SUSTAINABLE COMMUNITY DEVELOPMENT – IMPACT OF RESIDENTS' BEHAVIOUR ON TOTAL SUSTAINABILITY OF A SUSTAINABLE COMMUNITY

By

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We accept this thesis as conforming to the required standard

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Abstract

Planners and designers of sustainable communities claim they design them according to sustainability principles, but residents must also embrace those principles in their private lives in order to reduce the community's ecological footprint. One such sustainable community is the "UniverCity" on Burnaby Mountain next to the Simon Fraser University. This research investigated the influence of the residents' individual behaviour on the total ecological footprint of this sustainable community and how planners can influence their residents' behaviour. Using the UniverCity as a case study, this research demonstrates that not all sustainable community planners attempt to influence the residents' behaviour to be more sustainable and that the planners do not always measure the ecological footprint of a community. The study recommends that community planners should attempt to measure this or similar indicators and use direct and indirect influencing methods to build an active and engaged community and foster sustainable behaviour.

Keywords: sustainable community, planning, development, economic consideration, environmental performance, ecological footprint, behaviour, UniverCity

Acknowledgements

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Chapter One: Introduction

Many Canadian communities are experiencing increasing growth and its subsequent development pressures (Beckett, 2006). Infrastructure in Canada in past decades was developed with little understanding of the human impact on the environment, and it locked communities and residents into living practices now considered by many as unsustainable (e.g. Connelly, Markey, & Roseland, 2009). In response to this unsustainable development, some communities have initiated sustainable community development practices in order to engage in responsible and proactive planning (Beckett, 2006). Sustainable community development is an ideological shift that "recognizes the interrelated nature of the economic, environmental and social aspects of communities" (Beckett, 2006, p. 1).

Sustainable community planning, however, not only includes sustainable building practices, proper economic residential area development, and low-income housing, but should also include an educational program for residents to foster a more sustainable and environmentally conscious lifestyle (Hodge & Haltrecht, 2009). Although this part of sustainable community planning is widely accepted, it "is still not appreciated widely enough" (Hodge & Haltrecht, 2009, p. 6). The BedZED community in Surrey, UK, showed that by introducing a carbon neutral toolkit and influencing residents' behaviour in their community, "sustainable lifestyle strategies were a very cost effective way to reduce impacts compared to expensive infrastructure" (Hodge & Haltrecht, 2009, p. 6). It is therefore imperative to influence the community living within these sustainable communities to embrace sustainable initiatives and behaviour to increase overall sustainability.

This study examines the degree to which the inhabitants of a development planned as a sustainable community embrace sustainable lifestyle practices. The research uses the "UniverCity" community, a sustainable community on top of Burnaby Mountain in Burnaby, BC, Canada, as a case study to determine how participation of inhabitants determines the overall sustainability performance of this community.

This research explores the question: "How does decision making behaviour by the residents of a planned sustainable community influence environmental performance?" The main objectives of the research are:

1. To ascertain the degree to which the residents are influenced by the incentives created by planners to influence the residents' behaviour to be more sustainable.

2. To ascertain to what extent the behaviour of residents enhances or detracts from the sustainability of the community.

3. To ascertain what indicators are used to measure overall sustainability of the community, if at all.

Chapter Two: Context and Definition

This chapter will give the context of the research. It will set the background of the need

for sustainable community development by introducing the origin of sustainable development

and putting it into context with the definition of the expression of community. It will further

explore how the behaviour of a community can be influenced, how community members tend

to make decisions for or against sustainable behaviour, and how their influence can be

measured.

Sustainable Community Development

*Each generation is entitled to the interest on natural capital, but the principle should be handed
on unimpaired.*
                    —Canada's Commission on Conservation, 1915 (Irwin, 2004, p. 72)

Sustainable community development as a concept has developed over a number of

years, as sustainable development (SD) has been linked with community development and

created ideas of "sustainable" or "green cities" (Caldwell, 2008; Evans, 2002; Hallsmith, 2003;

Roseland, 1997; Roseland & Connelly, 2005).

Sustainable development. Sustainable development (SD) is vital for our current world if

we wish to meet our present needs without compromising the needs of future generations

(Brundtland, 1987). The idea of sustainable development established itself more than 40 years

ago in the directive adopted by the International Union for Conservation of Nature (IUCN) in

1969 (Adams, 2006). Sustainable development was also the "key theme of the United Nations

Conference on the Human Environment in Stockholm in 1972" (Adams, 2006, p. 1). The notion

of sustainable development differs from the idea of ecological stewardship (crop rotation, limits

on grazing on the commons), which has a long tradition in agriculture and other human

activities, because it explicitly suggests that it is possible "to achieve economic growth without

environmental damage" (Adams, 2006; Irwin, 2004). The concept was progressively developed

by the World Conservation Strategy (1980), the Brundtland Report (1987), and the UN

Conference on Environment and Development in Rio (1992) (Adams, 2006). The definition by

the Brundtland report, entitled "Our Common Future" (1987), states:

> Sustainable development is development that meets the needs of the present without
>
> compromising the ability of future generations to meet their own needs. It contains
>
> within it two key concepts:
>
> - The concept of "needs," in particular the essential needs of the world's poor, to
>
>   which overriding priority should be given; and
>
> - The idea of limitations imposed by the state of technology and social
>
>   organization on the environment's ability to meet present and future needs.
>
>   (Brundtland, 1987, Ch. 2, para. 1)

This definition encompasses two fundamental issues: "the problem of the

environmental degradation that so commonly accompanies economic growth, and yet the need

for such growth to alleviate poverty" (Adams, 2006, p. 2). Adams notes, "The core of

mainstream sustainable development thinking has, however, become the idea of three

dimensions: environmental, social and economic sustainability" (2006, p. 2).

The IUCN Programme 2005-8 (Adams, 2006), used a model of interlocking circles, as

shown in Figure 1, to demonstrate that the three dimensions of SD need to be better integrated

and that all three dimensions are equally important and should be in balance (Adams, 2006).
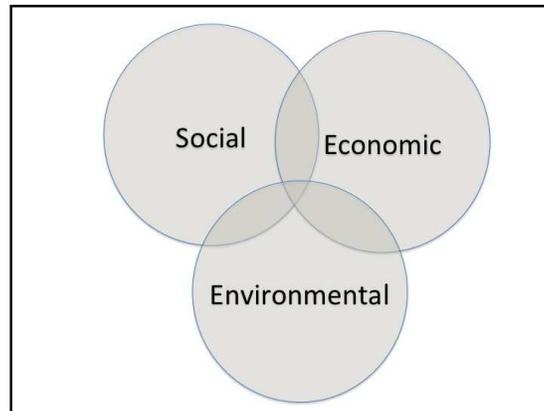
Figure 1. The three dimensions of sustainable development. (Adapted from "IUCN – The Future of Sustainability," by W. M. Adams, 2006, published on IUCN.org, retrieved from http://cmsdata.iucn.org/downloads/iucn_future_of_sustanability.pdf)

Sustainable development is therefore the ability to reconcile the need for economic development without compromising ecological or social systems (Beckett, 2006; Dale & Hill, 2001; Hallsmith, 2003).

The benefit of the continuing discussion between scientists, economists, politicians and communities on how SD should be understood keeps the topic of sustainable development from fading out of attention. Its ambiguity creates beneficial dialogue (Dale & Hill, 2001). SD can play a significant role in the community-planning context in achieving the ideal of local sustainability, although the conditions of sustainability might never be fully met (Beckett, 2006).

What is "community"? Barton (2000) describes "community" at first as a feeling, saying that "community" is a "quality of life that seems collectively valued giving a human being a sense of belonging," a quality of life that "resonates throughout our lives" (p. 147). He further describes it as the "layer of society in which interactions take place between people who are neither close family and friends, nor yet total strangers" and that "community" is "neither

private nor fully public" (Barton, 2000, p. 147). "Community" is commonly known as a group of

people (inhabitants of an urban area, a city, a country or even one house) but can also mean a

sense of belonging. Observing the way members of a group interact can help to determine

whether this sense of belonging exists in the group and if it can therefore be called a

community.

A sustainable community, therefore, is not just a group of people living in a certain area

but also a group that works together "based on ecological balance, community self-reliance and

participatory democracy" (Roseland, 1997, p. 199).

The need for sustainable community development. The 1992 Earth Summit in Rio de

Janeiro published what is referred to as Local Agenda 21 (Smith & Taylor, 2000), which

recognized the necessity of involving local governments in sustainable development through

local scale sustainable initiatives (Smith, 2000). Although many environmental issues are global

in scale, such as climate change and the loss of biodiversity and habitat around the world, it is

nonetheless essential that sustainability programs find a significant part of the solution in local

communities (Beckett, 2006; Irwin, 2004). These solutions could include retrofitting households

to be more energy efficient, improving public transport to reduce energy costs and carbon

emissions, repurposing land for urban agriculture and parks to strengthen the local food

systems and increase the number of ecosystems to prevent further elimination of species and

to prevent land erosion. These solutions may seem like small steps in comparison to global

issues, but they can provide the change society needs as long as all communities commit to

sustainability standards (Nozick, 1999). Population growth and subsequent land development

are inevitable in the future, and it is therefore important to have responsible, sustainable and

proactive land planning and community development mechanisms in place (Beckett, 2006).

Sustainable community development (SCD) is one suggested solution that attempts to

combine the three dimensions of economic, environmental and social development at the local

scale and is therefore an approach that has been taken by a number of community developers

and planners in Canada, such as the City of Guelph, Ontario and Southeast False Creek,

Vancouver, BC (Barton, 2000; City of Guelph, 2003; Irwin, 2004; Peck & Duancey, 2012).

Peck and Duancey (2012) consider the 12 major features of sustainable community

development to be:

- Ecological Protection	- Affordable Housing
- Density & Urban Design	- Liveable Community
- Urban Infill	- Sewage & Stormwater Management
- Village Centres	- Water
- Local Economy	- Energy
- Sustainable Transport	- The 3 R's (Reduce, Reuse, Recycle)

Communities are starting to include these features in their future planning, which is

redefining how they manage growth (Peck & Duancey, 2012). This is proving to be a challenge

for many, particularly as they attempt to integrate sustainable development while

accommodating local values and demands (Hanna, 2000).

The term *sustainable community* is as flexibly defined as sustainable development and

can be interpreted in many ways. There are a number of city planning concepts that have been

proposed to deliver sustainable communities, including "eco-cities," "healthy communities,"

and "sustainable" or "green cities" (Caldwell, 2008; Evans, 2002; Hallsmith, 2003; Roseland,

1997; Roseland & Connelly, 2005). The common theme is that these communities must support

and integrate the imperatives of sustainability into their planning goals. It should be a

community that meets the community's citizens' needs while preserving environmental

integrity (Beckett, 2006; Hallsmith, 2003; Roseland & Connelly, 2005). This is achieved by

minimising ecological impact in construction and operation but also by helping residents live in

responsible ways with respect to their impact on the Earth's resources (Hodge & Haltrecht,

2009). This implies that it is important not only to consider the buildings and how to design the

community but also to help the residents to live a sustainable lifestyle (Hodge & Haltrecht,

2009). This aspect is for example included in the 12 principles for a sustainable community

according to the Ontario Government Round Table on Economy and Environment (ORTEE)

(Smith, 2000). A sustainable community:

1. "Grows within limits and is linked to environment carrying capacity.

2. Places its values on cultural diversity.

3. Respects other life forms and supports biodiversity.

4. Nurtures values shared among community members and promotes them through
    sustainable education.

5. Employs ecological decision-making and integrates environmental criteria into all
    municipal government, business, and personal-decision making.

6. Makes balanced decisions and plans, which include perspectives from the social,
    health, economic, and environmental sectors of the community.

7. Makes best use of local resources and effort.

8. Uses reliable and renewable resources of energy.

9. Minimizes harm to the natural environment.

10. Fosters activities that use materials in continuous cycles.

11. Does not compromise the sustainability of other communities.

12. Does not compromise the sustainability of future generations through community

    activities." (Smith, 2000, p. 181)

Principle 4 implies the fostering of sustainable behaviour and the sharing of sustainable

practices in each citizen's day-to-day life and with their fellow community members. It also

implies an active role for the governing institution of each sustainable community to foster

sustainable behaviour amongst the inhabitants of the community. It suggests therefore that

community planners should play a more active role in fostering sustainable behaviour and

consumption patterns in their communities. The following paragraphs will describe some

techniques, methods, requirements, and dangers in implementing campaigns to foster

sustainable behaviour.

Fostering sustainable behaviour. One way in which behaviour can be influenced to be

more sustainable has been suggested by McKenzie-Mohr and Smith (1999). "Fostering

Sustainable Behaviour" is an introduction to community-based social marketing and gives local

governments or governing institutions, as well as engaged community members, a good

guideline for introducing a sustainable lifestyle into their community. The book provides a new

set of tools to run successful campaigns and persuade people to lead a more sustainable

lifestyle (McKenzie-Mohr & Smith, 1999). The authors provide the following step-by-step guide

to build and implement the marketing plan.

1. Uncovering barriers and benefits through

   a. Literature review

   b. Qualitative research (observational studies or focus groups)

   c. Survey

2. Creating commitment (what is it and how powerful can it be)

3. Using Prompts (how to use signs and reminders and how to create them)

4. How to identify and create social norms and how to use them

5. Communication: create effective messages

6. Incentives: enhancing motivation to act

7. Removing external barriers

8. Design and Evaluation: building effective programs

It can, however, be difficult to reach the commitment level required to implement a

new sustainability initiative because people have to alter their purchasing habits or behaviour

(McKenzie-Mohr & Smith, 1999). The proper development of a community-based social

marketing campaign, using the tools provided by McKenzie-Mohr and Smith (1999), has to

reach a certain level of commitment to be successful. The last step in their guide to creating

successful campaigns is therefore of great importance: the design and evaluation phase. The

designed campaign can be tested on small groups before implementation and its results can re-

shape the design (McKenzie-Mohr & Smith, 1999). The evaluation process can provide new

insights on the effectiveness of the designed campaign and feedback into the planning.

It is often believed "that by enhancing knowledge, or altering attitudes" (p. 9), is it

possible to change behaviour (McKenzie-Mohr & Smith, 1999). Simple sustainability education

campaigns, however, usually have limited impact on the behaviour of people living in a

community (McKenzie-Mohr & Smith, 1999). The issue with simple education campaigns is that

campaign managers of mass media information and education campaigns underestimate "the

difficulty of changing behaviour" (McKenzie-Mohr & Smith, 1999, p. 14). Most mass media

efforts to promote sustainable behaviour are based on traditional marketing techniques in

which the sustainable activity is perceived as a "product" to be sold, to be chosen over another

product. But altering consumer preferences is not creating behaviour (McKenzie-Mohr & Smith,

1999), who point out that "Campaigns that rely solely on providing information often have little

or no effect on behaviour" (p. 7). Traditional approaches should therefore be avoided.

McKenzie-Mohr and Smith (1999) recommend making connections with the community

in order to understand them better, and rather than implementing a simple educational

campaign, targeting campaigns at different groups within the community. The first step of their

guide emphasizes the cooperation with community members during the initial planning phase.

These community members are the ones that can help to identify their own barriers and social

norms. This information will lead to a campaign tailored to the target group (community).

Public participation is therefore necessary to create an effective campaign tailored to local

traditions and requirements.

Public participation. Public participation "is the meaningful involvement of people in decisions that affect their lives" (Hanna, 2000, p. 399). Communities with a high level of public participation during planning and rollout of policies and initiatives are more likely able to implement SCD policies regardless of resource availability (Irwin, 2004; Smith, 2000). Irwin (2004) confirms that a significant proportion of the social sustainability literature calls for vigorous public participation. He also states that any significant move towards sustainable urban development will require the interest, commitment, and social education of a wide cross section of the public.

Public participation is therefore an important factor in developing a consensus or shared understanding during sustainable community planning. It is also essential in the planning of successful campaigns to foster sustainable behaviour and to adjust sustainability strategies and plans to the local community's needs. Understanding these needs requires understanding how people make decisions. McKenzie-Mohr and Smith (1999) already pointed out that a proper campaign (and community) planner would have to understand the community in order to be able to implement a successful campaign. The community planner would have to understand what people targeted as valuable and what they see as barriers and how they make decisions.

Economic approach to decision making. McKenzie-Mohr and Smith (1999) criticise the classic economic understanding of decision making, whereby most decisions in a person's life can be traced back to a simple economic consideration. The classic understanding is that people make "decisions on production, consumption, and disposal within a certain set of economic institutions" (Field & Olewiler, 2005, p. 4). These institutions, which are the "fundamental set of public and private organizations, laws, and practices that a society uses to structure its

economic activity" (Field & Olewiler, 2005, p. 4), structure the incentives that lead people to

decide one way or another. These economic incentives are either designed to attract or repel

people from specific outcomes and, in theory, cause them to modify their behaviour in some

way. The personal valuation of these incentives is shaped by individual value systems and the

person's physical, social or economic environment. Economic incentives can be of monetary

nature (e.g. reduced costs) or non-monetary (e.g. self-esteem, the desire to preserve a

beautiful visual environment), and are often seen as consisting of payoffs in terms of material

or non-material wealth with people having an incentive to behave in a certain way in order to

accumulate wealth (material and non-material) (Field & Olewiler, 2005).

McKenzie-Mohr and Smith (1999) criticize this point of view; they point out that the

general assumption is "that individuals systematically evaluate choices, such as whether to

install additional insulation in their house or a low-flow showerhead, and then act in

accordance to their economic self-interest" (McKenzie-Mohr & Smith, 1999, p. 12). This would

suggest that a program designer simply has to run an education or information campaign to

point out the economic benefits of the installations or behavioural change in order to be

successful. Campaigns such as this, however, like most campaigns based on pure education and

the provision of information, have been largely unsuccessful (McKenzie-Mohr & Smith, 1999).

Programs have failed because they did not pay adequate attention to the "human side" of

promoting more sustainable energy use (McKenzie-Mohr & Smith, 1999). A United States

National Research Council (1984) study concluded that this view of human behaviour overlooks

the "mixture of cultural practices, social interactions, and human feelings that influence the

behaviour of individuals, social groups, and public and private institutions" (p. 2).

It is imperative for a sustainable community planner to understand the decision making behaviour and motivations of the current or future community members to be able to plan the community, its sustainable initiatives, education, and community based social marketing campaigns in a way to positively influence the community members in their adjustment to or adoption of a more sustainable lifestyle. These members might communicate their changes to others in the community and in turn stimulate a more significant impact of a campaign.

Sustainability indicators. The previous paragraphs provided details of possible ways to influence and understand behaviour of individuals and groups. In order to measure or track changes in behaviour, some scale of measurement is necessary. "Sustainability indicators have been defined as small pieces of information that reflect the status of larger systems" (Smith, 2000, p. 181) and have therefore the ability to measure the degree of success of these behavioural changes. These sustainability indicators have been developed in several sustainable community projects all around the globe (Smith, 2000).

Sustainable communities often use indicators to measure their degree of sustainability (Smith, 2000). These sustainability indicators make it possible to track progress towards a sustainable society (Bayley & Strange, 2008). Sustainability requires the measurement of more than monetary values due to the importance of ecological and social parameters as well as economic ones. The parameters that contribute essentially to "success" range from "access to education, health care and functioning ecosystems to freedom, justice and cultural expression" (Bayley & Strange, 2008, p. 100) and help to define indicators for measurement. An accurate definition of these indicators will give us the ability "to build a more sophisticated and stronger

knowledge base," and will probably speed up the progress in achieving sustainability (Bayley &

Strange, 2008, p. 100).

The Organisation of Economic Cooperation and Development (OECD) explored the

ability to measure sustainable development on a global scale and released their documents to

the public. They point out that it seems to be impossible to measure sustainable development

on a global scale due to the vastness of the topic (Bayley & Strange, 2008). Sustainability

indicators can help to alleviate this difficulty because they have the capacity to make complex

systems understandable, helping communities to determine "where they are, where they are

going, and how far they are from the chosen sustainability goal" (Smith, 2000, p. 181).

Bayley and Strange (2008) refer to a test created by the European Union (EU) to

demonstrate how to prevent pitfalls during the classification of sustainability indicators. The

"Sustainability A-Test" presents 44 different types of tools for assessing sustainability classified

into participatory processes, scenarios, multi-criteria analysis, cost benefit analysis, accounting

tools and models (Bayley & Strange, 2008; IVM Institute for Environmental Studies, 2012).

Bayley and Strange (2008) also point out that the development of sustainability

indicators touches a sensitive area of the society: "government accountability and social

participation" (p. 102). Smith and Taylor (2000) confirm and underline the importance of

participation by community members in the identification and implementation of these

sustainability indicators, since it is the community members themselves who will be most

affected by the community's sustainable development. This further illustrates the importance

of public participation on the process of sustainable community development.

Sustainability indicators can, however, "potentially narrow the scope of the process by limiting the individual's perspective and imagination, or community's focus" (Smith, 2000, p. 182), if not applied with thought to context (Smith, 2000). Despite this, the growing consensus is that the achievement of sustainable communities is best guided through the definition, implementation and monitoring of sustainability indicators that identify key factors of the progress (Hanna, 2000; Smith, 2000).

One example where sustainability indicators have been used to communicate SD and performance to a community is the "State of Sustainability" (City of Guelph, 1998), which provides data related to the City of Guelph in Ontario, Canada. The City tailored the indicators to their community's local context and requirements. The report uses quantitative indicators in combination with qualitative indicators and personal perception to create a data baseline to track progress and deterioration of natural systems in comparison.

The City of Guelph provided a follow up report in 2003 (City of Guelph, 2003). The report shows the progress of the community with sustainable development but also provides a view on the challenges they had to face after implementing the indicators. The second edition of the report concludes that

1. "The Guelph community is making progress in relation to the goal and target;

2. The Guelph community needs improvement in its performance;

3. It is hard to say whether we are moving in a favourable direction." (City of Guelph, 2003, p. iii)

The report shows that even with the proper process of public participation, identification of communal and local requirements, and the proper definition of sustainability

indicators, it is difficult to determine if the community is moving into the right direction when

adhering to the defined indicators.

Chapter Three: Case Study Background: UniverCity

This chapter provides a detailed background of the case study object "UniverCity." A case study is defined as an approach that uses in-depth investigation of one or more examples of a current social phenomenon, utilizing a variety of source data (Victor, 2006). UniverCity was developed as a sustainable community by the City of Burnaby, the Simon Fraser University (SFU) and the SFU Community Trust, to create a complete community on the Burnaby mountain, encompassing a diverse range of housing choices, shops, services and amenities (SFU Community Trust, 2011).

The groundwork for this community was laid in 1963, when Arthur Erickson and Geoff Massey submitted the initial plan for the Simon Fraser University (SFU) (SFU Community Trust, 2011). They envisioned a mountaintop campus anchoring a dense residential community. SFU agreed to transfer more than 320 hectares of University-owned land to the City of Burnaby 30 years later to start the envisioned project of a new suburban development. This act also doubled the size of the Burnaby Mountain Conservation Area. In return, the city approved an Official Community Plan (OCP) in 1996 to develop a residential community, which was later named "UniverCity" (SFU Community Trust, 2011). This OCP envisioned a dense, mixed-use community on 65 acres of land surrounding the SFU campus, allowing up to 4,356 residential units on two district neighbourhoods to the south and east, as shown in Figure 2. It included provisions for a commercial core, community facilities, and an extensive network of pedestrian paths and bike trails (SFU Community Trust, 2011). The City of Burnaby identified this as a perfect opportunity to build a model sustainable community. It formed the SFU Community Corporation, which manages the development of the UniverCity community and acts as a

trustee for the SFU Community Trust. It oversees the provision of zoned, serviced, subdivided

sites to private sector developers on a prepaid, long-term (99-year) leasehold. From the

beginning, the SFU Community Trust shaped the development of this community on Burnaby

Mountain. The SFU Community Trust has two goals/mandates:

1.   Create a complete community on Burnaby Mountain, with a diverse selection

        of housing and a full range of shops, services and amenities.

2.   Build an endowment fund to support teaching and research at SFU.
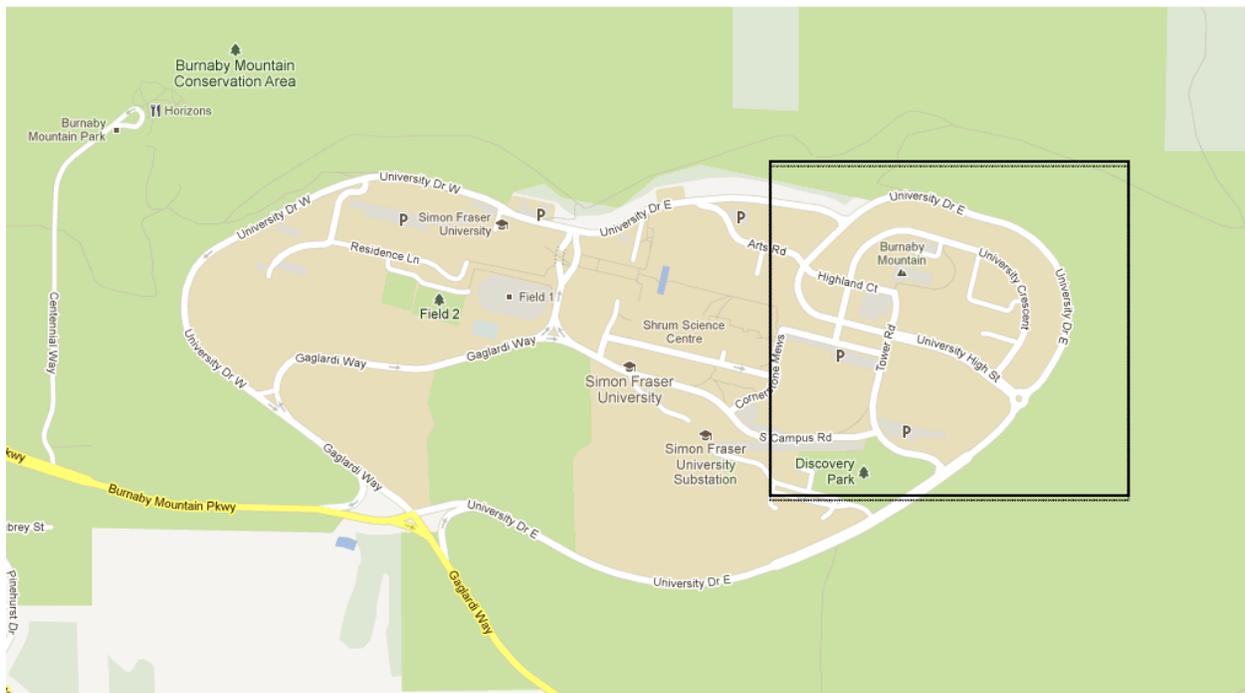
Figure 2. Location of UniverCity community on Burnaby Mountain (©**2013** Google)

The UniverCity Community is founded on four cornerstones of sustainability according

to the SFU Community Trust: Environment, Equity, Economy, and Education (SFU Community

Trust, 2011). The number of residents in 2012 was about 3,500 and is expected to increase to

about 4,000 during 2013 as several new developments will be completed. The estimate for the

maximum capacity at the end of all development phases is 10,000 with about 5,000 housing

units. So far about 25% of the units are in investor hands but are used as rental

accommodations; UniverCity is being marketed as an investment opportunity for local and

oversees investors due to its proximity to the Simon Fraser University campus.

Although there has never been a study like the present research conducted for the

community, two surveys were distributed in the past to determine the residents' satisfaction

with the quality of living and developments on Burnaby Mountain (SFU Community Trust,

2012). The case study provides a good opportunity to document and examine the processes,

views and factors affecting sustainability and will provide information to planners, decision

makers and communities in other areas.

Chapter Four: Research Methods

This research is a single case study as defined by Yin (2003) examining the UniverCity

sustainable community on Burnaby Mountain in Burnaby, BC adjacent to the Simon Fraser

University. A case study is defined as an approach "that uses in-depth investigation of one or

more examples of a current social phenomenon, utilizing a variety of source data" (Victor, 2006,

"Case Study Method," para. 1). The study is divided into four sections: (1) a literature review

on sustainable community planning, possible economic decision making behaviour and

motivations of residents of sustainable communities and environmental indicators; (2) a survey

of the residents; (3) interviews with selected individuals of the staff and board of the SFU

Community Trust ("the Trust"), the governing and planning institution in the community: and

(4) a review of data previously collected by the SFU Community Trust. These four sections and

methods of data collection have been used to ensure the validity of the data through

triangulation, which "refers to the use of more than one approach to the investigation of a

research question in order to enhance confidence in the ensuing findings" (Bryman, 2010, para.

1). The interviews, survey results and data review have several overlapping areas, which

converge on the facts of the case and made it possible in these instances to verify the data or to

point out possible discrepancies. The results from this case study cannot be generalized, but the

results and recommendations should be of help to planners, developers and planning scholars

in the field of sustainable community planning and development. Results of this investigation

can also be used for researchers for evaluation across empirical case studies in order to arrive

at results that can be generalized and compared.

Literature Review

The purpose of the literature review is to determine the indicators of sustainability to assess the degree to which the sustainable community is fulfilling its environmental/ sustainability objectives and to form the research's context and background (Victor, 2006). This consists of two parts:

   a. The review of the academic literature on sustainable community development describes how other communities have developed and used indicators to assess environment performance/sustainability. Examples of sustainable indicators can be "access to affordable housing or recreational opportunities (social indicators), unemployment levels or access to jobs (economic indicators), and water quality or the relative consumption rates of non-renewable versus renewable energy resources (environmental indicators)" (Smith, 2000, p. 181) (Objective 2 and 3)

   b. The review of material provided by the SFU Community Trust describes the UniverCity's performance indicators as set by the planners (Objective 2 and 3)

Survey of UniverCity Residents

The survey determines the degree to which residents understand the goals of the sustainability community, access the amenities that help to achieve the community goals, and accept the sustainable initiatives. The study used a mixed-methods approach to collect both quantitative and the qualitative data to obtain a richer, fuller and more complete understanding of the results given by the community (Victor, 2006, "Mixed Methods Research - Evaluation," para. 1). The data collected consist of:

a. Quantitative data on usage of facilities and alternative transportation, which made it

possible through categorization and statistical methods to rate the success and

acceptance of these programs and to show how the behaviour of the residents

influences the success of the community (Objective 2).

b. Qualitative data concerning the motivations of residents in moving to the

community and their acceptance and understanding of the sustainable community

goals. This provided information on the degree to which the sustainable community

was the reason people moved to the area, or if other motivations were of greater

influence (for example, cost of housing or proximity to employment) (Objective 1).

The survey was based on those conducted in 2007 and 2010 by the SFU Community

Trust through the Mustel Group (SFU Community Trust, 2010), which were conducted to track

the demographics of UniverCity's resident population and further gather feedback regarding

their attitudes, opinions, expectations and needs of their community. The survey was divided

into three segments:

1. Influences and Awareness of Sustainability Features

2. Work and Transportation

3. Demographics

Some of the questions were retained in the 2012 survey for trend analysis over the 5-

year period (SFU Community Trust, 2012b). Retained questions included questions about the

work location or about the primary mode of transportation to work of the respondent or other

members of the household. These questions enabled the observation of trends between 2007

and the present and, in some instances, a relationship between work location and mode of

transportation. A few questions were modified to either promote sustainability features of the community or to gather more detailed information of a household's mode of transportation. These new questions were introduced to gather information about the community's awareness of sustainability features and to ascertain whether the community is choosing to accept them. The SFU Community Trust and Mustel Group decided to release a condensed version of the survey and did therefore not include further questions asking for the motivation behind individual choices to accept or reject sustainability features. The research does therefore not touch on individual motivations of community members in the case study.

In the past the surveys have been conducted every two years to align with the SFU Community Trust development cycle. The Trust determines the needs of the community every two years and implements a strategic plan to address these needs in their development plan. An example for this currently is the community's desire to have larger apartments (three- and three-bedroom + den) available to accommodate families. Recent developments only include one- or two-bedroom condos because small condos give a higher profit margin for developers. The Trust approached potential developers of the next development phase to include larger apartments; this will be completed within the next two years.

I sent out a postcard invitation on 14th November 2012 to all residences from a list made available by the Trust. Included in the postcard was a survey link that respondents could use to access the survey. In addition to the postcard invitation, emails were sent out by the Trust to households for whom they held email addresses, and finally phone calls were made to households for whom a publicly listed telephone number was available.

These three forms of survey invitation were used in order to reach as many households as possible. Some units on Burnaby Mountain are rental units (approximately 30%) and a properly addressed letter could be ignored, as it would not carry the tenant's name. A sole email invitation would have reached only the households that signed up for the community newsletter. The phone invitation would have only reached residents with a publicly accessible phone number record. The combination of all three methods therefore maximised the chance to reach most of the households. As an incentive, all those completing a survey were offered the opportunity to enter a prize drawing with the chance to win a $200 gift certificate for the community's grocery store.

In total 273 residents completed a survey from a total of 1,394 households that were invited. The margin of error on this finite sample size is +/- 5% at a 95% confidence level. The survey is added to this thesis as Appendix A.

Interview of SFU Community Trust Representatives

These interviews determined the perspectives of those attempting to implement the goals of the sustainable community, and how the residents and the initiatives offered deliver those goals. These interviews yielded the following types of information:

a. Qualitative information on the set of incentives the SFU used to influence the residents' behaviour and how they judge the incentive's success (Objective 1)

b. Qualitative information on what the SFU Community Trust was hoping to achieve with their various incentives (Objective 1)

The interview questions were designed in a way that produced relevant responses to address the research criteria. The selection for the participants was done in cooperation with

the SFU Community Trust with the Trust suggesting the most suitable interviewees. The

research required a person from the planning department of the community trust and a

representative of the board of directors. The two participants were asked to respond to the

following seven questions:

1. How would you describe your position within the organization? How long have you

    been with the SFU Community Trust?

2. What does sustainability or sustainable community development mean to you?

3. How do you define this concept in relation to UniverCity?

4. How successful do you think the SFU Community Trust has been incorporating the

    principles of sustainable community development into the community planning

    goals for UniverCity?

5. Do you think some sustainability education for new and existing residents would

    help to improve the sustainability of the community?

6. What would be the opportunities or challenges in implementing such a program if

    you thought it would be desirable?

7. Has the intention during the development of the UniverCity sustainable community

    ever been to trigger a lifestyle change in individual community members? If yes: how

    are you trying to trigger that? Are you measuring the process and do you think you

    have been successful?

Interviews were digitally recorded and significant points, statements and themes then

transcribed. Both interviewees agreed that the discussion could be recorded and one

interviewee gave his written consent for his name to be published in the thesis. The semi-

structured interview made it possible to focus participants on the issue of sustainable

community development in general and the UniverCIty community specifically.

Data Review

The data provided by sustainable service providers at UniverCity helped to verify the

survey results and therefore counteract the possible biases introduced through it. These

sustainable service providers are institutions providing an alternative transport method to a

personal vehicle. They were chosen because use and access to alternative transport, as a

service to the community, is a mandate of the SFU Community Trust and has been measured

over the years. The following data have been received and used:

- Data from Modo, a not-for-profit car sharing co-operative (Modo, 2011), which rents

  cars to members on an hourly rate. Modo provided the number of members using

  their service in order to determine how successful this alternative transport concept

  is in the community and whether residents accept this offer introduced from the

  SFU Community Trust.

- SFU Community Trust provided data on usage and development of the offered

  Community Transit Pass, a subsidized fare pass for members of the community, until

  its fade out in the beginning of 2012 (SFU Community Trust, 2011). This data is

  another indicator to determine whether alternative transport methods are used and

  if the SFU Community Trusts initiatives are successful.

This data included information on the use of alternative transportation methods, which

can be considered an indicator of sustainable behaviour (Smith, 2000), and the SFU Community

Trust indicators of sustainability (SFU Community Trust, 2011) (Objective 1, 2 and 3).

Chapter Five: Results

This chapter will give an overview of the results of the community survey, interviews

with SFU Community Trust officials and the data review.

Community Survey Results

Influences and awareness of sustainable features. The strongest influences, or reasons

to choose UniverCity, include the natural setting (96%), affordability of development (89%),

recreational opportunities (84%), and proximity or access to amenities (92%). The architectural

design, proximity to work or sustainability features are among other influencing factors, as

shown in Table 1.

Table 1. Factors influencing decision to live at UniverCity. Table derived from page 9 of the
UniverCity Resident Survey by Mustel Group (2012b)

How important were each of the following in your decision to live at UniverCity?	Total: Important (incl.Very important, Somewhat important)		
	2007	2010	2012
Natural setting	93%	97%	96%
Proximity/access to amenities			92%
Price/affordability	93%	95%	89%
Outdoor recreational opportunities	73%	79%	84%
Proximity/access to work	79%	76%	79%
Sustainability community features	79%	76%	77%
Architectural design of building	81%	77%	77%
Proximity/access to SFU	54%	59%	72%
Investment Opportunity	63%	53%	48%
Homebuilder/developer			41%

Base: 2007 (n=318), 2010 (n=275), 2012 (n=275)

85% of the residents are aware of at least one of the five prompted sustainability

features, with about half or more aware of most features, as shown in Table 2.

Table 2. Awareness of sustainability features at UniverCity. Table derived from page 15 of the UniverCity Residency Survey by Mustel Group (2012b)

Before today, which of the following sustainability features or initiatives at UniverCity were you aware of?	
At least one of these (Net)	85%
Living Building Childcare Center	68%
MODO Car Co-op	58%
Stormwater Management System	52%
Green Building Bylaw	48%
Burnaby Mountain District Energy System	28%
None of these	15%

Base: 2012 (n=273)

Work and transportation. The majority of residents in 2012 are employed (86%), which

is consistent with previous rounds of the survey in 2007 and 2010. 9% work from home and

72% outside their home, while 6% do both. Most of the people that work outside of their home

commute to either Burnaby (30%) or Vancouver (36%). The most common mode of

transportation is by private vehicle, but the proportion of residents who drive has fallen

significantly from 51% in 2010 to 41% this year. Also falling significantly is the use of public

transportation, down from 36% in 2010 to 25%. The proportion of those who walk to work has

increased since 2007 from 16% to 27% in 2012: this is likely due to a corresponding increase in

the proportion of respondents who work at SFU (18% in 2010 to 24% in 2012), as shown in

Table 3.

Table 3. Mode of transportation of respondents and members of their household. Table derived from page 21 of the UniverCity Community Survey from Mustel Group (2012b)

What is your usual mode of transportation (to work)?	2007	2010	2012
Personal vehicle	60%	51%	41%
Transit	34%	36%	25%
Walk	16%	22%	27%
Bike	3%	5%	1%
Car pool/car share vehicle	4%	3%	3%
Other	2%	0%	2%
Not stated	3%	2%	0%

What is the usual mode of transportation to work of other members of your household working outside of the home?*		2010	2012
Personal vehicle		53%	46%
Transit		39%	46%
Walk		13%	25%
Bike		3%	0%
Car pool/car share vehicle		3%	7%
Other		2%	3%
Not stated		4%	0%

* Asked only in 2010 and 2012

While almost all residents have used public transport at one time or another, only 39% uses it at least once a week or more. The majority (59%) use transit a few times a month or less often. 19% of the residents have made use of the car co-op service (by Modo), but 13% of them who do only use it a few times a year or less often, as shown in Table 4.

Table 4. Use of alternative transportation at UniverCity. Table derived from page 22 of UniverCity Community Survey by Mustel Group (2012b)

How often did you personally use:	Public Transportation		Car Co-op / Car Share	
Ever Used (Net)		95%		19%
At least once a week	39%		3%	
A few times a month	20%		2%	
Once a month	9%		1%	
A few times a year	20%		7%	
Less often	7%		6%	
Never Used		5%		81%

Base: 2012 (n=273)

Demographics. The majority of households at UniverCity have two adults (68%) or a single adult (22%). The proportion of households with children increased steadily from 20% in 2007 to 40% currently. Almost all households have someone associated with the Simon Fraser University (SFU), an upward trend since 2007, explained by an increase in faculty and staff members living in the community (from 18% to 24%). The majority of households in the community have only one car (64%) and one parking space (78%). 83% of the respondents are planning to stay in the community for the foreseeable future.

Interview Results

Two interviews were conducted with officials of the SFU Community Trust. The first one was with a member of the board of the SFU Community Trust, who wished to remain anonymous; the second interview was conducted with Dale Mikkelsen, Director of Development at SFU Community Trust.

Dale Mikkelsen is a member of the staff of the SFU Community Trust. He oversees the development of the UniverCity and is its liaison to the community, board and contractors. He

works with the board of directors and is responsible for the strategic planning during the

development of the next building phases. The standard development timeframe for the

different stages of the UniverCity is two years. Mikkelsen states that he runs all decisions of the

board through the filter of the "Four E's": Environment, Economy, Equity, and Education. He is

responsible for the development of infrastructure and oversees the physical and sustainable

growth of the community. He has a staff of five.

Both interviewees explained what sustainable community development means for them

and the SFU Community Trust, and how it is implemented and measured it in the community.

What does Sustainable Community Development mean to you? Both interviewees

define SCD as using the "three legged" approach (environmental, economic, social), and

Mikkelsen extended this view during the interview with the model for sustainable community

development of the SFU Community Trust, which is explained below. Both believe that

sustainable community development means equal development in all three areas. The member

of the board pointed out that several sustainable developments have "stupid trade-offs." He

points out that these trade-offs are usually based on the uneducated understanding that

sustainability is only related to environmental sustainability and that the important thing is just

to "be green." To the board member, these developers do not consider the other two

dimensions: economic and social.

Mikkelsen added that the SFU Community Trust saw that it is difficult to develop the

three dimensions equally during each phase of the development of UniverCity. The economic

aspect is usually the most important in the beginning to get the developers in the door to start

the development. They therefore added the fourth dimension of "education" and created the

UniverCity's logo, displaying the four E's (Environment, Equity, Economic, Education). Mikkelsen

compared this view to a stool, seeing dimensions of sustainable community development as the

legs of the stool and the length of each leg as the amount of development in this area. He

usually says that a three-legged stool with unequal development in the three areas is easy to tip

over, while adding a fourth dimension makes it easier to keep the stool in balance. He added

that the Trust is running the community surveys at the end of each development phase to

check whether the development in the community's four dimensions are equal or if they have

to shift their focus during the next two-year phase on a specific dimension to reach

approximate equality again. As an example, he said that they would have to focus on sales if

they are unable to finance infrastructure enhancements and then shift back to the other

dimensions during the next phase if they neglected them. The 2012 community survey revealed

a surge in families in the community who are looking for a bigger living space. The survey shows

that there are insufficient numbers of units supporting families in the community. The next

development phase will therefore focus on the development of these family unit sizes.

The education dimension, which the Trust added to the standard three imperatives of

sustainable community development, is realized by educating students, community planners,

developers or other sustainable communities about the experiences gained and practices

developed during the creation process of the community. The Trust's staff travel to conferences

and universities throughout the year to share their experiences. They also conduct "open

houses" for community members of the UniverCity, but the turnout has been slim in the past.

These open houses are supposed to inform residents about the sustainability features and

initiatives the Trust has in store for them. Mikkelsen and his colleagues assume that the timing

for these open houses has been bad, and they are planning the next one during times where

residents will hopefully be able to attend.

The experience in creating and developing this community is extensive. The Trust is

usually ahead of federal regulations and tries to be as cutting edge with their initiatives as

possible. They developed the first LEED certified mixed use building (Cornerstone building) in

Canada. Mikkelsen said that critical voices stated that it would be impossible to create a

residential LEED certified building. They also created the first sustainable LEED certified low-

income housing project (Verdant building) and showed that the equity (social), environmental

and economic aspect of sustainable community development can be developed at the same

time. They recently opened the first "net zero" childcare center on the mountain. Mikkelsen

said that they try to stay ahead of the curve and to prove the possibility of a project before they

implement bylaws to enforce these new and proven aspects on new projects, built by

developers. They want to lead by example.

The goal is that the SFU Community Trust will close its office once the last building has

been built and the community is up and running. This shows the need for development of an

active and engaged community, which is able to care for its own once the office of the Trust

closes.

What does SCD mean in context to UniverCity? Both interview partners quoted the

four E's of the UniverCity's mission, pointing out that they just renamed the three SCD

dimension (environment = ecologic; equity = social; economy = economic) and added the

dimension of "education" for the UniverCity community. The member of the board said that

"education" in this definition of the UniverCity's vision was never about educating the

community about sustainable development or sustainable behaviour. It was simply defined in

respect of its geographical proximity to a major educational institution, also giving the

opportunity to educate students, and as a tool to share the experiences with other planners

and developers. Mikkelsen confirmed this view.

Implementation of SCD into the community. While Mikkelsen pointed out that the

Trust has been very successful in developing the community according to SCD principles (4 Es),

the member of the board advised that the Trust's mission does not include education about

sustainable behaviour. Their mandate/target is only to build a community and an endowment

fund for the university. He also said that they also want to become a model community of

international acclaim. The SFU Community Trust's board decided that the basic incorporation of

SCD principles into the planning of the community is important but not mandatory. To the

board member, the emphasis on the sustainability aspect very much depends on the members

of the board of directors and its CEO.

Several environmental-minded board configurations in the past led to the success of the

community. UniverCity won several ecological awards, among them "Award of Excellence: Most

Sustainable" from the Urban Development Institute in 2012 for the net-zero childcare center

(net-zero energy consumption and zero carbon emissions) and the "National Excellence Award

for Innovation in Green House Planning" from the American Planning Association in 2008. They

have done very well with respect to green building standards development, energy efficiency

and geothermal development (SFU Community Trust, 2012).

Both interviewees agree that the community has done very well economically. It developed properly according to the Trust's plans and provided a flow of money back to Simon Fraser University.

The social imperative of SCD has been addressed through the below-market housing in the Verdant project. SFU had a disadvantage due to its prime location and proximity to the high cost housing market in the Metro Vancouver area. They were not able to provide higher wages to alleviate the costs for prospective faculty's living expenses. It was therefore difficult to get new faculty members to join SFU. The below-market project "Verdant" has since been a successful project to attract new faculty and staff to work at SFU and at the same time make affordable housing available for them. Mikkelsen added that they are planning further affordable housing projects and maybe even a below-market rental building for faculty and staff.

Both interviewees agreed that the educational aspect of the four E's in the UniverCity community should include a program to educate the community on sustainable living and behaviour. The member of the board, however, said that he "does not know who would be the person responsible for this project." In Mikkelsen's opinion, the Trust cannot "act as a preacher" and "invade the living rooms of residents" with a message of sustainability. The member of the board agreed on this point and added that the Trust cannot dictate the residents' way of life. Both interviewees see the community as the responsible and active part in this development. The responsibility lies with the 3500 habitants of the community to show interest and passion for this education and lifestyle. The Trust would welcome this development and provide resources and financing for sustainable education campaigns and

initiatives. Both agree that the Trust is trying to make it easy for residents to lead a more

sustainable lifestyle by providing a local infrastructure, easy access to public transit and co-op

cars. Mikkelsen called it a "toolbox for the community" but said that "they have to be willing to

use it." The member of the board added that the intention of the Trust was to make it easy for

residents to make a sustainable decision without being a convinced environmentalist. He also

mentioned that behaviour change could lead to attitude change, although he stressed again

that the next step needs to come from members of the community. He stressed that it is more

difficult in UniverCity than in other communities to find a common and non-transient group to

drive an initiative like that.

One of the targets of the Trust is to create a similar demographic on the mountain as

found in the rest of the lower mainland and not to build an "elite" community, with the only

difference that they want to also attract faculty and staff for SFU. But they still have to live with

the fact that UniverCity is a primary location for students, faculty and staff. Mikkelsen had said

that 25% of the residents are tenants. The member of the board added that students are even

more transient than traditional tenants, and even if they buy their property they will only be at

the site for a limited amount of time. Additionally, single people or young couples, who tend to

seldom engage in community activities, occupy most of the homes. This makes it difficult to

create an active and engaged community that would be able to lead a sustainable behaviour

project over several years. It would be necessary to find local champions who are willing to take

on a project like this and stay for the duration of the project until its completion.

Measurement of SCD. Both interviewees said that the community survey is one of the

only forms of measurement the Trust initiates apart from the economic figures, such as house

prices, development sales numbers and rental numbers. It is important for them to identify

weaknesses in their strategic planning and to align the next developments with the residents'

desires and wishes. This will result in recommendations by current residents to prospective

residents and will also attract developers. There is no measurement or goal-setting for

sustainable education or its effects, since this is not in the Trust's mandate.

The Trust does, however, constantly improve the sustainability building standards and

just recently made it mandatory for developers to build to LEED standards, use low flow toilets

and Energy Star rated appliances. The next step will be, after the recent completion of the net-

zero childcare center, to educate other planners and developers about possibilities and

production costs of future developments, and to make "net zero" the new standard in the

UniverCity. Mikkelsen wants to get a future developer to build a net-zero residential building on

the mountain to prove that it is possible for other developers as well.

Data Review

This section presents the results of the review of data on Modo car and public transit

(Translink) use.

Modo – the car co-op. Modo was able to provide current numbers on members signed

up for their service in the UniverCity community. They have 46 people enrolled in the service.

This includes individual members and members that are affiliated as a driver on a corporate

account (Henegar, personal communication, November 29, 2012). They were not able to

provide further statistics (trends and developments over the past years). 46 members of 3500

residents is 1.3%. The survey result gives a significantly higher number of 19% (respondents

that used the coop car service at least once in a year). It shows the possible level of error

between the community survey and reality, due to the survey sample size.

Community Transit Pass. The SFU Community Trust started a program in February 2006

and provided the possibility for community members to sign up for a community transit pass

with the ability to travel the complete Translink network in Vancouver and the Lower Mainland

for about $30/month. The project was financed through Translink and Vancity, a member-

owned financial co-operative (Vancity, 2013), and was supposed to only run for one year

(Mikkelsen, personal communication, December 5, 2012). In the end it ran until the end of

2011. The numbers provided by the SFU Community Trust show an increase of sign ups of

1131% over the period of the project (12.3 times since the beginning). There was even a 9%

increase of users of the pass in the time from 2010 to 2011 without significant development of

new buildings on the community. The final number of people enrolled in the service was 726

(20%). The project was abandoned at the end of 2011 due to the withdrawal of funding by

Vancity. Community members can now sign up for the U-Pass provided by SFU. Translink was

not able to provide a number of enrolled residents of the UniverCity, as they do not distinguish

between SFU students and UniverCity residents in their statistics. The research will therefore

use the Community Transit Pass numbers for its analysis because there was no significant rise

or change in resident numbers in 2012.

Chapter Six: Analysis and Discussion

This chapter presents the analysis of the data in respect to the research objectives

outlined above. It compiles the data from the literature review, survey, interview, and data

review.

Objective 1: Degree to which residents are influenced by the incentives created by planners

to change the residents' behaviour to be more sustainable

Both interview partners confirmed that they think that a sustainable community should

also have a component of fostering sustainable behaviour, but they also agreed that the

initiative for this education should come from the community and would then get supported by

the Trust. They both confirmed that the SFU Community Trust would provide resources and

funding if the community were to approach them with the request to run campaigns to foster

sustainable behaviour. Mikkelsen's toolbox example ("we deliver toolbox but the community

has to accept it") confirms that UniverCIty is providing sustainable options with easy access to

public transport and co-op cars (Modo) and sustainable infrastructure planning (local shopping

facilities, elementary school and childcare center), but they do not engage in actively

influencing the residents of the community. The results of the community surveys show that

only a small number of residents engage with these "tools". Only 19% of respondents for

example ever used the Modo car co-op service, 6% at least once a month, although 58% are

aware of its existence as a sustainability feature of the community. The low interest in the

community's education attempts through "open house" evenings, seen through very limited

numbers of attendees, could show the low interest of the community in this topic, or just

require a different, more active marketing approach (Mikkelsen, personal communication,

December 5, 2012). Only 30% of respondents use public transport once per week, a number

that fell significantly since 2010, most likely through the abandonment of the Community

Transit Pass. The Modo (co-op car) membership is at 1.3% according to the company's records.

These numbers show that the community is either unaware of the options the Trust

provides to foster sustainable behaviour, that they are simply not interested in it or that these

incentives have not been advertised in a fashion that the community responds to them. They

show, however, that the planners were very successful with the initial mandate, to build a

community for SFU faculty, staff and students, because the number of respondents using

"walking" as their primary mode of travel to commute to work and the number of residents

with affiliations to the university increasing significantly between 2010 and 2012. This

represents another issue the community has to deal with: the number of students and other

transient residents. Mikkelsen pointed out in the interview that young professionals, singles

and couples, which make up a large population on the mountain, tend to return home from

their workday in Burnaby or Vancouver, park their car in the underground car park and then

lock themselves in their apartments instead of engaging in interaction with other community

members. This inhibits the forming of interactive groups, which could engage in fostering

sustainable behaviour amongst community member on the mountain. Mikkelsen sees a

positive development in the community working against this isolation with the results of the

current survey. The demand for family size apartments shows that more families are moving to

the mountain. He provided a personal example where families start to communicate and bond

on the playground when they go there with their children. He said that grown-ups tend to

distance themselves from others if they do not know them. Children do not know this and

interact with nearly every child they come across on the playground. Parents use this moment

to then start conversations with the parents of the new playing partner of the child, breaking

down the barrier formed by society. He said that a community of families is usually more

interactive than a community of individuals or couples. He hopes that the UniverCity

community will develop into an engaged and active community.

Mikkelsen and the representative of the board agree that the Trust would help to kick-

start a movement to educate about sustainable consumption patterns and behaviour if the

community would request it. The key for this would be to identify champions amongst the

residents who are willing to form a group of active people at the core of the movement. The

Trust would support them to run their campaigns within the community. A similar project

approach was very successful in Woonsocket and Olneyville, Rhode Island (Vaughan, 2009). The

process started there by hiring fulltime sustainable communities coordinators whose primary

responsibility was to build neighbourhood coalitions and advance the process (Vaughan, 2009).

They identified champions interested in developing the community into a sustainable and

active community, assembled this core group, and provided training to identify approximately

100 leaders in each community, including directors of non-profits, school principals, business

people, clergymen, and activists (Vaughan, 2009). Mikkelsen and the members of the board see

this as a possible track for UniverCIty to foster sustainable behaviour in the community in the

future. They agree that the community will have to develop an active and engaged community,

which might then demand the support for sustainable behaviour education and support. The

recommendations section will provide a potential development scenario for the UniverCIty.

Objective 2: To what extent does the behaviour of residents enhance or detract from the sustainability of the community?

Mikkelsen and the member of the board agreed that each resident of the UniverCity community is responsible for his or her own decisions and that the Trust cannot dictate a specific sustainable behaviour onto them. The only things they can do are to provide the "tools" to lead a more sustainable life, but the residents have to desire and make the change. The survey numbers confirm this. The primary mode of transportation remains to be the car. It is, however, significant that the numbers for using a personal vehicle as the primary mode of transportation to work is trending down although the number of residents increased slowly. The number of respondents walking to work increased, which might be the result of geographical location and the increasing number of residents affiliated with the local university. Commuting, if done by car, adds to the total carbon emission of a community, and can be as high as running a home (Hodge & Haltrecht, 2009). It is therefore necessary to reduce the use of fossil fuelled cars to reduce the ecological footprint of the community (Hodge & Haltrecht, 2009). The new trends at UniverCity to less use of personal vehicles and more public transport, walking and cycling as a mode of transport is a positive trend for the reduction of the ecological footprint of the community.

Wackernagel and Rees (1996) define the Ecological Footprint as a simple but comprehensive view that accounts for every transfer of matter and energy from any defined economy and converts it into the correspondent land/water area required from nature to support these transfers. It has been used as an indicator in several studies on national, municipal or institutional level (Chen & Chen, 2006; Flint, 2001; Giljum, Hammer, Stocker, &

Lackner, 2007; Jiun-Jiun, 2005). Transportation with vehicles requires energy from fossil fuels

and therefore contributes to the total ecological footprint of the UniverCity community. The

Trust is not measuring the total ecological footprint of the community but is monitoring the

development of the modes of transportation in order to be able to improve the transportation

infrastructure if the community requires it. This shows the more reactive nature of the Trust's

planning at the moment, whereby it gathers information on the community's needs through

the surveys and then aligns future developments to fulfil those needs if the budget and market

development allow it. They are therefore meeting demands but do not proactively stimulate

demand for "better" modes of transportation, simply because it is not part of their mandate.

An addition to the mandate to foster sustainable behaviour could enable them to be more

proactive. Hodge and Haltrecht (2009) found that it is important to make it easy and convenient

for people to take sustainable actions and difficult for them to take unsustainable ones (p. 6).

Their monitoring of the BedZED community in Surrey, UK shows that sustainable lifestyles

account for around half the eco-savings in their community (Hodge & Haltrecht, 2009).

Handrickson (2011), a former doctoral student at SFU, provides another aspect of

residents' influence on the community's ecological footprint. He researched the sustainable

consumption patterns of occupants of multi-unit residential buildings, like in the UniverCity

community (Handrickson, 2011) and compared these consumption patterns to those of a

conventional, co-housing and LEED standard building. He concluded that occupants of a

building built to sustainable standards accumulated significant savings due to their reduced

consumption of water and energy, but that they ultimately ended up spending the savings on

second cars and travels instead of reinvesting it into more sustainable practices (Handrickson,

2011). This led to a bigger total ecological footprint in the LEED standard buildings instead of, as

was expected, a smaller one. The occupants' consumption patterns had therefore a significant

impact. The co-housing concept, in which the interaction between the residents is much higher,

although not built to LEED standards, had the most sustainable development of the

consumption pattern towards a sustainable behaviour and a significantly lower ecological

footprint (Handrickson, 2011). This research shows that not only does the behaviour of the

residents of a community influence the total sustainability of a community but also that an

engaged and active community, working together on improving their behaviour towards a more

sustainable consumption pattern, can lead to a positive influence on the members' behaviour.

Objective 3: Presence and use of indicators to measure the overall sustainability of the

community

The SFU Community Trust did not define indicators for measuring the overall

sustainability of the community. The survey is the only means for measuring the success of the

Trust to build a community as planned. The reason for this lies in the mandate of the SFU

Community Trust to build a complete community with a diverse selection of housing and to

build an endowment fund to support teaching and research at SFU (SFU Community Trust,

2011). There is a difference between the targets of the SFU Community Trust and the

UniverCIty communities' targets. The UniverCity community is measuring its performance

through the four "E" and therefore according to the dimensions of SCD. The Trust's

mandate/goal has never been to build an active and engaged sustainable community; it is

therefore not necessary for them to measure it (Mikkelsen, personal communication,

December 5, 2012). This shows a significant gap between the SFU Community Trust's, the

planning and designing team for the community at the moment, and the UniverCity

community's targets. This gap is possibly the reason for the absence of initiatives to actively

build an engaged sustainable community. Mikkelsen said during the interview that this could

change in the future depending on the decisions of the board of directors of the SFU

Community Trust.

The absence of a mandate to influence behaviour, and as a result a lack of indicators to

measure change, might be a barrier to the UniverCity to becoming a sustainable community

beyond infrastructure planning and building. According to the Ontario Government Round

Table on Economy and Environment (ORTEE), the sharing of values among community

members and the promotion of them through sustainability education is part of being a "true"

sustainable community (Smith & Taylor, p. 181). The lack of this mandate also means that the

impact each resident has on the environment through his/her lifestyle is not measured or

reported on. This is important for achieving sustainable development, as noted by the planners

of BedZED in the UK (Hodge & Haltrecht, 2009). Adding this mandate and defining indicators

might push the UniverCity towards its goals to be a globally renowned beacon for sustainability,

as desired by the board of directors of the SFU Community Trust, and exceeding the basic

infrastructure environmental impact accounting to affect behavioural change in the people that

live there. The measuring of the new indicators would enable the SFU Community Trust to

implement strategies and targets to further foster the formation of a close and engaged

community and also to use campaign designing models, like the ones presented by McKenzie-

Mohr, to implement campaigns to foster sustainable behaviour and to engage the community

to become more active in reducing the overall ecological footprint of the community.

The SFU Community Trust is doing very well in respect to their current mandate, and the survey results reflect this success. A push towards engaging the community to further reduce the ecological footprint would be a welcome addition to the actual mandate of the Trust. The next chapter will provide a few recommendations to achieve this target.

Chapter Seven: Conclusion and Recommendations

The results derived from the gathered information and data in relation to the research

objectives suggest that the behaviour and consumption patterns of residents of a sustainable

community like UniverCity can have a significant impact on the overall sustainability of a

community, and community planners have direct, although limited, influence over that

behaviour. The SFU Community Trust tried to make it easy for residents to switch to a more

sustainable way of living by providing easy access to local shops and schools, access to a car co-

op network, and a subsidized public transport pass until the end of 2011. This is a relatively

passive approach, but the Trust did not wish to invade the residents' privacy with direct

educational and community based social marketing, and therefore did not implement these

more aggressive strategies. They are, however, willing to play a more active part in this

development as long as the community requests it. Promotion of this offer in the community

could help to spark the interest required.

The Trust intends to develop the community by providing more accommodation for

families and infrastructure enhancements (local businesses and education facilities) with the

aim of increasing engagement and community activity. This strategy might be successful, but

there is nothing in place to actively foster this development. A more active role by the SFU

Community Trust or the addition of professionals in the field to build and engage a community

might be necessary to achieve this goal. The Trust can then identify champions in the

community who are willing to drive campaigns to further educate the residents. This could be

an easy task by simply gathering people interested in sustainability in one of the available

community halls, but it will also require an active engagement on the part of the SFU

Community Trust.

Based on this research, the following are some recommendations for sustainable

community developers and planners, which are aimed at increasing the sustainability of

planned sustainable communities and reducing the ecological footprint of the community as a

whole and not just the footprint of its infrastructure and buildings:

Establish Holistic Sustainable Indicators and Measure their Progress

It has been the UniverCity's choice to build a sustainable infrastructure and to try to

exceed current regulations and building codes in order to show developers how easy it is to

adopt sustainable building practices, as well as to demonstrate to government what policy

changes they can make to improve current building codes and policies. It has not been the

Trust's goal to directly influence the community members' behaviour or to measure their

influence on the overall ecological footprint.

Planners of sustainable communities might want to extend the scope of indicators,

measuring the impact of construction, maintenance and upkeep of the community, by

indicators that measure the impact of consumption and lifestyle choices of members. This

would help to further reduce the overall impact of the development. Proper indicator tracking

is essential to monitor the progress of a sustainable community and to adjust strategic plans in

case of a negative development (Bayley & Strange, 2008). Indicators also provide a common

"language" by which decision-makers can determine over time which strategies and campaigns

make a difference and which do not (Bayley & Strange, 2008).

A recommendation based on the research is to use the ecological footprint as an indicator to assess the overall impact of the community and its improvement in becoming more sustainable. "The indicator Ecological Footprint has been developed into one of the most important measures for resource consumption of production and consumption activities on the international level" (Giljum, Hammer, Stocker, & Lackner, 2007, p. 7). It is today mainly "used as a communication instrument for issues of environmental sustainability and for awareness raising" (Giljum et al., 2007, p. 7). A large number of institutions around the globe, municipal and local administrators, educational institutions, companies and NGOs use this indicator (Giljum et al., 2007).

Wackernagel and Rees (1996) developed the basic concept for this indicator in the early 1990s, wanting to create a planning tool that could translate sustainability concerns into action. They ascertained that economic or demographic growth trends must be interpreted and assessed within constrains imposed by natural limits. The Ecological Footprint is a sustainability indicator that compares "anthropogenic demand for natural resources with their supply provided by ecosystems" (Giljum et al., 2007, p. 8). The indicator has been used to calculate the land area requirements for defined populations in a geographically specific scale (Flint, 2001). Wackernagel and Rees for example "calculated the Ecological Footprint for the Lower Fraser River Valley in Vancouver and showed the population's land area requirement to be 19 times the geographical area of the region" (Flint, 2001, p. 50). This means it would require 19 times the land area to offset the ecological impact of people and industry resident in this area (Flint, 2001). Flint (2001) used the Ecological Footprint indicator to calculate the Ecological Footprint of the University of Newcastle, Australia. The BedZED sustainable community is also using the

ecological and carbon footprint to measure their community's impact and development,

showing that the Ecological Footprint is scalable and can also be used for sustainable

communities (Hodge & Haltrecht, 2009).

As the ecological footprint accounts for the flow of energy and matter to and from any

defined area (Wackernagel & Rees, 1996), it could be a useful indicator of the sustainability of

UniverCity. As with all sustainability indicators the ecological footprint is imperfect and will not

capture all potential aspects of sustainability in the community (Giljum et al., 2007) – but it

could be used as a communication tool and broad indicator to measure the impact of the

residents' consumption patterns on its sustainability.

The list of data necessary to calculate the total ecological footprint of a community is

long, but planners could concentrate on the most important ones (energy and transport),

creating a special version of this indicator, and calculate the carbon footprint per community

member to be able to compare the data even in case of changes in the number of residents.

The BedZED community in the UK is determining the individual impact by running surveys in the

community, similar to the method used by the UniverCity at the moment. They added,

however, questions about the residents' food and waste habits, besides the transport methods

and feeling about living in the community, which the Trust already has in place (Hodge &

Haltrecht, 2009, p. 9). This extension of the survey could help to drive sustainable initiatives to

influence the residents' behaviour and would help to determine if these initiatives were

successful or not.

The adjustment of this indicator for the UniverCity community would require the ability

to measure the average carbon emission by each community member in order to determine

the area required to sequester the carbon again. The biennial survey could help to determine

the frequency of use for personal vehicles and the average distance traveled to and from work

and for pleasure. The local energy provider would need to be able to provide data on the

overall energy consumption of the community, adding to the calculation of the sequestration

area. Planners of the BedZED community are determining this information by taking meter

readings of water, electricity and heat consumption (Hodge & Haltrecht, 2009, p. 9). Carbon

emissions from clear-cut areas and development of green areas can be factored into the

equation from local resources. The public transport provider could provide data about bus trips

to and from the community. The design of additional park areas and the planting of trees could

be used as a positive influence on the ecological footprint.

Create a Paid Position to Help Develop Community Engagement and Action

Mikkelsen already stated in his interview that an active and engaged community is key

to the positive development of the UniverCity. He said that the idea is to close the SFU

Community Trust office at the end of the development phases and to hand over the

development of the community to itself. The community needs to be strong, engaged and

active to be able to lead itself into the future. Mikkelsen's plan to help more families become a

part of the community to trigger the building of a stronger community, as mentioned in the

results chapter, might be successful but will not necessarily lead to the desired outcome. An

active component of the SFU Community Trust might be required to achieve this community

cohesiveness. The BedZED community in the UK measures community cohesiveness by the

indicator "How many neighbours do you know by name?" (Hodge & Haltrecht, 2009, p. 9). They

found out that their residents like the sense of community and know on average 20 of their

neighbours by name (Hodge & Haltrecht, 2009, p. 9). This contributes to happiness: "Research

shows that people who are engaged in society in this way are more likely to be happier and

healthier" (Hodge & Haltrecht, 2009, p. 6).

The example of the villages of Olneyville and Woonsocket in Rhode Island show that it is

possible for planners to induce a community to become more active (Vaughan, 2009, p. 3). The

Local Initiatives Support Corporation (LIRC), responsible for the successful development of

these communities, used two fulltime employees to get the development started (Vaughan,

2009, p. 5). Mikkelsen had a similar idea. He investigated a while ago into the program of the

"ECO-Concierge," an invention of the joint project of WWF International and BioRegional, a

registered charity, which combined their efforts under the label "One Planet Living" (One Planet

Living, 2012d). This co-operation started the program for One Planet Communities and created

the definition for the position of the "ECO-Concierge" (One Planet Living, 2012b).

One Planet Living's "Eco Concierge" could be a model program for the position

necessary to develop community cohesiveness and awareness of sustainable lifestyle choices

(One Planet Living, 2012a). Mikkelsen described this position as a "sustainable party planner."

One Planet Living describes the Eco Concierge's mission to make "sustainable living accessible,

high quality and great value for all" (One Planet Living, 2012a). The Eco Concierge has a similar

skillset and mission to the two fulltime employees described by LIRC: to build and educate the

community about sustainable living practices. The Eco Concierge also help residents to make

easy life-style choices for a more sustainable behaviour. The Eco Concierge drives this directly

by giving day-to-day opportunities and support, while the employees mentioned by Vaughan

(2009) identify champions in the community and then assist them in building successful

campaigns (p. 5). The Eco Concierge combines both the indirect influence approach and the

direct approach through direct interaction. Mikkelsen sees the Eco Concierge as a viable way

for the Trust to explore and build the community and to influence their daily decisions towards

a more sustainable lifestyle.

Identify Champions

The next step should be to identify champions within the community. These are local

staff or community members who are willing to establish themselves as knowledgeable of

sustainable issues or as leaders for sustainability campaigns in the community (Beckett, 2006).

A champion found in the midst of the community is an ideal partner to drive campaigns to

foster sustainable behaviour. These partnerships are essential. For example, BioRegional in

Surrey, UK, believes that the need to make homes greener "can only be met by powerful

partnerships between social landlords, the Government, utility firms and residents themselves"

(Hodge & Haltrecht, 2009, p. 4). In the case of UniverCity this means a strong partnership

between the SFU Community Trust, the municipal government, utility providers, the champions

and their peers. The champions' peers will possibly see them as an equal member of the group

and would be more willing to follow their advice than an appointed employee dictating a

specific behaviour. An Eco Concierge as described by the One Planet Living program would be

able to work in the same function if they could successfully integrate themselves into the

community. Such an individual would be a starting point on the ground and could help to

identify potential candidates for the champion role.

Support Champions with Resources and Funds

Champions will require support from the local government, NGOs or community

planners if they are to be involved in running successful campaigns. Community planners could

set aside a fund to provide financial support for campaigns within the community. They could

also build the infrastructure to provide meeting and conference rooms for community

activities. Mikkelsen and the member of the board of directors of the SFU Community Trust

have already confirmed that they would support initiatives by the community with resources

and funding. This would have a positive impact on the success of campaigns and educational

programs run by the local champions for sustainable living because it would gives the

champions the opportunity to provide gathering places and proper funding for advertisement

and education campaigns or to invite speakers for community information evenings. Such a

fund could also provide funding for small infrastructure enhancements to foster sustainable

behaviour, for example a local composting facility, bike co-op, or a public transport subsidy. The

form of this funding can be determined by the SFU Community Trust and could even be a small

endowment fund to provide future financial support for these campaigns and initiatives.

Conclusion

At times the task of achieving sustainable development can feel overwhelming due to

our limited understanding of the interconnectedness of all aspects of our natural life. Scientists

find new relationships between ecosystems and life forms every day, and the question arises:

"How will we ever be able to correct our current way of life to reach again a balance with our

ecosystem?"

It is, however, the small steps, which will in the end lead to the desired goal. Fostering sustainable behaviour in our fellow peers is therefore an essential step towards this goal. This research shows that it is important to measure our progress to see how successful we are on our path. It also shows that, at least in this one community, sustainable community planners can, if they decide to foster sustainable behaviour, help to develop the community into an engaged and active community and provide assistance to identified champions to run campaigns fostering sustainable behaviour.

The definition of a "sustainable community development" leaves room for interpretation, and although the case study subject UniverCity does not measure its total ecological footprint, it is clearly an exemplary initiative. Its constant striving to be at the leading edge of building and infrastructure development bylaws and policies is exemplary for the industry and will definitely influence future sustainable community developments in Canada. The Trust could start by actively promoting its willingness to support community-based actions towards a more sustainable lifestyle with funding and resources. They might even consider including the total ecological footprint calculation into their indicators and, with it, continue to stay at the cutting edge of sustainable community development, leading the market in a direction all developers will have to go if they want to contribute to the solution of our global crisis. The Eco Concierge or a similar program might be the first step in this development, which will hopefully be followed by other communities. It is an attitude like the one of the SFU Community Trust, which will provide Canada a leading position in the effort to become a more sustainable country.

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Appendix

Questions first asked in 2012: A5, A6b, B6, C4, C5a, C5b, C6a, C6b, C7a, C7b, C7c, C7d, C12

Questions retained from 2010: A4ii, B4, B5, C3

Questiones retained since 2007: A1, A2, A3, A4i, A6a, B1, B2, B3, C1, C2, C8, C9a, C9b, C9c, C10,

C11

Welcome to the UniverCity Resident Survey. The information from this survey will provide valuable direction for the planning of services and amenities, improving the quality of life for UniverCity residents. Please be assured that all responses are confidential and results will be reported in aggregate form only.

A. UniverCity Life

A1.   How important were each of the following in your decision to live at UniverCity?

	Very Important	Somewhat Important	Not Very Important	Not At All Important	N/A or Don't know
a Price/ affordability	$\square^1$	$\square^2$	$\square^3$	$\square^4$	$\square^{99}$
b Natural setting/views	$\square^1$	$\square^2$	$\square^3$	$\square^4$	$\square^{99}$
c Proximity/access to amenities and services	$\square^1$	$\square^2$	$\square^3$	$\square^4$	$\square^{99}$
d Architectural design of buildings	$\square^1$	$\square^2$	$\square^3$	$\square^4$	$\square^{99}$
e Sustainability features	$\square^1$	$\square^2$	$\square^3$	$\square^4$	$\square^{99}$
f Proximity/access to SFU	$\square^1$	$\square^2$	$\square^3$	$\square^4$	$\square^{99}$
g Proximity/access to work	$\square^1$	$\square^2$	$\square^3$	$\square^4$	$\square^{99}$
h. Investment opportunity	$\square^1$	$\square^2$	$\square^3$	$\square^4$	$\square^{99}$
i. Outdoor recreational opportunities	$\square^1$	$\square^2$	$\square^3$	$\square^4$	$\square^{99}$
j. Homebuilder/developer	$\square^1$	$\square^2$	$\square^3$	$\square^4$	$\square^{99}$

A2.   What in particular do you like about living at UniverCity?

A3.   What in particular, if anything, do you dislike about living at UniverCity?

A4i.   Where did you live before moving to UniverCity?

	Lived before UniverCity (check only one in this column) ⇓
a. Burnaby	□[1]
b. Tri-Cities (Coquitlam/PoCo/Port Moody)	□[2]
c. New Westminster	□[3]
d. Vancouver	□[4]
e. North Shore	□[5]
f. Richmond	□[6]
g. Langley/Surrey	□[7]
h. Fraser Valley	□[8]
i. Other Specify:_____	□[9]

A4ii.   And which other communities did you consider moving to before choosing UniverCity?

	Considered before UniverCity (check all that apply in this column) ⇓
a. Burnaby	□[1]
b. Tri-Cities (Coquitlam/PoCo/Port Moody)	□[2]
c. New Westminster	□[3]
d. Vancouver	□[4]
e. North Shore	□[5]
f. Richmond	□[6]
g. Langley/Surrey	□[7]
h. Fraser Valley	□[8]
i. Other Specify:_____	□[9]

A5.   Before today which of the following sustainability features or initiatives at UniverCity were you aware of?

	Yes	No	Don't know
a. Green Building Bylaw	□[1]	□[0]	□[99]
b. Burnaby Mountain District Energy System	□[1]	□[0]	□[99]
c. MODO Car Co-Op	□[1]	□[0]	□[99]
d. Living Building Childcare Centre	□[1]	□[0]	□[99]
e. Stormwater Management System	□[1]	□[0]	□[99]

A6a.   Would you recommend UniverCity to friends or family?

□[1] Yes
□[2] No

A6b. IF NO: Why not?

B. Service/Amenity Needs

B1.   **Are you currently employed or working for pay?**

□[1] Yes, work from home
□[2] Yes, work outside the home
□[3] No

B2.   **IF WORK OUTSIDE THE HOME: Where do you work?**

	You
a. Burnaby	□[1]
b. Tri-Cities (Coquitlam/PoCo/Port Moody)	□[2]
c. New Westminster	□[3]
d. Vancouver	□[4]
e. North Shore	□[5]
f. Richmond	□[6]
g. Langley/Surrey	□[7]
h. Fraser Valley	□[8]
i. Other or multiple locations	□[9]

B3.   **What is your usual mode of transportation to work?**

	You
a. Personal vehicle	□[1]
b. Car pool/ car share vehicle	□[2]
c. Public Transit (e.g. bus, SkyTrain etc)	□[3]
d. Bike	□[4]
e. Walk	□[5]
f. Other	□[6]

B4.   If other adults or grown children in your household work outside the home, where do you they work?

	Other Adult1	Other Adult2	Other Adult3	Other Adult4	Other Adult 5
a. Burnaby	□^{1}	□^{1}	□^{1}	□^{1}	□^{1}
b. Tri-Cities (Coquitlam/PoCo/Port Moody)	□^{2}	□^{2}	□^{2}	□^{2}	□^{2}
c. New Westminster	□^{3}	□^{3}	□^{3}	□^{3}	□^{3}
d. Vancouver	□^{4}	□^{4}	□^{4}	□^{4}	□^{4}
e. North Shore	□^{5}	□^{5}	□^{5}	□^{5}	□^{5}
f. Richmond	□^{6}	□^{6}	□^{6}	□^{6}	□^{6}
g. Langley/Surrey	□^{7}	□^{7}	□^{7}	□^{7}	□^{7}
h. Fraser Valley	□^{8}	□^{8}	□^{8}	□^{8}	□^{8}
i. Other or multiple locations	□^{9}	□^{9}	□^{9}	□^{9}	□^{9}
No others in household work for pay outside the home					

B5.   And what is their usual mode of transport to work?

	Other Adult1	Other Adult2	Other Adult3	Other Adult4	Other Adult 5
a. Personal vehicle	□^{1}	□^{1}	□^{1}	□^{1}	□^{1}
b. Car pool/ car share vehicle	□^{2}	□^{2}	□^{2}	□^{2}	□^{2}
c. Public Transit (e.g. bus, SkyTrain etc)	□^{3}	□^{3}	□^{3}	□^{3}	□^{3}
d. Bike	□^{4}	□^{4}	□^{4}	□^{4}	□^{4}
e. Walk	□^{5}	□^{5}	□^{5}	□^{5}	□^{5}
f. Other	□^{6}	□^{6}	□^{6}	□^{6}	□^{6}

B6. **How often, if at all, do you personally use:**

	At least once a week	A few times a month	Once a month	A few times a year	Less Often	Never
a. Public Transportation (e.g. bus, SkyTrain etc)	□¹	□²	□³	□⁴	□⁵	□⁶
b. Car Co-Op/ Car Share	□¹	□²	□³	□⁴	□⁵	□⁶

C. You and Your Household

The following information will help us plan for the economic, recreational and housing needs of our community, today and into the future. Please note again that all responses are confidential and results will be reported as totals only.

C1. **How many people, including yourself, live in your household?**

	Number of children			Number of adults
a. Children Under 5 years of age	_____	e. Adults 18 – 34 years		_____
b. Children 5 – 9	_____	f. Adults 35 – 49 years		_____
c. Children 10 – 14	_____	g. Adults 50 – 64 years		_____
d. Children over 14	_____	h. Adults 65 years or better		_____

C2. **Do you own or rent your suite?**

□¹ Own
□² Rent

C3. IF OWN: Is this the first home you've purchased?

□¹ Yes

□² No

C4. **IF NOT FIRST HOME ASK: Is your current home smaller, larger or about the same size as your previous home?**

□¹   **Smaller**

□²   **Larger**

□³   **About the same**

C5. **Are you satisfied with the size of your current residence?**

□¹ Yes, Satisfied
□² No, Not Satisfied, but not considering a move

□³ No, Not Satisfied and Considering a change within the community

□⁴ No, Not Satisfied, and Considering a change <u>but not</u> within the community

IF C5 = Considering a change <u>but not</u> within the community: **Why is that?**

IF CONSIDERING A CHANGE:

C6a. What would be your ideal home size: #:_____ Square Feet

#:_____ bedrooms

C6b.And what price range would you be willing to pay?   RANGES: $:_____

C7a.   Are you satisfied with the amount of storage you currently have?

□¹ Yes, satisfied

□² No, would like more storage

IF WOULD LIKE MORE STORAGE:

C7b. Which of the following is closest to your estimated storage needs:

A) 5x5 (Small walk-in closet) storage for boxes, small furniture, miscellaneous household items. [NOT SHOWN:$79 per month]

B) 5X10 (Large walk-in closet) storage for larger furniture like couches, bicycles, lawnmowers, etc. [NOT SHOWN:$82 per month]

C) 6x16 (Fits household items plus sporting equipment like kayaks. [NOT SHOWN:$139 per month]

D) Other: SPECIFY

IF A, B or C ASK:

C7c. The typical rental storage cost in the region for that size of storage is: INSERT CORRESPONDING AMOUNT FROM RESPONSE GIVEN ABOVE   Would you be willing to pay that associated cost to get the storage you need?

□¹ Yes

□² No

C7d. IF NO ASK: What if anything would you be willing to pay for it: $:_____ per month (if not willing to pay write 0)

C8.   Including yourself, how many people in your household are associated with SFU as:

Faculty: #_____
Staff: #_____
Student: #_____

C9a.   How many cars does your household have?   #:_____ Car(s)

C9b.   How many parking spaces do you have?   #:_____ Space(s)

C9c.   IF HAVE MORE CARS THAN SPACES: Where do you park the extra cars?

☐^{1} On the street
☐^{2} SFU Resident Parking Program
☐^{3} Rent additional spot(s)
☐^{4} Visitor Parking
☐^{5} Other:
_____

C10.   Which language or languages are most commonly spoken in your household?

☐^{1} English
☐^{2} French
☐^{3} Cantonese
☐^{4} Mandarin
☐^{5} Korean
☐^{6} Punjabi
☐^{7} Other:
_____

C11.   How long have you lived at UniverCity?

☐^{1} Less than 6 months   ☐^{6} 4 years
☐^{2} 6 – 11 months   ☐^{7} 5 years
☐^{3} 1 year   ☐^{8} 6 years
☐^{4} 2 years   ☐^{9} 7 years
☐^{5} 3 years   ☐^{10} 8 years

C12.   Are you planning to stay in the community for the foreseeable future?

☐1 Yes
☐2 No   ⇒ why is that?
_____
Thank you!
Your participation and feedback are greatly appreciated