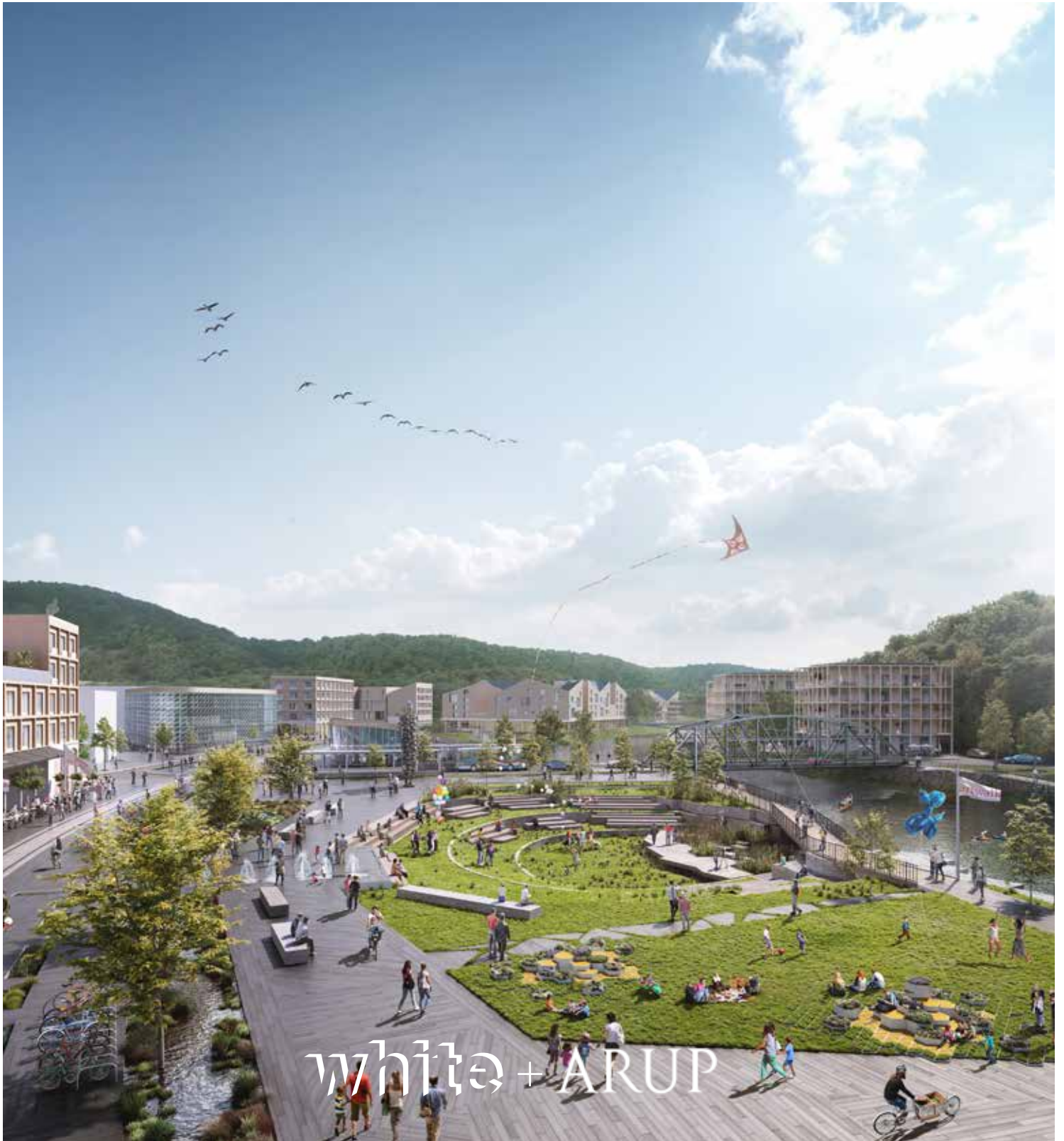


PROJECT BOOK

IN THE LOOP



white + ARUP



APPROACH & OBJECTIVES

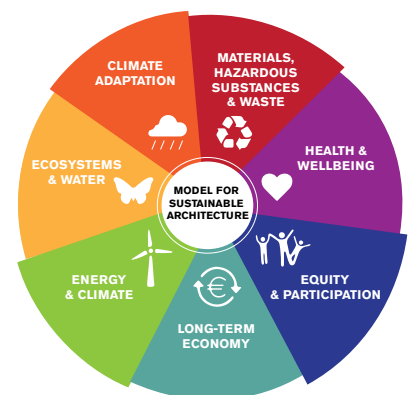
TAB 1 / IN THE LOOP

Net Zero+ Downtown Montpelier 2030 will require commitment, innovation, and most of all, collaboration. The proposal places the community, especially the youngest generations of Montpelier, at the center of the design to ensure a bright sustainable future for Montpelier, inspiring cities across the U.S. and worldwide.

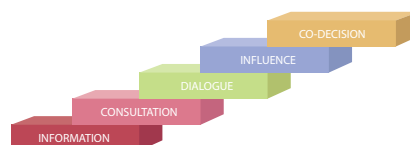
Our definition of what constitutes well designed sustainable architecture is that it places human well-being and supporting human potential at the center. It works in harmony with the ecosystems and ensures that the cycles of materials, energy and resources are optimized. We are convinced that collaboration is necessary to succeed in sustainable development. The key is dialogue and engagement – between different actors and competencies, across the industry and

throughout society. We have well-proven expertise in leading complex urban design processes involving varied stakeholders.

Community dialogue is always part of our projects. The conversation varies from distribution of critical information, to dialogue or even co-decisions. In The Loop encourages people to take initiative to breathe new life into the urban space. Creating the kind of city we all wish to live in means creating an urban design with room for everyone.



our model for sustainable architecture



dialogue stair

Architecture provides the framework for sustainable living and well-being and supports human potential.



TOPGETHER TOWARDS

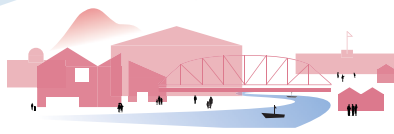
Net Zero+ Downtown Montpelier 2030 will require commitment, innovation, and most of all, collaboration. The proposal In the Loop places the community of Montpelier at the center of design, ensuring a bright sustainable future for Montpelier and also inspiring cities across the U.S. and worldwide.

NET ZERO+ MONTPELIER

Net Zero+ Downtown Montpelier is a robust urban design. Through innovative small scale solutions, the design is adaptive to meet and allow for future change by ensuring the well-being of the community of Montpelier for generations to come.

The adapted strategy to ensure a durable sustainability is to increase the adaptive capacity of Montpelier. The strategy consists of four steps:

1. Acknowledge future change
2. Provide for a robust urban design and community
3. Include small scale solutions that can be changed rapidly and cost-effectively
4. Place the citizens of the community at the center.



CELEBRATE MONTPELIER

The vision for a Net Zero+ Downtown Montpelier aims to establish a vibrant, dynamic and diverse community, making Montpelier a destination and a home. It is equitable and inclusive, providing opportunities for all to live, work and play by building upon those special qualities that already make Montpelier unique.

The proposal is “efficient by design”; efficient new buildings, retrofitted existing buildings and improved operations to reduce energy consumption.

***Why:** An urban identity increases the sense of belonging and caring for the city while a denser multi-functional city provides proximity, accessibility and diversity.*



ENSURE ENERGY

Net Zero+ Downtown Montpelier will use energy and resources more efficiently. The energy has to be affordable, accessible and renewable with the aim of delivering services which have the ability to reduce negative impact on health and ecosystems. Energy usage is reduced by retrofitting buildings in combination with new efficient construction that incorporates improved operations.

Urban fabric and technical systems which are robust and flexible have a proven tendency to last longer especially in regards to the inevitability of future change.

***Why:** A sustainable society requires that the community uses energy and resources in an efficient way.*



ENGAGE IN URBAN LIFE

Public space generates life in the urban environment. In The Loop weaves a diversity of public space into the urban fabric, integrated with an efficient transportation network consisting of pedestrian, bicycle and collective transportation.

The well designed public space and efficient network provide easy access for all people improving operations to reduce energy consumption.

***Why:** The space between buildings is what makes a city, enabling social interaction and movement in a safe environment.*



EMBRACE NATURE

We need and depend on nature for our survival, so a sustainable community requires an effective usage of energy and resources and a reduced impact on nature.

In The Loop embraces nature and intertwines it with every day life by providing access and use of surrounding natural environments and assets.

***Why:** An ecological balance is a prerequisite for our social prosperity for people to live, flourish and develop.*



White Architecture Festival 2015

COMMUNITY ENGAGEMENT

TAB 2 / IN THE LOOP

Net Zero+ Downtown Montpelier 2030 will require commitment, innovation, and most of all, collaboration. The community of Montpelier is the central focus for the design proposal In The Loop.

We are convinced that collaboration is necessary to succeed in sustainable development. The key is dialogue and engagement – between different actors and competencies, across the industry and throughout society.

Our employees are our core and their creativity and competences represent our most important assets. The shared ownership business model at White is essential for our culture. That's why every employee is offered the opportunity to become a shareholder. We can confidently say that co-ownership creates a unique engagement we're proud of.

The basis for our designs is often determined by extensive dialogue with district residents, collecting their expectations and needs. This enables us to create a neighbourhood with room for everyone.

Public space in the city can be democratised by creating temporary arenas for meetings and activities, free of charge and open for everyone. White's concept for a pop up park is such an initiative offering a temporary solution for a citizen-driven initiative to create a green oasis, a meeting place, a playground and a social hub. Inspired by the project a new handbook was launched in Stockholm with guidelines for flexible ways of leasing public areas. The new rules will make it also easier to create citizen-driven city planning of temporary parks in unexpected locations, like parking areas, encouraging people to take initiative

and breathe life into the urban space creating the city we all wish to live in.

These temporary arenas, in our proposal in the form of the **Net Zero+ LAB**, are inclusive and equitable placing special focus on youth. They will host a variety of for meetings, activities and educational programs, engaging and activating the community in the common goal to reach a Net Zero+ Montpelier.



Pop Up Park - White



Site plan

SITE PLAN

TAB 3 / IN THE LOOP

Both serendipitous meetings and planned gatherings in public spaces contribute to social interaction and engagement in Montpelier. Characterized by its strong sense of community, active engagement gives the local citizens an amazing opportunity to invest in their surroundings and to create value over time.

PUBLIC SPACE

The plan provides for a wide variety of parks and green public spaces of various sizes and characters for the diverse population of Montpelier, supporting all ages and abilities. The variation in seamlessly connected and integrated outdoor spaces and surrounding building typologies makes it easy to find a suitable space for any activity 24/7. Adjacent buildings define and support these places, complimented by a diverse urban forest, enhanced ri-

parian buffers and an wide range of integrated native and aesthetic plantings. These double serve as generators of biodiversity, air filters and temperature regulators.

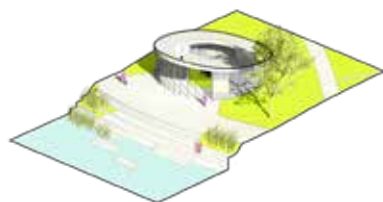
Front and center in the vitalization of Montpelier is Winooski River Park, a generous and multifunctional public greensward that reacquaints the City with the river. In line with multi-purpose design, the park serves many functions. Social & cultural functions such as play areas, a sculpture park, outdoor concerts, and market squares have a place. There is room for picnics and active recreation. Ecological aspects are integrated with open meadows, rich natural plantings, an open and a dynamic stormwater infrastructure. The park encourages direct contact with the river, efficient bicycle routes and waterfront promenades. It is open 24/7 and free to all.

Other important open spaces that make for a vibrant Montpelier include a series of river loops ranging from a half mile to 2 miles, activated interstitial spaces such as pocket parks and alley art walks. Nature trails are never far away and connect residents to the surrounding forests.

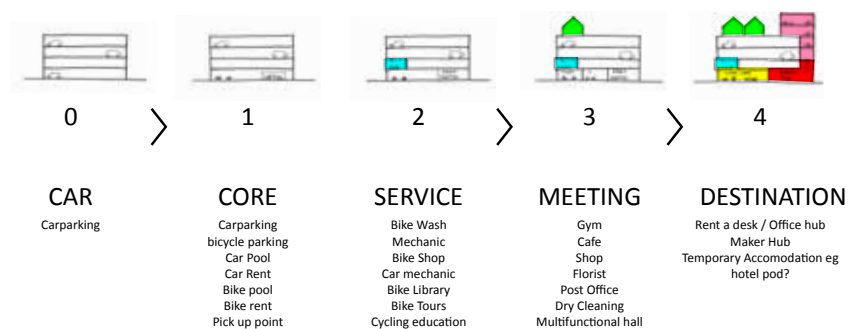
City streets and sidewalks are the town's meeting room. These spaces are strengthened with shade-giving street trees, integrated plantings, seating and other furnishings that encourage the public to stop and chat.

Stone Cutter Way extends the riverfront greensward upriver. River access and public open space is nested with existing and new buildings. This greenspace is vital to the neighborhoods directly to the north.

Multi-functional programming provides activity during all four seasons and ensures safety at all times.



Net Zero+ LAB



From car to destination

PUBLIC FUNCTIONS

A series of new public functions located strategically in the design work to engage the community. In the heart of Winooski River Park, the Net Zero+ LAB invites people to part take in the joined effort to reach beyond Net Zero by 2030. Several multi-functional buildings or multi-use centers allow for various usage by a variety of people. Included in the program is an indoor farmers market as well as meeting places, work spaces and public internet access points.

DENSITY

The increased density positions the community close to important daily destinations including work. Easy and comfortable access - by foot and bike - is a key feature of the proposal, reducing the need for car transportation and ultimately car-ownership. The denser land use encourages a net zero future lifestyle while additional qualitative housing stock attracts new residents.

CONNECTION

The proposal connects the public spaces and characteristic buildings and functions both physically and visually ensuring a continuous, integrated and diverse urban design. The visual connection consists of sight lines, views and visual transitions between the various places that comprise Montpelier. These include clear sight lines within the city structure and visual connections to the larger landscape.

CIRCULATION

The concept includes a series of circulation “loops” that are an addition to existing street patterns, working effectively to integrate and bind together existing and new development in downtown Montpelier. The “loops” integrate the larger community and essential elements that make up Montpelier; they include the commercial functions on State Street and Main Street, the State Office complex and the bridges to the new development with the new Winooski River Park at its heart.

The “loops” provide improved, continuous and more efficient access to include a variety of transportation catering to a plethora of individual needs. **Cyclist, pedestrian and public transportation take precedence with a separate loop that is free from motorized vehicles.**

Also included are innovative transportation solutions where streets with shared means of transportation have limited the traffic guidance measures, such as road marking and signage, which is proven to lead to more responsible movement and interaction.

A series of mobility hubs create a supportive network and “sharing services” linking various means of transportation, such as bike services, charging stations for electrical cars and car sharing stations providing for more efficient options available to all community members.

PARKING

Our ambition in the proposal is to facilitate the goal of making downtown Montpelier car-free. At the first stage of the transition to a car-free Montpelier, we propose all parking facilities downtown to fall under the category of **repurpose**. Included in this plan is a temporary parking structure on State Street, that over time will transform into a mobility hub and community center and eventually housing. Additionally, to facilitate a smooth transition to car-free, a series of parking satellite lots located outside of the downtown area, such as Montpelier Junction, will provide efficient and energy smart transportation to the new transportation hub in Winooski River Park on Taylor Street.



State Street Parking phase 2

The urban form of Net Zero+ will be of higher density with stronger integration defined by public space - the social nodes of the community.



Downtown development

HOUSING

The proposal includes more than **2,000 dwelling units**, which is close to 50% of the current housing stock. This is an enormous growth which requires careful inclusive urban planning. The proposal includes a variety of housing units for the diversity of the community of Montpelier, including our concept for smaller houses, maker space-living, elderly housing in combination with the indoor farmer's market, and various sized apartments and houses.

The housing units are positioned in three areas of downtown Montpelier, embedded carefully in their context in respect to scale and materials in direct relation to surrounding buildings.

In **downtown Montpelier**, the areas designated CIV and CB-1, include no less than **500 housing units** in blocks situated in locations now occupied by car parking. The new buildings are positioned strategically to shape and provide character to public space.

In direct relation to the new development in downtown Montpelier, the proposal includes rejuvenation and growth along the **south bank of Winooski River**. What this provides is a strong link to National Life by bringing its employees downtown, and furthermore the possibility for future development on the south side of the river.

Along the Winooski River, in the so-called **Stone Cutter Way Development** (zones RIV, CB-1 and CB-2), we see opportunity for a more dense urban development.

The new buildings in all three areas

have a location and form which directly relates to the existing neighborhoods that surround. Their strategic placement provides a seamless integration between the existing and the new development.



South bank Winooski River Development



Stone Cutter Way Development

STORMWATER MITIGATION

The design integrates a stormwater mitigation plan that follows the standards for Floodplain Development described in the zoning regulations. Buildings are designed to meet the requirements, but also suggest alternate solutions. **Raised first floors provide architectural opportunities such as stoops that function as meeting places.** The city structure is made more resilient with a series of fully integrated stormwater mitigation measures that clean water, regulate runoff volumes and promote infiltration, simultaneously creating a verdant urban experience that provides function in all seasons.



Integrated raingarden providing public space



Stoops as meeting place

Photo by Michael Nagle for The New York Times



ARCHITECTURAL & URBAN DESIGN CHARACTER

TAB 4 / IN THE LOOP

*The goal of our proposal is to rejuvenate Montpelier to reinforce a strong identity located **back to back** with the existing context. The aim is to create a downtown where people want to live, participate, and visit.*

The urban plan is comprised of a variety of housing types that caters to the community. To support this outcome our proposal is designed to respect diversity and to provide equal opportunity for business entrepreneurship by engaging residents in decision-making processes. The property types are designed to give ownership to young individuals, couples, families, and older generations alike. A range of housing types - from 270 sq. ft. to 1,200 sq. ft. houses, apartments and town houses - ensures a healthy and diverse mix. In combination with commercial and public

services and functions, the development will create a vibrant community full of opportunities.

We strongly believe that urban planning strategies should be transparent and recognizable to the community. Community engagement will encourage community ties, foster a sense of security, and protect the environment.

URBAN DESIGN

Starting point in the overall urban design strategy is to engage the community and to celebrate Montpelier by embracing its charm and vernacular. The design provides more density and a wide variety of smaller public and green spaces ensuring proximity, connectivity and accessibility for all.

The heart of the proposal is the Winooski River Park, a green cultural campus for the community that con-

nects the downtown development to the Winooski River and the landscape surrounding Montpelier. Its grass-roots character, with a wide variety of functions including culture and outdoor activities, provides the community of Montpelier a place for leisure and gathering. A lowered section of the park brings the downtown into an intriguing interplay with river's water level. The soil removed from the lowered section will be used to raise the other end of the park where the proposed Net Zero+ LAB forms a beacon in the urban design and a reminder of the common goal of achieving a Net Zero Downtown.

One of the goals of our proposal is to develop a place that gives the community of Montpelier a strong identity.



Transit hub on Taylor Street, encapsulated by the park

In the center of the park the transportation hub is elegantly encapsulated by the park integrating the building into the landscape while providing for a variety of uses for the green sloped roof.

The park connects to the city through a wide variety of connected outdoor spaces and a network of so-called 'loops' of various forms of transportation and character.

The design integrates the standards for Floodplain Development described in the zoning regulations, while providing innovative alternate solutions. Celebrating the flow, focus is on the opportunities of integrated flood preparedness and stormwater mitigation strategies that create a pleasant green urban environment. Solutions to the constraints of flood preparedness, such as a high flood plain construction and its relation to street life, provide for architectural elements such as stoops that vitalize street life bridging between the public and private realm.

WINOOSKI RIVER PARK

At 3.5 acres, Winooski River Park establishes a green heart for Montpelier. The park accommodates both individuals and large gatherings. There are intimate places to commune with nature and open spaces for active recreation. The park embraces Taylor Street as an active hub in the center of the park.

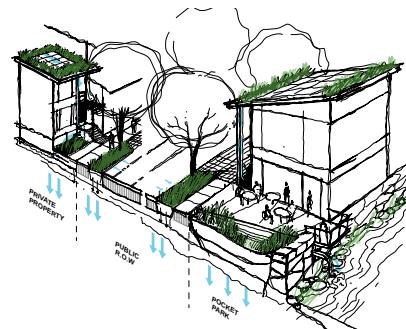
The Basin, west of Taylor Street, forms an outdoor amphitheater for concerts and sunbathing. It draws people down to the water and it allows for fluctuating river levels, creating a dynamic space that changes through the seasons. **Analysis for soil contamination is required.**

Meandering through the park is a generous river walk that ties east and west into the longer loops which extend through the city.

A series of rain gardens flanking the rail line and running through the park functions as a green spine and an area of transition into the surrounding city fabric as well as a functional frame for the park.



Winooski River Park and the new Park Bridge



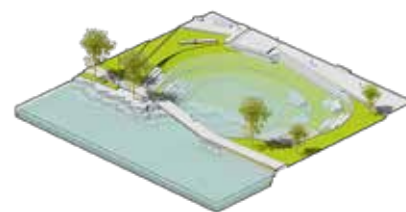
Concept sketch stormwater runoff

PARK BRIDGE

The park extends into the new Park Bridge along Taylor Street Bridge to strengthen the connection to south side of Winooski River. It provides a place to pause at the river in close contact with the water and is a safer pedestrian crossing and iconic entrance to Taylor Street and the civic district with the State House.

STRAINER STREETS

The existing street network and stormwater infrastructure is strengthened through the implementation of multiple small scale, low impact passive stormwater features. Streets abutting the rivers are vital in acting as "strainers" for runoff prior to it reaching the rivers. Rain gardens collect rain and snow-melt from vehicular surfaces, filtering the water and allowing for infiltration. Structural soils can be used under hardsurfaced areas to store water. Street trees add in uptake and evapotranspiration. Stormwater is made public in the form of visible, functional design where water is venerated, providing a purpose built landscape that is playful through the eyes of childrens and beautiful for residents in general.



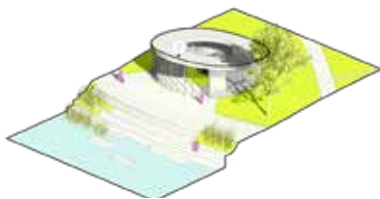
Stormwater retention in Winooski River Park Bowl

ARCHITECTURE

New development blends the scale and materials of the existing context of Montpelier providing an architectural interpretation. New construction is a hybrid of stone and timber construction, locally sourced when possible. Wood is certainly one of the all around best building materials that exists. Buildings of timber construction are outstanding from an environmental point of view, both in the short and long term. Timber construction has a negative carbon emission, a construction time two times faster than concrete, excellent acoustic qualities, weighs less, is easy to transport, slow burning qualities and takes only a minute to cultivate.*

In The Loop provides an extensive "toolbox" to help Montpelier to achieve Net Zero+. New housing includes a Net Zero "core" that can be complemented as desired to provide personal identity while ensuring Net Zero standards.

* current development and the growth of the Swedish forests



NET ZERO+ LAB

In the heart of Winooski River Park, the Net Zero+ LAB invites people to part take in the joined effort to reach beyond Net Zero by 2030 offering educational programs for the young, public internet access, being a meeting place for the community allowing for various usage by a variety of people.



State Street Parking phase 1



State Street Parking phase 2

STATE STREET PARKING

State Street Parking is a new hybrid of a parking garage and a public park. Gradually climbing the timber constructed federal parking is a landscape park. Housing about 400 parking spaces, the exterior surfaces allow for a variety of playful outdoor activities during all seasons. It is envisioned to be a temporary parking structure that, over time, will transform into a mobility hub and community center and eventually housing.

3 story
14 000 sq.ft. floor plan
Total 42 000sq.ft.



CONFERENCE FACILITIES

Strategically located between the existing conference center at the Capitol Plaza Hotel and the transit station within Winooski River Park, the new conference center has an distinctive architectural appearance making it easily recognizable. Besides its function as a conference center, we

envision the building to take a central role beside the Net Zero+ LAB for the community offering public functions such as a **community center and educational programs for the youth.**

Its triangulated facade is covered with PV-cells to produce renewable energy and the building is covered with a green roof providing excellent insulation and stormwater runoff control. Natural ventilation with passive stack effect, activated slabs can cool buildings powered by the river water, and efficient daylight design.

4 to 6 story apartment blocks
23 500 sq.ft. floor plan
200 units at 550 sq.ft.



MAKER SPACE LIVING

The proposal introduces maker space living which is a new hybrid of residential units and shared work space with a highly flexible construction that enables the building to adapt to market demands. Maker spaces can become residential or office and vice versa which provide excellent opportunities for younger generations and art enthusiasts.

Prefabricated modular interior elements for smaller housing units and office space are placed within the timber construction frame and can be adjusted and replaced to meet changing market demands.

Additionally, an activated roof landscape within the urban context is an attractive feature that can help to build a strong social network of creative entrepreneurs.

Maker Space Living is a highly flexible construction that enables the building to adapt to market demands.



INDOOR FARMER MARKET

An indoor farmers market is incorporated in the design on the east side of North Branch. Beyond the usual functions, the program also includes elderly housing and daycare **bridging generations**. A portion of exterior common garden provides an opportunity for young and old to mingle and smiles to be exchanged.

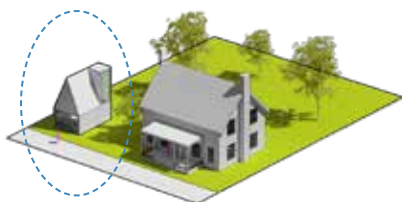
Gardening with children provides numerous opportunities for hands-on learning, inquiry, observation, and experimentation. It helps to build an understanding of and respect for nature and our environment. When children participate in growing edible plants, they are more motivated to taste, eat, and enjoy fruits and vegetables.



White's communal gardens

270 SQUARE FEET

The Scandinavian model, where no building permit is needed for structures less than 25 square meters or 270 square feet, **provides affordable opportunities for home ownership for the young**. We suggest the city of Montpelier lifts building permission from structures smaller than 270 square foot and makes available D.I.Y. kits that ensure safe and Net Zero construction while allowing for modification to meet individual demands.



RIVER HOUSING

The River Housing is a typology that includes a half sunken concrete plinth with apartments in timber construction above. The concrete plinth provides a solid foundation that can function as stormwater storage during possible flooding while the timber apartments embrace the warmth of

CELEBRATE MONTPELIER

The new architecture lends the scale and materials of the existing context of Montpelier into an architectural interpretation celebrating Montpelier.



ENGAGE IN PUBLIC LIFE

Public functions on the ground floor of new development activates the extensive and qualitative public space, this enables and encourages the community of Montpelier to engage in public life.



EMBRACE NATURE

Net Zero+ strengthens the bond and accessibility between the river city of Montpelier and the wooded hills surrounding. Accentuating this sentiment, In The Loop invites nature into its core and conversely. Riparian plantings are carried into the park and biodiverse plantings are integrated into the city fabric. The surrounding forests and canopy habitat are linked to each other through diverse street trees and a plentiful stock of urban trees.



ENSURE ENERGY

Buildings will reach Net Zero+ through utilizing their direct environments. The building design integrates PV-cells, green roofs, natural ventilation through passive stack effect, activated slabs that cool buildings powered by the river water, and efficient daylight design.



Concept sketch

PROGRAMMING & PHASING

TAB 5 / IN THE LOOP

To reach Net Zero+ it is crucial to involve all key stakeholders and to clarify aims, objectives and targets as early in the process as possible.

Sometimes there is a need to implement transitional and intermediate solutions which can ease citizens into the adaptation of new daily routines.

Our sustainable design specialists have a wide range of experience and specialist skills in environmental management, sustainable design, low energy solutions, renewable energy, healthy materials, indoor climate and environmental impact analysis.

Rather than a single solution, the proposal In The Loop provides a step-by-step strategy or toolbox to achieve a Net Zero+ Montpelier. The design includes a series of innovative design elements that allow for a gradual process and ensure adaptive capacity for

change when needed. This toolbox of elements allows for a wide variation without having to be implemented in a specific order.

Our strength is the ability to understand and lead the building process; for example, knowing what stage in the process requires which aspects to be taken into consideration is crucial in determining the sustainable success of a project.

In The Loop is a multi-year proposal that is dynamic, which means that it is possible to alter its course when needed. The design includes a crucial first step that is both easy and affordable - Net Zero+ Lab - with the purpose to engage and educate the community.

The State Street Parking garage is a temporary parking solution in a convenient location with the role of accommodating the community used to parking downtown. It helps to ease into the goal

of a car-free city with this initial step of clearing on-street parking and thereby allowing for the development along the Winooski River. When more housing in the downtown area is built and the need for car parking reduced, the timber structure will be transformed into a mobility hub, community center and even housing.

The design includes a series of 'nodes' that will anchor and spearhead future development, such as the Maker Space Living, the Indoor Farmers Market and the green connection parallel to the Taylor Street Bridge.

Innovative design elements will anchor and spearhead future development.



SITE SYSTEMS

TAB 6 / IN THE LOOP

Small scale solutions cover a lot of ground.

As architects, we can contribute to Net Zero cities by promoting sustainable urban mobility, creating energy efficient buildings with renewable energy and by selecting construction materials with low embodied carbon - to be energy and resource smart. In our proposal we also include policy changes that will contribute to ensure a Net Zero+ future. Through the use of computational design with wind, sun and climate analyses and simulations, we can plan urban environments which ensure optimum micro-climate conditions but also have the capability to handle climate changes. By taking advantage of the natural ecosystems, we not only contribute to increased urban ecology but also can mitigate the consequences of climate change.

COMMUNITY ENGAGEMENT

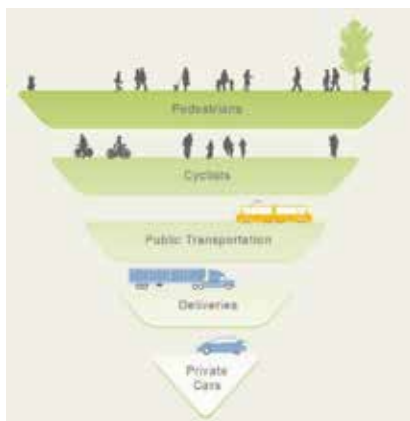
By engaging the local communities, we hope to encourage individuals to invest themselves personally in a more sustainable lifestyle. The design tells the story about a Net Zero+ future that will inspire the community.

Design can encourage and inspire people to reuse and recycle more. In Stockholm, White created a warehouse where materials were sorted and, additionally, a workshop was established for swapping, repairing and creating new products from old ones. An amazing 30% of the products got new owners and a further 45% were passed on to aid agencies. The percentages are as low as 2% at a traditional recycling center. Proximity, ability to leave all products in the same place and engagement seems to be a key to success.

NET ZERO TRANSPORTATION

In The Loop includes a variety of proposals to ensure a Net Zero+ future for Montpelier. A compact and dense mixed-use development in combination with good road and bike-way design will ensure that walking and biking are viable and preferred forms of transportation, reducing energy used for transportation. The design makes it safer to ride, easier to move through the city, more secure to store bikes, and makes people experience the myriad of health benefits that come from active transport. When walking and biking become convenient enough and ride-sharing and

We hope to encourage individuals to invest themselves personally in a more sustainable lifestyle.



Reverse focus from cars to pedestrians



Electric bus

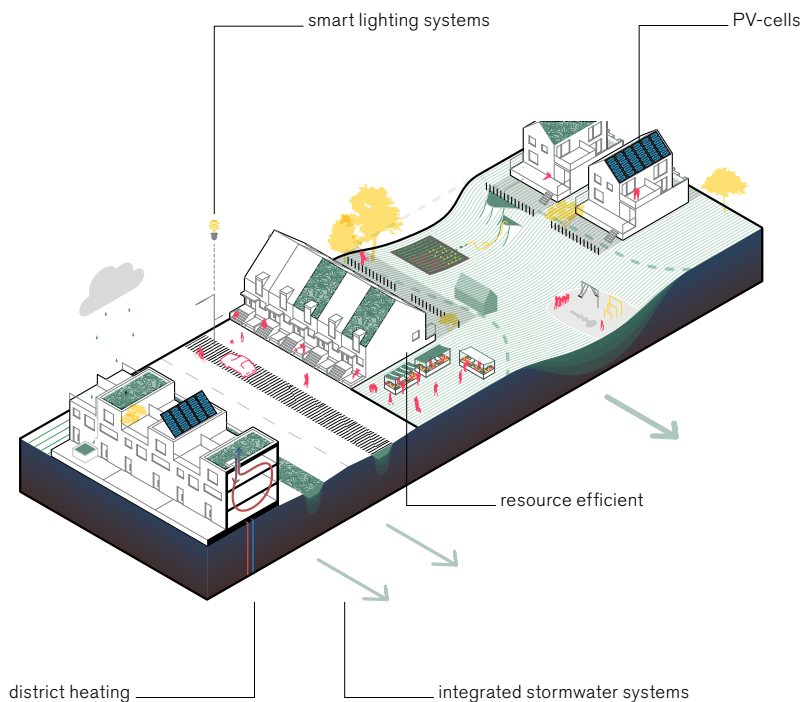
ride-hailing services are available and robust, residents can be encouraged to give up car ownership.

In the coming decades, fleets of all-electric autonomous vehicles, such as personal cars, taxis and buses, will contribute to reducing transportation energy through network and electric power train efficiency, as well as taking advantage of a dense urban fabric.

The city of Montpellier could take inspiration from initiatives such as The Netherlands where the most polluting cars are banned from cities centers and Oslo, Norway, a city that plans to ban all private vehicles from the center by 2019. The Dutch government even proposes to ban all diesel and petrol cars from sale by 2050.



Car free streets



Integrated sustainable measures.

NET ZERO BUILT

In The Loop proposes all new construction to be designed to meet the Passive House standard, which reduces the energy usage substantially, including heating energy by more than 75%, with very little added construction cost.

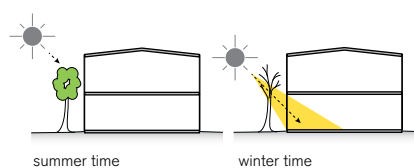
The proposal suggests the city of Montpellier implement an on-site renewables mandate. It would be reasonable to adopt a requirement of at least 10% renewable energy for new construction, similar to London's Meriton Rule, that required new commercial buildings over 1,000 square meters to generate at least 10% of their energy needs using on-site renewable energy equipment. A suitable solution to achieve this would be in the form of rooftop solar PV-cells.

For existing buildings, the city could adopt the Passive House retrofit standard, such as the German certification called EnerPhit, and provide incentives and regulations to retrofit all buildings by 2030. The use of the a

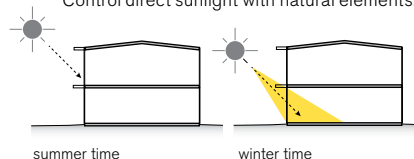
certification such as EnerPhit will lead to extensive improvements with reference to thermal comfort, economic efficiency and climate protection.

Passive house buildings significantly reduce energy needed for heating through better insulation, air tightness, and energy recovery. The small amount of heat needed for new construction can be supplied via Variable Refrigerant Flow (VRF) systems or by a district heating system. Compact buildings allow for efficient district energy systems.

Based on current technology and economics, valid urban renewable energy technologies include rooftop solar energy and run of the river hydroelectric which the proposal includes in the Taylor Street Park Bridge. Energy efficient new construction of 2-3 stories can achieve Net Zero with rooftop solar PV-cells. Larger and denser buildings will require import of renewable energy.



Control direct sunlight with natural elements.



Control direct sunlight with architectural elements.



Green roof insulates and controls stormwater runoff

SUPPORTING



biodiversity



ecological interrelation



maintaining soil fertility



habitat

REGULATING



air quality



noise control



protection from weather



water filtering



climate change adaptation



pollination

CULTURAL



health



experience



social interaction



education



symbolic value

PROVISION



food production



fresh water



material



energy

City's ecosystem services

A likelihood of 50% or more of the electricity could be provided within the city by full rooftop solar energy and district heating. Wind and solar arrays could be located outside the city, with new hydro possibilities where feasible.

The city could procure community renewable energy by seeking out renewable energy developers to build, own and maintain larger solar and wind arrays outside of the city center, and enter longterm contracts for purchasing this energy.

ENERGY SMART SYSTEMS

The development of energy smart systems holds a bright future. Initiatives such as the Oslo Smart Street Lighting project are testing new strategies that can be implemented in the design for Net Zero+ Montpellier. The project in Oslo is an evolving citywide initiative to improve the efficiency of the city's street lighting system. The city connected all its street lighting into a single, remotely accessible network

that allows monitoring and control of street lighting levels through Internet-based applications allowing automatic lighting control based on weather conditions, street use, and natural light availability.

ENERGY SMART ARCHITECTURE

The architecture includes design elements such as fixed sun shading and green roofs to reduce energy consumption. These passive elements do not require energy to operate.

GREEN INFRASTRUCTURE

Well-functioning ecosystems are the foundation of human well-being. The well-being of the ecosystem is the foundation of our human health and happiness. Let nature take care of you by taking care of nature.

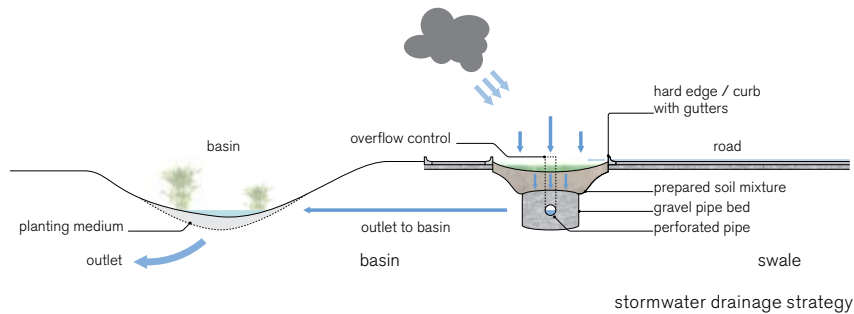
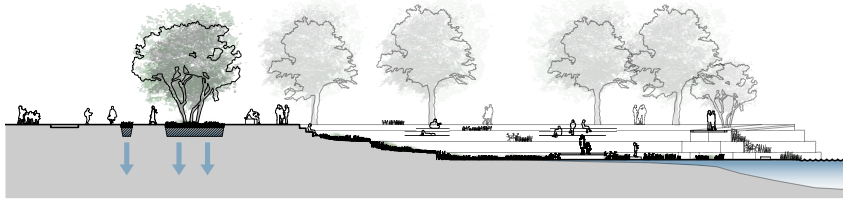
Strengthening the connectivity of the green areas around the city creates stronger possibility for dispersal of plant and animal life. This encourages biodiversity which is a supportive function to all other

ecosystem services. In general, the more biodiverse an area is, the more ecosystem services can be provided. By strengthening existing green corridors, we can enhance the functions of the river and the forest and bring these qualities in to the urban area connecting recreational and social program.

The inclusion of additional green in downtown Montpellier will capture and store Co2. Vegetation and water elements will regulate local climate creating cooler and moister environments which reduces the need for energy consumption.

The addition of green roofs will strengthen connections between green areas and are part of the stormwater mitigation strategy.

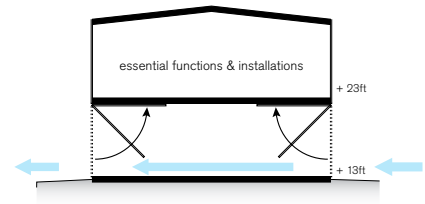
We have not only the opportunity, but also the responsibility to influence society to be sustainable.



integrated strainer street



bioswale along street



foldable facade



stormwater integrated buildings and landscape

STORMWATER MITIGATION

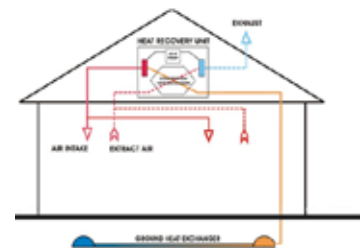
Green surfaces and vegetation slow and clean stormwater runoff, which protect the river from pollution creating a cleaner environment. A permeable green surface can take care of water 5-times better than hard surfaces. A single tree can reduce the amount of runoff surface water by 20 m²/year.

The establishment of strainer streets will clean stormwater and regulate runoff entering the river. Architecture can help in making these systems visible to the public. ownspouts lead water to integrated cisterns, providing the opportunity for rainwater harvesting for usage such as toilets and irrigation.

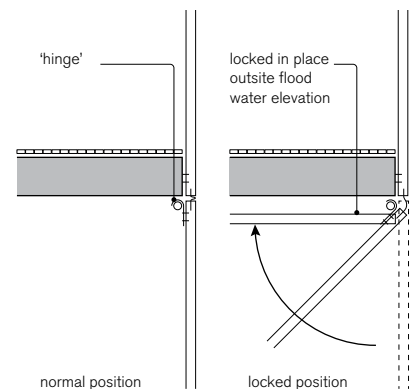
The basin in Winooski River Park is lowered to provide access to the river and allow for water storage in the event of a flooding. Native plantings and rain gardens further filter runoff prior to entering the river. This builds a reciprocal relationship with the river. It is visible, positive, and educational infrastructure.

The building design includes a series of stormwater measures that reduce damage during flooding.

Reducing damage has proven to be very efficient. Along the Hudson River, upstate New York, for example, a small town was flooded. The local restaurant that allowed stormwater to flood the ground floor level experienced the least damage and was up and running after just three days while other buildings were closed for months to restore damage. In The Loop adopts **a more adaptive strategy for existing and new construction:** bringing up installations, facades that allow water to run through and heating systems to ensure fast recovery - do-able solutions in comparison to raising the ground floor level of existing buildings. **Rather than fighting Winooski River it celebrates the flow.**



mechanical equipment located on higher floors



detail foldable facade