The Living City Pilot Project and publication would not have been possible without the gracious support of many people.

First, we thank the contributors who generously shared their visionary ideas with us over the last several months.

We sincerely thank the Summit Foundation for their support as we developed this series.

We are extremely grateful to the city of Bend, Oregon and its city leaders and engaged residents. We are constantly inspired by your creative thinking and your readiness to build better cities.

Thank you.
The International Living Future Institute has had success in spreading the Living Building Challenge across North America and beyond. In 2010, we celebrated the full certification of the world’s first Living Buildings, an 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 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 developed a powerful network of Living Building Challenge Collaboratives: communities of change agents dedicated to promoting the local implementation of this philosophy, advocacy tool, and certification program. Through this network, the restorative principles of the Living Building Challenge gained traction in communities around the world. In 2012, with the support of the Summit Foundation, we launched our Living Community Pilot to create actionable neighborhood-scale plans for a transformative vision of a Living Future (socially just, culturally rich, and ecologically restorative) in three communities: Bend, Oregon, San Francisco, California, and Burnaby, British Columbia.

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.

Working with our partners from the City of Bend as they infuse their Central Area Redevelopment with the Living Building Challenge. This draft 3rd Street Corridor redevelopment plan will guide the city’s revitalization of the neighborhood. A valuable outcome of the process is an inspired effort of our trained volunteer Ambassador group in Bend has blossomed into a much larger effort dubbed “Sustainable Bend.” The group, who was involved in the 3rd Street Corridor redevelopment process, is using its experience to advocate for sustainable development plans in seven other neighborhoods throughout the city.

Bend has proven to be an incredibly valuable testing ground for our Living Community model. Our work to date has proven that our public sector partners need not be on the leading edge of sustainability to find value in our strategies.
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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 concept of a Living City can be applied and adapted to all situations. Depicted below is an image from the Living City 2011 Competition depicting Paris, France as a city with a connection back to nature and ecological infrastructure.
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.
Working with Univercity in Burnaby, BC and Simon Fraser University, plans are being developed to apply Living Building Challenge standards to a new joint development on an existing parking lot as a way to connect the two parts of the mountain.

The main focus at this scale was to look at ways to develop a net zero energy and net zero water community within market rates.

In Bend, we are looking at a district of existing development and ways to plan for redevelopment that connects this area back to downtown and the surrounding neighborhoods as well as creating the framework for a net zero energy and water community.

We hope to provide actionable steps that will help demonstrate a way for communities and cities to plan for redevelopment of urban sprawl areas in ways that follow the Living Building Challenge principles.

Our third pilot project in San Francisco will be a project that looks at this dense urban environment and determines steps to retrofit urban areas according to the Living Building Challenge principles.

The strategies formulated in partnership with the city and stakeholders are hoped to be used throughout the city and elsewhere in other dense urban areas.
The winning entry by brothers Daniel and Maximilian Zielinski shows a vision of how to transform existing infrastructure and neighborhoods to reconnect individuals to one another and nature, and by so doing connect communities, spreading throughout the city.
“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.”
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.

“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.”
Roads converted to urban greenways in 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.

INFRASTRUCTURE AS A RESOURCE FOR RESTORATION

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.

CREATE A VISION AS A GUIDE FOR GROWTH

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.
LBC WORKSHOPS

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, leverage-able 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.
INITIAL CONCEPT AND VISION

The initial concept was rooted in an idea to create a Living Community within Bend on the existing land just across the freeway from the downtown core. As this early plan sketch shows, the goal from the beginning of this effort has been one of facilitating a transformation of this project area into one that helps sustain the healthy growth and life of the city by looking at redevelopment through the lense of the Living Building Challenge.
EARLY BEND PHOTO OF A PARADE ON THE
DIRT ROADS BEFORE THE CONSTRUCTION
OF PAVED ROADS IN THE EARLY 1900'S
Varying agglomerations of development result from a lack of a visionary plan for creating development and neighborhoods that reflect the thriving cultural qualities that define the residents of Bend and the scenic landscape of its place.

DEVELOPMENT HISTORY

From lumber settlement to thriving urban center

NEGLECT OF PEOPLE AND PLACE

Following the development of the automobile, cities expanded according to the expansion of road systems. Developments could now be accessed by anyone with a car and no longer needed to be centralized and focused within the boundary of downtown areas. Bend’s development from the late 1800’s to today reflects this pattern of expansion.

Similar to many cities, Bend's growth overtime has followed a pattern of urban sprawl, single use buildings, and a preference to the automobile rather than people and place. With the growth of urban development in this manner comes the loss of architectural diversity and character. Emphasizing vehicles over people results in less civic space, underutilized land reserved for parking, destruction of wilderness areas, and areas not welcoming to pedestrians.

This study aims to learn from the historic development of Bend and determine actionable steps that can be applied to existing developments in order to enhance redevelopment into areas that have a high livability and still provide the necessary areas for each type of development.

(NEXT TWO PAGES)

PHOTOS OF EARLY BEND SETTLEMENTS, LUMBER INDUSTRY, AND MAIN STREET AREAS
ANALYSIS OF EXISTING CONDITIONS
“In North America and the Northwest, we will not be creating whole, new cities from the ground up. Instead we will be gradually transforming our existing communities. Like living organisms, our cities can evolve over time to be a model of ecologically sustainable urbanization.”

- Richard Graves, Executive Director ILFI
EXISTING ANALYSIS

Site influences on redevelopment

Bend, Oregon is surrounded by beautiful landscapes. How do the existing conditions in the city and the surrounding context, influence and guide future development.

In most cities across the USA, urban development has sprawled away from downtown cores and followed the creation of new roads and transit paths. The continual outward expansion and development of common low-density, single use projects creates strips of development that tend to lose a sense of character, place, and appeal of beauty. As new areas are built, old strips of buildings decay, and sit alone on seas of impermeable parking lots and asphalt. Most new projects take place on undeveloped land instead of considering these areas of urban strips as potentials for redevelopment.

The International Living Future Institute, in partnership with the city of Bend and stakeholders in the community are working together to create solutions to address ways to plan for future development in Bend that preserve existing open spaces, provide necessary infrastructure for the future, and apply the Living Building Challenge principles to city planning.

The following pages are provided to share some of the influences we considered as we worked in partnership with the city to create steps toward a new master plan that will help guide future development.
Bend, Oregon is within a day's journey from major cities such as Seattle, Portland, and Spokane.
Bend is world renown as an outdoor enthusiast’s destination city. It is surrounded by pristine wilderness and host to events throughout the year.
The planning area is a mostly light commercial / industrial zone separated from downtown by Highway 97 and a railway track.
LIVING CITY DISTRICT

This photography of the 3rd Street Corridor district outlines the area we are working in to create plans for future development.
A majority of developments throughout the project area are characterized by underutilized and exposed parking lots with minimal vegetation. The structures are typically single-use type buildings.
SITE CONDITIONS

CENTRAL PROJECT AREA

The corridors along 3rd street and intersecting with Franklin Ave, Greenwood Ave, and Olney Ave consist predominantly of car-oriented retail uses, shopping strips, big box buildings, drive-through restaurants, banks, light industrial uses, hotels, a few residential spaces. A significant amount of open space is dedicated to exposed parking lots and most buildings lack quality definition. The extension of the sprawl has contributed to the unstructured character of the architectural styles that create a less than appealing welcome to downtown Bend and the riverfront area. One of the primary deficiencies of this area is the lack of walkable compact, neighborhood structure. As can be seen in the following photos taken throughout the corridor, the agglomeration of single-use development provides many opportunities to consider how to redevelop this area in the future. Our goal is to remedy these deficiencies by identifying important intersections along the corridor and create mixed-use, compact, well-connected neighborhood developments throughout the site.

(above) The intersection at 3rd street and Greenwood Ave
The deficiencies within this district are similar to those of other commercial sprawl areas, but they are amplified by the infrastructure of highway 97 and the train tracks in addition to the almost five million square feet of development in segregated agglomerations (see next page). The resulting block structure and the lack of public space are areas to improve as well as spatially connecting this district to downtown Bend and adjacent neighborhoods.
EXISTING DEFICIENCIES

The project area, at almost nine million square feet of space, is an area of sprawl and disconnected development as illustrated in the above diagrams. The dispersed and exposed parking and sprawled out single type developments do not maximize the potential of this space and is full of opportunities to revitalize the city in these areas.
Today the site has developed into an area of mixed low-density single use commercial and light industrial businesses.
DISCONNECTED DEVELOPMENT

The planning area is a brief walk from the Deschutes River Park and downtown Bend, but area is cut of and disconnected due to the freeway and railway infrastructure. This infrastructure creates a figurative wall that blocks in this site from downtown Bend.
Before the addition of the freeway and railway, the roads connected to downtown Bend in a seamless way.

The addition of the freeway and railroad intersected and cut off all but three of the roads that linked downtown Bend to the surrounding neighborhoods and developments.

This separation creates an area of development that is figuratively walled off from downtown and a loose sprawling development that has many opportunities to be better linked with downtown and redeveloped to maximize the area’s potential.
EXISTING ROAD CONDITIONS

Today, the roads and transit pathways within the site create large blocks. Many of the blocks lack sidewalks and walkable pathways. The existing railway has no passenger train service.
The main nodes within the site occur along 3rd street as it intersects with the three major cross streets; Franklin Ave, Greenwood Ave, and Olney Ave. Elsewhere, the nodes are typical cross streets on minor roads.
EXISTING ZONES

The district is mainly a commercial corridor containing a mix of car-oriented retail uses, banks, hotels, drive-thru restaurants, light office space, light industrial, shopping strips, and single-use residential.
In the project area there are limited connections to mass transit opportunities. There is an existing bus transfer station located on Hawthorne street yet there are only a few bus stops that service the site area. Additionally, the railway does not currently service passenger train transit.
**EXISTING PEDESTRIAN PATHS AND BIKE LANES**

The site currently has a bike lane space on Franklin Ave and Olney ave that connect underneath the freeway and railway to downtown Bend.
Storm water occurring within the site falls in four major drainage basins and is collected alongside storm drains to locations in the city where it is allowed to infiltrate back into the city storm water system.
Today the site is characterized by scattered patches of parking lot medians with grass, asphalt plus a sprinkling of trees. There are no open civic spaces, parks, gardens, and fields in the district. The largest open space is the space between the freeway and railways that are currently native grasses.
Bend is surrounded by beautiful forests and a lush Pacific North West desert landscape. The natural beauty of the landscape and the diverse opportunities provided by the expanse of wilderness attracts outdoor enthusiasts worldwide to come visit and live in Bend. However, within the city limits of Bend, the contrast between the forest and wilderness as one arrives to Bend and the developments throughout the city demonstrates the dichotomy of connections to greenspace as a daily in-city opportunity.

Green space connections within the existing site are primarily located in standard parking lot medians and sprinkled throughout the lots with a few trees. There area parks and green connections in other parts of Bend but in the Central Bend area under consideration, no such connection exists.
A PLAN FOR GROWTH AND DEVELOPMENT INSPIRED BY NATURE’S EXAMPLE
“Those who are inspired by a model other than Nature, a mistress above all masters, are laboring in vain.”

—Leonardo Da Vinci
ROOTS & ROADS

Planning for future growth and development by learning from nature

Forests grow and adapt over hundreds of years in an ever changing environment and provide plentiful lessons for cities in how to plan for future growth to remain healthy and thriving in a time of constant change.

How can the city provide the space for anticipated future growth and transform existing built developments into districts, neighborhoods, and places that are socially just, culturally rich, and ecologically just?

The focus area in Bend is an area of low-density, single story developments and characterized by areas of underutilized asphalt, parking lots, and aging infrastructure. The area is cut off from an attractive and vibrant downtown core alongside the Deschutes River by a freeway and railway track. Surrounding the focus area are residential neighborhoods, schools, light commercial areas. In a sense the project area is more of a place that is travelled through, than too. Continued expansion of more single use developments at the expense of new undeveloped land further and further away from the downtown core will result in inefficient sprawl and neglect by overlooking this important area and the potential role it can serve in the cities future growth.

The Living Building Challenge is inspired by the simplicity of nature and the elegant way that nature functions and finding patterns, lessons, and applications to apply towards the ideas, designs, and creation of homes, buildings, and communities.

As the city leaders and the community in Bend, Oregon create a vision and plan for the future growth and development of their city through the lense of the Living Building Challenge Petals, it will be beneficial to consider the lessons provided by observation of the plentiful North West evergreen forests that thrive throughout the region and surround the city of Bend. A healthy tree lives for decades, even centuries and provides a critical role for it’s location by serving as a shelter and home for a wide array of animals and plants, it functions as a natural HVAC system, cleaning and purifying the air, capturing and directing storm water for it’s own sustenance and onsite discharge, it is a valuable resource link. Thousands of trees in a forest work together in a more elegant and simple way to maximize their consumption of the sun, wind, and rain than most infrastructures in cities.
Bend is surrounded by a region of beauty as shown here in one of the Northwest high desert evergreen forests.
REDEVELOPMENT PATTERNS IN BEND 05
The ideal scale for energy generation and water treatment and capture is at the neighborhood scale. This approach allows economic development and growth while minimizing the need for expensive centralized infrastructure and maximizing ecological and social benefits.
EXISTING CONDITION

Today the site characterized by scattered patches of green space with few trees and asphalt plus a selection of mixed height buildings.
VARIOUS PHOTOS OF EXISTING BUILDINGS WITHIN THE PROJECT SITE.
LOCAL VERNACULAR

In order to create a modern and sustainable city we propose to preserve the buildings with the highest quality and significance and redevelop the current strip elsewhere.
LOCAL VERNACULAR

The following images are not meant to be viewed as literal precedents, but merely to express an idea of design.
SUN SHADING AND INDOOR / OUTDOOR SPACES
MATERIALS USING LOCALLY SOURCED TIMBER AND MASONRY IN A NORTHWEST VERNACULAR
STREETS FOR PEOPLE

We propose to position the main road directly on top of the existing roads. In order to optimize the traffic flow and create the basis for an active urban center we propose to lead 3rd street through the center and connect it to the main intersections.
PEDESTRIAN CONNECTION

The urban development is crisscrossed by small streets connecting the points of entrance to the site, thus creating natural short-cuts to the city. This subdivision results in the final building plots.
We propose to enhance the existing roads in the site by designating select road typologies that will continue to allow efficient travel to and through the site to adjacent neighborhoods and to downtown Bend. The new typologies will add value to each development by increasing walkability of blocks, provide more options for pedestrians, integrate a more efficient mass transit system including more bus stops and the addition of a street car servicing downtown Bend and the project area. The transformation of 2nd street into an mixed-use urban greenway will link up to surrounding trails and connect the site to the river path systems. Nature will be figuratively brought back into the heart of downtown Bend by means of the urban greenway and increase recreational amenities throughout the city.
We assume cities are always more sustainable: density reduces the pressure on land and encourages lower impact transportation choices. This is not necessarily the case. It’s critical to find the urban “sweet spot” that balances ecology, economics, social and cultural factors to create a thriving and resilient community.
STREET CAR & MAJOR ROAD TYPOLOGY

The image below depicts an idea of what a repurposed 3rd Street, Greenwood Avenue, and Franklin Avenue might look like with added bike lanes, bio-swales, and a street car.
STREET CAR AND MAJOR ROAD

A section cut diagram expressing the idea of how the redeveloped roads are designed to be the right type for each block, street, and neighborhood.

1. MIXED USE TYPE DEVELOPMENTS
2. SOLAR PHOTOVOLATICS ON ROOFS GENERATE ONSITE ELECTRICITY
3. BUS ROUTES CONNECTED TO GREATER BEND TRANSPORTATION OPTIONS
4. DESIGNATED BIKE LANES
5. A STREET CAR LOOP CONNECTING TO DOWNTOWN BEND LINKS THE SITE TO THE FUTURE TRAIN STATION, DOWNTOWN, AND BUS DEPOTS WITHIN THE CITY.
MAINT ROAD

A section cut diagram expressing the idea of how the redeveloped roads are designed to be the right type for each block, street, and neighborhood.

1. **MIXED USE TYPE DEVELOPMENTS**

2. **SOLAR PHOTOVOLATICS ON ROOFS GENERATE ONSITE ELECTRICITY**

3. **BUS ROUTES ON TOP OF MAIN ROADS LINK BLOCKS TO GREATER BEND MASS TRANSPORTATION AMENITIES**

4. **DESIGNATED BIKE LANES**

5. **SIDEWALKS PROTECTED BY VEGETATED BUFFERS CREATE PEDESTRIAN FRIENDLY BLOCKS**
MINOR ROAD

A section cut diagram expressing the idea of how the redeveloped roads are designed to be the right type for each block, street, and neighborhood.

1. MIXED USE TYPE DEVELOPMENTS
2. SOLAR PHOTOVOLATICS ON ROOFS GENERATE ONSITE ELECTRICITY AND CAN PROVIDE PASSIVE SHADING FOR DEVELOPMENTS
3. PERMEABLE PARALLEL PARKING IN FRONT OF DEVELOPMENTS
4. SIDEWALKS PROTECTED BY VEGETATED BUFFERS CREATE PEDESTRIAN FRIENDLY BLOCKS
ALLEY WAY

A section cut diagram expressing the idea of how the redeveloped roads are designed to be the right type for each block, street, and neighborhood.
URBAN GREENWAY

A section cut diagram expressing the idea of how the redeveloped roads are designed to be the right type for each block, street, and neighborhood.

1. MIXED USE TYPE DEVELOPMENTS
2. SOLAR PHOTOVOLATICS ON ROOFS GENERATE ONSITE ELECTRICITY
3. MIXED TYPE BRIDGES OVER STREAM CONNECT BOTH SIDES OF THE GREENWAY IN DIVERSE ARCHITECTURAL WAYS
4. DESIGNATED BIKE LANE AVENUE ALONGSIDE THE STREAM
5. MIXED USE TRAIL
6. VARIED BUFFER FOR DEVELOPMENT USE
Growth should occur along established main roads and be focused on strategies that begin to restore a relationship to the people and places we live and work in by encouraging and creating spaces for walking and biking as primary transit options supported by a network of smart transit amenities.
We suggest that existing blocks transform into pedestrian friendly developments with a mix of zones and programs that creates conditions for a diverse new connection to the downtown core and the Central Bend area. New development should occur along the existing main streets and form a walkable neighborhood that connects various residential, commercial, and industrial areas together. We focus this development on available existing areas inside the central planning area to avoid building on new land and more importantly activate the central area as a link between downtown and the greater Bend region.
CREATING PARKS AND WATER INFRASTRUCTURE

The building plots are preserved where existing buildings are designated to remain. Blocks that will be dedicated to parks, water treatment, and eco-machines are removed creating squares surrounded by streets and new developments. Each block is initially conceived as a courtyard volume. We open the courtyards when facing a park or to connect it to its adjacent existing structures. The volumes in the middle, between 3rd street and 2nd street are mixed-use blocks that are surrounded by a mix of housing and public parks and squares.
As development is built in the future, each lot and project within the site will be connected to a system of green spaces; including vegetated swales alongside roads and sidewalks, linking up with the urban greenway, private courtyard landscapes, and public plazas and parks that will be distributed around the site.
NEW URBAN GREENWAY

The transformation of 2nd street into an urban greenway activates an otherwise underutilized road and creates an opportunity for dynamic activity and links together existing developments with future developments. The possibilities to connect this urban greenway with adjacent neighborhoods, trails, and paths to downtown Bend adds another dimension to city life and increases the real estate value of properties. All of this is a side benefit resulting from the primary goal of creating a natural functioning storm water treatment system. Instead of directing storm water to underground systems, we want to open up this typically hidden process and in doing so, create vegetated landscapes with mixed-use trails to add a biological, economical, and social value.

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The new blue green street activates the interior core of the central planning area by providing a versatile link for water infrastructure, a wildlife corridor in conjunction with the wetlands, and a pedestrian transit area linking surrounding neighborhoods to downtown Bend, transit options, and businesses.
ECO MACHINES

Blocks that are selected to be reserved from development will become areas for eco-machines and hydroponic plants in order to treat the water within the site. Each eco-machine will be designed to handle water from existing buildings and future developments. The urban greenway will become the link between each park as it guides the water towards the Deschutes river.
Photo taken from inside the Omega Center of the Living machine which treats water in a natural process using a system of water plants that breakdown content in water, cleaning it up to allow infiltration back on the site.
Bend averages almost 300 days of sunshine per year and is an excellent climate for using renewable energy sources like photovoltaic panels to generate onsite electricity. The proposed development of mixed-use, two-story units averages more than 1,000,000 SQ FT of roof space to dedicate to energy production.
If each new building and new retrofit of existing buildings was to include rooftop solar power generation, then the new district could expect to be a surplus energy district and actually a net-exporter of energy.

The surplus could be fed back into the grid to benefit other districts in Bend to supply the energy for homes and businesses.

Not only does providing rooftop solar generation meet the need to be Net-Zero energy, they also become a surface to collect rain water, provide shading if extended over buildings where appropriate. In this desert climate, the extra shade would help cool buildings, lower temperature by providing passive cooling strategies.

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**ENERGY ESTIMATES**

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<tr>
<td>Energy Efficient Buildings</td>
<td>10,000,000 kWh/year</td>
</tr>
<tr>
<td>Energy Generated from Roof Top Solar</td>
<td>-100,000,000 kWh/year (200%)</td>
</tr>
</tbody>
</table>
Bend is a Northwestern desert climate and as such receives a small amount of rainfall per year. However, just as nature collects her water from rainfall and the soil we propose designing the new development in Bend to be Net-Zero Water. We use the roofs to capture and collect the maximum amount of rainfall to supply the daily needs and harness the water supplied by local wells to meet the remaining water requirements.
Looking at the potential new development under the lense of the Living Building Challenge demands that all new developments and retrofits be Net-Zero water, a difficult challenge in a Northwest Desert climate. However just like the pine forests that thrive all around Bend, Nature demonstrates a way to live and sustain herself by acquiring the necessary resources to live, grow, and thrive.

Our estimate is that with rooftop rainwater capture and using water from local resources the new development could in fact be Net-Zero water!

Achieving 100% Net-Zero water is being demonstrated within the city limits of Bend at a new residential project called Desert Rain House by residents Tom Elliot and Barbara Scott. They are seeking to be 100% Net Zero Energy, Water, and processing of their waste water. This helps demonstrate the potential for this to be applied successfully on a larger scale in the future of this district in Bend.
Before cities invest in such hugely expensive and long-term projects, it is critical to 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.
TRADITIONAL MODEL
ONE-WAY MODEL

LIVING BUILDING CHALLENGE
CYCLICAL MODEL

SITE USES
irrigation
aquifer recharge

BUILDING USES
sinks
sprinklers
bath / shower
toilets

PROJECT
BOUNDARY

regional water treatment plant

natural treatment systems
on-site constructed wetlands
storage

PROJECT
BOUNDARY

stormwater runoff

regional wastewater treatment plant

regional wastewater treatment plant

adjacent projects with water deficits
to supporting wetlands or other natural beneficial uses

Image Credit: © 2012 Miller Hull
EXISTING FOOD NETWORK

Today food and drink in the central area is limited to what is available from fast food businesses, a grocery store, a couple restaurants and gas stations. There is no current food production occurring in the area and all the food and drink that is consumed is brought in by freight. Absent any sustaining food production, the central area is a literal food desert.
A mix of community agriculture options such as hydroponic farms, garden plots, and edible landscaping throughout the central area in concert with food production on buildings such as roof top balcony gardens and pocket gardens distributes an area wide food network that can sustain people on their way to and from home, work, travel, and leisure.
LIVING PATTERNS
OF DEVELOPMENT
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.
Pattern Structure

**Intent:**
The intent gives a high level vision of how the pattern relates to the achievement of the system condition of a petal.

**Description:**
A description is provided to give context for the pattern and how it can be applied, important components, and relationships to other patterns.

**Solution, Examples and Diagrams:**
This section provides examples and diagrams of solutions to the pattern. Important data and relationships are described so that the pattern can serve as a template for solutions that can adapt to different contexts.

**Connection to other Patterns:**
No pattern exists in isolation. A Living Community is a whole organism with interrelated parts.
Great Streets
Great Streets
**Intent:**
Living Communities must include Great Streets planned and design to the ideas of Allan B. Jacobs

**Description:**
Great streets should be the center of public life and be designed for people and life, not cars and infrastructure. When designed well, they create opportunities for community to develop in cities. Major streets should have a mix of streetcars, automobiles and pedestrians to exhibit the pulse of civic activity, making these streets "the place to be seen." Businesses faced these streets, too, and spread their wares onto the sidewalks, blurring the line between commerce and community in a way that enhanced both. (From www.greatstreets.org)
Solution:

The San Francisco Great Streets project provides some great ideas to make streets complete and increase the potential for civic life.

- Ideas and elements to consider:
  - Sidewalk extensions
  - Crosswalk treatments
  - Utility Undergrounding
  - Street tree planting
  - Roadway median expansion and/or planting – provide traffic calming and ecological benefits
  - Road lighting
  - Bicycle improvements
  - Public art elements Site furnishings
  - Stormwater elements (Low Impact Design)
Intent:
Neighborhoods throughout cities should create meaningful and memorable landmarks at the heart of their community.

Description:
Creating landmarks at the heart of cities and neighborhoods provides a sense of place, direction, and a place for social gatherings that all work in concert to reflect the character of the city. Development at the 100% corner can incorporate a variety of Living Patterns to enhance this space into an attractive, timeless, and vital part of any neighborhood or city.

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Solution: Every neighborhood needs an intersection as the focal point of energy and development. The 100% corner is an opportunity to create a great place for the community that Great Streets and other features can relate.
Urban/Wild Blend
Intent:
Cities and neighborhoods should be designed to blend wild places with urban spaces.

Description:
Nature is continually being squeezed out of our urban experiences, as are the kind of experiences that are good for people. Ensuring a blend of wild natural places within urban spaces creates multiple opportunities for wildlife to thrive, biophilic connections to exist, and an appreciation for the landscape to nurture the human spirit in urban environments that are ever increasingly devoid of any natural inspiration and relaxation.

Related Patterns: Blue-Green Streets, Ecological Infrastructure, Biophilia, Great Streets, 100% corners, Child Centered

© 2013 Int’l Living Future Institute
Urban/Wild Blend

Great Streets
100% Corner
Blue-Green Street
Wildlife corridors
Urban/Wild Blend
Going with the Flow
Intent:
Transportation network within a community need to be designed with a basic structure of walking and biking streets overlaid with other clean modes of transportation to connect to other parts of the city.

Description:
A basic structure of streets and pathways designed for walking and biking should be the primary structure of our communities. In weaving, this is called the “Warp” or the structure that holds a fabric together. This is true for neighborhoods as well, making them healthier and culturally rich places to live, work and play. However, neighborhoods need to be connected to the rest of the city with clean transportation options. The transportation pathways for transit, cars and other modes should be designed as the “Weft” in weaving or a feature of the transportation network, but not the primary structure.
Solution: Every neighborhood needs a hierarchy of street types and connections as a way to safely weave together different modes of transportation while providing safe pathways and great places. (Jan Gehl Architects from Sydney, Australia)

Boulevards are grand city streets carrying heavy volumes of traffic, while still providing an attractive environment for walking and for cycling. Street trees, wide footpaths and a green median are essential parts.

High quality walking link with the occasional light trail or bus passing through. A low level of noise and a busy atmosphere of many people visiting and promenading are distinct trademarks. Cycling is a natural part of these streets.

Pedestrian priority streets prioritize walking. No kerbs have been installed and it is more a negotiation process than a right of way. These types of streets hold strong restrictions on vehicular traffic in terms of turning options and driving directions. Thus the level of vehicular traffic is low and space is gained for other people activities.

24 metre wide footpaths are essential parts of Champs-Élysées, which have a strong green profile and a clear division between transport zones and zones for street furniture etc.

A homogeneous paving unifies the street with the square and indicates a high level of shared space, where pedestrians are invited to cross at their convenience.

The one levelled pavement is divided into patterns defining the different zones for movement and for recreational purposes.
A section cut diagram expressing the idea of how the redeveloped roads are designed to be the right type for each block, street, and neighborhood.

1. MIXED USE TYPE DEVELOPMENTS
2. SOLAR PHOTOVOLATICS ON ROOFS GENERATE ONSITE ELECTRICITY
3. BUS ROUTES CONNECTED TO GREATER BEND TRANSPORTATION OPTIONS
4. DESIGNATED BIKE LANES
5. A STREET CAR LOOP CONNECTING TO DOWNTOWN BEND LINKS THE SITE TO THE FUTURE TRAIN STATION, DOWNTOWN, AND BUS DEPOTS WITHIN THE CITY.
Intent:

Neighborhoods and communities should aspire to be designed at the scale of people and not cars. Community design and planning should encourage the use of walking and bicycling as the primary modes of transportation.

Description:

There are three aspects to the Human Power Living pattern:

1. Communities must be designed with a mix of uses residential, commercial (services) and workplaces.
2. Pathways for biking and walking should be provided throughout the community and connected to transit.
3. Storage and parking for bicycles as well as other amenities need to be provided in buildings.
Solution:
The proposed development may not cause the predominant occupancy type within the catchment area to exceed a maximum percentage.

<table>
<thead>
<tr>
<th>Transect</th>
<th>Maximum percentage of any single occupancy type within catchment area</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>--</td>
</tr>
<tr>
<td>L2</td>
<td>--</td>
</tr>
<tr>
<td>L3</td>
<td>70%</td>
</tr>
<tr>
<td>L4</td>
<td>60%</td>
</tr>
<tr>
<td>L5</td>
<td>50%</td>
</tr>
<tr>
<td>L6</td>
<td>40%</td>
</tr>
</tbody>
</table>
Human Powered Living
Ecological Infrastructure
Ecological Infrastructure

Intent:
The neighborhood is often the most appropriate scale to provide water and to “treat” it after use so that the local water cycle endures.

Description:
Plan water infrastructure at the neighborhood scale with rain water captured on roofs, stored in building or neighborhood scaled cisterns. After water is used, it should be treated using eco-machines, wetlands and other low-energy technologies to prepare the water to recharge and regenerate natural systems.

Related Patterns: Blue-Green Streets, Roof Power
Solution:

Use a mix of centralized and distributed infrastructure solutions to provide water, energy and other needed resources to the community as well as to move “waste” products to other parts of the system. The appropriate scale must be designed based upon the assets and needs of the community and the ability of systems to meet those needs using clean energy and to optimize the system.
Ecological Infrastructure
Blue Green Street
**Intent:**

Neighborhoods need to create pathways not only for people, but also for resource flows. A Blue Green street can integrate water flow and natural habitat through a community.

**Description:**

A “Blue-Green Street” is a method of moving flows through a community. In our Living Community pilots, we have incorporated Blue Green Streets as a method of creating linear parks, with bike paths, jogging trails, but also as a continuous wetland for treating storm water, connecting to a network of eco-machines to treat the later stages of waster water, capture rainwater and provide a connection to nature.
**Solution:**

Use Blue Green Streets to move and treat water in the community while also providing habitat corridors and transportation pathways through the community. A Blue Green street can be integrated into a wide variety of transportation pathways and street types from “Great Streets” to major roads, to alleyways to bike paths.
Watergy (Water + Energy)
Intent:
Treat water in a community using low energy systems.

Description:
Research such as the Institute’s report Toward Net Zero Water: Best Management Practices for Decentralized Sourcing and Treatment have shown that not all green technologies for supplying and treating water perform equally from an energy, carbon, and pollution perspective. Some technologies can even be worse than centralized infrastructure systems. As a result, plan low impact systems like composting toilets, constructed wetlands, rain capture from roofs and cisterns into the community.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Footprint</th>
<th>Operating Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composting Toilet + Greywater Wetland</td>
<td>Large</td>
<td>Zero-Low</td>
</tr>
<tr>
<td>Constructed Wetland</td>
<td>Large</td>
<td>Zero-Low</td>
</tr>
<tr>
<td>Recirculating Biofilter</td>
<td>Medium</td>
<td>Low-Medium</td>
</tr>
<tr>
<td>Membrane Bioreactor</td>
<td>Medium</td>
<td>High</td>
</tr>
</tbody>
</table>
Solution:

Move water around a community as little as possible by using distributed systems and when treating waste water use low energy technologies like composting toilets and constructed wetlands. To accomplish a low energy water system plan a network of wetlands in the community. They can be designed either as parks, green roofs and/or Blue Green streets.
Bend, Oregon:
A network of Eco-Machines and Constructed Wetlands
Roof as Resource
Intent:

The roofs of a community can be large suppliers of the energy needs of a Living Community. They should be the first place to look for power generation.

Description:

After the obvious first step of driving the energy efficiency of a community to be 70% to 80% better than current (2014 usage), the energy production potential should be developed. This will not only increase the production of community-centered energy, but also lower the carbon footprint and increase neighborhood resilience. Roof top power generation should be integrated with an overall community energy plan and energy production at the community scale.
Solution:

The roofs should be optimized to do more than just keep the weather out of building. Roofs can capture and filter water with green roofs and generate energy through solar panels. Therefore, roof requirements for resource supply should be determined by the needs of the overall community.
Roof as Resource
Biophilia
**Intent:**

Neighborhoods must be designed to include elements that nurture the innate human attraction to natural systems and processes.

**Description:**

Communities are often designed with two assumptions: first that humanity and nature are separate and distinct and second that nature is out in the country and urban is “not-nature.” Living Communities are designed to integrate nature and humanity to build the human connection to natural systems. When a community is seen to be an integral part of nature, biophilia takes many forms: See the Living Building Challenge for ideas.
Solution:
Incorporate biophilic elements throughout a community using the examples below.

Related Patterns: Urban/Wild Blend, Blue Green Street

<table>
<thead>
<tr>
<th>Environmental features</th>
<th>Natural shapes and forms</th>
<th>Natural patterns and processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Botanical motifs</td>
<td>Sensory variability</td>
</tr>
<tr>
<td>Water</td>
<td>Tree and columnar supports</td>
<td>Information richness</td>
</tr>
<tr>
<td>Air</td>
<td>Animal (mainly vertebrate) motifs</td>
<td>Age, change, and the patina of time</td>
</tr>
<tr>
<td>Sunlight</td>
<td>Shells and spirals</td>
<td>Growth and efflorescence</td>
</tr>
<tr>
<td>Plants</td>
<td>Egg, oval, and tubular forms</td>
<td>Central focal point</td>
</tr>
<tr>
<td>Animals</td>
<td>Arches, vaults, domes</td>
<td>Patterned wholes</td>
</tr>
<tr>
<td>Natural materials</td>
<td>Shapes resisting straight lines and right angles</td>
<td>Bounded spaces</td>
</tr>
<tr>
<td>Views and vistas</td>
<td>Simulation of natural features</td>
<td>Transitional spaces</td>
</tr>
<tr>
<td>Façade greening</td>
<td>Biomorphy</td>
<td>Linked series and chains</td>
</tr>
<tr>
<td>Geology and landscape</td>
<td>Geomorphology</td>
<td>Integration of parts to wholes</td>
</tr>
<tr>
<td>Habitats and ecosystems</td>
<td>Biomimicry</td>
<td>Complementary contrasts</td>
</tr>
<tr>
<td>Fire</td>
<td></td>
<td>Dynamic balance and tension</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fractals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hierarchically organized ratios and scales</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Light and space</th>
<th>Place-based relationships</th>
<th>Evolved human-nature relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural light</td>
<td>Geographic connection to place</td>
<td>Prospect and refuge</td>
</tr>
<tr>
<td>Filtered and diffused light</td>
<td>Historic connection to place</td>
<td>Order and complexity</td>
</tr>
<tr>
<td>Light and shadow</td>
<td>Ecological connection to place</td>
<td>Curiosity and enticement</td>
</tr>
<tr>
<td>Reflected light</td>
<td>Cultural connection to place</td>
<td>Change and metamorphosis</td>
</tr>
<tr>
<td>Light pools</td>
<td>Indigenous materials</td>
<td>Security and protection</td>
</tr>
<tr>
<td>Warm light</td>
<td>Landscape orientation</td>
<td>Mastery and control</td>
</tr>
<tr>
<td>Light as shape and form</td>
<td>Landscape features that define building form</td>
<td>Affection and attachment</td>
</tr>
<tr>
<td>Spatial variability</td>
<td>Landscape ecology</td>
<td>Exploration and discovery</td>
</tr>
<tr>
<td>Space as shape and form</td>
<td>Integration of culture and ecology</td>
<td>Information and cognition</td>
</tr>
<tr>
<td>Spatial harmony</td>
<td>Spirit of place</td>
<td>Fear and awe</td>
</tr>
<tr>
<td>Inside-outside spaces</td>
<td>Avoiding placelessness</td>
<td>Reverence and spirituality</td>
</tr>
</tbody>
</table>
Biophilia
**Intent:**
Living Communities must integrate food production in a way that is appropriate to the local climate, scale, density and needs.

**Description:**
Agriculture may include aquaculture, ethnobotanicals, and medicinal gardens - assuming that the plants are used for these properties and are not ‘installed’ for ornamental purposes. Areas devoted to the storage of seeds, supplies and equipment should be integrated. The agricultural area does not need to be contiguous. It can be located at the ground plane, roof plane, vertically, or other combination.

*Related Patterns: Ecological Infrastructure, Blue Green Street, Urban-Wild Blend*
Solution:

Integrate food production and processing throughout the community. Analyze and coordinate production based upon the overall system food needs.

Related Patterns: Ecological Infrastructure, Blue Green Street, Urban-Wild Blend
Food Network
Intent:
Cities must create spaces designed for the most vulnerable, children. By doing so allows a place to exist that better serves everyone.

Description:
Rather than constructing communities around the automobile, we should treat our kids as our highest priorities. Doing so also has strong benefits for the elderly. Ensuring that our urban habitats are nurturing and supportive of human development results in environments that maximize human potential and harmonize with local natural ecological systems.

Related Patterns: Blue-Green Streets, Great Streets, Biophilia, 100% corners, urban/wild blend
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Solution:
Design the community so streets and public parks serve as the community gathering places or “living rooms” of the community. Include at least one public park in each square mile of the community.
Civic Life
Intent:
Living Communities should bounce back from disruptions and disasters healthier than they were before. In addition, they should allow for passive survivability and self-reliance during the rebuilding process.

Description:
The community must incorporate design features, strategies and community based programs to ensure community resilience through its infrastructure, community resources and social interactions in order to weather disruptions or disasters of any type.

Related Patterns: Blue-Green Streets, Great Streets, Biophilia, 100% corners, urban/wild blend
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Solution:

Infrastructure requirements

The community must provide a place or places to allow 100 percent of residents to marshal and congregate in a dry, covered, secure location that is out of the flood plain.

The community must require that all facilities, other than single-family residences have a working back-up generator or battery back up for emergency power needs that is located above the flood plain.

The community must create and designate a community ‘tool sharing’ operation with adequate storage for residents to sign out general tools for house and garden maintenance.

The development must identify a community ‘hub’ for information sharing.

The project must ensure that all sensitive infrastructure such as lift stations, sub-stations, sewage treatment, community centers, schools and the like are out of the flood plain.
Solution:

The community must create, actively maintain on a yearly basis and disseminate to all residents and tenants a disaster response plan that makes clear who to contact in an emergency, where to seek shelter and specific guidance for various types of disruption.

The community must assign, train and keep current two ‘block captains’ or building captains for every 500 residents who are highly versed in disaster response, first aid and general safety procedures. The positions may be voluntary.

The community must keep an emergency contact roster for all residents in both hard and electronic forms.

The community must have an active neighborhood watch and neighborhood community program that has a mandate to look out for resident well being and safety.

Related Patterns: Blue-Green Streets, Great Streets, Biophilia, 100% corners, urban/wild blend

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Human scale and humane places
Intent:
The community must be designed to create human-scaled rather than automobile-scaled places, so that the experience brings out the best in humanity and promotes culture and interaction.

Description:
In context of the character of each transect of the city there are specific maximum (and sometimes minimum) requirements for paved areas, street and block design, building scale and signage that contribute to livable places.
## Human scale and humane places

**Solution:**

Use the chart below as a guide to create a human scaled set of requirements for community design.

### Transect

<table>
<thead>
<tr>
<th>Surface Cover</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>L6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum dimension of surface parking lot before a separation is required on all four sides (e.g., building, wall, or 3 m wide minimum planted median or bioswale)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20 m x 30 m</td>
</tr>
<tr>
<td>Total area of surface parking lot allowed. All other parking requirements must be handled in structured or underground parking.</td>
<td>270 m²</td>
<td>270 m²</td>
<td>195 m²</td>
<td>130 m²</td>
<td>65 m²</td>
<td>0 m²</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Streets + Intersections*</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>L6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum street width, measured either shoulder-to-shoulder or curb-to-curb</td>
<td>5 m</td>
<td>7.5 m</td>
<td>10 m</td>
<td>15 m</td>
<td>22.5 m</td>
<td></td>
</tr>
<tr>
<td>Maximum street width before driving lanes must be separated by a pedestrian strip and planting median (Additional lanes may be included on the other side of median to a maximum of 22.5 m total width of driving area)</td>
<td></td>
<td></td>
<td>Not applicable</td>
<td></td>
<td></td>
<td>15 m</td>
</tr>
<tr>
<td>Maximum street width before tree plantings and sidewalks are required on both sides</td>
<td></td>
<td></td>
<td>Development of this kind is not permitted in a Natural Habitat Preserve or Rural Agricultural Zone</td>
<td></td>
<td></td>
<td>7.5 m</td>
</tr>
<tr>
<td>Minimum overall width of sidewalks and planted median</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1/3 street width</td>
<td>9 m</td>
</tr>
<tr>
<td>Maximum distance between trees in furnishing zone and planted median</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45 m</td>
</tr>
<tr>
<td>Maximum distance between circulation routes (Access way must be 3 m wide minimum to qualify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60 m x 120 m</td>
</tr>
<tr>
<td>Maximum street block size (Note: Providing multiple pedestrian/bicycle circulation routes within a block increases the approachability of urban areas.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>120 m x 120 m</td>
</tr>
</tbody>
</table>

### Signage

<table>
<thead>
<tr>
<th>Number of free-standing signs per development</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>L6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum dimensions of free-standing sign(s)</td>
<td>2 m x 2.5 m</td>
<td>2 m x 3 m</td>
<td>3.5 m x 6 m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum elevation of sign's bottom edge above ground</td>
<td>2 m</td>
<td>6 m</td>
<td>9 m</td>
<td>12 m</td>
<td>12 m</td>
<td></td>
</tr>
</tbody>
</table>

### Proprietary

| Maximum distance between façade openings (e.g., doors and windows) | N/A | 3 m | 6 m | 12 m | 12 m |
| Maximum footprint for any building with a single use, single owner or single tenant (Acceptable to provide additional floor area for tenant on upper/lower floor(s)) | N/A | 3750 m² |

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Maximum Single-Family Residence Size

<table>
<thead>
<tr>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>L6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Resources of Life
**Intent:**

Equal access to basic human needs of food, water, natural light, clean air, jobs, education, jobs and others must be integrated into a Living Community.

**Description:**

We need to prioritize the concept of “citizen” above that of “consumer” while elevating the notion of “community” above that of “self.” Equity implies the creation of communities that provide universal access to people of their basic needs and allow people to fully participate in the major elements of society. Since the act of community planning leading to sizeable development is a considerable environmental impact shared by all, there is an inherent responsibility to ensure that any community provides some public good and does not degrade quality of life.
Solution:
The plan must incorporate access to basic community services and amenities that support the health, dignity and rights of all people.

All residents must have access to the following within 1⁄2 mile directly or 1⁄4 mile to a public transportation line that provides direct (without transferring) access within 2 miles.

- a grocery store or farmers market that provides fresh organic produce, meat and dairy
- daycare facilities sufficient for the population
- a grade school
- a medical clinic or hospital
- a mixed use commercial zone
- parks or open space
**Intent:**
As a society we are often surrounded by ugly and inhumane physical environments. There should be aspects of the community designed solely for human delight.

**Description:**
The Living Communities should elevate our spirits. Mandating beauty is, by definition, an impossible task. And yet, the level of discussion and, ultimately, the results are elevated. We do not begin to assume we can judge beauty and project our own aesthetic values on others. But we do want to understand people’s objectives and know that an effort was made to enrich people’s lives with each
Solution:

The community must contain design features on every block, street and plaza intended solely for human delight and the celebration of culture, spirit and place appropriate to its function as well as the meaningful integration of public art.

Public art specifically must be located with a frequency and scale to have impact in the community. At a minimum public art must meet the following guidelines:

- A major installation for every 500 residents
- A Minor installation for every 100 residents
Beauty + Spirit

NYC Highline Project
Inspiration + Education
**Intent:**

Educational materials about the design and operation of the community must be provided to the public to motivate others within the community to make change.

**Description:**

A sustainable community plan cannot be successful unless it inspires and educates people to take action to improve their community in all of the performance areas.
Inspiration + Education

Solution:
Provide spaces for outdoor classrooms and displays throughout the community to learn more about the systems, performance and plan for transforming the community into a Living Community.
MASTER PLAN CONCEPT + 06
RENDERINGS
We urgently need many more inspirational models of the sustainable city that are socially just, culturally rich, and ecologically restorative to have hope that urban expansion in the next 20 years will create a life we want to live, in places we wish to inhabit
1 REDEVELOPMENT ON MAIN STREETS
2 REMEDIATED ROADWAYS
3 NEW URBAN GREENWAY CORRIDOR
4 DISTRICT WATER TREATMENT PARKS
5 ECO-MACHINES AND FACILITIES
6 MIXED RETAIL AND COMMERCIAL SPACES
7 LIGHT INDUSTRIAL AND MANUFACTURING
8 NEW RAIL TRANSIT STATION
9 NETWORK OF TRAILS CONNECTED TO EXISTING TRAIL SYSTEM AROUND BEND
The International Living Future Institute™ is a hub for visionary programs. We administer the Living Building Challenge™, the built environment’s most rigorous and ambitious performance standard. We are the parent organization for the Cascadia Green Building Council, a chapter of both the United States and Canada Green Building Councils that serves Alaska, British Columbia, Washington, and Oregon. We are also home to Ecotone Publishing, a unique publishing house dedicated to telling the story of the green building movement’s pioneering thinkers and practitioners.

The Institute offers green building and infrastructure solutions that move across scales (from single room renovations to neighborhoods or whole cities). We offer global strategies for lasting sustainability, partnering with local communities to create grounded and relevant solutions, and reaching out to individuals to unleash their imagination and innovation.

Through our work on the Living Building Challenge and other programs, we have helped to redefine the green building movement, substantially raising the bar for true sustainability. By embracing the psychology of the endgame, we strive to identify the most direct path to a future in which all life can thrive. We seek partnerships with leaders in the public, private and not-for-profit sectors in pursuit of a future that is socially just, culturally rich and ecologically restorative.