

montpelier NEXT montpelier TOGETHER

A SUSTAINABLE CONCEPT FOR THE FUTURE OF MONTPELIER BY WIEMANN LAMPHERE ARCHITECTS



INTRODUCTION

The challenges our planet faces for a sustainable future are many, and yet the potential solutions are well within our reach. We have to confront the issues and solve them in a way that is inspiring, thoughtful, and addresses not only the need for reduced energy consumption, but increases the vibrancy and livability of our urban centers. We applaud Net Zero Vermont for taking on this important work in helping Montpelier (and other communities) in developing ways to solve their needs on a path to a carbon neutral future.

Our proposal looks to address environmental and social sustainability in a holistic way. We are building upon the foundation that the City of Montpelier has provided us and we are enhancing the downtown core by removing desolate parking lots to create vibrant neighborhoods that are unique, interesting, and community oriented places to live, work and play. Our plans seek to make accessibility a top priority. We are activating the river's edge, creating park spaces, allowing for natural areas, and developing spaces that allow for a range of activities to occur, and strengthening the Main and State Street corridors. We seek to build highly efficient and durable buildings

that are environmentally friendly, powered by renewable energy, and designed to fit into the existing fabric of Montpelier. We seek to improve the transportation networks by adding infrastructure that lessens the need for the personal automobile, encourages healthy alternatives such as walking and biking and provides car-share opportunities for those occasions when a car is needed. All of these opportunities together can transform Montpelier into a strong and vibrant hub of activity where the community is engaged, healthy and doing their part to make Montpelier, and the world, carbon neutral.

The following pages outline our proposal based on the following concepts:

- 1. The Built Environment**
- 2. Integrated Transportation**
- 3. Accessibility, Connections and Natural Features**
- 4. Achieving Net Zero Energy**



State Street View

Accessible connections will be made from the existing streets to the new neighborhoods, outdoor spaces, and river front in a blended and complimentary way. New buildings will be seen in the back drop blending with the existing cityscape.

BUILT ENVIRONMENT

We are proposing the addition of more than 1 million square feet of new program and amenities to the City of Montpelier. These new additions will help to reinforce the Montpelier culture and downtown life by their placement, connectivity and design. The proposed buildings will blend in to the existing city scape by utilizing underdeveloped lots to fill the voids of the current City footprint with buildings that are compatible in scale, material use and composition to the existing historic character while providing opportunity for adding a modern touch. Material choices would include brick, granite, wood, metal and glass, complementing the existing character and charm of the city.



HOUSING

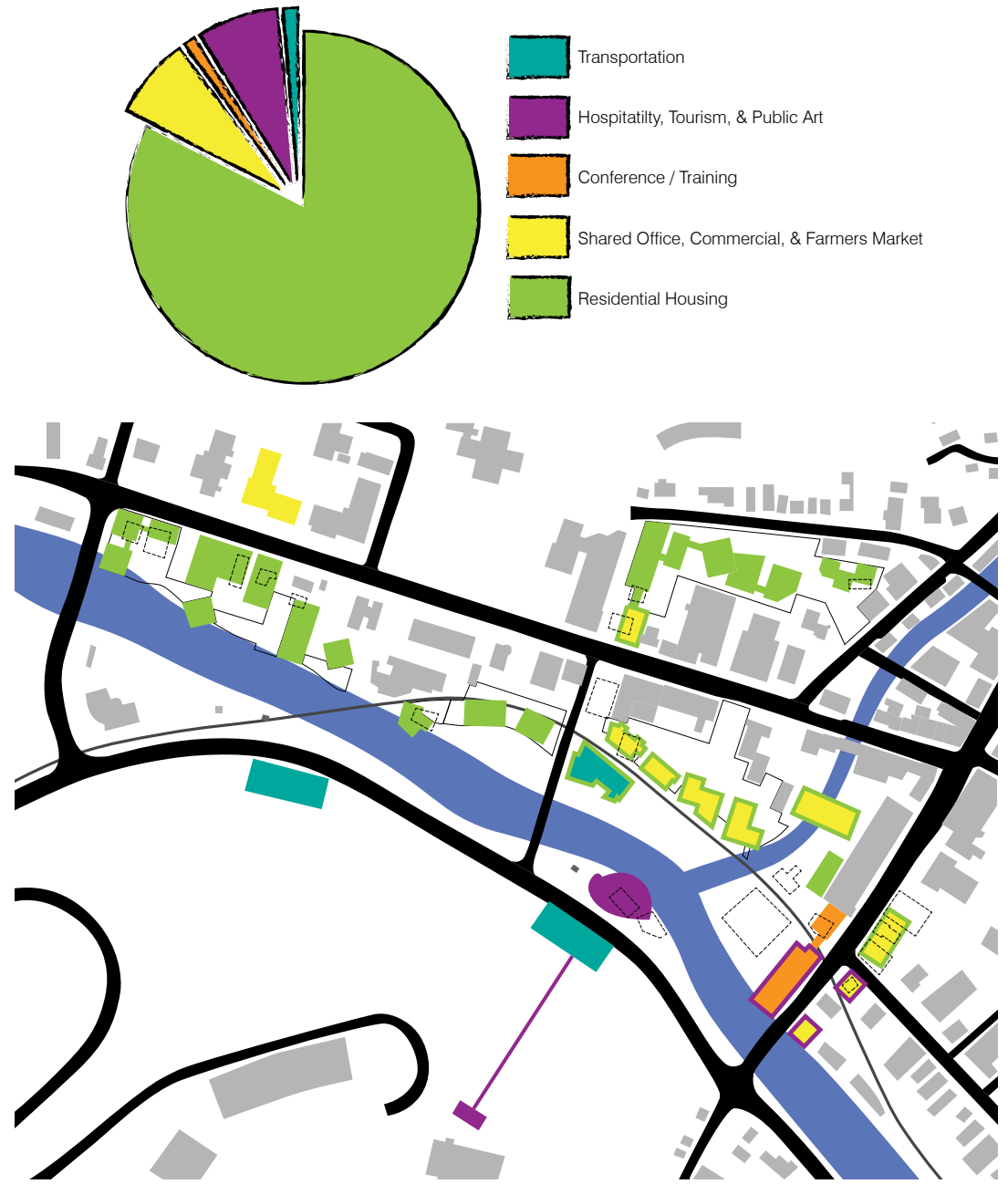
Our proposal includes over 900,000 square feet of various sized housing options totaling approximately 1,000 new residential units in the downtown area. We estimate this will attract 2,500 residents to the downtown area and could reduce gasoline consumption by 550,000 gallons per year as a result.

Our unit breakdown is as follows:

- 1 Bedroom - 400 units: 650 sf
One bedroom units will provide an affordable sized apartment for both young working singles and couples as well as older retirees looking to down size out of their single family homes. Smaller apartments are appealing as they are less expensive, and require less maintenance.
- 2 Bedroom - 500 units: 850 sf
Two bedroom units will provide more room for couples and small families who are looking to live in Montpelier. These mid-sized apartments will still be affordable, but offer a little more space for those who need it.
- 3 Bedroom - 100 units: 1,050 sf
Three bedroom units will provide enough room for small families looking to make a home in downtown Montpelier. We envision shared play areas and gathering spaces to make urban family life attractive.

NEW NEIGHBORHOODS

Buildings have been broken down in scale and developed to feel like neighborhoods, creating multiple pockets of small communities throughout the city that are easily accessible to each other. Various styles of residential units will be provided to accommodate various user preferences. Some will be placed in quieter areas at the edges of downtown, others along more public spaces such as the riverfront park. Some housing will be provided at ground level, but most will be on the upper levels of buildings. Commercial spaces will be at the street level interacting with the public, and limited in scope to help reinforce and strengthen the existing commercial and retail markets. Grouping and connecting amenities and neighborhoods makes a more livable and usable city throughout the year.



Program for Proposed Buildings New program is spread throughout downtown to reinforce the existing culture and neighborhoods. *color at the perimeter indicates upper level space programming.

PUBLIC FUNCTIONS

While the primary new program is residential, we are proposing a range of other new facilities and program spaces including transitional indoor/outdoor markets, restaurants, transportation hubs, a conference center, hotel, grocery store, office spaces and more. We feel that these additions, in strategic locations around downtown, will help to expand the vibrant life of Montpelier throughout the year and will help to support the growing downtown district.

A cultural center will act as the gateway to downtown just off of Memorial Drive and connect pedestrians to many of the other downtown amenities. This building will act as an icon of the new Montpelier and inside will help to educate visitors on the culture of the area as well as the Montpelier net-zero model.

A conference center and hotel will provide a place to host events in Montpelier bringing more visitors from further outside of the area to learn about the Montpelier net-zero model. Also proposed is an inclined tram leading from the cultural center and commuter parking zone to the top of the hill where National Life is located. The visitor center can include a restaurant and will have a viewing platform so visitors can look out over the city and beautiful landscape.

MATERIALS AND DURABILITY

Materials for the new buildings will be chosen based on their fit within the existing fabric of the city, their durability, and their embodied energy. High consideration will be given to locally sourced, renewable, and recycled materials that have long life spans. Structurally, we envision the use of mass timber products for the primary framing members of all buildings. This option is cost-competitive, carbon efficient, sustainable and reliable. For cladding, materials such as brick and stone both fit in with the existing character of the city as well as provide durable construction that can withstand many years of weather as well as potential flooding events. Other materials such as glass, metal and wood will be used intermittently to complement the existing fabric.



Market A new market area will expand and compliment the existing farmer's market with both open and sheltered areas for vendors to set up throughout the week and during events.



Materials and Durability New materials will compliment the existing fabric of the city, while also encouraging energy efficiency and durability.

FLOOD PLAIN AND FLOODWAY

New buildings will be located along the riverfront using a raised plinth concept designed to accept flood waters if flooding were to occur. Under normal conditions, this level will serve as a vehicle parking area provided for residents and visitors, and will also house locations under buildings for thermal storage chambers to be located. The plinth level will be built to be flood resilient by using masonry and concrete and all building utilities will be located on floors above the plinth level. If a flood occurs, water will be able to fill this level protecting other buildings and finished indoor spaces above. This plinth level will also act as a protective barrier to State Street by barricading existing unprotected buildings. Because these areas will be designed to take on water, damage to these areas will be very limited.



Site Section

A parking plinth constructed of flood resilient materials will act as a barrier between the Winooski River and finished spaces. If a flood occurs water will fill the parking level protecting the finished spaces above. A thermal energy storage will work with the heat pipes running to and from the district heat plant to reduce energy loss.





Sheltered Walkway Accessible connections will be made from the existing streets to the new neighborhoods, outdoor spaces, and river front in a blended and complimentary way. Primary pedestrian connections will be sheltered to make for greater accessibility even during harsh weather conditions.

INTEGRATED TRANSPORTATION SYSTEMS

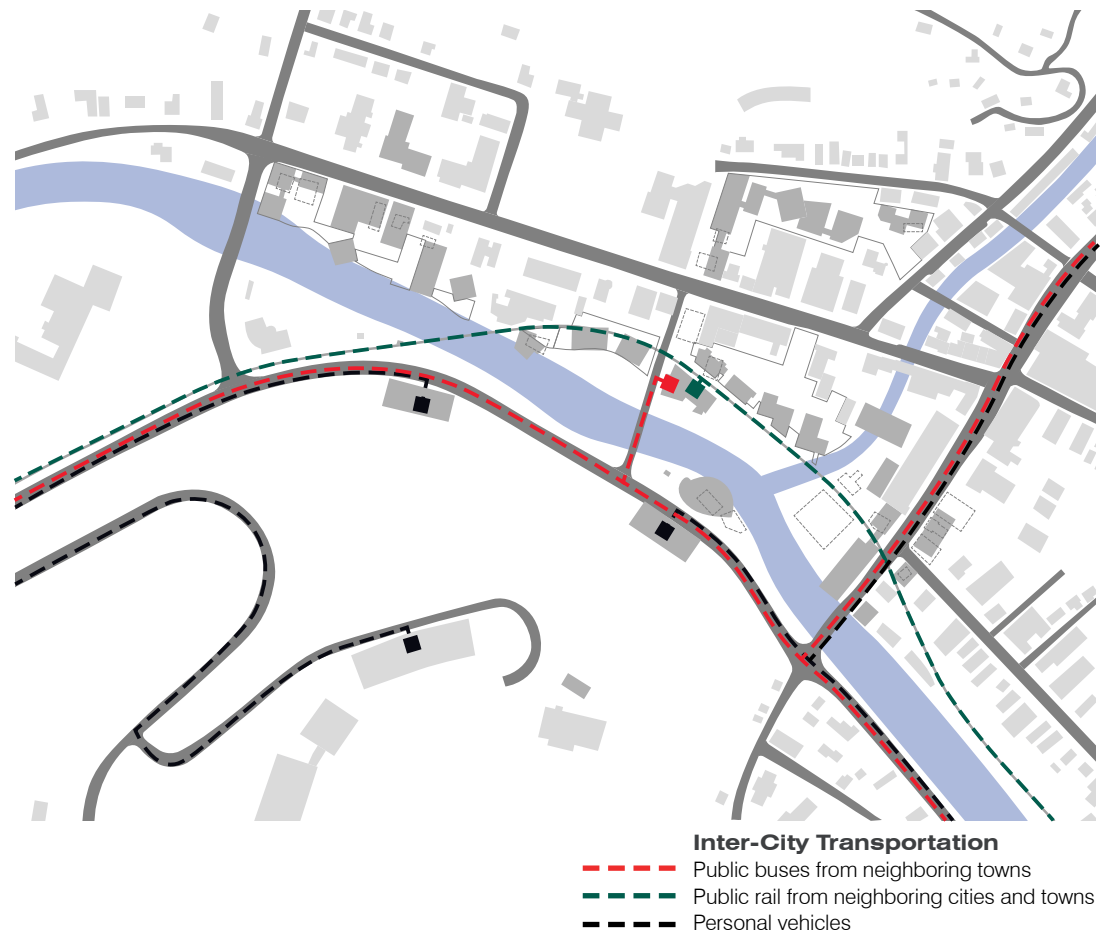
Our proposal envisions a combination of several alternative transportation systems to make Montpelier a more connected and efficient city. Our goal is primarily to reduce ownership of the personal automobile, a product that for many decades in American society has polluted our air, used non-renewable resources, encouraged sprawl, wasted countless hours of our lives spent behind the wheel, and continues to serve as a burden and unnecessary expense for nearly every person of driving age. To achieve this goal, we envision the following:

INTER-CITY TRANSPORTATION

Inter-city transportation in the form of bus lines and commuter rail lines that can connect other cities to the Multi-Modal station located off of Taylor Street in the heart of downtown, will provide easy access to amenities, walking paths, and the tram for visitors and commuters. It is our intention that the existing rail bed would be upgraded to serve future passenger rail needs, connecting north to Montreal and south to Boston, with points between.

INTRA-CITY TRANSPORTATION

Intra-city transportation could take many forms. Electric trams will be incorporated into the local transportation network that can run on electricity produced by solar PV panels. This tram will run a circular route utilizing Memorial Drive, Main Street, State Street and Bailey Avenue. This path will provide an easy and reliable connection around the outskirts of the downtown core, connecting people with the amenities of Montpelier. Another aspect of local transportation is the development of an inclined tram to provide greater connectivity to the existing parking and employees on the National Life hill, making the downtown district a short ride away. The incline will also serve to bring residents and visitors up the hill to a viewing platform and restaurant, serving as a local attraction.



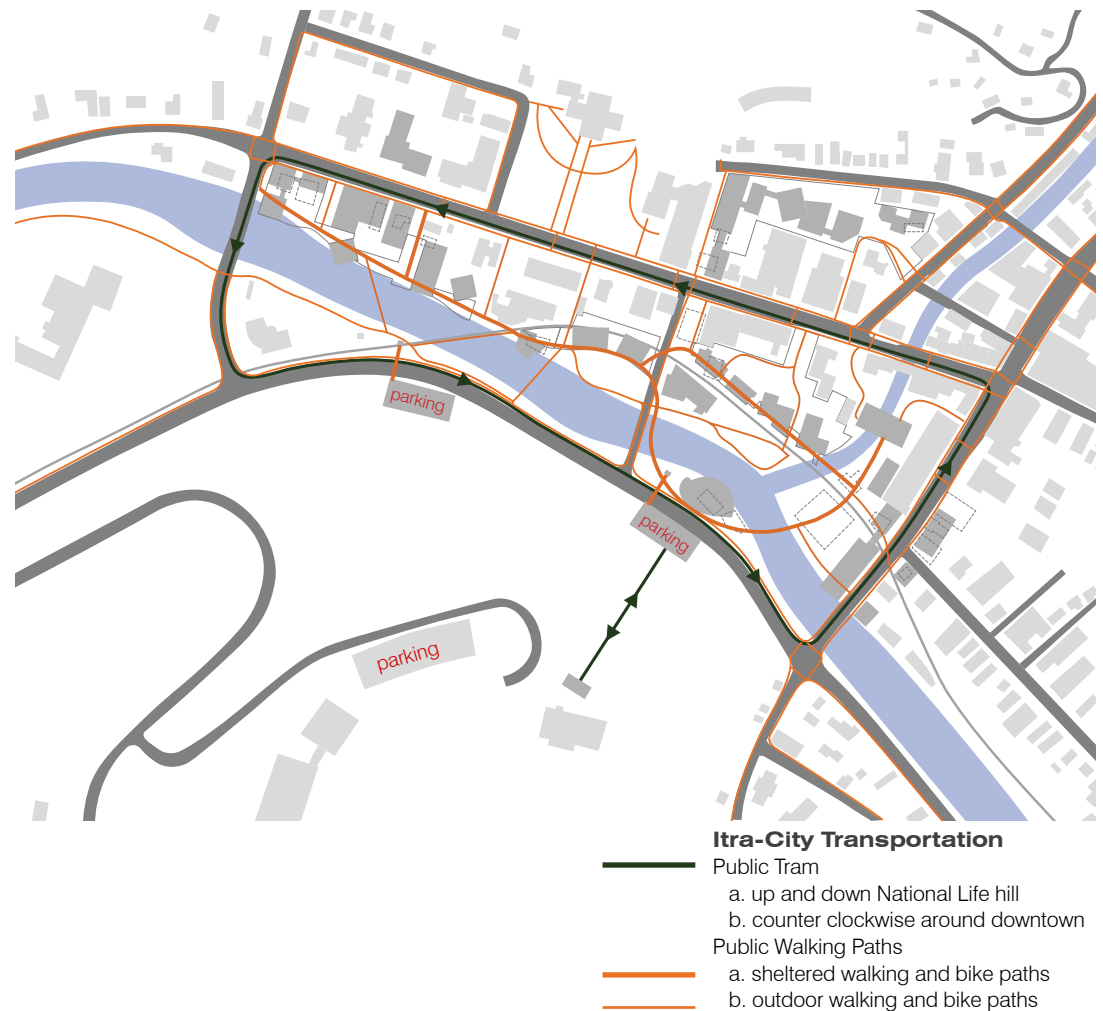
PEDESTRIAN LINKS

Indoor Pedestrian Links have been incorporated into the design to connect multiple buildings together while creating a protected path for residents and visitors to use when weather is not ideal. This will encourage a healthy lifestyle year around, create pedestrian activity when there otherwise might not be, and can include educational and cultural spaces that give the link a greater sense of purpose and identity. Beyond the indoor pedestrian links, our plan proposes several new pedestrian paths that connect multiple areas of the city on both sides of the river. This network of paths will encourage walking and provides a convenient link through the new neighborhoods and into the downtown shopping district of Main and State Streets. These changes will greatly improve connectivity between the different areas of downtown for residents, workers, and visitors alike. It will be easier for people to get from one area of the downtown to another without the burden of a car.

TRAFFIC & PARKING

In an effort to further reduce vehicle use, our plan seeks to remove much of the on-street parking along State Street and Main Street and eliminate one lane of traffic on State Street making it one way vehicle travel in the east to west direction. This reduction of space dedicated to the vehicle will allow space for bike lanes, and expanded sidewalks, enhancing the pedestrian experience and allowing businesses to utilize space in front of their buildings for outdoor restaurant or market use. Public traffic along Taylor Street will also be limited to one direction from north to south, freeing up additional space for buses to run in two directions to and from the Multi-modal transit center. We feel that these changes will help to alleviate traffic in downtown by encouraging a counter clockwise flow and reducing traffic crossings.

Main Street will remain as two way traffic in order to ensure vehicles approaching from the north can easily pass through. By eliminating street parking on Main Street between Memorial Drive and State Street there will be enough room for a dedicated tram lane as well as expanded sidewalks. To accommodate the majority of visitors with vehicles, parking structures along Memorial Drive will provide a location near downtown for parking.



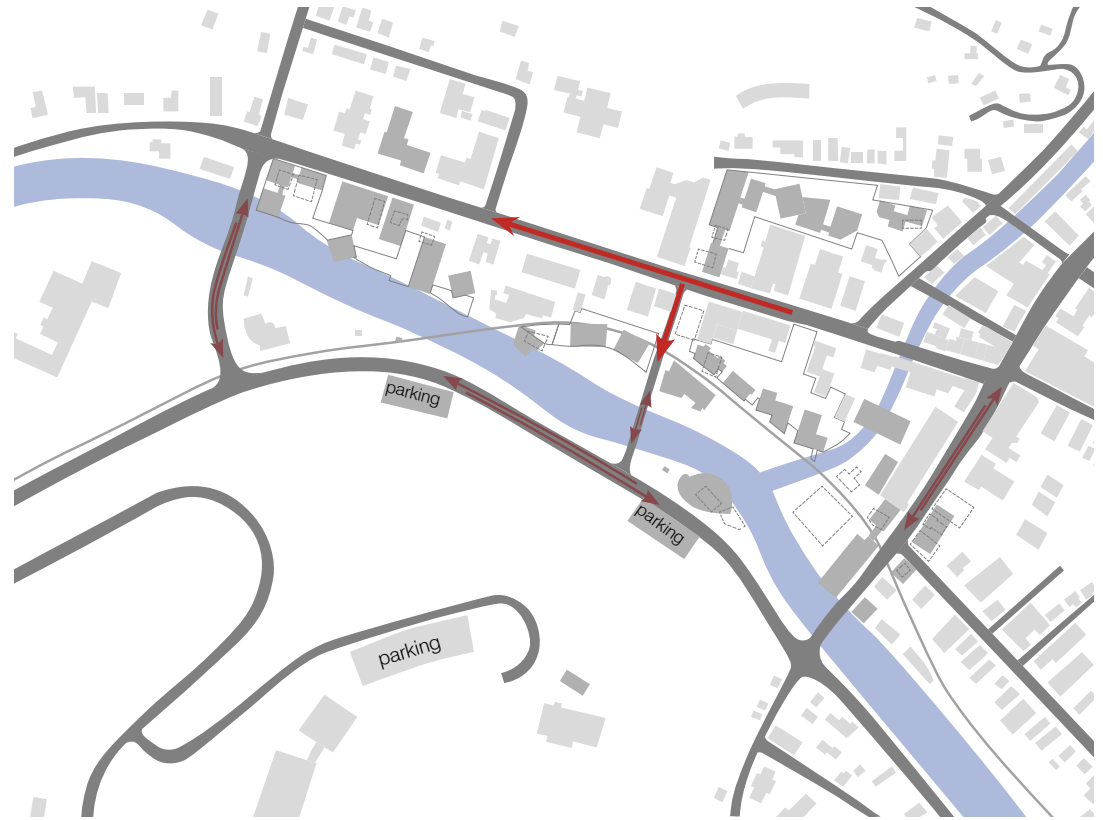


Pedestrian Connections A network of pedestrian paths will run throughout the downtown connecting housing, amenities, transportation hubs, and offices. These paths along with an intra-city tram system will make it convenient for pedestrians to leave their cars behind and access the city on foot.

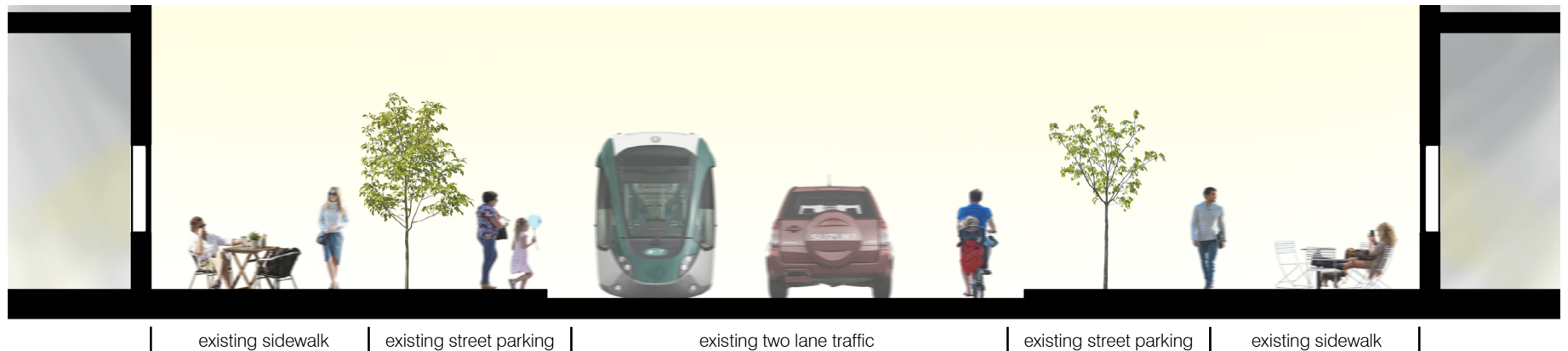
Minimal parking, including ADA accessible spaces will still be available for use throughout the city as needed. Our goal for State Street and Main Street is to create a more pedestrian friendly environment by reducing the amount of traffic, removing street parking, widening the sidewalks, and pulling commercial businesses out onto the street. Buildings and amenities will engage outdoor spaces by having mixed use programs on the first floor spilling out onto sidewalks and plazas. Our vision is that by reducing vehicles and increasing pedestrian access and commercial use, these streets will come alive more than ever.

At the commuter and visitor parking facilities, services such as car sharing and bike sharing will be available to allow residents without cars to access vehicles when needed without the burden of car ownership. This type of program can be sized and modified as participation grows.

In our proposal, we are utilizing about 85% of all existing parking lots in downtown for new buildings and public outdoor spaces. About 1,000 parking spaces will be provided under new buildings and the plinth as parking for new residential units. Two new parking garages have been planned for the hillside along Memorial Drive and have an additional 800 spaces. These parking garages will be conveniently connected to the downtown tram and walking paths via two pedestrian bridges going over Memorial Drive. One garage will be located with



Vehicular Traffic Flow One way traffic flow on State Street will help to alleviate congestion through the downtown area and will open up the street-scape for community and public use. One way traffic along Taylor Street for private vehicles will allow easier access for two way bus traffic coming in and out of the Multi-Modal.



State Street Section The elimination of street parking and one lane of traffic will allow sidewalks to be expanded, engaging the commercial shops and restaurants with the public on the street-scape.

easy access to the west side of town where many government offices are located, while the other will have easier access to the east side of town closer to shopping and restaurants.

These new parking lots will make for an easier experience for visitors as they will not have to search for a parking space or wait in downtown traffic. Also the location of new parking areas ensure they will not have to walk much further than they typically would have from the existing parking lots.

With this plan we are re-purposing land but not losing any parking spaces making for a smoother transition to net-zero. Although we are planning for an increase in population, we are encouraging a reduction in personal vehicle travel into the future by not increasing the number of parking spaces, and providing attractive alternative transportation options. As the future of car-sharing expands, garages would become the homes for shared electric vehicles in lieu of the personal vehicle.



Main Street View New buildings will blend in with the existing fabric of the city to compliment and reinforce the existing city culture and feel. At the south end of Main Street tired sites will be re-purposed and renewed to make for a more inviting gateway to the city.

ACCESSIBILITY, CONNECTIONS, & NATURAL FEATURES

An important element of our master plan is the development of various public spaces interwoven with the new neighborhoods. Our plan includes community spaces connected throughout the city via accessible pedestrian paths that are linking various portions of the city together. We have included multiple types of green spaces that will be created to engage the riverfront and provide variety and choice for residents and visitors. Some areas include hard-scape features such as ramps, steps, terraces, walls, and others allow for a more natural setting and would serve as a riparian buffer and wildlife habitat. Some outdoor spaces will serve as concert locations, some will have playground equipment, others will provide a more natural playground choice. Our goal is to develop the riverfront with parkland that provides residents and visitors with fun and interesting choices that will help create a more vibrant community. By providing various options and pathways, we are ensuring accessibility to people of all ages, abilities, and desires.



Green Spaces Dedicated outdoor green spaces will happen throughout the downtown area. These will be public spaces for use as parks or for events. These areas will be protected from future development to ensure open spaces remain throughout the city.



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ACHIEVE NET ZERO ENERGY

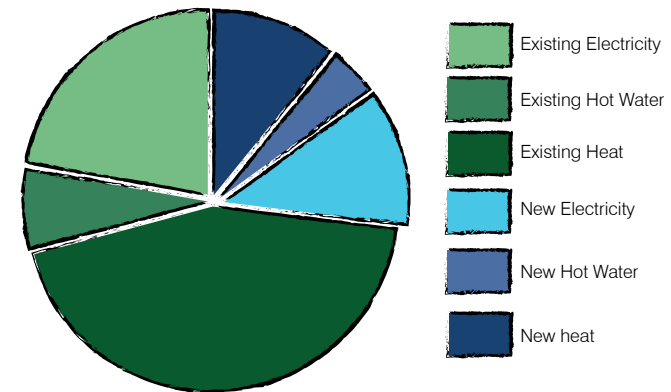
Maximizing efficiency in buildings is a crucial step to achieving net-zero. All new buildings will be designed as high performance net-zero buildings, and existing buildings will be audited and retrofitted to maximize energy efficiency. We will set Energy Use Intensity (EUI) goals for all new and existing buildings in order to reach an overall EUI that can be met by onsite renewable energy.

New high performance structures will target an EUI of 15 kBtu/SF. To achieve this, buildings will take advantage of solar orientation to maximize solar heat gain during winter months with shading for reduced solar heat gain during the summer months. Onsite renewable energy will be incorporated into all new buildings to provide for the electricity demand. We estimate PV solar panels on the roofs of all new buildings will provide more than 2 million kWh of electricity each year. Each new building will be connected to the district heat plant for heating and domestic hot water and solar. Thermal systems with highly insulated energy storage chambers have been incorporated into the plan and can be used to shave peak demand and reduce the amount of heat required to be produced by the district plant.

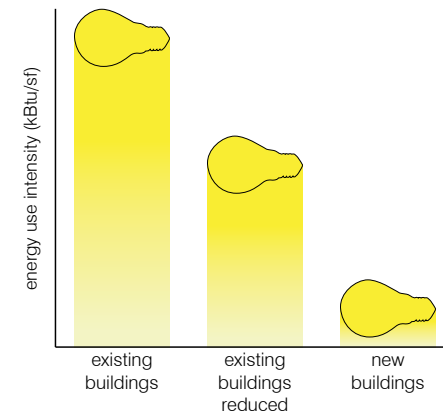
Existing buildings will target an EUI of 45 kBtu/SF. Energy audits will be performed on all existing buildings to target best approaches for achieving the target EUI or lower. Strategies will include added insulation, window replacements, air sealing, and lighting and appliance updates. Solar PV will be installed on rooftops that have the exposure and ability to support a system. We estimate this would offset about 50% of the electricity needed for existing buildings after energy retrofits. It is our intent that over time, the majority of downtown buildings will be connected to the district heat plant to provide heat and hot water.

Although efficiency, passive solar designs, and active solar installations will all be incorporated, we anticipate additional electricity needs (including the tramways, walkways, city lighting, and parking areas) will need to be offset with solar arrays installed outside of the urban district.

In order to maximize the use of available land, buildings have been placed to allow for sunshine and green spaces to penetrate down into the city, taking advantage of our natural resources. Parking within the downtown will happen under buildings in order to reduce heat island effect from asphalt parking lots which in turn helps to reduce cooling loads during the summer. Land use between buildings will be landscaped in a pleasing way in order to draw people outdoors and encourage windows to be opened reducing ventilation loads. Transportation hubs and tram lines will be provided in order to reduce the number of cars within the city.



Estimated Building Energy Use Allotment of new and existing buildings. *rough estimate based on a selection of existing buildings and new buildings.



Energy Use Intensity (EUI) We will evaluate and improve the EUI of existing buildings. New buildings will be designed with a very low EUI.

PROJECT PHASING

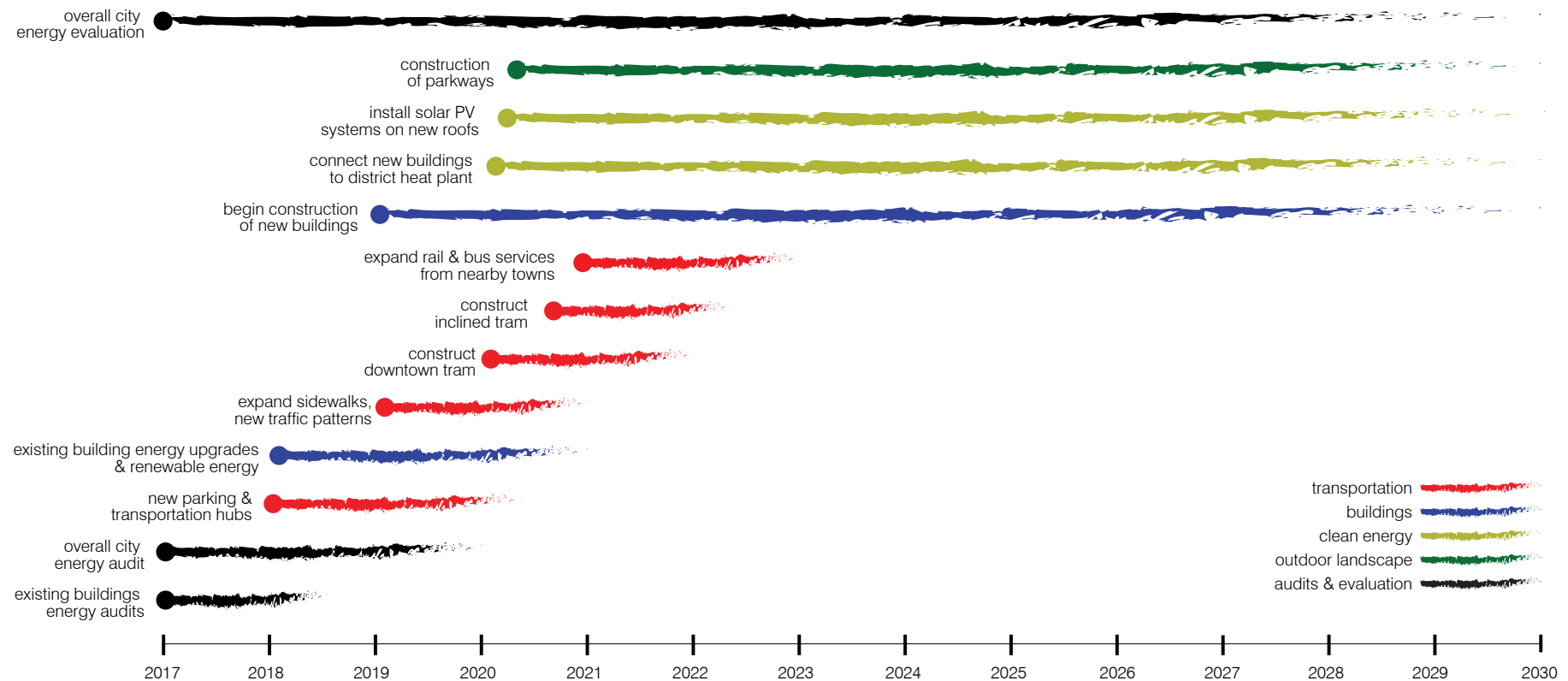
The phasing of the overall project will start with elements that can make a large impact on reducing the overall energy consumption of the city without making a huge impact on the function of the city. It will be important to continue to evaluate each step and its impacts as they are completed to ensure we reach our net-zero goal. A phased approach that starts small and ramps up will help both with transition of the function of the city as well as allowing careful evaluation of energy impacts along the way. Phase I projects will address existing infrastructure and city functions as well as preparing for larger Phase II projects. Phase II projects will include major development projects that will make a large impact on the city.

Addressing existing buildings is a critical first step to reaching net-zero. Energy audits should be performed on all existing buildings

to determine crucial steps toward meeting our EUI and other energy efficient goals.

New parking areas will need to be constructed before construction can begin on new buildings that will take over existing parking lots. This combined with construction of the new downtown tram will be an important step to transitioning to new traffic patterns throughout downtown.

The design of new buildings will start immediately in order to manage the overall evaluation of the city's energy use, however construction will begin after new parking and transportation infrastructure has been completed. Construction of buildings that will contain housing should be spread out throughout the transition, while buildings with new commercial and tourist amenities should be built at the start of the project.



Project Phasing will start with smaller but impactful projects and ramp up into major development projects. Evaluation of energy use and consumption will be an important ongoing practice which will help to inform decisions throughout the overall project and into the future.

