



01

destrian/Bike Path

High School Dr

PERSPECTIVE

Remote Parking garage

We envision that a careful relocation and management of automobile traffic patterns and parking in Montpelier can enhance the vibrancy and improve the livability of this unique City. Our concept breaks down the larger more complex sustainable vision into smaller easily managed neighborhoods that can be developed incrementally over time.

Winooski River

03.

TAYLOR ST **NEIGHBORHOOD**

> 05. VAY CONFERENCE CENTER

Winooski River

OWN HALL PL







- Replace parking lots with mixed use buildings possibly having a commercial use on the ground level and apartments on the upper floors.
- Develop green space that connects to the pedestrian way and existing sculpture park.
- Building scale will complement the adjacent buildings.

- Replace parking lot with a multilevel parking garage.
- Provide town house style buildings and green space on top of parking garage.
- Building scale and green space would be designed to enhance the neighborhood feel of the area.



- Replace parking lots with a multi-modal transportation facility with possible commercial space above. The facility would provide easy access to the down town area.
- Relocate the local grocery store and hardware store to the parking lot across from the transit facility. The new location would reduce Main Street traffic and create an opportunity for a new gateway park and conference center.
- Both facilities connect to the pedestrian way for easy bike and walking access as well as the light rail line.



- Develop a traditional style market square with some enhancements including an open covered market area.
- The square would be enclosed by mixed-use commercial buildings housing public meetings spaces, maker and entrepreneurial space, as well as a food processing hub.
- The Market square would connect to the French block parking lot via a new artistically designed metal foot bridge.
- The French Block parking lot will be converted into a Makers/ Arts space containing small creatively designed artist pavilions.



- Infill the lot created by relocating the grocery store with a sculpture park and conference center. The new building and park would become a symbol of vitality and a gateway to the City of Montpelier.
- The park connects to the pedestrian way allowing walking and biking access to the river frontage and downtown amenities.
- A new mixed commercial and apartment building would replace the parking lot adjacent to the Drawing board extending the downtown street frontage toward the river.



- Infill corner parking lot areas with multistory apartment buildings.Develop a multi use plaza behind the main street buildings.
- Modify parking lot configuration to allow for short term parking.

SUSTAINABLI

PERSPECTIVE 01



PERSPECTIVE 02



DWELLING UNITS:

 Proposed number of apartments created = 650 ~ 750.

COMMERCIAL SPACE:

• 257,164 gross square feet created.

HOSPITALITY / TOURISM:

GREEN/PUBLIC SPACE:

• 257,164 gross square feet created.

• 3,200 linear feet of riverfront access.

Hotel rooms created = 100.

GREEN POWER:

- Square footage of PV panels = 172,113 SF
- Total kWh annual production = 1,858,820 kWh
- Number of households powered = 387
 Total value (\$.19/kWh) = \$353,176/yr



 (2) Parking Garages = 1,349 parking spaces created.















Montpelier is a city surrounded by rich nature. This idea intends to develop not just ordinary housing plan but to cultivate the area potential behind the compact city that would benefit nature engaged in urban life.

In this proposal, we adapted multi-complex facility composed with physically and functionally integrated low-rise and high-rise buildings to provide human connection to urban sustainability.

The project site is located on the south of State St. neighboring to Vermont's state government. The facility emphasizes the image of the area by connecting the Winooski River to the city.

The facility is situated between State St. on the south and Winooski River on the south, which was modified by vertical and horizontal zoning - basically, commercial zone on the lower part, office zone at the middle, and residential zone on the upper level adjacent to the river. Providing atrium and courtyards maximize the surface on the ground level while incorporating natural sense of space.

The facility envisioned strengthening the community through the extensive common space and also to create new lifestyle emerging opportunities for younger generations.



Section A-A' scale=1:500

Set atrium and courtyards to maximize the horizontal space incorporating natural sense of space.



Maximize the horizontal land use



Residential zone in high-rise building

			a aller		
					2
			Strand 1		
00	38,500	9,000	22,500	9,000	
	266 000				



Atrium and courtyards to incorporate natural light

Limit the height to ensure great view

Open facility connecting the city and the river







Dusk view - from the west Incorporate natural light from the approaching space between the facility and the river.

Build up multi-complex facility while managing the environment. Develop the area potential behind the compact city that would benefit green space engaged in urban life.

80204



Framework 2030 proposes a reimagining of Montpelier's downtown core that is unlike anything that has been undertaken in any other American city. This proposal envisions a redevelopment of Montpelier's downtown in which the form of the city is no longer determined by the street but by public open space. The transportation hierarchy created by road infrastructure has largely determined the form of the contemporary American city. In most American cities, pedestrians and vehicles are strictly separated, and the scale of the city is dominated by the needs of the automobile. Montpelier is no exception to this fact. However, the advent of the self-driving car has the potential to radically transform the existing transportation hierarchy, as self-driving cars and pedestrians will be able to occupy the same surfaces without danger. Montpelier is poised to take advantage of the possibilities that this revolution in transportation technology has to offer.

Rather than banish the automobile from downtown, this proposal acknowledges that by 2030, autonomous vehicles will be able to occupy the same surface as pedestrians. Indeed, by 2030, mass transit may have begun to incorporate the self-driving car as a replacement for infrastructure-heavy bus rapid transit or light-rail. Framework 2030 proposes that the areas of existing parking lot to be replaced by a single surface on which pedestrians and vehicles can coexist, above which is lofted a network of narrow buildings that encloses a network of public courtyards. The ground surface is largely porous, both to allow for unencumbered movement and to mitigate the danger of the next Winooski River flood, but the spaces on the ground can be incrementally occupied with shops and storefronts.

Above the ground is a framework of building infrastructure. These buildings enclose a network of public squares that can be occupied with different programs. The buildings are envisioned as being constructed of cross-laminated and heavy timbers. Wood is the building material with the lowest embodied energy, thus any proposal with sustainability as a concern should consider replacing concrete and steel with wood construction. The mechanical and electrical infrastructure necessary to support the built space will be kept above the first level in order to avoid damage in the event of a flood. The enclosed spaces in the building network above the ground surface can accommodate a range of uses from traditional single family dwellings to commercial spaces to co-living spaces to workshops to co-working spaces.

Framework 2030 is a ultimately a program for a participatory design process. The grid of building infrastructure is overlaid on the area of existing parking lots and forms the basic framework of Montpelier's redevelopment. This grid is capable of accommodating the various needs of the brief as well as unforeseen community needs and desires. What you see on the wall is thus not a proposal for a fixed vision of Montpelier's future, but is rather one of a nearly infinite number of possibilities for how to insert Montpelier's needs into this proposed framework. The citizens of Montpelier would be able to participate in the decisions about how to place programmatic elements like the farmer's market, green spaces, convention center, greenhouses within the framework. As the new building space becomes occupied, residents can begin to claim ownership of their adjacent courtyard spaces on a small scale. The ultimate aim of the proposal is a situation in which the citizens of Montpelier are able to claim a greater degree of agency and control over their urban existence.







The ground surface is porous to allow a fluid movement of pedestrians and vehicles, as well as to mitigate flood risk.













Existing (dotted) and proposed (cross-hatched) green space.



The project area is overlaid with a grid of built space and open courtyards.

The existing transportation hierarchy strictly segregates pedestrians and vehicles.



Framework 2030

This drawing represents a work in progress. It is not a static proposal but is rather a proposal for a framework that can accomodate Montpelier's needs as they change over time. Montpelier's citizens can become involved in the process of inserting programmatic elements into the framework, thus taking a greater degree of control over their urban existence.



Entry Number 80213



MASTER PLAN INSPIRED BY WINOOSKI RIVER & LANDSCAPE

LEGEND

- 1. Transportation Center
- 2. Senior Center
- 3. Low-density rental in forest
- 4. Mid-density rental by river
- 5. High-density rental connected by sky bridge
- 6. Art plaza with tunnel and parking underground
- 7. Winooski River Park



SUSTAINABLE :: COLLABORATIVE :: DIVERSE

NEW ART PLAZA CONNECTING TO WATERFRONT









SHARED NETWORK



SHARING ECONOMY

80213-1





SHARED APARTMENT



SHARED LANDSCAPE

SHARED DRONE



SHARED CAR

SUSTAINABLE FACT SHEET

- 3 miles of walkable landscape connecting downtown
- 32 acres of greenery above and below buildings
- 1,249,329 kWh per Year from solar panel on existing buildings
- Use of high performance wall assembly and clear solar panels on windows of new buildings
 Use of wood as new building's structure to reduce carbon footprint by 75%
- Shared amenities to reduce the need of multiple private amenities
- Shared and driver-less vehicles in central location to lower energy waste by manned vehicles.

- 15min walking loop in downtown is created with bridges and passageways between buildings • Terraced landscape along the riverbank to reduce water pollutions.
- Permeable surface and rainwater collection system to reduce surface runoff
- Diverse program and spaces for people to work, live and play within downtown.
- A mobile office to let people to work anywhere without going back to the office
- Unified Apps to monitor all utilities usage

To LEAD DE



80213-2

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Entry Number 80215









- I. Great Lawn
- 2. Rail Trail Bike path
- 3. Net Zero Science Museum with Children's Discovery Park and playground
- 4. Rain Gardens
- 5. Amphitheater
- 6. Covered Farmers Market

- 7. Net Zero Hotel and Conference Center
- 8. State Street with new Boulevard Alignment Bike and Tram Priority
- 9. Proposed Net Zero Housing Min. 3fl Residential with Commercial on ground floor and underground parking
- 10. Sculpture Garden
- 11. Proposed Multi-story Commercial Development with Underground Parking
- 12. Proposed 'Gateway to Montpelier' Garden

- 13. Views to Capitol from Route 2
- 14. Proposed Access/Overlook to River
- 15. River Bike and Pedestrian path
- 16. Tram Link to Remote Commuter Parking Lots
- 17. Net Zero Transit Hub



Proposed buildings

Existing buildings





TRAM AND BIKE TRANSIT



RAIN GARDENS AND AMPHITHEATER



RAIL TRAIL



CITY STREETS



NET ZERO ARCH AND FARMERS MARKET







RAIN GARDEN STREETSCAPE

SCIENCE MUSEUM SUMMER

SCIENCE MUSEUM WINTER

reg # 80217

Entry Number 80218

Sustainability

Environmental

Optimal use of Natural Organic resources developing reciprocity between environment and inhabitants. **Social**

Education/training of all end users, providing sustainable reciprocity of inhabitants and environments relationship. Community gathering locations bond fires, designated yoga and free fitness/aerobics park/section. Events and festivals to maintain awareness and contribution to optimal success of system.

Durable

Planet preservation low carbon foot-print minimizing maintenance and reconstruction with room for expandability.

Introduction to Vision

Buildings too, are children of Earth and Sun. -- Frank Lloyd Wright--

We are approaching Montpelier from a retrofit perspective to preserve its organic, sacred appeal, while matching it with a balance of Hybrid designs. Each application will be sealed envelopes, reciprocating energy to its surroundings as would a plant in nature. We aim to make use of upcycling building materials for interior design as well as exterior design i.e. the **Student Dorms** are made using stackable shipping crates equipped with the retrofit kit, playing their part in minimizing the CO2 footprint. The **Retrofit kits** are to be implemented into every structure, making them all more efficient while paying it forward through creating more jobs and producing clean energy.

Redirecting and Recycling Energy

- The **Solar Panel Farm** is created based on the Nellis Solar Power Plant model located in Nevada using ground-mounted solar system employs an advanced sun tracking system, designed and deployed by SunPower. It produces over 32GW hours since going online providing over 25% of energy used for its application.
- For residential and commercial upgrades, each facility will implement the "Retrofit kit"
- With use of water towers, implement Heat Recovery technology for large dwelling units i.e. Hotels-Apt-Dorms-Gyms-Rec Centers. Windows collect BTUs and redistribute it to heat water.
- Reclaiming hot water heat from chiller tower, use rejected heat and insert into water stream to serve for hot water through electric reheat Rain reclamation systems for park reservation/gardens and indoor agriculture
- Hydronics loop melting snow on roofs to collect water and route to reclamation tanks.
- Farmers Market will host vendors and food carts in a retrofitted warehouse space that also is home for farm-to-table restaurants, a courtyard with vertical and traditional agriculture, and an urban grow-room (vertical farming).

Highlights

Farmers Market: innovative hybrid, tastefully mixing tradition and technology! **Shared Work Space**: the UNITY in community!

Multi-Level Family Rec-Center: awesome fusion of entertainment family fun and education!

Transportation

- 100% Electrical cars are the only personal vehicles allowed in the city zone as well as "Go Vermont!" carpool vehicles that comply with energy regulations. A special pass/permit will be required for compact parking spaces/passenger unloading zones. There will be shuttles that provide transportation to pedestrians to get them throughout the district, balancing light rails with precise routes for more rapid experience. Offsite commuter parking lots outside of city district will be shuttled into downtown or carpooled. Widen bike lanes to accommodate influx of biking throughout district.
- The Bike Stations are available 24hrs at the entrance and exits of the district as well as all throughout the district so that users can grab and go from anywhere; similar to employees and Google Headquarters. And when you are finish, just park it in the convenient bike racks located outside of every building and along the park/recreation trails. Reps will assist with maintaining even distribution of bikes availability.

Fun and Affordable

Outdoor Parks and Landscaping

• Skate Parks (2) locations throughout district; can be converted to Snow Park during winter.

• **Gardens and Plant Life preservations**, art sculptures, small sitting areas with mini outdoor stage for small functions and gatherings. Increase in plant life will assist with reducing CO2.

New Development Commercial and Public Facilities

- Affordable Living units and Elderly Suites are "Plug and play" insulated shells and cargo crates, using energy efficient components from **Retro fit kits**. Essentially all buildings, old and new will use kits; number and type of components will vary by case. Also explore eco cost effective materials such as hemp plant based brick/mortar, chill water towers, and geothermal plant.
- **Bookstore with performing Arts Center** has organic café inside with specialty drink options.
- "Farm to Table" restaurants and food cart/mini car vendors designated areas (instead of trucks)
- **Multi-Level Family Recreation Center** will be similar to YMCA or BGClub; facility provides afterschool programs, fitness, library, and arcade. Recreation will consist of tennis, basketball/volleyball, indoor pool and skate-park and driving range on the roof accompanied by green roof vegetation and solar power technology. Cafeteria serves (fruits and veggie based menu) from local farmers and gardens.
- Science Center will host traveling exhibits but will be anchored by a cutting edge, hands-on astronomy program.
- **The Shared Work Space** will operate similar to the inclusive, co-working facility in Oakland, Ca. The Impact Hub. Shared work space minimizing overhead allowing companies and entrepreneurs to rent space as needed, essentially networking and influencing partnerships to transform ideas and business.

References

https://netzerovt.org/resources/ https://www.epa.gov/ghgemissions/overview-greenhouse-gases http://www.skepticalscience.com/co2-plant-food.htm http://www.brainyquote.com/quotes/authors/f/frank_lloyd_wright.html

Environmental

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Social

Education/training of all end users, providing sustainable reciprocity of inhabitants and environments relationship. Community gathering locations bond fires, designated yoga and free fitness/aerobics park/section. Events and festivals to maintain awareness and contribution to optimal success of system.

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POI Map



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Farmers Market: innovative hybrid, tastefully mixing tradition and technology! **Shared Work Space**: the UNITY in community!

Multi-Level Family Rec-Center: awesome fusion of entertainment family fun and education!

Entry Number 80210

More People. Fewer Cars. Better Lifestyle. Net Zero Montpelier.

Montpelier can be the first city in Vermont to provide residents a practical way of reducing dependence on the automobile, while maintaining the convenience of shopping, services, recreation, entertainment, and employment — all within easy walking distance. By building bridges to the future that are sensitive to the past, Montpelier can be home to current and new residents wanting a lifestyle offered by a sustainably designed 21st century net-zero city.

Realizing a sustainably designed 21st century net-zero Montpelier — where people of all ages, incomes and physical conditions want to (and can) live, work, play and visit — requires bridging many gaps...in population, housing, technology, economic vitality, and lifestyle possibilities.

More People, Less Sprawl

By increasing Montpelier's current population from 7,500 to 10,500, the city would reclaim its share of central Vermont's population it had in the 1940's thereby reversing a half century of rural sprawl, and reinforce its place as a civic, employment, population, transportation and economic hub.

More Housing, Fewer Cars

By relocating approximately 1,000 downtown parking spaces to convenient satellite lots at the eastern and western edges of town, we can actively manage downtown parking, and develop 1,000 housing units on the newly available land, as well as another 500 elsewhere in the city.

People living in the new housing will park their cars in satellite lots, connected to downtown by streetcar, bus, aerial tram, and bike and pedestrian paths. Plus, an Uber-styled ride sharing program and Zipcar-like vehicle sharing system are convenient options for residents and visitors to get around and move goods.

More Vibrancy, Less Stress

More residents and fewer vehicles downtown means increased economic activity and decreased environmental impact, as well as a year-round farmers market, community food processing facility, hotel, and conference and training center.

Better Lifestyle

Our approach integrates the latest technology for conserving and generating energy, and integrates a full array of transportation systems. By 2030, Montpelier is a beautiful river city: we'll enjoy river views and access along the Winooski and North Branch, riverfront parks and art installations, a carousel and skating rink, year-round farmers market and multi-purpose space, boat launches, a new pedestrian bridge, and public and green space.

Your Vote For Team 80219 Is A Vote For A More Livable City

More People Increase Montpelier's population from the current 7,500 to 10,500 over the next 15 years

employment and population that existed here in 1940.

n 1940, Montpelier was home to 27% of Central Vermont's With a household size of 2.0 +/-, this creates demand population—today, just 20%. Also at that time, Montpelier's for 1,500 additional housing units. Our vision locates population represented 58% of employment in the city— approximately 1,000 units in the downtown area, and most today, only 42%. Adding 3,000 residents returns Montpelier's of the remainder in two new neighborhoods located in Sabin's share of the area's population to where it was more than 75 Pasture and on undeveloped portions of the National Life years ago, and also re-establishes the relationship between site. Both of these new neighborhoods are pedestrian friendly and served by public transit connecting to downtown.

Fewer Cars Relocate 1,000 parking spaces from the downtown area, and reduce the number of vehicles owned by 1,600

Currently, there are 2,200 parking spaces in the study area. **B**y providing a much wider variety of transit options Our plan is to relocate approximately 1,000 of these spaces (including an Uber-type program, increased bus service, to satellite lots at the east and west ends of the city. These and more bike lanes and a shared bicycle program), we can lots will be connected to downtown by a streetcar running increase the number of households without a vehicle from along the existing tracks. The only new downtown parking 5% to 20%, and reduce the number of households with more would be a two level parking structure below the new Court than one vehicle from 65% to 40%. These two changes will Street housing. This garage would replace the State and result in 1,600 fewer vehicles in Montpelier. private employer parking currently on the site and include 200+ spaces for the shared vehicle program.

More Vibrant Local Economy Increase annual tax revenues by \$4.35 million, and local consumer spending by \$58 million annually

Montpelier's recently adopted Economic Development ${\sf T}$ his broadening of the tax base and increase in local Plan estimates that each new housing unit generates \$2,900 spending will benefit everyone who lives or does business in in tax revenues annually, and each new resident will spend Montpelier. Its school system will be on a more sustainable about \$19,000 locally each year. Applying these figures to our fiscal footing as will city government. Local stores and proposed 1,500 new housing units and 3,000 new residents service providers will see significantly increased revenues, means that Montpelier's annual tax revenues will increase and residents and visitors will have more shops and services by \$4.35 million. In addition, the new residents living in these to choose among. 1,500 units will pump an additional \$58 million of spending into the local economy each year.

Save Time, Save Money, Conserve Energy Cut 3 hours of commuting time, \$1,245 in vehicle operating costs, and 1 million gallons of gasoline

The average daily two-way commuting time for someone f 3,000 new residents no longer commute an average of 30 living in Washington County outside of Montpelier or Barre miles a day, moving to Montpelier will reduce the number of is 47.5 minutes. Each person who works in Montpelier, yearly miles driven by 21.6 million. At an average of 22 mpg, and moves into one of the new housing units will save that saves nearly 1 million gallons of gasoline each year. approximately 37.5 minutes a day in commuting time. This At an average operating cost of \$0.17 per mile for an average translates to 3+ extra hours each week, or 150 hours per year. sized sedan, this translates to a savings of \$1,245. What's

more, if a family can eliminate one vehicle, it will save an additional \$5,841 per year.

Make Net Zero a Reality Electric vehicles, energy efficient buildings, local renewable energy sources

Net Zero occurs when Montpelier's Greenhouse Gas Sustainably managed forests can provide fuel for heating Emissions are equal to its total Carbon Offsets (e.g., Carbon (and replace fossil fuels) and materials for new construction, Sequestration, Renewable Energy Credits, and Efficiency as well as function as massive Carbon Sinks. By actively Strategies).

Combustion engines need to be replaced with electric Carbon Sequestration benefits. In so doing, Montpelier vehicles that run on clean electricity. Buildings need to be demonstrates its commitment to a durable sustainability, constructed with more efficient lighting, heating, cooling rooted in the local economy and natural resources of and insulation systems.

managing a given forest, Montpelier can then claim the Vermont and New England.



Existing rail line is spine of 21st Century Montpelier

- Streetcar service on existing rail line connects satellite parking lots outside downtown area.
- New residential neighborhoods—downtown, Sabin's Pasture, and National Life (connected to Taylor Street transportation center by aerial tram)

Riverside Park

Montpelier's new downtown residential neighborhood

- Court streets.



1. South Bank

- NECI's new home is the 7,000 sq ft building on the south bank of the Winooski river between the Taylor and Main Street bridges.
- Ground floor includes teaching kitchens, bakery/café, and restaurant, complete with outdoor dining on riverside deck.
- Upper floors house students in microapartments.

2. Taylor Street

- Series of 4 and 5-story residential buildings flank Taylor Street and rail tracks
- 340 units include studios, one-bedroom, and two-bedroom apartments and condos at a variety of prices.
- At least one building is age-restricted (55+) and all contain handicap accessible units.
- Ground floors house small shops and professional offices.



• Nearly 1,000 new residential units along both sides of Winooski River, flanking Taylor and along

• Banks of the Winooski and North Branch rivers provide views and recreational access. • Existing location of farmers market is enhanced by adding year-round multi-purpose pavilion.

 Farmers market remains at current location and new iconic 5,000 sq ft pavilion provides year-round operation.

• Riverside Park provides access to confluence of Winooski and North Branch rivers, and includes carousel featuring animals of Vermont.

4. Court Street

- 140 units of housing built along Court Street, above two levels of parking, replacing spaces currently used by State and private employers—providing 200+/- spaces for shared vehicle program.
- Residents, workers and visitors enjoy easy access to energy efficient cars for rent by hour, day or week.





Farmers Market and Riverside Park

Here is Montpelier's new civic space, where you can shop for local produce and food products, enjoy the riverfront, ride the carousel, and catch a streetcar. Downtown is a short walk or bike ride via the new bridge over the North Branch River. People working at National Life can board the aerial tram and be downtown in minutes without using a car. And the new Taylor Street neighborhood is right next door.



- streetcar line.
- The satellite lots and streetcar system make From the warmth of your super insulated, parking and getting around stress-free. I can air to air heat pump micro apartment, park my bike in the covered bike shelter and it's watch a skater below carve figure 8s in safe and dry 'till I ride home. It's a quick ride the blue ice. less than 10 minutes. Get off the shuttle in the heart of the Market The streetcar connects me to my job Center and recall the times you used to waste at DMV, downtown, helps save time in search of a parking place . Marvel at how and money, and I can go to the coop many more farmers and craft tables occupy on the way home. what used to be a sea of parking. Climb aboard. Bask in the pride

Take a ride share bike from the rack on the path for a quick picnic at Hubbard Park and be back at work

of place knowing Montpelier has achieved Net Zero and you are a part of it.

Watch the kids play carefree in the safety of a pedestrian street...on the raised Court Street promenade.



Riverside Park

• Riverbanks along North Branch (and Winooski) offer many recreational amenities. • Riverside Park brings nature to daily life—seasonal kayaking, fishing, walking, relaxing. • Adjacent bike path and streetcar, and nearby aerial tram make "getting there" fun.



Taylor Street Transportation Center

• Taylor Street is new gateway to Montpelier, and meeting place for civic and commercial goings-on. • Taylor Street transportation center realizes potential, offering many forms of transit. • Ground floor shops in new residential buildings, aerial tram arriving from National Life, and





Building an Ecological Capital Montpelier Achieves Net Zero by Modeling a Healthy Ecosystem

Energized by the Sun: Sunny outdoor spaces and gardens on the south side of buildings utilize passive solar and photovoltaic panels to capture solar energy. Main Street displays a solar canopy designed to power the downtown while shading pedestrians. Montpelier moves away from the fossil fuels of the 20th century, massing all new development on an east-west axis to maximize the amount of solar energy generated on buildings and over parking lots and garages. The District Heat project, fueled with local, sustainably harvested wood, now reaches all of the Designated Downtown. The energy from water flowing downhill from Berlin Pond is harnessed with micro hydro turbines.

Diverse: The land use pattern of the 20th century created silos of single use development, putting home, work, play and school in separate zones. A broad array of residential, civic and commercial uses in the downtown now provides for rich, vibrant and diverse community life. The vast parking areas of the 20th century settlement pattern are reconfigured and relocated to make way for expanded housing options with a density of 30-50 units per acre. Low to mid rise apartments, townhouses, cohousing, and congregate housing in the downtown create a total of 400-500 units plus shared spaces and facilities. Existing neighborhoods infill with apartment conversions, small accessory dwelling units and studios. With 300-500 units of housing near the site of National Life, a total of up to 1,000 new households add economic vitality to Montpelier's downtown. New preschools, fitness centers, community gardens, co-working office space, a year-round farmer's market, riverfront access, maker spaces, and conference facilities will enliven the downtown for both residents and visitors.

Interconnected: Montpelier preserves, supports, and improves pedestrian and bicycle access to the downtown and beyond through a network of paths and interconnected green spaces. With concentrated density, everyday needs are met within walking distance, and with 24/7 access to expanded public transit, mobility is assured for all. With light rail service to nearby towns, enhanced Amtrak service to regional destinations, a tram for commuters to travel to National Life, and an extensive network of electric vehicle charging stations, Montpelier is a multi-modal transportation hub. Infrastructure improvements—including walkways, bridges, plazas, bike paths and bike storage—prioritize pedestrians and cyclists, making it easy for residents and visitors to move around the city without a vehicle. And still it is easy enough for government employees, legislators, tourists, citizens, businesses, and shoppers to get around in a car—by providing strategically located multi-level parking garages with solar roofs and green spaces that can easily be repurposed in the future as combustion engines are phased out. New development is built over parking wherever possible, with parking below street level.

Adaptive: Montpelier models a healthy ecosystem by demonstrating how species adapt to a changing world. The creative re-use and regeneration of the existing historic building stock of the city expands job opportunities for Vermonters through weatherization, super insulation and renewable energy initiatives. By providing for residential and commercial growth within the downtown core, and by connecting these multiple uses through multi-modal transportation options, Montpelier creates an even more vibrant, resilient and beautiful capital city that enriches the lives of residents and visitors alike.





SOLAR INSTALLATIONS

MIXED USE RESIDENTIAL WITH SOLAR and PARKING









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1. Mass new buildings longer east west, to maximize daylight, solar access, and PV potential. 2. Mass buildings higher to the south and lower to the north to preserve solar access to neighbors.

especially.

4. Build 3-5 stories max. Maintain a human scale townscape, and this is good for fire safety. 5. Provide parking below all buildings, below and at grade, 1 or 2 levels. 6. Insulate and renovate all new buildings to "net zero ready" standards.

10 BUILDING PATTERNS FOR AN ECOLOGICAL CAPITAL

3. Design for generally 40-60' depth to allow daylighting of most spaces, residential and office

7. Employ solar PV awnings at ground level on many facades. 8. Maximize potential rooftop solar PV, on new and existing buildings. 9. Minimize the exposed exterior area of buildings, build as many joined uses as possible, while preserving town scale, and maximizing privacy, access to light, and connections to the outdoors. 10. Preserve historic facades, but encase existing non historic exterior walls with glass walls or insulation.

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MONTPELIER: A QUEST TO BE THE GREENEST CAPITOL

SUSTAINABLE AND PLANNED COMMUNITY GROWTH GOALS:

- 1. Increase efforts to control downtown flooding upstream while holding the lowest level of new critical building development above the 500-year flood plain. Focus new park and temporarily occupied functions along the river banks. Plan, locate and practice community resiliency strategies and locate civil defense shelters and supplies at high ground elevations.
- 2. Encourage all new buildings to be constructed on moderate-pitched, south-facing slopes in order to reserve richer soil flatlands for agricultural production. Plan future growth to minimize changes to the existing municipal water and sewer systems, as well as limit rural sprawl and new road constructions, and follow the existing city master plan where possible.
- 3. Preserve all possible designated prime agriculture land, woodlands and wetlands, as well as offer incentives for startup family farms and sustainable wood harvesting practices to supply a local wood chip supply to the central district heating plant.
- 4. Establish long-term durability material and assembly standards and a review committee for all new and renovated buildings.

DOWNTOWN DEVELOPMENT GOALS:

- 1. Increase downtown density to allow as much safe pedestrian access as possible within a 0.3 miles radius from the corner of State St. and Main St. Replace nearly all of the parking areas along the river with a new pedestrian boardwalk fronting new south and east-facing riverfront commercial shops and restaurants elevated above the 500-foot flood plain. The paver walkway would be connected to new hiking/biking trails throughout the city. Bike racks, rentals or even free-to-use bikes would be made available.
- 2. Renovate prominent existing key downtown buildings which are in need of aesthetic or structural renovation. Provide cityassisted relocation of lower priority existing facilities located on prime location real estate, such as along the south side of the river as first-impression traffic enters the city, at gasoline station locations within the downtown district, all parking lots along the river frontage, and buildings at the proposed Transportation and Convention Center sites.
- 3. Provide public and private economic development opportunities for up to 1,500 new net zero annualized energy, ADA-compliant rent/buy housing units for all income levels, renewable energy production and storage, street level commercial shops and restaurants, museums, light/green product industrial facilities and a possible parking garage for some of the displaced cars.
- 4. Build a new Convention Center near Main St., State St. and existing hotels which provides spaces for concerts, sports events, conventions, trade shows, lectures, training centers, conferences and an internal downtown train/monorail system stop.
- 5. Add unique new gateway towers at the three main entrances of the city to establish axial urban boundary clarity (see plan).
- 6. Redevelop the high school field to be a versatile and attractive new stadium home of a minor league baseball team as well as several other sport fields for the high school and public use.

GREEN ENERGY AND CLEAN ENVIRONMENT GOALS:

- 1. Electricity generated by non-polluting renewable energy sources will be the most commonly used clean energy source in the 21st-Century for our building, transportation, commercial and industrial sectors. A healthy Montpelier can move to be proactively prepared for this reality by installing new large-scale wind turbines, large commercial and small privately owned solar arrays and submerged in-stream river turbines. Solar arrays on parking lot canopies have some limited potential, but the geometry does not work for multiple-row parking in the snow belt of Vermont. Non-generation power period base load power needs can be provided from a series of new high elevation reservoirs where potential kinetic energy is stored by pumping water from the river up to the reservoirs when renewable energy is being produced. When base load energy for the city is needed, reversible pumps generate electricity with only about a 15% conversion loss. The new bodies of water can provide city-wide fire prevention water retention, swimming, boating, ice skating and park assets, as well as offer a limited geothermal heat pump source for municipal buildings. The goal of the combined resolution is to provide the city with 100% green energy with no pollution impacts long into the future.
- 2. Incentives for meeting net zero (or positive) energy and Passive House standards, installing new electrically powered highefficiency heat pumps, deep energy insulation retrofits and solar panels (where applicable) should be offered to the community in an effort to reduce green electricity demand and expand the capacity of the biomass district heating plant to support more buildings, especially if plant expansion might be possible. Incentives for the use of water saving fixtures, composting toilets and gray water systems in new and existing buildings would also ease clean water demand.

TRANSPORTATION GOALS:

1. Develop a new Transportation Center near the junction of I-89, Route 2 and the existing railroad line to provide a hub for rail, monorail, bus, taxi, shuttle, EV rental cars/van, e-bikes and a secure Park N Ride lot with EV charging and biofuel service stations. The center would also house tourist information, a café, freight shipping services and vehicle/train service bays. A second, close by rail stop would be at the new downtown convention center. A future electric higher speed monorail system would be developed to run on renewable energy-sourced power with new concrete support piers and roof rails located above the existing rail line easements which could stretch across Vermont and beyond.

STRENGTHENING THE SOCIAL AND CULTURAL FABRIC:

Create or upgrade unique "sense of place" destination nodes of interest throughout the city and increase downtown density to encourage community interaction. These should include an indoor/outdoor farmer's market, senior care facilities, new parks with playgrounds, sports courts, picnic areas, sculpture gardens, fountains and strong connections to the currently largely ignored river.







NEW TRANSPORTATION CENTER

GETTING TO NET ZERO:

IN ORDER FOR MONTPELIER TO REACH THE GOAL PRODUCING AS MUCH, IF NOT MORE, OF ALL OF IT'S ANNUAL ENERGY CONSUMPTION BY MEANS OF CLEAN, GREEN, NON-POLLUTING SOURCES A PLAN MUST DFIRST EFINE HOW MUCH IS CURRENTLY CONSUMED IN TERMS OF ELECTRICITY FOR POWER AND FUEL FOR SPACE CONDITIONING AND TRANSPORT. A REASONABLE PROJECTION OF FUTURE ENERGY CONSUMPTION GROWTH MUST ALSO BE CONSIDERED IN ORDER TO PREDICT HOW THE CITY MIGHT REASONABLY REACH NET ZERO FOR ALL OF THE SECTORS, INCLUDING TRANSPORTATION, COMMERCIAL, INDUSTRIAL AND HOUSING.

CURRENTLY, MONTPELIER HAS A POPOULATION OF ROUGHLY 7,600 PEOPLE WHICH IS ABOUT 1.22% OF VERMONT'S TOTAL POPULATION.

SINCE 34.7% OF VERMONT'S TOTAL ENERGY USE IS CONSUMED BY THE TRANSPORTATION SECTOR. CONVERTING A SIGNIFICANT PORTION OF THE CITY'S TRANSPORTATION ENERGY TO CLEAN **ELECTRICITY IS A CRITICAL FACTOR IN REACHING A** NET ZERO GOAL. A CALCULATED NUMBER OF VEHICLES OF ALL TYPES IN THE CITY IS ROUGHLY 3,600 AVERAGING ABOUT 20 MILES PER GALLON AND 12,000 MILES PER YEAR. ASSUMING 10% OF ALL VEHICLES WILL REMAIN LIQUID FUEL-POWERED (HOPEFULLY WITH LOW-POLLUTING BIOFUELS) FOR VARIOUS REASONS, THE CITY WOULD HAVE TO PRESENTLY PRODUCE THE CLEAN ELECTRICITY EQUIVALENT OF ABOUT 1.94 MILLION GALLONS OF GASOLINE, OR 71.1 GW-HOURS PEI **AR** TO POWER THE REMAINING 90% OF VEHICLES. ALL FAVORABLE ENERGY CONVERSION EFFICIENCIES OF ELECTRIC VEHICLES HAS BEEN **IGNORED FOR THIS ANALYSIS.**

USING 2014 STATEWIDE ENERGY TOTALS, THE OMMERCIAL, INDUSTRIAL AND RESIDENTIA SECTORS OF MONTPELIER USE A CALCULATED 67. **GW-HOURS OF PLUG LOAD ELECTRICITY PER YEAR.**

ENTS FOR ALL MONTPELIER SECTORS IN 2015 WERE PROVIDED BY ELECTRICITY (11%), PROPANE (10%) AND WOOL 5%). SPACE CONDITIONING VIA ELECTRICITY icluded in the above figure, wood heating IKFIY TO UILDINGS AS INCENTIVIZED DEEP ENERG' FFICIENCY RETROFITS TO ALREADY SERVICED XISTING BUILDINGS ARE EXECUTED. THE KEY T UCCESSFULLY USING LOCAL AND REGIONA IOMASS FOR HEATING IS TO CONTROL POLLUTIO ECHNOLOGY OR FOSSIL FUEL-BASEI LTERNATIVES. THE REMAINING TASK WILL B ILDINGS OF THE COMMERCIAL, I ESIDENTIAL SECTORS FROM FUSSIL FUEL (FU IL AND GAS) TO NON-PULLUTING, KENEW LECTRIC ENERGY POWERED SPACE CONDITIO ystems like ground water or Air-Source HIGH EFFICIENCY HEAT PUMPS. A VITAL FIRST ST IOWEVER, IS TO OFFER HIGHLY ATTRACTIV NCENTIVES (CARROTS NOT STICKS) TO RENOVA)r build highly energy efficient building HELLS USING SUSTAINAB FANDARDS CERTIFICATIONS SUCH AS PASSIV HOUSE, VERMONT BUILDS GREENER OR TH JSGBC'S LEED PROGRAMS WHICH HELP REDUC ONG-TERM COSTS AND THE AMOUNT OF GREE RENEWABLE ENERGY NEEDED TO REACH THE NET ZERO GOAL.

MONTPELIER HAS APPROXIMATELY 3,900 HOME **83% OF THEM USE FUEL OIL OR GAS TO HEAT. TH** ITY'S COMMERCIAL AND)MBINED HAVE APPROXIMATELY 50% OF T EATING FUEL CONSUMPTION AS THE RESIDENT ECTOR. ASSUMING THE AVERAGE MONTPELI ome uses somewhat more than 1 ATIONAL AVERAGE TO HEAT, OR 100 MILLION BTUH/YEAR, THAT EQUALS 518.7 BILLION BTUF YEAR., OR 152 GW-HOURS PER YEAR OF CLEAN LECTRICITY.

Γ RE Z





GREEN ELECTRICITY: HOW MUCH IS NEEDED **TO REACH NET ZERO?**

LTHOUGH A NUMBER OF VARIABLES COULD HANGE ' APORTANT TO DEVELOP A NERGY TARGET HICH MIGHT ACHIEVE NNUALIZED ENERGY AND ENVIRONMENTA POLLUTION GOAL FOR MONTPELIER.

OR ALL OF ' THE MONTPELIER SECTORS AN RESENTLY USED POLLUTING ENERGY TYPES FO OWER, TRANSPORT AND SPACE be converted t FCTRICITY GW-HOURS PER YEA SUMING A DESIRE TO ADD 1.500 NEW HOUSIN NITS AND FARS I SIGNIFICANT PORTION OF o it can be assumed 1 iemand by up to 50%, or down to a **to** ONTPELIER REQUIREMENT FOR CLEAN ELECTR VERGY BY 2030 OF 204 GW-HOURS PER YEAR.

n order to match that figure, a matur UBLIC ACCEPTANCE OF NEW LARGE AND SMAI SCALE RENEWABLE ENERGY SYSTEMS OF WIND POWER, SOLAR PHOTOVOLTAICS AND HYDRO **POWER WILL BE NECESSARY.**

LTHOUGH THE NUMBER AND LOCATIONS ARE DEBATABLE, THE PLAN SUGGESTS SEVEN NEW 3.5 **MW WIND TURBINES IN MONTPELIER (OR NEARBY)** WHICH MIGHT PRODUCE 64.2 GW-HOURS/YEAR WITH A 30% CAPACITY FACTOR.

THAT WOULD LEAVE ABOUT 140 GW-HOURS/YEAR TO BE PRODUCED BY OTHER RENEWABLE ENERGY SOURCES SUCH AS SOLAR OR HYDRO POWER.

IF 20 GW-HOURS/YEAR COULD BE PROVIDED BY NEW HYDRO DAMS AND IN-STREAM GENERATORS IN THE WINOOSKI RIVER AND IT'S ARTERIES, AND A LARGE 50% (35.6 GW-HOURS/YEAR) REDUCTION IN THE TRANSPORTATION ENERGY SECTOR THROUGH THE INCREASED USE OF MASS TRANSIT RAIL AND BUS SERVICE, AS WELL AS LOCALIZED USE OF SMALL ELECTRIC CARS AND BICYCLES.

INCENTIVE-DRIVEN SOLAR PV INSTALLATIONS ON SITES AND BUILDINGS THROUGHOUT THE CITY WOULD THEREFORE NEED TO PROVIDE THE MAINING 84.4 GW-HOURS/YEAR BY THE YEAR **D30.** THESE SOLAR ARRAY INSTALLATIONS WOULD BE ON OPEN SKYDOME SOUTHERN EXPOSURE SITES, FLAT ROOF NEW AND EXISTING URBAN BUILDINGS, AND INDIVIDUAL HOUSES. IN ORDER TO PRODUCE THAT MUCH POWER, IT IS ASSUMED THAT 164,715 WELL-ORIENTED 350 VATT SOLAR PV PANELS WOULD BE NECESSARY ROUGHOUT THE CITY. AN ASSUMPTION OF 18 SQUARE FEET PER PANEL MEANS NEARLY 3 MILLION SQUARE FEET OF SOLAR PANELS WOULD BE REQUIRED IN ADDITION TO THE DESCRIBED WIND AND HYDRO SYSTEMS TO REACH NET ZERO IN MONTPELIER BY THE YEAR 2030.

AS A FRAME OF REFERENCE, 164,715 SOLAR PV PANELS FOR ABOUT 4,200 MONTPELIER BUILDINGS WOULD REQUIRE NEARLY 22 SOLAR PANELS PER PERSON AS <u>PART</u> OF A PLAN TO FOREVER CHANGE THE CITY'S ENERGY USAGE AWAY FROM THE BURDENS OF POLLUTION, GEO-POLITICAL TURMOIL AND THE ETERNAL COST INFLATION OF FOSSIL FUELS.

REDUCTIONS IN THESE RENEWABLE ENERGY SYSTEM REQUIREMENTS ARE CERTAINLY POSSIBLE, BUT WOULD REQUIRE: 1) MORE LARGE-SCALE VIND TURBINES IN THE REGION DEVOTED TO ONTPELIER POWER USAGE, 2) INTENSE CITIZEN DNSERVATION EFFORTS, 3) MUCH SMALLER HOMES PER CAPITA, AND 4) THE DEVELOPMENT OF A MASS TRANSIT-TO-PEDESTRIAN CULTURE.



IMAGINE . . .

Montpelier as a **living**, **energy independent**, **vibrant community** with young and old engaged in work and play-creating a future that conquers climate change-no fossil fuels, all waste becoming resources, healthy local food, connection to ecosystems, no harm from floodinga community where **humans and natural systems are in balance and**

synergistically evolve. A place implementing a replicable vision for human wellness and stewardship–not only for Montpelier and Vermont, but for the country and planet.

These are aspirational, challenging and simultaneously ambitious goals to achieve. This competition will evolve into specific design solutions, it raises meaningful and large questions related to

achieving that vision for Montpelier-and beyond. Does a vision just pop out of a

creative teams' head? Or would the vision benefit including many stakeholders, investigating history, culture, energy metrics, aspirations, ecosystems, and whole systems and life cycle analysis thinking?

Or does the process generate the vision? Is putting the vision first and then the process second, putting the cart before the horse? Do the larger questions need to be asked at the beginning so that there is a shared vision that resonates deeply? Would funding a more **robust**

process with deeper research and engagement be more successful? Could the design ideas and team finalists from this competition be used as a part of a more inclusive, in-depth Net Zero process and strategy?

We believe achieving such aspirational visions must be an ENGAGING

PROCESS. Like a seed, it can grow into solutions that are replicable and can

evolve over time. We see the vision as emerging from an in-depth collaborative and iterative process, therefore we are not generating a vision, but a process to achieve a vision that emerges from the community itself. More specifically we propose:

- a skilled and experienced **TEAM** with a proven Net Zero track record
- an iterative and collaborative **PROCESS**
 - Our submission describes a detailed step by step process to facilitate stakeholder engagement beginning now one that will encourage the community to ...

...GET INVOLVED

- employs data collection and research to identify net zero solutions; socially, economically and ecologically
- A fiscally viable strategic plan with funding opportunities identified and secured to ensure successful implementation

JOIN NOW in this process to imagine what your Net Zero community will be.

Add your ideas to our competition boards. We need you to create the path to success.




NET ZERO MONTPELIER: A Product or a Process?

13 INITIATE PHASED IMPLEMENTATION 14 LIVE IT, SHARE IT, PASS IT ON

LIVE







1. **ENERGY.** Provide incentives for existing and new structures to be fit with superior insulation, triple-glazed windows and doors. New structures to include geothermal ground source pads to supplement the city central heat. HOT WATER incentives for roof top collectors. **Electricity**. PV collectors on new structures and existing where appropriate. All lighting in city to be

converted to LEDs. Encourage demonstration educational hydro on both the North Branch and the W. 2. **TRANSPORTATION.** - RAIL, Commuter rail, shuttle rail. TRAM to Vt. Life Amtrak will stay at

- Montpelier Jct. Until a route, likely a tunnel will bring the line along Rt. 2.
 - a. COMMUTER RAIL will link all the towns from White River to Burlington, Bennington and up to St.
 A. The link to Montpelier is the most important and the most difficult. This requires clear switching both ways along the existing curved ROWs and track up grades. It also requires a self-propelled vehicle that has controls at both ends and seat switching Park and ride at Montpelier Jct. The train car has to be as sensational as a rocket ship or it will not work.
 - b. **RAIL SHUTTLE**. MONTPELIER TO BARRE. SELF PROPELLED BATTERY POWERED. Link two new TOD communities on line. Also needs to be a stunning design. Better than Disneyworld
 - c. **ARIEL TRAM**. VT.Life office to transit hub in Montpelier.
 - d. AUTOMOBILE. Parking garages to minimize back lot parking .
 - i. PV on each roof.
 - ii. Under Arena.
 - iii. FREE charging in town PV on all public buildings
 - iv. FREE car loaners from City Library of public cars, Located at Western garage (maintained by town garage mechanics.).
 - e. **BIKES, SKATE BOARDS, SCOOTERS AND WALKING**. Bikes, bike lanes, bike racks, rental bike racks, and especially electric bikes for those living in the hills are essential for a sustainable vision, skateboard and scooters (skate board park in a public place) ESPECIALLY WALKING. This means safety, Art, Storefront exhibits, benches, gardens, snow and ice sculptures ;all an attractive magnetic social experience.
- 3. **LIVE WORK HOUSING AND MAKER SPACES**. The lowest floor of ONE of the parking garages will have high ceilings, light tubes from the roof for day lighting and be dedicated maker spaces. Geothermal ground heat recovery pads under the ground level supplies radiant heat powered by collectors on the roof (FREE HEAT AND ELECTRIC).
- 4. **ARENA** connected to both rail stops. Ice-skating, basketball, volleyball, concerts, conventions, shows, etc. 3000+ capacity. PV collectors on the roof. Center of everything but in the back by the river and not dominating the downtown.
- 5. **Create new bold entrances**. West end of STATE Street and Baily Avenue: TWO entrance markers. CORNER posts on Entrance Bridge to MAIN Street. And, the LOOKOUT TOWERS proposed for Taylor Street. Street from the river to Main Street with large skylight atriums that provide elevator, fire stair and emergency egress from all levels. Retail and shops open to ground floor of atrium (above one floor of parking), half level down.
- 6. **LOOKOUT TOWERS**. Montpelier is a city of spires and towers. All are inaccessible for the public. All are symbolic. As an entrance and gateway to the city these two towers will be totally accessible for the public. Lookout and snack bar on top, meeting rooms and galleries on the mid floors and the first 3 floors for seniors.
- 7. **NEW LIVE/WORK SPACES AND TERRACES** in upper stories of historic buildings both sides of State Strteet. Large Atrium cover for events. Music, art and circulation with parking under for residents.
- 8. **EDIBLE PARKS** and walkways throughout the city, Parks and river walks with sculpture and art, rest areas and educational markers all reinforce the pedestrian values.





Entry Number

80227 - Montpelier Design Competition – Major Issues Statement

- 1. Community Involvement. –No ideas imposed top down will be successful. Our first actions would be to solicit the significant community input required for a successful solution.
- 2. Transportation. Parking spaces will be required as long as few alternatives to cars exist. We propose a process of creating pedestrian friendly streets while building an integrated public transportation system, including rail, aerial tramway, parking garage shuttle services and local connections. As the public sees benefits, new housing can infill some of the parking, decreasing the need for cars and increasing the tax base. Continued support will further reduce car use and related health impacts, allowing more housing, better air quality, and an expanded pedestrian friendly environment. Regional and state support will significantly increase Montpelier's ability to achieve this vision. Our four step proposal is included on our sheets.
- Center City traffic. We still need Post Office, emergency vehicles access, services for the mobility impaired, product delivery & pickups and recycling/composting pickups to offices and retail facilities, even if we eliminate garbage. Perhaps relatively small service vehicles can be used before or after a specified time, to limit interference with pedestrian use.
- 4. River Walk. We have created a 50 foot wide public park along the river edge, doubling as sacrificial space for flood water management.
- 5. We are NCARB certified, licensed Architects, splitting certification and experience in net-zero energy buildings for both new construction and renovations. We have a wider perspective on regenerative design including the principles of the International Living Future Institute and the Living Community Challenge, addressing toxic materials, net positive water & waste, health & happiness, social equity, urban agriculture, education and beauty. We also propose incorporating the principles of biodiversity and the natural systems that can reverse Climate Change, not just adapt to it.
- 6. Infill Housing. The ground floor of housing will be devoted to stores and restaurants or artist lofts and greenhouses on south sides. These spaces will be made with waterproof materials and have a smaller upper floor for storage, allowing items to be moved upstairs during floods and rooms to be cleaned and quickly be operational after a flood.
- 7. To respond to Montpelier's mix of different scales our building massing will reflect the sizes of buildings around them. While we must use elevators, when seeking net zero, we design to decrease their use as much as possible. Walk ups will also create a more humane scale with identifiable addresses.
- 8. Water Resources. Impermeable services prevent water infiltration and disrupt the small water cycle. In time all surfaces should be changed to permeable types. All new and renovated flat roofs should be greened thus reducing storm water volumes. Wastewater will be processed and cleaned in greenhouses for growing plants. This will also reduce flooding problems.
- 9. Urban agriculture. We propose to integrate agriculture into the urban fabric, along the lines of nineteenth century Paris. The sides of the power plant and of parking garages will have a layer of greenhouses for commercial food production during all seasons and as a visual screen.
- 10. Sewage Treatment. A sustainable society cannot treat sewage as waste. We propose to implement the ideas of John Todd and the ILFI to treat human waste as the resource it is.















#80227 Expand Transportation Options



Markets and Lifestyle

Inspirations for Pedestrian Malls on State and Main Street.



Net Zero (Net Positive) Energy

New Building Stock- To be built to Passive House Standards to minimize energy input requirements. Calculations indicate our proposed housing stock will be net energy positive by about 27%, thus complying with the Living Building Challenge, or Living Community Challenge, Energy Petal. Existing Building Stock – Will require Deep Energy Retrofits, without reducing historic character, to achieve net zero, (net positive) energy.

Housing UnitsA	1207	
Unit Size	560 – 1,260SF	750 SF Ave.
Housing	902,117 SF	
Com. Spaces	91,380 SF	
Parking Spaces	1,535	
Bicycle Spaces	512	
Solar Panels	9,549	172,413 SF
Solar Output	3,056 KW	
Solar Energy	4,015,584 kWhs @15% CF	
Solar Capacity	1,147,310 SF Hsg	+27%

Embodied Energy – Material energy values, along with durability and toxicity will be important factors.

Other Renewable Energy Sources – Montpelier uses a significant amount of biomass. It appears that wind energy is not viable in the Montpelier region. Hydropower off the river would be excellent if feasible, but the river was too low to provide much power when I saw it. A hydro battery would be possible by pumping water uphill to a holding system during plentiful supply, and generating power in low periods. This is however, a net loss process, so its value is limited. With sufficient holding capacity, diverting water during flooding could theoretically reduce that danger, but I doubt its feasibility.

Regional Transportation Plan



1) Refurbished Montpelier/Barre Train Line

- 2) Parking Garage & Bike Storage at Train Station.
- 3) Existing Bike Path.
- 4) To-Be-built Bus station- Local Bus Routes.
- 5) New Multi-Modal Transit Center.
- 6) Montpelier-National Life Aerial Tramway.
- 7) Parking Garages with Housing Units and Arial Tram Stop.

Guides, Standards & Process



We provide Vision and Expertise. This is Your town and Your Future. Your participation in the decisions is crucial.

Manage Storm Water



- bio-retention,
- rain gardens,
- green roofs,
- permeable pavements,

- Surface Permeability:

Step 1. Create a pedestrian mall along State Street. Parking lots can be accessed from Bailey Avenue, Taylor Street or Court Street. Step 2A. Extend the pedestrian mall to Main St. Institute a one-way loop using existing roads. This routes traffic around the school, (or uses Cedar street), and adapts Hubbard which has some less than ideal sections, but the roads exist. Step 2B. Improve the loop by creating a new road through the parking lots behind City Hall to connect School Street with Barre Street. This is problematic around the Church on Barre, and requires removing or going through the parking garage on East State, but provides an improved route and rear access to businesses east of Main. This does use parking lots that might otherwise support infill housing. **Step 3.** To provide a nearly car free city center, create a ring-road connection behind the State House between Court Street and the parking lots between Baldwin and Terrace St. While there are challenges, contours below Terrace Street are only six to eight feet above the floor level at the back of the State House. Of course the roadway must be sufficiently separated from the State House to not damage the building structure. If a car free city center is sufficiently appealing, "can we achieve this?" becomes "how can we achieve this?" and a solution would be found.

Manage Storm Water

Landscaping : to include extensive use of green infrastructure techniques such as:

- porous asphalt or concrete, • bio-swales, and
- surface ponds.

River edge areas to be planted with erosion control species as recommended by the Buffer Handbook Plant List by the US EPA and the Maine Department of Environmental Protection, or similar source.

INTHE LOOP celebrating the flow

ID 80228

1. Our vision for Downtown Montpelier is to create an urban design strategy for the community of Montpelier that, through a series of innovative solutions, creates a model which rises beyond Net Zero and towards a level we call Net Zero+.

Sustainability

The true goal of our efforts in sustainability is to ensure the well-being of people and facilitate prosperity. An ecologically balanced society is the prerequisite for ensuring that everyone has good living conditions; to safeguard and balance the function of natural systems for our own future existence. That's why we use the formulation "sustainable economy", rather than economic sustainability. IN THE LOOP explores social sustainability in the 21st century with the support of a sustainable economy and within ecological balance.

2. 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.

Together Towards

Not only the design, but also the process is the key towards a Net Zero+ Montpelier. Success results from a process that includes collaboration, mutual respect and understanding for the overall vision between stakeholders. Inclusion of the community of Montpelier is essential and based on the Scandinavian model IN THE LOOP that will include an extensive range of tools to set a common goal and to drive the process forward. The construction of the proposed Net Zero+ Center marks the start point and lead by providing the place of meeting, education and collaboration for the process towards a Net Zero+ Montpelier.

3. Net Zero+ downtown Montpelier is a robust urban design by which innovative small scale solutions are adaptive to meet and allow for future change to ensure the well-being of the community of Montpelier for generations to come.

Adaptation

The strategy proposed increases the adaptive capacity of Montpelier. This is achieved by recognizing the fact that the future often brings changes and challenges that should be considered and addressed in advance. 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 community at the center of the process towards a Net Zero+ Downtown Montpelier.

4. IN THE LOOP celebrates Montpelier, engages in urban life, embraces nature and ensures energy.

Towards and Beyond

A Net Zero+ Montpelier proposes beyon the reduction of energy usage, by improving building design and operations, and the provision of affordable, accessible and renewable energy. It provides identity and diversity, it enables social interaction in a safe environment and it integrates nature into everyday life. It loops in all the elements of a great city.

.... let's get in the loop.

INTHE LOOP celebrating the flow

Our vision for Downtown Montpelier is to create an urban design strategy for the local community through a series of innovative solutions by using a model that rises beyond Net Zero towards a level we call Net Zero+.

A true sustainable future stretches beyond energy efficiency and renewal; it is focused on people, by inspiring a sustainable way of life that ensures well-being.

Our proposal is based on the Scandinavian model that is defined by being Inclusive, Equitable, Robust and Adaptive to meet and allow for future change benefitting the community of Montpelier for generations to come.

A sustainable community lives in harmony with the surrounding nature and its assets, celebrating the flow.

The formulated goals, represented in the loop, are a starting point for a successful and holistic development vision, strategy and process.

... let's get in the loop.

MONTPELIER JUNCTION - BARRE IN THE LOOP will bring the existing rail track back to life with a light rail train connecting Barre - Montpelier - Montpelier Junction, reducing car traffic in downtown. The train can be powered by electricity generated by the Winooski River and other natural sources.

4. ENSURE energy Describing the flows of energy

Net Zero+ Downtown Montpelier will use energy and resources more efficiently reducing impact on public health and local ecosystems. Energy usage is reduced by retrofitting existing buildings and by constructing new buildings and infrastructure with energy efficient methods and improved operations. Energy solutions are to be affordable, accessible and renewable, such as solar and wind energy. The built urban structure and technical systems are robust to last longer and, at the same time, be flexible enough to allow for necessary future changes.

Why: A sustainable society requires the community to use energy and resources in an efficient way.

added green social space in Montpelier

TOGETHER 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, a robust urban design, by which innovative small scale solutions are adaptive to meet and allow for future change to ensure the well-being of the community of Montpelier for generations to come.

RADICAL PRAGMATIC The proposed solutions are locally informed but strategically driven.

AROUND THE BRIDGES

The proposal provides new program and usage of the river front to celebrate the river and its value to Montpelier.

STATE STREET LOOP

The proposal establishes strong connections to the river from State Street for a coherent urban plan.

WINOOSKI RIVER PARK

The inclusion of civic and cultural uses within the river zone provide multiple destinations with shared audiences.

> **DOWNTOWN LIFE** Residential program within the center of Montpelier ensures a 24/7 downtown.

3. EMBRACE nature Describing the interrelation of city and nature.

We need nature for our survival. So, a sustainable community requires an effective usage of energy and resources to reduce the impact on nature. IN THE LOOP embraces nature, providing access and use of surrounding natural environments and assets and integrating nature into the design to include in everyday life.

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

ID 80228

CELEBRATE Montpelier Describing the urban character and identity.

The vision for a Net Zero+ Downtown Montpelier aims to establish a vibrant, dynamic and diverse community, making of place, destination and home. It is equitable and inclusive, providing opportunities for all to live, work and play building upon and celebrating what makes Montpelier unique. The proposal is "efficient by design" characterized by efficient new buildings, retrofitted existing buildings and improved operations to reduce energy consumption.

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

2. ENGAGE in urban life

Describing the open public space and connectivity.

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 shared 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.

LIGHT RAIL TO BARRE

celebrating the flow

Strategies for how to reach the goals of Net Zero+ Montpelier.

8. FARMERS MARKET

The proposal includes an indoor farmers market at the end of Barre Street. The building consists of a plinth with two esidential buildings on top that have direct access to the market. Proposed housing is for elderly and younger generations. The outdoor market will be located adjecent to the church on State Street.

axonometric viev

STRAINER STREETS

The proposal includes a series of "water streets" that connect the city to the river and fulfill an important role in storm water mitigation in the form of treatment, detention and infiltration. These can take the form of Low Impact Developments, such as rain gardens, permeable surfaces with underlying structural soils.

ADAPTATION

The strategy proposed increases the adaptive capacity of Montpelier. This is achieved by recognizing the fact that the future often brings changes and challenges that should be considered and addressed in advance. 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 costeffectively 4. place the community at the center.

7. 25 SQUARE METERS

The Scandinavian model, where no building permit is needed for structures less than 270 sq ft, provides affordable opportunities for the densification of existing neighborhoods. We suggest the City of Montpelier make available D.I.Y. kits that ensure safe and Net Zero construction.

TODAY

IN THE LOOP includes a step-by-step strategy towards a Net Zero+/downtown Montpelier 2030 and beyond. Innovative solutions allow for a gradual process. They ensure adaptive capacity for change by continuously placing the well-being of the community in focus and by providing economic opportunities. This toolbox allows for a wide variation and can be implemented in any order.

2030

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

SHAPE SPACE

New construction is placed strategically to shape, define and provide character and identity to the new public space of Montpelier. New residential buildings clearly define the new Winooski River Park.

> SPECTACLE OF DIVERSITY The proposal includes a wide variety of mixed-use buildings to ensure a resilient center.

CULTURAL CAMPUS

In addition to the commercial function of State Street, the new riverside park will be cultural venue including the new theater.

TIMBER CONSTRUCTION

Wood might be the best building material there is. Timber construction houses are outstanding from an environmental point of view, both in the short and long term. Timber construction has a negative carbon emission, construction time is two times faster than concrete construction, it has excellent acoustical qualities, weighs less, easy to transport, slow burning qualities and takes only a minute to cultivate.* * Growth of the Swedish forests

TOOLBOX

IN THE LOOP provides an extensive "toolbox" to help Montpelier achieve Net Zero+. New housing include a Net Zero "core" that can be complemented as desired to provide personal identity while ensuring Net Zero standards.

6. NORTH BRANCH BRIDGE

••••

The redesign of the existing rail bridge over the North Branch includes pedestrian and bike traffic connecting Winooski River Park to the Main Street and onwards towards Stone Cutter Way Development providing a waterfront promenade on the north bank.

THE LOOP

IN THE LOOP introduces a clear urban structure based on loops for pedestrian and bicycle traffic. Three loops start at the new transit hub and include 1. Main Street / State Street, 2. Hubbard Street / State Street, and 3. College Street / State Street. landscape.

1080228

1. NET ZER0+ CENTER

The proposal places the community of Montpelier central to the design strategy. The new center is a place of meeting, education and collaboration for the process towards a Net Zero + Montpelier and will become a center for arts and crafts after 2030.

2. STATE STREET PARKING

State Street Parking is a new hybrid of a parking garage and a public park. The landscape park gradually climbs the timber construction federal parking that houses about 400 parking spaces allowing for a variety of outdoor activities during all seasons.

3. WINOOSKI RIVER PARK

The new Winooski River Park is the a cultural campus for the community of Montpelier connecting the city to Winoosk River. Its grassroots character, with a wide variety of functions including culture and outdoor leisure activities, has a strong connection to residential areas and to State Street ensures active public life.

West of Taylor Street the park brings the people closer the river while providing for flood mitigation. While east of Tayler Street the park hides the integrates the transit hub underneath.

4. MAKER SPACE LIVING

A new hybrid of residential units and shared workspace with a highly flexible construction that enables the building to adapt to market demands - maker spaces can become residential and vice versa. This building typology provides excellent opportunities for art events, office space for start-ups and housing that works especially well for a young generation.

5. RIVER HOUSING

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

> STONE CUTTER WAY DEVELOPMENT

Creating a Sustainable City and Reconnecting With the Riverfront

In reimaging Montpelier's city design, we aim to create a more pedestrian-friendly downtown that connects to the river and offers numerous activities hubs that can be enjoyed by residents of all ages and physical ability. By expanding the existing bicycle path and creating a new public zone catering to foot traffic, a much more lively city will be established.

Implementation and Community Involvement

The following three types of development should expand simultaneously in order to create a more vibrant community:

1) Activities Hubs: Various hubs of activities that can be enjoyed year-round will attract both tourists and residents alike to downtown

2) *Commercial Spaces:* Thriving commercial spaces in a lively downtown setting will boost the local economy and create opportunities for more companies to move in, therefore creating new jobs

3) *Residential:* Due to an influx of new jobs throughout the vibrant city center, there will be a need for more dwelling units

Bringing more people, activity hubs, and energy production to downtown should be done with care, and should consider both the input and acceptance of the Montpelier community.

Social Sustainability

The design of a pedestrian-friendly core proposes to close Langdon Street to vehicular traffic, creating an open-air marketplace catering solely to foot traffic. The section of State Street parallel to Langdon will remain open to vehicular traffic; however, the new design removes all street parking in this area to favor a larger pedestrian zone containing food service tables and sales displays. This section of State Street is to be raised and cobbled, signaling that it is a special zone for slow-moving vehicular traffic.

The largest change to this pedestrian core is to create a small boardwalk over the North Branch of the river spanning between Landon Street and State Street. This boardwalk will be a gathering location for festivals and community events, as well as overflow from the farmers' market. The bicycle path will link to this boardwalk, making it accessible to people without necessitating the use of a vehicle.

The plan also eliminates a majority of surface parking in downtown, opening spaces for new developments such as senior living communities, dwellings for young people and families, commercial spaces, and parks and activities hubs.

Environmental Sustainability

The majority of surface parking will be replaced with parking garages, which require much smaller footprints. This reduces the urban heat island effect by limiting the use of asphalt. In addition, the top floor of the garages will be shaded with canopies topped by photovoltaic panels, cooling the parking surface while making each parking garage an energy production hub to lower electrical loads for adjacent buildings. Local food will be provided by the creation of several community gardens throughout downtown, including on the rooftop of the new farmers' market building.

Durability

The material selection for new construction will match the existing aesthetic of the downtown core. Facades will utilize brick, cement board paneling, metal paneling, and precast concrete. No imitation materials will be proposed for the new buildings, reducing future maintenance and expenses.

A City for its People and for its Environment

River-Connected Downtown

Connecting downtown and the center of Montpelier with its Riverfront will offer a better lifestyle for residents.

A vibrant downtown riverfront should be fully open to the public, and provide year-round hubs of activities that can be enjoyed by all.

Human-Centered Hubs + Connectors

Activity hubs will be placed along the riverfront from the visitor center area to the main commercial hub on State Street.

Ideally, each hub will be a multipurpose space appealing to people of all ages, levels of physical ability, and socioeconomic status, resulting in spaces that will be used frequently throughout the year. Connectors, such as bike and walking paths, will contribute to keeping these spaces active.

Connecting to the River - Ideas to bring people to the water

Year-Round Activities

Currently, Montpelier is busy during the summer and legislative season. However, to support its economy, it is necessary to provide activities that can be enjoyed in all four seasons.

A successful riverfront should offer: 1) plenty of exposure to winter sun, 2) protection from prevailing winds, and 3) enclosed winter comfort stations within walking distance.

MINGHU WETLAND PARK

ICE SKATING RINK IN MONTREAL

OARDWALK CONNECTOR BETWEEN STATE AND LANGDON STREET

Visitor Center Park

This new park will showcase local artists and net zero technology - a hub of nature, history, and culture with access to the river. This area has other potential uses. It could be transformed into a man-made wetland to treat stormwater prior to reentering the aquifer; or, greenhouses could be placed throughout the hub for food production.

State & Langdon Boardwalk

A boardwalk over the river will connect State and Langdon Streets, creating a new downtown event space. Langdon Street will become pedestrian-only, serving as Montpelier's new arts district. The boardwalk will connect to the new riverwalk path, linking downtown to its river.

Commercial Downtown

The commercial part of State Street will become mainly pedestrian while still allowing low-speed automobile access. The new downtown area will also offer a multi-modal transit center, as well as a combined hotel and conference/learning center that will offer public services on the ground floor and access to the river.

Farmers' Market and Food Production Center

Multipurpose space for weekly farmers' markets, food processing, and events. The building will offer a community garden for food production on the rooftop.

Sports Center

The outdoor sports hub will feature playgrounds and courts that can also be utilized as ice skating rinks during the winter months.

Images credits: Minghu Wetland Park – archdaily.com; Dutch Shared Street – theplanner. co.uk; Riverpark Farm – seedstock.com; Ice Skating Rink- montrealinpictures.com; Sitting Decks urbankiev.com; Lower River Hubs - landarchs.com; Riverwalk - landarchs.com

A City for its Environment and for its People

Sustainable Approaches - Energy and Food Production Hubs

SOLAR PANELS AND URBAN GARDENS WIND POWER POTENTIAL

PARKS + ACTIVITIES HUBS

SOLAR BIKE PATH

ENERGY PRODUCTION HUBS / PARKING

COMMUNITY GARDEN / WIND POWER POTENTIAL **EXISTING HEATING PLANT**

Net positive parking garage will produce energy for its neighboring buildings

Photovoltaic arrays will shade both cars and parking surface

Parking garages will have photovoltaic arrays on roof level making them energy production

Farmers' Market building will offer rooftop community garden, food processing, and event space

Transportation Practical, reliable, and convenient for wintertime

One of the main challenges that public transportation faces in New England is the fact that it is not as practical, reliable, or as convenient as automobile transportation.

To encourage more people to start using public transportation, it is necessary for it to have a clear advantage over private cars especially during wintertime, when waiting outdoors can be challenging.

In order to make public transportation functional and desirable, it must provide people of the transportation schedule. several options that suit different needs and Affordability also plays a major role when regions. A multi-modal public transportation opting to use public transportation. By using system could offer: 1) light rail paired with park-and-rides for electric vehicles that can be charged with those coming from neighboring towns, locally generated energy, the transportation 2) more buses or vans during high-demand cost might be greatly offset.

New Development Improving building energy performance

Bringing more development to downtown Montpelier will increase energy demand; therefore, new construction should be net zero, or able to obtain its energy from the proposed energy generation hubs.

Buildings should have efficient envelope using the principles of natural heating, cooling, and ventilation (ground-source heat, cross-ventilation, exposure to winter sun to provide heat gain, and reduced summer sun

Images credits: Solar Panel Walking/Biking Path – en.solaroad.nl; Electric Bikes Charging Station – electricbikereport.com; Tree-Shaped Windmill - offgridworld.com; Parking Garage Solar Panel Canopy - Springs Preserve, Las Vegas, NV; Sheltered Bus Station - Bus Stop at Curitiba, Brazil

TREE-SHAPED WINDMILL

hours (business and school hours for example), and

3) public and rentable bikes, electric bikes, and scooters to circulate through downtown with several pick-up/drop-off stations.

During wintertime, public transportation should provide stops that are sheltered from winds, and possibly heated. A reliable schedule must be adhered to so people can plan to leave their houses/businesses at a precise time to minimize exposure to cold. Apps and GPS systems can be utilized to alert

exposure). If possible, these new buildings should also generate energy by offering rooftop solar panels.

A downtown residential district should offer a diverse residential typology suitable to seniors and young people alike, as well as growing families. Local policies should offer rent and size control in order to keep it affordable and pleasant for its citizens.

Entry Number 80240

R.O.M.E.: Revitalization of Montpelier's Ecosystem - Team ID # 80240

The City of Montpelier has a long, rich history of providing a sense of intimacy, culture, and prosperity. To maintain Vermont's capital city, we must look ahead as to how we can provide a secure path to a bright future for the city. R.O.M.E. provides a path that both promotes sustainable community growth and addresses the environmental needs of Montpelier and the surrounding region.

Our first major ecosystem regeneration begins with a riverfront park along the Winooski River behind several state buildings. Visitors and residents can sprawl out on the green lawn to enjoy a bite to eat from local restaurants, host events on the weekend, or spend time to relax and enjoy the natural beauty of Montpelier's natural splendor. Furthermore, the environmental impact of a riverfront park would not only filter runoff into the Winooski, but also implement natural flood mitigation for the city.

Another major enhancement is the construction of mixed-use housing and a pedestrian mall below Court Street. This would not only provide a Church Street-style feel to the city, but it would also serve as a space for both residents and businesses to establish themselves in the heart of downtown. Limited parking for the area would be provided for commercial tenants and some residents, and a rideshare program will provide for those without access to a vehicle. This pedestrian-only street would span from Governor Davis Ave to Langdon Street, also to be converted into a pedestrian-only road.

Another exciting feature is a boardwalk-style path stretching along the riverfront from Bailey Ave to Main Street. It would run through the riverfront park and join up with the current railroad tracks next to the steam plant. Not only would this provide a recreational and alternative pedestrian path spanning downtown, but it would benefit freight going through the city. Trains would not have to stop down to a crawl to travel through downtown, therefore improving efficiency of the Vermont Rail Line.

To address a decrease in parking spaces from the various projects, the construction of a parking structure behind the Capitol Plaza Hotel provides a simplified way to find parking in close or immediate proximity to downtown Montpelier amenities, reducing congestion on both Main and State by directing incoming traffic to Taylor Street. A green roof with solar panels caps the top, providing both runoff mitigation and energy supply to the city. The farmer's market would be moved to the aforementioned riverfront park, a much more suitable space for promoting local agriculture.

Last, the current dam near the Main Street Bridge over the Winooski River would be taken out to improve both environmental and recreational space. Water flow would increase, narrowing the river and providing space for fishing and kayaking, with paths leading down from the riverfront park.

Through addition of recreational space, traffic alleviation and a welcoming residential and commercial atmosphere, R.O.M.E. assists Montpelier in becoming more energy independent, drawing in new faces to the economy, and providing the city with a systematic approach for sustainability.

RIVERFRONT PARK

This Recreational space revitalizes the aquatic ecosystem while providing natural scenery in an urban setting. The park will provide areas for basketball, fishing, kayaking, and playgrounds. The space will increase the city's square footage capacity for events such as farmer's markets, concerts, BBQ's and more! Furthermore, vegetation coverage assists in mitigating flood effects while also filtering runoff from the city, making the Winooski River a much healthier waterway.

Cincinatti Parks Foundation

Sustainability - Accessibility - Revival

REVITALIZATION OF MONTPELIER'S ECOSYSTEM

MIXED-USE & PEDESTRIAN MALL

Replacing the "Pit", this complex of mixed residential & commercial space provides a centralized location for both living & commerce. Similar to Church Street in Burlington, Vermont, spanning from Governor Davis Ave through Langdon Street, this development enables pedestrains to travel across the city with minimal vehicle interaction. Encouraged use of this pathway would result in a significant decrease of carbon emissions. Limited residential and

MIXED-USE

This small mixed residential-commerical complex will provide a space for government housing and businesses in close proximity to state office buildings and the proposed riverfront park across the street.

employee parking will be provided underground, with a ride

share program established for residents. Solar panels on the shop overhangs will add a source of energy to the city, tieing the complex with the new heating network.

(GreenCityChallenge.com)

(Goexplore.com) NEW RAILROAD ROUTE

RAILROAD ROUTE

The re-routing of the railroad traveling through the center of downtown Montpelier will not only provide space for the new pedestrian path, but will also allow the freight trains to bypass or travel through the area in a much quicker fashion, improving operating efficiency for the Vermont and New England economies.

PROPOSED TRANSIT CENTER (CARR LOT)

PEDESTRIAN PATH

In addition to the pedestrian mall, this path will span all the way from Main Street to Bailey Ave. The current railroad tracks, which run behind Capitol Plaza and over the North Branch of the Winooski, will be repurposed for the path. This will include a revival of the truss bridge over the north branch for pedestrian and bicycle use.

ARKING CTRUCTURE

NEW PEDESTRIAN P

Photo by Caitlin Corkins (Preservation in Pink Wordpress)

ID#: 80240

This "green" parking structure, similar to the one pictured below, will assist in providing an adequate amount of parking in close proximity to downtown. The structure will come equipped with a green roof arrayed with solar panels, and will simultaneously direct traffic in a clear, easy-to-understand path down Taylor Street. Alleviating congestion on Main Street and State Street would not only cut down on carbon emissions, but also make trips to Montpelier more accessible.

Live Wall (LiveWall.com)

DAM REMOVAL

The removal of the dam from this location will provide better flow for the Winooski River, as well as a narrowing of the banks of the waterway. This will open up endless opportunities for kayaking & fishing, while also providing a healthier environment for the plants and animals within the river's ecosystem.

The focus of the Montpelier 2030 Plan is sustainability. Sustainability has many facets, including environmental sustainability, energy sustainability, economic sustainability, and community sustainability, to name a few. These facets are all brought together with a fundamental planning concept called placemaking.

Placemaking refers to a holistic approach to the planning and design of public spaces. It capitalizes on a local community's assets, inspiration, and potential, with the intention of creating public spaces that promote people's health, happiness, and well being. The goal of placemaking is to help a community achieve sustainability in all aspects so that it is a whole community for every resident and visitor.

Given that the Montpelier 2030 Plan has a 15 year planning horizon, the focus is on projects that would have the biggest impact in achieving the desired outcomes of adding housing within the district, reducing the blight of large surface parking lots, creating community gathering places, and reconnecting the community to the river. Some of the notable aspects of the plan presented here are:

Energy Sustainability

The proposed public market project includes an integrated rooftop solar thermal electrical generation system made by Terrajoule. It solves the typical intermittency problem of solar energy in an innovative way. The system provides energy storage at less than twenty percent of the cost of battery storage systems in a very simple, non-toxic way. The Terrajoule power units are modular and can be the basis of a local distributed generation micro grid.

Economic Sustainability

The proposed public market is intended to be a cornerstone of both civic life and economic sustainability. Not only does the public market have indoor and outdoor space for a farmers market, but it also will house food production facilities, a community greenhouse, and small manufacturer "maker" space. The intent is to provide a place that fosters innovation and local entrepreneurship.

Natural Environment Sustainability

One of the features of the 2030 Plan is a bioswale running the length of State Street from Bailey Avenue to Main Street. A bioswale is a landscape element designed to filter surface runoff water. It consists of a swaled drainage course with gently sloped sides and filled with vegetation. In this case, the bioswale does triple duty in that it is also used as a streetscape beautification element, planted with perennial native wildflowers, which in turn could support honey making from local apiaries.

Sustainable Montpelier 2030 Design Competition

Transit-Oriented Development

Community Gathering Space

Team Registration Number - 80241

ENVIRONM

W

Entry Number 80242

A Strategy for Net Zero Montpelier

This design strategy takes cues from Leo Hollis: there is already strength and vitality in the community and city fabric. We asked how can a Net Zero strategy enhance existing opportunities, uncover hidden assets, expand and enrich public space, and make energy efficiency a catalyst for specific and targeted density, allowing for growth while also opening better living experience for all?

"Rather than imposing a bold new vision on the city, the plans should reinforce the existing city qualities: as a dense environment, the city should become more dense, and the city should become a place that people would want to come to."

-- Leo Hollis

There are four primary strategies in the design: engaging with the rivers, consolidating parking to recapture and make new public space, and knitting spaces and paths together to improve circulation and accessibility. New public spaces like the riverfront amphitheater, Confluence Park, and summer fountain/winter ice rink provide new places to gather, circulate, and play. The Market Plaza builds on the vitality of the weekly farmers market, new circulation paths allow faster and more dynamic dialog between people and places.

Environmental Sustainability

The environmental energy strategy addresses existing structures, as well as strong guidelines for new buildings. The plan calls for aggressive weatherization of existing downtown buildings and the application of photo voltaics to all roofs with appropriate exposures. The city should expand the Biomass District Energy System (BDES), and add co-generation.

The area of the city core is compact enough to accommodate significantly more pedestrian and bicycle circulation once accommodated effectively. The plan shows new paths, improved connectors and bridges to make paths that are fun, scenic, and efficient.

The addition of a People Mover makes it easier for more people to park at the edges of town and take this quick at-grade system, on the existing rails, into and out of the city core.

Social Sustainability

By reclaiming space currently dedicated to surface parking we create new opportunities for public space. The city recaptures the river edges through a new park and amphitheater by the multi-modal hub, Confluence Park where the rivers come together, and a new recreation center with fountain/skating area. Langdon street becomes pedestrian only west of Onion River Sports and connects to a new children's play area below Court Street.

The typical location of the summer farmers market is re-envisioned as a year-round market in the old garage building, with outdoor seating, market stalls, indoor market space, and local food-processing hub.

Durability and Resilience

With consideration of the flood plain, most new structures will have parking at grade and finished floors above, so they are protected from floods during extreme weather conditions. Parking is consolidated primarily into three high-density parking structures. By consolidating parking we reduce the amount of impervious paving thereby improving the impacts of runoff and storm water management.

Court Street looking west

•Three level mixed-use building over two levels of parking

• Designated bike lane

• Street-scape to scale with the surrounding neighborhood

• Hub Tower serves as a transition to the children's play area and pedestrian link to Langdon Street

Consolidated Parking

Court Street (State of Vermont & private) Potential Parking = 550 spaces Potential Building, 3 levels = 74,000 sf **133 State Street** (State of Vermont) Potential Parking = 286 spaces Potential Building, 5 levels = 100,000 sf Capital Plaza site (private) Potential Parking = 270 spaces Potential Building = 43,000 sf

Place Making Space within the city is enhanced and recaptured for public use, performance, market space, and play.

Market Plaza

• Formalized market plaza vith services

•The Garage building is fulltime four-season indoor market and food-processing hub

• Semi-enclosed frame with market platforms serve as place making and transition to the market hall

• North Branch overlook deck • Market Plaza serves as a significant link between State Street and the riverfront park/ multi-use path

Engaging

By recapturing land for public use community activities can engage the river edges.

River confluence looking west

• Community event space

• Brings together pedestrians, People Mover, bicyclists, and the mass transit center

• Confluence Park contains a significant increase in housing units

• HubTower provides amenities that improve the utility of the park

Net Zero Montpelier

• Aggressive weatherization program for existing buildings

- Expand the Biomass District Energy System
- Add co-generation to the Biomass District Energy System
- Reduce vehicles in town by establishing remote parking and People Mover using existing rail line
- Significantly increase pedestrian and bicycle circulation
- Consolidate parking under buildings for both resiliency and to increase opportunities for public space
- Photovaltaic program for all downtown roofs with appropriate exposure
- Significant decrease in impervious surfaces results in better and sustainable storm water management
- Recapture the rivers edge as public resource
- All new construction a minimum 2'-0" above FEMA flood elevation to insure resiliency

To Cross Vermont Trail

Vicinity Map City of Montpelier

Entry Number 80243

montpelier NEXT

montpelier TOGETHER

THE CHALLENGE:

To craft a solution for Montpelier, and beyond, that is **inspired and forward thinking**, while still being **relevant and viable**. To define a template of solutions that are **expandable**, **flexible**, **and able to unfold** as the future allows. To **build up from existing infrastructure** - railways, roadways, mass transit routes, district heating plant. To **celebrate the patterns of live**, **work**, **learn and play that are working**, while improving the ones that need improvement. To expand an urban platform while **broadening its focus on the natural environment**.

THE CONCEPTS:

ENVIRONMENTAL SUSTAINABILITY - Transportation, buildings, & energy:

Our solution looks to address environmental sustainability with a holistic approach. For transportation, we look to reduce the use of personal automobiles by developing a public transportation and pedestrian network that can support the City of Montpelier. At the larger local and regional scales, we are looking to integrate a public transit trolley system serving major business, civic, community and residential areas along the Main and State Street corridors. We envision the creation of dedicated alternative transportation hubs at the East and West city entrances that would house car share, bike share, regional commuters, and trolley cars. We are utilizing the proposed bus facility and existing railways to create a central node of regional transportation. Connecting all transportation hubs and major points of interest is a new dynamic spine of pedestrian circulation. This spine features an indoor pedestrian link that will connect people throughout the downtown district and places them at the heart of a vibrant new development of public parks, housing, cultural, & community space that front the Winooski River & the North Branch. This protected pedestrian circulation along with a convenient trolley system will become the prime method of circulating throughout the downtown. Along with the removal of street parking on a large portion of State Street, our plan is to encourage a more pedestrian friendly environment at all times of the year.

For buildings, this plan is meant to guide development in a way that balances and improves existing city use patterns. We look to infill areas along Main & State Streets with mixed use development that enhances the street wall and strengthens the already vibrant business district. New housing is placed along the pedestrian spine and riverfront, allowing thousands of residents to enjoy all the amenities of Montpelier within a short walk. As an anchor to the city, we have placed a Convention Center & Hotel at the Main Street Gateway. This placement allows for connection to the commuter hub, and aims to keep visitor vehicle traffic from entering the downtown district by connecting all visitors to the businesses, parks and cultural centers by way of the pedestrian link, enhancing the visitor experience.

To reduce energy use, new buildings will be high performance structures that take advantage of prime solar orientation, onsite renewable energy, and contain thermal energy storage chambers to store excess heat for use when demand is higher. The use of high performance buildings coupled with thermal storage will allow the district heating plant to connect to more facilities or reduce the output of new energy required at a given time.

SOCIAL SUSTAINABILITY - Community, Culture & Education:

Our goal is to reinforce and educate sustainability at every turn, beginning at the major access points to the City: Our plan strengthens the Taylor Street entrance and embodies the character of a sustainable future. It is our intent to provide educational opportunities within the indoor pedestrian spine to bring the concepts of a sustainable future to the forefront and make people aware of their individual impact and responsibility towards Montpelier's carbon neutral goal. We have added a cultural hub along Route 2 and connected it with pedestrian links to enhance the riverfront and provide community access and educational opportunities throughout, while providing event space and amenities to the City of Montpelier.

DURABLE SUSTAINABILITY - Resiliency

We have addressed durability and longevity at a large scale by designing new structures on a raised plinth. This concept raises vulnerable uses above the flood plain, while providing space for covered parking and building thermal storage chambers. On top of this plinth is the development of dynamic community green spaces and buildings, all of which are protected from future flooding.

T R A N S P O R T A T I O N

Create an integrated and distributed alternative transportation network. Utilize & expand existing infrastructure: street, rail, pedestrian access. Articulate and reinforce strategy at each major entrance to the city. Make visible & reinforce from major thruway.

1	 Trolley routes serving key civic, re and business points
2	 Mass transit raillines and multi-mo Bus, rail, extended commuter rail se
3	Gateway alternate transport comm (bike share/care share/trolley homes
4	Remove parking from state street reclaimed width for trolley transport, bicycle and pedestrian use
5	 Dedicated pedestrian and bicycle ad
6	 Protected/ enclosed pedestrian acce

esidential,

nodal hub: ervice

nuter hubs

– utilize , business,

access

ess

ENERGY

Create a net zero, high performance building stock that builds on site benefits & existing infrastructure.

- 7 Roof-top mounted renewables
- 8 Integrated link to biomass district heat plant
- 9 Integrated thermal storage
- 1 O Utilize South facing exposure

CULTURAL HUB PEDESTRIAN LINK NET ZERO HOUSING MULTI-MODAL

COMMUNITY PARK PEDESTRIAN LINK NET ZERO HOUSING RIVERWALK

montpelier 10002712R

SUSTAINABLE MONTPELIER 2030

RIVER'S EDGE: Activate the river's edge withpedestrian routes, gathering spaces & flexible community spaces. Focused increased public access at the confluence of rivers - a juncture of live-work-learn-play.

- A riverwalk
- B river
- C public plaza/greenspace at plinth
- D ground level parking
- E thermal energy storage
- F indoor pedestrian link
- G interactive sustainable education
- H semi-public usage
- residential housing
- J solar pv/solar thermal
- K flood stage

A SUSTAINABLE EDUCATION: Reinforce the guiding principles of environmental, social & durable sustainability at all scales: dedicated alternative transportation hubs at East & West city entrances.

COMMUNITY & CULTURE

Celebrate a dynamic downtown, craft new gathering spaces, reinforce human connections, strengthen community bonds.

- **1** Activate the river's edge with pedestrian routes, gathering spaces & flexible community spaces
- 12 Mixed use building stock to increase live/ work/play
- **13** Enhance connection to the natural environment
- 14 Increase cultural junctures: Cultural hub at Taylor Street entry

THE BUILT ENVIRONMENT

Expand & improve building stock in underutilized & open land tracts within the downtown district.

- 15 Net zero/high performance building design
- 16 Sympathetic design & material pallette
- **17** Reinforce a vibrant downtown: add density along existing streetscapes
- **18** Provide complimentary mixed use buildings to complement existing building inventory
- 19 Add new housing along river

Entry Number 800247

CAPITOL CONFLUENCE

80247

When standing on the banks of the confluence of the North Branch and Winooski Rivers, one enjoys a moment of serenity, the sound of Route 2 distant though present. There's not much to see: the rear side of Shaw's, a gas station and parked cars behind a line of trees. The uncelebrated moment is inherently Vermont: not very large or trying too hard to act a certain way. But this is precisely where all the magic happens.

After a summer storm the river swells; in order to protect the city against larger and more extreme flooding, the river is widened in three areas; where it is not widened, existing masonry walls are removed to create a soft, porous edge.

Beyond the banks of the river, new areas of pedestrian assembly are identified, encouraged by the relocation of Shaw's and the introduction of a new transit center. Occurring throughout the city in conjunction with new development, these moments become wayfinding points, linking a new pedestrian network, encouraging people to navigate the city without a car.

The most prominent gathering location is the 'Produce Plaza,' engaging the community and visitors to Montpelier with the farmers market culture of Vermont. The location of the distribution and processing facility is intentionally accessible, integrated with the market, shops and cafes around the square. Access to rail freight is key and the tracks become a focal point, engaging the passerby with the renewed transportation network of Vermont.

Residential developments are dispersed evenly, providing housing for all ages and incomes. Different housing options are available for rent or purchase, including more conventional townhouses, apartments, lofts and river terrace apartments with attached greenhouses. Overall square footage of apartments is kept to a minimum, augmented by community spaces, following a cohousing model. Apartments are built modularly to reduce construction waste and to allow for phased construction and future additions. Passive heating and cooling is employed throughout, utilizing thermal mass, trombe walls and attached greenhouses. Structures are built out of local materials such as rammed earth and timber. Roof gardens are integrated wherever possible.

Capitol Confluence intends to strategically augment an already thriving city, encouraging people to live within walking distance of the supermarket, transit hub and their place of work. This will be crucial as the city densifies. However, it is not intended to become the bustling metropolis so many Vermonters move away from, integrating the love of the land, recreation and natural beauty into the urban environment.

TURN ON \times