UNIVERCITY DEVELOPMENT

FROM LIVING BUILDING TO LIVING COMMUNITY
This study and report was made possible, thanks to the generous support from the sincere, kind individuals at the Summit Foundation.

We greatly appreciate the desire and commitment to contribute to efforts such as this study, that are dedicated to creating a living future.

Thank you.

The International Living Future Institute
<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>LIVING COMMUNITIES AND LIVING CITIES</td>
<td>Executive Summary // Richard Graves</td>
</tr>
<tr>
<td>18</td>
<td>UNIVERCITY DEVELOPMENT</td>
<td>History and background</td>
</tr>
<tr>
<td>21</td>
<td>SIMON FRASER UNIVERSITY</td>
<td>History and Background</td>
</tr>
<tr>
<td>27</td>
<td>UNIVERCITY CHILDCARE CENTER</td>
<td>The Living Building that started it all</td>
</tr>
<tr>
<td>35</td>
<td>PHASE 5 DEVELOPMENT</td>
<td>Planning for a Living Community</td>
</tr>
<tr>
<td>39</td>
<td>PHOTO ESSAY OF UNIVERCITY</td>
<td>Photos showing SFU and Univercity</td>
</tr>
</tbody>
</table>
52 ANALYSIS DIAGRAMS
Design Development Illustrations

75 PHASE 5 MASTER PLAN
Master plan and associated diagrams

107 VISUALIZATIONS
Selected renderings from master plan

128 APPENDIX
Child Centered Planning // Jason Mclennan
EXECUTIVE SUMMARY

By Richard Graves
“In 2010, we celebrated the full certification of the world’s first Living Buildings, and in doing so, we marked the transformation of our program from a visionary aspiration to a proven strategy for bringing the built environment into alignment with the ecosystem as a whole.”
The International Living Future Institute has had huge success in spreading the Living Building Challenge across North America and beyond. Projects have emerged in nearly every state and province. In 2010, we celebrated the full certification of the world’s first Living Buildings, and in doing so, we marked the transformation of our program from a visionary aspiration to a proven strategy for bringing the built environment into alignment with the ecosystem as a whole. More recently our Living City Design Competition has changed the scale of the conversation, focusing on city-level visions for a sustainable future.

Building on the same momentum of the design competition, we have developed a powerful network of Living Building Challenge Ambassadors, skilled green building, urban planning practitioners and others, who are committed to advancing the Challenge. The Ambassadors, in turn, are charged with creating Collaboratives: communities of change agents dedicated to promoting the local implementation of this philosophy, advocacy tool and certification program. With more and more Living Building Challenge Ambassadors being trained and the concepts and strategies that underlie the Challenge gaining traction in an ever growing constellation of Collaboratives, we launched our Living Community Pilot, in 2012, with the support of the Summit Foundation to create actionable neighborhood-scale plans for transformative vision of a Living Future (socially just, culturally rich, and ecologically restorative) in three communities: Bend, OR, San Francisco, CA, and Vancouver, BC.

In each partner city we are providing a series of trainings, forums and public events to demonstrate how the Living Building Challenge can be used to guide the retrofitting of an existing neighborhood.
Paris reconnected to nature.
The winning entry by brothers Daniel and Maximilian Zielinski share a vision of how to transform our neighborhoods to reconnect individuals to one another and nature, and by so doing connect communities, spreading throughout the city.

IMAGES FROM THE 2011 LIVING CITY COMPETITION

“More than 80 teams responded to our call for an actionable vision of a rich and vibrant future. Teams representing 21 different countries showed how existing cities might be retrofitted to achieve the Living Building Challenge.”
“Each partner city will emerge with a community-level plan with next steps for incorporating best practices around the Living Building Challenge into a neighborhood redevelopment effort.”

In partnership with each host city, which must commit to incorporating this project into its long-term planning, we will deliver the following:

• A community forum on the Living Building Challenge and how it functions at the neighborhood scale.

• In-depth trainings for city/county staff;

• A technical forum on city ordinances and policies around green building, water and waste issues and our other Living Building Challenge Petal categories, with guidance on removing barriers to advanced green building;

• Public exhibit of the Living City Design Competition;

• Public lecture on the Living Building Challenge and strategies for applying it to the neighborhood planning process;

• Ongoing technical support dedicated to exploring the Living Building Challenge as a tool for transforming the built environment;

• Ongoing presentations and outreach around the Living Building Challenge through the Living Building Challenge Ambassador program; and

• Opportunity to participate in ongoing communication with community groups around North America via monthly conference calls,

• Ambassador network and public social media tools.

Each partner city will emerge with a community-level plan with next steps for incorporating best practices around the Living Building Challenge into a neighborhood redevelopment effort.

Our experienced staff together with our local Ambassadors work to create a critical mass of excitement and knowledge about the Living Building Challenge in each of our target communities. These communities and their municipal leaders will continue their work after our intensive project is finished.
Chicago, IL as envisioned by the Living City entry from Rollerhaus Design Team.
“There is no widely accessible and actionable vision of the future that offers a clear alternative to the current model of incremental improvements.”

Our Living Community work addresses a current and pressing need for an ambitious, compelling and actionable vision for radically transforming how existing cities relate to the resources they rely upon. This project will support and promote both visionary leaders and inspirational city models and policies.

Urban infrastructure plays a massive role in determining both the quantity and quality of the resources consumed by a city’s inhabitants. Currently, these systems encourage excessive energy consumption, ecologically unsound water practices, fragmented social interactions and myriad other patterns detrimental to social and ecological health.

Efforts to improve urban infrastructure are focused on incremental improvements in the performance of existing systems. While these improvements have some positive effects, they also deepen cities’ commitment to a highly flawed paradigm of centralized, energy intensive and ecologically dislocated structures. For example, King County (Washington State’s most populous county and home to Seattle) is currently completing create Brightwater, a massive new sewage treatment facility. This facility, which cost over $1.8 billion to construct, represents a substantial upgrade from traditional centralized facilities, with its state of the art treatment processes and its plan to extensively incorporate reclaimed water in its operations. Still, an incredible amount of energy is required to operate the facility and to move water and waste through the miles of piping which wind underneath the city en route to the treatment plant. Despite its advanced design, the Brightwater project deepens the Seattle metropolitan community’s dependence on energy-intensive wastewater systems, sowing the seeds of future crisis in the event of an energy shock and setting the stage for problems when the city’s population outruns the facility’s processing capabilities.

Before cities invest in such hugely expensive and long-term projects, it is critical that they evaluate the full range of options and consider the value of ecologically sound strategies that may reduce costs while supporting biodiversity, eliminating carbon emissions and improving human health. Of course, water infrastructure is only one aspect of the larger issue. Our cities are in need of major upgrades to their energy, transportation and food systems to name a few. Unfortunately, right now, most city leaders are not even aware that options exist to costly and inflexible infrastructure. There is no widely accessible and actionable vision of the future that offers a clear alternative to the current model of incremental improvements.

Living Communities tap into the enthusiasm generated by the Living Building Challenge and the design competition and help cities transform these visionary efforts into practical, leverageable and transferrable solutions. The Institute is helping city leaders assess and begin to redefine their existing policy structures and informing city leaders about transformative urban planning models. Our goal is that these planning projects evolve into demonstration projects in the pilot cities to promote a new paradigm for urban sustainability based on an end-game philosophy of true sustainability.
“Our commitment to community building is also proceeding apace on Burnaby Mountain. When architects Arthur Erickson and Geoffrey Massey proposed the design in 1963, SFU was an inspired creation – an iconic campus perfectly designed to fit into its location. But it was also a creature of its time – a commuter destination far removed from the population it served.

We started to change all that in the mid-1990s…unable to move a mountain down to the community, we decided instead to bring a community up to the mountain.

Thanks to the development of UniverCity, Burnaby Mountain is no longer a weekend wasteland. It now boasts a High Street where students, staff and faculty mingle with local residents as they dine, shop for food, and access a host of new services.

There is an elementary school built to LEED Gold standards, and a brand new childcare centre that is on track to being certified as Canada’s first Living Building. This is a structure that generates more energy and harvests more rainwater than it uses, is free of toxins, and is built from materials sourced within 500 kilometres. Jason McLennan, the author of the Living Building Challenge, has called it “the greenest childcare on the planet.”

Andrew Petter, President and Vice-Chancellor of SFU, 2012
Burnaby Mountain is a protected forest surrounded by a dense urban environment East of Vancouver. Development of the Simon Fraser Campus and Univercity has sought to protect the forest and provide one of the most scenic campuses in the world with views of the surrounding landscape.
BRIEF HISTORY OF SFU

Simon Fraser University is radical by design. From the beginning in 1965, SFU was founded in response to a need for further educational diversification in the Vancouver area and selected noted architects Arthur Erickson and Geoffrey Massey to design the campus. A campus, informed by the traditional academic quadrangles in the world’s great universities and was intended to foster interdisciplinary contact between students and researchers but located upon Burnaby Mountain and built surrounded by preserved wilderness, in a modern, adventurous, open, and bold spirit. This spirit linked to the vision of SFU: to be Canada’s leading community-engaged research university.

Today, SFU has matured into one of the world’s leading teaching and research universities. It is consistently ranked among Canada’s top comprehensive universities and in 2012 appeared in Times Higher Education world rankings of 100 universities under 50 years old.
IMAGES CLOCKWISE FROM TOP: Tree lined walkways, the iconic covered campus center and academic Quad building
“...the Trust is embarking upon the Phase 5 neighbourhood and working with the International Living Future Institute to see if the principles of the Living Building Challenge can grow from building scale to community scale, while ensuring a competitive market-based environment is retained.”
UniverCity is a market-based sustainable community adjacent Vancouver, BC developed by the SFU Community Trust (the Trust). "4 Cornerstones" - Environment, Equity, Education, and Economy - are UniverCity’s framework for development. While requiring developers to build under a performance-based green building code, the Trust develops its own buildings to a higher standard. In 2012, the Trust, under leadership of HCMA architects, completed our Living Childcare, which upon certification, will be the "planets greenest childcare" (Jason McLennan, 2012). Learning from this project, the Trust is embarking upon our Phase 5 neighbourhood and working with the International Living Future Institute to see if the principles of the Living Building Challenge can grow from building scale to community scale, while ensuring a competitive market-based environment is retained.
Vancouver 4.6 tonnes per capita

UniverCity 3.5 tonnes per capita

BedZED, London 3.6 tonnes per capita

Hammarby-Sjöstad, Sweden 3.6 tonnes per capita
Images clockwise from top: Expansive views of the region, outdoor farmers markets, and active social spaces.
UNIVERCITY CHILD CARE CENTER AT SFU

BURNABY, BRITISH COLUMBIA
“...The Living Childcare Center, which upon certification, will be the "planets greenest childcare."

- Jason McLennan, 2012
In the summer of 2012, Univercity completed the construction of their first Living Building, a childcare center. The building showed the developers that it was possible to build truly sustainable buildings at Univercity. In addition, they learned that some of the imperatives for the Living Building Challenge were more effectively pursued by jumping scales to the community. Net Zero Energy and Net Zero Water were targeted using neighborhood scale infrastructure.
IMAGES CLOCKWISE FROM TOP: play areas outside of daycare, interior spaces full of light and warmth
The project is so successful, the developers asked:

"What if we planned the final phase of Univercity to be a Living Community?"
“What if we used the Living Building Challenge as the planning guideline for the last phase (5) of the University development to create a Living Community?”
A view of Burnaby Mountain and the potential area of future development for Univercity.
PHASE 5 DEVELOPMENT
A LIVING COMMUNITY

PLANNING FOR THE FUTURE
After the successful implementation of the Living Building Challenge for the Childcare building, The Simon Fraser Trust (the developers of Univercity) asked two questions:

What if we used the Living Building Challenge as the planning guideline for the last phase (5) of the Univercity development to create a Living Community?

What if we planned phase 5 of Univercity from the perspective of both children and elders to create an “Ageless Community”?

The International Living Future Institute worked with the Simon Fraser Trust in a series of charrettes to explore these questions, define goals, and review existing plans. Phase 5 of Univercity was originally planned for the south slope of Burnaby mountain in forested land. It quickly became apparent because of the steep slopes, ecological impact, first and lifecycle costs of infrastructure and distance from mass transit and other services that the master planned site would not work not only as a Living Community, but also as a practical next phase for Univercity.

A new site for Phase 5 is proposed in a parking lot currently owned by Simon Fraser University. The trust is proposing to trade the south slope site for the parking lots which make a superior development site for phase 5: close to other development, infrastructure, transportation, while minimizing environmental impact.

In addition, the Institute analyzed the potential phase 5 site, existing Univercity development, and the Simon Fraser University master plan and found the following opportunities:

DESIGN OPPORTUNITIES
1. Reconfiguration of Univercity Phase 3 parcels and the adjacent road between the campus and the development to create a better street, clear edge between campus and community while preserving development capacity for both the trust and the university.

2. Creation of two “Great Streets”: one that connects the heart of campus to the heart of the Univercity community and the other that connects the future gondola station with views to the south to a potential development site to serve as a gateway to the northern recreation area with views to the north.

3. Continuous connection of not only public space between the campus and neighborhood, but also between the natural life in the forested areas to the north and south and the centers of campus and neighborhood life along High Street.
Clear transportation connections for multiple modes: car, bus, pedestrian, bike, and future gondola.

A LIVING COMMUNITY
By taking a holistic approach to the planning process, we evaluated a full range of options with the Simon Fraser Trust and created a plan that using ecologically sound strategies that may reduce costs while supporting biodiversity, eliminating carbon emissions and improving human health.

The plan weaves: new approaches to ecological infrastructure, streets, parks and public spaces designed not only at the scale of people, but also to connect them to nature and all buildings will be Living Buildings. Petal Diagrams were used as a planning tool to think in systems and cycles to integrate ecology and planning.

We look forward to continuing to explore the potential of the UniverCity Living Community Plan as it is developed further, the principles are used to review the existing development and the university’s future master plan. These next steps are incredibly exciting when you consider that the current UniverCity development has some of the lowest greenhouse gas emissions per capita at 3.5 tons. With our Living Community and the retrofits for the existing development the potential results could set a new bar for sustainable development and a model of a community in a Living Future.
Looking North-East from Burnaby mountain.
Visiting Simon Fraser University and Univercity provided valuable insight to observe the development upon Burnaby Mountain.

We used the visits as an opportunity to better understand how Simon Fraser and the Univercity development connect together. This exercise allowed us to make informed design decisions when considering ways to incorporate and connect both entities into the new plan.

The following collection of pictures are shared to provide a visual story of coming to Simon Fraser and “walking” towards Univercity.
Simon Fraser University and the UniverCity development – Arial image of SFU and Univercity
Arriving at SFU presents visitors with this entrance – an automobile based design
The journey up from the transit drop off presents beautiful scenery framed by massive amounts of concrete structures.
One of the many views available walking around up on Burnaby Mountain and throughout Univercity and SFU
Passing through the Quad east towards UniverCity is a journey that literally takes you from inside a concrete cave out to an open landscape.
Clockwise from top left: Parking lots of future phase 5, Transit drop off staircase, driveway to transit drop off
Views of the parking lot where phase 5 is proposed to be developed
Looking west on the future phase 5 (top) and up north on Water Tower road to undergoing development.
Views of the temporary transit drop off where Univercity and SFU meet.
The concept of a living community at Univercity was formulated by studying the historical, physical, natural, and developmental context of the site.

This process produced a concept plan that could form the basis of a future Living Community.

The following analysis diagrams are provided to share the information and knowledge learned that formed the base of the plan.
Since the location of “South Neighbourhood” would not be practical, we considered the entire Simon Fraser University Campus to determine another suitable location for the next phase. This consideration produced the idea of existing development, being a literal “island of knowledge”...
SEA OF WILDERNESS

...seeing existing development as an island of knowledge amongst a sea of wilderness, provides direction, telling us that the next phase should be created upon the “land” of the existing SFU built environment
INTEGRATE INTO MASTER PLAN

The area of the existing parking lot fits well into an already established vision for the future of Simon Fraser and UniverCity developments. This area connects the planned phases to the university and ties in to existing utilities, infrastructure, transportation, and campus life.
We propose this lot as the area for phase 5 and the location to create and establish the worlds first living community. We look next to determine what parameters will influence the design.
RESPECTING THE VISION

The plan for phase 5 respects and builds upon the vision and idea for future development by looking at past plans and looking for ways to optimize opportunities that enhance the goal.
EXISTING INFRASTRUCTURE

Existing buildings on Burnaby Mountain that are located on the Eastern edge of Simon Fraser University and the UniverCity Trust Development area.
One of the most recent projects in UniverCity, was a daycare center designed and built according to the Living Building Challenge, the world’s most progressive building performance rating. It is a center piece of the continuing development and opened doors in 2012.
FOCUS ON THE FUTURE

Designing our cities and neighborhoods, the places we build, work, and live around the places where our children will grow up, explore, and learn creates an environment that enhances social connections and accessibility to learning opportunities in a safe, open way. UniverCity and Simon Fraser University has been based around the idea of locating core educational and recreational amenities in central locations with easy access. This design strategy is one of the choices that have led to creating the framework for a accessible and safe city on Burnaby Mountain.
Future development projects are planned currently for four phases of work in the different sections of East Burnaby Mountain surrounding the elementary school and children’s daycare center.
Current roads direct traffic on major roads to the transit hub connecting UniverCity and Simon Fraser. Also, there is a network of paths that tie together existing neighborhoods.
To plan the most effective and efficient development for phase 5 – it has to connect into the context and existing plan – so we learned where there are important intersections to make sure our plan falls in line with current development so that the transition to a new development is enhanced and more effective.
EXISTING NODES, EDGES, AND VISTAS

This side of the mountain lacks a well defined and welcoming entry point. Besides the current transit hub and stair plaza there isn’t much that distinguishes the edge between SFU and UniverCity as well as providing clear vantages of the beautiful scenery, which can only be seen through glimpses between the tree canopy.
Currently the available public space exists within the SFU Quad and pathway to the transit hub and within the UniverCity development, there is a forested path and play area for residents to enjoy.
SITE TOPOGRAPHY

The forested southern portion of UniverCity has 30% slopes that would be unsuitable for phase 5 development at this time.
WATER DISTRIBUTION

Existing water distribution system on Burnaby Mountain servicing SFU and UniverCity.
STORMWATER

Existing locations for stormwater drainage. Phase 5 development drainage will tie into the natural drainage pattern and slope of the mountain.
In the new development, we want to recreate the geological water flow of the streams pre-development so that the new phase allows storm water to be slowed down on site, infiltrate the soil, and recharge the existing watershed.
CENTRAL HEATING

The distribution system for central heating on campus.
DISTRICT ENERGY

Energy distribution planned for the UniverCity and future location of Bio-Mass plant.
Phase five is proposed to begin on the existing parking lot between UniverCity and Simon Fraser. To bring the two entities into union, we propose pushing East Campus road west in order to achieve a great North-South street.
PHASE 5 MASTER PLAN CONCEPT

PHASE 5 DEVELOPMENT

On the following pages, diagrams and illustrations are provided that speak to the features and ideas behind the Living Community concept.
PHASE 5 MASTER PLAN CONCEPT

UNIVERCITY DEVELOPMENT // PHASE 5 // A LIVING COMMUNITY
We propose designing phase 5 on the existing parking lots. This space is a great location, already connected to necessary infrastructure, transportation services, proximity to utilities, schools, shops, and parks.
BONUS BUILDINGS

Pushing the great street west creates an opportunity to develop additional buildings both residential and commercial, as well as possible academic buildings for Simon Fraser University.
VISIT THE MOUNTAIN

A new gondola station will potentially be located adjacent to the future phase five development
LANDMARK VISUAL

The current temporary transit drop off location is a pivotal link between Univercity and SFU. It is a perfect location to provide a visual landmark to people in the area.
WHERE AM I?

Some of the most successful gathering centers in the world include iconic clock towers.

We propose enhancing the central plaza location by installing a clock tower to inform students, residents, and visitors to the mountain of the time and provide a visual reference for meeting up and knowing where you are on campus. It could also become a new iconic feature of the university.
Iconic Gathering Spot

View looking towards Simon Fraser University from East Univercity street. The clock tower would be a signature landmark and iconic attraction right next to the future multi-use plaza.

This intersection will be connected together by the future phase 2 buildings (above right) and a proposed performance art building next to the clock tower.
DESTINATION VIEWING

At the north end of the new great street – currently the road ends in trees – missing a gorgeous view and opportunity to design a beautiful viewing platform and potential restaurant, café, or gallery overlooking the scenic view.
A view platform + potential café, restaurant, gallery, or event space would add a unique feature to the mountain amenities.
VISIT, SHOP, SEE, EAT, AND DRINK!

The additional attractions provided by a gondola station, iconic clock tower, performing/art center, and a scenic viewing platform would be meaningful additions to UniverCity and provide amenities for residents, students, and visitors.
We propose creating a “Living Water System” to naturally slow down, infiltrate, and clean storm water onsite in a water system engineered and designed to handle all storm water falling within the future phase five development and be applied to phase two.
THRIVING LANDSCAPE

The living system will also create a lush, relaxing, and natural environment designed to treat the storm water, but also become a destination, a place of solace or get togetherness, a place to enjoy and discover thru interaction.
SOCIAL SPACES

Cascading plazas, mini-waterfalls, bridges, hidden gardens, and open spaces will provide multiple opportunities for residents, students, and visitors to connect and enjoy the future phase five development.
SAFE CROSSINGS

We propose new pattern language for areas where major foot traffic will interact with vehicles. These spaces not only raise awareness to drivers, but also at the main plaza provide opportunities to hold street fairs for special events.
The future Phase 5 development of Univercity is exciting. This Living Community plan builds on what Univercity has already established and pushes development to the next step. A step that creates a resilient and restorative community that thrives in sync with its site and can become an even greater example of development...one that literally shines it light from up on a mountain.
FOOD BRINGS US TOGETHER

Graze and Go! To connect the planned phases and existing development – we propose bringing these spaces together by designing agriculture spaces of edible plants and community gardens along and throughout the development as a way to highlight food practices and bring fresh, local produce to our local homes and stores.
A LIVING COMMUNITY

The phase 5 plan will bring together two developments, SFU and Univercity, to embrace the Heart-to-heart and vista-to-vista connections, create great streets and gardens, celebrate water and appreciate the abilities of nature, and connect the young and old through paths, parks, and plazas. The result, a restorative, resilient, and thriving living community.
The new plan connects the heart of the campus, the heart of the Univecity community, and crosses the connection between the Vista to the north and the vista to the south.
NEW NODES, EDGES, AND VISTAS

By aligning East Campus Road directly North-South, new nodes, edges, and vistas are provided that connect UniverCity and SFU together as if the road was the "stich" linking these two fabrics of development together.
NEW PUBLIC SPACE

The new living community plan provides ample public space along the great streets, amongst the living water system by parks and water features, and enhanced by future paths connecting the entire development in UniverCity.
Based on date from previous studies, the phase 5 location under consideration lies within the desired five minute walk from the transit hub.
NET ZERO WATER

Storm water will be collected onsite to fulfill dwelling needs, then released into a living water system. It will then be slowed down naturally, and infiltrated back on site. Black water will be treated naturally in Eco Machines and then filtered back into the natural system.
URBAN AGRICULTURE

Opportunities for local food production are dispersed throughout the new phase. Agricultural amenities extend through all public spaces so that residents are able to pick and snack at any point along a stroll down the street. Plant only non-harmful species, fruits and berries with herbs and hardy plants that are native to the region. Public gardens, pea patches, and other resources connect people to the food they eat.
1. Vista Structure and Potential Destination Cafe
2. Rationalized Street Edge
3. Corner Towers
4. Street Side Townhomes
5. Internal court and Water Treatment
6. New Bus Parking
7. New Simon Fraser Entry Plaza
8. Simon Fraser Campanile
9. New Simon Fraser Academic Buildings
10. Proposed Community Gardens
11. Gondola
12. New Gondola Plaza
13. Water Court
14. Garden Roots
15. Photovoltaics
16. Interior Court and Storm-Water Features
17. South Water Park
18. Living Machine Waste Park
19. Entry Park
20. Walking Trails
21. Fire Lane
22. New Proposed Performing Arts Center and Gallery
PHASE 5 BUILDINGS
## UNIVERCITY UNIT COUNT 2

<table>
<thead>
<tr>
<th>SECTION</th>
<th>BUILDING</th>
<th>AREA (SF)</th>
<th>Assignable Area @ 65%</th>
<th>UNITS @ 1000 PER GROSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORTH PHASE 5</td>
<td>A</td>
<td>413,441</td>
<td>268,737</td>
<td>413</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>188,620</td>
<td>122,603</td>
<td>188</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>198,380</td>
<td>128,947</td>
<td>198</td>
</tr>
<tr>
<td></td>
<td>B&amp;C</td>
<td>353,459</td>
<td>229,748</td>
<td>353</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>176,704</td>
<td>114,858</td>
<td>176</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>257,769</td>
<td>167,550</td>
<td>257</td>
</tr>
<tr>
<td></td>
<td><strong>SUBTOTAL</strong></td>
<td><strong>1,588,373</strong></td>
<td><strong>1,032,442</strong></td>
<td><strong>1585</strong></td>
</tr>
</tbody>
</table>

| PERFORMING ART BUILDING* | F       | 69,352   | 45,079             | 69                     |

| SOUTH PHASE 5 | G        | 202,455   | 131,596             | 202                    |
|               | H        | 201,361   | 130,885             | 201                    |
|               | I        | 167,217   | 108,691             | 167                    |
|               | J        | 276,190   | 179,524             | 276                    |
|               | K        | 130,743   | 84,983              | 130                    |
|               | L        | 202,430   | 131,580             | 202                    |
|               | **SUBTOTAL** | **1,180,396**  | **767,257**        | **1178**               |

| TOTAL         | **2,768,769** | **1,799,700** | **2763**               |

*PERFORMING ART BUILDING DATA NOT INCLUDED IN TOTAL UNIT COUNT
Height limits on new buildings in Phase 5 allow for a density that satisfies development goals and provide access to solar light throughout the day, even on the longest day of the year in December when shadows are the longest.
A LIVING COMMUNITY

BIRDS EYE VIEW OF LIVING COMMUNITY MASTER PLAN
GREAT STREET NORTH // WHERE SFU AND UNIVERCITY MEET
A LIVING COMMUNITY
RECLAIMED WATER FROM THE ECO-MACHINE WILL BE RESTORED BACK TO THE STORM WATER STREAM. THE CULMINATION OF THE WATER SYSTEM WILL BE THE RESTORED WATER POND PLAZA WHERE PEOPLE CAN ENJOY THE WETLAND AREA FROM THE PHASE 5 UNITS, PATHWAYS, PLAZAS, AND PARKS.
APPENDIX

CHILD CENTERED PATTERNS

PLANNING FOR THE FUTURE WITH CHILDREN AND THE AGED IN MIND
“What if we planned phase 5 of University from the perspective of both children and elders to create an “Ageless Community”? 
I have written previously about the wisdom of designing buildings and communities that cater first to children as a way of ensuring that communities are well designed for people of all ages. (See “Our Children’s Cities: The Logic & Beauty of a Child-Centered Civilization” in my new book, *Transformational Thought*, and in the summer 2011 issue of *Trim Tab*.) I feel so strongly about this subject that I feel it’s worthy of presenting anew in another form.

Recently, I returned to my decades-old copy of Christopher Alexander’s seminal work, *A Pattern Language*, which had a profound influence on the design world (and on me) following its publication in the late 1970s. With child-centered design on my mind, I began to think about how one might apply an Alexander-esque pattern language to plan children-centric cities that are safe, beautiful and enjoyable for kids of all ages.

*After all, if great places share common patterns as Alexander asserts, then great child-oriented communities are capable of the same*

Once we identify the necessary patterns, the way forward will be made clear.
“Many of the patterns here are archetypal – so deep, so deeply rooted in the nature of things, that it seems likely that they will be a part of human nature, and human action, as much in five hundred years, as they are today”

- Christopher Alexander
The beauty of planning cities for their youngest inhabitants stems from the idea’s simplicity. Designing places for our most vulnerable citizens allows us to create places that better serve everyone. The focus on the young has particularly strong benefits for the elderly. Rather than constructing communities around the automobile, we should treat our kids as our highest priorities. Doing so will keep them safe and keep us sane.

**CHILD CENTER AS LIVING MODEL**

There is a wonderful example of successful child-centered design in the UniverCity Childcare Centre that opened and began measuring its performance in April 2012 at Simon Fraser University in British Columbia. Registered as a living building, this spectacular structure was designed and built for and because of kids. It will allow young students to explore the elements, vegetation and climate in an indoor-outdoor setting. The project is being used as a model by ILFI and the SFU Trust to explore how to expand child-centered design from a single building to the master plan for an entire community. This new pattern language for Child- Centered Communities will be pioneered at the SFU Trust project.
“This is a fundamental view of the world. It says that when you build a thing you cannot merely build that thing in isolation, but you must also repair the world around it, and within it, so that the larger world at that one place becomes more coherent, and more whole; and the thing which you make takes its place in the web of nature, as you make it.”

- Christopher Alexander in Pattern Language
What follows is a preliminary list of 40 patterns necessary for child-centered planning. This is only the beginning – as our project progresses we plan on adding and expanding to this important list that gets us thinking, talking and debating about how to create new systems that inject resilience into our built environment and logic into our plans. Most importantly, it allows us to surround our children with love.
CHILD CENTERED PATTERNS

BY JASON F. McLennan

We surround our children with love and do everything we can to protect them from harm. But we tend to dismiss them when we plan the communities where they live, which makes no sense. It’s time to nurture our cities in the way we nurture our kids. Following a pattern language catering to little ones will yield huge and long-ranging benefits for everyone. Children-centered cities will be more enriching, stimulating, educational secure, resilient and sustainable. And they will be more likely to remain thriving when our grandchildren—and theirs—need places to call home.

KEY

EDUCATION PLAYFULNESS

SAFETY ACCESSIBILITY

CONNECTEDNESS JOY

BIOPHILIA HEALTH

PATTERN DESCRIPTION

Pattern 1: The Bridging Place

This is an example of an accessible community designed for all residents, including elderly or those with physical disabilities. By connecting public spaces, residents can enjoy the benefits of being part of a larger community.

Pattern 2: The Child's Place

This pattern describes how children's play areas should be integrated into the community. By providing safe and engaging environments, children can develop their skills and socialize with their peers.

Pattern 3: The Connecting Path

This pattern highlights the importance of creating paths that connect different parts of the community. By ensuring that paths are safe and accessible, residents can easily navigate the area.

Pattern 4: The Learning Zones

This pattern emphasizes the importance of providing educational opportunities for all ages. By creating learning zones, residents can learn and grow in various aspects of their lives.

Pattern 5: The Nature Connection

This pattern focuses on the importance of connecting with nature. By providing green spaces, residents can enjoy the benefits of being in nature and improve their overall well-being.

Pattern 6: The Social Hub

This pattern describes how social hubs can be created within the community. By providing spaces for social interaction, residents can build connections and strengthen their community.

Pattern 7: The Resilient Neighborhood

This pattern highlights the importance of creating resilient neighborhoods. By designing communities that can withstand natural disasters, residents can feel secure and protected.

Pattern 8: The Sustainable Future

This pattern emphasizes the importance of sustainable practices in community planning. By creating sustainable communities, residents can reduce their environmental impact and improve their quality of life.

Pattern 9: The Accessible Environment

This pattern focuses on the importance of creating accessible environments. By ensuring that all residents can access community spaces, regardless of their abilities, they can feel included and respected.

Pattern 10: The Healthy Lifestyle

This pattern describes how communities can promote healthy lifestyles. By providing spaces for exercise and recreation, residents can maintain their health and well-being.

Pattern 11: The Cultural Diversity

This pattern emphasizes the importance of cultural diversity in community planning. By respecting and incorporating diverse cultures, residents can create a welcoming and inclusive environment.

Pattern 12: The Economic Opportunity

This pattern focuses on the importance of creating economic opportunities. By providing access to jobs and financial stability, residents can thrive and improve their quality of life.

Pattern 13: The Community Engagement

This pattern highlights the importance of community engagement. By involving residents in decision-making processes, they can feel empowered and invested in their community.

Pattern 14: The Stewardship of Place

This pattern focuses on the importance of stewardship of place. By caring for and protecting the natural environment, residents can ensure that future generations can enjoy it as well.

Pattern 15: The Art of Building

This pattern describes how art can be integrated into community planning. By providing spaces for artistic expression, residents can celebrate their creativity and cultural heritage.

Pattern 16: The Memory of Place

This pattern focuses on the importance of preserving the history and memory of a place. By honoring the past, residents can connect with their community's heritage.

Pattern 17: The Community Garden

This pattern describes how community gardens can be created. By providing green spaces for residents to grow their own food, they can improve their health and well-being.

Pattern 18: The Social Network

This pattern focuses on the importance of creating social networks. By providing spaces for social interaction, residents can form connections and strengthen their community.

Pattern 19: The Environmental Stewardship

This pattern emphasizes the importance of environmental stewardship. By protecting and preserving natural resources, residents can ensure a sustainable future for their community.

Pattern 20: The Education Hub

This pattern describes how educational opportunities can be provided within the community. By creating spaces for learning, residents can improve their knowledge and skills.

Pattern 21: The Cultural Celebration

This pattern focuses on the importance of cultural celebrations. By providing spaces for cultural events, residents can celebrate their heritage and连接

Pattern 22: The Economic Development

This pattern describes how economic development can be achieved within the community. By providing opportunities for growth and prosperity, residents can improve their quality of life.

Pattern 23: The Community Center

This pattern highlights the importance of creating community centers. By providing spaces for social interaction and activities, residents can feel connected and engaged.

Pattern 24: The Cultural Exchange

This pattern focuses on the importance of cultural exchange. By providing spaces for cultural events, residents can learn from and appreciate other cultures.

Pattern 25: The Environmental Protection

This pattern emphasizes the importance of environmental protection. By preserving natural resources, residents can ensure a sustainable future for their community.

Pattern 26: The Community Recreation

This pattern describes how community recreation can be provided. By creating spaces for physical activity, residents can improve their health and well-being.

Pattern 27: The Economic Support

This pattern focuses on the importance of economic support. By providing assistance and resources, residents can thrive and improve their quality of life.

Pattern 28: The Community Health

This pattern describes how community health can be improved. By providing access to healthcare and wellness programs, residents can maintain their health and well-being.

Pattern 29: The Cultural Identity

This pattern focuses on the importance of cultural identity. By preserving and celebrating cultural traditions, residents can feel proud and connected to their heritage.

Pattern 30: The Community Vision

This pattern highlights the importance of a community vision. By having a clear and shared vision, residents can work together towards a common goal.

Pattern 31: The Community Engagement Plan

This pattern describes how community engagement plans can be created. By involving residents in decision-making processes, they can feel empowered and invested in their community.

Pattern 32: The Community Economy

This pattern focuses on the importance of a community economy. By providing opportunities for growth and prosperity, residents can improve their quality of life.

Pattern 33: The Community Environment

This pattern describes how community environments can be created. By providing spaces for social interaction and activities, residents can feel connected and engaged.

Pattern 34: The Community Recreation Plan

This pattern focuses on the importance of community recreation plans. By providing opportunities for physical activity, residents can improve their health and well-being.

Pattern 35: The Community Health Plan

This pattern describes how community health plans can be created. By providing access to healthcare and wellness programs, residents can maintain their health and well-being.

Pattern 36: The Community Identity Plan

This pattern focuses on the importance of community identity plans. By preserving and celebrating cultural traditions, residents can feel proud and connected to their heritage.

Pattern 37: The Community Vision Plan

This pattern highlights the importance of community vision plans. By having a clear and shared vision, residents can work together towards a common goal.

Pattern 38: The Community Engagement Plan

This pattern describes how community engagement plans can be created. By involving residents in decision-making processes, they can feel empowered and invested in their community.

Pattern 39: The Community Economy Plan

This pattern focuses on the importance of community economy plans. By providing opportunities for growth and prosperity, residents can improve their quality of life.

Pattern 40: The Community Environment Plan

This pattern describes how community environment plans can be created. By providing spaces for social interaction and activities, residents can feel connected and engaged.
Pattern 1
The Story of Place
Education, Design/Beauty, Resilience, Connectedness, Biophilia
The more children understand the places where they live, the more committed they will be to celebrating and protecting their regions. In child-centered communities, youth must be taught the social, ecological, climatological and even architectural histories of the areas so that they can fully grasp the complexities – and make the most of the unique offerings – of their homes. Tools such as community weather stations and public interpretive elements will help children place their communities in a global context while rooting them more solidly in place.

Pattern 2
The Child’s-eye View
Design/Beauty, Safety, Connectedness, Accessibility
Respecting a lower ground plane lets us all see what children see. To enhance visibility, safety and beauty, accommodate individuals who stand 3-4’ tall rather than following the old standard that assumes everyone walks or wheels 5-6’ off the ground. Sights lines are clearer, barriers are less restricting, spaces are more open.

Pattern 3
Humane Scale
Design/Beauty, Safety, Joy, Connectedness, Biophilia, Accessibility
This is another way of thinking how to keep things at a child’s-eye view. Any component of the built environment that is disproportionately scaled can make even a tall adult feel diminished. Imagine how oppressive such elements are to a child. When a community’s infrastructure is outsized, it makes all residents feel insignificant. Retaining a humane scale means that building heights, parking lot footprints, signage square footage, etc. all stay within reasonable limits.
Pattern 4
Safe Crossings
Design/Beauty, Safety, Playfulness, Joy, Accessibility
Painted cement doesn’t do much to keep all pedestrians out of harm’s way. Develop more interactive crossing signals with sounds, colorful flags, visual pattern changes and a host of other features. This will do more to keep people engaged, entertained and protected.

Pattern 5
Finding Home
Safety, Playfulness, Joy, Connectedness
Identify pathways or individual identifiable neighborhoods using dedicated iconography or color palettes to help children navigate safely and independently through communities. Perhaps a certain animal species’ footprints lead to schoolyards or certain city blocks contain common front door colors. The idea is to help children find their way while making them feel celebrated instead of simply tolerated.

Pattern 6
Revealed Systems
Education, Design/Beauty, Resilience, Playfulness, Connectedness
When we expose occupants to the systems that power their buildings, we help connect them to their built and natural surroundings. Reveal water, energy and transportation systems within structures and communities to provide living classrooms (that never close) for students of all ages. Don’t hide vital operational functions; show them, study them, celebrate them so that our children can discover how to improve upon them.
Pattern 7
Tamed Commercialism
Design/Beauty, Joy, Biophilia
Children, like all of us, deserve to walk down the street without being barraged by advertising. Cities that cater first to kids and prioritize nature over marketing will limit commercial signage that barks at residents about what they should buy, do and prefer. Choosing products and services will then emerge from a more organic decision-making process.

Pattern 8
The Child and the Seat
Design/Beauty, Safety, Playfulness, Health, Joy, Connectedness, Biophilia, Accessibility
Since children need and want to sit with greater frequency than other people, their cities must feature a variety of seating options. Such amenities will also serve the elderly, individuals with mobility challenges and anyone who chooses walking as a primary mode of transportation. Offer seating at multiple heights, similar to the way drinking fountains and even urinals are situated in many public spaces. Think of it as outdoor furniture that complements a city’s overall decor.
Pattern 9
Biophilia and Unstructured Play
Design/Beauty, Playfulness, Health, Joy, Connectedness, Biophilia
Add plentiful opportunities for children and adults to interact with nature, even in the midst of urban settings. Design around fishponds, water features, fountains, climbing trees, sandboxes and anything else that allows citizens to expand on their relationships with the environment, particularly in spontaneous ways. (This is one way to protect our children from what writer Richard Louv calls nature-deficit disorder.) Kids want to get dirty because it’s fun and it’s good for them. Let’s show them we approve, then let’s join them.

Pattern 10
Access to Nature
Design/Beauty, Playfulness, Health, Joy, Connectedness, Biophilia, Accessibility
Nothing should stand between children and the natural world. Ensure that they have direct and ongoing access to non-design based water, sunshine, trees and vistas, wherever they live. Give them opportunities to visit the natural world, support their rights to nature and never let the built environment stand in the way.
Pattern 11
The Sense of Danger
Education, Resilience, Safety, Playfulness, Joy
We need to reintroduce elements of “safe danger” to our cities so our children learn how to test and master suitable boundaries. Give them balance beams, zip lines and climbing apparatus that offer them experiential knowledge of what they can and can’t do. They’ll be better able to distinguish between real and imagined danger when they’re occasionally allowed to fall.

Pattern 12
The Engineering Child
Education, Resilience, Playfulness, Connectedness
Give children opportunities to participate in their cities’ changing systems so that they can observe simple cause-and-effect dynamics. Let them serve as junior hydrologists by experimenting with how a waterway alters its course when dammed. Show them the modulations in a photovoltaic array’s energy draw on sunny versus rainy days. Enrich them with the option to take part in what’s happening around them.
Pattern 13
The Hunter/Gatherer
Education, Design/Beauty, Resilience, Health, Joy, Biophilia
Surround children with edible landscapes so that their cities become agricultural classrooms. Start with urban farms, then extend the concept into all public spaces so that residents are able to pick and snack at any point along a stroll down the street. Plant only non-harmful species, mixing fruits and berries with herbs and hardy plants that are native to the region.

Pattern 14
The Farmer
Education, Design/Beauty, Resilience, Health, Joy, Connectedness, Biophilia
Expanding on Pattern 12, involve children in local food production efforts. Public gardens, pea patches and other resources connect people to the food they eat while connecting them to one another and enhancing community resilience. Giving children farming-related roles and responsibilities gives them the gift of sustainability.

Pattern 15
Frequent Amenities
Design/Beauty, Playfulness, Health, Joy, Connectedness, Biophilia, Accessibility
Distribute child-friendly amenities throughout a city to ensure that all citizens have ready access to them. Sprinkle bike racks, sport courts, public art, water features, revealed systems and natural playgrounds throughout the community (and not just in concentrated mega-parks). This will keep citizens of all ages healthier, happier and more likely to spend their leisure time in the outdoors rather than in front of a computer screen.
Pattern 16
Amenities at the Heart
Education, Design/Beauty, Resilience, Connectedness, Accessibility
Consider placing key community resources at the center of the community. Schools, playgrounds, gardens and other amenities offering the most advantages to the greatest portion of the population should be located in the core, with less critical services and residential structures radiating outward. This pattern stands in healthy opposition to Pattern 14, so planners must determine the ideal approach for each community.

Pattern 17
Non-toxic World
Resilience, Safety, Health
Eliminate poisonous substances from the built environment that surrounds our children. Adhere to the requirements of the Living Building Challenge’s materials petal by using only Red List-approved supplies and substances.

Pattern 18
Programs for Children
Education, Resilience, Joy, Connectedness
Curate activities and curriculum in schools and community centers that educate and inspire kids. These programs might be overseen by municipal parks and recreation departments and/or private non-profit organizations. Nest them with other initiatives designed to engage and support citizens of all ages as a way to bring the city’s youngest and oldest citizens closer together.
Pattern 19
Universal Children’s Design
Design/Beauty, Safety, Playfulness, Joy, Connectedness, Accessibility
Expand on the concept of universal design, which caters primarily to the elderly and the physically challenged, by thinking first of how to adapt buildings and communities to children’s needs. Just as universal design benefits users of all abilities, universal children’s design makes things easier and more enjoyable for users of all ages.

Pattern 20
Sheltered Waiting Areas
Education, Design/Beauty, Safety, Connectedness
Protect every generation by designing sheltered public waiting areas. Turn these structures into mini classrooms with interpretive historical information on the neighborhood, mini galleries with student art from nearby schools or mini communication centers where people can interact in writing.
Pattern 21
Public Drinking Fountains
Design/Beauty, Safety, Playfulness, Health
Kids love moving water, and everybody needs to stay hydrated. Offer this fun and healthful service throughout the city, if even just to provide an alternative to soda.

Pattern 22
The Hill
Design/Beauty, Playfulness, Health, Joy, Connectedness, Biophilia, Accessibility
Every child knows that there is something uniquely enjoyable and empowering about being on higher ground. Hills of any elevation offer endless opportunities to run, sled, roll, even take in more of the view. Repurpose soils to create a modest hill in an otherwise flat region if necessary, but give people an opportunity to climb.

Pattern 23
Swings for All Ages
Playfulness, Health, Joy, Connectedness
Swinging is intoxicating. Cities need places where everyone can experience such dizzying exhilaration, whether for stress relief, family togetherness or just for the sheer fun of it.
Pattern 24
Sound Parks
Education, Design/Beauty, Playfulness, Joy, Biophilia
Help community members hear the music of nature by creating dedicated places where sound is celebrated and multiple senses are engaged. (The water drums at the Cedar River Watershed near Seattle offer a perfect example.)

Pattern 25
Crazy Art
Education, Design/Beauty, Playfulness, Joy, Connectedness
Install public art that starts by identifying place and continues by inspiring kids to think beyond the ordinary. Instead of creating intersections of numbered roads, establish artistic navigational tools that support whimsy – such as public clocks, colorful paintings and interactive sculptures.

Pattern 26
Patterned Walks
Design/Beauty, Playfulness, Health, Joy, Connectedness
Encourage childhood games in public places for all community members. Design beautiful patterns of hopscotch squares, sidewalk skipping lines and other modules into the walkways of the city. It will invite sport, encourage rhythmic activities and allow children to lead the way.
Pattern 27
Six-story Max
Design/Beauty, Resilience, Safety, Health, Connectedness, Biophilia, Accessibility
Places where children live should be limited in height to six stories. This will keep residents close enough to the earth to allow them to stay connected to the natural and human elements on the ground level. Even from the roof of a six-story building, children can still see and call to their friends who pass by on the sidewalk below and make out facial features – beyond that a distinct human connection is lost. A six-story building is walkable - children can walk the stairs to the top floors or they can scurry down to join in a street-level activity. They are never far from anything that grows in the soil. And, crucially, all buildings can be net zero, living buildings.

Pattern 28
House Size Mix
Design/Beauty, Resilience, Connectedness, Accessibility
Any city celebrating children has to include a reasonable blend of house sizes and types. Plan a mix of residential structures that accommodates every resident and family grouping. Keep all larger ‘family’ style units as close to the ground as possible.
Pattern 29
Bedrooms to the Street
Education, Design/Beauty, Resilience, Safety, Joy, Connectedness, Biophilia, Accessibility
Residential buildings must give children (and the adults who care for them) visual and physical access to the world outside their rooms. While this pattern is particularly important for urban apartments and multistory housing, it is important to consider in any living space. Children need a visual connection to the life of the street so that they can see people and nature in vibrant action.

Pattern 30
Courtyards For Reflection
In the hustle and bustle of the city it’s important to have places that are sanctuaries of quiet

Pattern 31
A Place for Dogs
Children need dogs! Create places in the city where dogs can run off leash safely. Dog parks bring community alive. Install dog-walking infrastructure such as bag stations throughout the city and signs to keep pets on leash and safe.
Pattern 32
**Small Egg Business**
What better job than allowing Children to raise chickens and collect and sell eggs? Ensure that local community bylaws allow for a small brood of chickens (without roosters) and designate chicken spots within each development.

Pattern 33
**Ground Level Fountain**
Having the ability to actually run through water is a sheer delight. Fountains should be active and invite you in.
Pattern 34
Neighborhood Treehouse

Pattern 35
The Wide Sidewalk

Pattern 36
Bike Paths

Pattern 37
Short Blocks and Short Cuts

Pattern 38
Clock Tower
Children don’t wear watches…

Pattern 39
Community Meeting Place

Pattern 40
Skateboard Spots