street Fronatges: Uniformity of Building Age

Location No. 4 - Commercial Street (660 ft)
- Gradualism of Change: Uniformity of Building Age
- Transparency of Street Frontages: Transparent Frontages
- Fronatges: Taking Over the Whole Block
- Points for Social Interaction: Only Couple of Points
- Complexity of Street Fronatges: Uniformity of Building Age
Appendix C: Case Study Analysis
DIVERSITY OF DESIGN & GRADUALISM OF CHANGE

LOCATION No. 1

LEGEND:
10101: Decade when it was built

ANALYSIS OF LOCATION No. 1

Unit of analysis: Street Frontages
Dependant Variable: Social Sustainability
Independent Variable: Diversity
Related Public Realm Quality: Number of buildings
What is analyzed: Diversity of design
Analysis:
12 Buildings with different design

Unit of analysis: Street Frontages
Dependant Variable: Social Sustainability
Independent Variable: Dynamism
Related Public Realm Quality: Number of buildings
What is analyzed: Gradualism of change
Analysis:
12 Buildings in total
New buildings (less than 5 years old);
Medium age buildings (between 5 and 10 years old);
Old buildings (more than 10 years old);
DIVERSITY OF USE LOCATION No. 1

LEGEND
- Residential 3
- Beauty Salon 5
- Retail-Service 2
- Cafe/Bakery -
- Restaurant/Eatery 2
- Retail - Children -
- Grocery Store 2
- Retail 4
- Office / Bank 7
- Sport / Fitness 2
- Medical 4
- Parking
- Empty Space 3

ANALYSIS OF LOCATION No. 1

Unit of analysis: Street Frontages
Dependant Variable: Social Sustainability
Independent Variable: Diversity
Restored Public Realm Quality: Number of buildings / Width of frontages
What is analyzed: Diversity of use

Analysis:
12 Buildings
34 Units in total
9 of 11 groups of use found at location no. 1 - variety of groups found
Most of units (20 out of 34 - 59%) are occupied by following 4 groups of use:
- Office/Bank
- Beauty Salon
- Retail
- Medical
POTENTIAL POINTS FOR SOCIAL INTERACTION / WIDTH OF UNITS
LOCATION No. 1

LEGEND

Path of travel:

- Locations where paths of travel cross
- Potential points for social interaction

Location of doors:

ANALYSIS OF LOCATION No. 1

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Social Interaction
Related Public Realm Quality: Number of buildings/units
What is analyzed: Potential points for social interaction

Analysis:

NW Block - 4 units / 6 potential points
NE Block - 13 units / 14 potential points
SW Block - 13 units / 15 potential points
SE Block - 4 units / 4 potential points

Total number of units: 34
Total number of potential points for social interaction: 39

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Walkability
Related Public Realm Quality: Complexity of street frontages
What is analyzed: Width of units

Analysis:

Total number of units: 34
Percentage of frontages up to 25’ in width: 67%
TRANSPARENCY OF STREET FRONTAGES / DIALOG BETWEEN INSIDE AND OUTSIDE LOCATION No. 1

LEGEND
- Opaque walls - no connection between inside and outside
- hard edges - social interaction does not exists
- Translucent walls - even though these frontages have potential for connection between inside and outside it does not exists
- hard edges - social interaction does not exists
- Transparent walls - visual connection between inside and outside
- soft edges - social interaction partially exists
- Open walls - physical connection between inside and outside
- no edges - full potential for social interaction
- Fences - visual connection between "inside" and "outside", but unclear message of physical division between the two
- soft edges - social interaction partially exists
- Private realm occupies public realm
- no edges - high potential for social interaction

ANALYSIS OF LOCATION No. 1

Unit of analysis: Street Frontages
Dependant Variable: Social Sustainability
Independent Variable: Social Interaction
Related Public Realm Quality: Transparency of edges
What is analyzed: Transparency of street frontages / Dialog between inside and outside

Analysis:

NW Block: Soft edges; private on public realm present - no edges
NE Block: Combination of soft and hard edges
SW Block: Soft edges; private on public realm present - no edges
SE Block: Hard edges

Overall conclusion: Significant area of frontages with soft edges - Three blocks with soft edges, one block with hard edges
WEATHER PROTECTION LOCATION No. 1

Analysis

NW Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Shelves with goods
3. Transparency: Transparent Protection - protection from the rain is provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

NE Block:
1. Continuity: Weather protection is continuous
2. Obstacles: Sand-itch Boards
3. Transparency: Solid Protection - protection from both, rain and sun, is provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

SW Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Shelves with goods and sand-itch boards
3. Transparency: Solid Protection - protection from both, rain and sun, is provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

SE Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: There are no obstacles
3. Transparency: Solid Protection - protection from both, rain and sun, is provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

Overall conclusion:
1. Continuity: Except one block weather protection is not continuous
2. Obstacles: Various types of obstacles are found
3. Transparency: Except one block weather protection is solid
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather
HOURS OF OPERATION
LOCATION No. 1

LEGEND
- Open at particular time
- Closed at particular time
- No information
- Location of doors

ANALYSIS OF LOCATION No. 1

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Safety
Related Public Health Quality: Number of units
What is analyzed: Hours of operation

Analysis:
11:00 AM
- Total number of units: 34
- Total number of open units: 18
- Total number of closed units: 4
- Total number of units with no information: 12

2:00 PM
- Total number of units: 34
- Total number of open units: 20
- Total number of closed units: 13
- Total number of units with no information: 12

6:00 PM
- Total number of units: 34
- Total number of open units: 9
- Total number of closed units: 13
- Total number of units with no information: 12

10:00 PM
- Total number of units: 34
- Total number of open units: 4
- Total number of closed units: 10
- Total number of units with no information: 12
LOCATION No.2 - WEST BROADWAY - CONTEXT

LEGEND: SIGNIFICANT LOCATIONS
1. Vancouver Public Library - Kitsilano Branch
2. Vancouver Fire Hall No.12

LEGEND: USE OF BUILDINGS / AREAS
- Single Family Detached House
- Multi Unit Residential Building
- Mixed-use (Commercial + Resid.) Bldg
- Commercial Building
- Community / Culture / Arts
- Educational
- Green Area

LEGEND: ANALYZED LOCATION
- Bus Stop
- Bus Route and Number
- Boundary of the analyzed area
- Analyzed buildings - frontage

ANALYSIS OF THE LOCATION No. 2 - WEST BROADWAY
1. Housing: 88% single unit detached houses and 12% mixed-use buildings.
2. Community / Public Buildings: Public Library and Fire Hall.
3. Green Areas: Significant amount of trees and planted areas along the street (photo no. 1, 2, 3).
4. Special characteristics
   a. Public Art and Community Presence: No public art found, community expression through the concern about the trees (photo no. 5).
   b. Some specific characteristics on the sidewalk and on the lamp post (photo no. 4, 6, 7, 8).
   c. Crosswalks: Connection between two sides of the street. Pedestrian friendly crosswalks, visually expressed. Traffic lights are controlled by pedestrians (photo no. 9).
5. Public Transit: Three bus lines in the East-West direction (009, 014, N17 - two operating during the day, one operating during the night) and two bus lines in the North-South direction (002, N22 - one operating during the day, one during the night).
DIVERSITY OF DESIGN & GRADUALISM OF CHANGE

LOCATION No. 2

LEGEND:
1935: Decade when it was built

ANALYSIS OF LOCATION No. 2

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Diversity
Related Public Realm Quality: Number of buildings
What is analyzed: Diversity of design

Analysis:
27 Buildings with different design

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Dynamicism
Related Public Realm Quality: Number of buildings
What is analyzed: Gradualism of change

Analysis:
27 Buildings in total
New buildings (less than 5 years old):
Medium age buildings (between 5 and 10 years old):
Old buildings (more than 10 years old):
POTENTIAL POINTS FOR SOCIAL INTERACTION /
WIDTH OF UNITS
LOCATION No. 2

W BROADWAY

MACKENZIE ST

LEGEND
Path of travel
Locations where paths of travel cross
- potential points for social interaction
Location of doors

ANALYSIS OF LOCATION No. 2

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Social Interaction
Related Public Realm Quality: Number of building units
What is analyzed: Potential points for social interaction

Analysis:
NW Block - 7 units / 7 potential points
NE Block - 33 units / 33 potential points
SW Block - 22 units / 22 potential points
SE Block - 8 units / 9 potential points

Total number of units: 70
Total number of potential points for social interaction: 71

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Walkability
Related Public Realm Quality: Complexity of street frontages
What is analyzed: Width of units

Analysis:
Total number of units: 70
Percentage of frontages up to 25' in width: 70%
TRANSPARENCY OF STREET FRONTAGES / DIALOG BETWEEN INSIDE AND OUTSIDE LOCATION No. 2

LEGEND:
- Opaque walls - no connection between inside and outside
- Hard edges - social interaction does not exist
- Translucent walls - even though these frontages have potential for connection between inside and outside it does not exists
- Soft edges - social interaction does not exist
- Transparent walls - visual connection between inside and outside
- Fence - visual connection between "inside" and "outside", but clear message of physical division between the two
- Private realm: no edges - high potential for social interaction

ANALYSIS OF LOCATION No. 2

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Social Interaction
Related Public Realm Quality: Transparency of edges
What is analyzed: Transparency of street frontages / Dialog between inside and outside

Analysis:
NW Block: Soft edges; private on public realm present - no edges
NE Block: Soft edges; private on public realm present - no edges
SW Block: Combination of soft and hard edges; private on public realm present - no edges
SE Block: Soft edges; private on public realm present - no edges

Overall conclusion: Significant area of frontages with soft edges - Three blocks with soft edges, one block with combination of soft and hard edges.
WEATHER PROTECTION LOCATION No. 2

ANALYSIS OF LOCATION No. 2

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Walkability
Related Public Space Quality: Weather Protection

What is analyzed: Continuity, Obstacles, Canopy Material

Analysis

NW Block:
1. Continuity: Weather protection is continuous
2. Obstacles: Sandwich Boards, Tables and Chairs
3. Transparency: Transparent Protection - protection from the sun is not provided
4. Continuity of trees: There are a lot of trees but not enough to provide continuous protection from the weather

NE Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Sandwich boards, Shelves and Goods, Tables and Chairs
3. Transparency: Combination of Solid and Transparent Protection - protection from the sun is partially provided
4. Continuity of trees: There are a lot of trees but not enough to provide continuous protection from the weather

SW Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Sandwich boards, Shelves and Goods, Tables and Chairs
3. Transparency: Combination of Solid and Transparent Protection - protection from the sun is provided
4. Continuity of trees: There are a lot of trees but not enough to provide continuous protection from the weather

SE Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Sandwich boards, Shelves and Goods, Tables and Chairs
3. Transparency: Solid Protection - protection from the sun is provided
4. Continuity of trees: There are a lot of trees but not enough to provide continuous protection from the weather

Overall conclusion:
1. Continuity: Weather protection is not continuous, except one block
2. Obstacles: Various types of obstacles are found
3. Transparency: Two blocks have the combination of Solid and Transparent Protection
   One block has Solid Protection
   One block has Transparent Protection
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather, except one block
HOURS OF OPERATION
LOCATION No. 2

LEGEND
- Open at particular time
- Closed at particular time
- No information
- Location of doors

ANALYSIS OF LOCATION No. 2

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Safety
Related Public Realm Quality: Number of units
What is analyzed: Hours of operation

Analysis:
11.00 AM
Total number of units: 70
Total number of open units: 47
Total number of closed units: 3
Total number of units with no information: 20

2.00 PM
Total number of units: 70
Total number of open units: 50
Total number of closed units: 0
Total number of units with no information: 20

6.00 PM
Total number of units: 70
Total number of open units: 24
Total number of closed units: 26
Total number of units with no information: 20

10.00 PM
Total number of units: 70
Total number of open units: 5
Total number of closed units: 45
Total number of units with no information: 20
LOCATION No.3 - MAIN STREET - CONTEXT

LEGEND: USE OF BUILDINGS / AREAS
- Single Family Detached House
- Multi Unit Residential Building
- Mixed use (Commercial + Resid.) Bldg
- Commercial Building
- Community / Culture / Arts
- Educational
- Green Area

LEGEND: SIGNIFICANT LOCATIONS
1. General Brock Elementary School

LEGEND: ANALYSIS LOCATION
- Bus Stop
- Bus Route and Number
- Boundary of the analyzed area
- Analyzed buildings - frontages

ANALYSIS OF THE LOCATION No.3 - MAIN STREET
1. Housing: 89% single unit detached houses and 11% mixed use buildings;
2. Community / Public Buildings: School;
3. Green Area: Some trees along the street, but insignificant; no larger green areas such as parks or community gardens;
4. Special characteristics
   a. Public Art and Community Presence: Both are very scarcely present (photos no. 2 - 6)
   b. Crosswalks/Connection between two sides of the street: Crosswalks are generally unmarked, some traffic lights are controlled by pedestrians, poor connection between street sides (photo no. 1)
5. Public Transit: One bus line (803 operating during the day), North-South direction
DIVERSITY OF DESIGN & GRADUALISM OF CHANGE
LOCATION No. 3

LEGEND:
- Year when it was built

ANALYSIS OF LOCATION No. 3

Unit of analysis: Street Footages
Dependent Variable: Social Sustainability
Independent Variable: Diversity
Related Public Realm Quality: Number of buildings
What is analyzed: Diversity of design

Analysis:
22 Buildings with different design

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Dynamism
Related Public Realm Quality: Number of buildings
What is analyzed: Gradualism of change

Analysis:
22 Buildings in total

New buildings (less than 5 years old):
Medium age buildings (between 5 and 10 years old):
Old buildings (more than 10 years old):
DIVERSITY OF USE LOCATION No. 3

**LEGEND**
- Residential: 14
- Beauty Salon: 5
- Retail+Service: 4
- Coffee/Bakery: -
- Restaurant/Eater: 1
- Retail: Children: -
- Grocery Store: -
- Retail: 16
- Office/Bank: 6
- Sport/Fitness: -
- Medical: 4
- Parking: 3
- Empty Space: 2

**ANALYSIS OF LOCATION No. 3**

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Diversity
Related Public Realm Quality: Number of buildings / Width of frontages
What is analyzed: Diversity of use

Analysts:
22 Buildings
53 Units in total

7 of 11 groups of use found at location no. 3 - variety of groups found
Most of units (41 out of 56 - 77%) are occupied by following 4 groups of use:
- Residential
- Retail
- Office/Bank
- Beauty Salon
POTENTIAL POINTS FOR SOCIAL INTERACTION / WIDTH OF UNITS
LOCATION No. 3

LEGEND

Path of travel

Locations where paths of travel cross - potential points for social interaction

Location of doors

ANALYSIS OF LOCATION No. 3

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Social Interaction
Related Public Realm Quality: Number of building units
What is analyzed: Potential points for social interaction

Analysis:
NW Block - 6 units / 6 potential points
NE Block - 21 units / 21 potential points
SW Block - 10 units / 11 potential points
SE Block - 16 units / 17 potential points

Total number of units: 53
Total number of potential points for social interaction: 56

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Walkability
Related Public Realm Quality: Complexity of street frontages
What is analyzed: Width of units

Analysis:
Total number of units: 53
Percentage of frontages up to 25' in width: 0.1%
TRANSPARENCY OF STREET FRONTAGES / DIALOG BETWEEN INSIDE AND OUTSIDE LOCATION No. 3

LEGEND:
- Opaque walls - no connection between inside and outside
  - hard edges - social interaction does not exist
- Translucent walls - even though these frontages have potential for connection between inside and outside, it does not exist
  - hard edges - social interaction does not exist
- Transparent walls - visual connection between inside and outside
  - soft edges - social interaction partially exists
- Open walls - physical connection between inside and outside
  - no edges - full potential for social interaction
- Fence - visual connection between "inside" and "outside", but clear message of physical division between the two
  - soft edges - social interaction partially exists
- Private realm occupies public realm
  - no edges - high potential for social interaction

ANALYSIS OF LOCATION No. 3

Unit of analysis: Street Frontages
Dependant Variable: Social Sustainability
Independent Variable: Social Interaction
Related Public Realm Quality: Transparency of edges
What is analyzed: Transparency of street frontages / Dialog between inside and outside.

Analysis:
NW Block: Combination of hard and soft edges; private on public realm not present
NE Block: Soft edges; private on public realm present
SW Block: Soft edges; private on public realm present
SE Block: Combination of hard and soft edges; private on public realm not present

Overall conclusion: Two blocks have combination of hard and soft edges
Two blocks with soft edges
Private on public realm (no edges) present significantly only within one block
WEATHER PROTECTION
LOCATION No. 3

LEGEND
- Sandwich Boards
- Tables and chairs
- Shelves and Sheds
- Solid Canopy - Protection from both rain and sun
- Transparent Canopy - Protection from the rain, no protection from the sun
- Street Trees

ANALYSIS OF LOCATION No. 3

Unit of analysis: Street Frontages
Dependant Variable: Social Sustainability
Independent Variable: Walkability
Related Public Realm Quality: Weather Protection
What is analyzed: Continuity, Obstacles, Canopy Material

Analysis

NW Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Sandwich Board
3. Transparency: Combination of Solid and Transparent Protection - protection from the sun is partially provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

NE Block:
1. Continuity: Weather protection is continuous
2. Obstacles: Shelves with goods and sandwich boards
3. Transparency: Solid Protection - protection from both, rain and sun, is provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

SW Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Shelves with goods and sandwich boards
3. Transparency: Solid Protection - protection from both, rain and sun, is provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

SE Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Shelves with goods and sandwich boards
3. Transparency: Combination of Solid and Transparent Protection - protection from the sun is partially provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

Overall conclusion:
1. Continuity: Weather protection is not continuous
2. Obstacles: Various types of obstacles are found
3. Transparency: Two blocks have the combination of Solid and Transparent Protection
   Two blocks have Solid Protection
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather
HOURS OF OPERATION
LOCATION No. 3

LEGEND
- Open at particular time
- Closed at particular time
- No information
- Location of doors

ANALYSIS OF LOCATION No. 3

Unit of analysis: Street Footages
Dependent Variable: Social Sustainability
Independent Variable: Safety
Related Public Realm Quality: Number of units
What is analyzed: Hours of operation

Analysis:
11.00 AM
Total number of units: 53
Total number of open units: 35
Total number of closed units: 3
Total number of units with no information: 15

2.00 PM
Total number of units: 53
Total number of open units: 37
Total number of closed units: 1
Total number of units with no information: 15

6.00 PM
Total number of units: 53
Total number of open units: 21
Total number of closed units: 17
Total number of units with no information: 15

10.00 PM
Total number of units: 53
Total number of open units: 16
Total number of closed units: 22
Total number of units with no information: 15
DIVERSITY OF USE LOCATION No. 4

Legend:
- Residential
- Beauty Salon
- Retail-Service
- Cafe/Bakery
- Restaurant/Eateries
- Retail - Children
- Grocery Store
- Retail
- Office / Bank
- Sport / Fitness
- Medical
- Parking
- Empty Space

Analysis of Location No. 4:

- Unit of analysis: Street Frontages
- Independent Variable: Social Sustainability
- Independent Variable: Diversity
- Treated Public Realm Quantity: Number of buildings / Width of frontages
- What is analyzed: Diversity of use

Analysis:
- 24 buildings
- 50 units in total

9 of 11 groups of use found at location no. 4 - variety of groups found

Most of units (37 out of 50 - 74%) are occupied by following 4 groups of use:
- Residential
- Retail-Service
- Eateries
- Beauty Salon
POTENTIAL POINTS FOR SOCIAL INTERACTION / WIDTH OF UNITS
LOCATION No. 4

LEGEND

- Path of travel
- Locations where paths of travel cross
- Potential points for social interaction
- Location of doors

ANALYSIS OF LOCATION No. 4

Unit of analysis: Street Frontages
Dependant Variable: Social Sustainability
Independent Variables: Social Interaction, Related Public Realm Quality, Number of building units
What is analyzed: Potential points for social interaction

Analysis:

NW Block - 8 units / 14 potential points
NE Block - 16 units / 16 potential points
SW Block - 11 units / 13 potential points
SE Block - 15 units / 15 potential points

Total number of units: 50
Total number of potential points for social interaction: 57

Unit of analysis: Street Frontages
Dependant Variable: Social Sustainability
Independent Variables: Walkability
Related Public Realm Quality: Complexity of street frontages
What is analyzed: Width of units

Analysis:

Total number of units: 50
Percentage of frontages up to 25' in width: 64%
TRANSPARENCY OF STREET FRONTAGES / DIALOG BETWEEN INSIDE AND OUTSIDE LOCATION No. 4

<table>
<thead>
<tr>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opaque walls - no connection between inside and outside</td>
</tr>
<tr>
<td>hard edges - social interaction does not exists</td>
</tr>
<tr>
<td>Translucent walls - even though these frontages have potential for connection between inside and outside it does not exist</td>
</tr>
<tr>
<td>hard edges - social interaction does not exists</td>
</tr>
<tr>
<td>Transparent walls - visual connection between inside and outside</td>
</tr>
<tr>
<td>soft edges - social interaction partially exists</td>
</tr>
<tr>
<td>Open walls - physical connection between inside and outside</td>
</tr>
<tr>
<td>no edges - full potential for social interaction</td>
</tr>
<tr>
<td>Fences - visual connection between &quot;inside&quot; and &quot;outside&quot; but sense message of physical division between the two</td>
</tr>
<tr>
<td>soft edges - social interaction partially exists</td>
</tr>
<tr>
<td>Private realm occupies public realm</td>
</tr>
<tr>
<td>no edges - high potential for social interaction</td>
</tr>
</tbody>
</table>

ANALYSIS OF LOCATION No. 4

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Social Interaction
Related Public Realm Quality: Transparency of edges
What is analyzed: Transparency of street frontages / Dialog between inside and outside

Analysis:

NW Block: Soft edges; private on public realm present - no edges
NE Block: Soft edges; private on public realm present - no edges
SW Block: Soft edges; private on public realm present - no edges
SE Block: Soft edges; private on public realm present - no edges

Overall conclusion: Significant area of frontages with soft edges - All four blocks with soft edges
WEATHER PROTECTION
LOCATION No. 4

LEGEND
- Sandwich Board
- Tables and chairs
- Shelves and Goods
- Solid Canopy - Both protection from the rain and sun
- Transparent Canopy - Protection from the rain, no protection from the sun
- Street Trees

ANALYSIS OF LOCATION No. 4

Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Walkability
Related Public Realm Quality: Weather Protection
What is analyzed: Continuity, Obstacles, Canopy Material

Analysis

NW Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Sandwich Boards; Shelves with goods; Tables and chairs
3. Transparency: Solid Protection - protection from both, rain and sun, is provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

NE Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Sandwich Boards; Shelves with goods; Tables and chairs
3. Transparency: Solid Protection - protection from both, rain and sun, is provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

SW Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Tables and chairs; and sandwich boards
3. Transparency: Solid Protection - protection from both, rain and sun, is provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

SE Block:
1. Continuity: Weather protection is not continuous
2. Obstacles: Tables and chairs; and sandwich boards
3. Transparency: Solid Protection - protection from both, rain and sun, is provided
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather

Overall conclusion:
1. Continuity: Weather protection is not continuous
2. Obstacles: Various types of obstacles are found
3. Transparency: Weather protection is solid
4. Continuity of trees: There are not enough trees to provide continuous protection from the weather
Hours of Operation
Location No. 4

Legend:
- Open at particular time
- Closed at particular time
- No information
- Location of doors

Analysis of Location No. 4
Unit of analysis: Street Frontages
Dependent Variable: Social Sustainability
Independent Variable: Safety
Related Public Health Quality: Number of units
What is analyzed: Hours of operation

Analysis:
11.00 AM
Total number of units: 50
Total number of open units: 25
Total number of closed units: 5
Total number of units with no information: 10

2.00 PM
Total number of units: 50
Total number of open units: 39
Total number of closed units: 1
Total number of units with no information: 10

6.00 PM
Total number of units: 50
Total number of open units: 31
Total number of closed units: 9
Total number of units with no information: 10

10.00 PM
Total number of units: 50
Total number of open units: 14
Total number of closed units: 26
Total number of units with no information: 10
Appendix D: Sample Questionnaire
QUESTIONNAIRE
Subject #: __________

July, 2017

Street: ______________________________ Block:_________

1. How long have you been working at this location
   □ Less than 1 year
   □ 1-5 years
   □ More than 5 years

2. Do you work both in the morning and in the afternoon?
   □ Yes
   □ No
   If you checked “No” please check one of the following:
     □ Only in the morning
     □ Only in the afternoon

3. Please check the appropriate box below
   □ I work on week days
   □ I work on weekends
   □ I work both on week days and on weekends
4. Please distribute 10 points between following 4 age groups to reflect the most common customers at this location:

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Children (0-14 years)
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Youth (15-24 years)
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Adults (25-64 years)
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Seniors (65+ years)

5. Please check the most accurate answer, according to your own knowledge:

☐ Most of customers at this location are local residents*

☐ Most of customers at this location are occasional visitors**

☐ Most of customers at this location are regular visitors***, but I do not know where they live

☐ Customers at this location represent a mix of local residents, regular visitors, and occasional visitors

☐ I do not know if customers at this location are either local residents, regular visitors or occasional visitors

*Local Residents are people that you recognize and you know that they live in surrounding neighbourhoods

**Occasional Visitors are people that you do not recognize and you do not know where they live

***Regular visitors are people that you recognize but they might not live in the surrounding neighbourhood

Thank you for participating.

To return completed questionnaire or if you have any questions, please contact:
Slavica Atanackovic-Puzovic, 604 7215481, s.atanackovic-puzovic@alumni.ubc.ca
Appendix E: Survey Results

Location no.1 - Dunbar Street:
- results from 6 units

1. How long have you been working at this location
   - Less than 1 year  1
   - 1-5 years  2
   - More than 5 years  3

2. Do you work both in the morning and in the afternoon?
   - Yes  6
   - No  0

3.  
   - I work on week days  3
   - I work on weekends  0
   - I work both on week days and on weekends  3

4. Please distribute 10 points between following 4 age groups to reflect the most common customers at this location
   - Children (0-14)  0  0  (0-10) 1  1  1  1
   - Youth (15-24)  0  2  (0-10) 5  2  2  1
   - Adults (25-64)  5  3  (0-10) 10  3  4  3
   - Seniors (65+)  5  4  (0-10) 10  4  3  5

5. Please check the most accurate answer, according to your own knowledge:
   - Most of customers at this location are local resident  6
   - Most of customers at this location are occasional visitors  0
   - Most of customers at this location are regular visitors, but I do not know where they live  0
   - Customers at this location represent a mix of local residents, regular customers, and occasional visitors  0
- I do not know if customers at this location are either local residents, regular visitors or occasional visitors 0

*Local Residents are people that you recognize and you know that they live in surrounding neighbourhoods

**Occasional Visitors are people that you do not recognize and you do not know where they live

***Regular visitors are people that you recognize but they might not live in the surrounding neighbourhoods

Location no. 2 - West Broadway:
- results from 9 units

1. How long have you been working at this location
- Less than 1 year 3
- 1-5 years 4
- More than 5 years 2

2. Do you work both in the morning and in the afternoon
- Yes 9
- No 0

3.
- I work on week days 0
- I work on weekends 1
- I work both on week days and on weekends 8

4. Please distribute 10 points between following 4 age groups to reflect the most common customers at this location
- Children (0-14) (0-10)8 1 0 0 2 1 0 0 0 (0-10) 8
- Youth (15-24) (0-10)7 1 3 2 3 2 0 2 1 (0-10) 7
- Adults (25-64) (0-10)7 6 5 6 3 4 5 5 6 (0-10) 7
- Seniors (65+) (0-10) 9 2 2 2 2 4 5 3 3 (0-10) 9

5. Please check the most accurate answer, according to your own knowledge:

- Most of customers at this location are local resident 3
- Most of customers at this location are occasional visitors 0
- Most of customers at this location are regular visitors, but I do not know where they live 0
- Customers at this location represent a mix of local residents, regular customers, and occasional visitors 6
- I do not know if customers at this location are either local residents, regular visitors or occasional visitors 0

*Local Residents are people that you recognize and you know that they live in surrounding neighbourhoods

**Occasional Visitors are people that you do not recognize and you do not know where they live

***Regular visitors are people that you recognize but they might not live in the surrounding neighbourhoods

Location no.3 - Main Street:

- results from 7 units

1. How long have you been working at this location
- Less than 1 year 2
- 1-5 years 2
- More than 5 years 3

2. Do you work both in the morning and in the afternoon
- Yes 7
- No 0
3. 
- I work on week days 0
- I work on weekends 0
- I work both on week days and on weekends 7

4. Please distribute 10 points between following 4 age groups to reflect the most common customers at this location
- Children (0-14) 0 1 0 0 (0-10) 5 0 (0-10) 1
- Youth (15-24) 1 2 2 0 (0-10) 6 2 (0-10) 2
- Adults (25-64) 7 5 6 10 (0-10) 9 6 (0-10) 10
- Seniors (65+) 2 2 2 0 (0-10) 8 2 (0-10) 4

5. Please check the most accurate answer, according to your own knowledge:
- Most of customers at this location are local resident 2
- Most of customers at this location are occasional visitors 0
- Most of customers at this location are regular visitors, but I do not know where they live 0
- Customers at this location represent a mix of local residents, regular customers, and occasional visitors 5
- I do not know if customers at this location are either local residents, regular visitors or occasional visitors 0

*Local Residents are people that you recognize and you know that they live in surrounding neighbourhoods

**Occasional Visitors are people that you do not recognize and you do not know where they live

***Regular visitors are people that you recognize but they might not live in the surrounding neighbourhoods
Location no.4 - Commercial Drive:
- results from 5 units

1. How long have you been working at this location
   - Less than 1 year  1
   - 1-5 years  2
   - More than 5 years 2

2. Do you work both in the morning and in the afternoon
   - Yes  4
   - No  1 – Only in the afternoon

3.
   - I work on week days 0
   - I work on weekends  1
   - I work both on week days and on weekends 4

4. Please distribute 10 points between following 4 age groups to reflect the most common customers at this location
   - Children (0-14)  1 (0-10) 8 1 1 1 (0-10) 4
   - Youth (15-24)  3 (0-10) 5 1 3 (0-10) 3
   - Adults (25-64)  3 (0-10) 1 6 5 (0-10) 8
   - Seniors (65+)  3 (0-10) 6 2 1 (0-10) 7

5. Please check the most accurate answer, according to your own knowledge:
   - Most of customers at this location are local resident  1
   - Most of customers at this location are occasional visitors 0
   - Most of customers at this location are regular visitors, but I do not know where they live 0
   - Customers at this location represent a mix of local residents, regular customers, and occasional visitors 4
   - I do not know if customers at this location are either local residents, regular visitors or occasional visitors 0
*Local Residents are people that you recognize and you know that they live in surrounding
neighbourhoods

**Occasional Visitors are people that you do not recognize and you do not know where they live

***Regular visitors are people that you recognize but they might not live in the surrounding
neighbourhoods
Appendix F: Glossary of Items

Social Sustainability
Based on the reviewed literature following definition of sustainability was adopted for this study:
Social sustainability represents a set of constant and variable qualities and processes that characterize certain (urban) area in order to provide quality, equitable, inclusive and diverse living for all members of the related community, with five elements that build social sustainability of the public realm of a neighbourhood: equity, diversity, urban design, democracy and governance, and community stability.

Public Realm
“The public realm is made up of the public places or spaces in a city, which spaces tend to be inhabited by persons who are strangers to one another or who “know” one another only in terms of occupational or other nonpersonal identity categories such as bus driver/customer.”
Similarly, in this study the term public realm of a neighbourhood includes all non-private spaces, open and enclosed, including various buildings, parks, streets etc.

Dynamism
Dynamic feature of social sustainability is reflected through the dynamic change of buildings; it s valued through the number of buildings, since more buildings most likely means more owners which leads towards more incremental change within the neighbourhood, and variety of building age; more owners and variation in age between
buildings possibly means economic diversity of community.

Diversity
Diversity is reflected in flexibility and adaptability of a neighbourhood to support needs of different social groups.
Diversity of use provides opportunity for different activities at different times throughout the day; contributes to higher variety of users;
Diversity of design reflected through the number of buildings, diversity of design add to the overall interest and quality of the street;
Diversity of users suggests that people belonging to different social groups (age in this case) have the reason and opportunity to actively participate in the life of the street.

Social Interactions
Socially sustainable public realm implies opportunities for different social interactions between members of different groups
Transparency of frontages – building/street frontages that are transparent and/or open promote interactions and connections between people inside and outside of the buildings;
Potential points for social interaction – shown through the number of doors located on the building side facing the street, and the number of passageways between buildings, it represents the potential number of opportunities to come across someone walking down the street.

Walkability
Walkability is defined as the feature of the street that characterizes it as comfortable to walk on, and includes proper weather protection, either natural or artificial, complexity of building frontages and width of different units within the building which both contribute to the attractiveness of the street.
Safety

One of the ways to achieve the safety of the street is to have people continuously present on the street, overseeing the activities on the street. Therefore, fairly even number of units open throughout the day is potentially creating continuous flow of people down the street from early in the morning until late evening.