



**LEBANON PLANNING BOARD
MAY 22, 2023 - 6:30 PM
COUNCIL CHAMBERS, CITY HALL OR
REMOTE VIA VIRTUAL PLATFORM
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1. Call to Order

2. Public Hearing Items

- A. **UPDATE TO CHAPTER 5 (NATURAL RESOURCES) OF THE MASTER PLAN** - The Master Plan describes the City's vision for itself in the future. It is a policy document which is implemented, in part, through regulations such as the Zoning Ordinance, Site Plan Review and Subdivision Regulations, and is used extensively by City Administration and Local Land Use Boards to guide budgeting, decision-making, and other actions. The current Master Plan was adopted in 2012, and the City is currently undertaking an effort to update each Chapter of the Master Plan over the next several years. The first of these Master Plan updates is to Chapter 5 (Natural Resources), which was prepared by the Lebanon Conservation Commission and presented to the Planning Board for discussion at the Board's work sessions in March and April. In accordance with NH RSA 674:4 and 675:6, the Planning Board will hold a public hearing on **Monday, May 22, 2023, at 6:30pm**, to give further consideration to the draft Chapter 5 update and to receive public comment. Following the public hearing, the Board may take action on whether to adopt the updated Chapter 5 as presented or with changes. Comments from the public can be presented at the hearing or forwarded in writing to the Planning & Development Department prior to the meeting. Comment received through the Planning & Development Department will be forwarded to the Board for their consideration at the public hearing.

3. Study Items

- A. Review of final draft Walk Bike Ride Lebanon multimodal and complete streets implementation plan
- B. Review of proposed amendments to the Site Plan Review Regulations re: electric vehicle (EV) charging infrastructure - continued from April 24, 2023
- C. Rules of Procedure/Planning Board Meeting Procedures

4. Committee Reports

- A. **City Council Subcommittees:**
--Class VI Roads Advisory Committee
--Lebanon Energy Advisory Committee
- B. **Other Subcommittees:**
--City Council Representative

- Heritage Commission
- Pedestrian & Bicyclist Advisory Committee
- Upper Valley Lake Sunapee Regional Planning Commission
- UV Subcommittee of the Connecticut River Joint Commissions
- Upper Valley Transportation Management Association
- Mascoma River Local Advisory Committee
- West Lebanon Revitalization Advisory Committee
- Planning & Development Department – Task Status

C. Minor Site Plan Committee

5. Other Business

6. Approval of Minutes

A. April 24, 2023

7. Adjournment

The order of agenda items is subject to change.

Meetings are open for in-person and remote attendance. Members of the public that wish to attend remotely may do so by going to LebanonNH.gov/Live where you will find instructions on how to enter the meeting. Members of the public will be able to participate and ask questions through the City's virtual platform or by phone. Please note: Should technical difficulties occur during the meeting that disrupts virtual or phone connection(s), the meeting will continue without remote access capabilities.

5 | **Natural Resources**

5 | A **Vision & Purpose**

Lebanon's natural environment, comprising lands and waters under both public and private ownership, is a community asset whose conservation is essential to our continued health, quality of life, and the health of all species. It is recognized to be in the public interest to encourage the preservation of open space, thus providing a healthful and attractive outdoor environment for the City's residents, maintaining the character of the City's landscape, and conserving its land, water, forest, agricultural, and wildlife resources.

The City of Lebanon shall identify its significant natural resources and promote their preservation, conservation, responsible management, and harmonious use for the benefit of current and future generations. Public and private investment improves the quality of our waters, air, and soils and shall ensure the clarity of the night sky. A concerted combination of land protection, responsible stewardship, creative site planning, and climate change mitigation and adaptation measures shall conserve significant natural areas and important natural systems for the benefit of current and future generations while respecting and preserving the rights of property owners.

Conservation areas, greenbelts, working farms and forests, and other open spaces are linked with the City's built environment to provide "green infrastructure" (a network of natural lands, working landscapes, and other open spaces that conserves ecosystem values and functions and provides associated benefits to people) supportive of convenient public access and compatible recreation, viable waterways, and thriving wildlife populations

5 | B **Issues & Priorities**

5 | B-1 **Balancing Resource Protection with Growth**

Lebanon, as the regional center of the Upper Valley, will continue to face demand for growth and development. The City needs to implement plans that allow development, protect the natural environment, and retain the open spaces and rural character that residents value.

5 | B-2 **Healthy Environment, Healthy Community**

Clean air and water and healthy soil are essential for Lebanon to remain a place people want to live and work. For example, protecting the quality of the water in the Mascoma River is a paramount issue for Lebanon, which depends on the River as a municipal water supply. However, connections between public health and the health of the natural environment go beyond concerns about pollution. Healthy, functioning ecosystems provide many benefits to human communities, and degraded ecosystems can create hazards.

5 | B-3 Climate Mitigation & Adaptation

Climate change is already impacting the natural resources of Lebanon. Extreme weather events cause erosion and flooding. Changes in temperature and precipitation patterns impact water quality, forest health, and the viability of working farms. The effects of climate change on Lebanon's natural environment include the proliferation of invasive species, increased stress at both the species and natural community levels; and other impacts on biodiversity and wildlife habitat. Increases in tick populations and associated tick-borne diseases impact our health and our relationship with nature. Seasonal changes also affect how we experience nature, i.e., hiking, birding, hunting, skiing, snowshoeing, viewing fall foliage, nature tourism, and other types of outdoor activities.

It is necessary to identify other impacts and to better understand the effects of a changing climate on the natural environment. It is imperative that the community works to reduce greenhouse gas emissions associated with human activity and to protect the natural environment that plays an important role in sequestering carbon. Mitigation and adaptation measures will be necessary to lessen the impacts of a changing climate.

5 | C **Existing Conditions & Trends**

The abundance and high quality of Lebanon's existing natural resources, including clean air and water, undeveloped land and natural vistas, agricultural and forestry enterprises, open spaces, and wildlife habitat are among the City of Lebanon's greatest assets.

Lebanon's natural resources have degraded over time as the City has grown and changed. Many formerly open fields, including some of the Northeast's richest soils, have been covered with shopping centers, houses, and other types of development. Some of the City's most significant floodplains and wetlands were drained or filled before the advent of protective regulations, and development pressure continues to affect these resources. In the uplands, wooded ridges and hillsides are being fragmented by roads and rural development. Increasing vehicle emissions, fertilizers, pesticides, road salt, and other pollutants threaten air and water quality even in rural areas of Lebanon. Numerous environmental impacts result from development, often driven by regional pressures. Small environmental impacts may not be immediately visible or dramatic, but over time the impacts accumulate and can be damaging in the long term.

The 2010 Lebanon Phase II Natural Resource Inventory (NRI) provides a detailed description of Lebanon's natural resources and a foundation for future planning efforts. The following sections provide a general description of natural resource features.

5 | C-1 **Air and Sky**

- 5 | C-1a **Air Quality.** Lebanon, like the Upper Valley in general, has historically enjoyed clean and healthy air. Maintaining this good air quality and preventing air pollution are vital to planning Lebanon's growth. Some well-known sources of air pollution include motor vehicles, power plants, industries, wood smoke, and commercial/institutional and residential activities. Air pollutants from these sources can be emitted locally, or they can be transported over great distances from upwind regions. This pollution can have health impacts such as aggravation of asthma and other respiratory illnesses; environmental impacts such as acid deposition and eutrophication of water bodies; and other impacts such as accelerated weathering of stone structures and property damage from climate change effects.

The Clean Air Act (CAA) as amended in 1990 directs the U.S. Environmental Protection Agency and the states to regulate air quality. If air quality in an area is in non-attainment, i.e., does not meet the National Ambient Air Quality Standards (NAAQS), the state must come up with a plan to bring that area back into attainment. This is done via state-wide regulation by state environmental agencies such as NHDES and other state and federal agencies.

Ozone (O₃) and particulate matter less than 2.5 microns (PM_{2.5}) are two critical pollutants for assessing a community's air quality. Since 2007, their levels have generally trended downward in Lebanon and have been well below the levels of the NAAQS.

Virtually all air pollutants deposit onto ground and water surfaces to some extent, through either wet or dry deposition. The most significant contributors to acid deposition are sulfur dioxide (SO₂) and nitrogen oxides (NO_x). Other compounds such as mercury and perfluorinated compounds (including PFAS) have been found to deposit and affect the food chain and water quality. The trends for acid and nitrogen deposition in NH are improving, supported by decreases in emissions of NO_x and SO₂ in both NH and the US overall.

Carbon emissions continue to be a significant threat to the earth's ecosystems and to Lebanon's natural resources and infrastructure. Lebanon's municipal greenhouse gas emissions have been routinely inventoried and measured since 2010 and show a trend of significant reduction. A community scale inventory has yet to be conducted and so it is unknown whether increases in technological efficiencies are offsetting the increased development trend in the City.

5 | C-1b **Dark Sky**. As development has expanded in Lebanon in recent decades, the use of outdoor lighting has grown, particularly on Route 12A, and along the Mt Support and Route 120 North corridor. While some lighting is needed for visibility and security purposes, excessive lighting of commercial and industrial developments, parking lots, and streets can alter the character of a community. Excessive lighting wastes energy and can cause glare, impair vision, and cause accidents. Sky glow, which is reflected light visible in the night sky over large developments, reduces one's ability to see celestial elements at night. Excessive lighting has been shown to have adverse effects on humans, wildlife, and the environment. Negative impacts include disruptions to a person's biological clock, animal species migration, and nesting patterns.

The City continues to amend development regulations to guide the types of lighting fixtures permitted, favoring cut-off and other style fixtures. However, the sheer volume of new development is increasing sky glow, as does the increased lighting from single and multi-family homes and other types of development exempt from development regulations.

5 | C-2 Landform

Lebanon's landform is defined by undulating hills and steep slopes that rise from its river valleys. The ridgelines are the most visible elements in our scenic landscape and help define the City's character.

5|C-2a **Steep Slopes**. Construction, blasting, excavation, and loss of vegetation on steep slopes can reduce soil stability, increase runoff and erosion, degrade water quality, compromise wildlife and plant habitat, reduce carbon sequestration, and diminish the City's natural landscape. Locating development on steep slopes can also increase maintenance costs for infrastructure such as roads and sewer/septic systems. The City currently has a Steep Slope District to prevent development on slopes in excess of 25 percent. The Steep Slope District currently is limited to the RL-3 zone. However, the RL-3 zoning district contains a relatively small percentage of Lebanon's land area. Therefore, potential adverse impacts occurring on steep slopes continue to warrant monitoring and prevention measures as needed.

5|C-2b **Ridgelines**. Lebanon's ridgelines create corridors through which wildlife can move, provide habitat for species like raptors and bobcats, and sustain many plants and animals not found at lower elevations. Some of the City's exemplary natural communities, including those defined by the New Hampshire Natural Heritage Bureau as rare or exceptional, are found on ridgelines. Ecologists and climate scientists have highlighted the emerging additional importance of these higher elevation habitats as species adapt to warming temperatures and migrate to suitable habitats.

The City's ridgelines contribute greatly to Lebanon's scenic character due to their current undeveloped state. The ridgelines are highly visible from many vantage points around the City, so a small development or even a single house on a ridgeline could be visible for miles.

5 |C-2c **Bedrock**. As Lebanon has grown, the availability of flat dry land suitable for development has decreased. New development increasingly occurs in less suitable areas, such as those that have thin soils over bedrock, or outright ledge. Blasting may be required to make such land suitable for building but may negatively affect underground water resources in bedrock faults and fissures, in addition to degrading the City's naturally scenic resources.

5 | C-3 Water Resources

Lebanon's water resources include more than 130 miles of rivers and year-round streams, as well as floodplains, wetlands, seasonal streams, vernal pools, and other hydrologically connected features as described in great detail within the NRI.

5 | C-3a **Surface Waters**. Surface waters in Lebanon include: the Connecticut and Mascoma Rivers, their many tributaries (Hardy Hill Brook, Great Brook, Stoney Brook, Blodgett Brook, among others); Mascoma Lake, Boston Lot Lake, and a number of smaller ponds and vernal pools.

The terrain in Lebanon, as in many New Hampshire communities, has resulted in roadways built in close proximity to surface waters. This has increased the vulnerability of these surface waters to pollution and spills. As described in the Community Facilities and Services chapter of this plan, the Mascoma River is Lebanon's public drinking water supply. As such, the City has particular concern for safeguarding the River's water quality. However, much of the River's watershed, tributaries, and headwaters are upstream of Lebanon.

In 2011, the Mascoma River became the sixteenth protected river in the New Hampshire Rivers Management and Protection Program (RMPP). This designation formalizes a local and state partnership for the management of this river. A local advisory committee, with assistance from the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC), is coordinating the development and adoption of a river corridor management plan.

The New Hampshire Shoreland Water Quality Protection Act (NH SWQPA) is a regulatory measure that offers protection to the Connecticut and Mascoma Rivers, as well

as other surface waters in the City (Mascoma Lake, Bloods/Trues Brook, Great Brook, and Boston Lot Lake). Various protection measures apply within the 250-foot protected shoreland of these water bodies.

In 2014, the Lebanon Zoning Ordinance was amended to include the Riverbank Protection District. This includes additional protection measures for water bodies regulated by the NH SWQPA, as well as other water bodies outside of the jurisdiction of the NH SWQPA.

The Connecticut River Joint Commission (CRJC) advises that preserving vegetated buffers along waterways, including smaller streams, is the most effective protection for water resources. Buffers filter polluted runoff, stabilize banks, regulate stream flow, recharge aquifers, and provide important habitat, among other benefits.

5 | C-3b **Floodplains.** The floodplains along the City's surface waters have experienced substantial development since the 1970s, most notably, significant portions of the developed area on the west side of Route 12A. Floodplain development reduces flood storage capability, increasing the likelihood of greater flooding including areas not previously affected and increasing the threat to life and property posed by flooding. Floodplain development also reduces the scenic and habitat value of the river valleys. Since 1980, the City has been in compliance with the National Flood Insurance Program, which is administered by the Federal Emergency Management Agency. This program prohibits development in the actual floodway, but permits it in the 100-year floodplain if the developments are flood-proofed.

5 | C-3c **Wetlands.** Within Lebanon, there are an estimated 1,500 acres of wetlands. Small, incremental filling and degradation of wetlands over the years continues to add up to a significant loss of wetland acreage and function. Some wetland ecosystems in the City have become increasingly isolated islands surrounded by development, which decreases their ecological value, particularly as habitat. The NRI provides descriptive information related to the functions and values of Lebanon's wetlands, as well as a priority ranking of their importance.

The value of wetlands for groundwater and stream recharge, flood attenuation, pollution abatement, carbon storage, and wildlife habitat is still vastly under-appreciated. Wetlands and their valuable functions save us money and effort in pollutant and flood mitigation.

The land surrounding wetlands is critical for maintaining the functions and values of the wetland itself. In 2014, the City amended the Zoning Ordinance to include the Wetlands Conservation District. The essence of the regulation is to restrict development from occurring within this buffer area to provide additional protection measures to high value wetlands.

5 | C-4 Land Resources

5 | C-4a **Open Space.** Lebanon residents have a long history of expressing their appreciation for and desire to maintain open space. Open space helps define community character, is home for wildlife and plants, protects drinking water supplies, and provides opportunities for recreation.

Studies have demonstrated that in addition to numerous ecological benefits, open space land is of high economic value. Open space is a “fiscal winner” for the City, as it brings in more money in taxes than it uses in services. Open space also increases the value of nearby developed land. It is vitally important to attracting and retaining businesses and is also the foundation of the agriculture, forestry, tourism, and recreation industries.

The City still has a considerable amount of undeveloped (open/forested/agricultural) land. The 2021 Open Space Plan identifies 21,293 acres as undeveloped or natural habitat, representing approximately 81% of the City’s land area. Approximately 18,000 acres of open space lands are in Current Use, a reduced-rate property tax classification that is intended to help preserve the land base for forestry, agriculture, and other traditional uses.

5 | C-4b **Conserved Land.** Approximately 2,100 acres of land within the City are conserved and protected from future development. These conservation lands provide important habitat for plants and wildlife; protect water and air quality; and fulfill resident’s needs for recreational opportunities, an experience of nature close to home, and outdoor solitude. ADA access is provided where feasible and could be incorporated into the management policies of the City’s conservation lands.

There are more than 21 miles of trails on the City’s conservation lands, as depicted on the property maps generated by the City. Additionally, there are ongoing efforts to identify and plan for additional linkages to a community wide trail network. The City employs a seasonal conservation ranger to help maintain the City’s conservation lands, including the trails, and to help recruit and organize volunteers to assist as well.

5 | C-4c **Working Land.** Agriculture and forestry play an important role in the regional and state economies, as well as in stewardship of our natural resources and scenic landscape.

Increased development pressures and decreased profitability of small farms (partially due to higher tax burdens) have gradually diminished the rural and agricultural character of Lebanon’s outlying areas. However, the working farms, orchards, and woodlots that remain continue to contribute to our economy, and the City’s remaining undeveloped prime agricultural soils could provide opportunities for continued farming in the future. Local farms provide fresh, high-quality food directly to the community and the region, eliminating the need for energy- and cost-intensive shipment and travel. They contribute directly and indirectly to the economy by providing the quality of life that attracts companies, their workforce, and tourists.

Forest lands are a dominant feature of Lebanon’s landscape and ecosystems and the City’s productive forests are an important renewable resource. Several forest-based commercial enterprises (logging, milling, maple sugaring) rely upon the availability of

healthy woodland. Conversion to other uses has many ecological, economic, and social impacts, such as reduced water quality, forest fragmentation, habitat loss, fewer traditional recreational opportunities, and reduced carbon sequestration.

5 | C-5 Plants and Animals

5 | C-5a **Biodiversity.** Biodiversity enriches the community by providing environmental, economic, and social benefits. A diverse ecosystem can better survive disease and disturbance; can maintain essential biological services such as natural recycling of nutrients and wastes; and can provide models and resources for human advances in agricultural, medical, and other endeavors.

Lebanon is home to a wide variety and abundance of plants and animals, including more than 40 rare or endangered species. The 2010 Natural Resource Inventory provides a tremendous amount of information related to Lebanon's biodiversity, identifying 73 "Significant Ecological Areas" (SEAs) within the City's borders.

5 | C-5b **Invasive Species.** Invasive exotic plants and insects are impacting the health of trees, forests, and wildlife, as well as ecosystem biodiversity in Lebanon and surrounding areas. With guidance from the New Hampshire Department of Agriculture, the NH Invasive Species Committee, and other organizations, the City is making efforts to reduce these impacts. The Conservation Commission regularly recommends that developers eliminate or limit the spread of known invasive plant species in the course of their work, and the Planning Board's Site Plan Review Regulations include a list of invasive species that cannot be used to satisfy landscaping requirements. However, broader coordinated efforts are needed. Purple loosestrife, buckthorns, honeysuckles, barberries, and Japanese knotweed are just a few of the invasive species spreading on City-owned conservation lands, along roadsides and power-line cuts, as well as on private land throughout Lebanon. Invasive insects such as Emerald Ash Borer, are impacting the health of our urban and rural forests.

5 | C-5c **Forests.** Forests are valuable assets that provide habitat for wildlife and opportunities for recreation, sequester carbon, and purify our air. Development, forest fragmentation, climate change, invasive species, and deer overabundance, among other threats, are impacting the health of our forests.

It was often cost prohibitive to construct and maintain lengthy driveways to serve residences. The preference was often to locate the home as close as possible to an existing maintained road. A current trend in the Upper Valley, including Lebanon, is to locate house sites in remote locations served by driveways that can exceed 1/2 to 1 mile in length. These features fragment undeveloped blocks of land, resulting in increased predation, the spread of invasive species, disruption to migration patterns, and other adverse effects on the natural environment.

5 | C-5d **Urban Trees.** Trees in residential and commercial neighborhoods serve many important roles in the City of Lebanon. Among other benefits, urban trees provide shade and windbreak, cleaner air, shelter and food for wildlife, privacy, beauty, and higher

property values. When planted in the proper location, trees can help decrease summer cooling and winter heating bills. Also, the leaves, branches, and trunks of trees catch rainwater before it reaches the pavement, reducing runoff, erosion, pollution, and other stormwater effects. Development, construction, improper placement, planting, or maintenance, climate change, and invasive insects such as the Emerald Ash Borer are serious threats to the health of the City's urban forest.

5 | D **Future Challenges & Opportunities**

Development pressures and climate change will continue to impact Lebanon's natural resources. Careful planning, conservation efforts, and better protections are needed to ensure that the City retains its vital natural assets while allowing opportunities for future growth. Without proper protection through local regulations, incentives, educational efforts, and good stewardship the City could lose the very assets that have made this community a desirable place to live and work.

The 2010 Natural Resource Inventory, the 2016 Wildlife Corridor Analysis, and the 2021 Open Space Plan form the basis of Lebanon's Conservation Program. Associated planning tools and protections such as the City's Wetlands Conservation District, Steep Slope District, and Riverbank Protection District, and the Shoreland Protection Act should inform future planning decisions and be utilized to guide future development. Future protections such as a blasting ordinance, an urban tree ordinance, an expanded steep slope overlay district, and a watershed management plan are needed to better guide future development and ensure additional protections of natural resources.

The challenge of addressing issues associated with a warming planet can be daunting, but implementing both mitigation and adaptation measures is imperative to minimize disruptions of natural ecosystems. The technological solutions currently exist to mitigate some of the impacts of climate change; but political will is needed to fully engage in the necessary deployment of these technologies.

5 | D-1 **Air and Sky**

5 | D-1a **Air Pollution**

Maintaining good air quality is essential to making the City and the Upper Valley a great place to live and work. Even though all of New Hampshire is currently in attainment with the National Ambient Air Quality Standards (NAAQS), Lebanon cannot take clean air for granted. Localized sources of air pollution, such as wood smoke, tailpipe emissions from idling vehicles and equipment, and emissions from businesses can impact both the health and enjoyment of residents in some areas of the City.

Opportunities for Lebanon to contribute to maintaining good air quality include procuring low and zero-emission vehicles such as battery electric and plug-in hybrid cars and trucks as older City-owned vehicles are retired; specifying clean vehicles and equipment when making procurements (e.g., requiring electric trash trucks and school buses in bids/contracts); improving the efficiency of city-owned building stock and incorporating renewable energy sources such as solar, conducting education and outreach

to businesses and residents to ensure they are aware of the options available to them; and improving infrastructure to support less polluting vehicles in both the public and private sectors. A potential opportunity for the City to help inform state actions could include community science monitoring of PM2.5 to help identify hyper-local levels of PM2.5 due to wood burning and other activities.

A present and future challenge is building community resilience, especially in neighborhoods that may be disproportionately impacted by air pollution and climate change. The heat island effect results in significantly hotter summer air temperatures, increased air pollution and health risks in locations dominated by impervious surfaces and inadequate tree canopy.

Detailed information on air quality and how it is regulated in New Hampshire can be obtained from the NHDES Air Resources Division. The latest edition of the State of New Hampshire Air Quality Report is a valuable reference for additional trends.

5 | D-1b **Dark Sky.** Lebanon would likely not qualify as a dark sky community as certified by the International Dark-Sky Association, but should commit to improving dark sky conditions and improve opportunities for star and planet gazing.

Within the development review process, and in all City municipal operations, outdoor lighting installations should be designed to provide the minimum light levels needed for adequate visibility while avoiding over lighting and its associated problems, such as glare, sky glow, light trespass, and biological impacts on both humans and wildlife. For instance, down-lit fixtures, cut-off lighting, timers, and motion detectors can be used.

5 | D-2 Landform

5 | D-2a **Steep Slopes.** To avoid adverse impacts from development on steep slopes, the City should expand the existing Steep Slope District to apply to all zoning districts. The Steep Slope District should be reviewed and modified as needed to incorporate appropriate measures such as performance or review process techniques.

5 | D-2b **Ridgelines.** As recommended in the 1986, 1993, and 2006 Lebanon Master Plans, a ridgeline conservation overlay district should be incorporated into Lebanon's Zoning Ordinance to ensure proper siting of development and to minimize impacts to the existing landscape and scenic qualities of the ridgelines. Adopting a ridgeline conservation overlay district would assist with maintaining the functions and values of these ecologically sensitive areas. The overlay district could include regulating the siting and design of telecommunications towers, wind turbines, and associated facilities.

5 | D-2c **Bedrock.** Examining the effects of blasting on groundwater, as well as on the viewsheds of Lebanon, should be part of the development review process, with City staff consulting a hydrogeologist as needed. To further protect groundwater quality and hydrology, the City should consider adopting a blasting ordinance, such as those described in the NH DES 2019 publication Rock Blasting and Water Quality Measures That Can Be Taken To Protect Water Quality and Mitigate Impacts.

5 | D-3 Water Resources

5 | D-3a **Watershed Protection.** As Lebanon is dependent on the Mascoma River for its drinking water and is the most populous community in the watershed, the City should be involved in planning efforts for the watershed. The development and adoption of a water resources management plan would lay the groundwork for appropriate ordinances to protect Lebanon's surface and ground waters. Elements of the plan should include techniques or methods to address water quality degradation resulting from non-point source pollution, erosion, runoff, etc. Such techniques or methods could include:

- adding measures to the development review process (e.g., Low Impact Development);
- limiting the extent of impervious areas;
- preserving vegetated stream buffers;
- reducing herbicide, pesticide, and road salt use near waterways;
- landowner education and outreach;
- a water quality testing program;
- waterway clean-up events;
- aquifer and source water overlay districts;
- and land conservation techniques (e.g., easements, acquisition).

The Water Treatment Plant sub-watershed would be the logical starting point for defining the scope of a water resources management plan, but Lebanon residents would benefit from having a plan that includes all of the community's water resources. Any watershed protection efforts in the Mascoma and Connecticut River watersheds should be coordinated with other watershed communities. Continued participation in the Upper Valley Lake Sunapee Regional Planning Commission, the Mascoma River Local Advisory Committee, and Connecticut River Joint Commission's (CRJC) Upper Valley River Subcommittee will offer opportunities for regional information sharing and collaborative solutions to common challenges. Partnerships with private organizations to achieve water resource objectives can be beneficial and should be explored as part of the watershed planning effort.

Comprehensive community campaigns to continue the clean up of Lebanon's waterways will enhance water quality and scenic resources. As these natural assets continue to improve, the City will benefit greatly from increased property values and quality of life. The Lebanon Rotary Club has performed a considerable public service by organizing a biennial clean-up of the Mascoma River. This event could be augmented or directly coordinated by other local civic, neighborhood, or school groups, and supported by the City, to bring further attention to the River.

One threat to our water resources is the increased frequency of toxic cyanobacterial blooms. These algal blooms are occurring more often in part because longer ice-free seasons result in more time for surface waters to warm up and for blooms to develop. To limit the likelihood of toxic blooms, it is important that the City and its residents work to control phosphorus inputs from impervious runoff, lawn clippings, fertilizer, wastewater,

and septic systems. Protecting shorelands is also key - native plants have deep roots. Land conservation, outreach to homeowners, preventing the clearing of steep slopes, adopting larger shoreland buffer zones, requiring larger buffer zones for septic systems, improving stormwater management by increasing infiltration and improving culverts are additional steps to further protect our surface waters.

5 | D-3b **Floodplains.** Development has decimated the extent of functioning floodplains in the City. The increased frequency of extreme weather events has underscored the importance of floodplains to mitigating floodwaters. Every effort should be made to protect Lebanon's remaining floodplains and valuable floodplain forest communities.

5 | D-3c **Wetland Conservation.** Incremental filling and degradation of wetlands is continuing to contribute to a significant loss of wetland acreage and function. Efforts to avoid wetland impacts should continue. In situations where temporary or permanent impacts are unavoidable, the functions and values of each wetland should be the focus of the permitting review process. In situations where impacts exceed the requisite threshold and mitigation is required, the parties associated with the proposed impacts should prioritize mitigation opportunities on site, within proximity, or within the community, in that order.

The Lebanon Zoning Ordinance includes the Wetlands Conservation District to prevent the destruction of wetlands. This district includes a buffer for high and very high value (as categorized in the 2010 NRI) wetlands. *Buffers for Wetlands and Surface Waters: A Guide for New Hampshire Municipalities* (Audubon Society of New Hampshire and New Hampshire Office of State Planning, revised 1997) recommends 100 feet as a reasonable minimum buffer width to protect the values of wetlands under most circumstances. The City should consider expanding its wetlands overlay district to include buffers for all wetlands, including vernal pools.

5 | D-4 Land Resources

5 | D-4a **Open Space Planning.** Responsible growth is critical to the City's livelihood and vitality. It is necessary to identify and implement planning techniques that encourage respectful development while preserving important landscapes. The Lebanon Open Space Plan, completed in 2021, provides useful information on desirable open space characteristics and articulates the City's long-term vision for land conservation. The plan's prioritization framework sets open space benchmarks and identifies key components of the landscape that warrant conservation protection measures. It also provides useful information on the tools and processes for managing the ecological integrity of open space.

Innovative land use controls, such as conservation design and transfer of development rights, can be used to preserve more open space areas. Generally speaking, conventional subdivision design creates residential developments in which all land is divided into house lots and streets, with the only open space typically being the yards around single-family homes. On the other hand, conservation design provides greater flexibility for the design of a development to encourage the preservation of valuable open

land and natural features and to promote more efficient use of land, community facilities, services, and utilities. As a result, the same number of homes can be built in a less land-consumptive manner. This technique allows the balance of the property to be permanently protected and added to an interconnected network of community green spaces. Conservation design is an equitable way to balance both conservation and development objectives. As recommended in the Land Use chapter, the City should continue to require conservation design where appropriate with incentives to ensure that conservation design is a financially favorable alternative for residential, industrial, and commercial development. The City should also study transfer of development rights and other methods to protect important open space. These innovative techniques could help the City attain a pattern of development that matches the overall vision of this Master Plan.

The Open Space Plan provides a guide for prioritizing important natural features that the City should protect, including Significant Ecological Areas, valuable natural resources identified in the Natural Resource Inventory, Wildlife Crossing Analysis, Wetlands Conservation District, or the NH Wildlife Action Plan, and other natural areas. Lebanon should use the Open Space Plan to guide development; maximize the size of connected open space areas; conserve and prevent further fragmentation of wildlife habitat; and increase the visibility and functionality of the Lebanon Conservation Program.

5 | D-4b **Land Conservation.** The Lebanon Conservation Program should work to preserve and protect Lebanon's open space and valuable natural resources, as prioritized in the Open Space Plan. Outreach and education are needed so that City residents and property owners understand Lebanon's conservation goals; can participate in and appreciate land conservation; and have the opportunity to become engaged stewards of natural Lebanon. Protection measures to be used include purchasing or accepting gifts of property, conservation and public access easements, and development rights from willing landowners for priority areas as detailed within the Open Space Plan.

There are a variety of funding sources and partners for land conservation efforts in Lebanon. The Department of Environmental Services Aquatic Resource Mitigation (ARM) Fund is one potential source of funding, and has been used successfully in Lebanon for past open space protection projects. The Land and Community Heritage Investment Program (LCHIP) is another source of funding for high-priority projects, if the state legislature continues to fund it.

Money received from Land Use Change Tax penalties (for removing land from the New Hampshire Current Use program) should continue to be used to conserve new lands, as well as to maintain previously acquired ones. The City should continue to dedicate 100 percent of its Current Use penalty receipts to the Lebanon Open Space Trust fund, as recommended in the Land Use chapter of this Master Plan.

As potential trail linkages are identified, the City should work with willing landowners, land trusts, and other conservation and recreation groups to acquire trail easements, when feasible. The City also should negotiate with developers of large or strategically located parcels to protect existing trails and/or set aside additional land, if feasible, for a trail system or connection.

Stewardship of City-owned conservation properties should continue to be guided by management plans developed by professional land stewards, with policy oversight from the Lebanon Conservation Commission. Implementation of management recommendations should be achieved by a combination of professional staff and volunteer assistance, with outreach to neighbors of these properties.

5 | D-4c **Working Lands.** Agriculture is an important contributor to Lebanon's scenic, historic, and cultural quality of life. The municipality should continue to support such uses and try to meet the needs of the local agricultural community.

Sustainable local food production has a positive economic impact, saves energy on transportation, can promote healthy habits among local residents, and has the potential to be regenerative to the soil and to ecosystems. The community should continue to actively support the Lebanon Farmer's Market and the marketing of Lebanon's agricultural resources, and the City should work with farmers to target the fiscal, regulatory, and practical obstacles to sustaining local agriculture.

Local working forests supporting active commercial harvests provide local economic benefits, as well as a sustainable source of building products. A well-managed working woodlot can support sequestration measures by restoring the forest closer to its natural condition.

In conducting silvicultural activities, sound forestry practices should be followed, especially on ridgelines, steep slopes, and adjacent to waterways, to prevent sedimentation and erosion that contribute to the degradation of water quality. The New Hampshire Division of Forests and Lands has a publication *Best Management Practices for Erosion Control on Timber Harvesting Operations in New Hampshire* (2016) that is a good reference for anyone working in the woods, along with *Good Forestry in the Granite State: Recommended Voluntary Forest Management Practices for New Hampshire* (2010).

5 | D-5 **Plants and Animals**

5 | D-5a **Biodiversity.** It is important to maintain diverse ecosystems in Lebanon that can better survive disease and disturbance and can maintain essential biological services. The Natural Resource Inventory, Open Space Plan, and Wildlife Corridor Analysis provide the basis for proposing changes to zoning, site plan, and/or subdivision regulations to minimize adverse development impacts on Lebanon's diverse plant and animal communities. Several state agencies and other organizations can offer the City practical, research-based suggestions, such as NHDES fact sheets on minimizing development impacts on wildlife, and on habitat-sensitive site design and development practices; the 2015 New Hampshire Wildlife Action Plan; and numerous planning tools from NHDES, NHF&G, and UNH Extension.

When parcels are developed near important natural areas, existing wildlife corridors should be identified and preserved, including road crossings and wildlife-friendly culverts constructed with the advice of wildlife biologists. Conservation design and other

innovative zoning techniques (elaborated on in the Land Use chapter of this Master Plan) might also be utilized to provide or protect habitat.

Efforts should be made to mitigate the impacts of climate change on plants and local and migratory animals and to develop and implement strategies for adaptation.

5 | D-5b **Invasive Species.** The proliferation of invasive plant species is having a negative impact on plant diversity as well as wildlife habitat in the City. The City should inventory infestations of invasive species in Lebanon, develop plans to control these plants, and increase awareness of the damage that can be done when they are left unchecked. City staff, private landowners, and contractors should follow best management practices for removal and disposal of invasive species. Roadside mowing, for example, should be done prior to seed development and the blades should be scrupulously cleaned before leaving the mowing site. Invasive insects including Asian Longhorned Beetle, Emerald Ash Borer, Spotted Lanternfly, Spotted-Wing Drosophila, and Brown Marmorated Stink Bug pose various risks to local agriculture, urban trees, and forests.

5 | D-5c **Forests.** Lebanon's forests, one of its most defining natural features, are important wildlife habitat, sources of forest products, and are central to much of our local recreation and nature economy.

Forest fragmentation and conversion to other uses have many ecological, economic, and social impacts, such as reduced water quality, habitat loss, fewer traditional recreational opportunities, and reduced carbon sequestration. The City should implement road and driveway standards to reduce further fragmentation of undeveloped blocks of land by private roads and lengthy driveways. Other steps the City should take to further protect forest blocks are expanding the Steep Slope District; implementing a ridgeline ordinance; and continuing to pursue the Lebanon Conservation Program's conservation goals of permanent land protection through conservation easements, purchases, and donations.

Among the many threats to the City's forests are invasive insects such as the Emerald Ash Borer. In the next few years Lebanon will experience a dramatic shift in the health and composition of its forests as ash trees succumb to this insect. The City should prepare for future impacts of other invasive insects, in combination with the impacts of climate change, on our forest health and composition.

Deer overabundance inhibits the regeneration of native tree species, reduces the regeneration and diversity of native forest understory species, and leads to the spread of invasive plant species. The City should encourage deer hunting in areas showing signs of overbrowse to better manage deer populations.

Resident and visitor use of Lebanon's natural areas has increased significantly in recent years, putting pressure on our trails and the quality of wildlife habitats. Trail use has physiological and behavioral impacts on wildlife, and can impact reproductive success and predation. For example, the upland forest surrounding vernal pools is essential for the

successful life cycle of many amphibians, who in turn are an important component in the forest ecosystem. A trail's corridor of influence - how far in either direction our presence can be detected by wildlife - might be 60 feet for amphibians, but is about 400 feet in both directions for larger animals. The City should evaluate its trail network using guidelines such as those from the NH Trails for People and Wildlife Program.

Maintaining healthy forests is an important climate mitigation measure as forests naturally store carbon, absorb rainwaters, and filter pollutants. Programs to provide financial incentives to landowners to engage in forest carbon sequestration are beginning to emerge and could be an attractive option for Lebanon landowners.

- 5 | D-5d **Urban Trees and Greenways.** The City is losing urban trees to development, disease, and damage faster than it is replacing them. Lebanon's estimated urban (places served by sidewalks) tree canopy is below 30% and falling, while many American cities are striving for 40% or greater. As people become more aware of the benefits of trees, they realize the importance of maintaining the health of existing trees and the desirability of planting new ones. It is very important that native and site-suitable species be properly planted in appropriate places, to keep maintenance costs low and reduce impacts from natural hazards such as ice storms.

The City should continue to support the recently established Tree Advisory Board's efforts to inventory important trees, especially those in the City's urban centers, and to develop a tree ordinance outlining proper tree planting, care, and maintenance. The City should hire a tree warden as defined in RSA 231:139 to help plant, maintain, and protect shade and ornamental trees and shrubs in urban public spaces and along municipal rights-of-way. Such an effort might even produce valuable input for greening locations such as the Route 120/I-89 (Exit 18) interchange.

Public education is also important in regards to the proper choice, placement, and care of residential, public, and other street trees. The City should continue observing Arbor Day, maintain its Tree City USA status, and utilize the resources available through the State's Urban and Community Forestry program and the UNH Extension County Forestry program to promote the health and appreciation of its urban tree canopy.

The City needs to diversify its urban forest. History has shown us the risks of overreliance on one or a few main species in the urban forest. When a species-specific pest or disease inevitably attacks, the impacts on the urban forest canopy are dramatic. This has happened with the American Elm and is soon to happen in Lebanon with species of ash, which line many roads, parking lots, and developments across the City. Lebanon currently has an overreliance on maples in the urban forest, and should encourage the planting of other tree species to diversify its urban tree canopy.

5 | D-6 Coordination & Outreach

It is imperative that the City manage development to preserve its open land and scenic resources. This can best be achieved by implementing the Open Space Plan; coordinating zoning, site plan, and subdivision regulations; and using the Capital Improvement Plan.

The Conservation Commission and related staff play a pivotal role as stewards of the City's natural and scenic assets and, along with the Recreation Department, its recreational assets. As volunteers, Conservation Commissioners have an important job to do with limited time and resources. Accordingly, City staff and Conservation Commission members should continue to keep one another apprised of ongoing opportunities for training and education, so that they can be better-informed and more effective decision-makers. Communication should be improved among the City's boards, departments, and residents, to ensure that the policies and actions of one body are not inconsistent with those of others, and that Lebanon's treasured natural resources are not compromised. Efforts to partner with local and regional organizations, neighboring towns, state agencies, and private landowners should continue on behalf of conservation.

Through successive master plans, land conservation efforts, municipal elections, partnerships with the private sector, and other processes, the people of Lebanon have sustained an interest in protecting the City's natural resources and scenic character. The Conservation Commission, with its partners in schools, scouting, other service organizations, neighborhood groups, and other conservation and natural resource organizations, should continue to engage the public in conservation by encouraging participation in the Stewardship Program and by sponsoring community educational events, outings, workdays, and celebrations.

key points | vision & purpose

- Recognize that conservation of the natural environment is essential to maintaining the City's quality of life and economic vitality
- Conserve open space and maintain the functions of natural systems while respecting the rights of property owners
- Establish a connected network of open spaces, conservation lands, greenbelts, and working farm and forest land

key points | issues & priorities

- Seek a balanced approach to protecting the City's natural resources while accommodating anticipated growth and maintaining the City's role as a regional center
- Maintain healthy, functioning natural systems that contribute to the City's quality of life and economic vitality
- Support efforts to reduce greenhouse gas emissions, implement mitigation and adaptive measures, and continue to monitor impacts

– key points | existing conditions & trends

- Lebanon's natural resources, among its greatest assets, have been diminished over time and are increasingly under threat.
- Clean air and a dark night sky should not be taken for granted as the City continues to grow and develop.
- Lebanon's hillsides and ridgelines are defining characteristics of the landscape, and are especially vulnerable to poorly planned development.
- The City's water resources (rivers, streams, lakes, ponds, vernal pools and other wetlands, floodplains) serve multiple functions, and their protection and health is critical to Lebanon remaining an attractive place for people to live and work.
- A large percentage of Lebanon remains undeveloped, however only a small amount of open space is permanently protected from future development. Open space, scenic views, working lands, and rural character contribute significantly to the City's quality of life.
- The biodiversity in Lebanon's many ecosystems, including its varied forests and urban trees, enriches the community by providing environmental, economic, and social benefits, but is under threat from invasives and climate change.

key points | future challenges and opportunities

- As Lebanon faces growth pressures, careful planning and better protection are needed to ensure that the City preserves its important natural resources. The City will need to implement mitigation and adaptation measures to minimize the effects of climate change on natural ecosystems.
- Lebanon needs to act, in concert with the state and federal governments, to prevent air pollution and preserve a dark night sky as the City continues to grow and develop.
- Lebanon needs to expand its regulations applying to development on steep slopes to cover the entire City and to address the related issues of ridgeline development and the potential ecological damage caused by blasting.
- Lebanon needs to develop and implement watershed protection plans, particularly for the Mascoma River, in coordination with neighboring communities and the state.
- Lebanon needs to implement the 2021 Open Space Plan to maintain open spaces and working lands for future generations.
- Lebanon should seek professional guidance to protect the biodiversity of its ecosystems and improve the quality of wildlife habitat on public lands, which are under threat from invasives and climate change.
- There should be greater coordination among City Departments, staff and volunteers to increase the effectiveness of Lebanon's efforts to protect natural resources.

Section - Topic	ID	Action
OUTCOMES	O.1	A balanced approach to protecting the City's natural resources
	O.2	Healthy, functioning natural systems that contribute to the City's quality of life and economic vitality
Air & Sky - Air Pollution	5.1a.1	Adopt practices that reduce air pollution and the heat island effect.
	5.1b.1	Maintain existing dark sky conditions by using and promoting lighting design standards (e.g., in site plan regulations) that ensure adequate lighting, but avoid over lighting, sky glow, and impacts on wildlife.
Landform-Steep Slopes	5.2a.1	Expand regulations applying to development on steep slopes to cover the entire City.
Landform-Ridgelines	5.2b.1	Adopt regulations that enforce appropriate siting and design of both telecommunication towers and wind turbines.
	5.2b.2	Adopt a ridgeline ordinance to protect ridgelines, adjacent hillsides, and wildlife corridors from poorly sited development.
Landform-Bedrock	5.2c.1	Develop a blasting ordinance to protect groundwater.
Water Resources - Protection	5.3a.1	Develop and adopt water resource management plans to protect surface waters, groundwater, aquifers, and drinking water sources.
	5.3a.2	Utilize current innovations in stormwater management, e.g., low-impact development (LID), for both City and private development projects.
	5.3a.3	Regularly update subdivision and site plan regulations to include current innovations in stormwater management.
	5.3a.4	Develop and implement policies that reduce herbicide, pesticide, fertilizer, phosphorous, and road salt use near waterways, wetlands, and surface waters.
	5.3a.5	Make impervious surface reduction a goal of parking policies and regulations in the Zoning Ordinance.
	5.3a.6	Enforce stormwater and erosion control standards and conditions during and after construction.
	5.3a.7	Support volunteer clean-ups of the Connecticut and Mascoma Rivers, as well as other water bodies.
Water Resources - Floodplains	5.3b.1	Protect Lebanon's remaining floodplains and work to restore the valuable floodplain forest communities.
	5.3b.2	Develop an ordinance more stringent than that developed by Federal Emergency Management Agency to restrict development or filling in of floodplains to provide flood storage, water quality protection, and wildlife habitat adjacent to waterways.
	5.3b.3	Request updated flood hazard mapping by FEMA.
Water Resources - Wetlands	5.3c.1	Periodically assess and update surface water, wetlands, and stream buffer regulations, making adjustments as needed to ensure the health of the resource.
	5.4a.1	Establish a connected network of open spaces, conservation lands, greenbelts, working farms, and forest lands, as informed by the Lebanon Natural Resource Inventory and Open Space Plan, -to preserve the ecological integrity of the Lebanon landscape.
	5.4a.2	Use the Open Space Plan to guide development; maximize the size of connected open space areas; conserve and prevent further fragmentation of wildlife habitat; and increase the visibility and functionality of the Lebanon Conservation Program.

Land Resources - Open Space Planning	5.4a.3	Support conservation throughout the City, particularly in critical habitat areas as identified in the Natural Resource Inventory and Open Space Plan, using measures including the purchase of easements or property, donations of land, and an informed development review process.
	5.4a.4	Work with Dartmouth College to protect the Landmark Lands.
	5.4a.5	The Conservation Commission should periodically review all City-owned property and to recommend what land should have third-party conservation easements.
Land Resources - Land Conservation	5.4b.1	Manage conservation land for habitat protection and wildlife habitat whenever possible.
	5.4b.2	Review and implement recommendations within existing management plans, and develop management plans for remaining City-owned conservation properties.
	5.4b.3	Continue to highlight the City's conservation properties through publicity and improved signage and maps that includes historical and ecological information about the property
	5.4b.4	Continue to employ a Conservation Ranger to help maintain the City's conservation lands, including the trails, and to help organize volunteers.
	5.4b.5	Recruit and coordinate local volunteers to continue the care, maintenance, promotion, and appropriate use of conservation lands.
	5.4b.6	Work with developers, private landowners, and local land trusts to enhance the existing city-wide trail network to provide public access while protecting the wildlife habitat and ecologically sensitive areas.
	5.4b.7	Follow guidelines from NH "Trails for People and Wildlife" when evaluating a trail or designing a trail system.
	5.4b.8	Provide ADA accessibility on conservation lands where feasible.
Land Resources - Working Lands	5.4c.1	Support opportunities for sustainable agricultural activity in the City.
	5.4c.2	Support the local agricultural community by continuing to promote the Lebanon Farmer's Market and the marketing of local agricultural products.
	5.4c.3	Promote land stewardship, including best management practices (BMPs) for logging.
P&A - Biodiversity	5.5a.1	Guide new development away from wildlife habitat areas that have been identified in the Natural Resources Inventory and the Wildlife Corridor Analysis.
	5.5a.2	Implement the recommendations from the existing wildlife corridor reports.
	5.5a.3	Identify and protect reptile and amphibian breeding areas, habitat, and migration corridors.
	5.5a.4	Evaluate existing protections for vernal pools, including their buffers, and recommend protection measures.
	5.5a.5	Identify and support efforts to protect bees and other pollinators.
	5.5b.1	The City should prepare for future impacts of invasive insects and climate change on our forest health and composition.

P&A - Invasives	5.5b.2	Inventory areas that have been impacted by invasive species and develop plans to remove or reduce impacts, where possible.
	5.5b.3	City staff, private landowners, and contractors should follow best management practices for removal and disposal of invasive species.
P&A-Forests	5.5c.1	Develop policies and practices to reduce forest fragmentation and promote healthy forests and ecosystems.
	5.5c.2	Encourage landowners to engage in practices that promote forest health, wildlife habitat, and carbon sequestration.
	5.5c.3	Continue to celebrate Arbor Day and participate in the Tree City USA program to raise awareness of the importance of trees.
	5.5c.4	Encourage doe hunting in areas showing signs of overbrowse to better manage deer populations and improve ecosystem health.
P&A - Urban Trees	5.5c.1	Develop and adopt an urban tree ordinance to protect urban and residential trees.
	5.5c.2	Support the efforts of the Tree Advisory Board and Tree Warden to promote the health and diversity of the urban tree canopy, reduce air pollution, and reduce heat islands.
	5.5c.3	Develop recommended landscaping guidelines for distribution to landowners regarding such issues as the protection of existing trees and landscaping, choosing plant species native to the region, and proper tree planting and care techniques
Coord/Outreach	5.6a.1	Pursue partnerships with local and regional organizations, neighboring towns, state agencies, and private landowners regarding natural resource protection and conservation initiatives.
	5.6a.2	Continue formal cooperative planning and alliances with regional organizations and neighboring communities to protect water bodies and watersheds.
	5.6a.3	Increase training, information sharing, and coordination on natural resource issues for City staff, the Conservation Commission, the Planning Board, other volunteer boards, and the public.
	5.6a.4	Conduct education and outreach to members of the public about the benefits of land conservation and options for conserving their land, for example with conservation easements.
	5.6a.5	Promote public awareness of the importance of conservation lands and other natural areas and their appropriate use by continuing to host nature programs, such as Wild about Lebanon, workshops, and digital outreach.
	5.6a.6	Promote the benefits of viable functioning habitats and-provide guidelines for good stewardship.
	5.6a.7	Develop and disseminate public education materials regarding the importance of protecting our water supply sources.
	5.6a.8	Increase involvement in invasive plant species control and removal by providing educational materials, hosting workshops, and sponsoring community work events.
	5.6a.9	Educate City staff and the public regarding the proper choice, placement, and care of residential, public, and other street trees.
	5.6a.10	Work with schools to increase students' connections to the natural world.



CITY OF LEBANON ~ PLANNING & DEVELOPMENT

MEMORANDUM

TO: Lebanon Pedestrian and Bicyclist Advisory Committee (“Ped Bike”)
CC: Rebecca Owens, Senior Planner
FROM: Nathan Reichert, Planning & Development Director
RE: Review and Endorsement of Walk Bike Ride Leb Plan
DATE: May 2, 2023

Overview

Over the years, progress has been made toward improving the safety and comfort of walking and bicycling in the City of Lebanon. Some notable achievements include constructing the Mascoma River Greenway, improving pedestrian facilities along the Miracle Mile, and adopting a [Complete Streets policy](#). However, Lebanon has never had a comprehensive, citywide guide for walking and bicycling infrastructure and programming needs.



Walk, Bike, Ride Leb (WBRL), developed between 2022 and 2023, is a plan to create a **safe**, **comfortable**, and **connected** walking and bicycling network in the City of Lebanon, including connections to public transportation. The WBRL Plan is founded in review of existing data and plans, and incorporation of diverse public input. It identifies the community’s highest priority multimodal improvements. Now near completion ([see attached final draft](#)), this plan is poised as a key tool to inform how walking and bicycling improvements are factored into [City budgets](#) and [Capital Improvements Programs](#), which grant opportunities are pursued, and how new and existing developments can be connected to the walking and bicycling network.

Development of the Plan

Development of the WBRL plan was led by a Project Team comprised of the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) and the City’s Planning and Development Department. The Lebanon Pedestrian and Bicyclist Commission (“Ped-Bike”) was involved at all points in the process between project scoping and priority project identification. Other Project Advisory Committee (PAC) members included representatives from the Department of Public Works, Department of Recreation, Arts and Parks, City Manager’s Office, Police Department, Planning Board, and Advance Transit. Numerous project contributors from throughout the community were also engaged.

Community outreach, review of existing data, plans and studies, and multimodal network analysis were the primary outcomes of Phase 1 of the project. Phase 2 focused on the identification, categorization and prioritization of key projects and strategies shared by the community, to create an actionable plan that helps decision-makers focus on “pre-vetted”

opportunities for improvement. The WBRL plan's major recommendations thus fall into two main buckets: (1) network improvement projects or the "Implementation Plan" (i.e., priority projects list) and (2) non-capital project "Related Key Strategies" (i.e., education, design, maintenance, operations, policy, and safety).

Some of the input tools created for the outreach process, including the network map and non-capital projects list, were developed for on-going utilization—as permanent tools to help the City reassess priorities going forward.

As a final outcome, the plan produced conceptual designs and cost estimates for three network improvements from the priority projects list, which are included in the appendix with some similar pre-engineering due diligence generated by the City for three additional priority improvements. These six concepts are intended to support grant readiness for the City.

For more information about the project's development and input process, the WBRL [website](#) includes links to the City's Complete Streets Policy, WBRL public survey dashboard, network map, CIP proposal, and Scope of Work.

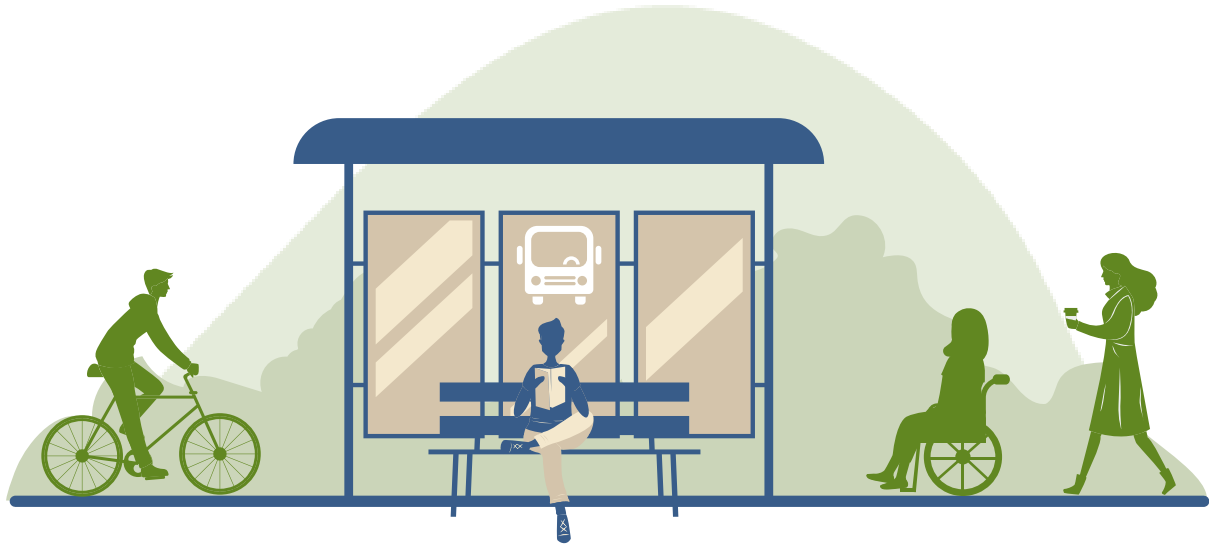
Final Draft Review

At their regular monthly meeting of May 2, 2023, Ped-Bike members will review and comment on a final draft version of the WBRL Plan. If members see it fit to do so, they will be asked to formally endorse the WBRL final draft ("with comments addressed") and recommend that the City Council should adopt the plan.

Concurrently, members of the PAC will be emailed the final draft for review and comment and the public will be made aware of the draft via LebNews.

On May 22, 2023, the Planning Board will provide its review, comment, and hoped for endorsement. Subsequently, edits provided to date will be addressed to the degree possible in a draft provided to the City Council for its consideration and recommended adoption on June 7, 2023. Some minor concluding edits, formatting and project team coordination will close out the project following these reviews and the completed WBRL plan will be published to the City website.

In the long-term, one of the WBRL Plan's strategic recommendations is for there to be a regular interdepartmental review of the plan and priority projects, in conjunction with updates to WBRL's living tools, the network map and project lists.



WALK·BIKE·RIDE·LEB

City of Lebanon, NH

MAY 2023

FINAL DRAFT FOR REVIEW

This file does not include recommended edits/comments from the 5/2/23 Ped-Bike or PAC reviews. A Table of Contents is forthcoming.



LEBANON
NEW HAMPSHIRE





ACKNOWLEDGEMENTS

The *Walk Bike Ride Leb Plan* was prepared by the Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) and funded by the City of Lebanon. The Project Team would like to thank the following people and organizations for their time, effort, and collaboration on this project.

Project Team

- Alex Belenz, Planner, UVLSRPC
- Meghan Butts, Executive Director, UVLSRPC
- Andrea Cass, Associate Planner, UVLSRPC
- Rebecca Owens, Senior Planner, City of Lebanon

Project Advisory Committee

- David Brooks, City Planning
- Jay Cairelli, City Department of Public Works
- Paul Coats, City Department of Recreation and Parks
- Shaun Mulholland/Paula Maville, City Manager's Office
- Colin Smith, City Pedestrian-Bicycle Advisory Committee
- Marie McCormick, City Pedestrian-Bicycle Advisory Committee
- Kim Chewning, City Planning Board
- Tim Cohen, Police Department
- Van Chestnut, Advance Transit

Project Contributors

- Dartmouth College
- GCSCC
- Hanover Bike-Walk Committee
- Hanover Co-op Food Stores
- SAU 88
- Tri-Valley Transit
- Upper Valley Cycling Club
- Upper Valley Running Club
- UVMBA
- West Lebanon Revitalization Advisory Committee



EXECUTIVE SUMMARY

INTRODUCTION

Throughout years of transportation planning, the City of Lebanon identified a need for a comprehensive and concise multi-modal transportation plan. Some notable achievements include constructing the Mascoma River Greenway, improving pedestrian safety along Miracle Mile, and adopting a [Complete Streets policy](#). Other cities and towns across the country have recognized the required thoroughness to develop a multi-modal plan. These are sometimes referred to as "master ped/bike plan" or "comprehensive bike plans" in other towns and cities. While multi-modal transportation challenges and opportunities have been discussed in plans for many years, the *Walk Bike Ride Leb Plan* identifies specific actions that the City can take to develop a safe, comfortable, and connected walking and bicycling network, including connections to public transportation services. As potential funding sources, public input, and mobility continue to change, the City believes a comprehensive plan with a focus solely on multi-modal transportation would benefit all people living, working, and traveling in Lebanon.

Most of the workforce population living in Lebanon works in or near Lebanon, with a mean travel time of under 20 minutes (primarily by single occupant vehicle).¹ In addition, in Grafton County, the greatest share of trips averages 1-3 miles, followed by trips under 1 mile, meaning that biking and transit has the potential to serve a significant portion of travel.² Ostensibly, there is a significant portion of Lebanon's populace that could (and would) commute and go to school more regularly by transit, walking, bicycling, or a combination if the accessibility of those modes and level of comfort navigating them in Lebanon were bolstered. That is one of the goals of this plan: to promote the build-out of improvements that complete and modernize Lebanon's multimodal network in a way that markedly improves our citizens' level of comfort getting around their community—with safety at the front and center.

PURPOSE

The primary purpose of the Lebanon Multimodal and Complete Streets Implementation Plan (herein referred to as the "Plan") is to apply existing information and recommendations found in City, regional, and State plans, as well as public input, to establish baseline conditions and improvement, needs assessment for pedestrian and bicycle facilities, standardize criteria for and verify improvement priorities, and better prepare the City for the funding and implementation of priority projects. The intended use of the plan is for internal use for budget planning, operations, grant applications, development review, and a public guide to Lebanon's facilities.

CHAPTER 1: SUMMARY OF EXISTING DATA

The Project Team collected readily available multi-modal transportation data for the City of Lebanon. This data came from local, regional, and statewide resources. Data topics included vehicular traffic, pedestrian and bicyclist traffic, crashes, transit ridership, surveys, and public outreach. This data was used to inform the development of the Plan and to inform additional data collection and analysis efforts needed for the development of the Plan. The Project Advisory Committee assisted in reviewing the data summary and assessing gaps and needs for data collection.

CHAPTER 2: SUMMARY OF EXISTING PLANS AND STUDIES

The Project Team reviewed over 30 documents that contained an element of multi-modal transportation planning relating to the City of Lebanon. Sources included neighborhood, local, regional, and statewide plans. The purpose of reviewing previous studies and plans was to 1) evaluate the City's current progress toward multi-modal transportation; 2) ensure that

¹ Economic & Labor Market Information Bureau, NH Employment Security, 2021. Community Response Received 5/27/22.

<https://www.nhes.nh.gov/elmi/products/cp/profiles-htm/lebanon.htm>

² U.S. Department of Transportation, Bureau of Transportation Statistics, Trips by Distance, <https://www.bts.gov/daily-travel>

previously studied needs are reflected in this PLAN; and 3) help identify multi-modal transportation needs and opportunities that need further planning and study.

CHAPTER 3: PEDESTRIAN, BICYCLE, AND TRANSIT NETWORK ANALYSIS

The Project Team verified key data/metrics deemed critical for the assessment of existing and planned pedestrian, bicycle, and transit conditions in Lebanon. Then, team evaluated associated conditions and synthesized results to create a baseline analysis (text and data) and graphics (e.g., map). The objective was to create a needs assessment that identified locations for facility and programmatic improvements. The analysis included primary network gaps, barriers, and opportunities, with an emphasis on pedestrian and bicyclist improvements for key destinations.

CHAPTER 4: PUBLIC ENGAGEMENT AND COMMUNITY OUTREACH

To inform the development of the *Walk Bike Ride Leb* plan, the Project Team conducted a series of public engagement efforts. The goal of the public engagement effort was to invite residents into the planning process by bringing the planning to them. The Project Team utilized existing communication channels in the City and hosted a mix of **in-person and virtual events using creative public involvement strategies and tools**. As a result of the public engagement and stakeholder meetings, an inventory of existing infrastructure, identified gaps, and desired multi-modal network was created and displayed on a network map using ArcGIS. The suggested improvements and identified network gaps went through a series of criteria to determine the feasibility and true need of the project in order to prioritize improvements. Criteria included the analyses mentioned above: walkability, bicycle level of stress, supporting commuting data and key destinations, existing plans and studies support, steep slopes, and traffic volumes. Geographic Information Systems (GIS) was used to overlay analyses on top of the suggested improvements and network gaps to assist in determining if the project was feasible based on those criteria. The network map can be found [here](#). On top of this effort, the public survey for this project revealed incredible results. Based on the survey, **more than 80% of community members think that Lebanon should invest more city funds into pedestrian and bicycle infrastructure**. When asked what keeps them from walking and biking, community members listed issues with road safety among their top concerns, including busy road crossings and traffic speeds. Community members with an accessibility challenge said snow/ice on sidewalks along with sidewalk/road in poor condition were key issues. These insights will directly support the implementation of the *Walk Bike Ride Leb* plan.

CHAPTER 5: PROJECT DEVELOPMENT SUMMARY

The Project Advisory Committee (PAC) engaged first in a work session to catalog known infrastructure improvements, projects, and locations. The work session resulted in a list of identified projects that could improve the multimodal network when implemented. The WBRL project list was further refined and expanded, with many key projects confirmed for local support, via the project team's interview of various stakeholders and a public survey. The PAC then engaged in a second work session to evaluate community feedback, incorporate new projects, and identify and rank top-priority projects to be implemented based on project readiness and community need. Projects were ranked into "tier" and "priority" categories.

CHAPTER 6: IMPLEMENTATION AND RELATED KEY STRATEGIES

The Project Team developed supporting strategies based on findings revealed in prior tasks for the improvement of bicyclist and pedestrian safety and connectivity in Lebanon. While the prior tasks focused on corridor gaps and infrastructure improvements, these strategies require complementary "soft interventions" to ensure the success of Lebanon's Complete Streets Policy implementation. These key strategies include education/engagement, infrastructure design, operations, pilot programs, regulations, and safety. Each strategy has an overarching goal with associated activities. The goals included 1) Increase usership of bicycle and pedestrian facilities by utilizing education strategies to increase awareness among community members; 2) Incorporate design principles that promote sustainability, safety, and smart-growth concepts in infrastructure; 3) Strengthen bicycle and pedestrian programs through updating municipal procedures and daily activities; 4) Test novel bike/ped projects to maximize limited resources and generate public enthusiasm; 5) Reduce regulatory barriers and promote policies that further the adoption of bike/ped projects; and 6) Proactively combat safety issues for all biked/ped users and strive towards eliminating all bike/ped accidents. The Project Team created a "living" document (excel spreadsheet) with recommended activities to meet these goals.



OVERVIEW:

This document provides a summary of readily available multi-modal transportation data for the City of Lebanon, NH. This data will be used 1) for the development of the *Walk, Bike, Ride, Leb* plan, 2) to inform additional data collection and analysis efforts needed for the implementation of the *Walk, Bike, Ride, Leb* plan, and 3) serve as a support for the pursuit of funding for projects.

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PREPARED BY:

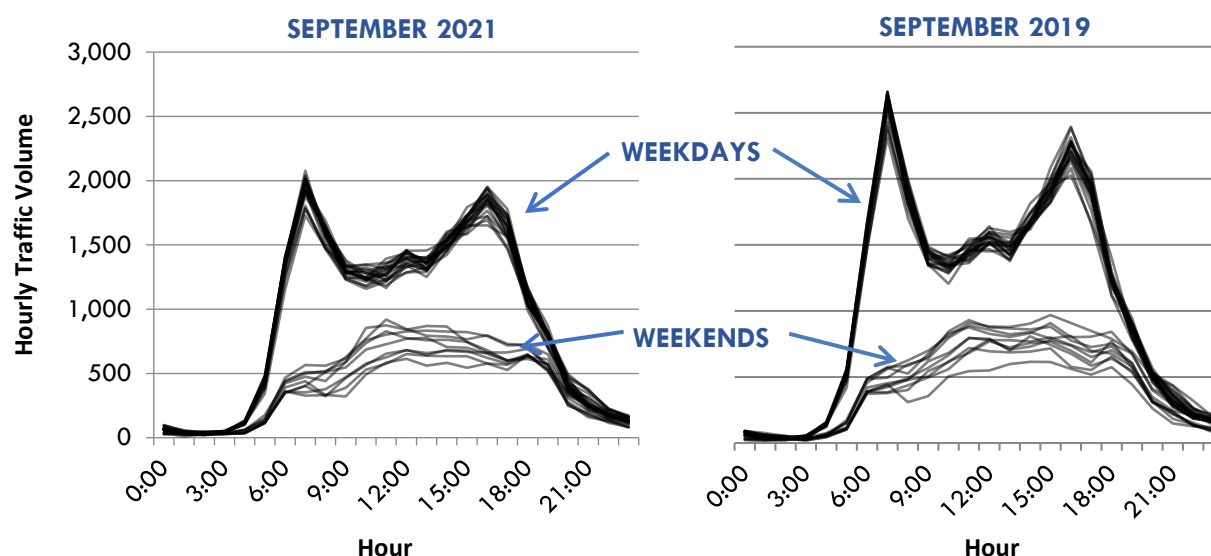


VEHICULAR TRAFFIC DATA:

Due to the COVID-19 pandemic, uncertainty exists around present and future traffic volumes. Traffic volume data were collected in 2020 for some locations by UVLSRPC; however, there were significant fluctuations in the data depending on 1) where it was collected, and 2) when in 2020 the count was performed. For consistency's sake, pre-COVID-19 data (2019 and earlier) is presented in the table below.

Data from the continuous traffic monitoring station on NH Route 120 south of Lahaye Drive indicates that, as October 2021, weekday traffic volumes are down approximately 15% compared to October 2019. This continued dip in traffic volumes is likely influenced by remote work policies at DHMC, Dartmouth College, and other major employers in the NH Route 120 corridor, and may not apply equally to other count locations in the City.

HOURLY TRAFFIC VOLUME – NH ROUTE 120 SOUTH OF LAHAYE DRIVE:



EXISTING TRAFFIC VOLUME DATA:

ROAD / ROUTE	LOCATION DESCRIPTION	AADT*	YEAR
Bank St Ext	Bank St Extension at Mascoma River	3,200	2018
Daisy Hill Rd	Daisy Hill Rd West of NH 120	630	2018
Glen Rd	Glen Rd Under State of NH Railroad Active Trail	3,600	2018
Great Brook Rd	Great Brook Rd South of Cross Rd	140	2018
Mascoma St	Mascoma St over I-89	1,500	2017
Mascoma St	Mascoma St West of Granite St	3,100	2015
Mt Support Rd	Mt Support Rd N of Dartmouth Ave	3,600	2018
NH 10	NH 10 (No. Main St) South of Lakeview Dr at Wilder Dam	6,400	2017
NH 120	NH 120 South of Lahaye Dr	20,100	2019
NH 120	NH 120 (Meriden Rd) South of Messenger St	3,500	2018
NH 120	NH 120 (Mt. Support Rd) at Hanover TL	11,900	2018
NH 120	NH 120 (Hanover St) South of Taylor St	5,900	2017
NH 120	NH 120 South of Heater Rd	25,400	2016
NH 120	NH 120 West of I-89 Exit 18	10,800	2016
NH 12A	NH 12A (So. Main St) South of Glen Rd	13,400	2016

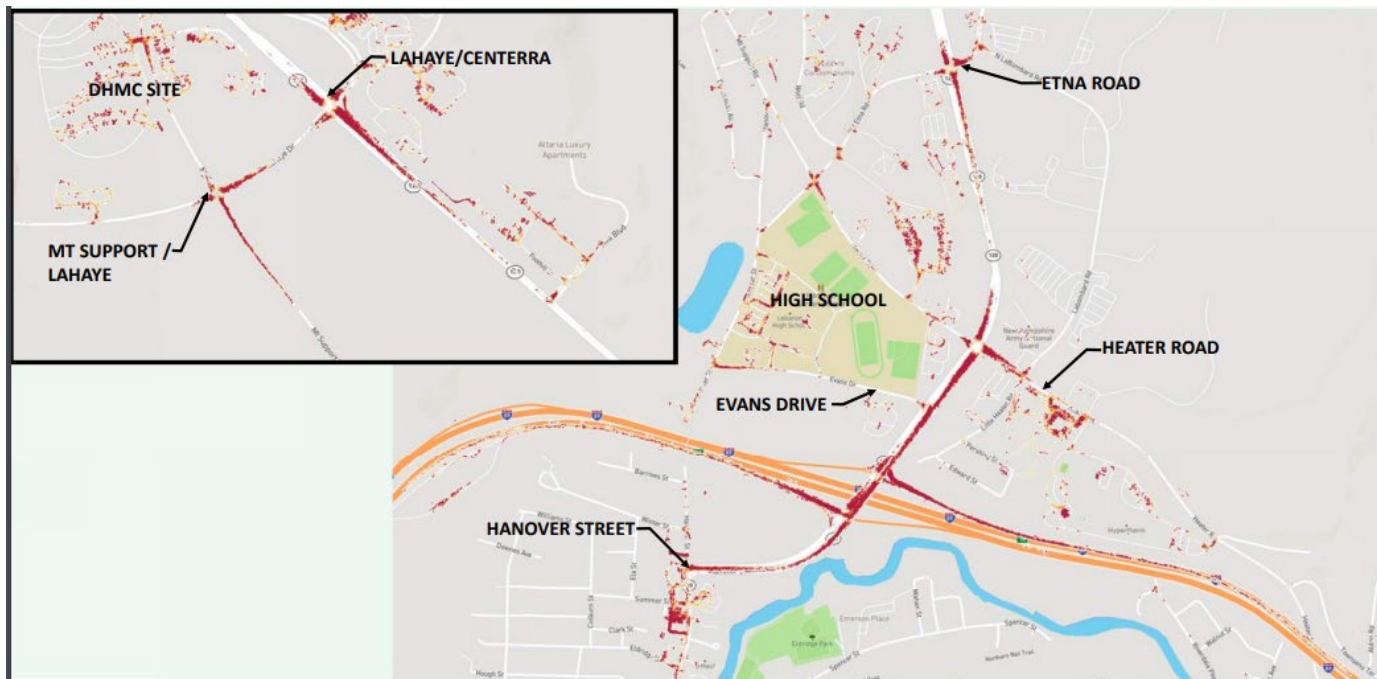
*AADT = Annual Average Daily Traffic. Traffic data from 2020 are not reported due to COVID-19 impacts.

ROAD / ROUTE	LOCATION DESCRIPTION	AADT*	YEAR
NH 12A	NH 12A (So. Main St) at State of NH Railroad	8,200	2017
Payne Rd	Payne Rd over Mascoma River	170	2019
Poverty Ln	Poverty Ln over I-89	1,200	2019
Riverside Dr	Riverside Dr at Mascoma River South of Hardy Hill Rd	1,700	2018
Slayton Hill Rd	Slayton Hill Rd over Mascoma River	1,100	2015
Spring St	Spring St over Great Brook	454	2016
Trues Brook Rd	Trues Brook Rd East of Derby Ln	1,130	2018
US 4	US 4/NH 10 (Mechanic St) West of Poverty Lane	13,900	2019
US 4	US 4 West of I-89 at Exit 17	5,000	2017
US 4	US 4 (Bridge St) at Vermont SL	12,100	2017
US 4	US 4 at Lebanon TL	10,000	2017
US 4	US 4/NH 10 (Seminary Hill Rd) South of Johnson Ave	8,100	2017
US 4	US 4 (Mechanic St) West of Blacksmith St	10,100	2017
US 4	US 4 (Mechanic St) East of Foundry St	9,500	2016
US 4	US 4 (Bank St) West of Elm St	4,600	2019
US 4	US 4 (Mechanic St) East of Buckingham Place	14,000	2016
US 4	US 4/NH 10 (So. Main St) North of Tracy St	14,500	2018
US 4	US 4 East of Stoney Brook Rd	13,600	2019
US 4 / NH 120	US 4/NH 120 (So. Park St) West of School St	8,200	2017

*AADT = Annual Average Daily Traffic. Traffic data from 2020 are not reported due to COVID-19 impacts.

NH ROUTE 120 CORRIDOR - VEHICLE DELAY:

Red dots = vehicle stopped traveling very slowly

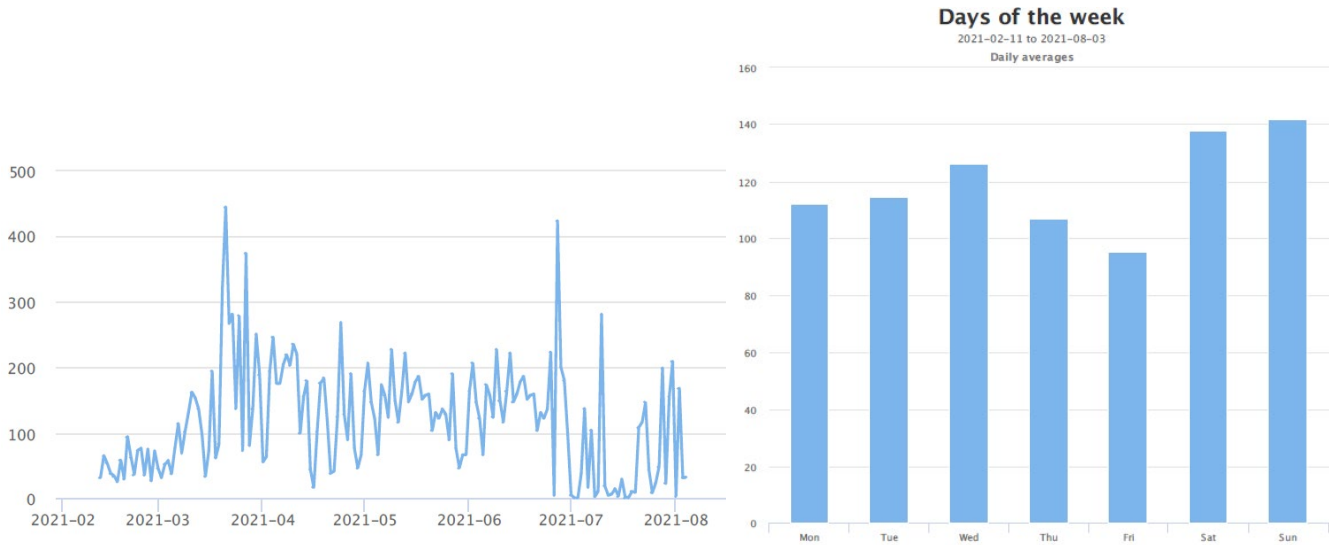


Source: <https://www.nh.gov/dot/projects/lebanon29612/documents/29612-pre-pac3-06032021.pdf>

PEDESTRIAN & BICYCLIST TRAFFIC DATA:

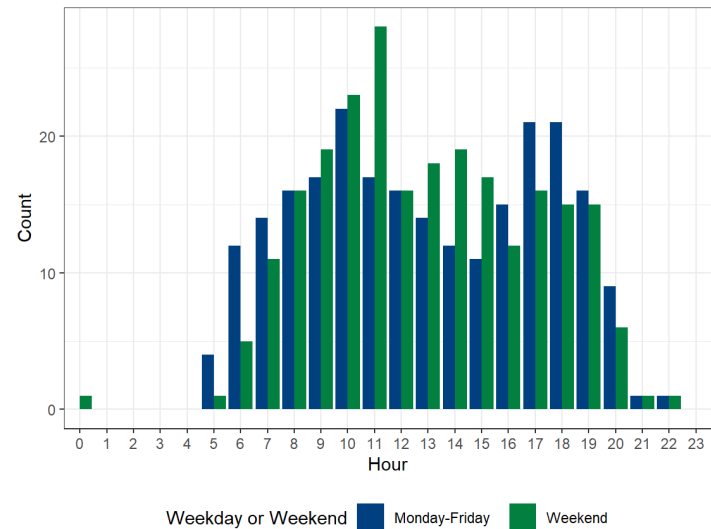
MASCOMA RIVER GREENWAY (BEHIND MIRACLE MILE):

Total Daily Users, February 2021 – August 2021

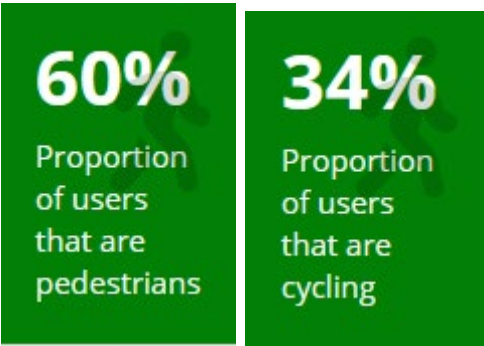


Data courtesy Upper Valley Trails Alliance

Mascoma River Greenway – Hourly Trail Users, July – August 2021



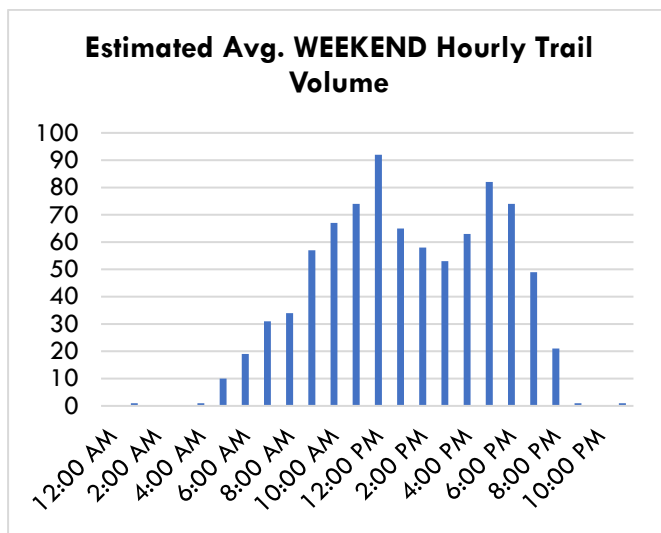
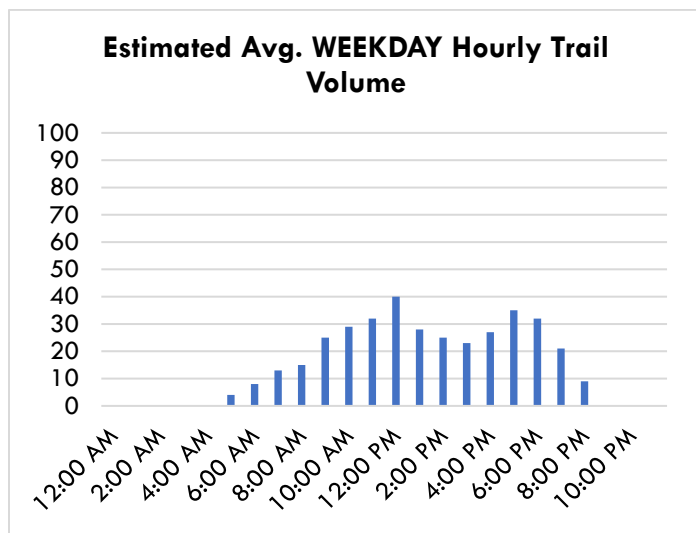
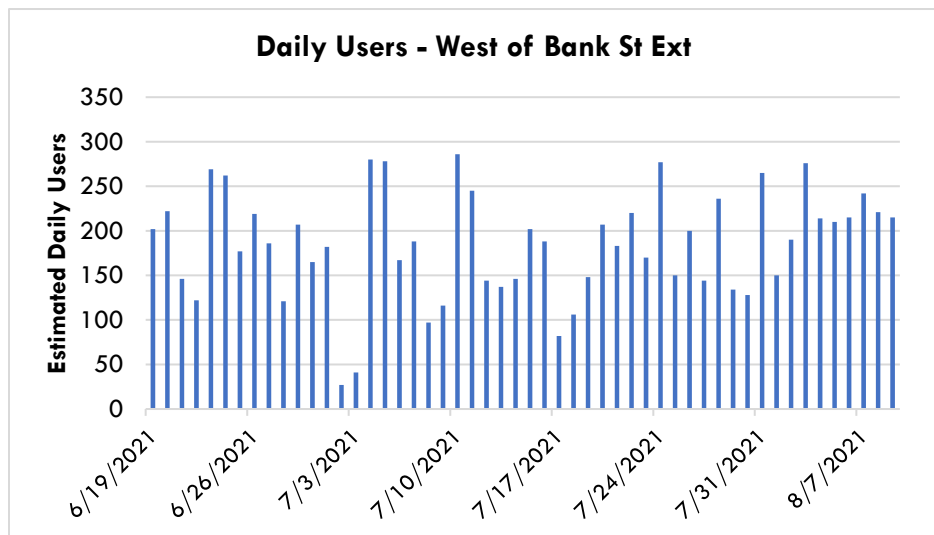
Mascoma River Greenway - Mode of Travel, August 2020



Source: 2020 Mascoma River Greenway Survey & Count Results - https://abelenz.github.io/MascomaGreenway/MRG_Survey_And_Count_Results.html#counts

NORTHERN RAIL TRAIL:

Trail use estimates performed by UVLSRPC using TRAFx infrared trail counter, June 2021 – August 2021



Daily Users: Estimated number of unique individuals using the trail each day

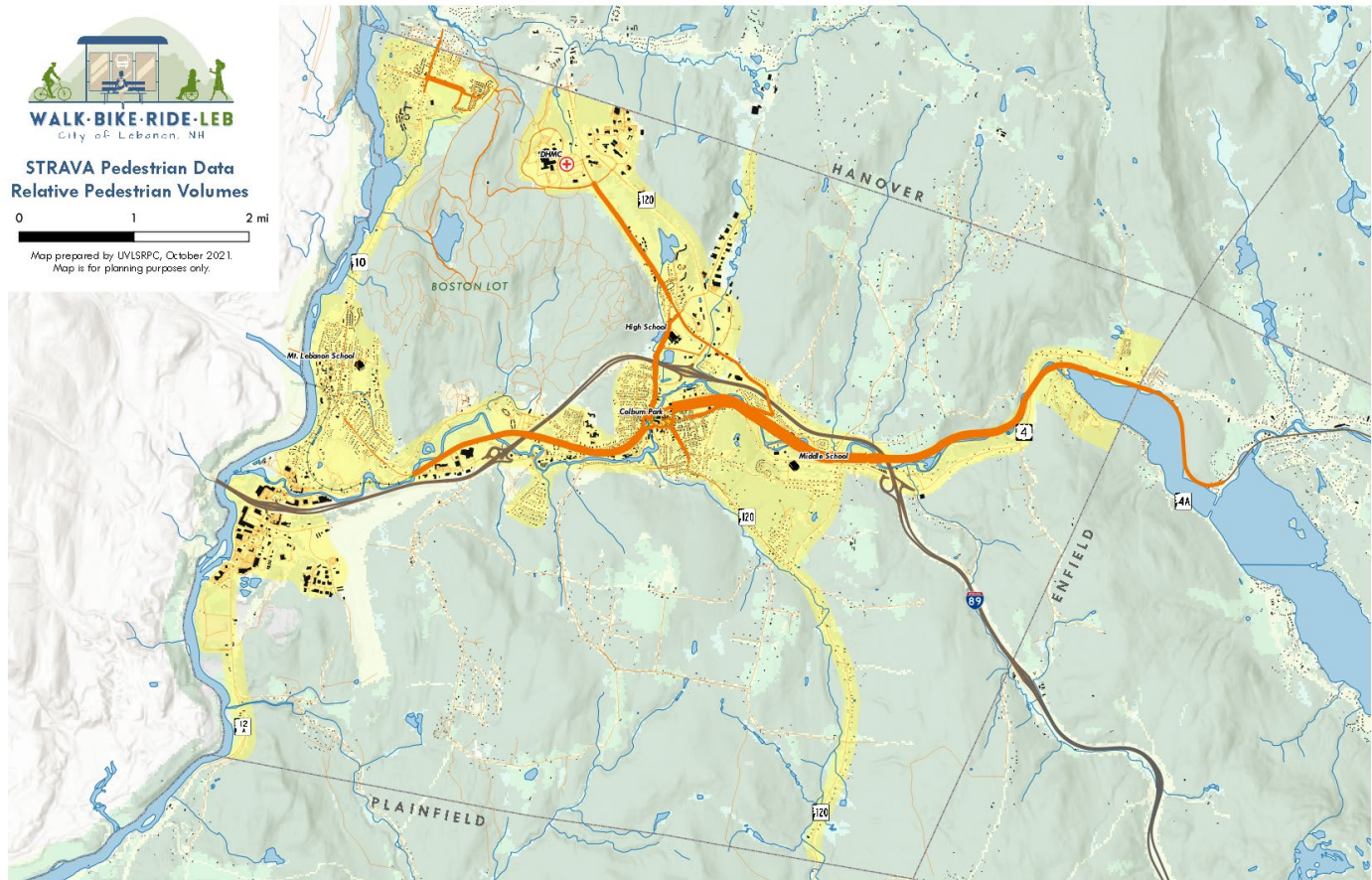
Hourly Trail Volume = Estimated usage level of the trail each hour (may include individual users multiple times)

Source: UVLSRPC

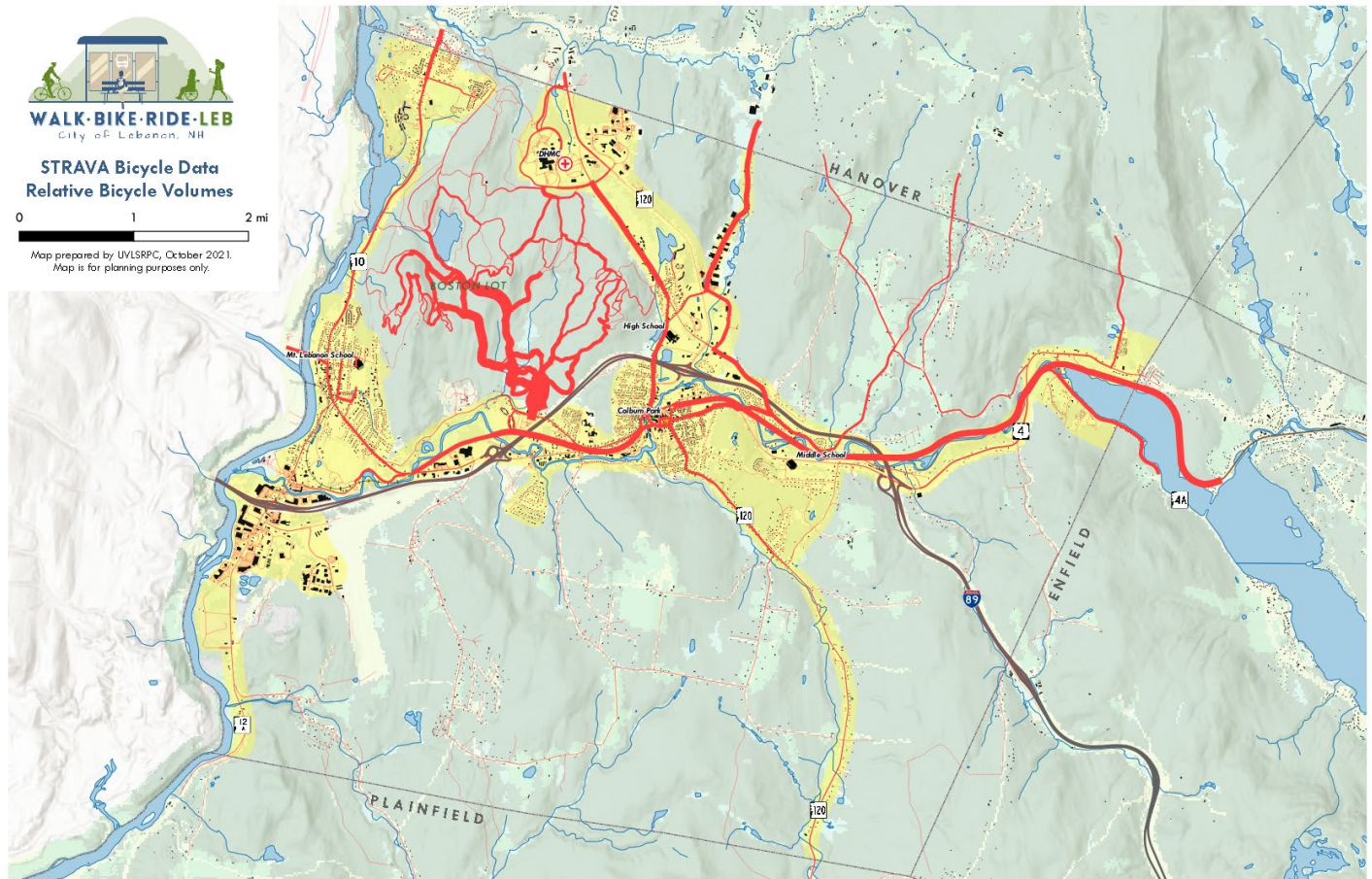
STRAVA PEDESTRIAN AND BICYCLIST DATA:

STRAVA is a popular fitness app used by many to track activities such as walking, bicycling, and running. STRAVA has developed the Metro dataset, which runs STRAVA user data through a model to predict the **relative** amount of pedestrian and bicyclist traffic in a given area. More information: <https://metro.strava.com/faq>

Relative Pedestrian Traffic Volume:



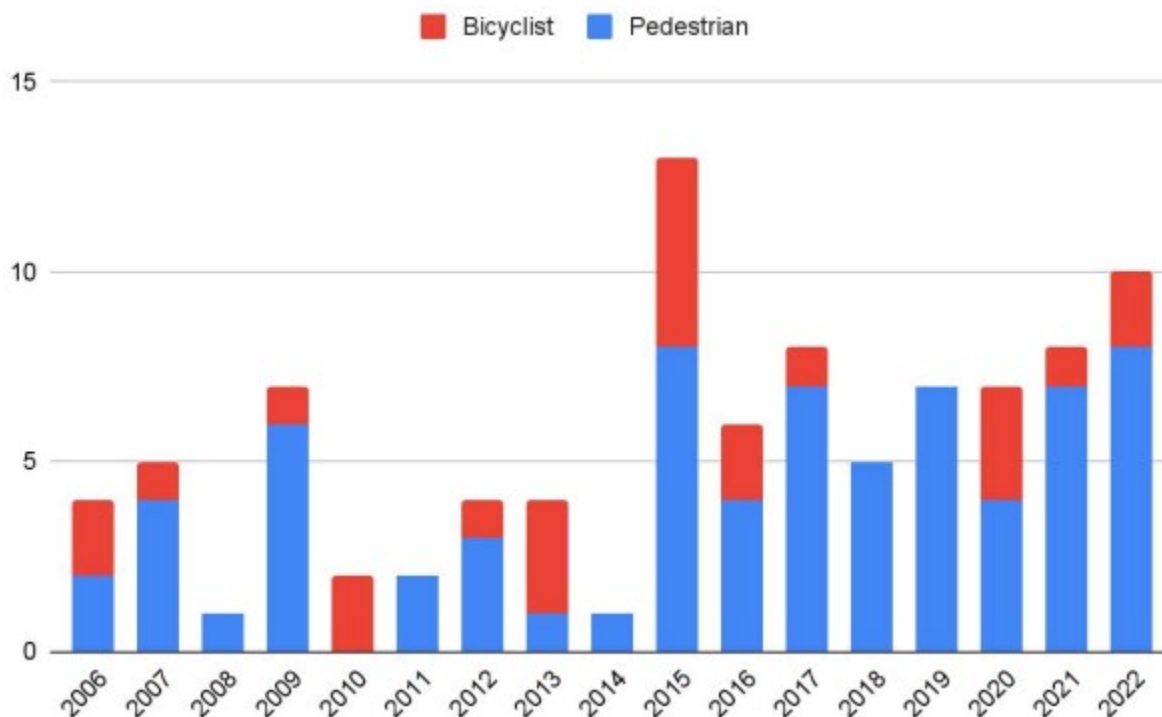
Relative Bicyclist Traffic Volume:



CRASH DATA:

Aggregated pedestrian and bicyclist crash data has been collected and summarized by Haynes Bunn of the City Pedestrian and Bicyclist Advisory Committee from 2006 – 2022 here: <https://lebanonnh.gov/1246/Safety-and-Skills>. The increasing number of crashes involving pedestrians in recent years is consistent with [national trends](#).

Crashes involving pedestrians and bicyclists, by Year, Lebanon NH, 2006-2022* (n=94 crashes)

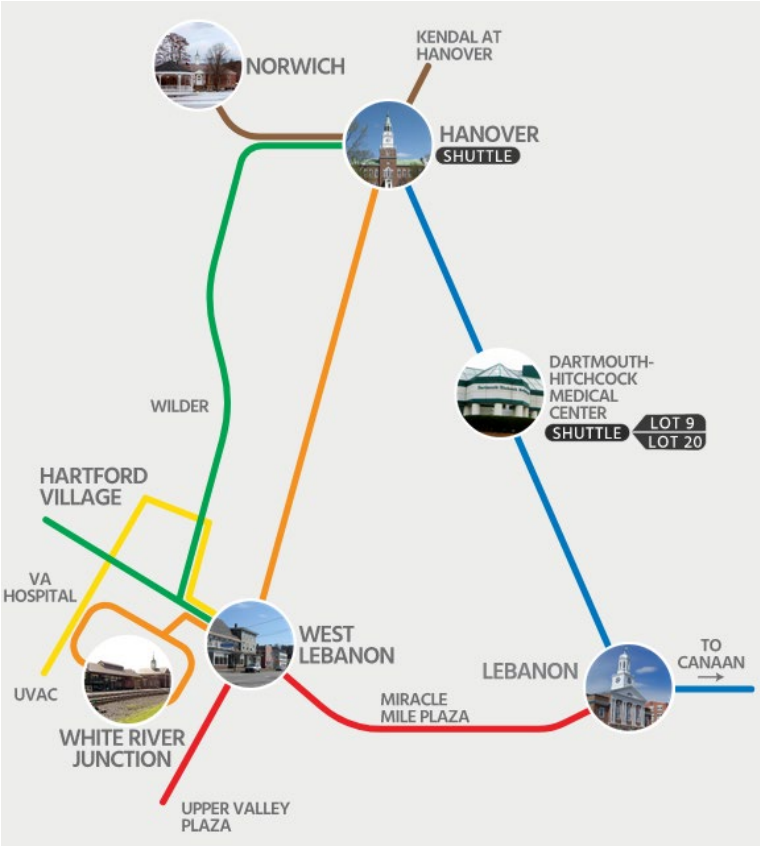


*Includes LFD EMS data: Pedestrian-involved crashes in 2015, 2016, and 2019. Source: Leb. Police Dept. data & Leb. Fire Dept. EMS data provided to LPBAC through Leb. Planning Office

An additional analysis performed in 2018 discusses high-crash locations within the City, identifying parking lots and crosswalks as the most frequent locations for crashes involving pedestrians:

<https://lebanonnh.gov/DocumentCenter/View/8405/LPBAC-Crash-Data-Analysis->

TRANSIT RIDERSHIP DATA:



Ridership for Advance Transit fixed-route bus service is reported in the [2023 Transit Development Plan Interim Report](#).

Figure 2.2 Six-Year Ridership Trend by Route

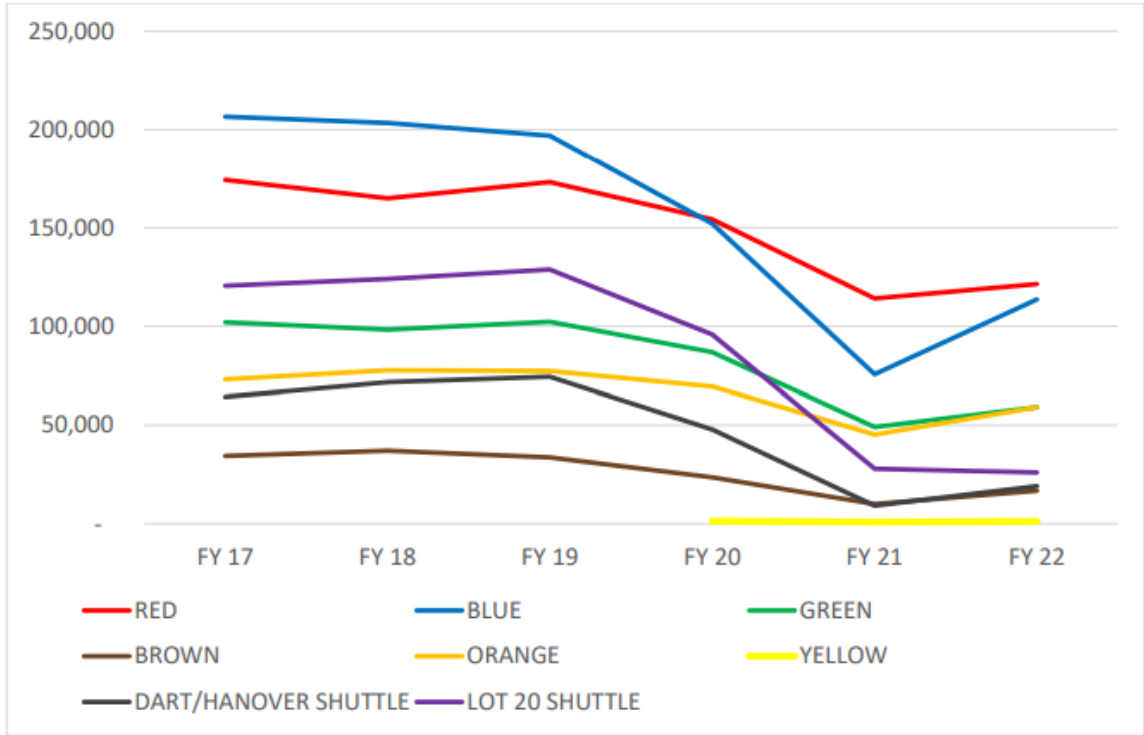


Table 2.1 Advance Transit Performance, Feb-Mar-Apr 2022

	Total Rides	Daily Rides	Rides per Hour	Rides per Round Trip
Blue	30,630	479	11.6	10.0
Brown	4,353	68	5.9	4.0
Green	13,545	212	8.6	8.1
Orange	15,080	236	15.3	11.8
Red	29,246	457	20.5	19.9
Yellow	271	4	1.4	0.7
DH Lot 20*	8,374	190	15.9	1.3
Dartmouth/DT	5,177	81	2.9	1.4
All routes	106,676	1,726	11.0	5.1
Line routes	93,125	1,455	12.3	10.4

*The Lot 20 Shuttle did not operate in April 2022. Statistics represent February and March only.

Table 2.2 Advance Transit Performance, 2017 and 2022

FEBRUARY–APRIL 2017 AND 2022

RIDERS PER DAY

	2017	2022	Change
BLUE	871	479	-45%
GREEN	402	212	-47%
RED	654	457	-30%
BROWN	137	68	-50%
ORANGE	284	236	-17%
YELLOW	N/A	4	N/A
DARTMOUTH	332	81	-76%
DH	896	190	-79%
TOTAL	3,576	1,726	-52%
REGULAR ROUTE	2,347	1,455	-38%

Blue Route:

- During October of 2017, four Blue route bus stops accounted for 63% of passenger boardings on the route. The busiest stop was DHMC, with 25% of Blue route boardings. Since most people travel round trip, this figure suggests that travel to and from the medical center accounts for approximately 50% of Blue route usage. The bus stop at Lebanon City Hall generated 18% of Blue route boardings, while the Dartmouth Bookstore accounted for 12% of boardings and Vail/DMS generated 7%. Stops in Canaan and Enfield accounted for 1,112 boardings in October of 2017, or 6% of the Blue route total. All of these percentages are slightly lower than those in 2012, suggesting that other stops became somewhat more important during the last five years.
- Stops in downtown Hanover and on the Dartmouth College campus generated a combined total of 5,682 boardings, or 31% of the Blue route total. This suggests that about 62% of Blue route rides involve trips to or from Hanover or the college. Clearly many of the riders are traveling between Hanover/Dartmouth and DHMC.

Red Route:

- During October of 2017, three Red route bus stops accounted for 68% of passenger boardings on the route. The busiest stop was in front of Kilton Library in West Lebanon, which generated 28% of Red route boardings. Lebanon City Hall, with 25% of Red route boardings was the next busiest. Walmart accounted for 15% of boardings on this route.
- Other Route 12A plaza stops (from Glen Rd Plaza south) accounted for 14% of Red route boardings. Since most people travel round trip, these figures suggest that travel to and from the Route 12A plazas accounts for 50% or more of Red route usage (since some riders likely make multiple stops among the plazas).

Green Route:

- In October of 2017, West Lebanon accounted for 22% of Green route boardings, while stops on the Dartmouth College campus and in downtown Hanover accounted for 20% of Green route boardings. Assuming that most people ride round trip, this suggests that 84% of Green route usage involves trips to New Hampshire, with West Lebanon accounting for 44% and Hanover/ Dartmouth College accounting for 40%, although there are likely some people who ride all the way from West Lebanon to Hanover via the Green route, and they would be double counted by this method.
- The busiest stop in Vermont is the Haven, with nearly 1,000 Green route boardings in October 2017 (about 45 per day northbound and southbound combined).

Orange Route:

- In October of 2017, 27% of Orange route passengers boarded in White River Junction, 45% boarded within the town of Lebanon, and 28% boarded in Hanover. The busiest stop on the route was West Lebanon, which accounted for 24% of Orange route boardings, down from 27% in 2012. Sachem Village, which had been the fourth busiest stop at the time of the last TDP in 2012 is now the second busiest, with more than 1,100 boardings there in October 2017 (over 50 per day), in spite of the long walk from where the housing is out to the bus stop on Route 10. That figure represents 16% of total Orange line riders. The next busiest stops were the Dartmouth Bookstore with 9%, and the Coolidge Hotel/American Legion with 8%. The VA Hospital accounted for 4% of Orange route boardings.
- Downtown Hanover and the Dartmouth College campus combined to account for 24% of Orange route boardings. Assuming that everyone rides round trip, this would suggest that trips to and from Hanover/Dartmouth College account for 48% of Orange route usage.

SURVEY/PUBLIC OUTREACH DATA:

LEBANON 29612 EXIT 18/NH ROUTE 120 PROJECT SURVEY & OUTREACH (2021):

Survey and interactive map were used to collect feedback on the NH Route 120 corridor from Hanover St to Lahaye Dr. Survey and public meeting summaries are presented at <https://www.nh.gov/dot/projects/lebanon29612/>; key results are presented below. Additional survey data to be requested from consultant.

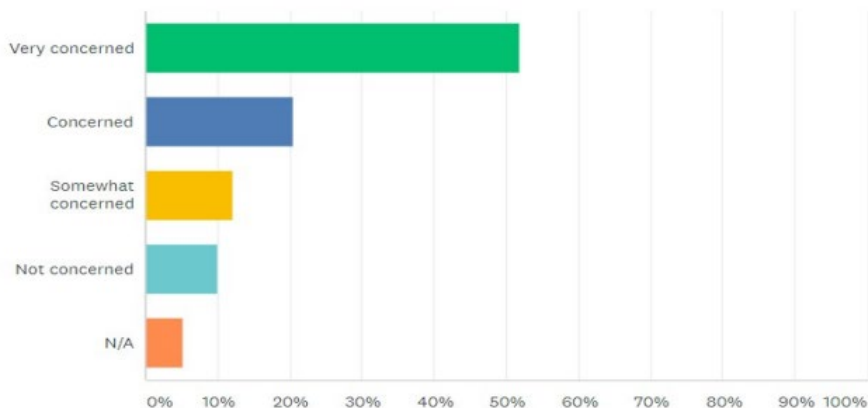
Questionnaire: Current Transportation Challenges

- Speed of traffic and number of vehicles traveling and turning in and out of the road
- Congestion and not cyclist / pedestrian friendly
- Traffic backed up on I-89 is extremely dangerous
- Bicycling between Lebanon and Hanover is treacherous; should have bike path not in roadway
- Traffic during peak hours; pedestrian safety to walk along NH 120 during weekdays

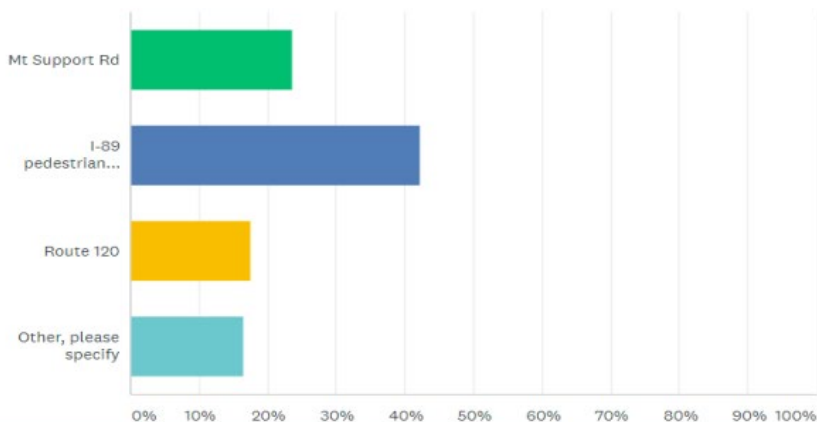
Questionnaire: Potential Improvements Suggestions

- Improve Traffic Signal coordination / management
- Improve pedestrian access to the schools and could reduce some congestion on NH 120
- Create a walking/bike trail that goes through woods on either side of NH 120, bypassing the road altogether and connecting new housing projects with commercial spaces
- Add dedicated sidewalk or bicycle path along NH 120 between Hanover and Lebanon
- Preserve and maintain trees in the area

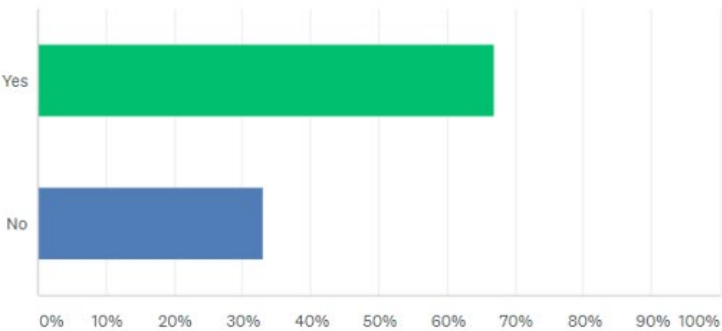
How concerned are you with walking along and/or crossing NH 120 or adjacent roadways (assume pre-COVID-19 traffic patterns)?



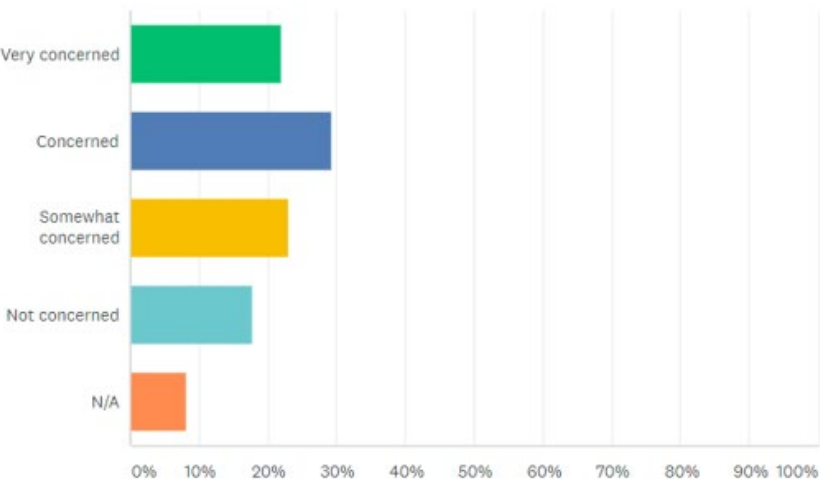
If you choose to bicycle or walk through the corridor, how do you travel from Hanover Street to points north?



If improvements are made along and/or crossing NH 120 or adjacent roadways for bicyclists and pedestrians, would this increase the amount that you use these modes of transportation in the area?

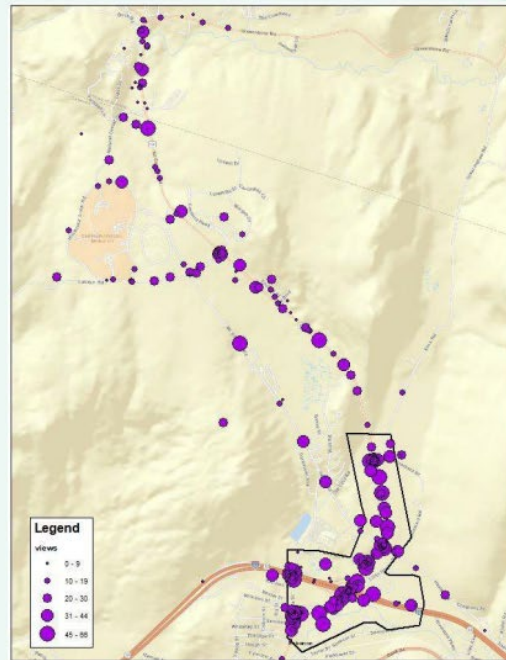
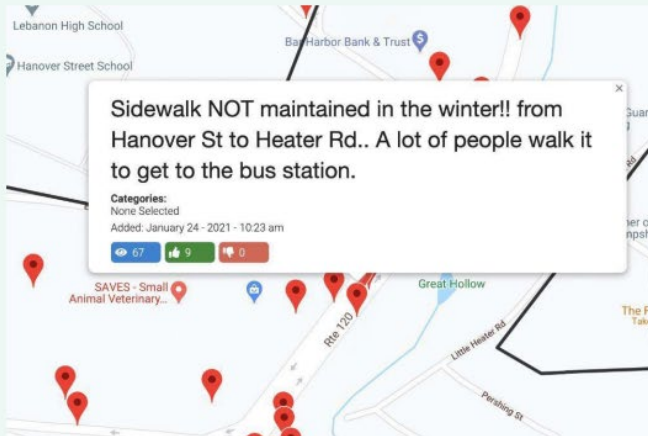


How concerned are you with transit connections between local and regional destinations and services?



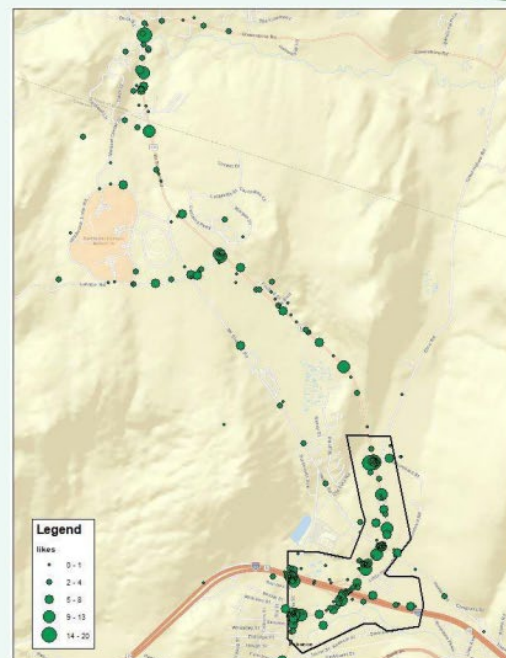
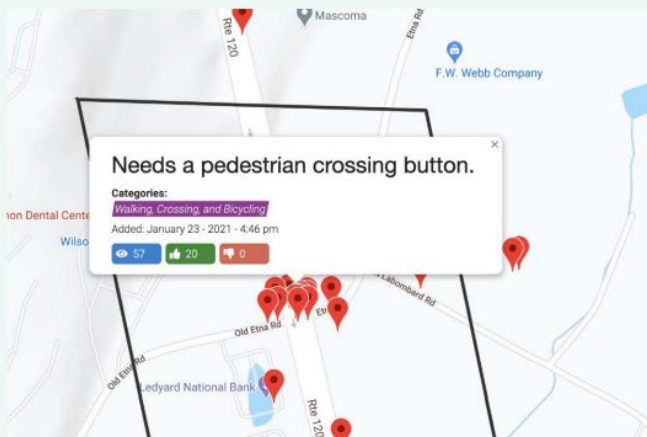
Early Website Feedback

Most viewed comment: **67** views



Early Website Feedback

- Most liked comment: **20** likes

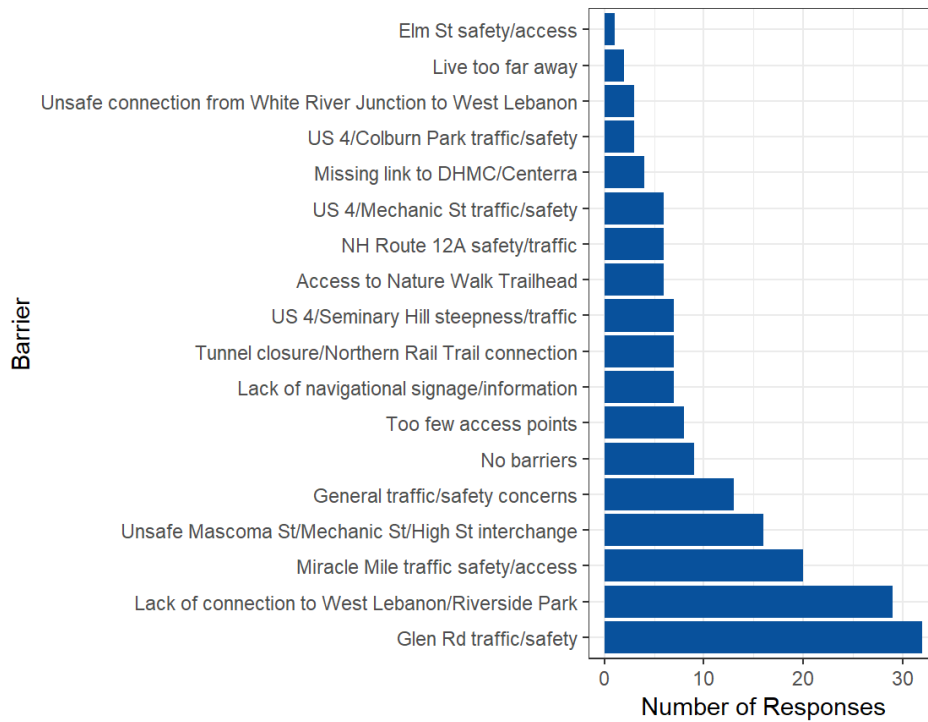


MASCOMA RIVER GREENWAY SURVEY (2020):

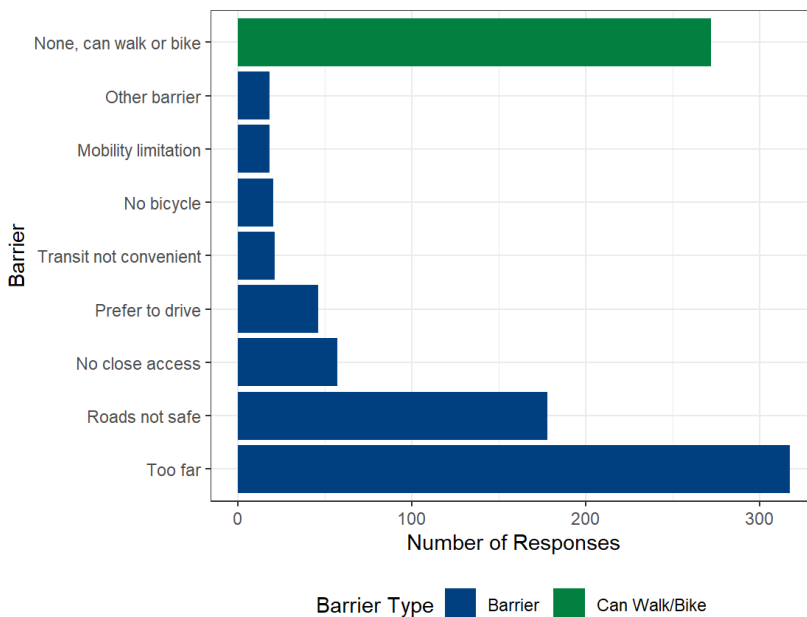
Full breakdown of survey results is presented at

https://abelenz.github.io/MascomaGreenway/MRG_Survey_And_Count_Results.html; key results are presented below:

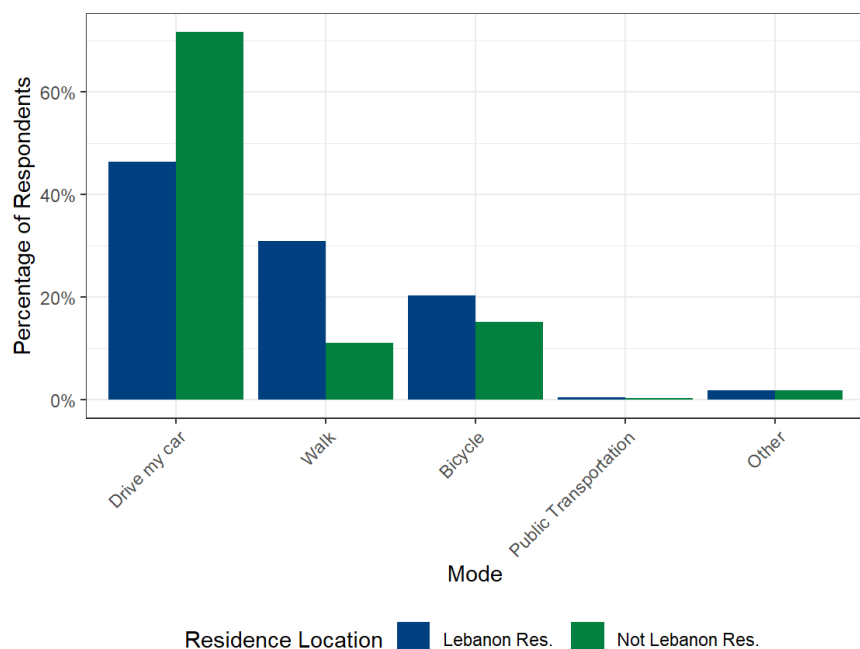
MRG Access Barriers:



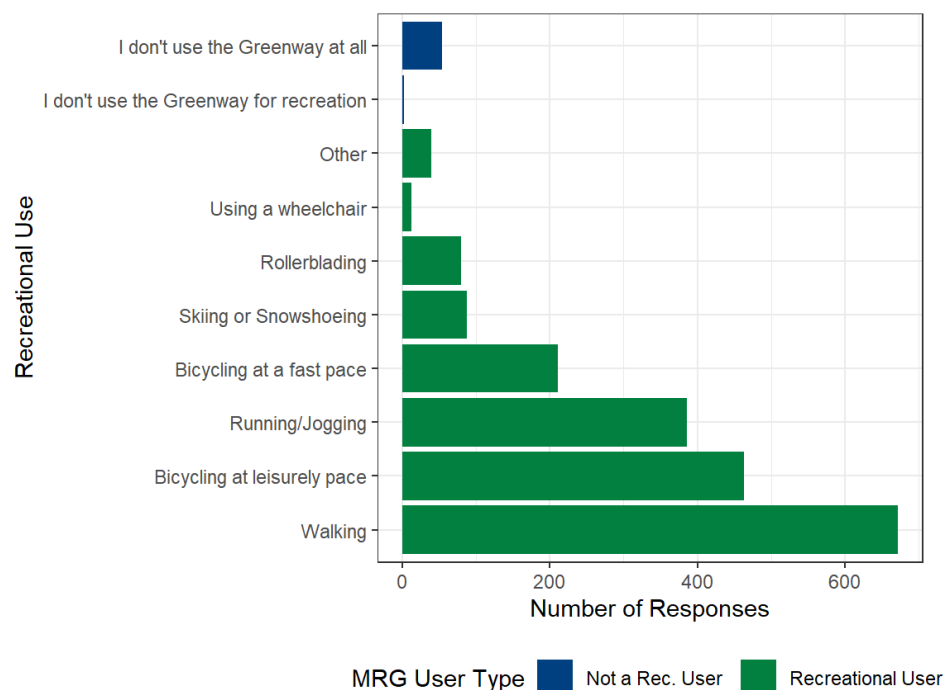
MRG Access Barriers (categorized):



Mode of Travel to Access the MRG:



Recreational Use of the MRG:



UVLSRPC REGIONAL CORRIDOR TRANSPORTATION PLAN (2020 - 2021):

Online surveys and an interactive map were used to collect data on regional transportation needs, including pedestrian, bicycle, and transit access. The full draft *Plan* with public input summaries will be posted in November 2021: <https://www.uvlsrpc.org/projects/transportation/regional-corridor-transportation-plan/>

ADVANCE TRANSIT - TRANSIT DEVELOPMENT PLAN (2018):

An on-board passenger survey of Advance Transit riders was taken in 2017. A program of targeted stakeholder outreach was undertaken as well. Detailed results are presented in the *Plan*; a summary of key results is presented below.

Table 3.7 2017 Trip Purposes by Route (including transfer routes)

	Blue	Red	Green	Orange	Brown	Total
Work	70%	48%	46%	34%	33%	53%
Shopping	4%	26%	10%	12%	4%	11%
School or college	13%	3%	15%	38%	61%	18%
Medical	7%	14%	14%	6%	0%	9%
Recreation/Social	2%	4%	8%	5%	0%	4%
Other	4%	4%	8%	4%	2%	5%

Table 3.14 Employment Status

	2008	2012	2015	2017
Full-time	66%	53%	62%	55%
Part-time	16%	22%	16%	18%
Retired	6%	6%	8%	7%
Unemployed	6%	13%	9%	14%
Other	6%	6%	6%	7%

Table 3.16 Automobile Usage

	2004	2008	2012	2015	2017
No car available	57%	47%	61%	48%	58%
Home	23%	29%	23%	28%	24%
DHMC Lot	0%	1%	3%	2%	4%
Dartmouth or Hanover lot	2%	3%	2%	2%	2%
Someone else is using it	8%	7%	5%	13%	7%
Garage for repairs	1%	1%	3%	2%	1%
Near AT bus stop	8%	10%	3%	4%	2%
Other	2%	2%	1%	1%	1%

Table 3.17 Distribution of Advance Transit Riders by Age Group

	1999	2004	2008	2012	2015	2017
Under 18	1%	8%	3%	4%	2%	5%
18-25	17%	21%	22%	26%	19%	19%
26-40	39%	24%	29%	32%	36%	37%
41-65	37%	40%	41%	30%	34%	32%
Over 65	5%	8%	5%	7%	8%	7%

Table 3.15 Employment Locations

Location	Responses	Percent
Downtown Hanover	138	31%
DHMC main campus	109	25%
West Lebanon	30	7%
White River Junction	27	6%
Route 12A Plazas	26	6%
Hanover Lyme Rd	17	4%
Downtown Lebanon	16	4%
Wilder	8	2%
Centerra	6	1%
DHMC Heater Rd	5	1%
Norwich	4	1%
Other	56	13%
	442	100%

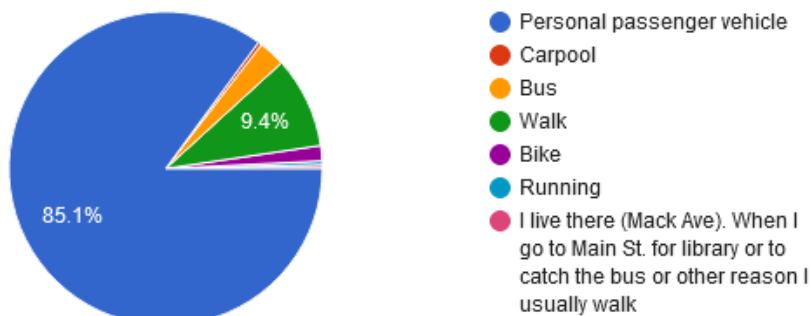
WEST LEBANON VILLAGE VISION CHARRETTE (2019):

An in-person charrette and online public survey were conducted regarding West Lebanon revitalization in 2019. Full results are available at <https://lebanonnh.gov/1324/West-Lebanon-Village-Visioning>; key survey results are summarized below:

When you visit West Lebanon Village, what mode of transportation are you most likely to use?



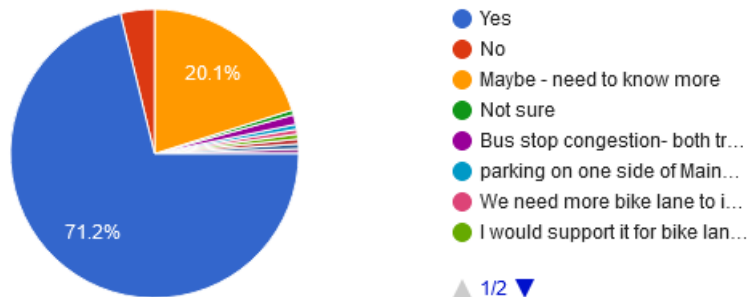
255 responses



Would you support the relocation of on-street parking from one side of Main Street to another nearby location convenient to Main Street if doing so enabled safety and streetscape improvements, such as street trees, sitting areas, wider sidewalks, and accessibility improvements?



184 responses

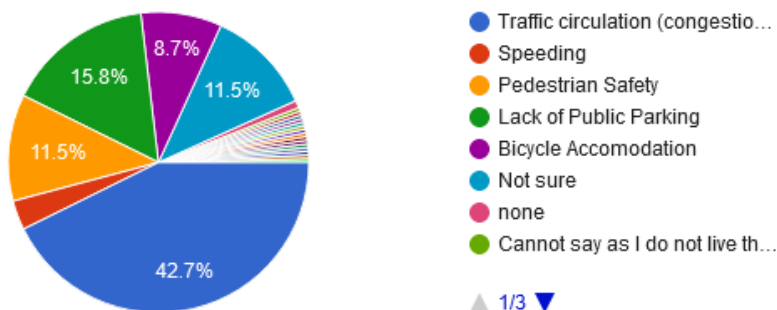


▲ 1/2 ▼

Of the following choices, what do you view as the most important mobility issue within West Lebanon Village?



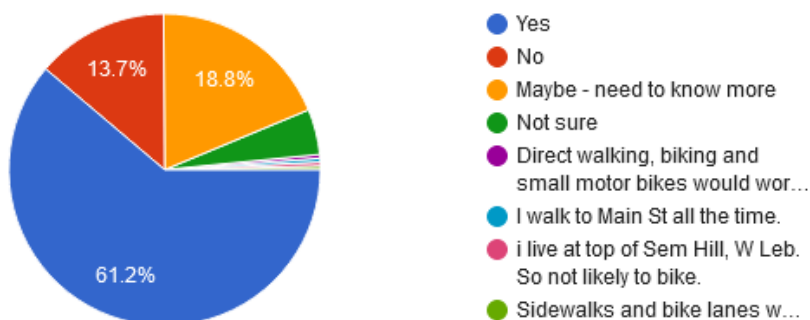
253 responses



▲ 1/3 ▼

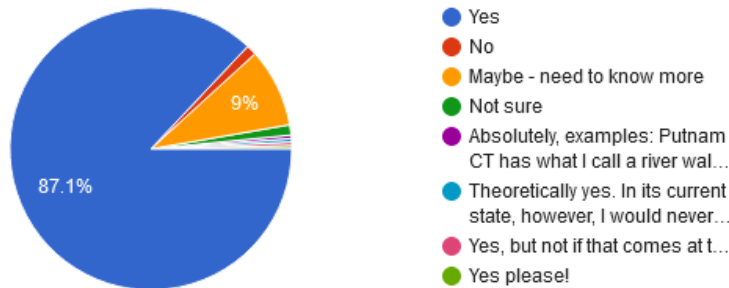
Would safer, more inviting and direct walking and biking connections between West Lebanon Village and adjacent neighborhoods make you more likely to walk or bike to West Lebanon area destinations?

255 responses



Would you support creating walks or trails along and/or across the Connecticut River, to celebrate and experience the river as a special part of West Lebanon?

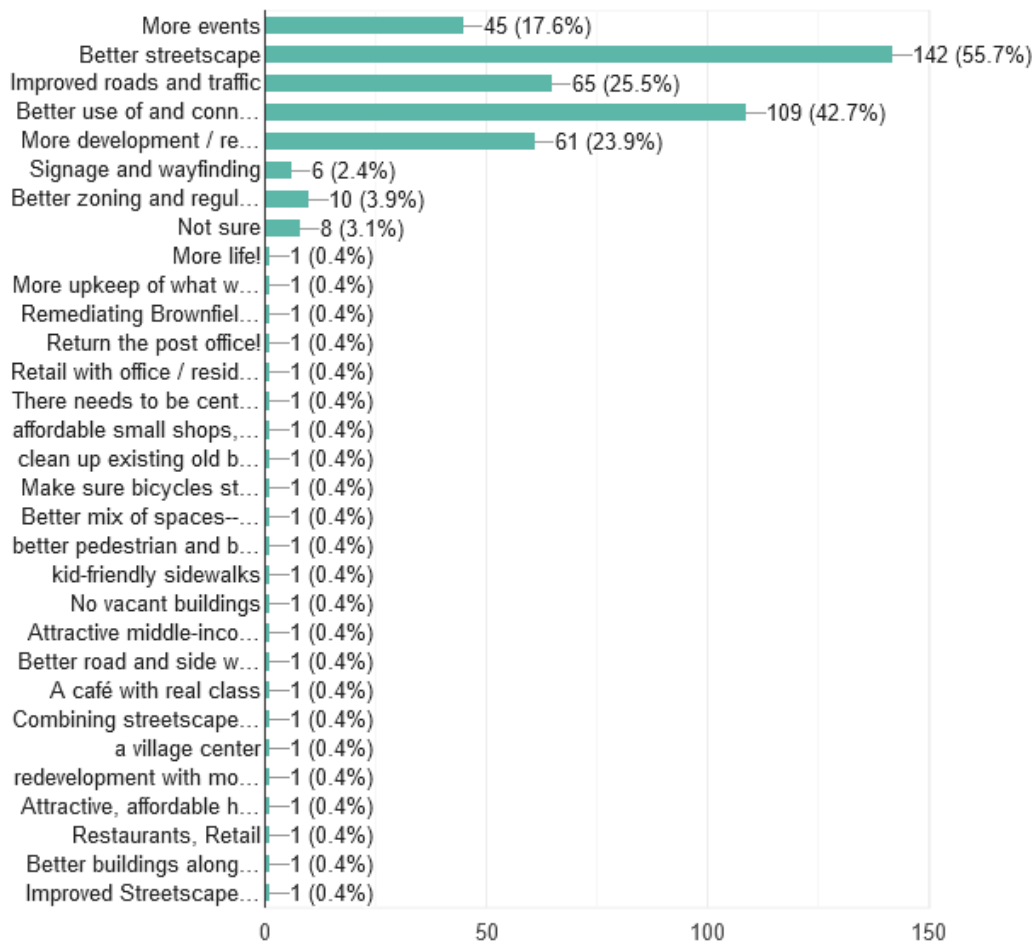
255 responses



What 2 things could make the downtown better?



255 responses



This study included public meetings, stakeholder interviews, and an online survey. The full study is available here: <https://lebanonnh.gov/DocumentCenter/View/687/Lebanon-Downtown-Vision-Plan-and-Tunnel-Assessment-Full-Report-PDF>; key results are summarized below.



Businesses

Tunnel

Blight

Friendliness

Confusion

Brightness

Greenery

Parking

Disconnected

Ped/Bike

Transportation

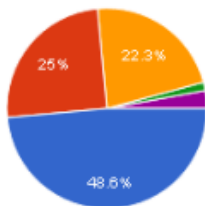
Mall

Connections

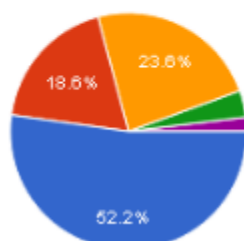
Housing

Pavement

4. Would you be willing to park 1-2 blocks away from a downtown destination (post office, restaurant, Colburn Park, etc.) if you could walk to your destination along a prominent, well-lit sidewalk, and cars had to stop at crosswalks?

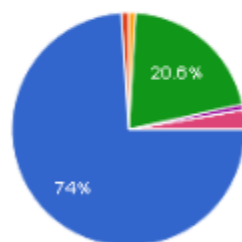
25

5. Would you tolerate more stop signs and/or traffic signals downtown if they improved safety and convenience of walking and driving?



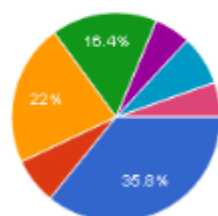
Yes	272	52.2%
No	97	18.6%
Maybe - need to know more	123	23.6%
Not sure	19	3.6%
Other	10	1.9%

6. When you visit the downtown, what mode of transportation are you most likely to take?



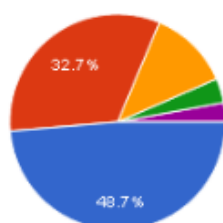
Personal passenger vehicle	385	74%
Carpool	5	1%
Bus	5	1%
Walk	107	20.6%
Bike	4	0.8%
Not sure	0	0%
Other	14	2.7%

7. Of the following choices, what do you view as the most important mobility issue within the downtown?



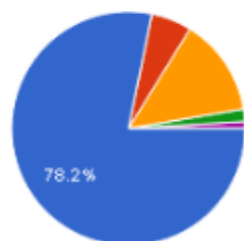
Traffic circulation (congestion, wayfinding)	186	35.8%
Speeding	37	7.1%
Pedestrian Safety	114	22%
Parking	85	16.4%
Bicycle Accomodation	29	5.6%
Not sure	40	7.7%
Other	28	5.4%

8. Would safer, more inviting and direct walking and biking connections between downtown and adjacent neighborhoods make you more likely to walk or bike to downtown area destinations?



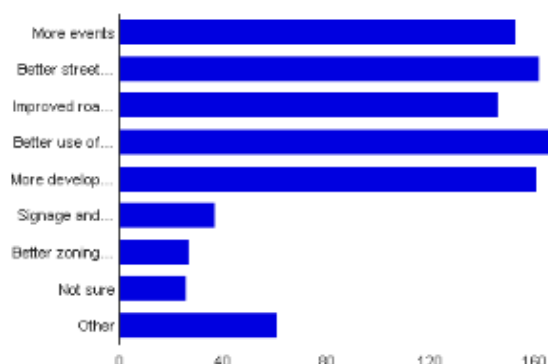
Yes	253	48.7%
No	170	32.7%
Maybe - need to know more	63	12.1%
Not sure	19	3.7%
Other	15	2.9%

9. Would you support creating walks or trails along and/or across the Mascoma River downtown, to celebrate and experience the river as a special part of Lebanon?



Yes	406	78.2%
No	29	5.6%
Maybe - need to know more	70	13.5%
Not sure	9	1.7%
Other	5	1%

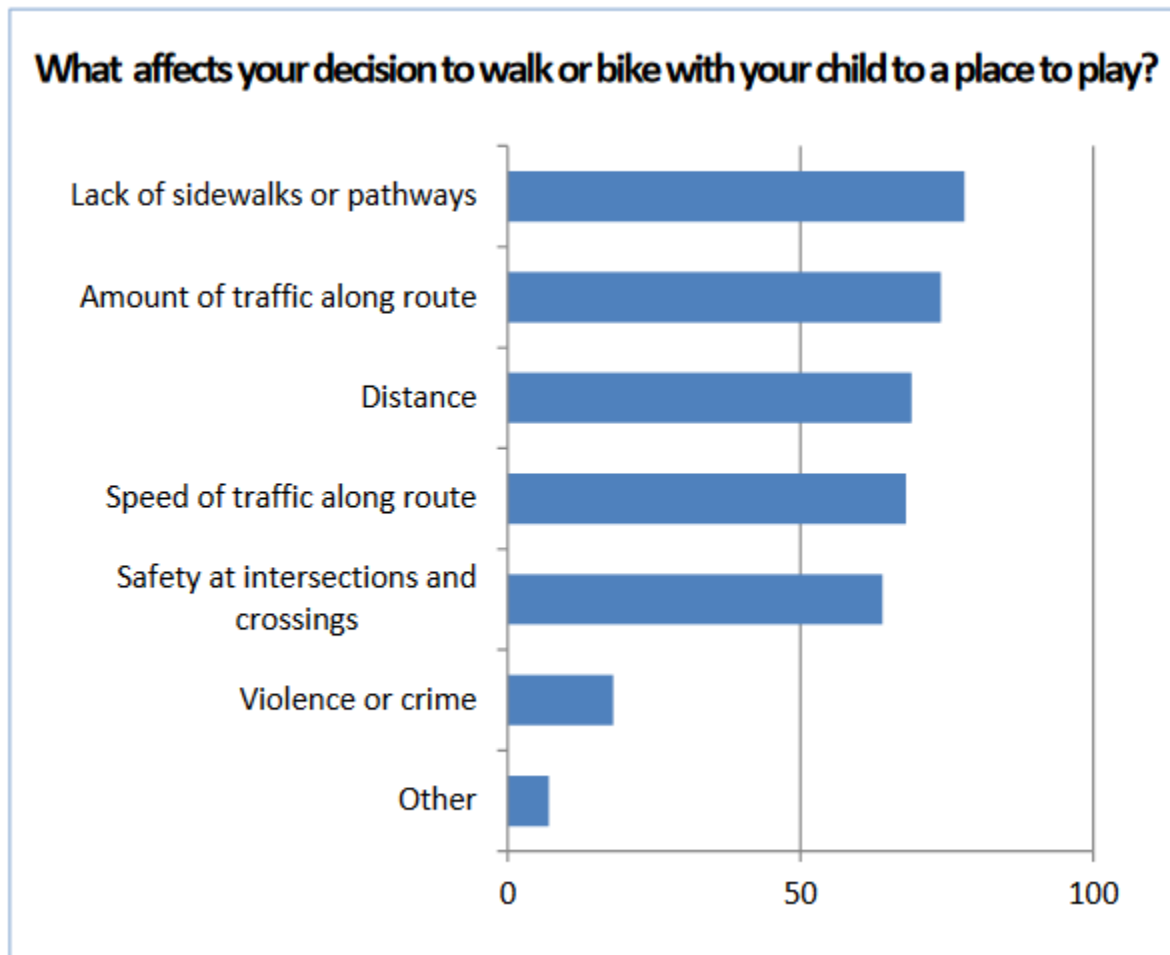
12. What TWO (2) things could make the downtown better?



More events	153	29.5%
Better streetscape	162	31.2%
Improved roads and traffic	146	28.1%
Better use of and connections to the river	169	32.6%
More development / redevelopment	161	31%
Signage and wayfinding	37	7.1%
Better zoning and regulations	27	5.2%
Not sure	26	5%
Other	61	11.8%

SAFE ROUTES TO PLAY (2014):

A parent survey was conducted as part of this planning effort. **This survey data is now over eight years old, and may not reflect current needs and preferences.** Full SRTS report is available at: <https://www.gpred.org/wp-content/uploads/2014/09/Lebanon-SRTP-CompleteFinal11182014.pdf>.



Identified Safety Concerns – Safe Routes to Play:

In addition to a general concern that users of Lebanon's roads do not know or follow the rules of the road, participants identified several intersections or sections of road that they consider especially unsafe for bicycle or pedestrian use. These include:

- The Lebanon Green (Colburn Park);
- The intersection of NH Route 10/Gould Rd/Oak Ridge Rd;
- NH Route 10 from Sachem Village to West Lebanon;
- School Street (near South and Messenger Street);
- NH Route 120 (Meriden Road) at the access to Goodwin Park;
- Mechanic Street between High Street and I-89 Exit 19;
- The intersection of Plainfield Road/NH Route 12A;
- The intersection of U.S. Route 4/NH Route 4A adjacent to Mascoma Lake.

SAFE ROUTES TO SCHOOL – SURVEY DATA (2009 - 2011):

Outreach to school parents was performed as part of Safe Routes to School planning efforts in 2009 and 2011 for all public schools in Lebanon. **This survey data is now over ten years old, and may not reflect current needs and preferences.** Full SRTS reports are available at: [https://www.uvlsrpc.org/project/Lebanon Safe Routes to School 76/](https://www.uvlsrpc.org/project/Lebanon%20Safe%20Routes%20to%20School%2076/).

Lebanon Middle School Survey Data:

Figure 3-2: Past Interest and Participation in Active Transportation

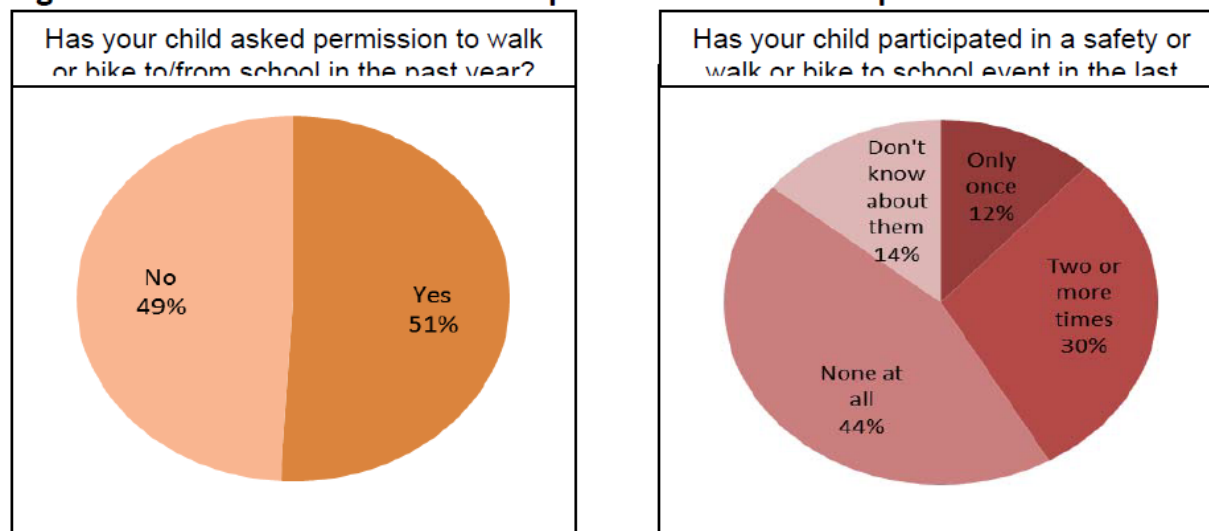


Figure 3-3: Parent Opinions about Active Transportation

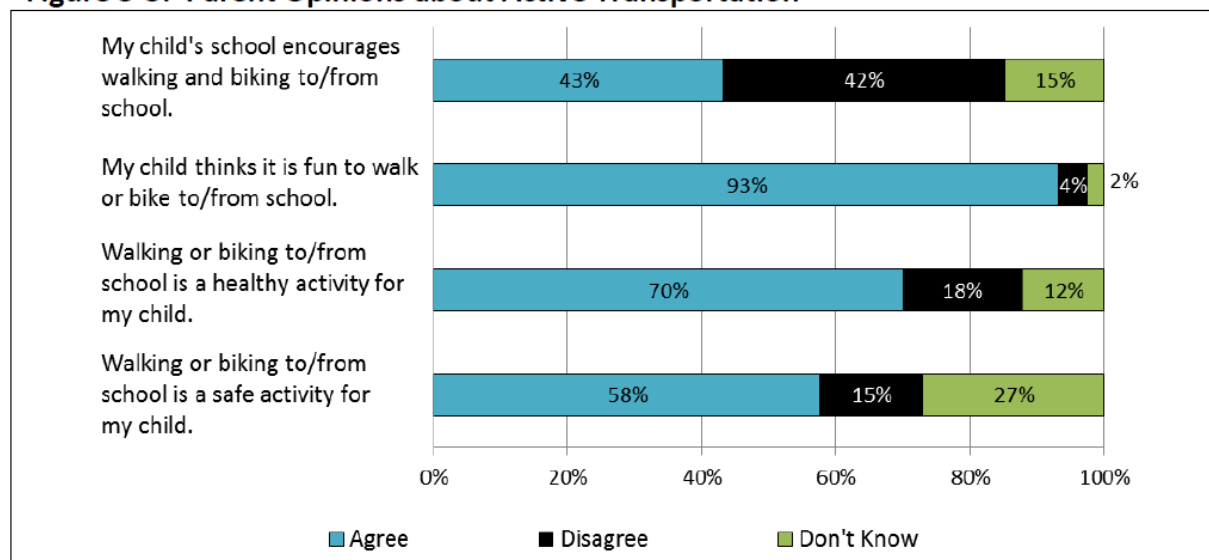


Figure 3-5: Stated Travel Choices to/from LMS

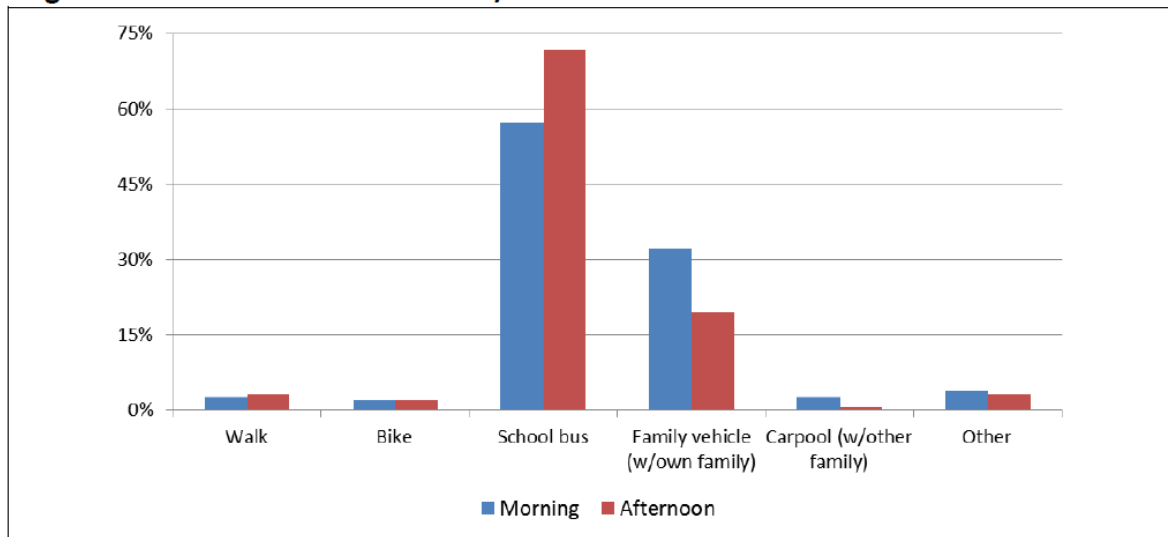
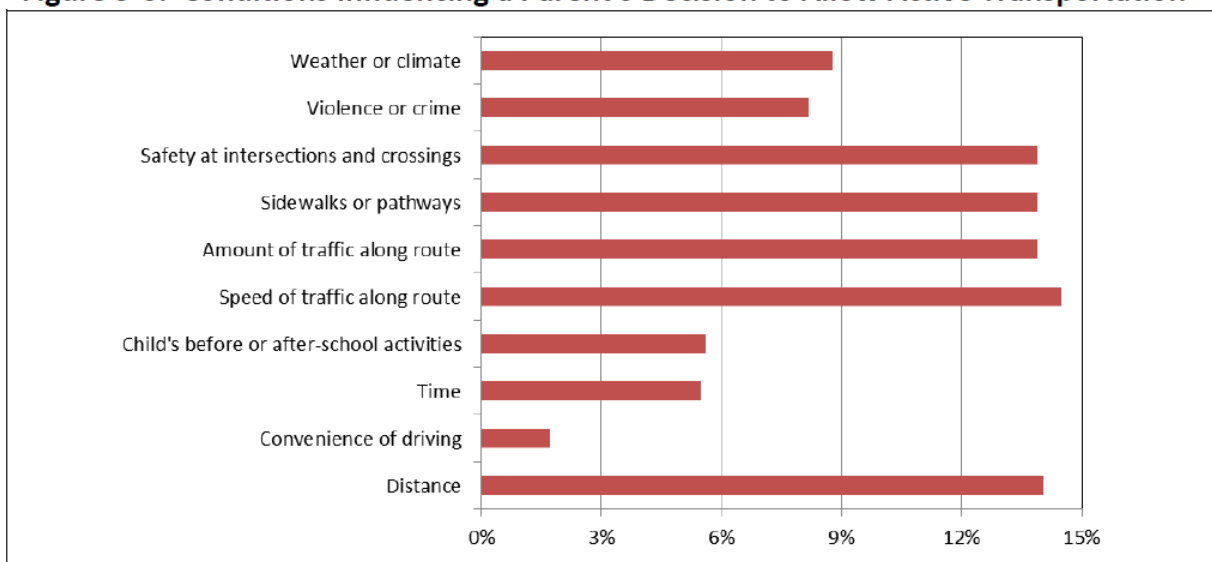


Figure 3-6: Conditions Influencing a Parent's Decision to Allow Active Transportation



Mount Lebanon Elementary School:

Figure 4-1: Number of MLES Children by Distance They Live from School

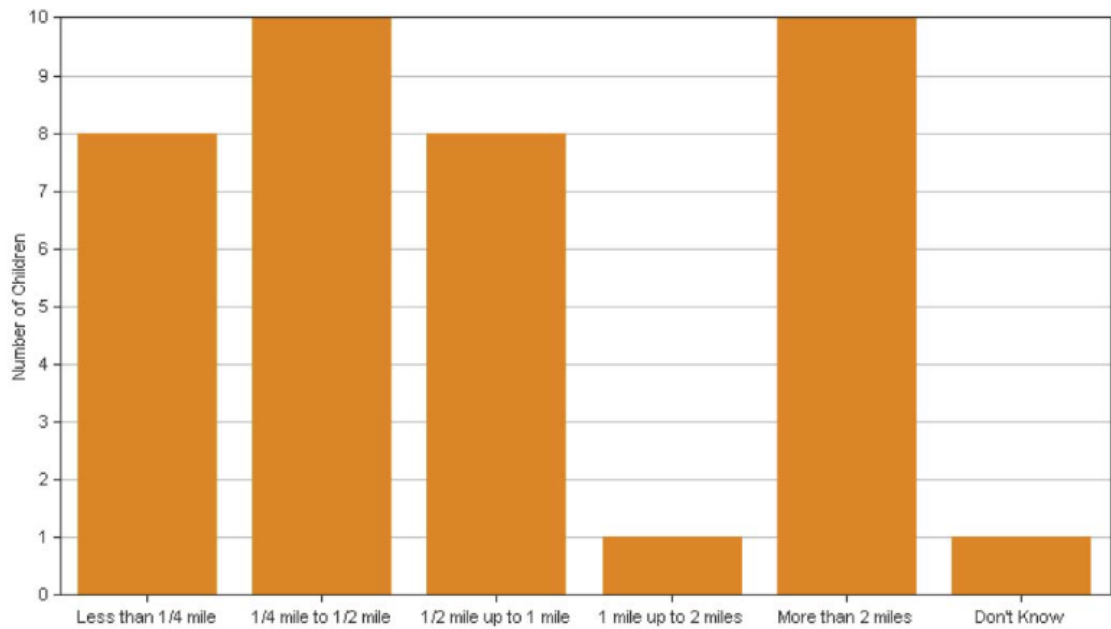


Figure 4-2: Percentage of MLES Children by Travel Mode to School

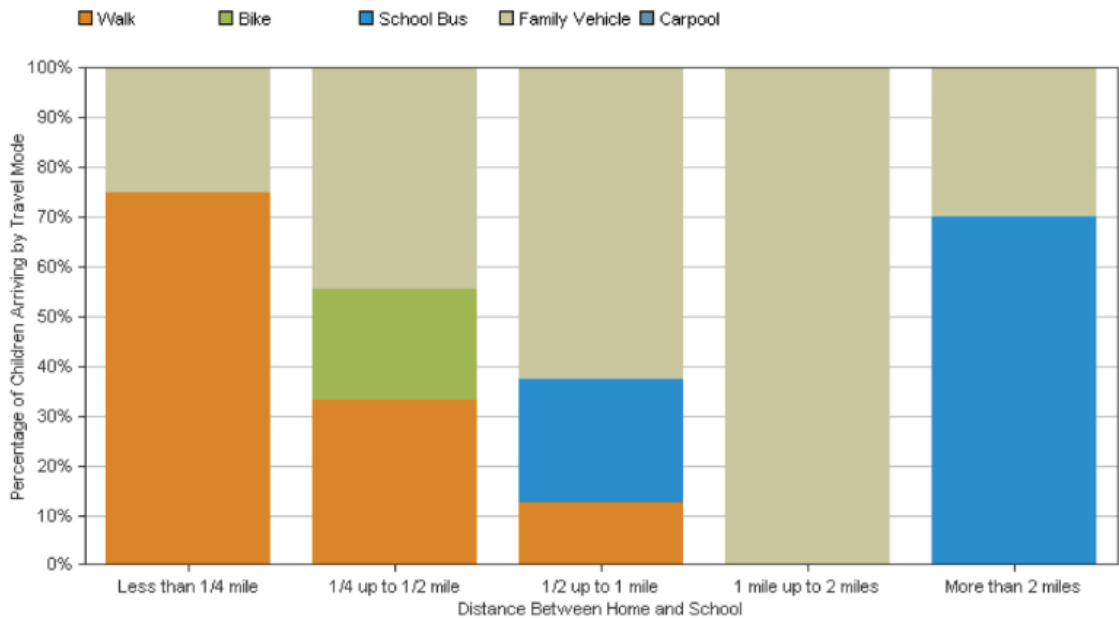


Figure 4-3: Percentage of MLES Children by Travel Mode from School

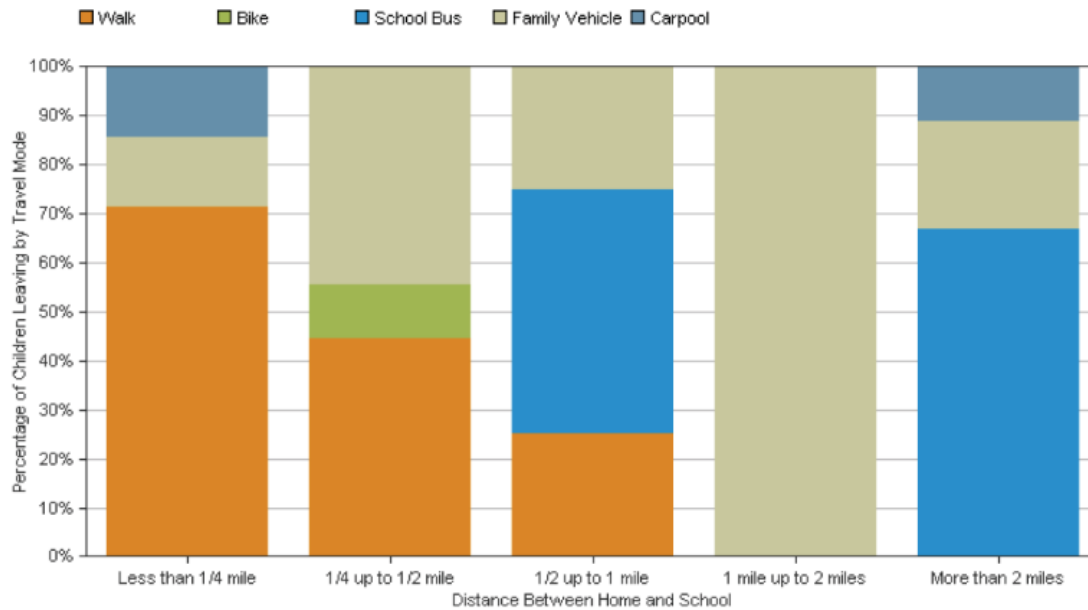


Table 4-1: Issues that Affect Parent's Decision to Allow or Not Allow Their Child to Walk or Bike to/from School Separated by Children who Do and Do Not Already Walk or Bike to/from School

Issue	Child walks/bikes to school	Child does not walk/bike to school
Distance	8 (61.5%)	16 (66.7%)
Convenience of driving	1 (7.7%)	2 (8.3%)
Time	3 (23.1%)	8 (33.3%)
Before/after-school activities	2 (15.4%)	7 (29.2%)
Traffic speed along route to school	9 (69.2%)	18 (75.0%)
Traffic volume along route	6 (46.2%)	20 (83.3%)
Adults to walk/bike with	5 (38.5%)	3 (12.5%)
Sidewalks or pathways	9 (69.2%)	14 (58.3%)
Safety of intersections & crossings	12 (92.3%)	11 (45.8%)
Crossing guards	9 (69.2%)	4 (16.7%)
Violence or crime	3 (23.1%)	11 (45.8%)
Weather or climate	4 (30.8%)	11 (45.8%)
Number of Respondents Per Category	13	24
No Response: 7		

(Percentages may not total 100% due to rounding.)

Hanover Street Elementary School:

Figure 4-1: Number of HSES Children by Distance They Live from School

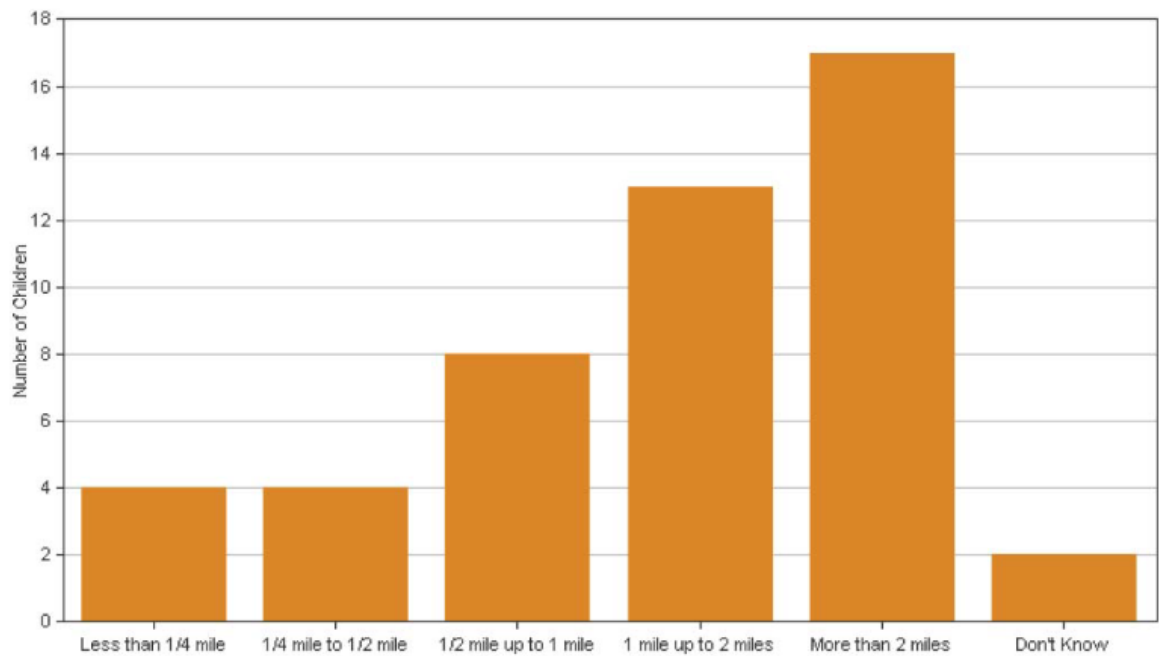


Figure 4-2: Percentage of Children by Travel Mode to School

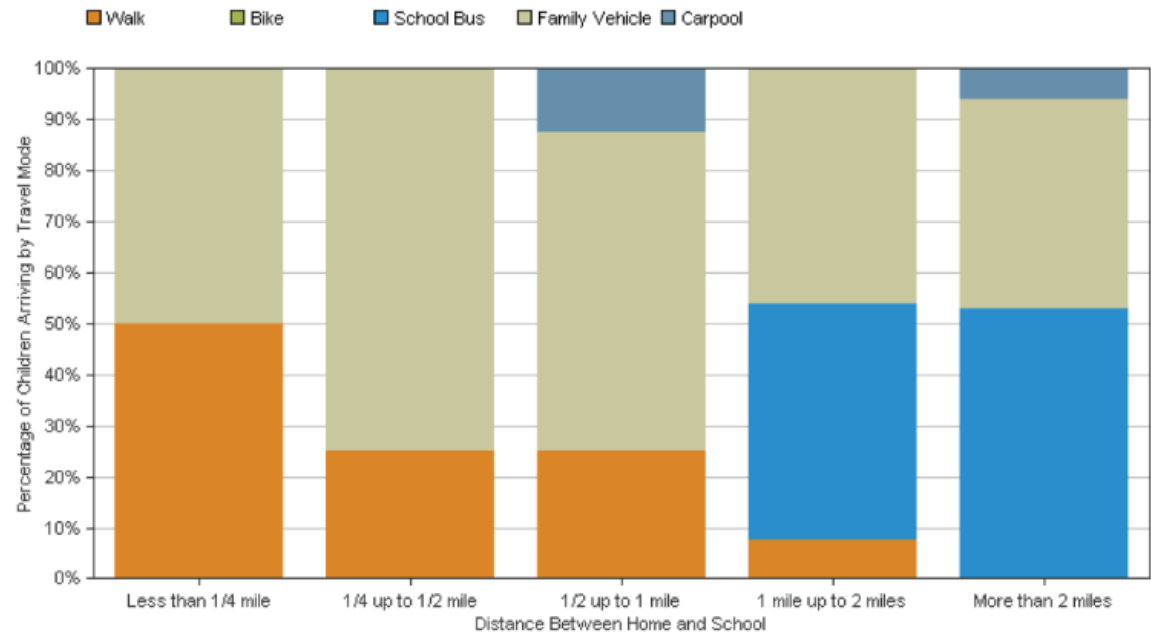


Figure 4-3: Percentage of HSES Children by Travel Mode from School

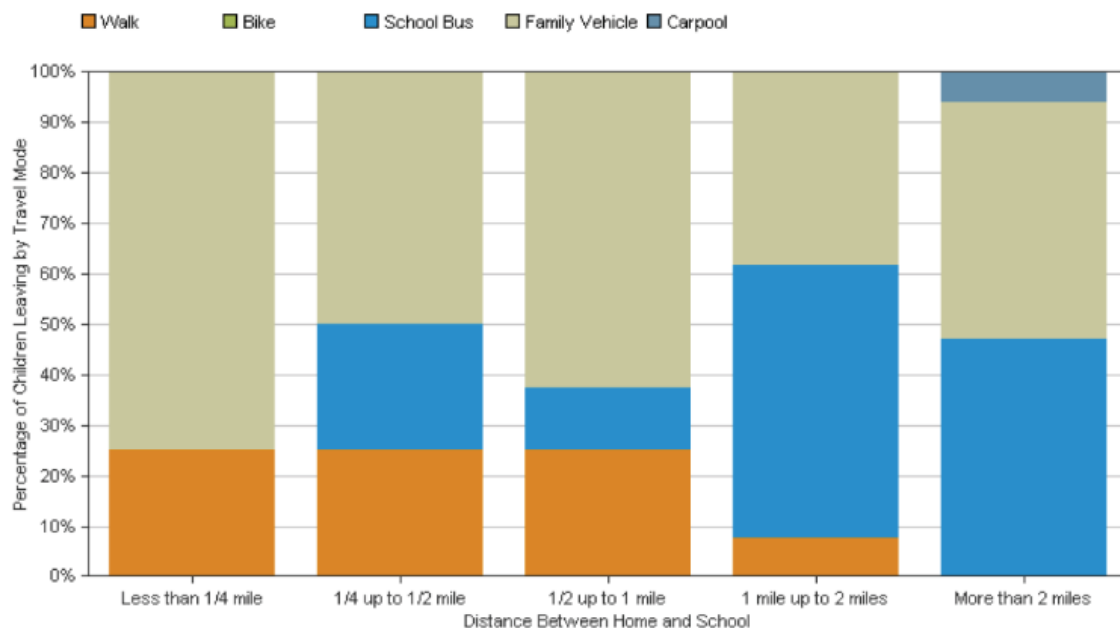


Table 4-1: Issues that Affect Parent's Decision to Allow or Not Allow Their Child to Walk or Bike to/from School Separated by Children who Do and Do Not Already Walk or Bike to/from School

Issue	Child walks/bikes to school	Child does not walk/bike to school
Distance	5 (83.3%)	30 (73.2%)
Convenience of driving	0 (0.0%)	0 (0.0%)
Time	2 (33.3%)	14 (34.1%)
Before/after-school activities	1 (16.7%)	5 (12.2%)
Traffic speed along route to school	4 (66.7%)	26 (63.4%)
Traffic volume along route	3 (50.0%)	28 (68.3%)
Adults to walk/bike with	5 (83.3%)	14 (34.1%)
Sidewalks or pathways	4 (66.7%)	20 (48.8%)
Safety of intersections & crossings	3 (50.0%)	28 (68.3%)
Crossing guards	3 (50.0%)	9 (22.0%)
Violence or crime	2 (33.3%)	17 (41.5%)
Weather or climate	2 (33.3%)	20 (48.8%)
Number of Respondents Per Category	6	41
<i>No Response: 7</i>		

(Percentages may not total 100% due to rounding.)

EXISTING DATA SUMMARY & NEEDS ASSESSMENT

SURVEY DATA SUMMARY & NEEDS ASSESSMENT:

PLAN / STUDY / SURVEY TITLE	YEAR	GEOGRAPHIC AREA(S)	METHOD(S)	TOPICS	RESPONSE STATS
Lebanon 29612 Exit 18/NH 120 Survey & Outreach	2021	NH Route 120-DHMC corridor; Downtown area	Online Survey Interactive Map	Multi-modal access & safety; Project ideas	527 survey responses
Mascoma River Greenway Survey	2020	Downtown area; Mechanic St - Miracle Mile corridor	Online Survey Interactive Map	Trail access; Trail user experience; Trail destinations; Priorities for improvements	880 survey responses
UVLSRPC Regional Corridor Transportation Plan	2020-2021	City-wide, focusing on major transportation corridors	Online Survey Interactive Map	Multi-modal access & safety; Project ideas	1,450 survey responses total (need to break down for Lebanon); hundreds of interactive map points
Advance Transit Transit Development Plan	2018	Downtown area; Mechanic St - Miracle Mile corridor; NH 120 - DHMC Corridor; West Lebanon area; Sachem area; NH 12A Commercial area;	Passenger survey	Trip purpose; Employment status/locations; Access to personal vehicle	583 returned surveys; 93% response rate
West Lebanon Village Vision Charrette	2019	West Lebanon area	Online Survey In-Person Charrette Stakeholder Meeting	Mode choice; Parking; Mobility challenges; Ped-bike connections; CT River connections; Streetscapes;	256 online survey responses
Downtown Visioning Study & Tunnel Project	2016	Downtown area	Online Survey Public Meetings Stakeholder Interviews "I Wish" Posters	Park & walk; Traffic calming; Mode choice; Mobility challenges; Ped-bike connections; Recreational trails	"Hundreds" of participants at public meetings; 530 online survey responses; 263 responses on "I Wish" posters
Safe Routes to Play	2014	City-wide, focusing on major recreation areas/facilities and parks	Parent survey Public meetings	Ped-bike access/safety; Ped-bike areas of concern	107 survey responses; 60% response rate
Safe Routes to School	2009; 2011	Areas surrounding public schools in Lebanon	Parent survey Public meetings	Distance to school; Mode choice; Parent concerns/barriers	n/a

NEEDED PUBLIC INPUT	OUTREACH METHOD(S)	NOTES
First-mile / last-mile connections to public transit	Passenger survey at bus stops; targeted stakeholder outreach	In-person administration using QR code; iPad as backup. Can use Soofa signs for additional public input.
Spot improvements for ped-bike safety & access	Online public input portal on project website; targeted stakeholder outreach	Use interactive map or other virtual media to solicit input on specific areas & locations. Can use Soofa signs for additional input.
Desired City-wide pedestrian and bicycle network	In-person or virtual charrette; targeted stakeholder outreach (building on all prior input/studies)	Desired networks can be built using existing data; additional public input is needed to validate and refine.



OVERVIEW:

To inform the development of the *Walk Bike Ride Leb* plan, a review of existing City of Lebanon plans and studies was performed. This included the 2012 City of Lebanon *Master Plan*, as well as a number of transportation-specific studies and plans. This summary will be used to 1) evaluate current progress towards improving multi-modal transportation; 2) ensure that previously identified multi-modal transportation needs are reflected in the *Walk Bike Ride Leb* plan; and 3) help identify multi-modal transportation needs and opportunities that need further planning and study.

This summary presents 1) specific planned and proposed multi-modal transportation projects identified in City plans and studies; and 2) higher-level multi-modal transportation needs and opportunities described in City plans and studies. Multi-modal transportation projects, needs, and opportunities are grouped by sub-areas and corridors within the City.

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PREPARED BY:



GLOSSARY OF TRANSPORTATION PLANNING TERMS:

Bike Lane: A painted lane with bicycle markings designating operating space for bicyclists within the roadway.

Bike Shoulder: A painted shoulder/fog line without bicycle markings that provides operating space for bicyclists within the roadway. Shoulder must typically be 4+ feet to be considered a suitable bike shoulder (5+ feet if curb/guardrail is present).

CIP: City of Lebanon Capital Improvements Program

FTA: Federal Transit Administration

Multi-Modal Transportation: Refers to multiple “modes” (types) of transportation (driving, walking, bicycling, public transit, using a wheelchair, etc.) that comprise the local and regional transportation system.

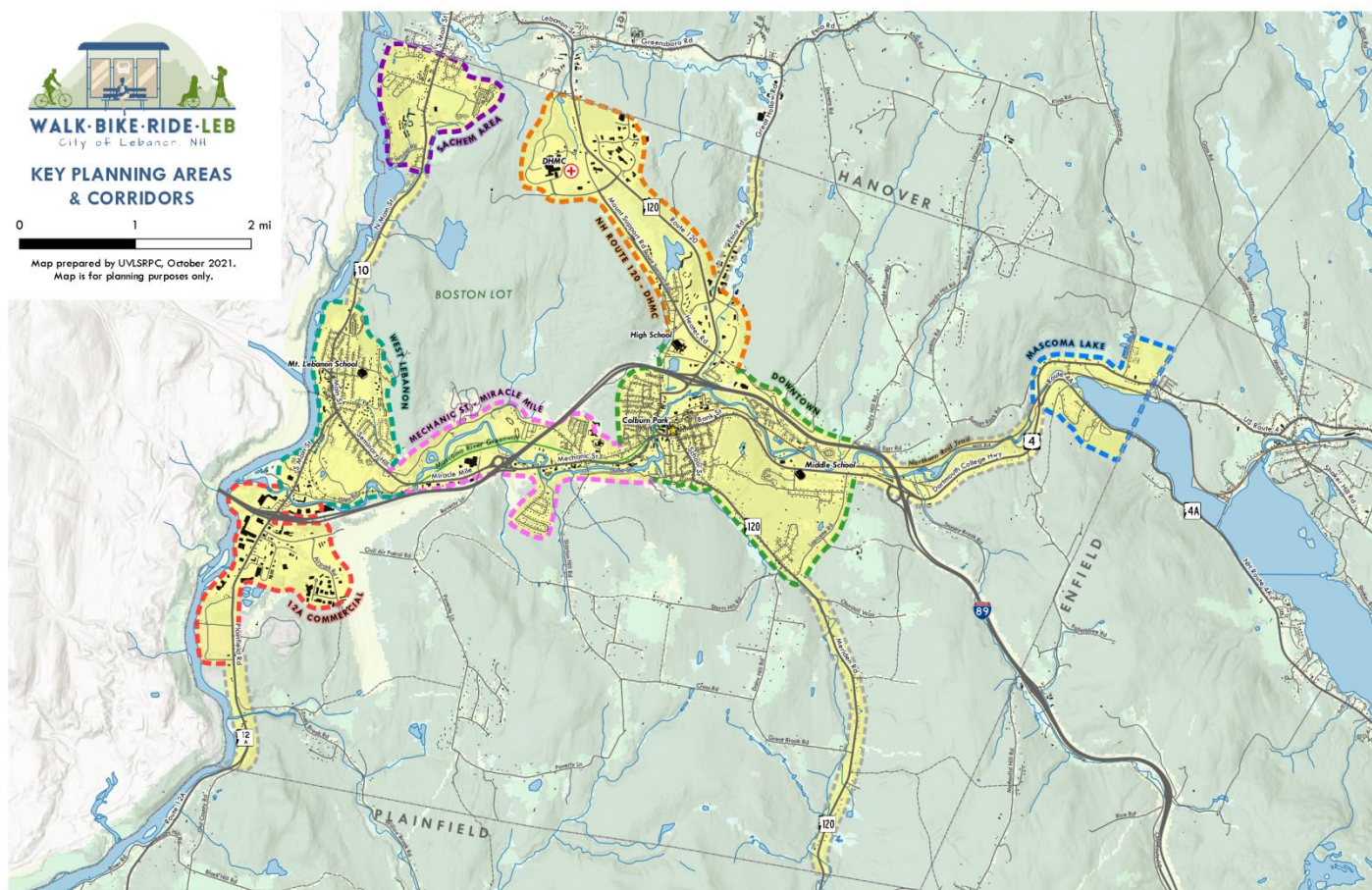
Multi-Use Path: A pedestrian and bicycle path that is physically-separated from adjacent/nearby roadway(s).

NH Ten-Year Plan: The NH Ten-Year Transportation Improvement Program (“Ten-Year Plan”) - the statewide transportation budget. Ten-Year Plan projects typically use federal funds, but may require local match.

TAP: Transportation Alternatives Program – a federal aid program (administered by NHDOT) for pedestrian and bicycle infrastructure improvements.

Traffic Calming: The use of physical infrastructure, signage, and/or other techniques to reduce vehicle speeds and increase driver awareness in busier areas with increased pedestrian and bicycle traffic.

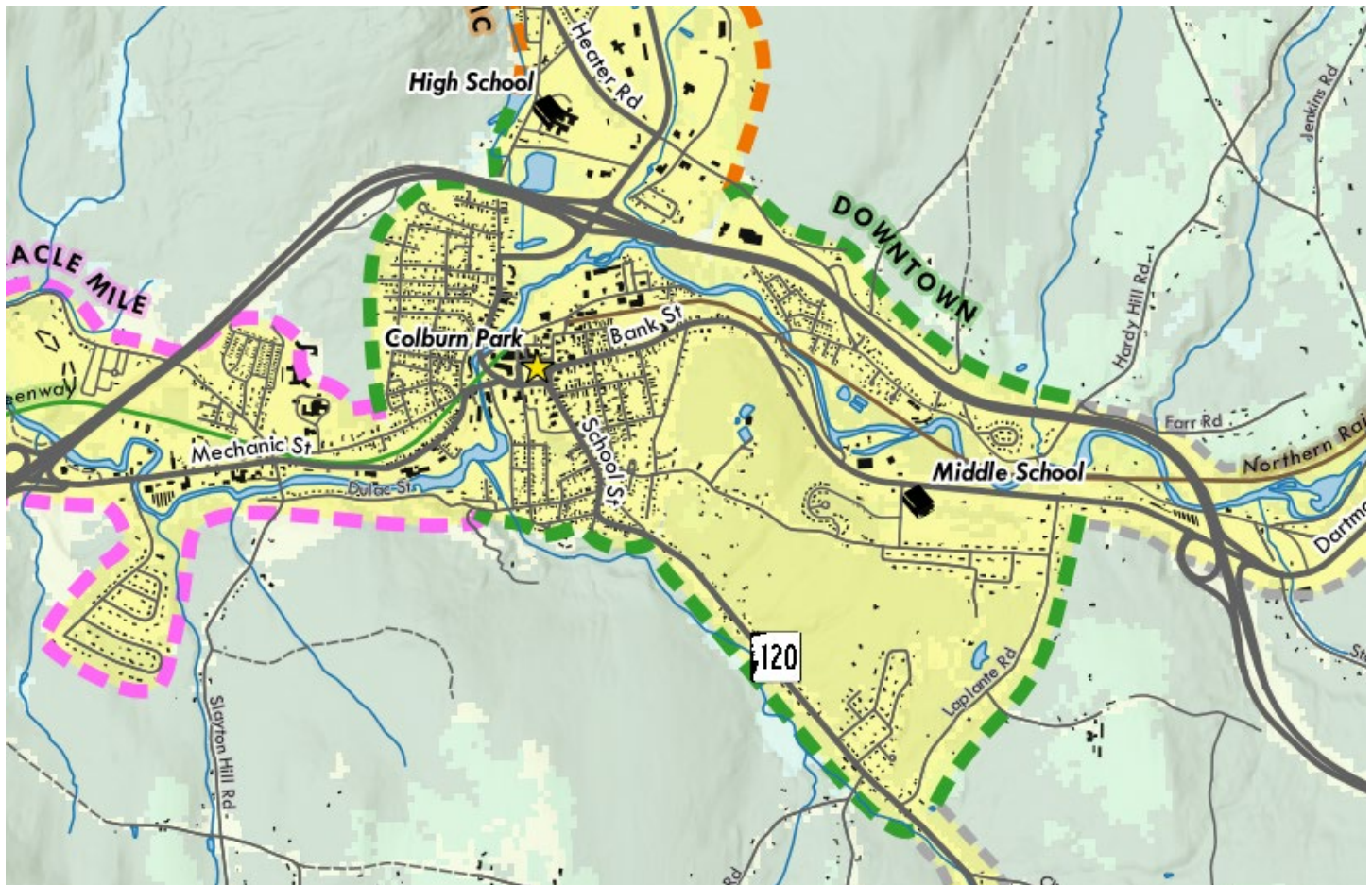
KEY MULTI-MODAL TRANSPORTATION PLANNING AREAS & CORRIDORS:



CITY-WIDE MULTI-MODAL TRANSPORTATION NEEDS & OPPORTUNITIES IDENTIFIED IN EXISTING PLANS & STUDIES:

NEED / OPPORTUNITY	SOURCE
Improve pedestrian and bicycle connections between employers, residential areas, major hubs, and bus stops.	<i>City 2012 Master Plan</i>
Improve availability of bicycle parking.	<i>City 2012 Master Plan</i>
Small/inconsistent shoulder widths limit bicycle access.	<i>City 2012 Master Plan</i>
Create a “String of Pearls” connecting parks and recreation areas with pedestrian and bicycle paths.	<i>City 2012 Master Plan</i>
Balance needs of all transportation system users when considering parking locations, layouts, and number of spaces.	<i>City 2012 Master Plan</i>
Create more inviting/attractive streetscapes for pedestrians, including landscaped buffers, street trees, seating, etc.	<i>City 2012 Master Plan</i>
Manage vehicular travel demand/congestion by promoting other modes of transportation.	<i>City 2012 Master Plan</i>
Improve access to the Mascoma River.	<i>City 2012 Master Plan</i>
Encourage future developments to be less auto-oriented/reliant, including improved public transit access.	<i>City 2012 Master Plan; 2010 Advance Transit Bus Stop Study</i>
Improve safe walking and bicycling routes to schools – traffic speed, development density, and distance identified as primary barriers.	<i>City 2012 Master Plan</i>
Aging population will create increased demand for mobility services and alternatives to driving.	<i>City 2012 Master Plan</i>
Currently there are few bus pullouts and covered shelters in Lebanon.	<i>City 2012 Master Plan; 2010 Advance Transit Bus Stop Study</i>
Manage driveway access points to minimize potential conflict points for all modes of transportation.	<i>City 2012 Master Plan</i>

DOWNTOWN AREA



Planned & Proposed Multi-Modal Transportation Projects:

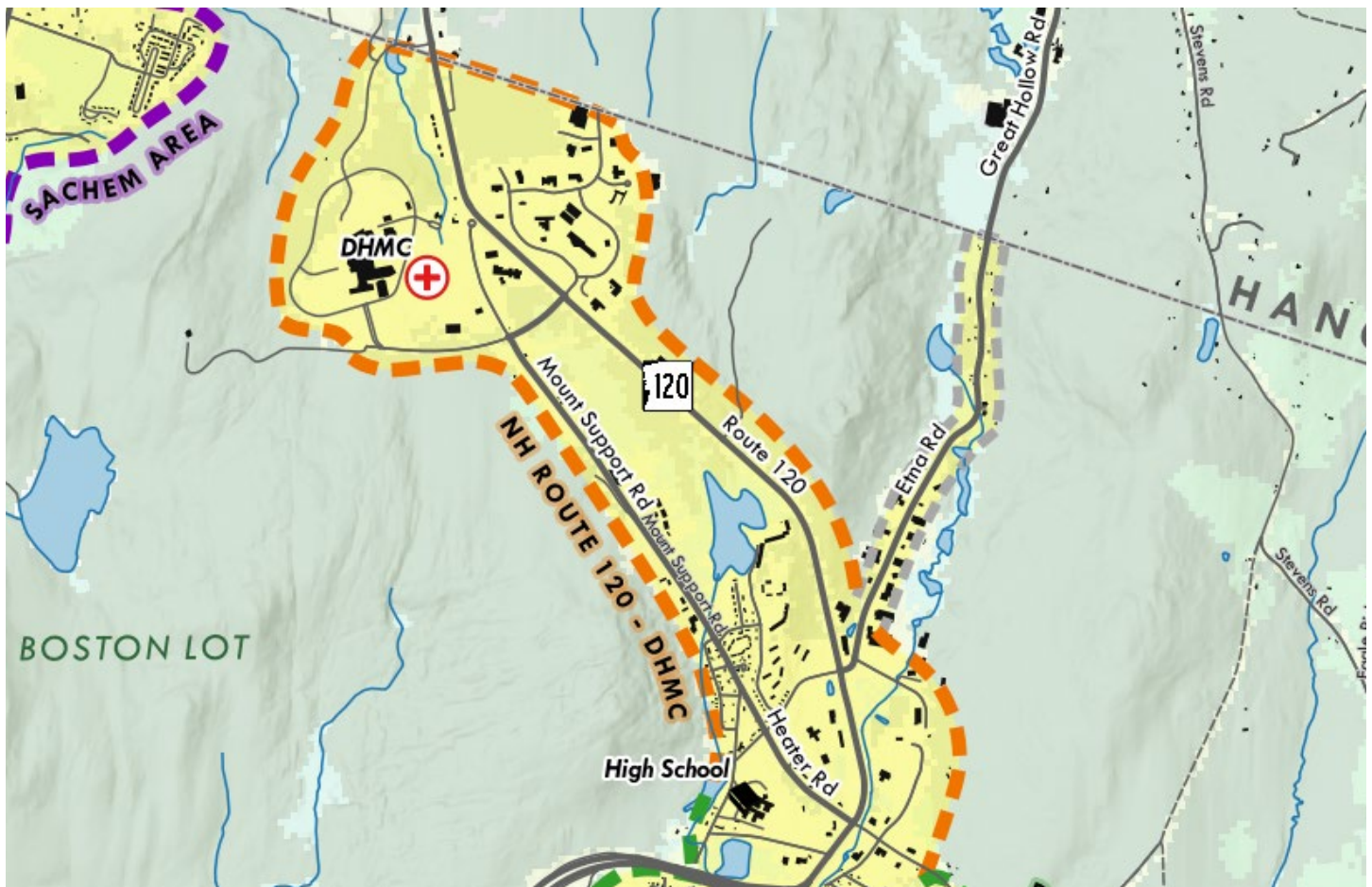
PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
Sullivan County Transit Claremont-Lebanon NH 120 bus service	Commuter bus service from Claremont to downtown Lebanon/DHMC	FTA; other contributions	Funded	?	2021	Bus service started this year, serves City Hall & DHMC; potential for future service changes/expansions
Spencer St Reconstruction	Reconstruction of Spencer St from Northern Rail Trail crossing to Kendrick St, including new sidewalks and crosswalks	CIP	Funded	\$1,974,000	2021	Underway
US Route 4/Moulton Ave Pedestrian Crossing & Trail	Construct ped-bike connection from Northern Rail Trail to Middle School, including woods trail, road crossing, and sidewalk extension along Moulton Ave	CIP	Funded	?	2021 - 2022	Underway

PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
Kimball St sidewalk upgrade	Improve sidewalks along Kimball St	CIP	Funded	\$1,191,160	2022	2022-2027 does not provide detail
Resurfacing NH 120 from City urban compact to Plainfield	Light capital paving of NH 120/Meriden Rd (project #22202)	NHDOT Paving Program	Funded	n/a	2022	Opportunity to consider lane striping adjustments for wider shoulders
Mascoma St/High St/Mechanic St Roundabout	Construct roundabout at Mascoma/Mechanic/High St	City of Lebanon; NH Ten-Year Plan	Funded	\$3,053,580	2023	Connection between Mascoma Greenway and ped-bike tunnel
Hanover St/ NH 120 Reconstruction	Reconstruction of Hanover St from NH 120 to High St, including traffic calming, streetscape, and ped-bike access improvements. Includes intersection improvements at NH 120/Hanover St and Hanover St/High St/Hough St	CIP; NH Ten-Year Plan (potential)	Planned	est. \$6,000,000	2024 - 2026	\$1.4m in 2024 with \$5.9m planned for full street overhaul after 2026. \$1.4 is for intersection improvements at NH 120 and remainder is for remainder through the High St Intersection after 2026. NH 120/Hanover St intersection could be folded into NH 120/Exit 18 Ten-Year Plan project.
Reconfigure of NH 120/US4/Park St around Colburn Park	Convert N Park St to one-way w/ wider sidewalk & public space; convert E W & S Park to 2-way w/rotary at S/E Park and NH 120S	n/a	Concept	est. \$6,000,000	n/a	From 2016 <i>Downtown Visioning Study</i> ; includes numerous site improvements such as pedestrian crossings, bus shelters, etc.
Extend Taylor St access	Extend Taylor St through parking and formalize roadway to access behind Opera House	n/a	Concept	n/a	n/a	From 2016 <i>Downtown Visioning Study</i> ; would be part of larger scale re-imagining of downtown area
Reconfigure Hanover St/Mascoma St intersection	Realign merge intersection into T-intersection	n/a	Concept	est. \$500,000	n/a	From 2016 <i>Downtown Visioning Study</i>
Ped-bike improvements south NH 120/Meriden Rd	Extend shoulder widening/ped-bike improvements south along NH 120/Meriden Rd south of prior CSO project/urban compact line	n/a	Concept	n/a	n/a	Concept plans previously worked on – need more information.
Ped-bike improvements along Bank St Ext east of Heater Rd	Extension of sidewalk along Bank St Ext; formalize connection to Northern Rail trail	n/a	Concept	n/a	n/a	From UVLSRPC <i>Regional Corridor Transportation Plan</i>

Additional Identified Multi-Modal Transportation Needs & Opportunities:

DESCRIPTION	SOURCE	NOTES
Improve amenities for transit users (shelters/benches, public restrooms)	City 2012 <i>Master Plan</i> ; 2016 <i>Downtown Visioning Study</i>	Increased importance with new NH 120 bus service from SCT
Downtown recreation path network	City 2012 <i>Master Plan</i> ; 2016 <i>Downtown Visioning Study</i>	Concepts presented in 2016 study; unclear if additional planning/feasibility work has been done. Focus on connections to key destinations and public spaces/park areas
Provide improved & attractive streetscape amenities, such as movable planters, seating, adequate trash cans, and bicycle racks through the CBD	City 2012 <i>Master Plan</i> (p. 3-9)	Consider permanent conversion of Court St to public, car-free space?
Improve Mechanic St with sidewalks and bike paths	City 2012 <i>Master Plan</i> (p. 3-9)	Progress has been made, gaps remain in sidewalk network.
Identify a pedestrian route to Storrs Hill from CBD, utilizing existing sidewalks	City 2012 <i>Master Plan</i> (p. 3-10)	Refers to signage/wayfinding?
Develop a plan for bikeways/pedestrian paths connecting neighborhoods in the CBD core	City 2012 <i>Master Plan</i> (p. 3-9)	Several proposed/planned projects address this goal – important to evaluate where gaps remain
Develop downtown Tax Increment Finance (TIF)/Special Assessment District to support projects	City 2012 <i>Master Plan</i> (p. 3-6); 2016 <i>Downtown Visioning Study</i>	Downtown TIF still active?
Ped-bike improvements along Bank St Ext east of Heater Rd	UVLSRPC <i>Regional Corridor Transportation Plan</i>	Sidewalk ends at Heater Rd; minimal shoulder; no formal connection to Northern Rail Trail

NH ROUTE 120 – DHMC CORRIDOR



Planned & Proposed Multi-Modal Transportation Projects:

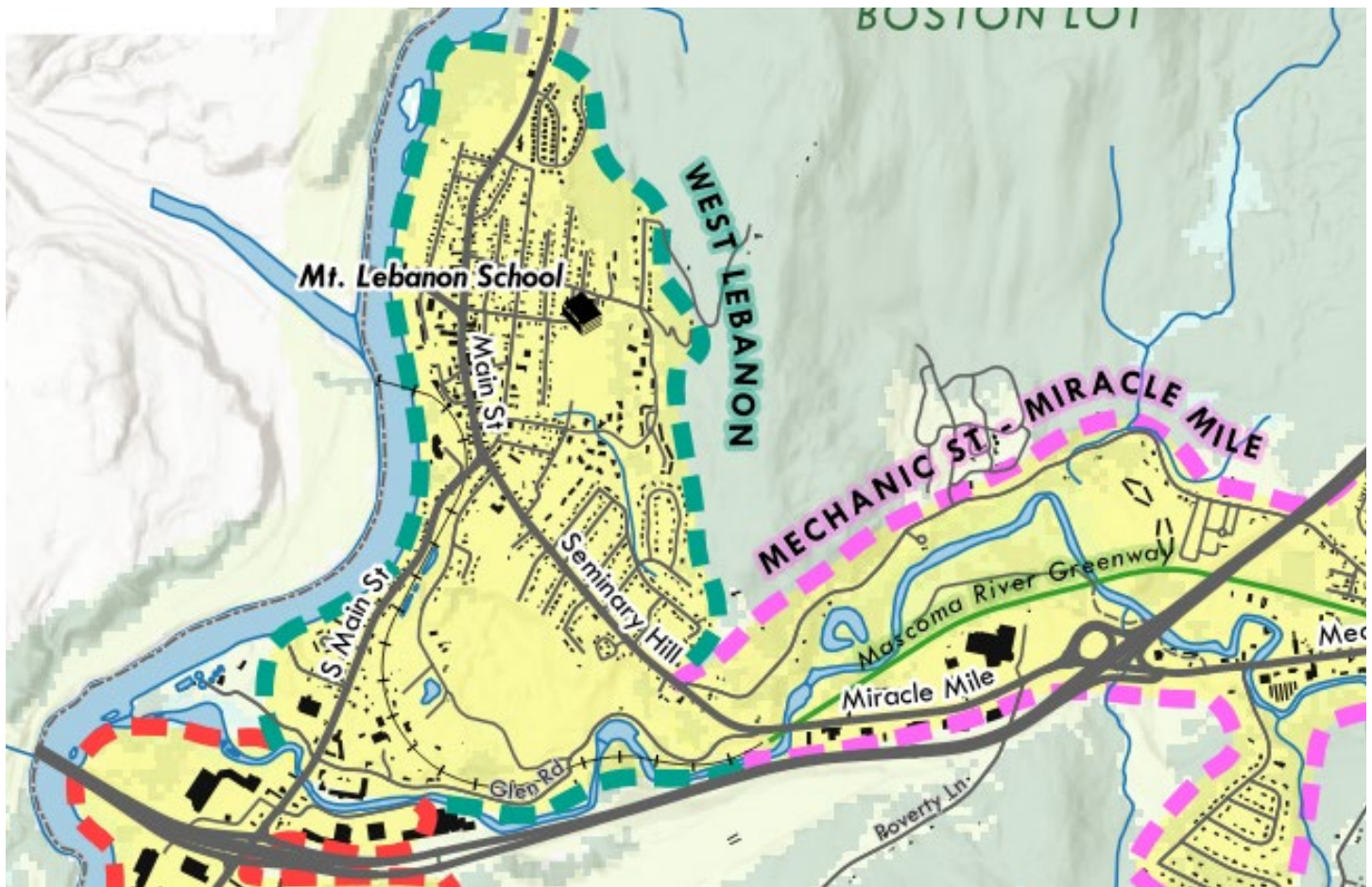
PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
Sullivan County Transit Claremont-Lebanon NH 120 bus service	Commuter bus service from Claremont to downtown Lebanon/DHMC	FTA; other contributions	Funded	?	2021	Bus service started this year, serves City Hall & DHMC; potential for future service changes/expansions
Sullivan County Transit Newport-Lebanon NH 120 bus service	Commuter bus service from Newport/Grantham along I-89 to DHMC	FTA; other contributions	Funded	?	2021	Service scheduled to start in fall 2021
Advance Transit Blue Route Expansion	Increasing Blue Route to 15 min service between downtown Lebanon and Hanover	Advance Transit; NHDOT/FTA; municipalities; private entities	Planned	\$316,586	2022	Partially funding via CMAQ; AT currently raising additional funds. Identified in 2018 <i>Transit Development Plan</i> .
Mt Support Rd/LaHaye Drive Intersection Improvement	Upgrade Mt Support/LaHaye Dr intersection	CIP; Special Assessment District	Funded	\$2,250,000	2023	Will connect into Lahaye Drive multi-use path project. Currently in preliminary design.
Resurfacing Etna Rd from NH 120 to Etna	Light capital paving of Etna Rd (project #22206)	NHDOT Paving Program	Funded	n/a	2023	Opportunity to consider lane striping adjustments/other spot treatments

PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
NH 120 corridor improvements from Hanover St to Etna Rd	Improve vehicular operations and ped. bike, and transit access along NH 120 corridor from Hanover St to Etna Rd, including I-89 Exit 18	NH Ten-Year Plan/STBG	Funded	\$7,000,000-\$18,133,581	2024	Additional \$11 million in construction funds proposed in draft Ten-Year Plan. Currently in preliminary engineering. Many potential improvements could be considered.
Lahaye Drive multi-use path	Construct multi-use path from Mt Support Rd to Centerra Parkway, including improved crossing of NH 120	City of Lebanon; Transportation Alternatives Program	Funded	\$857,237	2026?	Project unexpectedly proposed to be delayed by 3 years in draft NH Ten-Year Plan. City currently advocating to NHDOT to move up project timeline.
NH 120/Etna Rd pedestrian crossing	Construct pedestrian crossing of NH 120 at Etna Rd	City of Lebanon	Concept	n/a	n/a	Identified in 2021 in response to resident inquiry. Could potentially be included in NH 120 Ten-Year Plan project.
Advance Transit new Purple Line	Create new Purple Line to serve additional destinations in Lebanon -- APD, Mascoma St, Labombard, Centerra/Altaria	n/a	Concept	\$576,838	n/a	Identified in 2018 <i>Transit Development Plan</i> .
Pedestrian access to Advance Transit stop at Heater Rd/Old Etna Rd	Add sidewalk to Advance Transit stop at Heater Rd/Old Etna Rd	n/a	Concept	n/a	n/a	Identified in UVLSRPC <i>Regional Corridor Transportation Plan</i> .
Advance Transit Purple Route	New Advance Transit service with connections to Mascoma St, Dartmouth Coach, Lobombard Rd, Centerra Park, and DHMC	n/a	Concept	n/a	n/a	Identified in 2018 AT <i>Transit Development Plan</i>

Additional Identified Multi-Modal Transportation Needs & Opportunities:

DESCRIPTION	SOURCE	NOTES
Comprehensive plan for ped-bike access between downtown Lebanon, DHMC, and Hanover	UVLSRPC <i>Regional Corridor Transportation Plan</i>	Consideration necessity of on-road or separated bicycle facility along NH 120 vs alternate route (Mt. Support Rd/Lahaye), connections north towards Hanover
Lack of ped-bike connection from Mt. Support Rd multi-use path to DHMC	UVLSRPC <i>Regional Corridor Transportation Plan</i>	
Park-and-ride facility near I-89 Exit 18	City 2012 <i>Master Plan</i> ; UVLSRPC <i>Regional Corridor Transportation Plan</i>	Need for a park-and-ride is identified in NHDOT <i>Statewide Strategic Transit Assessment</i> . 2010 <i>Intermodal Facility Study</i> did not lead to further project development.

WEST LEBANON AREA:



Planned & Proposed Multi-Modal Transportation Projects:

PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
Westboro Rail Yard demolition; multi-use path (West Leb Greenway) & park	Demolition of buildings on site of Westboro Railyard to enable redevelopment, including multi-use path/Mascoma Greenway extension	NHDOT (demolition); City of Lebanon	Funded / Planned	\$756,420 (demolition)	2021 (demo)	Demo contract approved G&C 9/15/21, state funds. Future lease agreement to be negotiated. Site proposed to host park and multi-use path.
NH 12A/South Main Street Bridge Replacement #062-117	Replacement of NH 12A/South Main St "Dry Bridge" including wider bike shoulder and access road to Westboro Yards	City of Lebanon: NH Ten-Year Plan	Funded	\$10,063,536	2024	City contributing ~\$2.12 million to \$8.2 million bridge replacement; plus \$ for Westboro access
River Park - West Lebanon multimodal transportation facility	Move Advance Transit queuing station from Kilton Library to Riverpark	Lyme Properties; Advance Transit	Planned	?	?	Identified in 2018 AT Transit Development Plan

PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
Bridge St/Main St intersection improvement	Construct roundabout or other improvement at Bridge St/Main St intersection	n/a	Concept	n/a	n/a	Preliminary engineering underway w/ WLRAC. Potential to improve pedestrian access in "North Gateway" to West Lebanon
West Lebanon Main St Improvements	Streetscape improvements along West Lebanon Main St; including improved pedestrian and bicycle access	n/a	Concept	n/a	n/a	From 2020 <i>West Lebanon Charrette Report</i> ; preliminary designs being worked on. Opportunity to add street furniture and bicycle parking as well.
Mascoma River Greenway extension to Riverside Park	Extend MRG along State of NH rail line to arch bridge; create connection from MRG to Riverside Park	n/a	Concept	n/a	n/a	Being planned/worked on by Recreation & Parks.
Mascoma River Greenway extension West Lebanon	Extend MRG along State of NH rail line West Lebanon/ Westboro Yard	n/a	Concept	n/a	n/a	Rail line is actively used; unclear if/when extension along rail line will be an option.
Pedestrian access to AT stop at Glen Rd Plaza	Construct sidewalk to AT stop at Glen Rd Plaza	n/a	Concept	n/a	n/a	Identified in UVALRPC <i>Regional Corridor Transportation Plan</i>
Connecticut River ped-bike bridge	Formalize ped-bike access along existing rail bridge between West Lebanon and White River Junction	n/a	Concept	\$0.83-\$1.2 million (2007 dollars)	n/a	2007 Feasibility Study completed by Upper Valley Trails Alliance; bridge used by Rhymes Propane currently. Identified in 2021 <i>West Leb Action Plan</i> .
River Park trail connection**	Connect Bridge St to Wilder Dam via River Park and Connecticut River waterfront	Lyme Properties	Planned	?	?	Lyme Properties has support from NPS Rivers, Trails, & Conservation Assistance Program; UVTA is fiscal sponsor. Not planned to be an accessible trail, but is proposed to connect to multi-use path in Westboro Yard

** Private entity project

3. West Lebanon Greenway - Action Items

1. Complete lease for Westboro Yard and waterfront corridor with NHDOT.
2. Advance engineering of Westboro yard segment of WLГ with VHB, including underpass beneath the RR bridge.
 - 2.1. NH Shoreland Urban Exemption may streamline this [Page 13]
3. Proactively engage landowners with proposed land-use changes that can increase land value, enable future economic development, and facilitate broader community trail goals [Chapter 5].
4. Establish the Greenway as the preferred alternative transportation route alongside West Lebanon Main Street and Route 10, to contribute towards larger, regional transportation plans.
 - 4.1. May open up potential transportation funding at the State and Federal level.
 - 4.2. Proposed streetscape improvements for Main Street does not have corridor width for dedicated Bike Lane.
 - 4.2.1. Currently Maple Street is shown as alternative walk/bicycle route.
 - 4.2.2. West Lebanon Greenway would be the preferred alternative, and would simultaneously make larger contribution to bike/ped infrastructure
 - 4.3. UVLSRPC Corridor Study and Lebanon Bike/Ped plan continue to build upon decades of community requests and study.
5. Support Rec Use Statute before NH Legislature in 2022.
6. Re-visit opportunity identified in 2007 Study to connect West Leb to White River Junction, Vt. via safe pedestrian passage across rail bridge.
7. Work with Greenway coalition members to advance plans and identify sources of potential funding, and tie to significant State and Federal funding priorities.

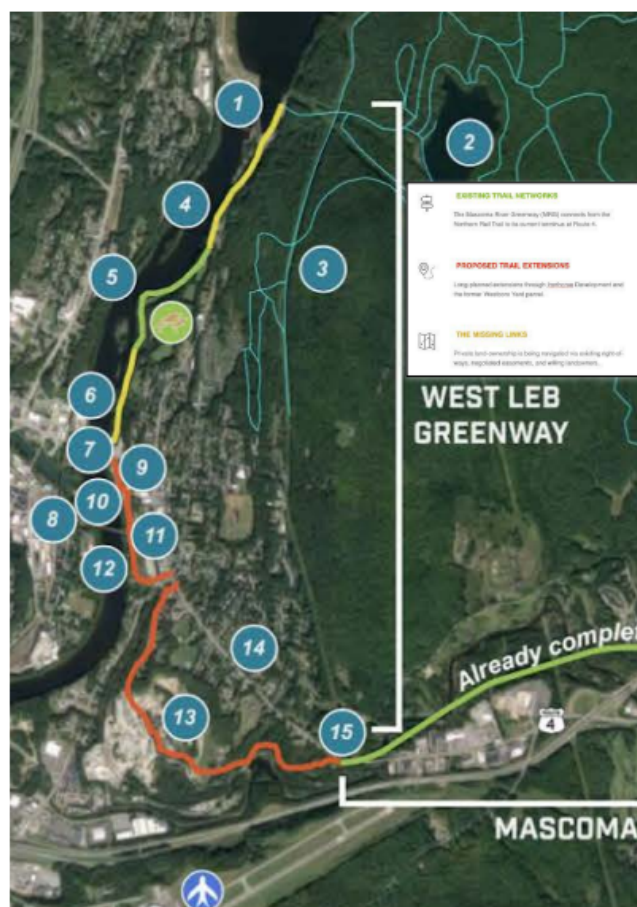
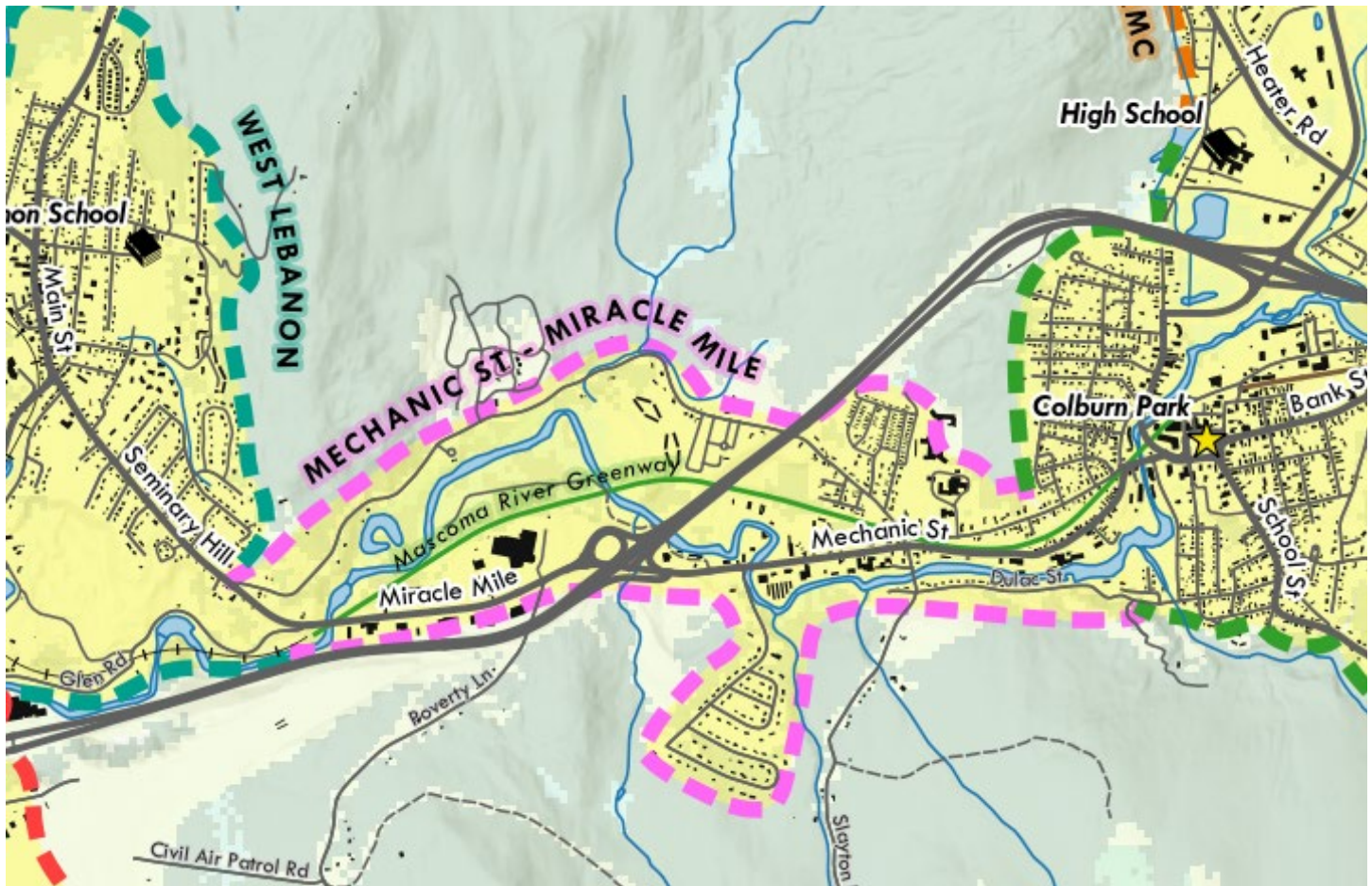


Figure 1. Screenshot of action items of West Lebanon Greenway from Action Plan for West Leb.

Additional Identified Multi-Modal Transportation Needs & Opportunities:

DESCRIPTION	SOURCE	NOTES
Seek opportunities for greater connectivity between West Lebanon Village and surrounding neighborhoods	West Lebanon Village Vision Charrette Report	
Seek opportunities to add street trees, benches, and other character-enhancing improvements along Main St	West Lebanon Village Vision Charrette Report	
Main St serves more as a pass-through for regional traffic than a destination itself	West Lebanon Village Vision Charrette Report	Connect ped-bike access improvements to placemaking and village revitalization strategies
Glen Rd access to Mascoma River Greenway is challenging for pedestrians and bicyclists	2020 Mascoma River Greenway survey	Would be remedied by changing primary access point to Riverside Park, but may need to consider short-term improvements.
Continuing the Greenway through West Leb and beyond	Action Plan for West Leb	Since the 2004 Westboro Riverfront Park Design Study there has been an ever-growing library of relevant documentation that references the potential for the Greenway through West Lebanon. This ranges from the initial envisioning work to in-depth land-use and engineering analysis. Recommendations from the plan include enhancing the pedestrian and bicyclist experience by upgrading infrastructure and expanding the network of sidewalks and bikeways to and within the village. Website: https://www.westleb.org/actionplan

MECHANIC ST – MIRACLE MILE CORRIDOR



Planned & Proposed Multi-Modal Transportation Projects:

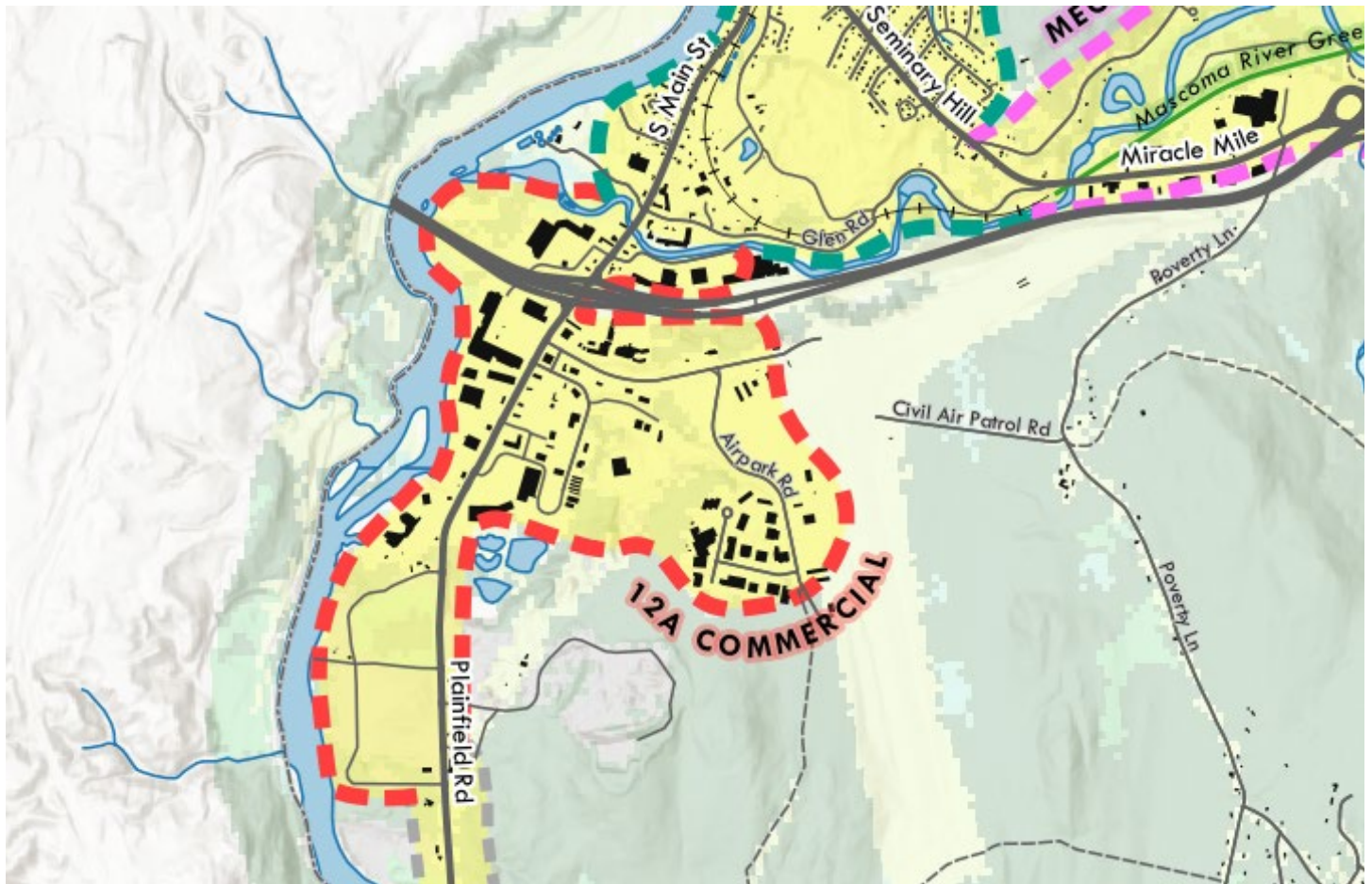
PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
Mechanic St/Slayton Hill Rd roundabout	Construct roundabout at Mechanic St/Slayton Hill Rd	NH Ten-Year Plan; City of Lebanon	Funded	\$4,712,731	2029	Concept design includes pedestrian refuge islands and sidewalks in vicinity of proposed roundabout; may be able to incorporate additional improvements depending on funding availability
Mechanic St sidewalk extension	Construct sidewalk along Mechanic St from Slayton Hill Rd to American Legion	Congressional earmark	Planned	est. \$1,200,000	?	Rep. Kuster secured %290,250 earmark; project to tie into Mechanic St/Slayton Hill Rd intersection improvement project
Mascoma River Greenway – Miracle Mile connection	Construction ped-bike connection from MRG to Miracle Mile at Lebanon Ford	n/a	Planned	n/a	n/a	Being worked on by Recreation and Parks Department
Miracle Mile sidewalk extension	Construct sidewalk from current terminus to Poverty Lane/Timken	n/a	Planned	n/a	n/a	

PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
Mascoma River Greenway - Mascoma St connection	Create ped-bike connection between MRG and Mascoma St/Boston Lot Nature Walk Trailhead	n/a	Concept	n/a	n/a	Cemetery Board rejected connection through cemetery, could potentially make connection along edge of I-89 ROW or other alignment.
Advance Transit Purple Route	New Advance Transit service with connections to Alice Peck Day & Mascoma St, as well as DHMC/Centerra	n/a	Concept	n/a	n/a	Identified in 2018 AT Transit Development Plan

Additional Identified Multi-Modal Transportation Needs & Opportunities:

DESCRIPTION	SOURCE	NOTES
Address gaps in the sidewalk network Mechanic St/US Route 4	2012 City Master Plan	
Improve navigation/access to Mascoma River Greenway	2020 Mascoma River Greenway survey	
Extension to West Lebanon is a priority	2022 NH Rail Trails Plan	There is active railroad activity in West Lebanon. Rail with trail or off corridor connection required.
Guidance for NHDOT Rail Trail Agreement	2022 NH Rail Trails Plan	The 2022 NH Rail Trails Plan includes a template for Rail Trail Guidance in the Appendix.

12A COMMERCIAL AREA



Planned & Proposed Multi-Modal Transportation Projects:

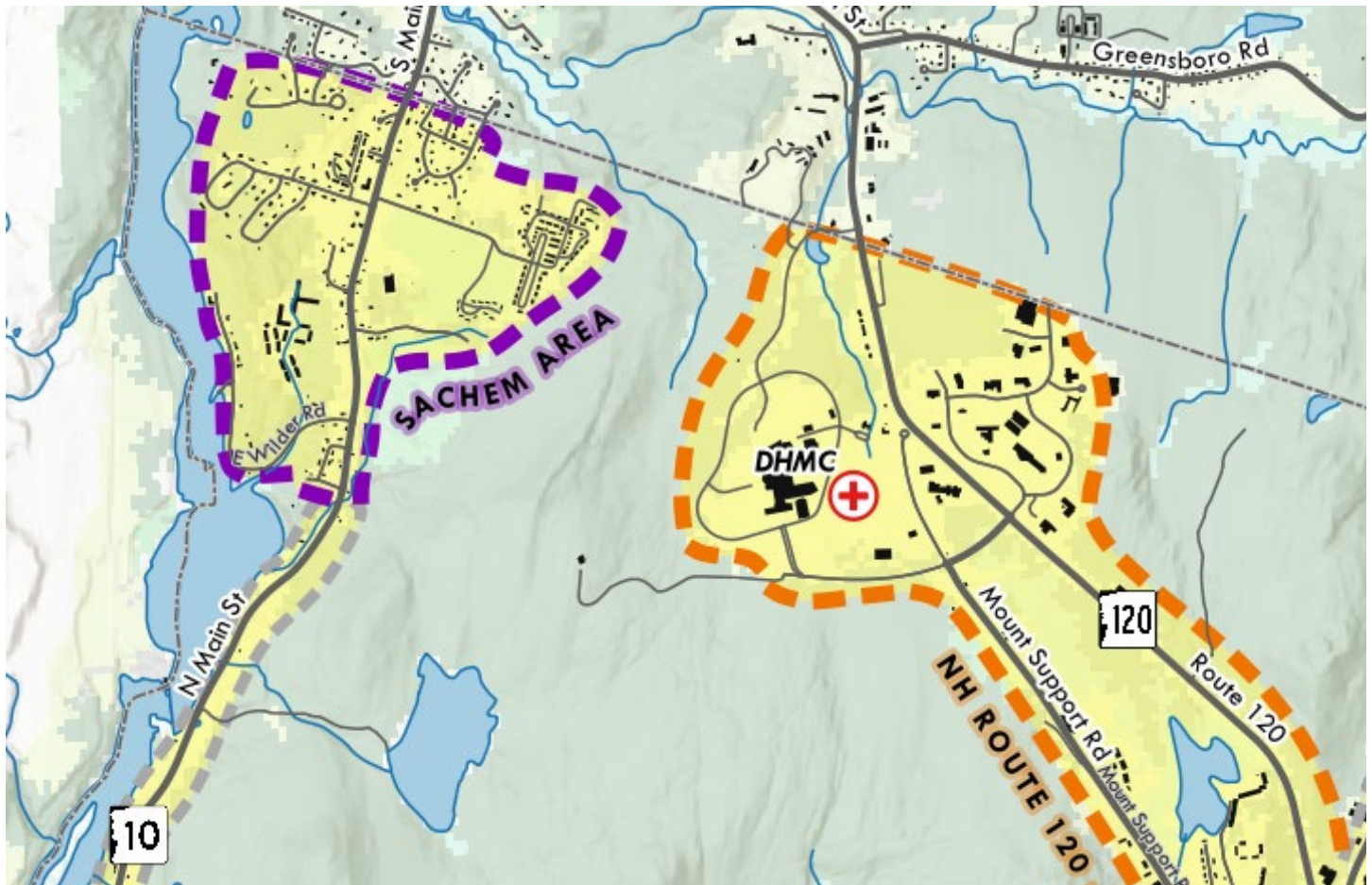
PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
Add covered bus shelter(s) along NH 12A	Add covered bus shelter(s) along NH 12A	n/a	Concept	n/a	n/a	Identified in UVLRPC Regional Corridor Transportation Plan
Pedestrian crossing at Walmart	Create pedestrian crossing across NH 12A at Walmart	n/a	Concept	n/a	n/a	Identified in UVLRPC Regional Corridor Transportation Plan
NH 12A "bike bypass"	Study feasibility of "bike bypass" around NH 12A commercial, including potential riverside path	n/a	Concept	n/a	n/a	Identified in UVLRPC Regional Corridor Transportation Plan & River Park's Green Vision for West Lebanon

Additional Identified Multi-Modal Transportation Needs & Opportunities:

DESCRIPTION	SOURCE	NOTES
Address gaps in the sidewalk network Mechanic St/US Route 4	2012 City Master Plan	
Improve navigation/access to Mascoma River Greenway	2020 Mascoma River Greenway survey	

DESCRIPTION	SOURCE	NOTES
Glen Rd is challenging for pedestrians and bicyclists due to traffic and curves	UVALRPC <i>Regional Corridor Transportation Plan</i> ; 2020 <i>Mascoma River Greenway survey</i>	Gravel path from Riverside Park to Powerhouse Mall provides alternate route, but does not appear to well-known/utilized

SACHEM VILLAGE AREA



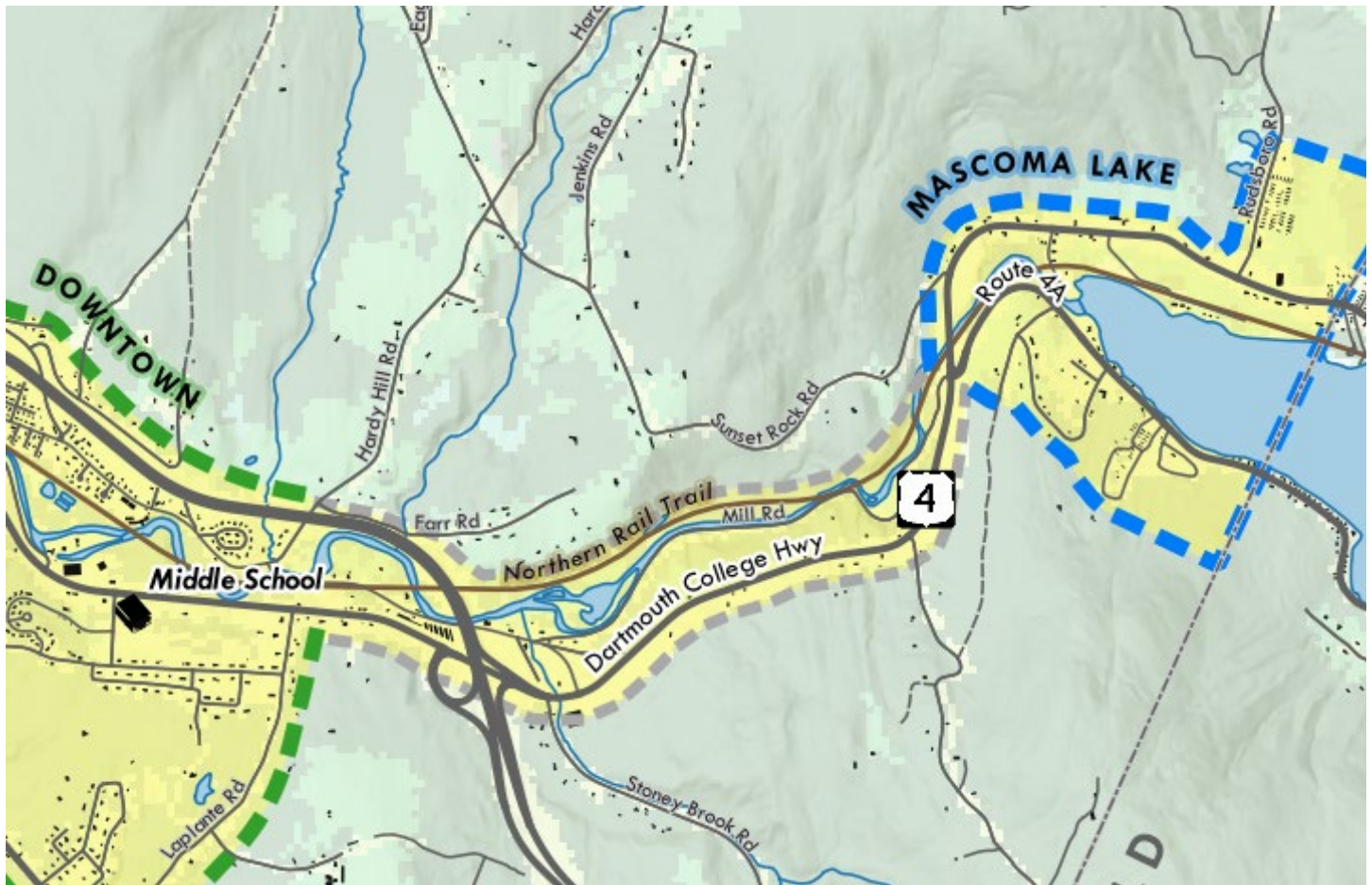
Planned & Proposed Multi-Modal Transportation Projects:

PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
Resurfacing NH 10 from urban compact to Hanover town line	Light capital paving of NH 10 (project #18215)	NHDOT Paving Program	Funded	n/a	2022	Opportunity to consider lane striping adjustments for wider shoulders, though limited space exists within narrow roadway
Dartmouth campus shuttle	Shuttle service from Sachem Village to Dartmouth campus; park-and-ride	n/a	Concept	n/a	n/a	Identified in 2021 <i>Dartmouth College Strategic Master Plan</i>
Sachem Village – DHMC transit & ped-bike connection	Limited-access roadway connecting Sachem Village to DHMC	n/a	Concept	n/a	n/a	Identified in 2021 <i>Dartmouth College Strategic Master Plan</i>

Additional Identified Multi-Modal Transportation Needs & Opportunities:

DESCRIPTION	SOURCE	NOTES
Lack of bicycle access/shoulders on NH Route 10	2012 Lebanon Pedestrian & Bicyclist Advisory Committee report; 2021 <i>Dartmouth College Strategic Master Plan</i>	Limited opportunity for lane reconfiguration of existing roadway given narrow roadway/ROW

MASCOMA LAKE AREA



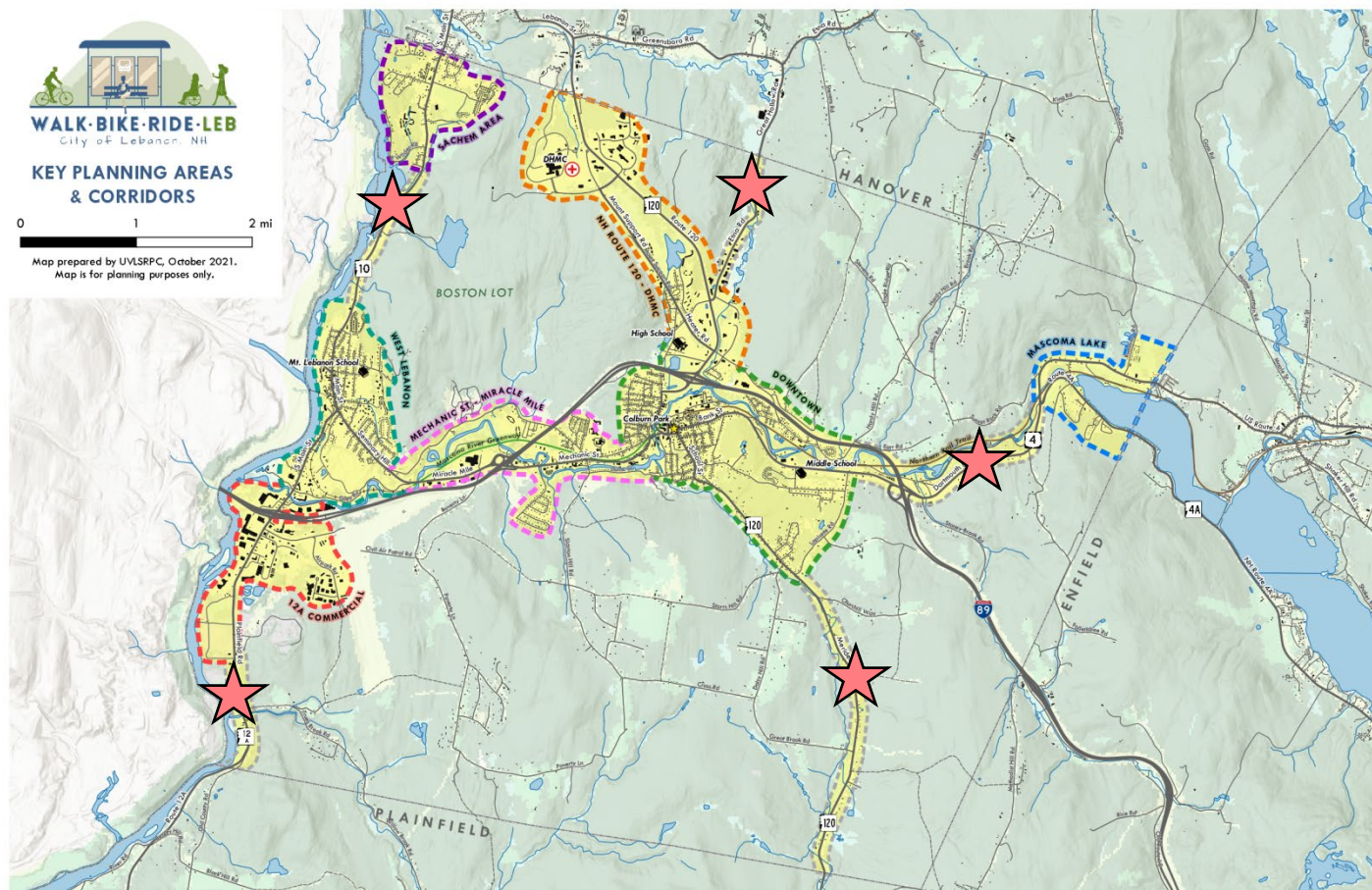
Planned & Proposed Multi-Modal Transportation Projects:

PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
Resurfacing NH 4A from US 4 to Enfield town line	Pavement preservation of NH 4A (project #22205)	NHDOT Paving Program	Funded	n/a	2023	Scope of maintenance project unclear; potential opportunity to reconfigure lane striping
Northern Rail Trail access at Payne Rd	Formalize access trail to Northern Rail Trail at Payne Rd overpass	n/a	Concept	n/a	n/a	Identified in UVLRPC <i>Regional Corridor Transportation Plan</i> ; steep grades are a challenge for ADA access
US Route 4/ NH Route 4A intersection improvement	Improve intersection at US Route 4 and NH Route 4A	n/a	Concept	n/a	n/a	Identified in UVLRPC <i>Regional Corridor Transportation Plan</i> ; intersection of US Route 4 and NH 4A is challenging for pedestrians and bicyclists accessing the Northern Rail Trail, particularly at peak commuting times. Creating rail trail access at Payne Rd would limit need for pedestrians and bicyclists to cross US Route 4

Additional Identified Multi-Modal Transportation Needs & Opportunities:

None identified in existing studies and plans.

KEY RURAL CORRIDORS



Planned & Proposed Multi-Modal Transportation Projects:

PROJECT	DESCRIPTION	FUNDING	STATUS	COST	YEAR	NOTES
Resurfacing NH 10 from City urban compact to Hanover town line	Light capital paving of NH 10 (project #18215)	NHDOT Paving Program	Funded	n/a	2022	Opportunity to consider lane striping adjustments for wider shoulders, though limited space exists within narrow roadway
Resurfacing NH 120 from City urban compact to Plainfield	Light capital paving of NH 120/Meriden Rd (project #22202)	NHDOT Paving Program	Funded	n/a	2022	Opportunity to consider lane striping adjustments for wider shoulders
Resurfacing Etna Rd from NH 120 to Etna	Light capital paving of Etna Rd (project #22206)	NHDOT Paving Program	Funded	n/a	2023	Opportunity to consider lane striping adjustments for wider shoulders

Additional Identified Multi-Modal Transportation Needs & Opportunities:

DESCRIPTION	SOURCE	NOTES
Etna Rd truck traffic and bicycle access; narrow/windy roadway	UVLRPC Regional Corridor Transportation Plan	Limited opportunity for lane reconfiguration of existing roadway given narrow roadway/ROW
NH 12A south of Lebanon landfill lacks adequate bicycle shoulder	UVLRPC Regional Corridor Transportation Plan	



SUMMARY OF NETWORK ANALYSIS

OVERVIEW:

To inform the development of the *Walk Bike Ride Leb* plan, a series of analyses of the current pedestrian, bicycle and transit network in the City of Lebanon was conducted. The individual analyses were used to provide guidance on future improvements to the transportation network in the City.

CONTENTS:

Walkability Analysis.....	2
Bicycle Level of Traffic Stress Analysis.....	3
Traffic.....	4
Safety Data.....	5

PREPARED BY:



Upper Valley Lake Sunapee
Regional Planning Commission

WALKABILITY ANALYSIS:

UVLSRPC staff conducted a walkability analysis following the methodology in the table below. Destinations included but were not limited to those relevant to commuters (employment), recreation (both routes and end location, e.g., parks, places of play/sports), education (schools), community and critical services, housing (higher density residential), and food access (grocery).

ANALYSIS TASK	METHOD(S)
1. Conduct a “heat map” of destinations that can be applied to public engagement processes and help reveal network gaps	Use interactive platform to create map showing propensity metrics for pedestrian and bicycle travel and transit access. Metrics that can be shown on map: 1) destination locations/density (employment; recreation; education; services; residential; food access); 2) population density; 3) land use patterns (present & future). Use overlays to create heat map showing ped-bike travel propensity (for bikes - show Hanover/WRJ/Enfield)
2. Pedestrian “Walk Shed” analysis	Use task 1 outputs to identify likely pedestrian walkshed. Use ¼ and ½-mile travel distance using network distance.
3. Pedestrian connectivity analysis	Within pedestrian walkshed, highlight existing sidewalks & low-stress roadways, and network gaps. Incorporate last-mile connections.

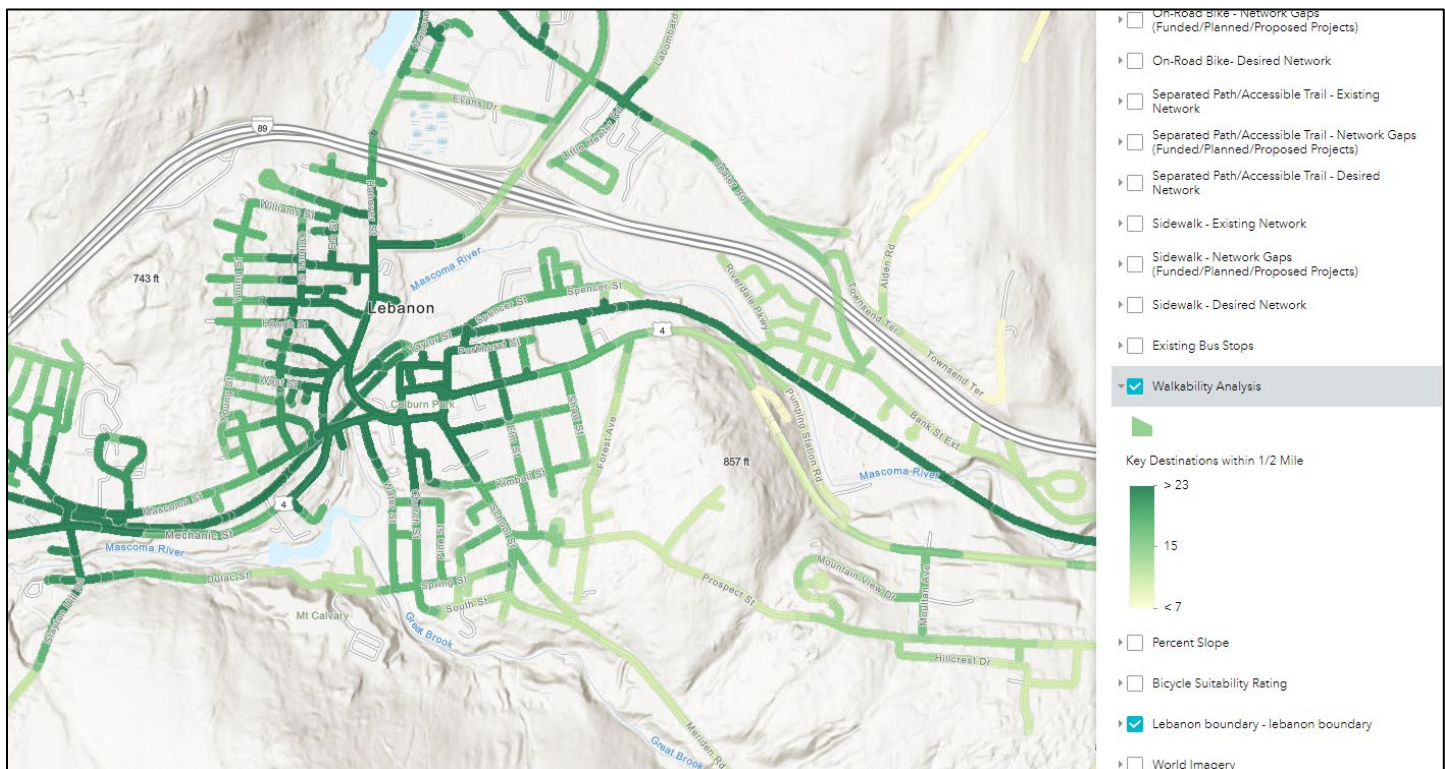


Figure 1. This is a snapshot from the interactive map to illustrate the walkability analysis. Darker green indicates more walkability and lighter green indicates less walkability in the area.

BICYCLE LEVEL OF TRAFFIC STRESS (BLTS) ANALYSIS:

A bicycle level of traffic stress test was conducted using the methodology below. The results were presented in as a suitability rating indicating the types of users that may comfortably cycle on that roadway. The information was used to determine project priorities in areas of identified gaps in the network.

ANALYSIS TASK	METHOD(S)
1. Confirm metrics	Many metrics can be used to inform a BLTS analysis. Metrics have been grouped below into “core” metrics that are foundational to BLTS and “auxiliary” metrics. It can also be useful to perform separate BLTS analysis for intersections vs roadway segments.
2. Roadway segment BLTS	Core Metrics: • Vehicular traffic volume (categorized based on FHWA Bikeway Facility Design Guide) – use existing traffic count data and estimates. • Posted/prevaling traffic speed (MPH categorized) • On-street parking (Y/N) • Striped shoulder presence/width (N/A, <4 ft (5 ft if curbed), >4 ft (5 ft if curbed) • Striped bike lane presence/width (N/A, <4 ft (5 ft if curbed), >4 ft (5 ft if curbed) • Presence of separated bike facility (directly adjacent to roadway) (Y/N)
3. Intersection BLTS	• Presence of right turn lane(s). • Length of right turn lane. • Turn lane configuration (bike lane shifts vs. bike lane continues straight). • Width/# lanes of cross street • Cross street traffic volume • Speed limit/prevaling speed of cross street (MPH) • Presence or absence of median refuge.

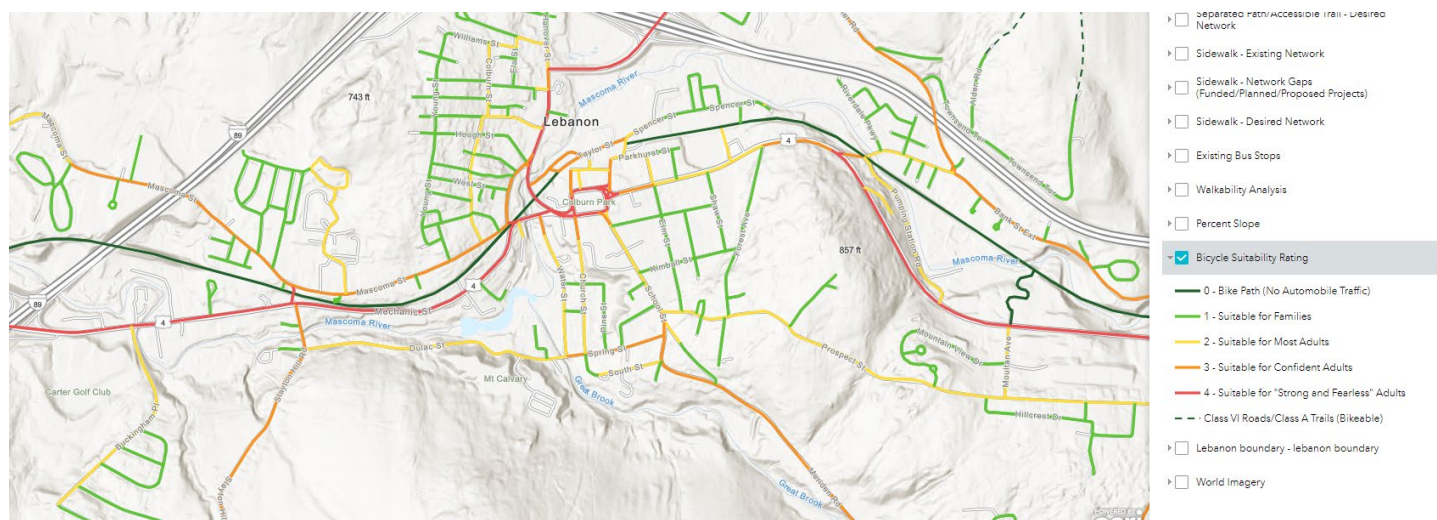


Figure 2. This is a snapshot from the interactive map to illustrate the bicycle suitability rating. Darker green indicates the area is more suitable for families while red indicates the area is suitable for “strong and fearless” adults.

TRAFFIC:

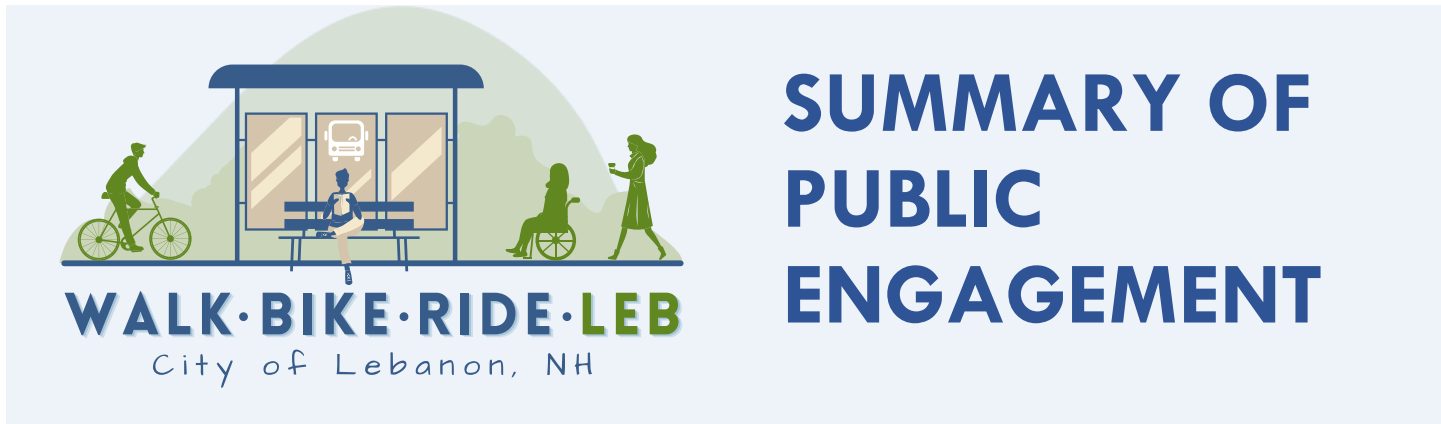
A traffic analysis was conducted to have a better understanding of how people move around and through the City using different modes. In the traffic analysis traffic counts and ridership data were used as well as speed limits to determine traffic flow *challenges*. While this data is not included on the interactive map, it can be found in the *Existing Data Summary*. The methodology in the table below was used to conduct this analysis.

ANALYSIS TASK	METHOD(S)
1. Review traffic, pedestrian, and bicyclist data, collecting information on vehicle and ped-bike volumes to inform level of traffic stress analysis and use of existing ped-bike facilities.	All existing data has been pulled and summarized in <i>Existing Data Summary</i> .
2. Include recent bike-walk traffic counts in Lebanon, such as those conducted by NHDOT, UVLSRPC, and Friends of the Northern Rail Trail.	All existing data has been pulled and summarized in <i>Existing Data Summary</i> . This includes STRAVA data showing relative ped and bike volumes. STRAVA data can potentially be correlated and converted to volume estimates using Mascoma River Greenway/Northern Rail Trail usage counts.
3. Review transit ridership data from Advance Transit.	2018 data has been pulled and summarized in <i>Existing Data Summary</i> .
4. Identify speed limits (MPH) for the primary local and state travel corridors in Lebanon.	Pull from NHDOT GIS database. Work with City staff/perform field visits to verify current posted speeds.
5. National Household Travel Survey (trip distance data) may also be reviewed to validate last mile connectivity needs and potential.	Review as needed. High-level data about trip distance may be useful to highlight the % of trips that are walkable/bikeable distances.

SAFETY DATA:

UVLSRPC staff identified, collected, and derived patterns from recent collision data, with support from Lebanon Police, Fire/EMS, Pedestrian and Bicyclist Advisory Committee and Dartmouth Health Children's to highlight priority improvement locations and needs.

ANALYSIS TASK	METHOD(S)
1. Identify, collect, and derive patterns from recent collision data, with support from Lebanon Police, Fire/EMS, Pedestrian and Bicyclist Advisory Committee (PBAC), Dartmouth Health Children's to highlight priority improvement locations and needs	• Review high-level summary from PBAC. • Develop set of questions to share with Police Department, Pedestrian and Bicyclist Advisory Committee (PBAC), Dartmouth Health Children's ○ Figure out how they use/report data and what can be improved. ○ Facility types for crashes • Acquire crash reports. • Compare City data to NHDOT crash data. • High-level crash review • Identify clusters. 1. Start with GIS data. 2. Verify with City/ChaD data. • Deeper dive into clusters • Identify relevant regs, plans, studies, etc. • Recommendations on standardized data management/reporting
2. Recommend a collaborative regular review and/or common database management approach to evaluate priority improvement needs and track progress over time. Recommend a collaborative regular review and/or common database management approach to evaluate priority improvement needs and track progress over time	Develop based on results of Task 1 Reach out to towns/Regional Planning Commissions for examples



OVERVIEW:

To inform the development of the *Walk Bike Ride Leb* plan, the Project Team conducted a series of public engagement efforts. The goal of the public engagement effort was to invite residents into the planning process by bringing the planning to them. The Project Team utilized existing communication channels in the City and hosted a mix of in-person and virtual events using creative public involvement strategies and tools.

This summary presents 1) a description of the public involvement plan strategies 2) public feedback and survey responses.

CONTENTS:

Public Involvement Plan Overview.....	2
Project Advisory Committee.....	3
Virtual Public Engagement.....	4
Public Survey Summary.....	5
Targeted Outreach.....	6
Other Strategies	8

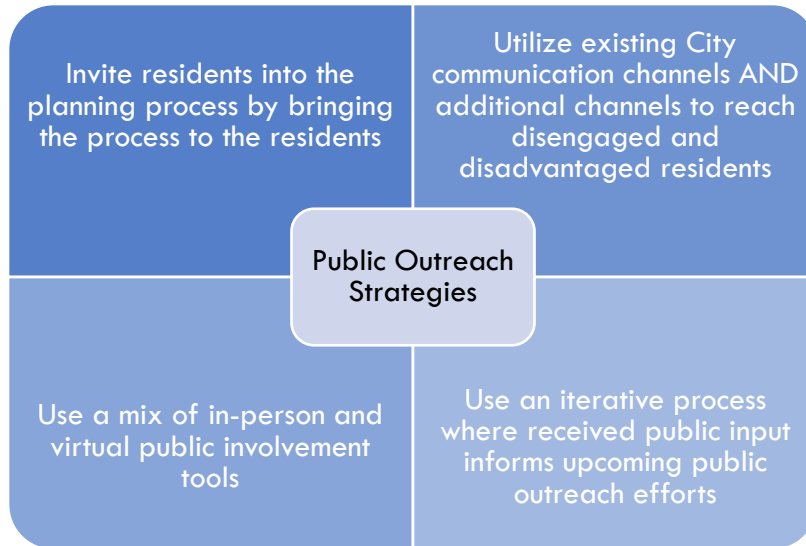
PREPARED BY:



PUBLIC INVOLVEMENT PLAN OVERVIEW:

The public involvement for this project included in-person and virtual engagement efforts. The goals of the public involvement were to reach all types of roadway users including disengaged and disadvantaged residents in order to provide a more comprehensive sense of the multimodal needs in the City.

Public Outreach Strategies



Project Launch Strategy



PROJECT ADVISORY COMMITTEE:

As part of the planning process, a project advisory committee was formed made up of City staff and residents to help guide the process. A list of the members and meeting summaries and materials are below.

Members

PAC LIST			
Name	Representing	PAC/"Friend"	Responsible Party
David Brooks/Rebecca Owens	City Planning	PAC	Planning
Jay Cairelli	City DPW	PAC	Planning
Paul Coats	City Rec & Parks	PAC	Planning
Shaun Mulholland/Paula Maville	City Manager's Office	PAC	Planning
Colin Smith	City PBAC	PAC	Planning/Chair
Marie McCormick	City PBAC	PAC	Planning
Kim Chewning	City Planning Board	PAC	Planning/Chair
Tim Cohen	Police Dept	PAC	Planning
Van Chestnut	Advance Transit	PAC	Planning

Meetings and Materials

A series of meetings and exercises were held with the PAC to assist in the drafting of the *Walk, Bike, Ride Leb Plan*.

Meeting 1 Summary:

The goal of this meeting was to introduce the PAC to the project. The highlights from the meeting include a discussion about the purpose of the plan and the PAC, an introduction to multimodal planning, and an overview of the project goals, timeline, budget, and vision.

Meeting 2 Summary:

The intent of this meeting was to briefly review the summary of existing studies and to use that information to identify 5-10 priority locations within the City that are in need of multi-modal improvements. The PAC broke out into groups to perform this exercise utilizing information provided and local knowledge.

Meeting 3 Summary:

The purpose of this meeting was to identify and gather information about priority projects within the identified priority locations. Potential projects were identified, discussed, and ranked to determine priority efforts.

VIRTUAL PUBLIC ENGAGEMENT:

Virtual public engagement efforts started with the creation of a [landing page](#) on the City of Lebanon's website. This site was used as an information gathering place to explain the project, provide contact information, and to host links to the project progress and items including surveys. The City used its Leb Alerts and LebNews systems to spread the word to Lebanon residents of the effort.

Walk Bike Ride Leb

What is Walk, Bike, Ride Leb?

Walk, Bike, Ride Leb will be a plan to create a **safe, comfortable, and connected** walking and bicycling network in the City of Lebanon, including connections to public transportation.

View the project [Story Map](#) for an interactive overview of this planning process!

Why is the City developing this plan?

Over the years, progress has been made towards improving the safety and comfort of walking and bicycling in the City of Lebanon. Some notable achievements include the construction of the Mascoma River Greenway, improved pedestrian safety along the Miracle Mile, and the adoption of a [Complete Streets policy](#).



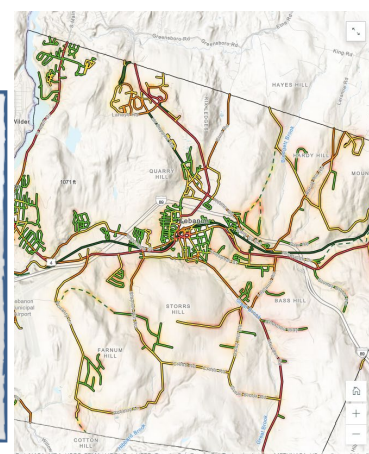
Figure 1. A Snapshot of the project's landing page on the City of Lebanon's website.

INTERACTIVE STORY MAP

UVLSRPC created a story map of the *Walk Bike Ride Leb* initiative using ArcGIS to provide background information and an overview of the project. The interactive story map can be found [here](#). Not to be confused with the planning and detailed ArGIS interactive map (found [here](#)), the interactive story map is a public-facing resource to provide bite-size pieces of the project to ordinary residents. It provides a timeline of previous plans and studies that have been completed. The story map also explains more “technical” information and language like the definitions of multi-use path, painted bike lanes, shared lane markings, etc. The story map highlights the importance of transit stops within the pedestrian and bicycle network and shows the location of these stops. Then, the story map explains how “walkability” and “bicycle suitability” analyses are conducted and their relevance to the project. In sum, the story map provided the public with a quick understanding of the *Walk Bike Ride Leb* initiative and bolstered further public engagement.

Walk, Bike, Ride Leb will be a plan to create a **safe, comfortable, and connected** walking and bicycling network, including connections to public transportation.

Scroll through the steps below to learn how the City is developing this plan. Then, take the quick survey provided at the bottom of the page.



Bicycle Suitability Analysis

This analysis helps show which City roads are more suitable for bicyclists of different ability levels. The analysis includes automobile traffic volumes and speeds; the presence of bike paths, lanes, or shoulders; and the presence of obstacles like on-street parking, commercial driveways, and challenging intersections.

Bicycle Suitability Rating

- Rating
- 0: Bike Path (No Automobile Traffic)
 - 1: Suitable for Families
 - 2: Suitable for Most Adults
 - 3: Suitable for Confident Adults
 - 4: Suitable for "Strong and Fearless" Adults
 - Class VI Roads/Class A Trails (Bikeable)

Percent Slope

- Percent Slope
- Flat/Rolling (0-3%)
 - Moderate (4-6%)
 - Steep (7-10%)
 - Very Steep (10-15%)
 - Extremely Steep (15%+)

Figure 2. Two snapshots from the Interactive Story Map of the project found [here](#).

PUBLIC SURVEY SUMMARY

In March of 2022, we asked how Lebanon residents and transit users feel about pedestrian, bicycle, and public transit infrastructure in their community. We received **410 responses** with 90% of respondents living or working in Lebanon, indicating the remaining 10% of respondents from outside of the community also have a vested interest in ped/bike infrastructure. Respondents also tended to have higher median household incomes than the median household income in Lebanon.

When asked what keeps them from walking and biking, community members listed issues with road safety among their top concerns. Respondents noted their top barriers to walking: 1) a lack of sidewalks, 2) busy road crossings, and 3) traffic speeds. To put it into perspective, **167 community members indicated sidewalk maintenance should be a top priority**, and 159 community members indicated road/sidewalk condition discourages them from walking more. Respondents also noted their top barriers to biking: 1) distracted drivers, 2) traffic speeds, and 3) traffic volume with 170 community members saying road conditions discourage them from bicycling.

When zooming in on these specific ped/bike attributes, community members believe **intersections/road crossings, walking/biking to stores and services, and walking/biking to work are in need of more attention**. This indicates a desire to replace low-mileage car trips with more active forms of transportation. However, the current state of safety discourages these behaviors for many community members.

While it is important to illuminate top concerns, it is also important to acknowledge barriers of lesser concern. For example, respondents did not see weather or steep hills at the largest barriers for bicycling or walking. Respondents also did not see access to bus stops or visibility/lighting as items that are in need of more attention. However, it should be noted these priorities can shift from the perspective of accessibility.

For the existing public infrastructure in Lebanon, we asked participants with a mobility limitation or other accessibility challenge to remark barriers based on their experience. **Community members with an accessibility challenge said snow/ice on sidewalks along with sidewalk/road in poor condition were key issues**. Given the fact Lebanon undergoes harsh winters and severe storms, this result was not a complete surprise. However, this may indicate more attention is needed to maintain ped/bike infrastructure year-long.

When asked about what projects are priorities, community members noted three projects that expand locations on the pedestrian and bicycle network. These included the Mascoma Greenway Extension, Colburn Park Ped/Bike Access, and NH Route 12A Commercial Area Access. While priority projects varied based on each respondent's needs and experiences, highly trafficked walk/bike routes reflected these preferences.

Any improvements or maintenance for ped/bike infrastructure require time and resources to accomplish. However, our survey significantly indicates it is worth the investment! **More than 80% of community members think that Lebanon should invest more city funds into pedestrian and bicycle infrastructure.**

In conclusion, our survey illuminated safety and accessibility concerns around pedestrian and bicycle mobility in Lebanon. The survey provided many insights into the types of investments the City should be making to improve community needs.

ONLINE SURVEY RESULTS DASHBOARD

UVLSRPC displayed these survey results online via ArcGIS. The dashboard can be found [here](#).

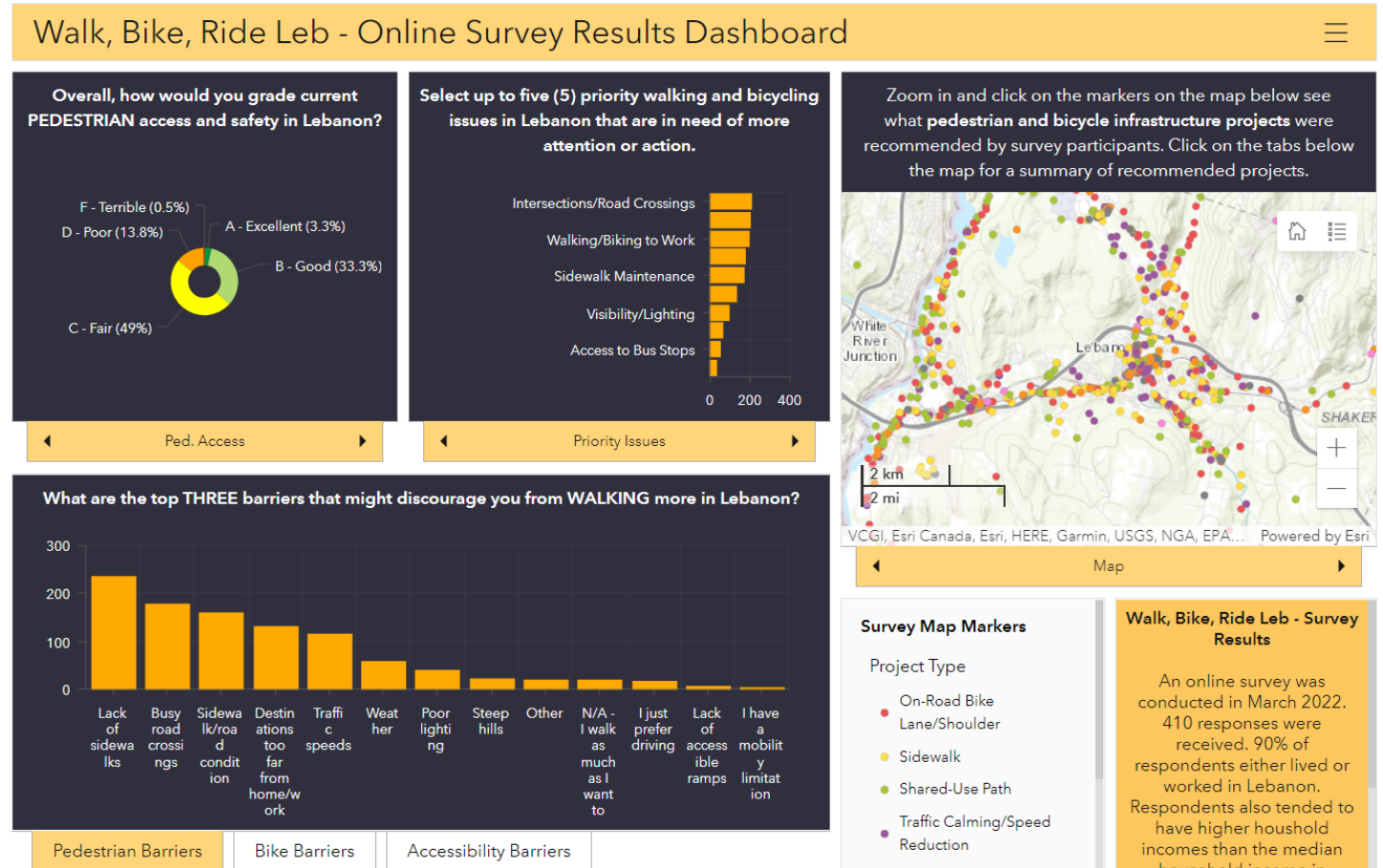


Figure 3. A snapshot of the online survey results dashboard.

Targeted Direct Outreach – User Groups

UVLSRPC reached out to “friends,” or individuals and organizations who could provide critical local knowledge, perspective, and connections, of the City’s Walk, Bike, Ride Leb initiative via email to garner meaningful participation. Staff conducted semi-structured interviews with 10 people using the questions listed below:

1. Describe the population that your organization serves.
2. How would the population your organization serves benefit from better walking, bicycling, and public transit access?
3. How are these goals related to your organizational goals?
4. Are you aware of specific issues or locations where walking, biking, and transit access are a problem?
5. Can you assist us with publicizing our public outreach opportunities as part of this plan?

User Groups

Upper Valley Cycling Club

- The group mostly organizes group rides in the area. The representative noted that the Westboro Rail Yard could be a multi-use path connecting Bridge Street and Mascoma River Greenway. Specific priorities included continuity of MRG to Northern Rail Trail past CCBA, resurfacing of roads not extending to pavement edge (Heater Rd), a

trail from MRG to Boston Lot, and shoulder widening of Heater Rd to Lobambard, NH 120 to Meriden, and Etna Rd to the Hanover Line. Besides from these priorities, utilizing Class XI roads are becoming more of-interest to cyclists. The representative also highlighted how cycling is a way-of-life and opportunity for economic development. For example, Boston Lot is a major mountain biking destination and cyclists support local coffee and bike shops in the area.

SAU 88

- Improving walking, bicycling, and public transit will help children travel to and from school safely and provide reason for educational programs. The biggest problems for Safe Routes to School programs have been the specified times for the walking school bus. This lack of flexibility has created a barrier. There is a small population of students who utilize public transportation to get to school. The school used to have a bike program led by the physical education teacher at the former Middle School, but a lack of crosswalk at the new Middle School was a major barrier. There is potential to reactivate the program given parents feel more comfortable with their children utilizing rail trails and COVID-19 is less of a concern; however, a lack of storage is also a potential barrier. Bringing back marketing and awareness of the SRTS program could be beneficial, especially with new bike/ped opportunities. Many things have been addressed since SRTS Plans were done (US 4 crosswalk, Moulton Ave) and proven successful. For example, “guides” along the Rail Trail resulted in higher Middle School ridership given the need for more bike racks. School zone flashing lights have also been successful at improving safety. The key priorities for the school include improving and connecting sidewalks and increasing awareness (“railroad days,” activity transport, etc.).

West Lebanon Revitalization Advisory Committee

- The representative brought a lot of insight on development. The key priorities included the advancement of planning for multi-use path through Westboro, connections north of Bridge St, and south to 12A. The representative indicated it is hard to prioritize projects without knowing costs. Also, the representative added how there are tradeoffs with any project like reducing parking or adding a bike lane. River Park hopes to adjust and implement a larger Loop Rd for Advance Transit queue and use mitigation payments to Greenway improvements (ARM). There is a “clear mandate” to advance waterfront trail. The top immediate priorities included advance greenway plans, the next phase of land control/planning for Westboro Park, and streetscaping. The representative noted a need for the City to create opportunities for investment, adjust future land use map and zoning, improve transportation, provide more flexibility with minimum parking requirements, and examine shared parking models. Civic engagement is also a critical piece.

GCSCC

- There is limited capacity on buses. The proximity of Rogers House to Advance Transit has been very successful. They organization has limited capacity due to 1 driver and 5 buses. Many of the riders need physical assistance and often use the bus for medical appointments and shopping. The drivers help passengers go from the pick-up point to destination. Paperwork is difficult for paratransit/fixed route. It is tough to get to folks who are rural (not served by paratransit/fixed routes), and the bus does not provide weekend service (given a lack of volunteers). The driver volunteers are also older which creates a sustainability issue for the future. Liabilities and insurance costs have also added pressure to their organization. There are other volunteer organizations that provide similar services. The representative indicated concern over far distances to walk given high fall rates.

Tri-Valley Transit

- The organization has no plans for expansion or additional stops, serving as a true commuter service to DHMC. However, they are open to that discussion in the future. The representative indicated there has not been a lot of feedback regarding pedestrian access. However, pedestrian access through Centerra would make their service more efficient. Bus bike racks have been used.

Upper Valley Running Club

- This group organizes running groups and meet-up points. Smaller groups often run on the rail trail around Lebanon. Large groups and potholes (especially filled with water) can be a safety challenge. Not a lot of spots in Lebanon have a reliable/stripped shoulder even though that feels a lot more comfortable as a runner.

Hanover Bike-Walk Committee

- The representative suggested the City find more wiggle room within the public right-of-way by using “road money.” There are a lot of soft infrastructure options like signage, shoulder/lane striping, process-oriented improvement, and speed limit adjustments that can improve bike/ped safety. There needs to be more coordination amongst transit, bike-ped, road maintenance, and lighting. For example, Lebanon’s crosswalks are poorly lit. Urban3 has insight of return on investment for ped-bike infrastructure. Some of these insights include the life cycle

cost versus roads. People are much happier/comfortable with NH 120 ped-bike connection from Hanover to Lebanon vs Route 10. Centerra Parkway is a gap for biking. Hardcore cyclists avoid South Main/Route 10 and many grad students need access. Lowering the speed limit on Route 10 would have an immediate impact for cyclists. Wider shoulders can create problems/is challenging. Poor condition create additional challenges. South Main St (Hanover) and Main St (Lebanon) are both being traffic-calmed but the connection between the two suffer from high speeds. The representative noted that Dartmouth wants to develop intercept lots w/ shuttles and the Sachem to DHMC connection for ped-bike-bus is less of a priority. The representative also spoke about micro-mobility strategies. A previous bike share was very inconvenient, lacked stations at destinations, and overall poor bike quality. However, Valley Bikes is a different model to examine. The gap of Route 10 could also use a multi-use path. Further engineering is needed.

Hanover Co-op Food Stores

- The organization has been a part of surveys to identify transportation needs. Centerra access from NH 120 has been challenging. A purple route would help connect Coach, APD, Dartmouth Coach, and Centerra. There have been community forums where some feedback for ped-bike needs have emerged. These consistent observations include how NH 120 is dangerous and that bus options are often inconvenient. Centerra Park has sufficient sidewalk connectivity but there are some remaining gaps. This area is important for the Hanover Co-op. Many co-op employees commute from far away given the lack of affordable housing. Therefore, fewer people can walk or ride. Grocery shopping is a challenge for bikes and buses, however, many people conduct “fill-in” shopping via bus or bike. The representative was also a resident of Plainfield and shed light on the priorities. For example, NH 120 has narrow shoulders, higher speeds, and poor sightlines which are challenges for bicyclists. On 12A, it is very difficult to enter from Trues Brook. Finally, the southern approach to Dry Bridge is also dangerous due to narrow shoulders, poor pavement condition, and curving roads.

UVMBA

- UVMBA had volunteered to build a pe-bike trail from MRG to Boston Lot. However, there has been no funding for trails. The Nature Walk to DHMC is the highest priority with funding to build a pavilion. Hospital access has led to competition for parking but new development would provide a more accessible population. Class XI roads are largely unknown, so adding them to trail maps and providing signage for public access is needed. The City trail maps could also be improved by ongoing maintenance.

Dartmouth College

- The land from Sachem to DHMC is Dartmouth-owned. This connection could be shifted as a paved path or limited access highway to improve connectivity. The college could assist with planning, but the money would only come as part of a redevelopment or matched grant funds. The limited access road would likely get pushback from neighbors, so outreach would be important. Route 10/South Main remains a priority along with intercept lots for the Hanover shuttle at Sachem.

OTHER STRATEGIES:

Meetings with City Boards and Committees

- While key City boards and committees were represented on the Project Advisory Committee, UVLSRPC staff facilitated discussions and planning process updates to these boards directly. This included brief updates on the planning process, and more in depth and/or targeted presentations and discussions.

FARMER'S MARKET OUTREACH RESULTS*

DO YOU THINK THE CITY OF LEBANON IS DOING ENOUGH TO IMPROVE
SAFE AND COMFORTABLE WALKING FOR RESIDENTS? CHOOSE ONE:

The City needs to spend more time and money on improving walking safety and comfort than it currently is.

XXXXXXXXXX

The City is currently spending about the right amount of time and money on improving walking safety and comfort.

The City is currently spending too much time and money on improving walking safety and comfort.

DO YOU THINK THE CITY OF LEBANON IS DOING ENOUGH TO IMPROVE
SAFE AND COMFORTABLE BICYCLING FOR RESIDENTS? CHOOSE ONE:

XXXXXXXXXX

The City needs to spend more time and money on improving bicycling safety and comfort than it currently is.

The City is currently spending about the right amount of time and money on improving bicycling safety and comfort.

The City is currently spending too much time and money on improving bicycling safety and comfort.

GRAB A STICKY NOTE!

DESCRIBE WHAT ITS
LIKE TO WALK, BIKE,
AND/OR USE PUBLIC
TRANSIT IN LEBANON:

"There are places where we feel very safe and places where we feel very unsafe."

*X indicates a sticky note.



SUMMARY OF PROJECT DEVELOPMENT

OVERVIEW:

Limited resources and funding necessitate a method to rank and prioritize bicycle, pedestrian, and transit projects. This section details what informed project priorities and how these priorities developed. There were eight identified priority projects. Three of those projects received conceptual designs and cost estimates by a contracted engineering firm: MRG to Lebanon Ford, MRG to Mascoma Street path, and Meriden Road Ped-Bike Improvements. The City also created two additional conceptual plans and estimates for the Sachem/DHMC Path and MRG extension.

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PREPARED BY:



Upper Valley Lake Sunapee
Regional Planning Commission

PROJECT PRIORITY SUMMARY

The PAC engaged first in a work session to catalog known infrastructure improvements, projects, and locations. The work session resulted in a list of identified projects that could improve the multimodal network when implemented. The WBRL project list was further refined and expanded, with many key projects confirmed for local support, via the project team's interview of various stakeholders and a public survey. The PAC then engaged in a second work session to evaluate community feedback, incorporate new projects, and identify and rank top-priority projects to be implemented based on project readiness and community need. The PAC identified 8 priority projects for a more detailed discussion. These summaries can be found in this document. Ultimately, based on funding, three projects were sent to engineering for initial review and cost estimates.

Table 1. Priority projects identified by the Project Advisory Committee. Projects highlighted in green received conceptual designs and cost estimates by an engineering consultant. Projects highlighted in yellow received conceptual designs and cost estimates by the City.

PROJECT	DESCRIPTION
Sachem – Wilder Dam Path	This path would link up with the Bridge St - Wilder Dam trail (spearheaded by Friends of River Park) to form a key regional connection between West Lebanon and downtown Hanover and bypass of NH Route 10. Potential linkages include the existing utility corridor or a side path along NH 10.
NH 120 Ped-Bike Bridge	A ped-bike bike bridge of NH 120 would create a grade-separated crossing between the DHMC campus and Centerra Park. Previous planning efforts in the NH 120 corridor have identified the terminus of Mt. Support Rd as an ideal location.
NH 12A Riverfront Path	The NH 12A "Riverwalk" would create a safe and accessible pedestrian and bicycle connection along the Connecticut River, bypassing the busy highway commercial stretch of NH 12A/North Plainfield Rd. This connection is facilitated across some private properties via prior site plan approvals; access to other properties would need to be negotiated by the City.
MRG Extension	Extension of the Mascoma River Greenway from the current terminus near Glen Rd approximately 0.4 miles to Riverside Park. Future extension of the Mascoma River Greenway from Riverside Park to Westboro Yards.
Sachem – DHMC Path	Construct an accessible pedestrian and bicycle path from Sachem Village to Medical Center Drive using existing utility right of way.
MRG to Lebanon Ford*	Create an access point between the MRG and Route 4, establishing a connection to commercial areas.
MRG – Mascoma St Path*	Construct a path or trail from the Mascoma River Greenway to Mascoma St near Boston Lot trailhead.
Meriden Rd Ped-Bike Improvements*	Reconfigure road to increase shoulders and provide a dedicated space for pedestrians and bicyclists.

A. Sachem Village to Wilder Dam

Purpose and Need: An existing informal foot path exists in the utility right-of-way. A multi-use path would formalize this connection and serve as a key linkage for the residents between West Lebanon and Downtown Hanover.

Project Description: The path would start at the existing gravel access road at the intersection of Ralston Ln and Haddock Ln in Sachem Village and travel south along the utility right-of-way the existing Boston Lot Lake access trail. The path would then follow the existing trail east to the existing parking area on NH Route 10. The path would then travel south parallel to NH Route 10 to the terminus of the planned trail being advanced by Friends of River Park (adjacent to the Wilder Dam). A crosswalk and rectangular rapid-flashing beacon (RRFB) would be installed where the path crosses NH Route 10. Further evaluation is needed to see if this path would go along the east or west side of NH Route 10. The path would be gated at Sachem Village to restrict vehicular traffic, permit pedestrian and bicycle access, and permit periodic access by Liberty Utilities and City maintenance crews.

B. NH 120 Ped-Bike Bridge

Purpose and Need: There is already a shuttle for employees between the DHMC campus and Centerra Park. However, as activity and development increases in this area, there will be a need to accommodate this growth for all users.

Project Description: This project would involve the construction of a grade-separated ped-bike bridge over NH Route 120, connecting the DHMC campus to Centerra Park. The specific dimensions of the bridge will depend on the exact location, though it is likely that the span will be approximately 125 - 150'. The length and grade to the approach to the bridge will also depend on the location and associated bridge height versus base elevation.

C. NH 12A Riverfront Path

Purpose and Need: Public survey respondents indicated a need to establish a connection between the Home Depot Plaza and Market Street. This area holds unique recreational value and potential to increase commercial activity.

Project Description: In the past, conservation easements running along the Connecticut River behind the route 12-A shopping plaza have been secured. Although not entirely contiguous, it offers a significant opportunity for a future trail that could provide public access to a hidden and beautiful section of the river. However, more project development is needed to answer private property and scope questions.

D. Mascoma River Greenway Extension

Purpose and Need: Currently, the Mascoma River Greenway is heavily utilized by recreationists, bicyclists, walkers, families, people with mobility challenges, people without cars, etc. An extension of the MRG would expand its usage while providing new connections for residents.

Project Description: This project extends the Mascoma River Greenway (MRG), a 10-foot wide paved corridor, 1.3 miles from its current terminus at Glen Road westward to the existing sidewalk network on Route 12A. It will also provide a new access point between sidewalks on Route 4 (Miracle Mile) and the MRG. The MRG is the primary non-motorized travel connection between residential and commercial hubs in West Lebanon and Lebanon but it lacks safe "last mile" access to the 12A and Miracle Mile destinations. The two new segments address the access gap and are anticipated to support a significant increase in non-motorized travel because over 50% of Lebanon's residents live within a half-mile of the MRG, and two-thirds live within one mile. These extensions into West Lebanon are vital for connecting neighborhoods to businesses, schools and parks as well as to the existing multimodal transportation network, including transit. The project scope is straightforward and entails the clearing of existing railroad tracks, laying of sub-base and pavement, conversion of 2 railroad bridges, installation of an earthen ramp, and addition of new railings and decking to an existing wooden bridge.

E. Sachem Village to Medical Center Drive

Purpose and Need: Similarly to Sacem Village to Wilder Dam, a multi-use path would provide a critical connection between where people live and where they work. This will increase walkability and improve quality of life.

Project Description: The project involves creating an accessible, 10-12' multi-use path from Sachem Village to Medical Center Drive using the existing utility right-of-way. This path could be a paved or crushed stone surface. The path would start at the existing gravel access road at the intersection of Ralston Ln and Haddock Ln in Sachem Village and would terminate near the electrical substation on Trailhead Lane. The path would be gated at either end to restrict vehicular traffic, permit pedestrian and bicycle access, and permit periodic access by Liberty Utilities and City maintenance crews.

F. Mascoma River Greenway to Route 4/Miracle Mile at Lebanon Ford

Purpose and Need: Currently, there is no access between the MRG and Route 4, preventing cyclists and pedestrians from accessing commercial areas along this road. By creating an access point, this will expand multi-modal travel along this corridor.

Project Description: The intent of this project is to construct an ADA accessible multi use connection from the sidewalk on Route 4 at the east end of the bridge over the Mascoma River, near Lebanon Ford's parking area, to the existing timber bridge over the Mascoma River Greenway (MRG). And reconstruct an existing non-ADA compliant path from the existing timber bridge over the MRG, then down to the rail trail. The MRG is a 4-mile multi-use separated pathway starting from

the current terminus of the Northern Rail Trail at Spencer Street in downtown Lebanon. The MRG is a core transportation corridor for bikes and pedestrians through the heart of Lebanon and West Lebanon, connecting Lebanon's neighborhoods with workplaces, schools, open spaces, shopping areas, restaurants, a medical center and transit stops.

G. Mascoma River Greenway to Mascoma Street at Bridge over I-89

Purpose and Need: The City recently purchased a residential property at the junction of Mascoma Street and I-89 to help facilitate the construction of an accessible path or trail from the Mascoma River Greenway to Mascoma St. Currently, there is no formal public access from MRG to this section of Mascoma Street.

Project Description: The intent of this project is to construct a bicycle path from just north of the bridge where the Mascoma River Greenway crosses I-89 to Mascoma St., along the north side of the I-89 right of way corridor (adjacent to Valley Cemetery). The path will then cross through a property recently purchased by the City and connect to the access driveway of the Boston Lot trails/conservation area onto Mascoma St. The Mascoma River Greenway (MRG) is a 4-mile multi-use separated pathway starting from the current terminus of the Northern Rail Trail at Spencer Street in downtown Lebanon. The MRG is a core transportation corridor for bikes and pedestrians through the heart of Lebanon and West Lebanon, connecting Lebanon's neighborhoods with workplaces, schools, open spaces, shopping areas, restaurants, a medical center and transit stops. The Boston Lot Conservation area comprises 436 acres with seven miles of trail and recreational access to Dartmouth Hitchcock Medical Center and surrounding neighborhoods.

H. Meriden Rd from Messenger Street to Laplante Street

Purpose and Need: This stretch of Meriden Rd includes residential neighborhoods located a short distance from downtown Lebanon and has minimal shoulders; constructing wider shoulders would provide a dedicated space for pedestrians and bicyclists. Currently, pedestrians and bicyclists use this road, posing serious safety concerns.

Project Description: The intent of this project is to widen the shoulder on one side of Meriden Rd. from the existing sidewalk near Messenger St. to the Goodwin Park entrance, with the goal to improve safety for bicycle users and make the connection to Goodwin Park. This shoulder widening would be as wide as possible while minimizing impacts to Right-Of-Way (ROW) and costs such as extensive retaining walls or slope cuts.



SUMMARY OF IMPLEMENTATION & KEY STRATEGIES

OVERVIEW:

To inform the development of the *Walk Bike Ride Leb* plan, a series of related key strategies were recommended and specific capital improvements with outlined action steps for decision-makers. The key related strategies are non-capital, policy, or programmatic suggestions intended to complement Lebanon's Complete Streets Policy implementation.

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PREPARED BY:



Upper Valley Lake Sunapee
Regional Planning Commission

IMPLEMENTATION PLAN

The Implementation or “Action” Plan is a process to turn multi-modal needs and concepts into projects that are ready to compete for funding and be implemented. The Implementation plan will also be used to track the status of strategies and projects as they are developed. The City will track potential funding opportunities and needed studies for each project listed below. The Summary of Project Development describes how the tier system and priority rankings were developed.

The City will periodically update the list with new projects and add details to active projects. The City will continue to move forward projects while awaiting funding sources. As funding sources become available, the City will look at this list for eligible projects.

The PAC engaged first in a work session to catalog known infrastructure improvements, projects, and locations. The work session resulted in a list of identified projects that could improve the multimodal network when implemented. The WBRL project list was further refined and expanded, with many key projects confirmed for local support, via the project team’s interview of various stakeholders and a public survey. The PAC then engaged in a second work session to evaluate community feedback, incorporate new projects, and identify and rank top-priority projects to be implemented based on project readiness and community need. Projects were ranked into “tier” and “priority” categories.

The tiers delineate “project readiness.”

- Tier I – Shovel ready (cost estimates, general support, sufficient data collected)
- Tier II – Almost there (missing cost estimates/engineering, a data study)
- Tier III – Idea phase (missing clear location or improvement, engineering, unclear support, needs a study)

Since resources are limited, projects were prioritized based on the needs of the community, project advisory committee, relevant stakeholders, and the public. The prioritization criteria can be seen below.

- Priority A – Highest priority (clear need, overwhelming support, network significance)
- Priority B – Medium priority (known need, support, average return on investment)
- Priority C – Lowest priority (wish list item, many constraints – fiscal, social, etc.)

Tier I	Tier II	Tier III
• Fully-developed priority projects that are ready to compete for funding	• Priority projects that may benefit from additional planning or study before competing for funding	• Undefined project concepts that may require significant improvement and feasibility assessments.

TIER	PRIORITY	SCOPE	SUB-AREA	PROJECT LOCATION	PROJECT DESCRIPTION	PROJECT TYPE
I	A	Major	NH 10/Sachem	Sachem Village/DHMC	Multi-use path or accessible trail from Sachem Village to Medical Center Dr	Multi-use path
I	A	Major	Mechanic St - Miracle Mile Corridor	Mascoma River Greenway; Mascoma St	Multi-use path or accessible trail from MRG to Mascoma St/Nature Walk	Multi-use path
I	A	Major	West Lebanon	Mascoma River Greenway	Extend Mascoma River Greenway to Riverside Park; improve connection to Powerhouse Mall	Rail Trail
I	A	Major	Key Rural Corridors	NH 120/School St/Meriden Rd	Improve bicycle level of comfort; widen Meriden Rd roadway / broaden shoulders down to Laplante Rd	On-road bike lane/shoulder
I	A	Major	Downtown	Hanover St from High St to NH 120	Reconstruction of Hanover St; streetscape/traffic calming improvements; intersection improvements at NH 120 and High St; and improved connections to Mall area	Complete Street
I	A	Minor	Mechanic St - Miracle Mile Corridor	Mechanic St/Slayton Hill Rd	This project is the second phase of the Mechanic St improvements to traffic flow. The RR pass would be raised with sidewalks and a roundabout on Mechanic. Also improve bus stop locations, including crosswalk just east of Slayton.	Intersection Improvement
I	A	Major	NH 120 - Mt Support Corridor	NH 120; Etna Rd; Old Etna Rd; Labombard Rd	Pedestrian crossing of NH 120 at Etna Rd; add sidewalk on Old Etna Rd; add sidewalk on Etna Rd to Treetops; add sidewalk on Labombard Rd	Sidewalks; Pedestrian Crossing
I	A	Major	West Lebanon	Westboro	Multi-use path through Westboro from Dry Bridge to Bridge St (West Lebanon Greenway)	Multi-use path
I	A	Major	West Lebanon	NH Route 10/Main St	Streetscape improvements on Main St	
I	A	Major	Mechanic St - Miracle Mile Corridor	Miracle Mile (Poverty Lane to Price Chopper)	Add sidewalk along Miracle Mile from Price Chopper to Poverty Lane	Sidewalk
I	B	Major	West Lebanon	Glen Rd	Riverfront path or sidewalk from terminus of stone dust path at Powerhouse Mall to NH 12A, possibly in conjunction with MRG extension	Off-Road Path
I	B	Minor	West Lebanon	NH Route 10	Stripe wider shoulders for bicyclist travel (reallocate travel lane space)	On-road bike lane/shoulder
I	C	Spot	Downtown	Meriden Rd	Speed feedback sign on Meriden Rd north of Laplante Rd	Traffic calming
I	C	Spot	Downtown	Northern Rail Trail crossings at Spencer St; Bank St Ext; Riverside Dr	Using distinctive crosswalk markings (e.g., hi-vis green) at rail trail crossings	Pedestrian crossing

II	A	Major	West Lebanon	Mascoma River Greenway	Extend Mascoma River Greenway from Riverside Park to Westboro/Dry Bridge; consider alternative/interim connections	Rail Trail
II	A	Major	Mechanic St - Miracle Mile Corridor	Mechanic St (Rivermill to Slayton Hill, south side of road)	Add sidewalk along Mechanic St from Rivermill to Slayton Hill Rd	Sidewalk
II	A	Major	Mechanic St - Miracle Mile Corridor	Mechanic St (Buckingham to Poverty Ln)	Add sidewalks along Mechanic St from Buckingham Place to Poverty Lane and update/relocate AT bus stops near former (at Gardener Supply) including new crosswalk	Sidewalk
II	A	Major	Mechanic St - Miracle Mile Corridor	Mascoma River Greenway; Miracle Mile	MRG access improvement at Miracle Mile: 1) add a safe crossing over Seminary Hill Road, 2) rehab bridge over Greenway and add ADA-accessible route through Ford dealership, 3) update bicycle lanes, 4) make PChopper MRG trail accessible	Multi-use path
II	A	Spot	NH 120 - Mt Support Corridor	NH 120; Heater Rd	Improve pedestrian crossing of NH 120 at Heater Rd	Pedestrian crossing
II	B	Major	NH 10/Sachem	Sachem Village to Wilder Dam	Multi-use path or accessible trail connecting Sachem Village to Wilder Dam	Multi-use path
II	B	Major	Downtown	Colburn Park/US 4/NH 120	Improve circulation and pedestrian access around Colburn Park per 2016 Downtown Vision Study	Complete Street
II	B	Major	Downtown	Taylor St	Multi-use path connecting Mascoma Greenway tunnel to Northern Rail Trail - Phase II: Senior Center to Tunnel)	Multi-use path
II	B	Minor	NH 120 - DHMC/Centerra	Lahaye Dr/DHMC	Construct 4-foot shoulder from Mt. Support Rd to DHMC staff entrance OR sidewalk to Emergency entrance west of Outpatient Center entrance	Sidewalk
II	B	Major	West Lebanon	West Lebanon	Trail from Bridge St to Wilder Dam (West Lebanon Greenway)	Multi-use path
II	B	Major	NH 12A	NH 12A commercial area	Riverfront hardpack, multi-use path or accessible trail from Home Depot plaza to Market St	Multi-use path
II	B	Major	Mascoma Lake	NH Route 4A	Traffic calming measures to reduce bicyclist level of traffic stress	Traffic calming
II	B	Minor	Mechanic St - Miracle Mile Corridor	Mascoma St	Extend sidewalk on Mascoma St from I-89 bridge to NatureWalk, possibly in conjunction with MRG connector (project #3)	Sidewalk
II	B	Minor	NH 120 - DHMC/Centerra	DHMC /Jack Byrne Center	Improve pedestrian connection to palliative care on west side of Loop Rd at DHMC	Sidewalk
II	B	Minor	NH 120 - DHMC/Centerra	Loop Rd from Lahaye Dr to Medical Center Dr	Add bicycle lanes on Loop Rd on both sides	On-road bike lane/shoulder
II	B	Major	NH 12A	NH 12A south of Home Depot	Widen/reallocate space on NH 12A and provide bicycle shoulders	On-road bike lane/shoulder
II	B	Major	West Lebanon	NH 12A/South Main St	Complete bike shoulder gaps along NH 12A/South Main St from Dry Bridge south to existing bike shoulder/CSO project	On-road bike lane/shoulder
II	B	Minor	West Lebanon	US 4/Seminary Hill Rd	Traffic Calming	Traffic calming

II	B	Minor	West Lebanon	Glen Rd Plaza	Improve accessibility of transit stops at Glen Rd Plaza	Accessibility improvement
II	B	Minor	West Lebanon	NH 10	Extend sidewalk along NH 10 from Beyerle St to River Park	Sidewalk
II	B	Major	West Lebanon	US 4 between Seminary Hill and Miracle Mile	Improve (widen) shoulders to create compliant bike lanes on Dudley bridge and bridge lane gap between Miracle Mile and Seminary Hill	On-road bike lane/shoulder
II	C	Major	Downtown	Prospect St	Add sidewalk along Prospect St from Reservoir Rd to Moulton Ave	Sidewalk
II	C	Minor	Downtown	Hough St	Extend sidewalk on Hough St to Granite St	Sidewalk
II	C	Major	Downtown	Bank St Ext east of Heater Rd	Extend sidewalk along Bank St Ext from Heater Rd to Riverside Dr	Sidewalk
II	C	Minor	Downtown	Pumping Station Rd	Traffic calming/speed reduction/discourage cut-through on Pumping Station Rd	Traffic calming
II	C	Minor	Downtown	Eldridge St	Traffic calming/speed reduction on Eldridge St	Traffic calming
II	C	Minor	Downtown	Elm St	Add sidewalk on Elm St north of Bank St; add pedestrian crossing of Bank St at Elm St	Sidewalk; Pedestrian Crossing
II	C	Major	Key Rural Corridors	NH 120/Meriden Rd	Widen roadway and add bicycle shoulders from Laplante Rd to the Plainfield town line	On-road bike lane/shoulder
II	C	Minor	Key Rural Corridors	US 4/Fellows Hill	Increase shoulder width on US 4 on eastbound side at Fellows Hill	On-road bike lane/shoulder
II	C	Spot	Key Rural Corridors	NH 12A; Trues Brook Rd	Add shoulder width at intersection of NH 12A and Trues Brook Rd to allow bicyclists to accelerate	Intersection Improvement
II	C	Minor	Key Rural Corridors	Northern Rail Trail at US 4 park-and-ride lot	Improve accessibility to Northern Rail Trail from US 4 park-and-ride lot	Accessibility improvement
II	C	Major	NH 10/Sachem	NH 10	Traffic calming/speed reduction on NH 10 from downtown Hanover to Gould Rd	Traffic calming
II	C	Minor	NH 120 - Mt Support Corridor	Heater Rd	Widen/reallocate space on Heater Rd and provide bicycle shoulders on both sides	On-road bike lane/shoulder
II	C	Minor	NH 120 - Mt Support Corridor	Labombard Rd	Bike lanes along both sides of Labombard Rd	On-road bike lane/shoulder
II	C	Spot	NH 12A	NH 12A/Walmart	Crosswalk across NH 12A and bus shelter at Walmart	Pedestrian Crossing; Bus Shelter
II	C	Minor	NH 12A	Airport Rd; Airpark Dr	Add bicycle lane/shoulders on both sides of Airport Rd and Airpark Dr	On-road bike lane/shoulder
II	C	Minor	West Lebanon	Maple St	Extend sidewalk on Maple St to NH 10; add pedestrian crossing of NH 10	Sidewalk; Pedestrian Crossing
II	C	Minor	West Lebanon	Maple St	Traffic calming/discourage through-traffic on Maple St	Traffic calming
III	B	Minor	Mechanic St - Miracle Mile Corridor	Mascoma River Greenway	Create accessible connections to MRG from Mechanic St, Buckingham Pl	Multi-use path
III	B	Major	Key Rural Corridors	Etna Rd	Widen roadway and add bicycle shoulders from Etna Rd to Hanover town line	On-road bike lane/shoulder

III	C	Minor	NH 10/Sachem	Route 10N (near Quail Hollow)	Construct new sidewalk from Gould Rd to Quail Hollow Dr	Sidewalk
III	C	Minor	NH 120 - DHMC/Centerra	Centerra Parkway	Drop vehicular travel lane and add bicycle lanes along existing 4-lane section of Centerra Parkway, with new ped crossing and sidewalks into site from sidewalk to main Coop entrance	On-road bike lane/shoulder and sidewalk
III	C	Major	NH 120 - DHMC/Centerra	NH 120	Pedestrian bridge over 120 between Centerra and DHMC area, such as near terminus of Mount Support Road	Ped-bike bridge
III	C	Major	Downtown	Hanover St; Eldridge Park	Multi-use path or accessible trail connecting to Hanover St ped-bridge from Eldridge Park/downtown, including bridge over Mascoma River	Multi-use path
III	C	Major	Downtown	School St	Improve ped-bike safety along School St; including traffic calming	Traffic calming
III	C	Spot	Downtown	Parkhurst St	Pedestrian crossing of Parkhurst St at Spencer St	Pedestrian crossing
III	C	Minor	Mascoma Lake	Payne Rd; Northern Rail Trail	Construct accessible connection to the Northern Rail Trail at Payne Rd	Multi-use path
III	C	Major	NH 120 - Mt Support Corridor	NH 120 north of DHMC/Centerra	Lane drop on NH 120 accomodate bicycle shoulder on both sides	On-road bike lane/shoulder
III	C	Major	NH 12A	Airport Business Park	Add sidewalks in Airport Business Park	Sidewalk
III	C	Major	West Lebanon	NH 12A/Connecticut Riverfront	Multi-use path or accessible trail along the Connecticut River from Westboro to Market St following City sewer line easement	Multi-use path
III	C	Major	West Lebanon	West Lebanon - White River Junction	Formalize ped-bike connection across CT River RR bridge	Multi-use path
III	C	Major	West Lebanon	Bridge St	Widen Bridge St and add bicycle lanes	On-road bike lane/shoulder

PROJECTS CONSIDERED TO BE “FUNDED”

TIER	PRIORITY	SCOPE	SUB-AREA	PROJECT LOCATION	PROJECT DESCRIPTION	PROJECT TYPE
I	A	Major	Downtown	Mascoma/High/Mechanic St	Roundabout; pedestrian crossings	Intersection Improvement
I	A	Major	NH 120 - Mt Support Corridor	Mt Support Rd north of Lahaye Dr	Multi-use path along Mt Support Rd extending approximately 1,200' north of Lahaye Dr	Off-Road Path
I	A	Major	West Lebanon	NH Route 12A/South Main St	Replacement of NH 12A Dry Bridge, including new sidewalks and wider bicycle shoulders	Bridge
I	B	Major	Mechanic St - Miracle Mile Corridor	Mechanic St from Slayton Hill to American Legion.	NH Ten-Year Plan project #42604. Interim incremental improvement project to add sidewalks	Sidewalk
I	B	Minor	West Lebanon	NH Route 10	Stripe wider shoulders for bicyclist travel (reallocate travel lane space)	On-road bike lane/shoulder

RELATED KEY STRATEGIES

Pedestrian and bicycle capital projects are critical for increasing connectivity and facilities. However, non-capital and policy decisions enhance and strengthen overall mobility goals of the City. Strategies were divided into categories: education/engagement, infrastructure design, operations & maintenance, pilot programs, regulations & policy, and safety.

EDUCATION/ENGAGEMENT

Goal: Increase usership of bicycle and pedestrian facilities by utilizing education strategies to increase awareness among community members

Suggested Activities:

- Map showing current and planned bike-walk network including on- and off-street facilities, other markings and features, and speed limits
- Equity / DEI-related recommendations including public participation parameters
- Bolster educational programs including schools, youth instruction
- Bolster ped-bike educational facilities to support City programs and school PE classes (e.g., traffic garden)
- Community signage plan with unified design/branding and wayfinding
- Run ride/route showcase series like Wild About Lebanon
- Driver education
- Recommend for future updates to brand routes e.g., Providence's urban trails network

Education/Engagement

Infrastructure Design

Operations & Maintenance

Pilot Programs

Regulations & Policy

Safety



Figure 1. Example of a "Bike Bus" in Oregon. Source: <https://bikeportland.org/2022/09/21/the-alameda-bike-bus-has-more-than-doubled-in-size-in-just-four-months-364010>

Examples/Resources:

- [Boulder, CO Multimodal Planning Division](#)
- [Environmental Justice Public Participation Checklist for Governments](#)
- [Bicycle Friendly Community Equity and Participation Criteria](#)
- [Spectrum of Public Participation](#)
- [Indianapolis revised Complete Streets Policy](#)
- [Alta Quick Build Guide](#)
- [USDOT National Roadway Safety Strategy](#)
- [Street Mix Interactive Tool](#)
- [New London, NH Bike Rodeo Engagement Materials](#)
- [Bicycle Friendly Driver Initiative](#)
- [Bike Signage Project in Santa Cruz, CA](#)
- [Bike Route Wayfinding Signage and Markings System](#)
- [Providence Complete Streets Plan](#)

INFRASTRUCTURE DESIGN

Goal: Incorporate design principles that promote sustainability, safety, and smart-growth concepts in infrastructure

Suggested Activities:

- Update requirements/design guidance (in Complete Street Policy, Roadway Design Manual, Traffic Calming Bid Specifications with lane widths, shoulders, boulevards, traffic calming criteria, etc.)
- Incorporate green infrastructure into ped-bike projects
- Improve commercial/service offerings in downtown areas/near residential clusters
- Equity/DEI-related recommendations including public participation parameters



Figure 2. Picture of a "shared space" concept. Source: <https://altago.com/wp-content/uploads/Quick-Build-Guide-White-Paper-2020-1.pdf>

Examples/Resources:

- [Alta Quick Build Guide](#)
- [Design Guide for Low-Speed Multimodal Roadways](#)
- [Seattle Design Standards](#)
- [FHAW Self-Enforcing Roadways](#)
- [NACTO Urban Design Guide](#)
- [Green Infrastructure and Bike Design in Utah](#)
- [Boulder County Transportation Master Plan](#)

OPERATIONS & MAINTENANCE

Goal: Strengthen bicycle and pedestrian programs through updating municipal procedures and daily activities

Suggested Activities:

- Provide and support development of public bike/micromobility storage
- Pursue federal funding programs for major capital projects
- Coordination opportunities with related plans
- Continue participating in Upper Valley Transportation Management Association (UVTMA) and Upper Valley Lake Sunapee Regional Planning Commission's Transportation Advisory Committee (TAC)
- Increase staff resources for transportation planning
- Toolkits/checklists (Transit Demand Management etc.)
- Bike Friendly Community designation - timeline, integration, key outstanding actions
- Facility Maintenance Opportunities for Improvement or Regular Review
- Overall criteria for City project prioritization including CIP (noting back to how WBRL priority project list was developed) / Ped-bike checklist for major capital road & bridge projects
- Metrics: prioritizations, tracking success
- Include user data infographics/metrics summary for existing conditions section of plan (not recommendations)
- Update criteria for traffic studies in development review and capital projects
- Do regular multimodal traffic counts/get permanent counters
- Update employee dress code to facilitate more active walk-bike commuting and activity between facilities and become a "bicycle-friendly" workplace
- Travel demand management programs
- Monitor impacts of development to currently low-stress bicycle roads

MEASURING GOAL & OBJECTIVES

Goal and Objectives		Outcome Measures	Region		Trend		New Hampshire	United States	Data Source(s)
Goal			2012	Today	Desired	Observed			Note: Some figures may be influenced by the COVID-19 pandemic.
	Increase use and availability of local and regional transportation options in the Monadnock Region	Average Annual Vehicle Miles Traveled Per Resident	8,553	8,699	🟢	🔴	10,486	9,807	NHDOT and USDOT 2013, 2019 HPMS Data; 2019 NH OSI Annual Population Estimates, US Census Bureau
1	Increase Use & Availability of Sidewalks & Walkways	% of People that Walk to Work	5.2	2.8	🟢	🔴	3.0	2.8	American Community Survey 2006-2010 and 2015-2019 Estimates, US Census Bureau
		Miles of Sidewalk	103.0	105.4	🟢	🟢			SWRPC, 2021
		Miles of Improved Rail Trail		12.0	🟢	🟢			SWRPC, 2021
		Local Complete Streets Policies	0	9	🟢	🟢	13	1,404	Smart Growth America, 2021
2	Increase Use & Availability of Bicycle Infrastructure	# Commute Trips by Bike		1,472	🟢				Strava Metro, 2020 (Cheshire County)
		# Leisure Trips by Bike		23,375					
		% of People that Bike to Work	0.5	1.7	🟢	🟢	1.2	1.8	American Community Survey 2006-2010 and 2015-2019 Estimates, US Census Bureau
		Miles of Bike Lanes	0.7	0.7	🟢	↔️			SWRPC, 2021
		Bicycle Friendly Communities	1	1	🟢	↔️	5	485	
		Bicycle Friendly Businesses	0	2	🟢	🟢	7	1,406	League of American Bicyclists, 2021
3	Use & Availability of Public Transportation	Bicycle Friendly Universities	0	1	🟢	🟢	2	208	
		% of People that Wish the Bus Were Available or Easier to Use		42%	🟢				Cheshire Medical Center Community Survey, 2020 (Cheshire County)
		# of Trips Per Week		21	🟢				Home Healthcare Hospice & Community Services, MOOver, 2021
		# of Stops		37	🟢				
4	Increase Use & Support for Ridesharing & Car Sharing	Route Miles	17.6	18.5	🟢	🟢			SWRPC, 2021
		% of People that Carpool to Work	8.1	7.8	🟢	🔴	8.0	9.8	American Community Survey 2006-2010 and 2015-2019 Estimates, US Census Bureau
		# of Park and Ride Lots	1	1	🟢	↔️			SWRPC, 2021
		# of Park and Ride Parking Spaces	35	35	🟢	↔️			
5	Increase Awareness & Support of Intercity Bus Services & Rail	# of Commute Smart NH Rideshare Participants		4	🟢				Commute Smart NH, 2021
		# of Stops	1	1	🟢	↔️			Greyhound, 2021
6	Implement Non-Transportation Strategies to Replace Vehicle Trips	# of Trips Per Week		14	🟢				Greyhound, 2021
		% People that Work from Home	7.4	9.8	🟢	🟢	4.3	5.6	American Community Survey 2006-2010 and 2015-2019 Estimates, US Census Bureau
7	Increase Location Efficient Siting of Housing, Jobs and Services	% of People that Live Less than 15 Minutes Away from Work	39.4	34.7	🟢	🔴	27.1	25.5	American Community Survey 2015-2019 Estimates Table B08303, US Census Bureau

-8-

Figure 3. Sample Metrics for Implementing Action Plan. Source: <https://www.mastnh.org/wp-content/uploads/2022/01/MAST-Action-Plan-2021-2030.pdf>

Examples/Resources:

- [Employer Guide to Promoting Alternative Transportation](#)
- [Resources for Building a Bicycle Friendly Community](#)
- [Winter Bike Lane Maintenance](#)
- [Decision Support Framework for Cycling Project Prioritization](#)
- [Vital Communities Mobility Checklist](#)
- [Quick Build Prioritization Process](#)
- [Sample Metrics for Implementing Action Plan](#)
- [How to Become a Bicycle Friendly Workplace](#)

PILOT PROGRAMS

Goal: Test novel bike/ped projects to maximize limited resources and generate public enthusiasm

Suggested Activities:

- Tactical urbanism/demo project/quick build project ideas and resources

- Low-cost traffic calming measures
- E-bike program
- (Electric) bikeshare or at least fleet for City employees e.g. meetings between City Hall and DPW and/or Leb Housing Authority



Figure 4. Picture from Vital Communities' E-Bike Lending Library Program. Source: <https://vitalcommunities.org/transportation/upper-valley-e-bike-lending-library/>

Examples/Resources:

- [Calbike Quick-Build Street Design](#)
- [Burlington, VT Quick Build Design](#)
- [Transportation Intervention Objects](#)
- [Quick Build Materials](#)
- [Worcester, MA E-Bike Program](#)
- [Colorado E-Bike Program](#)

REGULATIONS & POLICY

Goal: Reduce regulatory barriers and promote policies that further the adoption of bike/ped projects

Suggested Activities:

- Create dedicated ped-bike capital reserve

- Promote connectivity, walkability through land use regulation, including updated site plan requirements
- Revise Lebanon Complete Streets Policy and/or require annual review with annual actions that go into City Workplan
- Update Lebanon streetscapes policy
- Update Class VI Roads policy
- Adaptive speed management policy

III. The National Walkability Index in Action

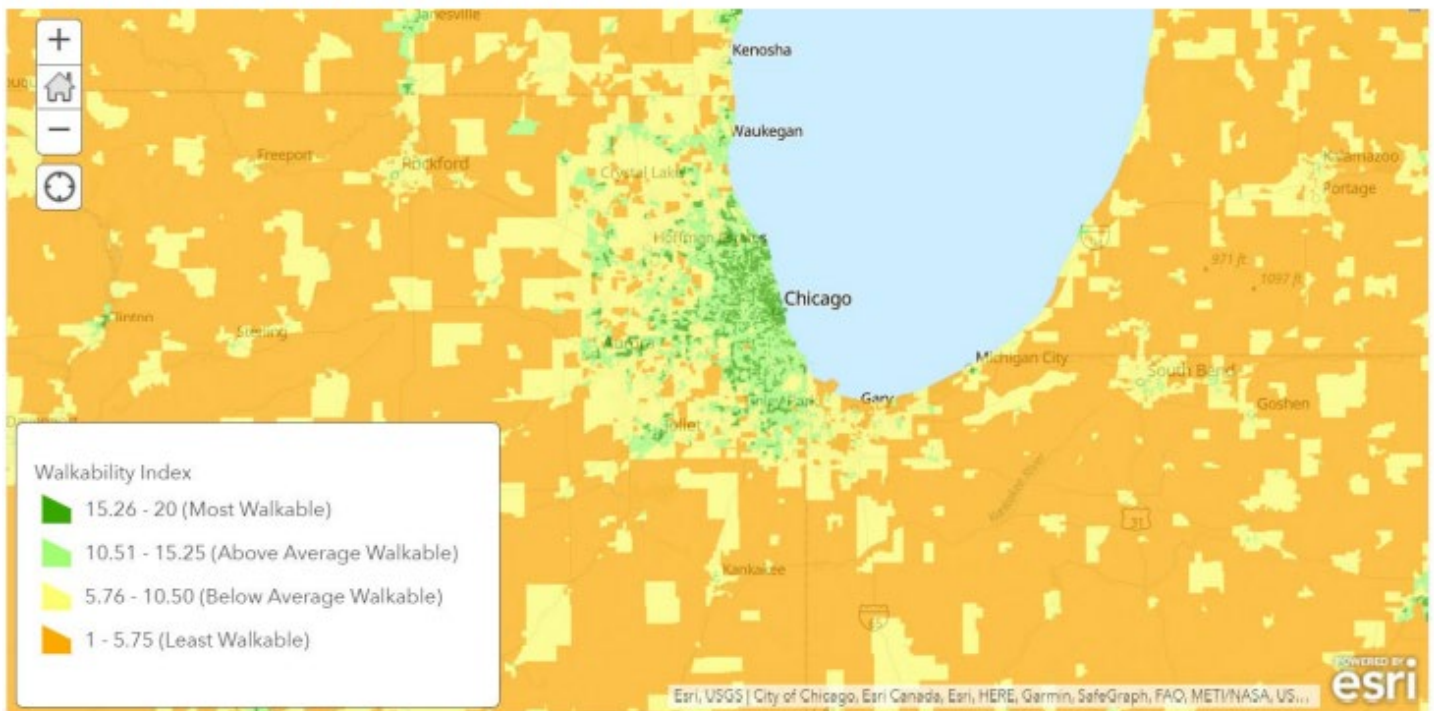


Figure 5. EPA's Walkability Index in Chicago. Source: https://www.epa.gov/sites/default/files/2021-06/documents/national_walkability_index_methodology_and_user_guide_june2021.pdf

Examples/Resources:

- [Guidelines for Regulating Shared Micro-mobility](#)
- [EPA Walkability Index](#)
- [Essentials of Bike Parking](#)
- [Streetscape Policy in Stoughton](#)
- [Durham, NH Class 6 Road Policy](#)
- [Creating a Speed Management Program](#)
- [FHWA Speed Management Strategic Initiative](#)

SAFETY

Goal: Proactively combat safety issues for all biked/ped users and strive towards eliminating all bike/ped accidents

Suggested Activities:

- Integrate Safe Routes to School with WBRL including safe bus stops and crossings

- Adopt Vision Zero
- Improve ped-bike crash data collection/reporting
- Revamp the Safety Committee
- Develop and adopt a Pedestrian and Bicycle Safety Action Plan



Safety Treatment Evaluation (2005-2018)

2022 – New York City Department of Transportation

Sample Size

Safety Treatment	Treatments	Centerline Miles
Road Diets	28	29.1
Conventional Bike Lanes	542	133.8
Protected Bike Lanes	146	36.7
Pedestrian Islands	177	2.1
Curb & Sidewalk Extensions	266	9.5
Turn Calming	107	NA
Leading Pedestrian Intervals (LPIs)	1446	NA

Figure 6. Safety Treatment Evaluation Example. Source: <https://www.nyc.gov/html/dot/downloads/pdf/safety-treatment-evaluation-2005-2018.pdf>

Examples/Resources:

- [New York City DOT Safety Measure Rankings](#)
- [Safe Routes to School Toolkit](#)
- [Boulder's Vision Zero](#)
- [Pedestrian and Bicycle Safety Action Plan](#)

DEVELOPMENT OF KEY STRATEGIES PLANNING DOCUMENT

UVLSRPC staff recommended a collaborative regular review and/or common database management approach to evaluate priority improvement needs and track progress over time. Also, UVLSRPC staff recommended a collaborative regular review and/or common database management approach to evaluate priority improvement needs and track progress over time. Using a spreadsheet in Excel, UVLSRPC Staff created a “living” document for decision-makers to enhance project development of pedestrian and bicycle initiatives (Figure 1). As priorities shift and opportunities arise, maintenance of this document will be paramount. It is recommended that planning staff at the City continue to maintain this document.

The excel sheet enables decision-makers to determine a priority level (1 to 3) for each non-capital project/program. Users then identify the key strategic area listed above. Given financial and temporal constraints, the drop-down menu includes projected costs (low to high) and timeframes (1 year to 10+ years). Rather than providing exact estimates, this process provides decision-makers with high-level considerations. The tool identifies stakeholders involved with each suggested activity and includes examples from other communities.

Priority Level (1 =	Strategy Category	Non-Capital Project/Program	Cost	Timeframe	Document/Project/Rt	Met
1	Education/engagement	Map showing current and planned bike-walk network including on- and off-street facilities, other marking	Low		BFC, WBRL	
2	Education/engagement	Update Lebanon web resources	Low	1 to 2 years		
1	Education/engagement	Equity / DEI-related recommendations including public participation parameters	Low	1 to 2 years	WBRL	
2	Education/engagement	Bolster educational programs including schools, youth instruction	Medium	2 to 4 years	BWANH Youth Instruction	
2	Education/engagement	Bolster ped-bike educational facilities to support City programs and school PE classes (e.g., traffic garden)	Medium	2 to 4 years		
2	Education/engagement	community signage plan with unified design/branding and wayfinding	High	5 to 10 years		
2	Education/engagement	Run ride/route showcase series like Wild About Lebanon	Low	1 to 2 years		
2	Education/engagement	Driver education	Low			
3	Education/engagement	recommend for future updates to brand routes e.g., Providence's urban trails network (combine this with	Medium	2 to 4 years	WBRL	
1	Infrastructure Design	update requirements / design guidance (in CS Policy, Roadway Design Manual, Traffic Calming Bid Spec	Medium	1 to 2 years	Complete Streets Policy	
2	Infrastructure Design	Incorporate green infrastructure into ped-bike projects	High	2 to 4 years	Envision	
1	Infrastructure Design	Add category to master projects list to identify key first and last mile connections	Low	1 to 2 years		
3	Infrastructure Design	Improve commercial/service offerings in downtown areas/near residential clusters	Medium			
1	Operations	provide and support development of public bike/micromobility storage	Medium		Master Plan	
1	Operations	Pursue federal funding programs for major capital projects	Low	2 to 4 years	NA	
1	Operations	Coordination opportunities with related plans	Low			
1	Operations	continue participating in TMA, TAC	Low			
2	Operations	Increase staff resources for transportation planning	High	2 to 4 years		
2	Operations	toolkits/checklists/TDM etc)	Low			

Figure 7. A snapshot of the key strategies tool for bike/ped decision-making.

KEY FUNDING SOURCES

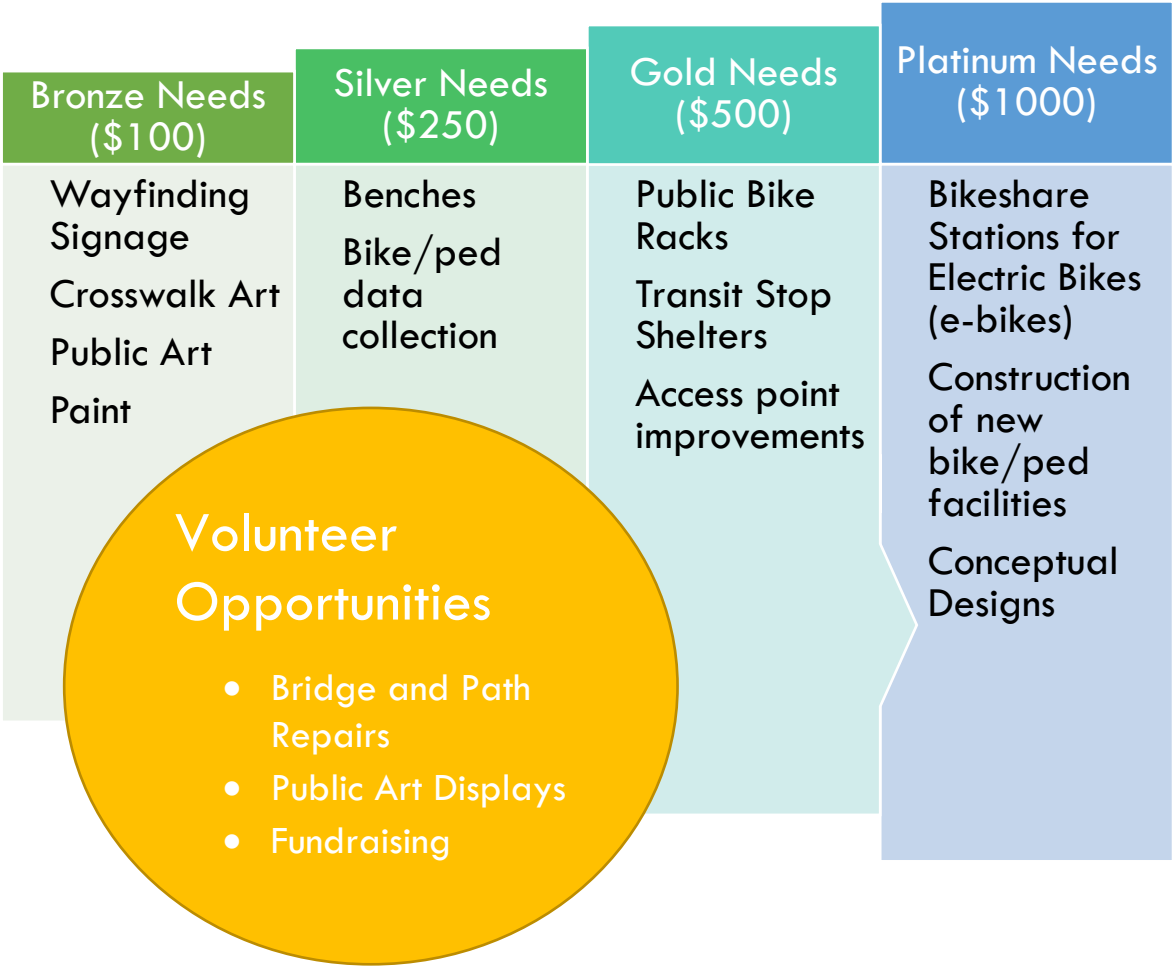
Funder	Program Name	Details
OST Programs	Safe Streets and Roads for All (SS4A) Grant Program	The SS4A program supports the Department's goal of zero deaths and serious injuries on our nation's roadways.
OST Programs	RAISE	The Rebuilding American Infrastructure with Sustainability and Equity, or RAISE Discretionary Grant program, provides a unique opportunity for the DOT to invest in road, rail, transit and port projects that promise to achieve national objectives. Previously known as the Better Utilizing Investments to Leverage Development (BUILD) and Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants, Congress has dedicated nearly \$12.1 billion for fourteen rounds of National Infrastructure Investments to fund projects that have a significant local or regional impact.
FHWA	Congestion Mitigation and Air Quality Improvement (CMAQ) Program	The Congestion Mitigation and Air Quality Improvement (CMAQ) program provides a funding source for State and local governments to fund transportation projects and programs to help meet the requirements of the Clean Air Act (CAA) and its amendments and is codified at 23 USC Sec 149. CMAQ funds support state- and locally selected transportation projects that reduce mobile source emissions in both current and former areas designated by the U.S. Environmental Protection Agency (EPA) to be in nonattainment or maintenance of the national ambient air quality standards for ozone, carbon monoxide, and/or particulate matter. Many types of projects are eligible under the CMAQ program including electric vehicles and charging stations, diesel engine replacements and retrofits, transit improvements, bicycle and pedestrian facilities, shared micromobility projects including shared scooter systems, and more. In addition to improving air quality and reducing congestion, CMAQ projects can improve equitable access to transportation services, improve safety, and promote application of new and emerging technologies.
FHWA	Transportation Alternatives Program	The Transportation Alternatives (TA) Set-Aside from the Surface Transportation Block Grant (STBG) Program provides funding for a variety of generally smaller-scale transportation projects such as pedestrian and bicycle facilities; construction of turnouts, overlooks, and viewing areas; community improvements such as historic preservation and vegetation management; environmental mitigation related to stormwater and habitat connectivity; recreational trails; safe routes to school projects; and vulnerable road user safety assessments.

MULTI-MODAL PLACE-MAKING WISHLIST

The Project Team developed a Walk, Bike, and Ride Related Accessibility and Place-Making Wishlist to be used for fundraising activities. Many of these items include multi-modal accessories that are essential to a comprehensive multi-modal transportation system.

Ready to partner with us on these goals?

Here’s Lebanon’s Walk, Bike, and Ride Related Accessibility and Place-Making
Wishlist





APPENDIX

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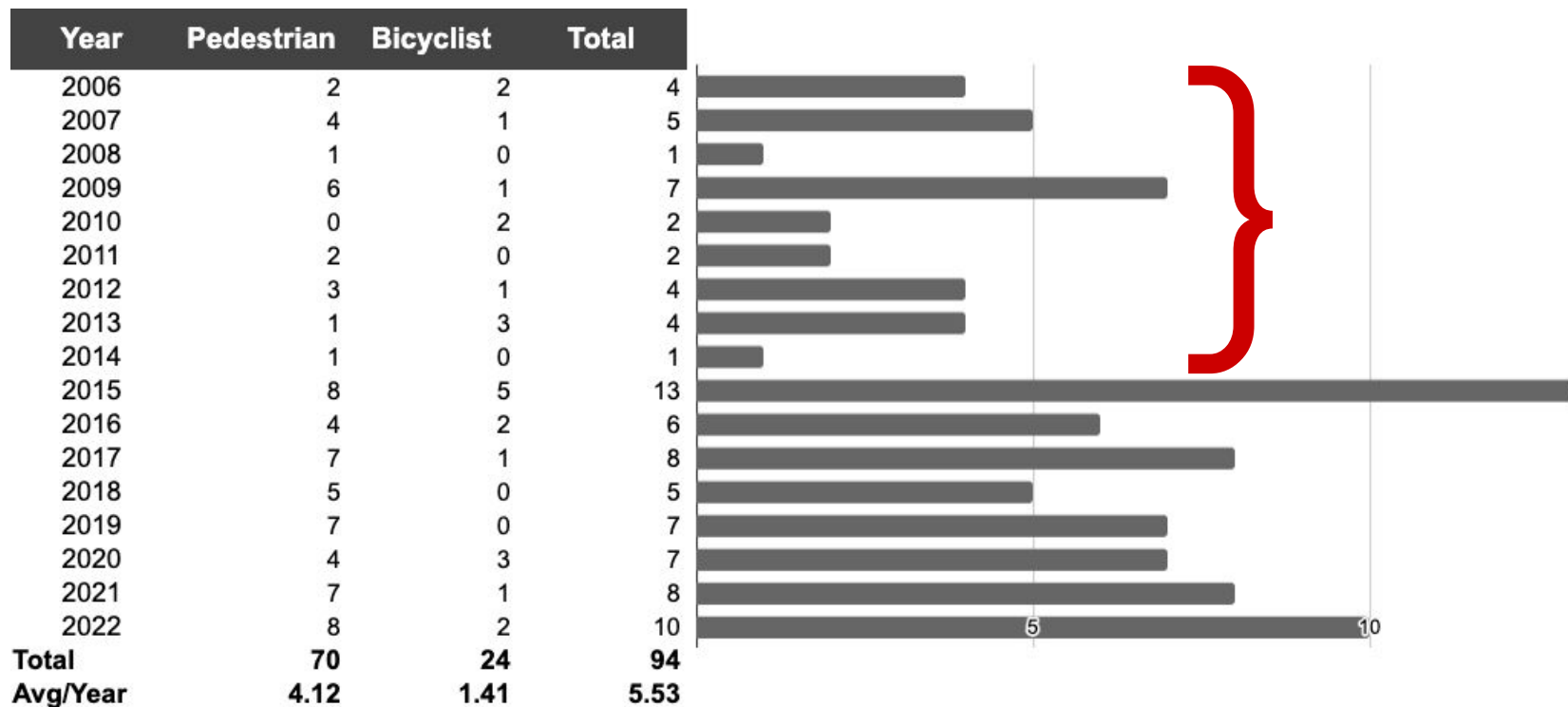
2022 Lebanon NH Pedestrian and Bicyclist Crash Data Analysis

LPBAC Presentation
February 7, 2023
Haynes Bunn

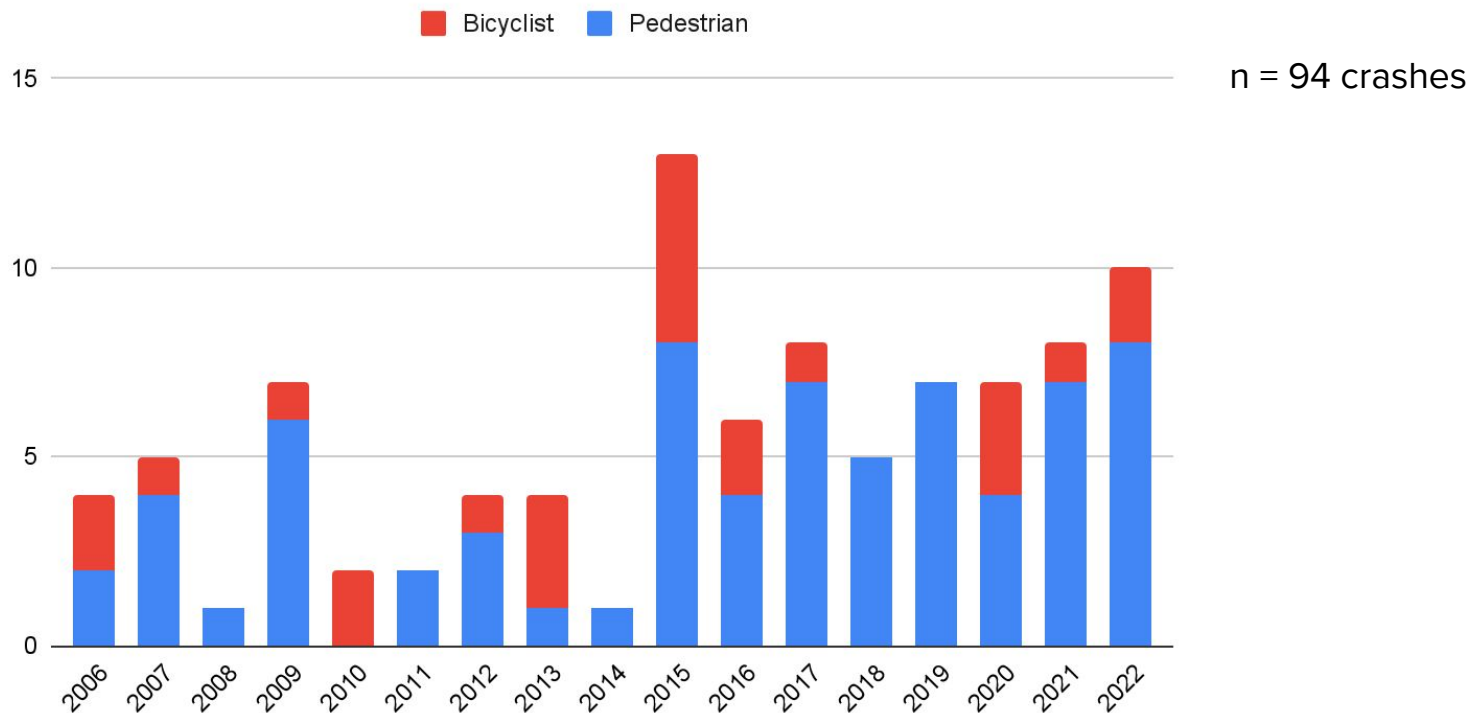
2022 Crash Data Overview

ID	Month	Ped/Bike	Type-Location	Comments
22-001	Feb.	Pedestrian	Parking Lot - Salt Hill West Leb	
22-002	Feb.	Pedestrian	Parking Lot - Boulders Condominiums	
22-003	May	Pedestrian	Parking Lot - Centerra Co-op	
22-004	June	Pedestrian	Parking Lot - McDonald's	Motor vehicle operator had seizure
22-005	July	Pedestrian	Parking Lot - Renihan Meadows	Truck driver backing into parking space, hit ped
22-006	July	Bicyclist	Airport Rd.	Bicyclist hit by motorist exiting Airport Rd.
22-007	Oct.	Bicyclist	Hanover St. @ Summer St.	Walking/Cycling along roadway against traffic
22-008	Nov.	Pedestrian	N. Main St. @ entrance to Circle K	Ped on sidewalk, vehicle turned from N. Main
22-009	Dec.	Pedestrian	Fairview & High St.	Crossing roadway
22-010	Dec.	Pedestrian	Parking Lot - CVS Pharmacy	Crossing roadway

Crashes Involving Pedestrians and Bicyclists 2006-2022*



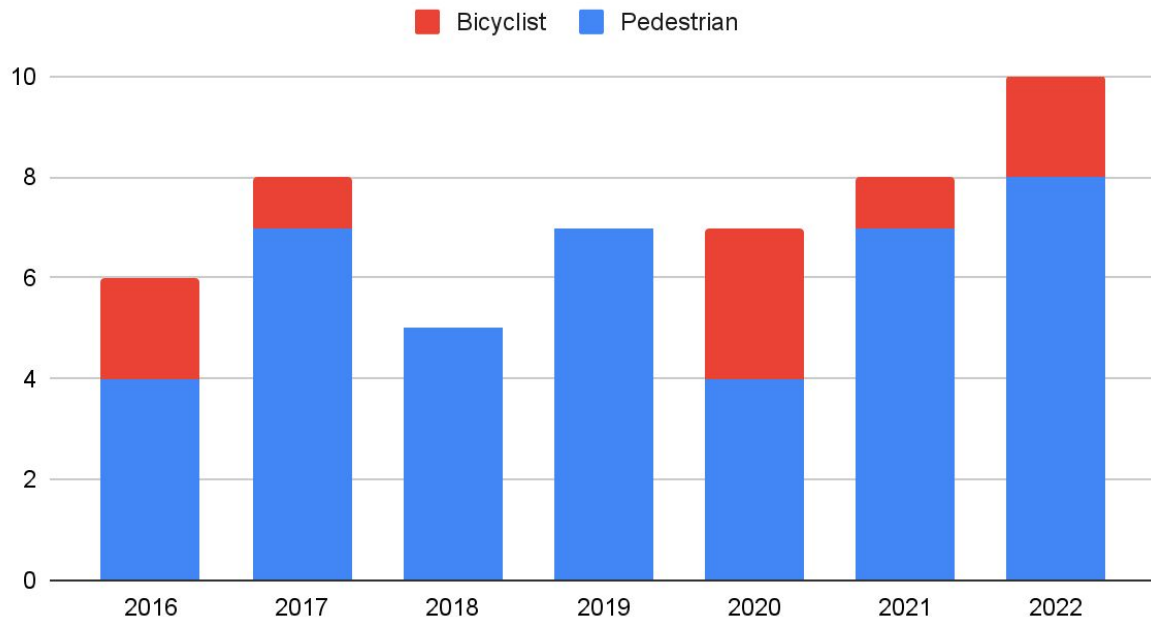
Crashes Involving Pedestrians and Bicyclists 2006-2022*



Crashes Involving Pedestrians and Bicyclists 2016-2022*

By Year

n = 51 crashes

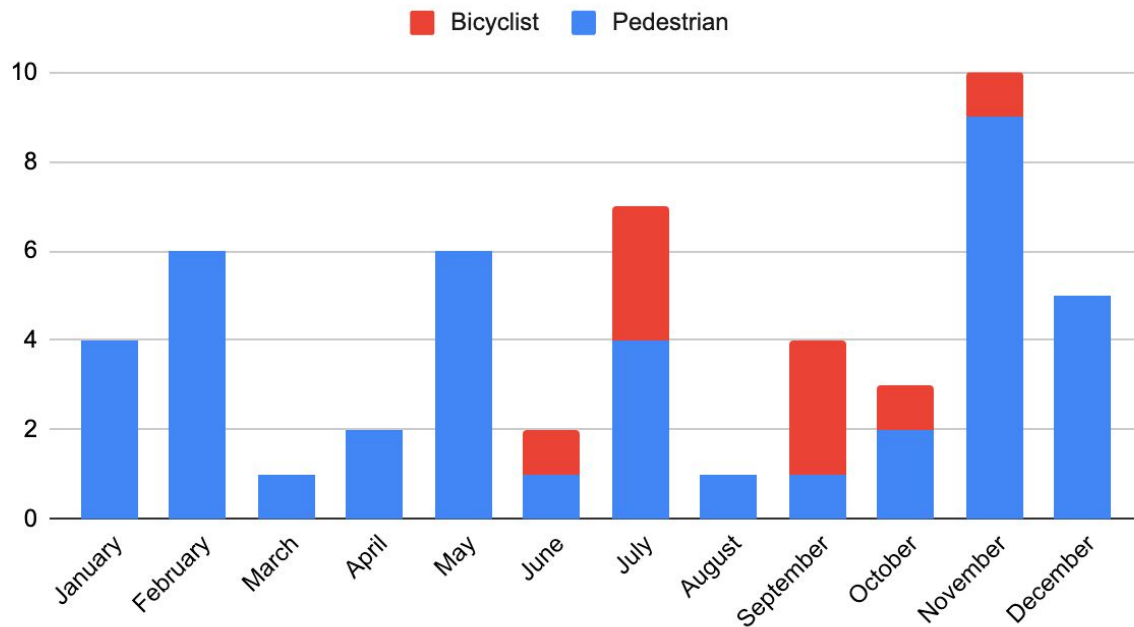


Crashes Involving Pedestrians and Bicyclists 2016-2022*

Month	2022 Pedestrian	2022 Bicyclist
February	2	0
May	1	0
June	1	0
July	1	1
October	0	1
November	1	0
December	2	0

By Month

n = 51 crashes

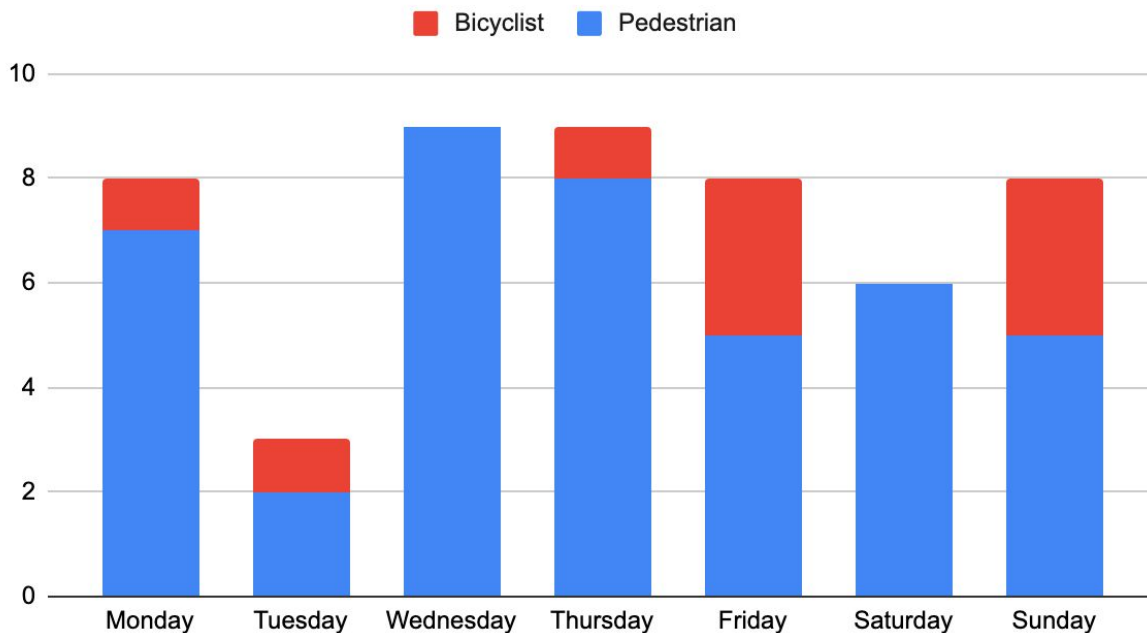


Crashes Involving Pedestrians and Bicyclists 2016-2022*

Day	2022 Pedestrian	2022 Bicyclist
Monday	0	1
Tuesday	1	0
Wednesday	1	0
Thursday	1	0
Friday	2	0
Saturday	1	0
Sunday	2	1

By Day of Week

n = 51 crashes

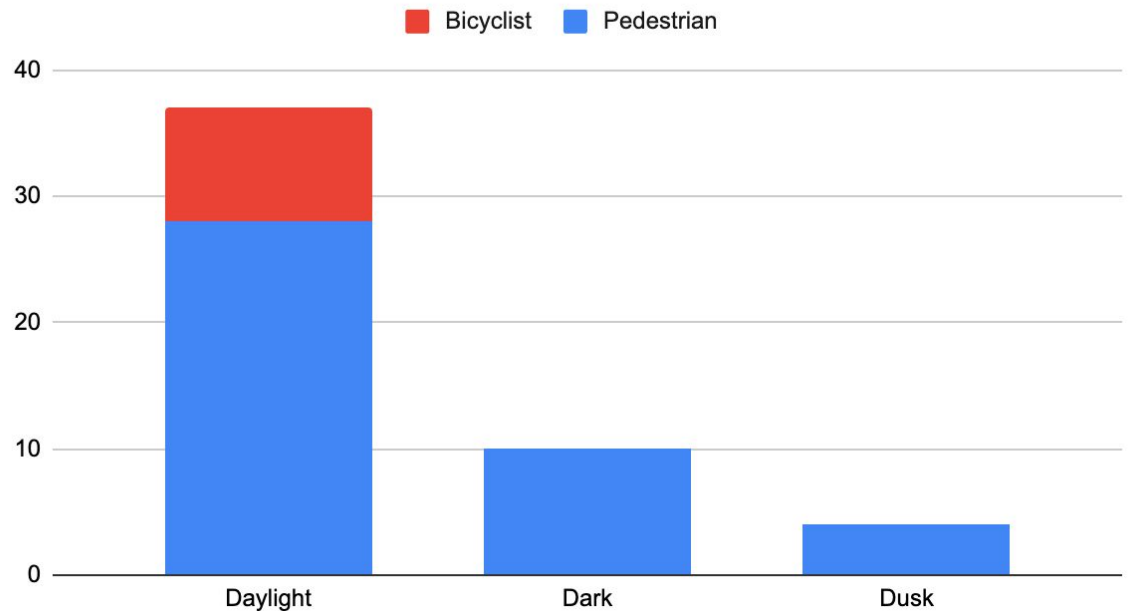


Crashes Involving Pedestrians and Bicyclists 2016-2022*

Light Condition	2022 Pedestrian	2022 Bicyclist
Dark	2	0
Daylight	6	2

By Light Condition

n = 51 crashes



Crashes Involving Pedestrians and Bicyclists 2016-2022*

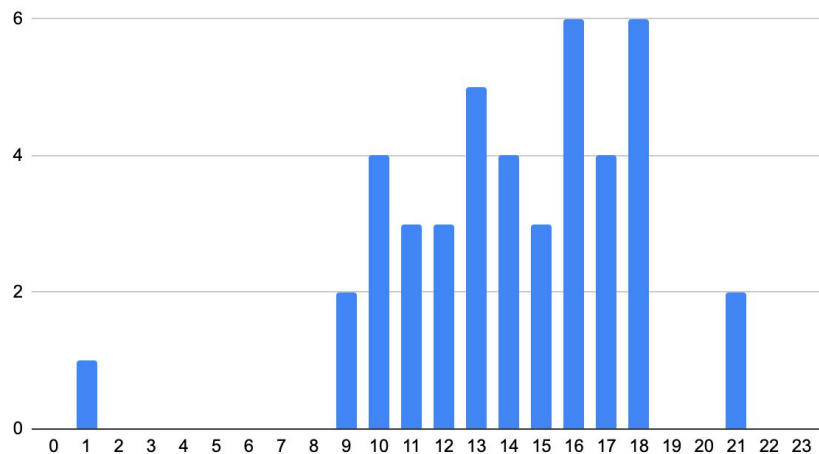
Pedestrians: n = 42 crashes

- 14 (33.3%) in Dusk/Dark
- 28 (66.6%) in Daylight

Bicyclists: n = 9 crashes

- All happened in daylight, which is a change from the 2006 - 2015 dataset
- Between 9am and 4pm

By Time - Pedestrian

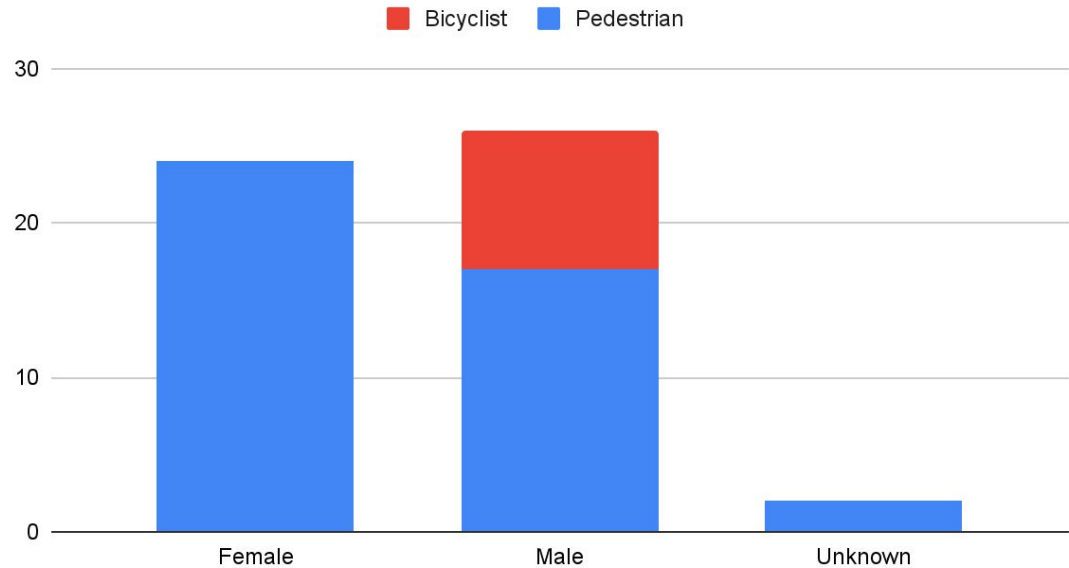


Crashes Involving Pedestrians and Bicyclists 2016-2022*

Sex	2022 Pedestrian	2022 Bicyclist
Female	6	0
Male	2	2

By Sex

n = 52 people

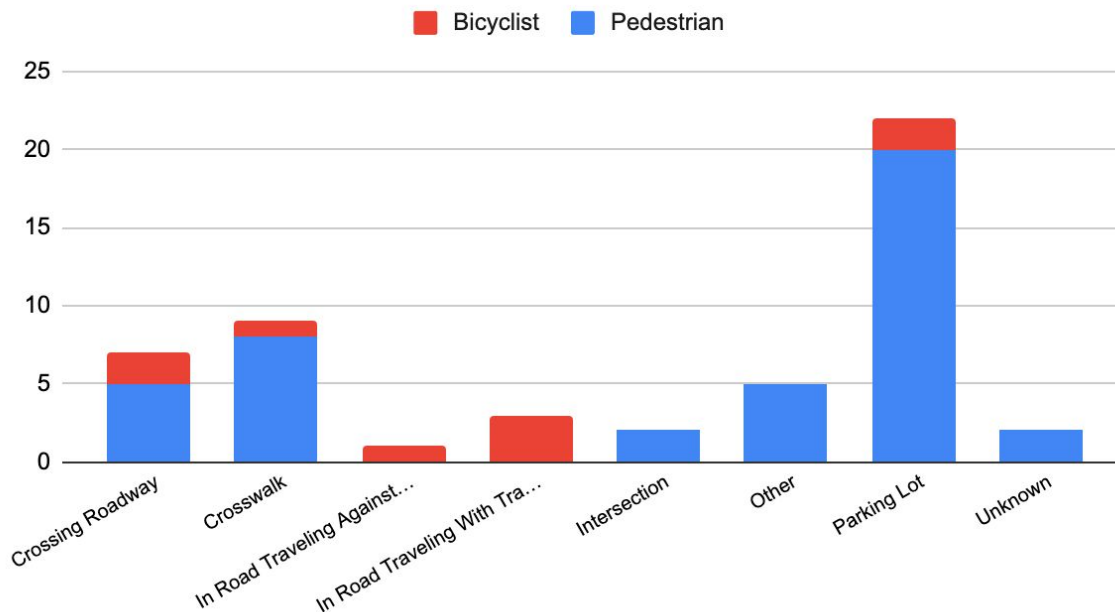


Crashes Involving Pedestrians and Bicyclists 2016-2022*

Location Type	2022 Pedestrian	2022 Bicyclist
Crossing Roadway	1	0
In Road Traveling Against Traffic	0	1
In Road Traveling With Traffic	0	1
Intersection	1	0
Parking Lot	6	0

By Location Type

n = 51 crashes



Crashes Involving **Pedestrians** 2016-2022*

Year	Total Crashes (People)	Parking Lot Crashes (People)	Avg. Age Parking Lot	Avg. Age All Peds	Comments
2016	4	1	71	63.5	- 2 people age unknown
2017	7	5	68.8	59.3	
2018	6	3	32.7	39.7	- Includes a 7 and a 17-year-old - 1 crash w/ 2 peds
2019	7	3	57	55.5	- 1 person age unknown
2020	4	0	N/A	56	
2021	7	3	60.7	45.6	
2022	8	6	48.8	45	

n = 43 people

Crashes Involving **Pedestrians** 2016-2022*

n = 43 people

Injury Type	Total Ped Crashes	Dusk/Dark Ped Crashes	% of Crashes when Dusk/Dark
None	4	0	0%
Minor	27	9	33.3%
Moderate	5	2	40%
Serious	4	2	50%
Fatality	1	1	100%
Unknown	2	0	0%

Analysis/Discussion - Overall

- Caveat: yearly numbers are small in terms of drawing conclusions from data trends.
- Data collection seems to be getting more standardized (as far as I can tell looking back at older datasets). This is great and very helpful for analysis. Are there things we can do to further or help with this?
- Reports no longer include data about the Motor Vehicle, but some things could be helpful like vehicle make/model/size/height. Do we know why this is the case?

Analysis/Discussion - Pedestrians

- Parking lots remain a common area for crashes
 - In 2016, 2017, 2019, 2021, and 2022, average age of those in parking lot crashes is higher than the average age of all pedestrians in crashes
- Since 2016, have had a pedestrian crash in every month (combined)
- In aggregate, November has the highest number of pedestrian crashes
- By raw numbers, most crashes happened in Daylight, but can we otherwise adjust these for volumes? (ie: if Dark/Dusk accounts for x% trips but 2x% crashes?)

Analysis/Discussion - Bicyclists

- 9 crashes 2016 - 2022
- Since 2016 all bicyclists in reported crashes were male
- All in Daylight
- All in June - November
- Most likely to occur on Friday or Sunday

CONCEPT 1: MULTI-USE PATH OR ACCESSIBLE TRAIL CONNECTING SACHEM VILLAGE TO WILDER DAM*

*Please note the following descriptions are working notes. These notes do not reflect current project statuses or priorities.

Define the project, including project areas, extents, and desired dimensions/design elements;

Create an accessible, 10-12'-wide multi-use path between Wilder Dam and Sachem Village using an existing utility right-of-way. This path could be a paved or crushed stone surface. Crushed stone would be somewhat less expensive but would require more periodic maintenance, and would not hold up as well to winter maintenance.

The path would start at the existing gravel access road at the intersection of Ralston Ln and Haddock Ln in Sachem Village and travel south along the utility right-of-way the existing Boston Lot Lake access trail. The path would then follow the existing trail east to the existing parking area on NH Route 10. The path would then travel south parallel to NH Route 10 to the terminus of the planned trail being advanced by Friends of River Park (adjacent to the Wilder Dam). A crosswalk and rectangular rapid-flashing beacon (RRFB) would be installed where the path crosses NH Route 10. Further evaluation is needed to see if this path would go along the east or west side of NH Route 10. The path would be gated at Sachem Village to restrict vehicular traffic, permit pedestrian and bicycle access, and permit periodic access by Liberty Utilities and City maintenance crews.

In its entirety, this path would be approximately 1.8 miles long:

- Approximately 1.51 miles along the utility ROW from Sachem Village to the Boston Lot Lake trail;
- Approximately 1,100' feet along the existing Boston Lot Lake trail;
- Approximately 600' feet along NH Route 10 from the Boston Lot trailhead to the Wilder Dam/River Park trail.

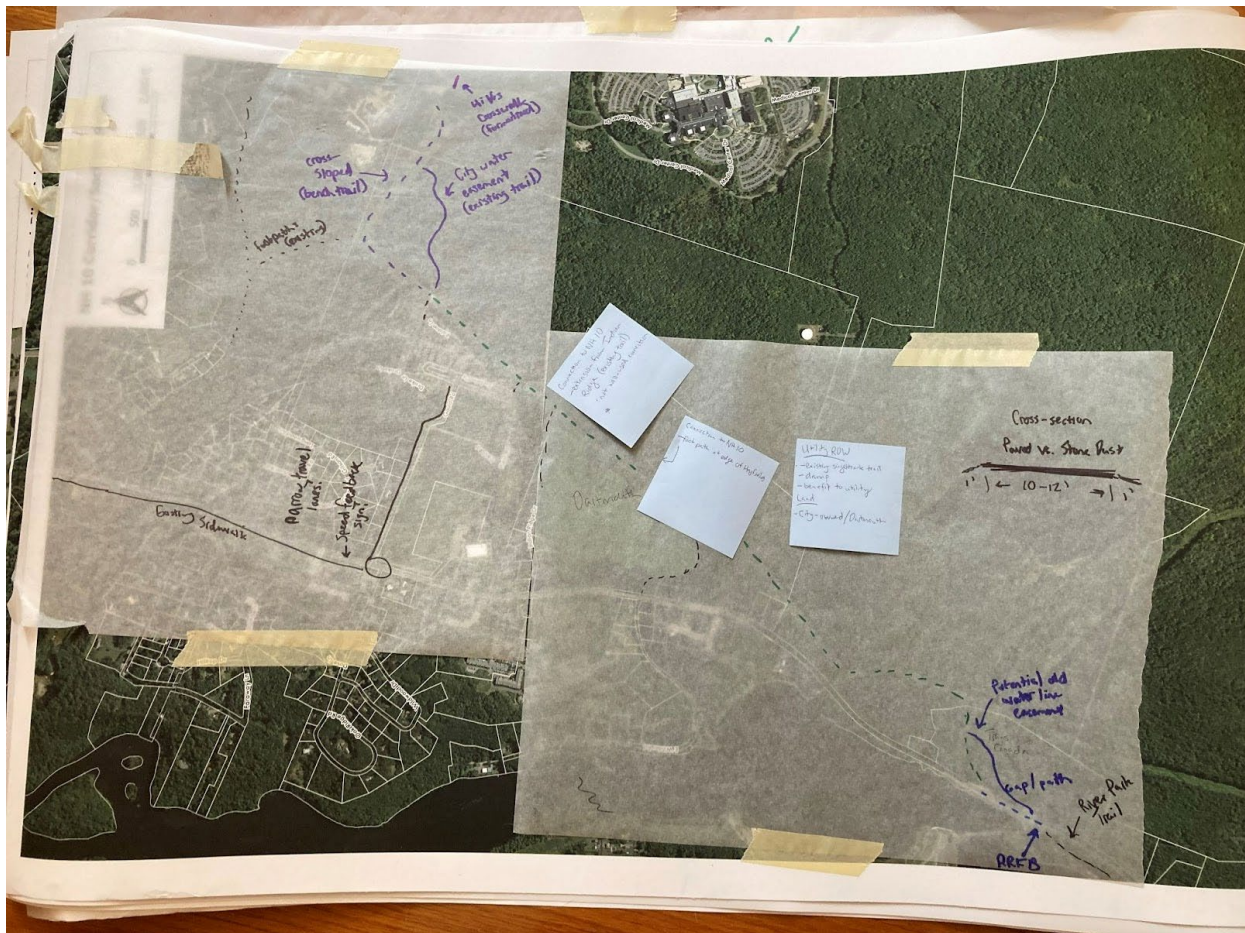
Once completed, this trail would form a key linkage between other proposed trails to create a continuous trail connection from Bridge St in West Lebanon to Sachem Village and DHMC, totaling 3.6 miles.

A second phase of this project would involve creating access trails from locations along NH Route 10 north of the Boston Lot trailhead. Two access points are proposed for consideration:

A trail connection from the end of Indian Ridge Dr (approximately 1,500'). This would involve formalizing an existing and infrequently-used trail that currently connects Indian Ridge Rd to the utility right-of-way.

A trail connection starting at NH 10 across from East Wilder Rd and following the woods line around hayfields to the utility right-of-way (approximately 1,800').

Sketch out concept designs (e.g., roadway layouts, cross sections with dimensions, etc);



Note feasibility challenges (e.g., terrain constraints, land ownership, etc):

It was noted that areas along the utility right-of-way may be wet. The proposed path does cross one mapped wetland area along the Boston Lot Lake outlet stream. The right-of-way travels along the base of some steep slopes; there are not notable areas of steep slope along the right-of-way itself, though there may be ephemeral streams and drainages that would need to be accommodated.

The existing section of trail from Boston Lot trailhead to the utility right-of-way is somewhat steep.

The northern part of the corridor is owned by Dartmouth College Trustees. The City of Lebanon owns the portion of the corridor closer to Boston Lot Lake. The area around the Boston Lot Lake trailhead adjacent to NH Route 10 is owned by TransCanada Hydro.

Identify multi-modal connection opportunities (e.g., transit access improvements):

The Advance Transit Orange Route serves the NH 10 corridor, but there is not an obvious opportunity to connect into the transit network from this proposed path.

Identify potential implementation opportunities (e.g., CIP, developer exaction, grants, etc):

Given the size and scope of this project, it is most likely a candidate for pursuing outside funding via federal programs, earmarks, or another funding source.

While the River Park trail from Bridge St to the Wilder Dam has already been identified as a potential candidate for mitigation funding from the Wilder Dam FERC relicensing process; this project could be considered an expansion of that

project for the purposes of securing funding. At this time it is not clear if any funds will become available through the relicensing process.

For some projects, identifying multiple alternatives and interim improvements (including the preferred alternative) may be useful.

An existing informal foot path exists in the utility right-of-way. The path is somewhat overgrown, not actively maintained, and not accessible in the winter.

The only somewhat-reasonable alternative for this corridor would be a separated multi-use path along NH Route 10. While such a path would be more direct and convenient, it would likely be far more expensive due to 1) the steep terrain along NH Route 10; and 2) the need to establish a right-of-way for the path through numerous private properties.

The section of NH Route 10 from the Boston Lot trailhead to the Wilder Dam could potentially be bypassed via City-owned water main easement.



Identify lead/key point of contact(s) for project development/implementation; identify key partners/parties.

- City: Planning & Development; DPW, Rec and Parks, PBAC, Planning Board, ConComm
- Dartmouth College Trustees & Planning Office
- TransCanada
- Liberty Utilities
- Upper Valley Mountain Bike Association

Identify needed information/resources for consulting engineer to advance project concept/cost estimate.

Preliminary conversations with Liberty Utilities may be beneficial before proceeding with project development. Assemble information on NH recreational statues and examples of trail projects in utility corridors to share.

A more well-defined understanding of natural resource conditions along the utility right-of-way (wet areas, stream/drainage crossings, etc) will assist with assessment of feasibility and cost.

CONCEPT 2: PED-BIKE BRIDGE OVER NH 120 AT THE NORTHERN TERMINUS OF MT. SUPPORT RD*

*Please note the following descriptions are working notes. These notes do not reflect current project statuses or priorities.

Define the project, including project areas, extents, and desired dimensions/design elements;

Construction of a grade-separated ped-bike bridge over NH Route 120, connecting the DHMC campus to Centerra Park. The specific dimensions of the bridge will depend on the exact location, though it is likely that the span will be approximately 125 - 150'. The length and grade to the approach to the bridge will also depend on the location and associated bridge height versus base elevation.

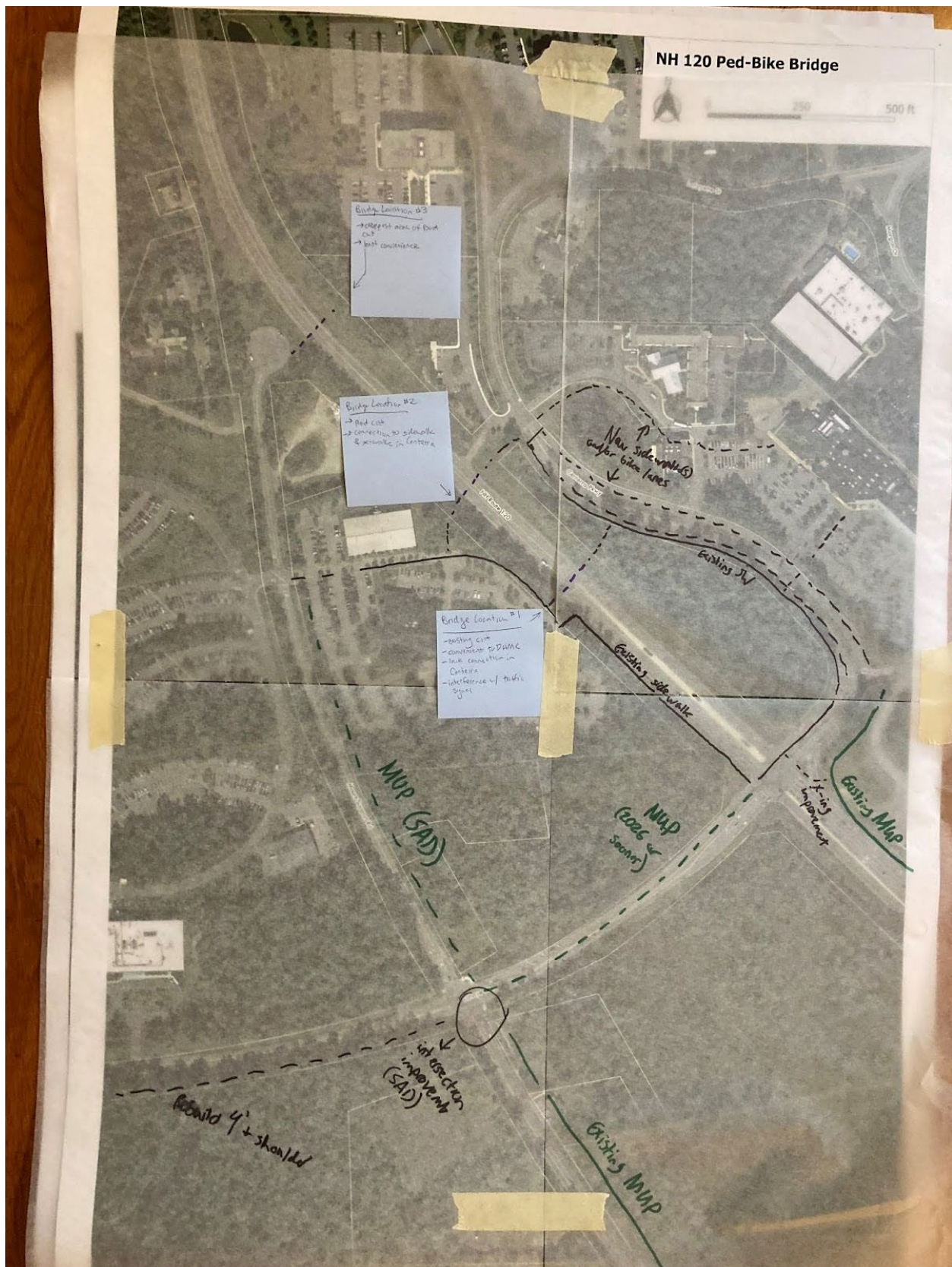
Three potential locations were identified:

- Location #1: approximately 750' northwest of Lahaye Dr (just passed the end of the median in NH 120). This location would be most convenient to the existing DHMC campus and would be accessible via existing sidewalks from Colburn Hill and along NH 120. A modest road cut would assist with the bridge achieving the desired height. The proximity to the traffic signal at NH 120/Lahaye Drive would potentially poses challenges.
- Location #2: approximately ¼-mile northwest of Lahaye Dr (at the gated service access to Centerra Park). This location would connect to an existing crosswalk on Centerra Parkway (just east of the Wells Fargo driveway) and would also be accessible from existing sidewalks near Colburn Hill.
- Location #3: at the northern terminus of Mt. Support Rd. This location would utilize a deeper cut in the roadway, and would be the most convenient location if new housing were to be developed north of Centerra Parkway. However, it would be less convenient for existing DHMC & Centerra Park facilities/businesses.

With all potential locations, it was noted that it is unlikely that residents living on Mt. Support Rd would opt to use the bridge except in specific circumstances. The need for the bridge seems to be more driven by activity and development on the DHMC campus and in/near Centerra Park. It was also noted that there is an existing DHMC-Centerra shuttle for employees, which may be a more convenient option. Ultimately, it was noted that the ideal way forward may be to develop the ped-bike bridge concept, then “hibernate” it until the need for it is triggered by proposed developments in the area.

Additionally, it was noted that a larger sub-area plan for ped-bike connectivity is needed as part of a future ped-bike bridge concept. For example, Centerra Parkway is currently deficient in many ways for ped-bike access, and would need to be improved in order to facilitate access to the bridge. See the sketch below for more details.

Sketch out concept designs (e.g., roadway layouts, cross sections with dimensions, etc);



Note feasibility challenges (e.g., terrain constraints, land ownership, etc);

A primary feasibility constraint is the presence of other options for crossing NH 120 (i.e., Lahaye Drive intersection and planned MUP) that may be more convenient for potential users. A robust cost-benefit lens should be used to evaluate the return on investment for the bridge.

As noted earlier, the ped-bike connections to the bridge would need to be evaluated and improved.

A potential concern from NHDOT will be visual interference with the traffic signal at NH 120.

Identify multi-modal connection opportunities (e.g., transit access improvements):

N/A

Identify potential implementation opportunities (e.g., CIP, developer exaction, grants, etc):

Developer exaction and/or Special Assessment District: The need for the bridge seems to be more driven by activity and development on the DHMC campus and in/near Centerra Park. It was also noted that there is an existing DHMC-Centerra shuttle for employees, which may be a more convenient option. Ultimately, it was noted that the ideal way forward may be to develop the ped-bike bridge concept, then “hibernate” it until the need for it is triggered by proposed developments in the area.

The area behind Jesse’s Restaurant has been considered for housing development for 250-300 units; bridge location #3 could be considered as part of mitigation for such a development.

For some projects, identifying multiple alternatives and interim improvements (including the preferred alternative) may be useful.

Planned multi-use path and NH 120/Centerra Park crossing improvement will provide interim improvement.

Identify lead/key point of contact(s) for project development/implementation; identify key partners/parties.

- City: Planning & Development, DPW, PBAC, Planning Board, ConComm
- DHMC
- Centerra Park businesses/landowners
- NHDOT

Identify needed information/resources for consulting engineer to advance project concept/cost estimate.

N/A

Additional Notes and Resources:

- <https://www.nh.gov/dot/programs/bikeped/documents/october152009uppervalleybicycle.pdf>:
 - “Joanna Whitcomb, Dartmouth College, shared information on Lot 9 and the proposed 390 car parking lot – need to identify how to connect to Greensboro Rd. intersection and to paths leading to the hospital”.

Need to consider connections to existing/planned/conceptual ped-bike network and distance/directness.

- Gather costs from recent ped bridge projects.
- Project could be Special Assessment District 'Phase II' after initial scope of work approved for funding, funded and constructed (intersection/MUP); the boundaries of the SAD would have to be expanded to include Centerra.
- This could be a safer crossing for peds/bikes, could be slightly more direct for DHMC employees going to and from lunch, and would have less impact on the traffic operations of the 120/Lahaye/Centerra intersection. However, it is presumed to be a project costing well over a \$1M. Shaun recently commented that with Dartmouth undergrads occupying part of the Michael’s project on Mt. Support (for at least the next year or two), he could

envision more pedestrian activity between the apartments and the Co-Op for “beer runs”. He is concerned that some inebriated undergrad student is going to get hit crossing the road and wants the City to be planning for alternatives.

- There is a plan for the Special Assessment District to build a multi-use path to the end of Mount Support Road; a pedestrian bridge could potentially link to that or there would need to be sidewalks added on 120 so either way, that linkage (in addition to the ped bridge itself) needs to be integrated with engineering feasibility, design alternatives, and cost estimates.
- Relevant article on pedestrian bridges that features a pretty good case study for this area of NH 120: <http://www.mikeontraffic.com/pedestrian-bridge-safety-vs-convenience/>. I copied the key section below:
 - Recently, Traffic Data Inc. (TDI) helped Kimley-Horn and Associates determine the answer to this question at one location in Columbia Heights, Minnesota. This location had a pedestrian bridge over a busy four-lane divided road with turn lanes. At this signalized intersection, the major road travels north-south and the pedestrian bridge provides for east-west travel on the south side. There are no marked east-west crosswalks across the major road. Other characteristics of the intersection:
 - The distance from curb to curb is about 140 feet
 - The pedestrian bridge adds about 700 feet to the crossing distance
 - The major road has about 25,500 vehicles per day
 - Using two video cameras, one camera pointed at the pedestrian bridge access on one side of the road and the other camera focused on the intersection, we conducted a 24-hour count of how pedestrians and bicyclists cross this major road.
 - From this 24 hours of data collection, approximately 44% of the 170 total pedestrians and bicyclists crossed using the pedestrian bridge. That means the majority picked convenience over safety in this case.

CONCEPT 3: NH 12A “RIVERWALK”: MULTI-USE PATH OR ACCESSIBLE TRAIL FROM HOME DEPOT PLAZA TO MARKET STREET*

*Please note the following descriptions are working notes. These notes do not reflect current project statuses or priorities.

Define the project, including project areas, extents, and desired dimensions/design elements;

- Did survey respondents mean a river side trail or the sidewalks along 12A, which have been improved?
- What is the goal? Who would this serve? Is it for recreation or transportation? Who would maintain it and how and when (year-round use), litter, etc.
- There are safety concerns within Two Rivers Park (drug use, homeless encampments, lack of access for public safety, (additional public access/use may help displace safety concerns)
- Ticks; sensitive natural resources;
- Could businesses and property owners turn some uses around to face the river as an amenity?
- Need to span drainage area between Koto and Applebees
- Better ped/bike connectivity between 12A and the rest of the community could increase potential use of riverwalk

Sketch out concept designs (e.g., roadway layouts, cross sections with dimensions, etc);

Some sort of hardpack path or boardwalk; need to avoid erosion, shoreland concerns

Note feasibility challenges (e.g., terrain constraints, land ownership, etc);

- Land ownership and permission; who will maintain it, how, and when? Potential flooding and erosion concerns; public safety and access; sensitivity of Two Rivers property;
- Cost and logistical issues of trying span Mascoma River between Two Rivers and Wastewater Treatment Plant
- Infringement along planted buffer along the river, creation of informal access points.

Identify multi-modal connection opportunities (e.g., transit access improvements);

Possible connections to AT along Route 12A, but not necessarily more useful than existing sidewalk network.

Identify potential implementation opportunities (e.g., CIP, developer exaction, grants, etc);

- Enforcement of past development approvals; opportunity for new developers to turn uses around to face the river as an amenity; Grants and volunteer labor to re-establish previously built segments
- For some projects, identifying multiple alternatives and interim improvements (including the preferred alternative) may be useful. Interim improvements could entail redevelopment of past segments to see if they would be used, how they would maintained, work out potential issues and concerns

Identify lead/key point of contact(s) for project development/implementation; identify key partners/parties.

Business and property owners that don't already have an obligation to build improvements; (if Staples/JCP aren't willing or interested, is there any point in doing the rest)

Identify needed information/resources for consulting engineer to advance project concept/cost estimate.

Need to answer some basic questions before proceeding

West Leb Greenway

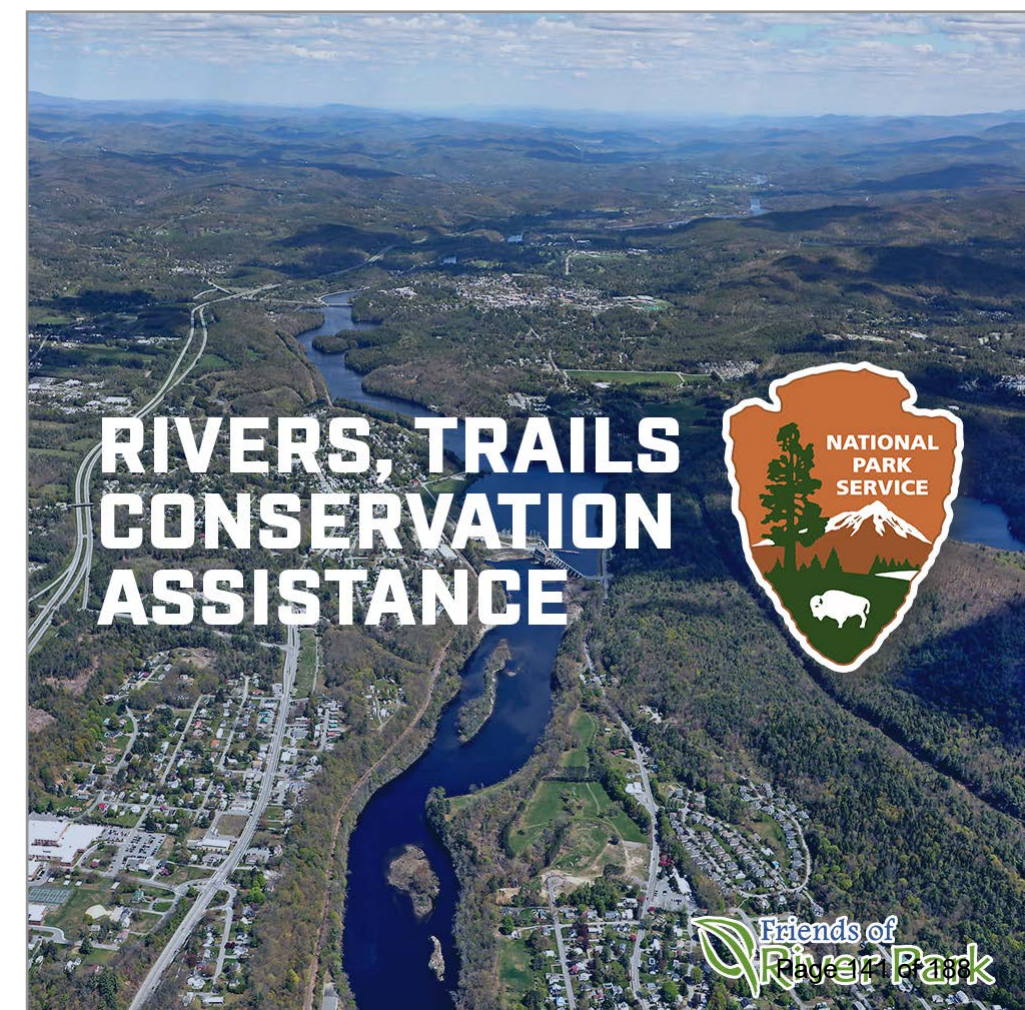
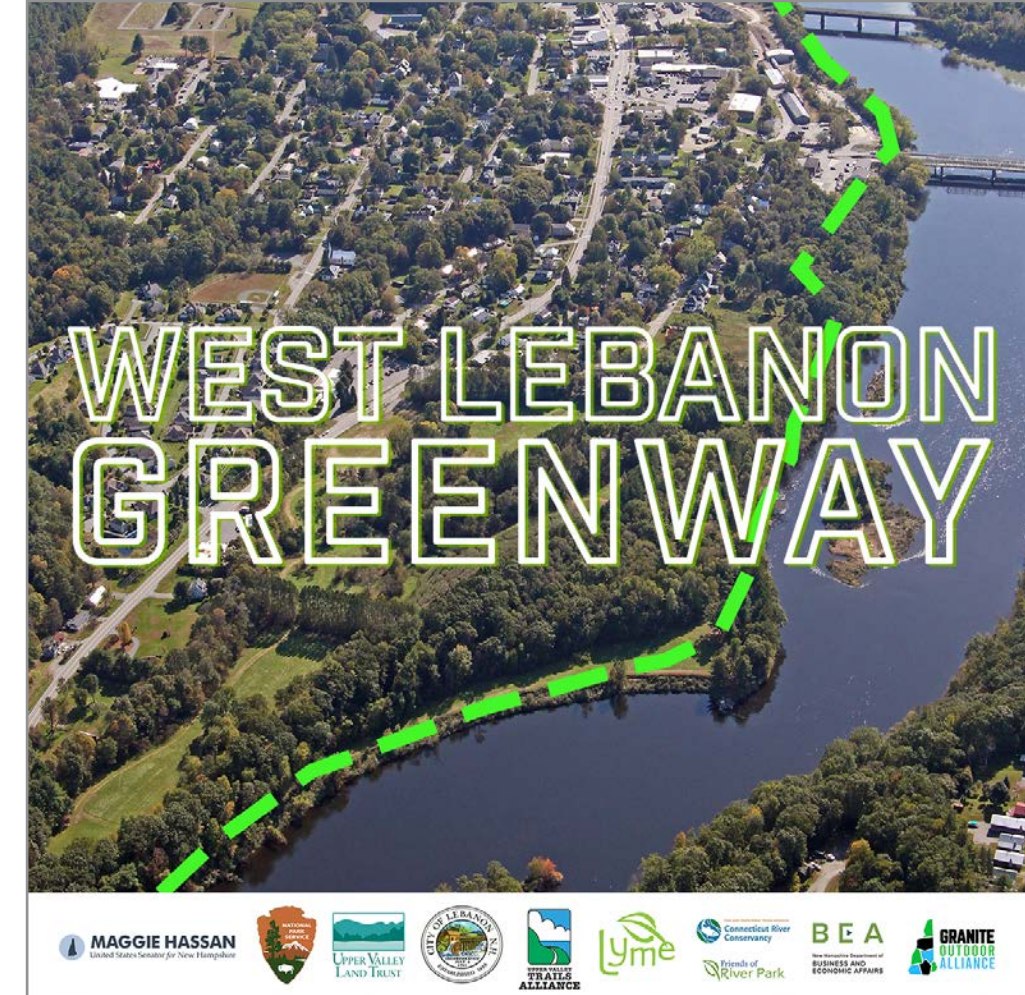
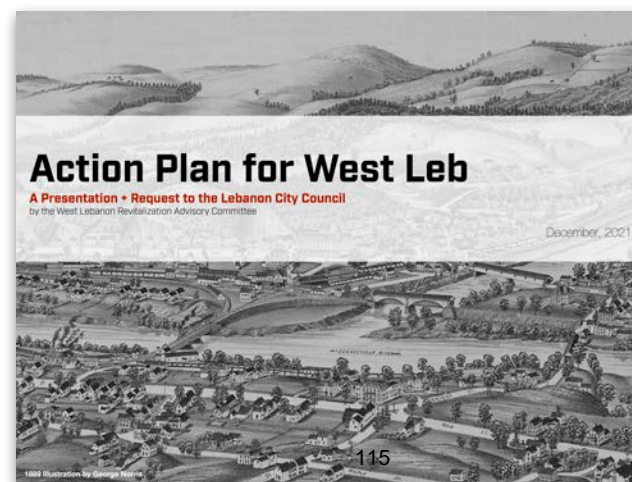
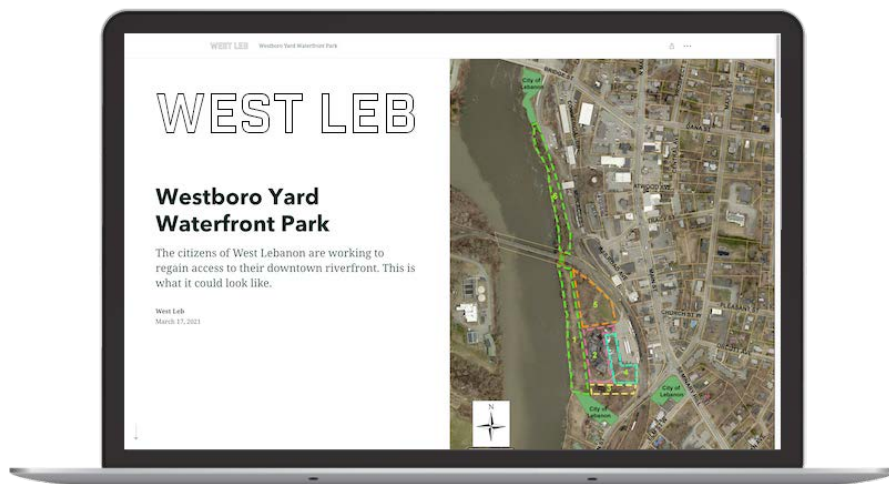
Lebanon BikePed Committee



www.westleb.org/greenway • February 7, 2023

www.westleb.org/greenway

- Put everything on a simple website to make available to the general public, and drive public interest and engagement.
 - www.westleb.org
 - Links to ArcGIS segment-by-segment of West Leb Greenway and Westboro
- The desire is well-analyzed and well-documented, we reviewed 17-applicable studies as it relates to West Lebanon revitalization and Greenway idea.
- *Action Plan for West Leb* tried to simplify decades of studies and efforts into a “Top 10 Plan,” which was submitted to the Lebanon City Council in January ’22.
- *Friends of River Park* applied for and received support from the National Park Service’s “Rivers, Trails & Conservation Assistance” program in 2021 and extended it in 2022.
- NPS would like to be helpful, looking for “official” direction from the City of Lebanon.
 - concentrate on the trails and parks sign inventory and provide examples of what other communities have done. This seems like a doable/helpful project for the City when the pieces come together.



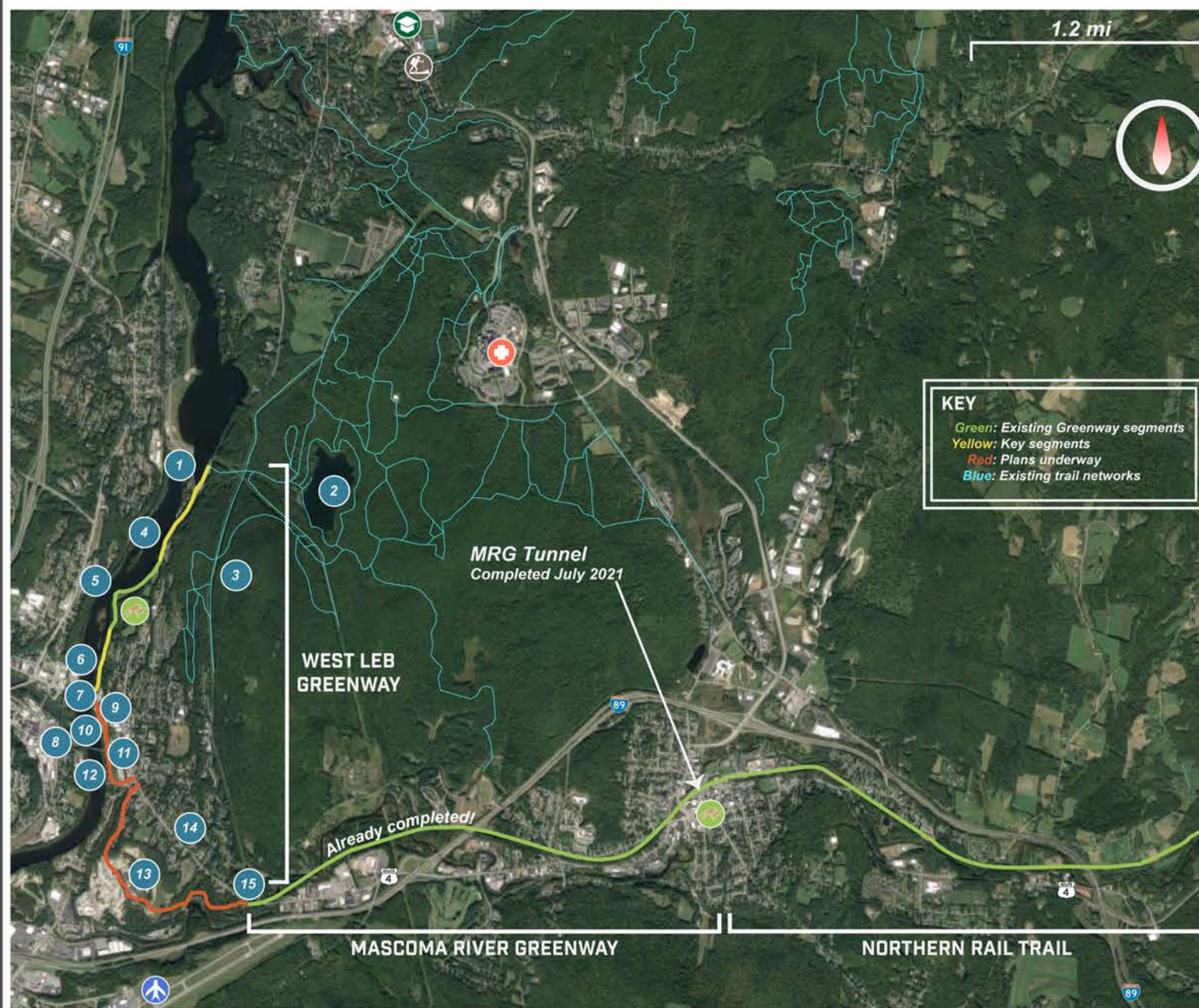
Pieces of the Puzzle

Segment-by-segment

TRAIL ROUTE SECTIONS

- 1 **Wilder Hydro. Dam**
 - The Wilder Dam is currently undergoing FERC re-licensing, which will have ecological impacts and public recreational opportunities.
- 2 **Boston Lot Lake & Conservation Area**
 - Over 7 miles of trails connecting to DHMC, lake trails, and points north.
- 3 **Dartmouth's Landmark Parcel**
 - Existing trail network maintained by Upper Valley Mountain Bike Association. (UVMBA)
- 4 **Wilder Dam to River Park**
 - There are three privately-owned parcels representing 450' of river frontage that will require trail easements.
- 5 **Friends of River Park**
 - 6 Acre riverfront parcel with 1/2 mile of trails owned by non-profit Friends of River Park.
 - Trails improved in 2021 with UVTA Summer Trail camps.
- 6 **Greenway Street & Lincoln Avenue**
 - 1912 plans show a 30-foot wide "Greenway Street" and "Lincoln Avenue," allowing for a contiguous corridor running from the southern boundary of River Park to Bridge Street (Route 4).
- 7 **Lyman Bridge & Connections to WRJ**
 - There exists a pedestrian underpass under Lyman bridge for the Greenway. Lyman bridge provides connections to White River Junction.
- 8 **Bridge Street Park**
 - The waterfront park is owned by the City of Lebanon and will be part of trail and park network.
- 9 **Westboro Yard Pathway**
 - The 2004 Westboro Riverfront Park Design Study identified the City of Lebanon's existing sewer line easement to create a path along the riverfront.
- 10 **Rail Bridge Underpass**
 - There currently exists an unimproved (but visibly utilized) trail passing beneath the New England Central Railroad Bridge; being analyzed by the City.
- 11 **Westboro Yards Waterfront Park**
 - In 2018 the City of Lebanon proposed a 99-year lease of a portion of the Westboro Yards from the NHDOT, calling for the demolition of the dilapidated structures and allowing for recreational improvements along the waterfront.
- 12 **MRG Extension Options**
 - A 2017 Thayer study identified three options: Via the proposed Iron Horse Development, South Main Street, or a Rail-With-Trail option continuing down the Claremont Concord Railroad corridor.
- 13 **Seminary Hill Shortcut: The Sidewalk**
 - The contiguous sidewalk running from the current terminus of the MRG to downtown West Lebanon can serve as an interim option.
- 14 **Current Terminus of the MRG**
 - The Mascoma River Greenway is a 4 mile pathway starting from the terminus of the Northern Rail Trail at Spencer Street in downtown Lebanon, NH to West Lebanon's Rt. 12-A and Seminary Hill.

WEST LEBANON GREENWAY



LEARN MORE:

INTERACTIVE MAP



Explore online with our interactive story-map.

WWW.WESTLEB.ORG/GREENWAY

TAKE ACTION:

WESTBORO PETITION



We Want Our Waterfront.

Add your voice to the call for improvement in West Leb.

WWW.WESTLEB.ORG/PETITION

YOUR VOICES:

MRG SURVEY RESULTS



A 2020 Survey completed by the UVLSRPC measured the use of the completed MRG, showing strong community support for extending the greenway to West Leb.

WWW.WESTLEB.ORG/SURVEY

THE OPPORTUNITY:

This project is an opportunity to execute upon years of planning and public opinion. The West Lebanon Greenway would bring recreation improvements and help economic development in West Leb.

PREPARED BY:

A GROWING COALITION OF PARTNERS:



Recreational Access @ Wilder Dam

Improvements & Connections



TRAIL EASEMENT(S) TO FACILITATE CONNECTION FOR WEST LEBANON GREENWAY

A trail easement to the Upper Valley Land Trust to facilitate a connection between River Park trails and Wilder Dam, a missing link in the broader trail network.



IMPROVED PORTAGE AROUND DAM

As part of the Connecticut River Paddlers Trail, improvements to the portage trail to allow easier passage.



FUNDING OF RECREATIONAL IMPROVEMENTS IN WEST LEBANON

As part of the Connecticut River Paddlers Trail, improvements to the portage trail to allow easier passage.

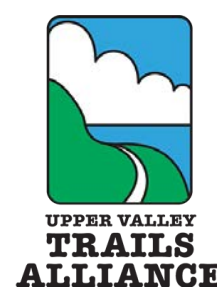


YEAR-ROUND MAINTENANCE OF ACCESS TO BOSTON LOT RECREATION AREA

As requested by the Lebanon Recreation, Arts, & Parks Department, improved maintenance and plowing of the Parking Area to allow year-round access to the popular recreation area.

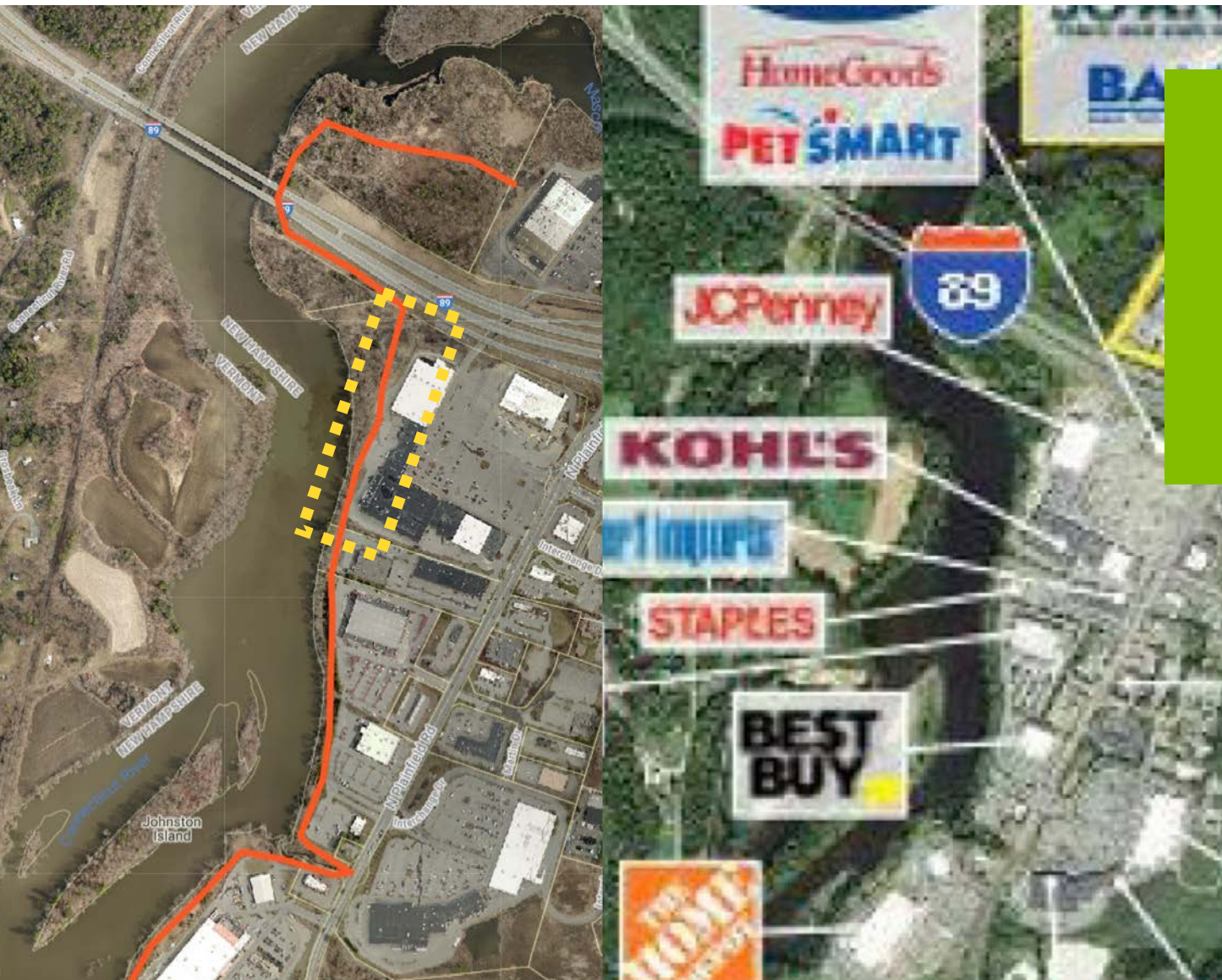


Clean water. Healthy habitat. Thriving communities.
Connecticut River Conservancy



Route 12-A Trail Corridor

A hidden gem, tangled in



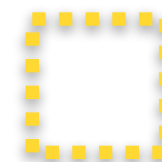
The Path Along 12-A

Extending the riverfront trail through West Lebanon

Existing, but unimproved and unenforced access is available

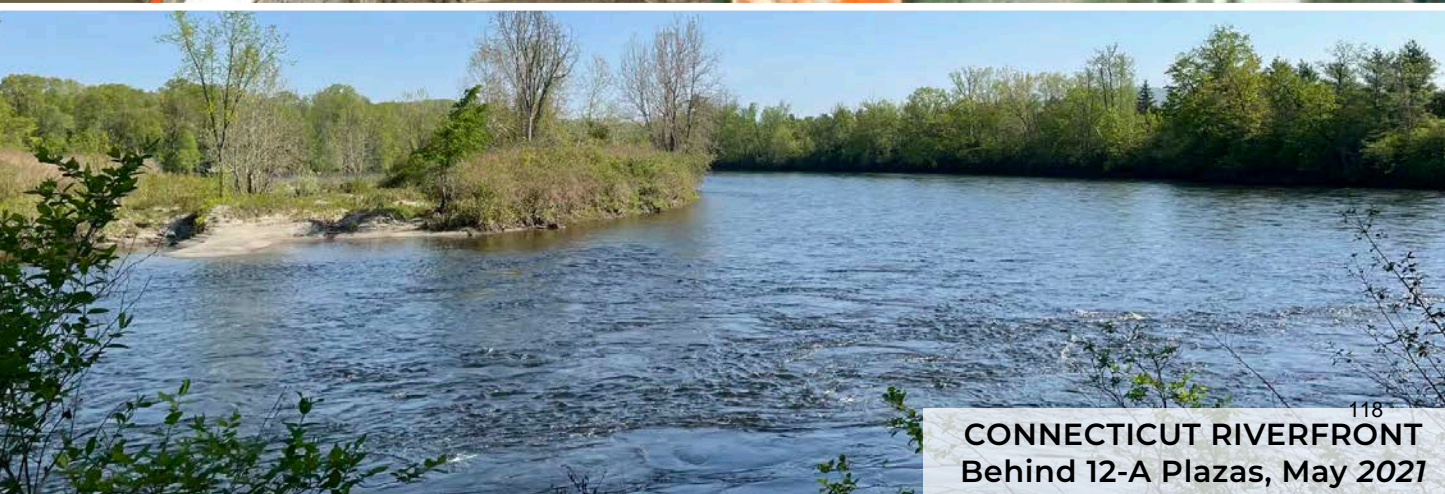
Conditions of approval placed upon various stages of the Route 12-A retail strip mandated that a recreational buffer be created between the riverfront and the development.

A rudimentary trail exists, but it is overgrown with invasive species and hardly passable. A recent exploration identified a possible route, and efforts continue with the City of Lebanon Planning Department to determine the status of access along the various parcels.



ONLY MISSING LINK

The former JCPenny Plaza property is the only “piece of the puzzle” that doesn’t have a dedicated waterfront access easement.



118
CONNECTICUT RIVERFRONT
Behind 12-A Plazas, May 2021

CONCEPT 4: MASCOMA RIVER GREENWAY EXTENSION TO RIVERSIDE PARK*

*Please note the following descriptions are working notes. These notes do not reflect current project statuses or priorities.

Project Description:

Extension of the Mascoma River Greenway from Riverside Park to Westboro Yards.

Notes/Resources:

- 2019 Thayer School of Engineering study (Chapter 3 - Proposed Trail Alignments):
https://mascomagreenway.files.wordpress.com/2019/03/2019_march_dartmouth_thayer_mrg-extension_report_final-web.pdf
- The state-owned rail corridor is currently active and is leased to NECR through 2030. There is a current push at the state level to revise state recreational statutes to permit “rail-with-trail” projects, which may permit a future (albeit more costly) extension along the current rail corridor.
- Alternative alignments and interim connectivity strategies should be considered.

Project Description:

This project extends the Mascoma River Greenway (MRG), a 10-foot wide paved corridor, 1.3 miles from its current terminus at Glen Road westward to the existing sidewalk network on Route 12A. It will also provide a new access point between sidewalks on Route 4 (Miracle Mile) and the MRG. The MRG is the primary non-motorized travel connection between residential and commercial hubs in West Lebanon and Lebanon but it lacks safe “last mile” access to the 12A and Miracle Mile destinations. The two new segments address the access gap and are anticipated to support a significant increase in non-motorized travel because over 50% of Lebanon's residents live within a half-mile of the MRG, and two-thirds live within one mile. These extensions into West Lebanon are vital for connecting neighborhoods to businesses, schools and parks as well as to the existing multimodal transportation network, including transit. The project scope is straightforward and entails the clearing of existing railroad tracks, laying of sub-base and pavement, conversion of 2

railroad bridges, installation of an earthen ramp, and addition of new railings and decking to an existing wooden bridge.

MASCOMA RIVER GREENWAY EXTENSION

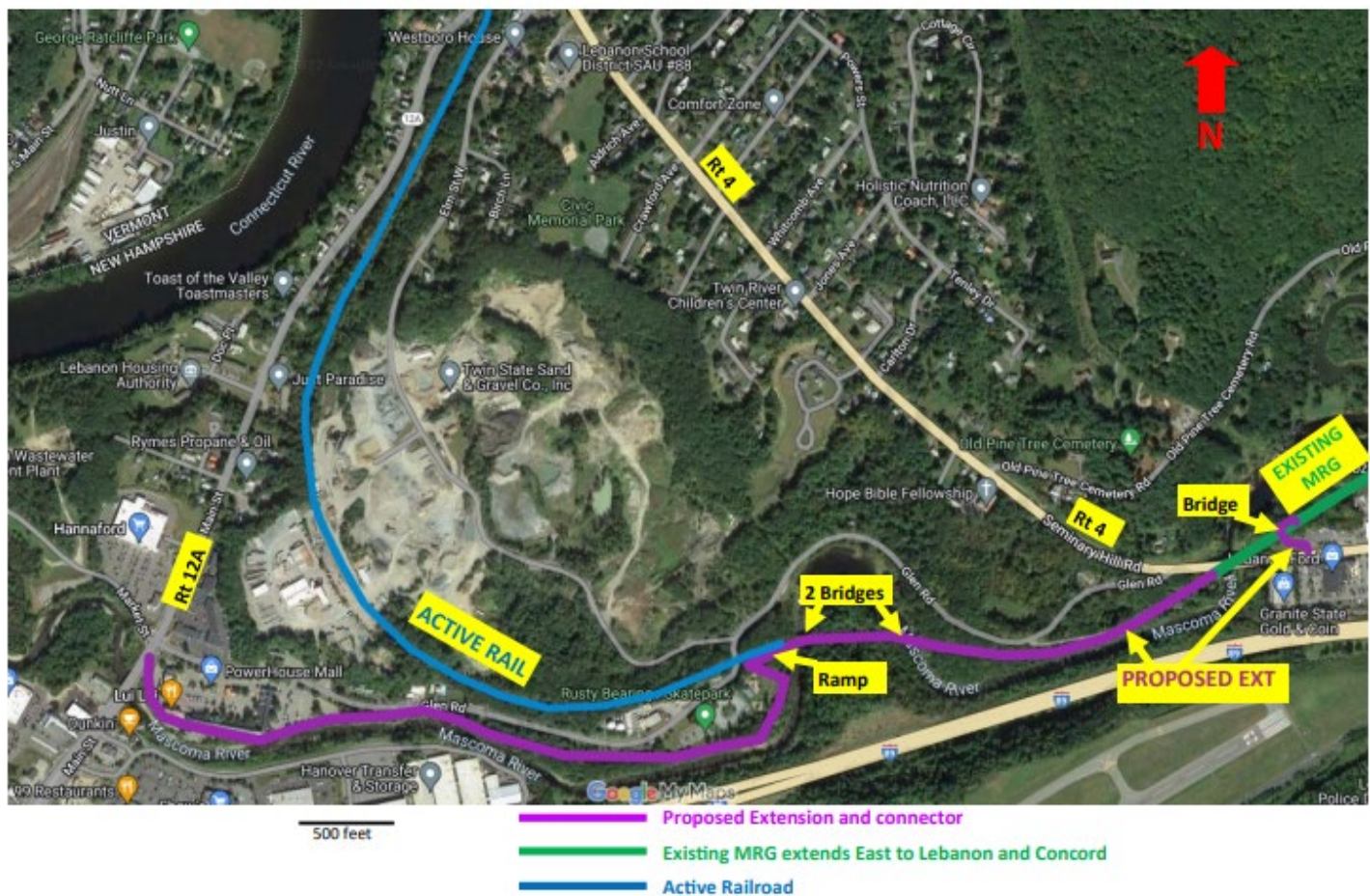


Figure 1. Conceptual Plan of MRG Extension as part of the Congestion Mitigation and Air Quality (CMAQ) program.

Notes/Resources:

- As of March 2023, this project will likely receive funding (\$1.92 million) from the Congestion Mitigation and Air Quality (CMAQ) program as part of the 2025-2034 NH TYP.
- MRG extension per West Lebanon Greenway and Mascoma River Greenway final concepts and design
- As of March 2022, NHDOT has approved the City to pursue an incremental abandonment of the rail corridor approximately 0.3 miles from the current terminus. The City will then need to proceed with an application to the federal Surface Transportation Board for abandonment and discontinuance of the corridor.
- Erica/Paul have original plans/quotes for the MRG and some aspects of its extension including:
 - Budget Detail spreadsheet
 - MRG Plan set (4/24/17) by Stantec
 - Greenway Contract Book 4/24/17
- Map of approved abandonment corridor:
https://drive.google.com/file/d/1PaAamB9683KszueHGdbpYkclTjPVB_1h/view?usp=sharing
- 2019 Dartmouth / Thayer School of Engineering study (Chapter 3 - Proposed Trail Alignments):
https://mascomagreenway.files.wordpress.com/2019/03/2019_march_dartmouth_thayer_mrg-extension_report_final-web.pdf
- [2022 Walk Bike Ride Lebanon Plan](#) and [survey results](#) (see "Priority Projects" tab, where Mascoma River Greenway extension is #1)

- UVLSRPC's [Regional Corridor Transportation Plan](#) lists the extension of the Mascoma River Greenway as a regional priority project.
- [2010 Mascoma River Greenway Action Plan](#) (particularly noting the vision on pages 3-4 and [MRG blueprint map](#).)
- [2020 Mascoma River Greenway Survey](#) (had over 1000 respondents, with many responses urging extension of the Greenway)
- Rails-to-Trails Conservancy is working on an interstate trail plan for the [New England Rail-Trail Spine Network](#), of which the MRG extension is one of the last missing links in NH—and the link between NH and VT.
- NH 2022 Draft [Rail Trails Plan](#). The draft section [Prioritizing State Investments document](#) includes both the Granite State Rail Trail (GSRT) and the New England Rail Trail Spine Network (NERTSN) [which includes NRT/MRG] as “destination corridors” (see page 3) that can serve as priorities for investment in state-owned rail trail corridors. The GSRT corridor includes the NRT and MRG and proposed extension of the Mascoma River Greenway to West Lebanon from the current terminus at Glen Rd. This extension is a top local and regional priority, and is a project of statewide significance when considering broader rail trail network goals. Upper Valley Lake Sunapee Regional Planning Commission has urged the plan’s committee to commit to including this segment in the final list of priorities in the plan, including clarifying that this segment [MRG extension] is indeed included as part of the envisioned GSRT and NERTSN.



BUDGET ESTIMATE (Stantec Consulting Services with City of Lebanon additions in green or blue)

To: Paul Coats, Erica Douglas From: David McNamara
City of Lebanon Auburn
Project/File: Mascoma River Greenway - Extension Date: May 4, 2022

Reference: Mascoma River Greenway Extension - Conceptual Costs Does not include Rt 4 connector, added in green

This document is intended to provide concept level costs for the extension of the Mascoma River Greenway, westerly to NH Route 12A. There are a variety of alternatives as described below. The estimate is largely based on construction costs to complete the existing portion of the Greenway in 2017 and 2018, as well as some standard linear foot cost estimates for similar items of work that Stantec has developed on other projects.

The assumed route for the trail, which is subject to change during design development, is as follows:

- Work will begin at the western end of the bridge over the Mascoma River under Route 4. A portion of the existing stone dust trail will be regraded and paved, new trail will begin at the second crossing of the existing path and the railroad. Approximately 1,000 feet.
- From that point, the trail will follow the existing rail corridor ending at Riverside Park. The trail will leave the rail corridor after the second Mascoma River Crossing, sloping down to meet existing grades at Riverside Park. This estimate assumes that portion of the trail will be built into the existing side slope of the rail corridor, and may contain a switchback or two. The trail will be wide enough to allow pickup truck access, and will attempt to meet full ADA requirements. Approximately 1,800 feet, including path to the park. There is approximately 250 feet of bridges as well in this segment.
- An existing riverwalk along the back of the Park and heading west will be widened to the extent possible to at least 8' but preferably 10' to the back edge of the parking lot of the Powerhouse Mall. This is approximately 2,650 feet. An additional 500 feet of trail is included as a potential secondary route, in order to bypass pinch points in the existing riverwalk that will not allow the minimum widening.
- A new 6' wide sidewalk along the edge of Glen Road will be constructed along the frontage of the mall, ending at NH Route 12A. New granite curbing will be installed along with the sidewalk. This is approximately 1,000 feet.

Estimated costs for the different segments are as follows:

- Construct rail trail along existing rail bed:
 - \$160/lf (escalated from \$105/lf (2017 pricing))
- Convert existing rail bridge to pedestrian bridge

Reference: Mascoma River Greenway Extension - Conceptual Costs

- \$1,320/lf (escalated from \$900/lf (2017 pricing))
- Construct at grade 10-foot-wide paved multiuse path:
 - \$50/lf
- Construct 6' sidewalk and granite curb along existing roadway edge:
 - \$65/lf
- Additional cost assumptions:
 - \$50,000 – earth work to connect the trail from the rail corridor to Riverside Park
 - \$50,000 – Miscellaneous stormwater management due to runoff changes with the new curblin along the Power House Mall property. Included in the sidewalk estimate.
 - 12% - Engineering and permitting
 - 7% - Construction Engineering
 - No ROW costs will be necessary
 - No costs for rail removal are included, that work will be by others. 2350 lf
 - 15% contingency
 - Assume 5% escalation per year to 2024 construction
2025

Based on these assumptions, we offer the following conceptual cost estimates for the segments described above:

	Existing Stone Dust	Rail Corridor – Glen to Riverside	Multi-Use Path	Multi-Use Path (secondary)	Sidewalk
	1,000 lf	1,800 lf (trail) plus Rt 4 connector: 400 lf 250 lf (bridges) plus Rt 4 connector: 105 lf bridge	2,650 lf	500 lf	1,000 lf
Construction Costs	\$160,000	\$668,000 +\$203,000 for connector T: \$871,000	\$132,500	\$25,000	\$115,000
Contingency (15%)	\$24,000	\$100,000 T: \$131,000 incl. connector	\$20,000	\$4,000	\$18,000

Reference: Mascoma River Greenway Extension - Conceptual Costs

Subtotal 2022	\$184,000	\$768,000 \$1,002,000 w/connector	\$152,500	\$29,000	\$133,000
2024 Subtotal 2025	\$211,000 \$226,000	\$879,000 \$1,228,000 w/connector	\$175,000 \$187,000	\$33,000 \$36,000	\$152,000 \$163,000

Full extension subtotal: \$1,450,000 \$1,840,000 with connector

Design and Permitting – 12% - \$174,000 \$221,000

Survey - \$50,000

Construction Engineering – 7% - \$101,000 \$129,000

~~Contingency – 15% - \$220,000~~

Project Total - \$1,775,000 \$2,240,000 includes Rt 4 connector. Add RR removal, ties, fencing, landscaping
\$50,000 rail removal.
\$60,000 ties removal and disposal
\$50,000 fencing and landscaping
Total additional = \$160,000

Thank you,

STANTEC CONSULTING SERVICES INC.

Total Project = \$2,400,000

David McNamara PE
Principal
Phone: (603) 263-4653
david.mcnamara@stantec.com

Attachment: [Attachment]

CONCEPT 5: MULTI-USE PATH OR ACCESSIBLE TRAIL FROM SACHEM VILLAGE TO MEDICAL CENTER DRIVE*

*Please note the following descriptions are working notes. These notes do not reflect current project statuses or priorities.

Define the project, including project areas, extents, and desired dimensions/design elements:

Create an accessible, 10-12' multi-use path from Sachem Village to Medical Center Drive using the existing utility right-of-way. This path could be a paved or crushed stone surface. Crushed stone would be somewhat less expensive but would require more periodic maintenance, and would not hold up as well to winter maintenance.

The path would start at the existing gravel access road at the intersection of Ralston Ln and Haddock Ln in Sachem Village and would terminate near the electrical substation on Trailhead Ln. From here, there are several potential alternatives for the connection to Medical Center Drive:

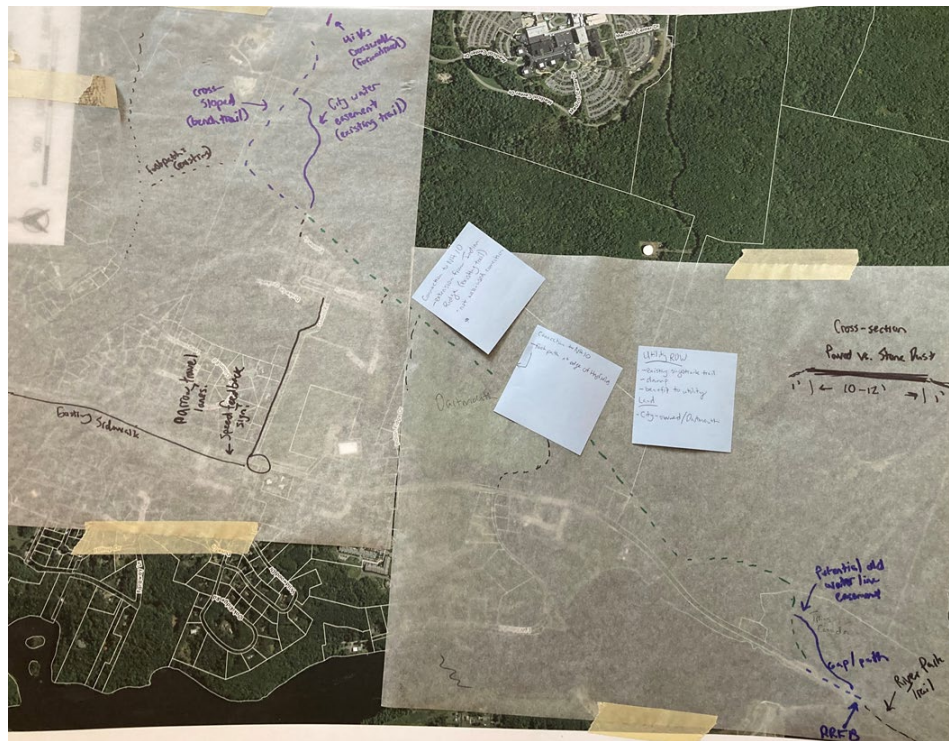
- Have the path cross Trailhead Ln (using hi-vis crosswalk) and continue to Gile Dr, then turn and travel south along Gile Dr to Medical Center Dr. This may be difficult due to slope terrain along Gile Dr.
- Construct a 5' sidewalk along the southeast side of Trailhead Ln at the terminus of the path (continuing to the end of Gile Dr), and instruct cyclists to use the roadway.
- Continue the multi-use path along Trailhead Ln and to the end of Gile Dr.

The path would be gated at either end to restrict vehicular traffic, permit pedestrian and bicycle access, and permit periodic access by Liberty Utilities and City maintenance crews.

At Medical Center Dr, a high-visibility crosswalk would be added to connect to the existing multi-use path on the east side of the road. [is this necessary? There is already path on west side; crossing over MCD would not be needed until its intersection with Loop Rd?]

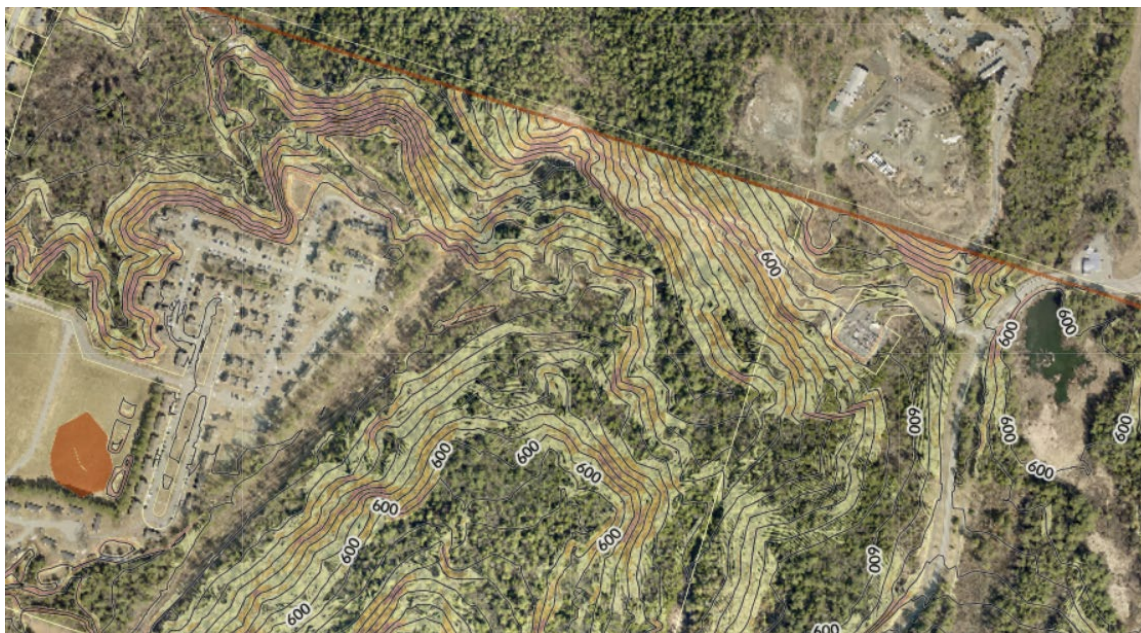
The total length of the proposed path is approximately 3,300 ft.

Sketch out concept designs (e.g., roadway layouts, cross sections with dimensions, etc):



Note feasibility challenges (e.g., terrain constraints, land ownership, etc):

Slope is a primary challenge for this corridor. The path would climb from approximately 490' at Sachem Village to approximately 620' at Trailhead Ln over a distance of approximately 2,700 linear feet, an average grade of 5%. The path would cut across the fall line while heading east through the utility corridor, likely requiring earthwork and potential retaining walls.



The entire corridor is owned by Dartmouth College Trustees, except for a small parcel around the electricity substation owned by Liberty Utilities. Liberty Utilities operates the utility right-of-way.

Identify multi-modal connection opportunities (e.g., transit access improvements):

The proposed multi-use path would allow Sachem Village residents to access the Advance Transit Blue Line. There is currently a stop at the Irving Oil station on Medical Center Dr approximately 600' north of Gile Dr.

Identify potential implementation opportunities (e.g., CIP, developer exaction, grants, etc):

- Partnership with Dartmouth College: the Dartmouth College Strategic Master Plan identifies an improved multi-modal connection from Sachem Village to DHMC as an infrastructure recommendation. While not identified in the plan, Sachem Village could be a potential location for additional student housing as the College seeks solutions to the student housing shortage, which may provide an opportunity for an exaction as a condition of approval.
- DHMC exaction: this project could be considered for vehicular traffic mitigation as part of a future DHMC expansion.
- For some projects, identifying multiple alternatives and interim improvements (including the preferred alternative) may be useful. An existing foot path provides an interim connection. The path is not actively maintained and is not cleared in the winter

The City owns a water main easement that could serve as an alternate route for this path. The water line travels mostly through wooded areas; the cleared utility right-of-way is considered the preferred route.

Identify lead/key point of contact(s) for project development/implementation; identify key partners/parties.

- City: Planning & Development; DPW; Rec & Parks, PBAC, Planning Board, ConComm
- Dartmouth College - Planning Office
- DHMC
- Liberty Utilities

Identify needed information/resources for consulting engineer to advance project concept/cost estimate.

Preliminary conversations with Liberty Utilities may be beneficial before proceeding with project development. Assemble information on NH recreational statues and examples of trail projects in utility corridors to share.

The primary needs for engineering support for this project are: 1) more accurately delineate the proposed trail; 2) identify the incidental costs (e.g., drainage, earthwork, retaining walls) that will be the primary driver of costs.

Date: 02/24/2023 Job No.: 10539
To: Meghan Butts, Executive Director
Upper Valley Lake Sunapee Regional Planning Commission
Cc:
From: BETA Group, Inc
Subject: Lebanon, NH – Meriden Rd. Safety Improvements

Existing Condition, Project Scope and Goals

NH Route 120, Meriden Rd., is a north-south major collector through Lebanon with an AADT of approximately 3,550. The project location is approximately 700 feet of Meriden Rd., from the Messenger St. intersection/crosswalk to the entrance of Goodwin Park. This area primarily serves significant through traffic to downtown Lebanon and surrounding residential neighborhoods. The existing typical section includes two 11-foot-wide travel lanes, 6" to 3' shoulders going southbound and 1 foot to 4-foot shoulders in the northbound direction. The posted speed limit is 25 mph and pedestrian, and bicycle facilities exist north of the Messenger St. /Meriden Rd. intersection. Guardrail exists on the southbound side of the road for the length of the project, with breaks for driveway openings. Overhead utilities, a closed drainage system and City water services are located on the northbound side. Currently there is no pedestrian or separated bike connection from the Messenger St. intersection to the entrance of Goodwin Park. The intent of this project is to widen the shoulder on one side of Meriden Rd. from the existing sidewalk near Messenger St. to the Goodwin Park entrance, with the goal to improve safety for bicycle users and make the connection to Goodwin Park. This shoulder widening would be as wide as possible while minimizing impacts to Right-Of-Way (ROW) and costs such as extensive retaining walls or slope cuts.

Engineering Review

BETA attended a site meeting/walk with representatives of the City to observe site conditions and note constraints within the project limits. Included in this memo are conceptual plans and order of magnitude estimate to depict the proposed work and total project costs. On the southbound side of the road (western shoulder), the topography beyond the shoulder generally slopes steeply downward (1:1 or greater) onto private property or consists of retaining walls beyond the guardrail posts. There is no opportunity to move the existing guardrail as they area already installed on steep back slopes or in front of existing retaining walls. From the intersection of Messenger St. and Meriden Rd. to 140 Meriden Rd, the shoulder can be expanded from the existing edge of pavement to the face of existing guard rail, providing a varying 2.75-3.5' shoulder width. From 140 Meriden Rd. to Goodwin Park entrance, a varying 3.5'-5' shoulder can be accommodated. However, at driveway entrances, the shoulder narrows to almost no shoulder with no opportunity to widen unless driveway grades are increased and some retaining walls reconstructed. Existing driveway slopes are current at approximately 20% grade. Expanding the shoulder in these locations does not add safety value, as typical bicyclist accommodations are 5' wide minimum. A consistent shoulder width of at least 5' cannot be obtained through widening without removing the guardrail, installing/rebuilding walls or expanding fill slopes on private properties, and reinstalling the guardrail. These impacts will require extensive impacts to right of way and private property and will likely be very cost prohibitive. Additionally, BETA does not recommend encouraging pedestrian access to roadway facilities without a buffer separated sidewalk or curb and sidewalk.

On the northbound side of the roadway (eastern shoulder), the topography beyond the shoulder generally slopes steeply upward (1:1 or greater at the steepest points) onto private property. From the intersection of Messenger St. and Meriden Rd. to 127 Meriden Rd., and from 131 Meriden Rd. to the entrance of Goodwin Park the shoulder can be expanded to accommodate a 5' shoulder with no impacts to right of way. The work would require minor full depth pavement widening from the existing edge of pavement, pavement markings and some slope and temporary driveway work to match existing grades. The major constraint on this side of the road is along the frontage of 127 Meriden Rd, where only a 1-2' shoulder can be achieved. This area is the narrowest segment of the roadway and has steep upward slopes potentially containing boulders/ledge. Currently, there is no geotechnical information on the underlying soils. Given this unknown, this study will assume that a retaining wall is required. If a geotechnical analysis reveals stable ledge in this area, a wall might be avoided, requiring only rock excavation typically at lower cost than wall construction.

To accommodate a consistent shoulder of at least 5' and a 2' clear zone for bicyclists and snow storage will likely require excavation, extensive slope work, wall installation and significant impacts to the abutting property. Except for the frontage of 127 Meriden Rd, where a retaining wall, temporary earth support, and excavation will be required. However, shoulder widening on the east side appears to be more cost effective and feasible than on the west side as a consistent 5-foot shoulder width can be maintained with fewer impacts.

The wall at 127 Meriden Rd. will likely be approximately 160 feet long with an approximate 4-foot exposed height at its highest point. A 5-foot embedment for frost protection has been assumed, as even for manufactured block walls, embedment to frost depth is needed to meet NHDOT design standards. The installation will require temporary earth support (sheeting) in order to minimize impacts to the abutting property. An earth support system will significantly add to total project cost. If earth support is not used, excavation limits would extend beyond the abutter's driveway limiting access during construction and requiring significant driveway reconstruction afterwards. Wall construction will require the relocation of utility poles along the embankment and rebuilding the driveway entrance at 127 Meriden Rd. Temporary construction easements will be required to access private property with or without earth support. Traffic control will be needed during the construction phase, where the work zone requirements will require travel lanes be reduced to minimum widths (10' in each direction) for two-way traffic and potentially one way alternating as needed. Geotechnical and structural engineering will be required to determine soil properties and to complete the final wall design.

A 4' shoulder could be considered at this pinch point however the cost difference is negligible from a 5' shoulder as a similar type of construction is expected. Wider shoulders on the eastern side could be striped to extend the existing bike lane from Messenger St. to Goodwin Park (in the northbound direction). The downside of this option is that southbound bicyclists will have no improved access to the park. They will still have to share the road with vehicles or cross the road at Messenger St., travel in the opposite direction of vehicular traffic and will be required to cross again to access the park. A high visibility mid-block crosswalk is recommended for a roadway crossing to Goodwin Park. Elements of this may include pavement markings, enhanced signage, and rectangular rapid flashing beacons. BETA does not recommend encouraging pedestrian access to roadway facilities without a buffer separated sidewalk or curb and sidewalk.

BETA completed a conceptual estimate using the most recent NHDOT weighed average bid prices from the DOT website, IPDWeb Database and recent bids received by BETA with similar items and construction elements. The IPDWeb Database allows for the most recent bid items from DOT funded projects to be sorted and averaged based on specific timeframes. On average, unit prices on major items have increased significantly over the last 2 years. Unit prices were based on project size, quantity of the item and project location; for example, items with low quantities on smaller projects tend to have higher unit prices and vice versa. Total project cost (including engineering, survey, permitting, right of way and construction) is approximately \$456,000 in 2023 dollars and \$635,000 in 2035 dollars using 2.8% inflation per year. 15% indirect costs have been added to the project costs for administration and construction engineering.

Summary:

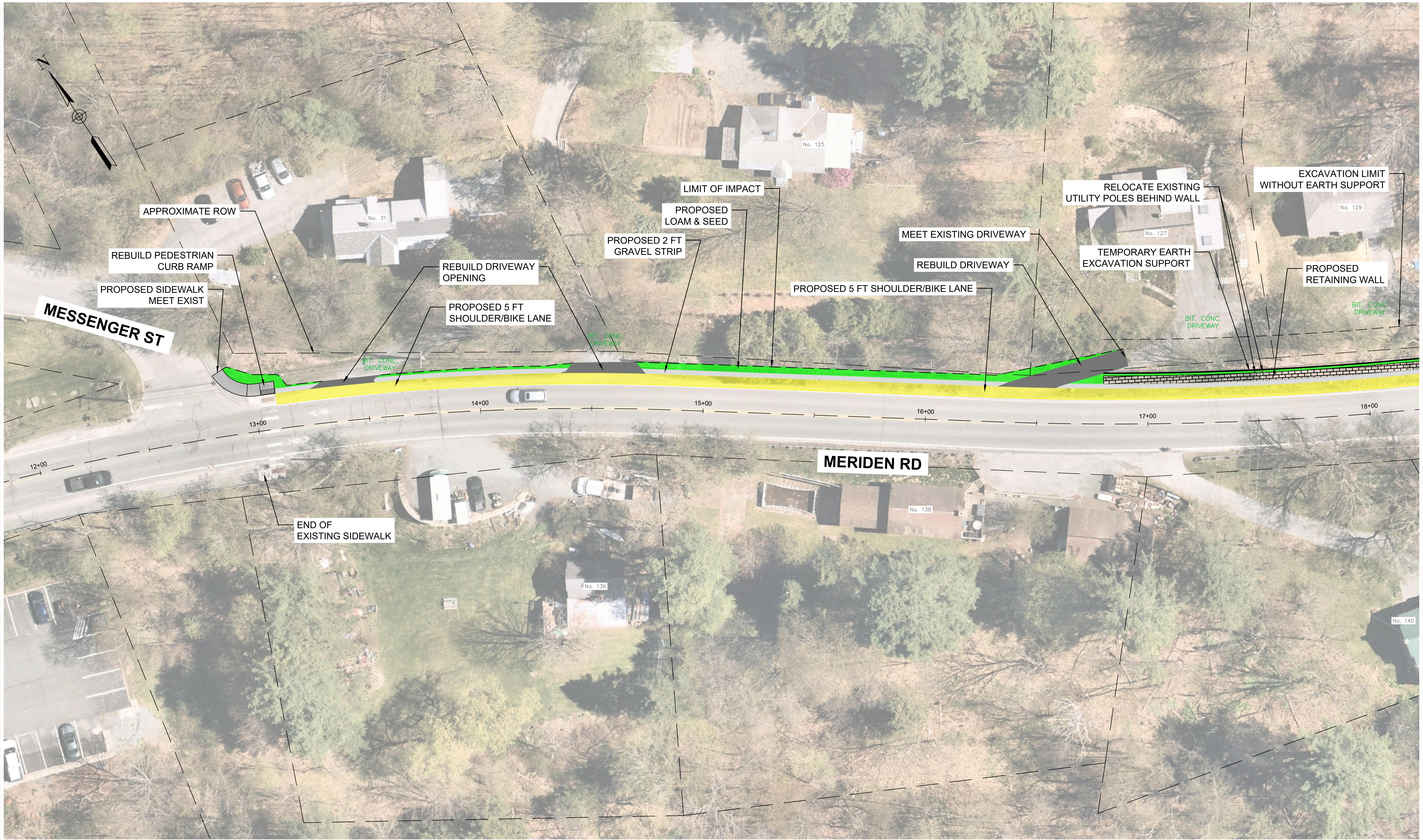
Improvements and widening to the eastern shoulder of Meriden Rd. from Messenger St. to the entrance of Goodwin Park is recommended versus the western shoulder as this is the most feasible side to provide an adequate connection from the existing pedestrian and bike facilities along Meriden Rd. Given existing roadway features, alignment, dimensions, and the local terrain, it is not economically viable to add pedestrian and bike accommodations on both sides of the road without extensive impacts to abutters. The proposed construction on the east side of Meriden Rd. will require full depth box widening, excavation, utility pole relocation, a retaining wall, surface restoration and shoulder restriping to accommodate a 5-foot bike lane and 2-foot clear zone. This connection from Messenger St. to Goodwin Park will provide a safer and more inviting experience for bicyclists.

BUDGETARY ESTIMATE -

Unit Cost Update 1/2023

Meriden Rd Shoulder Widening Lebanon, NH

Date	2/24/2023					
Length	690					
ITEM	UNIT	QUANTITY	UNIT \$	\$	COMMENTS	
Clear & Grubbing	A	0.25	\$25,000.00	\$6,250		
Embankment	CY	50	\$15.00	\$750		
Misc. Excavation	CY	150	\$30.00	\$4,500		
Gravel Strip	CY	25	\$40.00	\$1,000	Clear zone	
Bike Lane (widening)	SF	3,265	\$8.27	\$26,987		
Driveways	SF	700	\$6.53	\$4,569		
Ped Ramp	EA	1	\$2,324.33	\$2,324		
Signage	U	1	\$1,000	\$1,000		
RRFB	U	1	\$20,000	\$20,000	Rectangular Rapid Flashing Beacon	
Pavement Markings	U	1	\$2,000.00	\$2,000		
Surface Restoration	SF	1,198	\$1.73	\$2,073	Loam & seed	
Block Retaining Wall	SF	1,422	\$35.00	\$49,770	158 length * 9' height	
Temporary Earth Support	U	1	\$116,000.00	\$116,000		
SUB TOTAL				\$237,223		
Maintenance of Traffic			7%	\$16,606		
Mobilization			5%	\$11,861		
Contingency			25%	\$59,306		
CONSTRUCTION TOTAL				\$324,995		
Engineering, Survey & Permitting			20%	\$64,999.09	Assume LPA process	
Right of Way			2%	\$6,500	Temp easements	
TOTAL				\$396,494.44		
Construction Engineering			15%	\$59,474.17	Assume full time resident	
Project Cost (2023 Dollars)		SAY		\$456,000		
2.8% Inflation 2.8%				\$635,158.65	2.8% per NHDOT	
Project Cost (2035 Dollars)		SAY		\$635,200		



NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:	CM
DESIGNED BY:	CT
CHECKED BY:	JB

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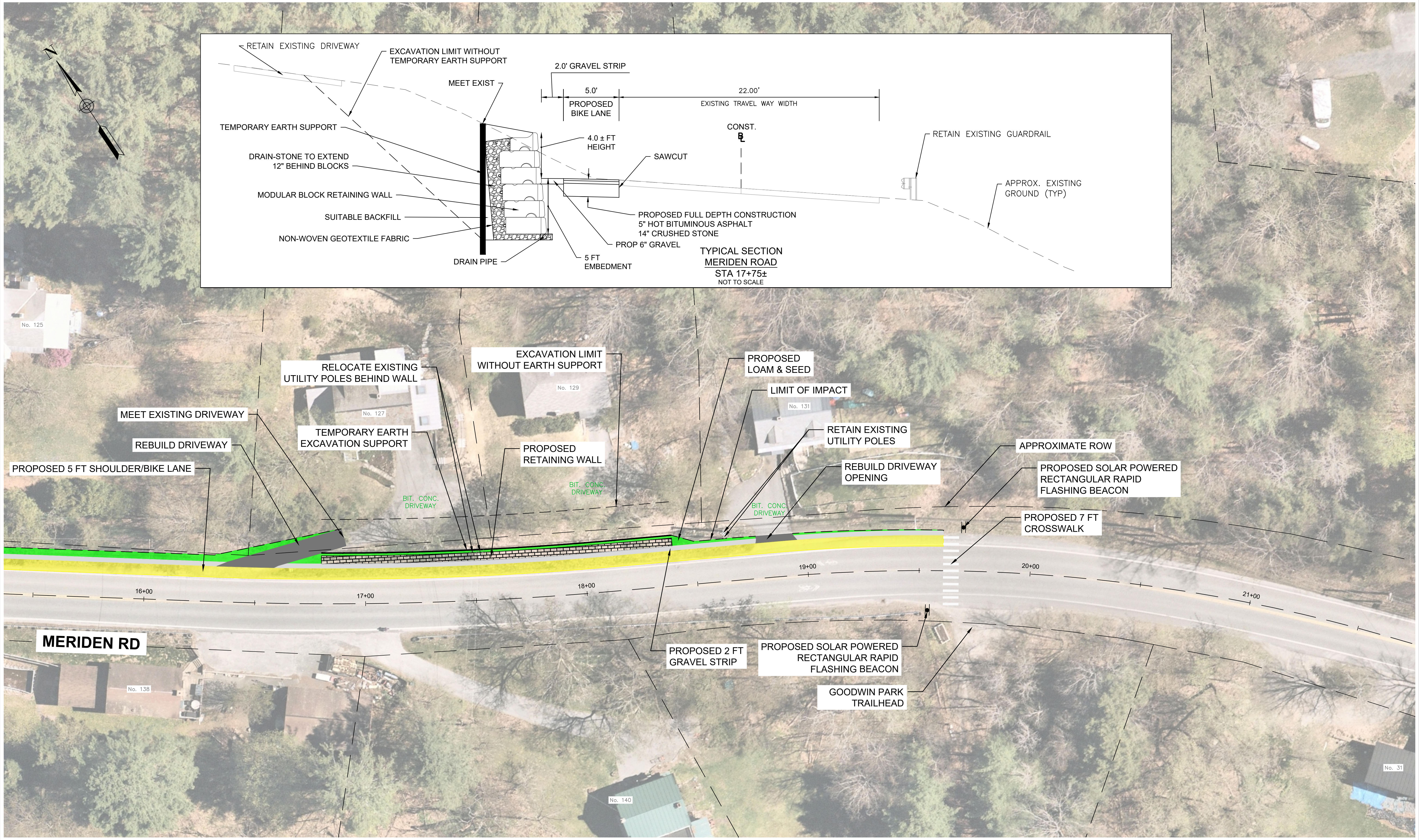
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SCALE

SCALE IN FEET: 1"=20'
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TITLE
LEBANON, NH
MERIDEN ROAD: SHOULDER WIDENING
MESSENGER ST - GOODWIN PARK TRAILHEAD
CONCEPT PLAN

BETA JOB NO.	10539
ISSUE DATE	1/13/2023 2:38 PM
SHEET NO.	1



					DRAWN BY: CM	REGISTERED PROFESSIONAL For Review Only	PREPARED BY  www.BETA-Inc.com	SUBCONSULTANT	SCALE  UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION	TITLE LEBANON, NH MERIDEN ROAD: SHOULDER WIDENING MESSENGER ST - GOODWIN PARK TRAILHEAD CONCEPT PLAN	BETA JOB NO. 10539
					DESIGNED BY: CT						ISSUE DATE 1/13/2023 2:38 PM
					CHECKED BY: JB						SHEET NO. 2
NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS							

Date: 02/24/2023 Job No.: 10539
To: Meghan Butts, Executive Director
Upper Valley Lake Sunapee Regional Planning Commission
Cc:
From: BETA Group, Inc
Subject: Lebanon, NH – MRG to Mascoma Street Connection

Existing Condition, Project Scope and Goals

The intent of this project is to construct a bicycle path from just north of the bridge where the Mascoma River Greenway crosses I-89 to Mascoma St., along the north side of the I-89 right of way corridor (adjacent to Valley Cemetery). The path will then cross through a property recently purchased by the City and connect to the access driveway of the Boston Lot trails/conservation area onto Mascoma St. The Mascoma River Greenway (MRG) is a 4-mile multi-use separated pathway starting from the current terminus of the Northern Rail Trail at Spencer Street in downtown Lebanon. The MRG is a core transportation corridor for bikes and pedestrians through the heart of Lebanon and West Lebanon, connecting Lebanon's neighborhoods with workplaces, schools, open spaces, shopping areas, restaurants, a medical center and transit stops. The Boston Lot Conservation area comprises 436 acres with seven miles of trail and recreational access to Dartmouth Hitchcock Medical Center and surrounding neighborhoods.

The existing area is mostly wooded and undeveloped land, sloping upwards from I-89 to the back portion of the Valley Cemetery, and flat grades on top of the highway embankment from the cemetery to Mascoma St. The exact location of NHDOT and City right of way (ROW) is unknown, ROW lines have been obtained from tax map information but a more accurate re-establishment of the ROW through deed research and survey will be needed in the future. There is an existing chain link fence that runs along the eastern boundary of the cemetery to Mascoma St. The City of Lebanon has recently purchased the property of 226 Mascoma St. and anticipates using a portion of the property to build the bike path. This bike path connection will allow MRG users a safe and convenient access to the Boston Lot, which is open to hiking, biking, snowshoeing, ski touring, as well as hunting, fishing, and camping.

Engineering Review

BETA attended a site meeting/walk to observe site conditions, note constraints, and discuss with UVLSRPC and the City of Lebanon the preferred design parameters. Included with this memo, are conceptual plans and order of magnitude estimate to depict the project goals and likely costs. In general, the proposed bike path includes an 1,100-foot long (from MRG to the Boston Lot trails driveway), 10-foot-wide paved surface for bi-directional travel, with 2-foot gravel shoulders as clear zones to avoid obstructions. The proposed path would begin as a connection to the MRG approximately 65' north of the MRG bridge over I-89. Then generally follows an existing 3-foot-wide path in the easterly direction at a gradual incline, until it levels off at the top of the highway embankment near the rear of the Valley Cemetery property. The area before the cemetery property has steep side slopes due to the highway embankment and water currently flows between the toe of the slope and the existing path. Therefore an upside drainage swale will be required at this location with a headwall and pipe outlet to divert stormwater away from the path. As shown on

the attached plan, the proposed path has been aligned around this existing and proposed drainage area. Additionally, a 3 to 4-foot-tall retaining wall will be required for approximately 55-feet along this segment in order to achieve the desired path width. The proposed retaining wall is close to the cemetery property and the excavation required to install the wall may impact the property. Shifting the bike path alignment further to avoid wall construction maybe possible and should evaluated during the preliminary design when more accurate topographical data is available. Extensive tree and brush clearing will be required, as this segment is wooded. The path would then continue along an existing fence line for approximately 430' along the cemetery property at a relatively flat grade, where it turns into the back of the 226 Mascoma St. property. Here, a section of the existing fence will have to be removed to make room for the bike path and gravel shoulders. The existing flat area at the top of the highway embankment is wide enough that extensive widening for the path is not needed. Some tree removal and brush clearing will be required along this segment. Additionally, a new fence is proposed along the right side of the path in the gravel shoulder, from the MRG connection to the 226 Mascoma St. property. The bike path continues along the property line with the cemetery, on City property, for 420 feet where it connects to a proposed crossing at Mascoma St. and then turns left to connect to the terminus at the Boston Lot driveway. Most of the bike path will be constructed in City right of way. The segment along the NHDOT highway right of way may require some permanent easements.

BETA completed a conceptual estimate using the most recent NHDOT weighed average bid prices from the DOT website, IPDWeb Database and recent bids received by BETA with similar items and construction elements. The IPDWeb Database allows for the most recent bid items from DOT funded projects to be sorted and averaged based on specific timeframes. On average, unit prices on major items have increased significantly over the last 2 years. Unit prices were based on project size, quantity of the item and project location; for example, items with low quantities on a smaller project tend to have higher unit prices and vice versa. Total project cost (including engineering, survey, permitting, right of way and construction) is approximately \$293,00 in 2023 dollars and \$408,000 in 2035 dollars using 2.8% inflation per year. 10% indirect costs have been added to the project costs for administration and construction engineering.

Summary:

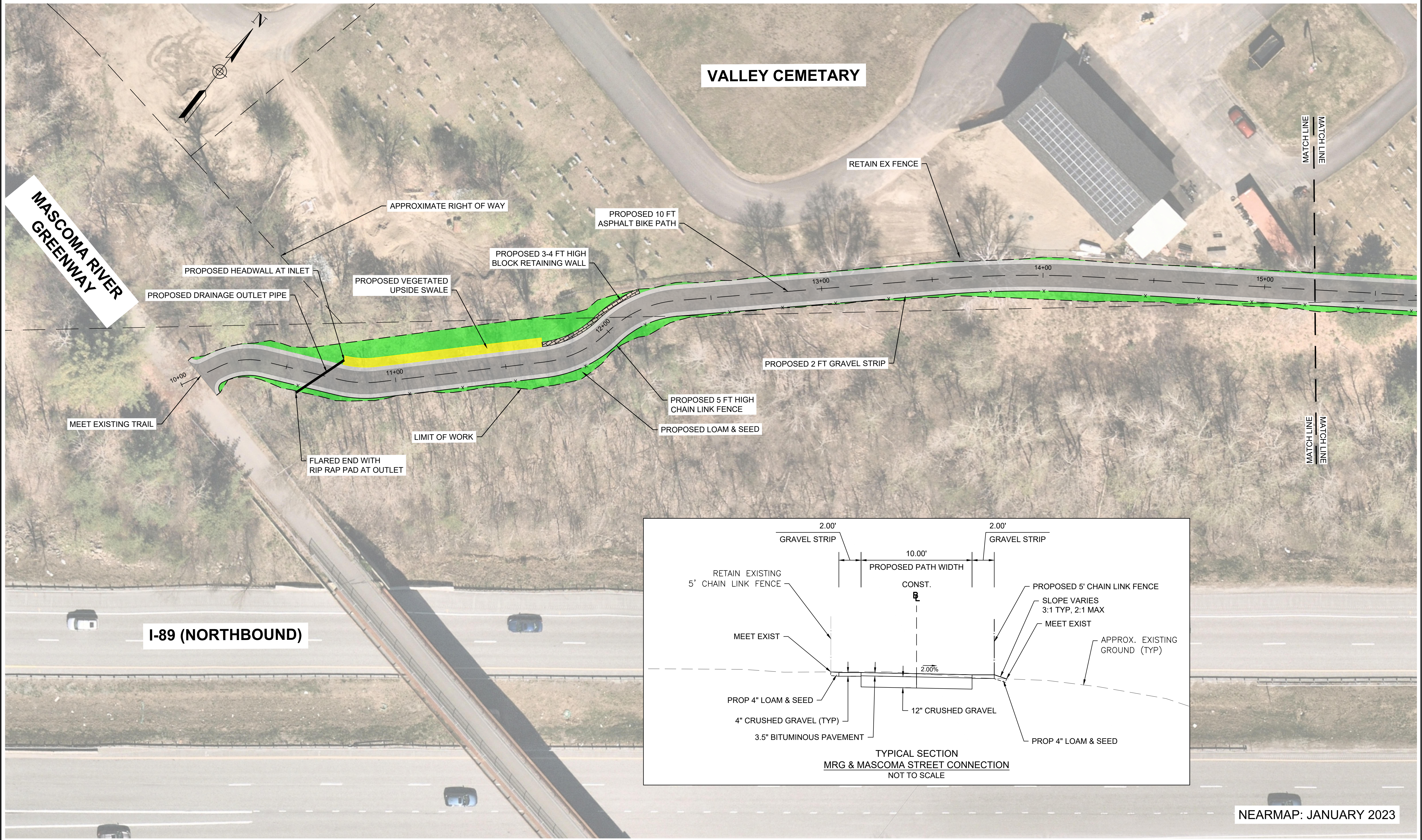
The proposed 10-foot-wide asphalt bike path from the MRG to the Boston lot trails will provide a safe and convenient access for the community's users. As there is an existing trail from the MRG to the top of the highway embankment and there is adequate space at the top of the embankment, significant slope regrading or construction of significant retaining walls to create the path is not needed. Therefore, it appears construction of this path will not be overly difficult.

BUDGETARY ESTIMATE -

Unit Cost Update 1/2023

Mascoma St Bike Path Connection Lebanon, NH

Date	2/24/2023					
Length	1100					
ITEM	UNIT	QUANTITY	UNIT \$	\$	COMMENTS	
Clear & Grubbing	A	1	\$25,000.00	\$25,000		
Embankment	CY	200	\$20.00	\$4,000		
Misc. Excavation	CY	150	\$35.00	\$5,250		
Gravel Shoulder	CY	81	\$40.00	\$3,246		
Bike Path	SF	11,039	\$6.53	\$72,060	3.5" HBP Bike Path	
Drainage Swale	LF	100	\$20	\$2,000		
Headwall & Outlet	LS	1	\$5,000	\$5,000		
Drainage pipe	LF	30	\$65	\$1,950		
Chain Link Fence	LF	700	\$20	\$14,000		
Signage	LS	1	\$2,000	\$2,000		
Pavement Markings	LS	1	\$1,000.00	\$1,000		
Surface Restoration	SF	3,300	\$1.73	\$5,709	Loam & seed	
Block Retaining Wall	SF	550	\$35.00	\$19,250		
SUB TOTAL				\$160,465		
Maintenance of Traffic			3%	\$4,814		
Mobilization			8%	\$12,837		
Contingency			25%	\$40,116		
CONSTRUCTION TOTAL				\$218,232		
Engineering, Survey & Permitting			20%	\$43,646.50	Assume LPA process	
Right of Way			2%	\$4,365		
TOTAL				\$266,243.64		
Construction Engineering			10%	\$26,624.36	Assume LPA process	
Project Cost (2023 Dollars)			SAY	\$292,900		
2.8% Inflation	2.8%			\$407,978.00	2.8% per NHDOT	
Project Cost (2035 Dollars)			SAY	\$408,000		



NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:	CM
DESIGNED BY:	CT
CHECKED BY:	JB

REGISTERED PROFESSIONAL

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TITLE

LEBANON, NH
MASCOMA RIVER GREENWAY -
MASCOMA ST CONNECTION
CONCEPT PLAN

BETA JOB NO. 10539

ISSUE DATE 2/24/2023

SHEET NO. 1



NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

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TITLE
LEBANON, NH
MASCOMA RIVER GREENWAY -
MASCOMA ST CONNECTION
CONCEPT PLAN

BETA JOB NO.	10539
ISSUE DATE	2/24/2023
SHEET NO.	2

Date: 03/03/2023 Job No.: 10539
To: Meghan Butts, Executive Director
Upper Valley Lake Sunapee Regional Planning Commission
Cc:
From: BETA Group, Inc
Subject: Lebanon, NH – Mascoma River Greenway (MRG) Access at Route 4 (Miracle Mile) and
Lebanon Ford

Existing Condition, Project Scope and Goals

The intent of this project is to construct an ADA accessible multi use connection from the sidewalk on Route 4 at the east end of the bridge over the Mascoma River, near Lebanon Ford's parking area, to the existing timber bridge over the Mascoma River Greenway (MRG). And reconstruct an existing non-ADA compliant path from the existing timber bridge over the MRG, then down to the rail trail. The MRG is a 4-mile multi-use separated pathway starting from the current terminus of the Northern Rail Trail at Spencer Street in downtown Lebanon. The MRG is a core transportation corridor for bikes and pedestrians through the heart of Lebanon and West Lebanon, connecting Lebanon's neighborhoods with workplaces, schools, open spaces, shopping areas, restaurants, a medical center and transit stops.

Currently, there is no formalized access from the sidewalk on Route 4 (Miracle Mile) to the timber bridge and existing path connecting to the MRG. The existing path connecting the bridge to the MRG is mostly dirt/topsoil and gravel and varies from 4-10 feet in width. The existing bridge and path are not ADA compliant and have longitudinal slopes greater than 5%. The location of proposed connection is the area between the back of the existing sidewalk on Route 4 and the timber bridge over MRG and is mostly located on private property (Lebanon Ford). This area generally slopes steeply from Route 4 down towards the bridge at a maximum slope of approximately 8.5-9%. It is assumed that no work to the bridge is required as a part of this project.

Engineering Review

BETA attended a site meeting/walk to observe site conditions, note constraints, and discuss with UVLSRPC and the City of Lebanon the preferred design parameters. Included with this memo, are conceptual plans and order of magnitude estimate to depict the project goals and likely costs. In general, the multi-use path will be 10 feet wide, either compacted gravel or a paved surface, with 1 foot gravel shoulders and cross slope at 2% to provide positive drainage. The segment of path connecting to the existing sidewalk on Route 4 to the timber bridge is proposed as a "switchback" alignment to provide a shallow enough slope to meet ADA compliant accessibility requirements. Ground survey and final design will be required to confirm this segment can meet ADA requirements. Some side slope work (both earth cuts and fills) will be required from the path to existing grade, however retaining walls are not necessary. To construct this segment, the driveway opening to Lebanon Ford parking lot will likely have to be narrowed to 24-foot wide, granite curbing installed, and the sidewalk and pedestrian ramp extended to the new edge of driveway. Additionally, some of the area used for parking may have to be removed and relocated. Preliminary discussions of these potential impacts have been initiated between the property owner and

the City. Right of way acquisitions will be required. A portion of the existing guard rail will have to be removed to connect the path to the existing sidewalk and a new guardrail end section installed.

The segment of path from the end of the timber bridge to the connection at the MRG will follow the existing path alignment and approximate slope. Some clearing and grubbing and shoulder/slope work will be required to maintain the full 10-foot-wide path. A chain link fence is proposed along the left side of the path (Mascoma River side) as the existing side slopes are steep posing a safety concern.

BETA completed a conceptual estimate using the most recent NHDOT weighed average bid prices from the DOT website, IPDWeb Database and recent bids received by BETA with similar items and construction elements. The IPDWeb Database allows for the most recent bid items from DOT funded projects to be sorted and averaged based on specific timeframes. On average, unit prices on major items have increased significantly over the last 2 years. Unit prices were based on project size, quantity of the item and project location; for example, items with low quantities on a smaller project tend to have higher unit prices and vice versa. Total project cost (including engineering, survey, permitting, right of way and construction) is approximately \$185,000 in 2023 dollars and \$258,000 in 2035 dollars for the gravel path option and \$204,000 in 2023 dollars and \$284,000 in 2035 dollars for the paved path option (all with 2.8% inflation per NHDOT). Indirect costs have been added to the project costs for administration and construction engineering.

Summary:

The proposed 10-foot-wide multi use path from the Route 4 to the MRG will provide a safe and convenient access for the community's users. The construction of the path does not appear to be overly difficult, however coordination and working with the property owner to modify the driveway and obtain right of way will be critical to the success of the project.

BUDGETARY ESTIMATE -

Unit Cost Update 1/2023

MRG Access at Lebanon Ford Lebanon, NH

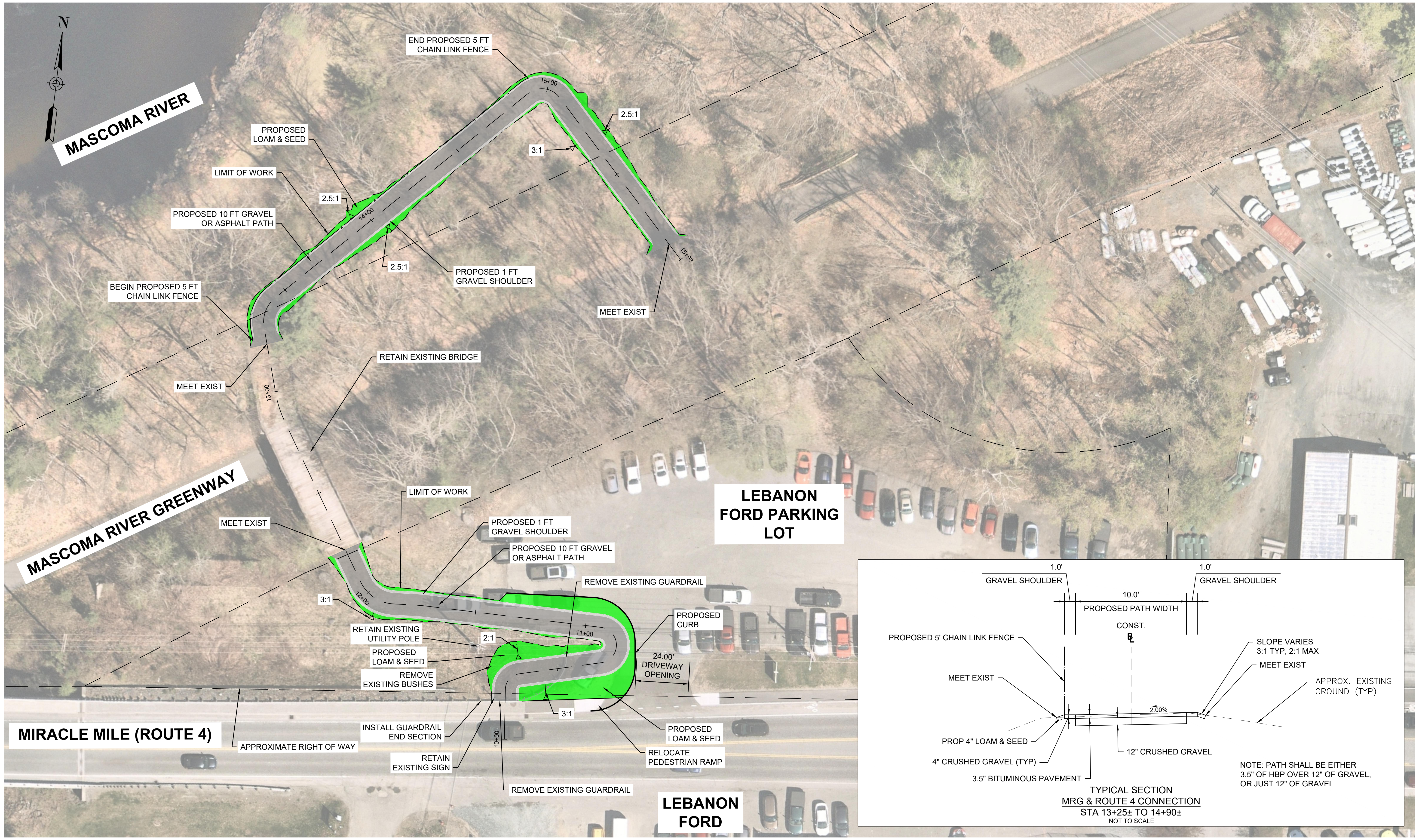
Date	3/3/2023					
Length	560					
	ITEM	UNIT	QUANTITY	UNIT \$	\$	COMMENTS
	Clear & Grubbing	A	0.50	\$25,000.00	\$12,500	
	Embankment	CY	100	\$25.00	\$2,500	
	Misc. Excavation	CY	100	\$35.00	\$3,500	
	Bike Path	SF	4,750	\$3.85	\$18,296	Gravel Bike Path
	Conceret Sidewalk	SF	200	\$12.19	\$2,437	
	Handicap Ramp	EA	1	\$2,379	\$2,379	
	Granite Curb	LF	120	\$45.00	\$5,400	
	Chain Link Fence	LF	180	\$25	\$4,500	
	Signage	LS	1	\$2,000	\$2,000	
	Guardrail end section	U	1	\$10,000.00	\$10,000	
	Surface Restoration	SF	2,000	\$1.73	\$3,460	Loam & seed
	SUB TOTAL				\$66,972	
	Maintenance of Traffic				\$5,000	
	Mobilization				\$15,000	
	Contingency			30%	\$20,092	
	CONSTRUCTION TOTAL				\$107,063	
	Engineering, Survey & Permitting				\$43,000.00	Assume LPA process
	Right of Way			8%	\$10,000.00	
	TOTAL				\$160,063.38	
	Construction Engineering				\$25,000.00	Assume LPA process
	Project Cost (2023 Dollars)			SAY	\$185,100	
	2.8% Inflation	2.8%			\$257,824.27	2.8% per NHDOT
	Project Cost (2035 Dollars)			SAY	\$257,900	

BUDGETARY ESTIMATE -

Unit Cost Update 1/2023

MRG Access at Lebanon Ford Lebanon, NH

Date	3/3/2023					
Length	560					
ITEM	UNIT	QUANTITY	UNIT \$	\$	COMMENTS	
Clear & Grubbing	A	0.50	\$25,000.00	\$12,500		
Embankment	CY	100	\$25.00	\$2,500		
Misc. Excavation	CY	100	\$35.00	\$3,500		
Bike Path	SF	4,750	\$6.95	\$33,023	3.5" Paved Bike Path	
Conceret Sidewalk	SF	200	\$12.19	\$2,437		
Handicap Ramp	EA	1	\$2,379	\$2,379		
Granite Curb	LF	120	\$45.00	\$5,400		
Chain Link Fence	LF	180	\$25	\$4,500		
Signage	LS	1	\$2,000	\$2,000		
Guardrail end section	U	1	\$10,000.00	\$10,000		
Surface Restoration	SF	2,000	\$1.73	\$3,460	Loam & seed	
SUB TOTAL				\$81,698		
Maintenance of Traffic				\$5,000		
Mobilization				\$15,000		
Contingency			30%	\$24,509		
CONSTRUCTION TOTAL				\$126,208		
Engineering, Survey & Permitting				\$43,000	Assume LPA process	
Right of Way			8%	\$10,000		
TOTAL				\$179,207.79		
Construction Engineering				\$25,000	Assume LPA process	
Project Cost (2023 Dollars)			SAY	\$204,300		
2.8% Inflation 2.8%				\$284,567.79	2.8% per NHDOT	
Project Cost (2035 Dollars)			SAY	\$284,600		



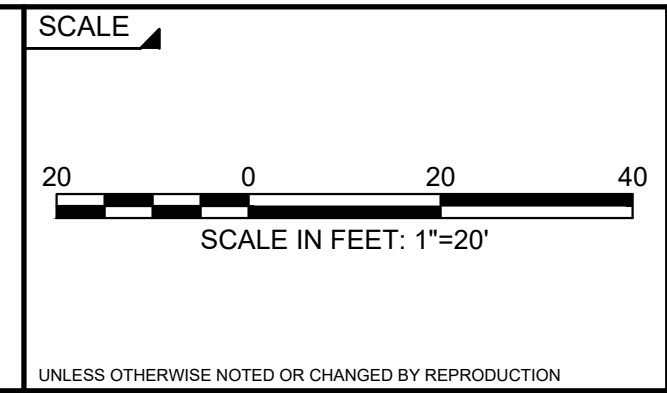
NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:	CM
DESIGNED BY:	CT
CHECKED BY:	JB

REGISTERED PROFESSIONAL
For Review Only



SUBCONSULTANT



TITLE

LEBANON, NH
MASCOMA RIVER GREENWAY
ROUTE 4 CONNECTION
CONCEPT PLAN

BETA JOB NO.	10539
ISSUE DATE	3/2/2023
SHEET NO.	1

DRAFT SITE PLAN REVIEW REGULATION AMENDMENTS

NEW SECTION 6.11 - ELECTRIC VEHICLE (EV) INFRASTRUCTURE

A. Parking Space Design.

1. Battery charging station outlets and connector devices for ***Electric vehicle supply equipment*** (EVSE) shall be no less than 36 inches and no higher than 48 inches from the ground or pavement surface where mounted.
2. EVSE and associated parking space elements (including components mounted on pedestals, lighting posts, bollards, or other devices) shall be designed and located as to not impede pedestrian travel or create trip hazards and should include a barrier-free accessible route of travel to a primary building entrance. Provide a retraction device or place to mount cords and EVSE pedestals or protections designed to minimize vandalism, pedestrian conflict, and potential damage by accidents, snow storage/plowing and inclement weather.
3. ***Electric vehicle*** (EV) parking spaces shall meet standard dimensional and related requirements of the Site Plan Regulations, Section 6.5E and ADA parameters from the [U.S. Access Board](#).
4. EVSE shall be protected such as by wheel stops or concrete filled bollards or shall be placed a minimum of 24 inches clear from the face of the curb.
5. Adequate lighting (may be on timers or motion sensors) must be provided unless charging will always be for daytime purposes only.

B. EVSE signage.

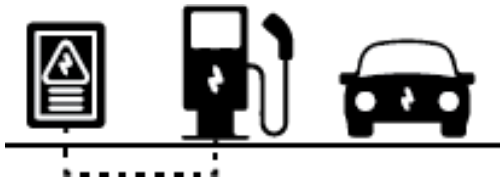
1. Identify individual ***EV-installed spaces*** as EV-parking only, according to the Federal Highways Administration/Manual on Uniform Traffic Control Devices (MUTCD) Interim Approval (IA-13) for Electric Vehicle Charging, current edition, except when located in conjunction with single- or two-family dwellings or where there are assigned tenant spaces.
2. Required information. At each ***EV-installed space*** or cluster of EV charging stations, except when located in conjunction with single- or two-family dwellings or with assigned/permitted spaces, signage must be posted and include: time limits or similar restrictions (e.g., "Electric Vehicle Parking Only While Charging"), pricing, safety information (e.g., voltage and amperage levels), contact information for service problems (including phone number), hours of operation (e.g. MUTCD R7-5), and penalty warnings (e.g., idling/maximum duration of charging sessions, non-EV parking), if applicable.

3. Format. As an alternative to posting all of the above information, details subject to change (e.g. rates) may be provided via a digital screen, website or similar. All published physical and digital content must be kept up-to-date. Signage must be included in the specifications package for Site Plan approval.
4. Labels. Submittal plans and associated installed equipment must be clearly labeled as follows: 1) service panels must identify full circuits available for EV charging as “**EV Ready**”, 2) service panels designated for future additional EV charging must be identified as “**EV Capable**”, and 3) Conduit endpoints must be marked as “**EV Ready**” for full circuits, and “**EV Capable**” for inaccessible conduit installed.

C. Other requirements

1. Multifamily dwellings and non-residential EVSE installations must include a plan (e.g., EVSE vendor contract) for Operations & Maintenance of the chargers and related equipment, such as software.
2. EVSE and related parking facilities must adhere to the Electric Vehicle Charging Design Guide (see Appendix B).

ARTICLE II – DEFINITIONS

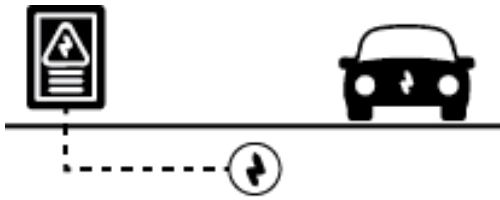


Electric vehicle supply equipment (EVSE)/ EV charging station: The apparatus installed specifically for the purpose of transferring energy between the site or building wiring and the Electric Vehicle. EVSE does not include any equipment affixed to the electric vehicle.

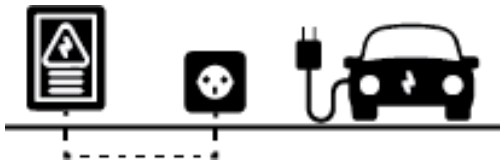
Electric vehicle infrastructure: Structures, machinery, and equipment necessary and integral to support an *electric vehicle*, including **EV charging stations** and electrical outlets.

Electric vehicle (EV): An automotive-type vehicle for on-road use primarily powered by an electric motor, including any battery electric vehicle, fuel cell electric vehicle, or plug-in hybrid electric vehicle, that draws current from an onboard battery charged through a building or site electrical service, **EVSE**, or other source of electric current.

EV-capable space: An *off-street parking space* with electrical panel capacity and space for a branch circuit dedicated to the parking space that is not less than 40ampere and 208/240-volt and equipped with raceways, both underground and surface mounted, to enable the future installation of **EVSE**. For two adjacent EV-capable spaces, a single branch circuit is permitted.



EV-ready space: An *off-street parking space* provided with a full dedicated branch circuit that includes not less than 40-ampere and 208/240-volt panel capacity, conduit, wiring, receptacle, and overprotection devices terminating in an outlet, receptacle or junction box that will support an installed EVSE and which is located in close proximity to the location of the parking space. For two adjacent EV-ready spaces, a single branch circuit is permitted. These spaces are “ready to go” with the addition of an EV charging station (EVSE).



EVSE-installed space: An *off-street parking space* with a dedicated branch circuit and **EVSE** for **Level 2 EV** or **Low Power Level 2 charging stations**, at minimum.

Level 1: “Trickle” charging level for **EVs** that operates on a 15- to 20-amp breaker on a 120-volt AC circuit (wall outlet) while drawing 1.4 to 2.4 kW to add 2-6 miles of range per hour of charging.

Low Power Level 2: Charging level for **EVs** that operates on a 208- or 240-volt, 20-amp circuit while drawing around 3.8 kW to add approximately 13 miles of range gained per hour of charging.

Level 2: Charging level for **EVs** that operates on a dedicated 40- to 100-amp breaker (same kind used by a clothes dryer or stove) on a 208- or 240-volt AC circuit while drawing around 6.2+ kW to supply approximately 19+ miles of range gained per hour of charging.

Level 3: Fast or rapid charging level for **EVs** that operates on a 60-amp or higher breaker on a 480-volt AC electric circuit or higher three phase circuit with special grounding equipment and mounting on an equipment pad.

Electric Vehicle Load Management System: An automatic load management system designed to distribute load across one, or to locate charging capacity among multiple, EV charging stations. The system should distribute a minimum of 8 amps per charger (though allocations may vary) and is intended to increase cost-effectiveness by allowing the system to “share” the load across multiple EVs in the parking facility depending on aggregate and individual charging needs.

CITY OF LEBANON SITE PLAN REGULATIONS APPENDIX B

ELECTRIC VEHICLE CHARGING DESIGN GUIDE

This guide provides detailed requirements for electric vehicle charging and is part of the City's Site Plan Review development regulations. Companion requirements for EV Charging Infrastructure thresholds are part of the Zoning Ordinance. A key objective of this guide is to foster the greatest uptime of EVSE, a smooth user experience, and maximum value of related investments.

A. Site selection

1. Utility coordination. Prior to initiating permitting in conjunction with the requirements of Zoning Ordinance Section 607.8, proposed EVSE sites should have a mandatory site survey in coordination with utilities to assess physical and financial options of existing electrical power capacity or needs for bringing power to the site, if required. The purpose is to avoid conflicts that might increase project complexity or impact parking configurations. Submission of load requests to utilities for power reviews should use GPS coordinates rather than address locations. Such a strategy will lead to a more accurate assessment of the feasibility of supplying power to the site.
2. Power level. Where **Level 3** and **Level 2** EV charging station capacity is demonstrated to be unsuitable due to user needs or the site's power capacity, and upgrades are not practical, **Low Power Level 2** or **Level 1** EV charging stations should be considered for alternative provisions.
3. Visibility. The site design and location of EVSE is an important factor in its potential for maximized utilization. EV parking spaces are encouraged to be sited in visible (readily identified by EV users), desirable and convenient locations on the site. Facilities should blend with the surrounding landscape/architecture for compatibility with the character and use of the site. EV charging station wayfinding signage and markings are highly encouraged to effectively guide motorists.
4. Risk management. Consider the risks of locating chargers in areas subject to 100-year floods. For example, protections can include waterproof connectors that guard the grid from moisture. Some stations can use batteries, but they need to be elevated and have the ability to ventilate.

5. Accessibility. EV parking spaces should be located adjacent to the principal use. Accessible electric vehicle charging stations should be located in close proximity to the building or facility entrance and connected to a barrier-free accessible route of travel. The owner of the property may designate the accessible electric vehicle charging station exclusively for use by people with disabilities.
6. Shelter. EV batteries are degraded in hot conditions and not charged fully in cold weather; the applicant may wish to provide shade, canopy or other shelter (i.e., enclosed structured parking), noting that 60-70 degrees (F) is the ideal charging temperature.
7. Energy optimization. When selecting a charging station location, site hosts and developers should consider existing and future needs for incorporating on-site distributed energy resources, and prioritize areas that can easily accommodate these assets, which in turn could reduce the cost of future upgrades. It is best practice to identify existing locations with excess load capacity that can support the deployment of curbside EV charging; for example, consider repurposing light poles.

B. Electrical system

1. Code compliance. All installations of EVSE shall meet National Electric Code (Article 625) and UL certification is recommended. The applicant should consult with the local code officials to ensure electrical code compliance as well. Level 2, including all auxiliary loads, should be metered in accordance with electric utility requirements.
2. Service. The electric service panels for EVSE ready circuits should be positioned near EV parking and shall provide sufficient capacity and space to accommodate the circuit and over-current protective device.
3. Load balancing. Property owners should consider equipment that is capable of supporting demand response, time-of-use (TOU), and/or smart charging. For example, evaluation and installation of an **electric vehicle load management system** in conjunction with other EVSE is recommended for larger projects, with the system designed to allocate charging capacity among multiple EV charging stations at a minimum of 8 amps per charger (minimum allocation may vary).
4. Enhanced charging infrastructure. Innovative charging strategies are encouraged, such as battery pack storage integration with EVSE for TOU demand management, solar canopy parking, co-location with electric bike storage and charging, and bidirectional EV chargers for vehicle-to-grid, -home, or -building load balancing.

5. Future-proofing. The make-ready portion of electrical infrastructure installed at publicly-funded, publicly-accessible locations, in particular, should be capable of supporting chargers with a minimum 150kW capacity.

C. Other best practices

1. Price signals. Usage fees must be transparent. Related considerations for programming include time of use rates and demand charges. Charging stations should display on their face the rate of charge, unit price (in whole cents or tenths of one cent), kWh at which the EVSE dispenses electricity during a transaction, and total kWh delivered per charging session, and demand charge signals prior to payment (where applicable).
2. Payment type. Multiple payment operations should be enabled. Each newly installed publicly-funded, publicly-accessible charging station must accept payments, with appropriate consumer data protection safeguards, via credit card reader and at least one other accessible form of payment. Publicly accessible EVSE should not require use of cell phone-based payment approaches.
3. Materials. EV infrastructure should be made of low-maintenance durable materials that are vandal-proof to the extent possible and operational in extreme weather conditions (including low and high temperatures).
4. Publicly accessible EVSE. The owner or operator should disclose the location and characteristics of each publicly accessible EV charging station to the U.S. Department of Energy's Alternative Fuels Data Center. Information that must be disclosed includes, but is not limited to, address, voltage, and timing restrictions.

**RULES OF PROCEDURE
FOR THE PLANNING BOARD
CITY OF LEBANON, NEW HAMPSHIRE**

ARTICLE I **GOVERNING RULES**

- 1.1 GOVERNANCE.** The Planning Board of the City of Lebanon shall be governed by the provisions of all applicable State statutes, City regulations, and these Rules of Procedure adopted under the authority of RSA 676:1.
- 1.2 DEFINITION OF BOARD.** As used in these rules, the term "Board" shall mean the Planning Board duly appointed by the legislative body of the City of Lebanon under the authority of RSA Chapter 673.
- 1.3 DEFINITION OF MEETING.** As used in these rules, the term "meeting" shall have the meaning as set forth in RSA 91-A:2.
- 1.4 RULES OF DECORUM.** Meetings of the Planning Board shall be conducted in the spirit of the "Lebanon Boards, Committees, and Commissions Rules of Decorum and Commitment to Civil Behavior," which is addended hereto and made a part of these Rules of Procedure, and all Board members shall endeavor to adhere to the principles set forth therein.

ARTICLE II **MEMBERS AND ALTERNATES**

- 2.1 REGULAR MEMBERS.** The Planning Board shall consist of nine (9) regular members, namely eight persons who shall be appointed by the City Council, by majority vote, upon nomination by the City Manager, and one member of the City Council who shall be selected by it as a member ex-officio with voting privileges.
- 2.2 ALTERNATE MEMBERS.** Alternate members of the Board shall be appointed by the City Council, by majority vote, upon nomination by the City Manager. Alternate members shall join the regular members in all presentations, public hearings, and discussions except that such alternates may not vote on any proposal or motion before the Board unless so directed by the Chair. In the absence of any regular member, except the ex-officio member of the City Council, the Chair shall appoint an alternate member to fill such vacancy. Said alternate shall then act as a regular member.
- 2.3** All members of the Planning Board shall be residents of the City of Lebanon and shall be sworn in and take an oath of office as required by RSA 42:1.
- 2.4 ATTENDANCE.** A Board member may be excused for non-attendance of a meeting or hearing for valid reasons if he or she notifies the Chair or Clerk prior to the meeting or hearing. Any Board member may leave the Board chambers for pressing business while in regular session after notice to the Chair.
- 2.5 TRAINING.** All newly-appointed Board members shall attend one (1) orientation meeting with the Planning and Zoning Director, prior to sitting as a member of the Board, unless waived or extended by the Chair at the request of the Planning and Zoning Director.

ARTICLE III **OFFICERS AND DUTIES**

- 3.1 ELECTION OF OFFICERS.** At the annual meeting, the Board shall elect a Chair and a Vice-Chair from the regular members and such other officers as it may deem necessary;

but in case of failure to elect at the time specified, the election shall take place at the next meeting. The Chair and the Vice-Chair, shall hold their respective offices until the next annual meeting after election or until their successors are elected and qualified. They shall perform such duties as the Board may prescribe. The office of Chair and Vice-Chair shall be held by an individual for no more than three consecutive terms per office unless waived by the Board.

- 3.2 DUTIES OF THE CHAIR.** The Chair shall call the meeting together, preside over all meetings and hearings of the Board, put all questions to a vote, maintain order, decide all questions of order and procedure, subject to these rules, and shall appoint any committees found necessary to carry out the business of the Board.

The Chair may present to the Board such matters as in the Chair's judgment require attention.

At the request of any Board member, the Chair shall direct that the yeas and nays be taken and entered on the record on any question before the Board.

When the Board has no established rule of parliamentary practice, the Chair shall be guided as nearly as may be by Robert's Rules of Order, which may be simplified by the Chair as deemed necessary and appropriate. In the event of a challenge by a Board member of any modification of Robert's Rules by the Chair, Robert's Rules shall prevail.

The Chair shall exercise a general supervision over the business, papers, and property of the Board and shall execute all formal documents on behalf of the Board.

- 3.3 DUTIES OF THE VICE-CHAIR.** The Vice-Chair shall assume the duties and powers of the Chair in the Chair's absence.

- 3.4 CLERK.** With the approval of the City Manager, the Director of Planning & Zoning, through the Department of Planning & Zoning, shall function as the Clerk for the Board. The Clerk shall administer official correspondence, subject to these rules and at the direction of the Board; shall issue the proper forms, compile all information, maps, and records for the Board's review; shall send all notices required by law; shall keep the minutes of all Board actions and proceedings; shall prepare reports and perform other duties as directed by the Chair; and, shall keep records of its examinations and other official actions.

The Clerk shall direct the recording secretary to take complete and accurate minutes, to tape record all meetings, to prepare in writing the official minutes of all meetings; to show the vote of each regular member upon every question, or if absent, disqualified, or failing to vote so indicate; to include in the minutes the names and addresses of all witnesses, a summary of the facts on which the decision is based and the decision rendered; and to deliver to the Clerk within 144 hours the completed document for submission to the Board for acceptance.

The Clerk, in consultation with the Chair, shall prepare the agenda for each meeting, provide all supportive documentation, and deliver said materials to each Board member no later than the Thursday preceding any scheduled Monday meeting. The Clerk shall also make public notice of the agenda of each meeting in accordance with the appropriate regulations. Any Board member may request and have placed on the agenda any item for discussion.

The Clerk shall perform other duties as directed by the Chair.

- 3.5 VACANCIES.** At the direction of the Chair, the Clerk shall give immediate notice of any vacancy to the City Council. Any vacancy among the officers of the Board shall be filled by a regular member by election, for the unexpired term, at the next regular meeting of the Board.
- 3.6 STAFF SUPPORT.** The Chair may request, through the City Manager, the attendance of any officer or employee of the City to confer with the Board. The Board may vote to request the City Manager to provide an officer or employee.
- 3.7 ASSISTANCE BY THE DIRECTOR OF PLANNING & ZONING & DEPARTMENT OF PLANNING & ZONING.** Requests for assistance to the Director of Planning & Zoning and/or Department of Planning & Zoning in matters before the Board or Chair of the Board shall be made by the Board either by consensus or motion duly passed. Requests for information may be made to the Director of Planning & Zoning and/or Department of Planning & Zoning by any Board member through the Chair.

ARTICLE IV **MEETINGS**

- 4.1 ANNUAL MEETINGS.** The annual meeting of the Board shall be the second Monday in the month of January each year, or if there is no meeting due to a lack of business, then the first public meeting held thereafter.
- 4.2 REGULAR MEETINGS.** Regular meetings shall be conducted by the Board at which applications for development shall be reviewed and acted upon. Regular meetings of the Board shall be held on the second Monday of the month unless there is no business to transact, in which case no meeting shall be held. The Clerk shall give each Board member timely notice of the cancellation of such meeting and shall post a notice in at least one public place by the time of the regularly scheduled commencement. Regular meetings shall normally start at 6:30 p.m. and terminate at 9:30 p.m.
- 4.3 PLANNING SESSIONS.** Planning sessions shall be conducted by the Board at which study items and planning issues are analyzed. Said sessions shall be held on the fourth Monday of the month unless there is no business to transact, in which case no meeting shall be held. The Clerk shall give each Board member timely notice of the cancellation of such meeting and shall post a notice in at least one public place by the time of the scheduled commencement. Planning sessions shall normally start at 6:30 p.m. and terminate at 9:30 p.m.
- 4.4 SPECIAL MEETINGS.** Special meetings of the Board may be called by the Chair provided that at least 48 hours notice shall be given to each Board member of the time, place, and business of such meeting. The Clerk shall ensure the provision of adequate public notice of such special meetings as required by law.

Upon the written or oral request of at least four (4) Board members, a special meeting shall be called. Said meeting shall take place not later than one week after the fourth Board member shall have made the request for a special meeting, or otherwise may be scheduled for a date agreeable by all requestors.

- 4.5 PLACE OF MEETING.** Meetings of the Board shall normally be held at City Hall, in the City of Lebanon, or at some other public place in the City of Lebanon, or at the site of a proposed project for the express purpose of inspecting said site as part of the review for a proposed project.
- 4.6 OPEN MEETINGS.** All meetings of the Board and its committees shall be open to the public except as stipulated by State Law.

- 4.7 HOLIDAYS.** When any meeting date happens to be a holiday, the Board shall determine either to conduct the meeting on the next business day, cancel said meeting, or call a special meeting.

ARTICLE V **CONDUCT OF BUSINESS**

- 5.1 CALL TO ORDER.** Meetings shall be called to order by the Chair, or in the Chair's absence, by the Vice-Chair. In the absence of both, the Clerk or staff member shall call the meeting to order after which those Board members present may elect a Chair pro tem.

- 5.2 QUORUM.** The Board shall only conduct a meeting and transact business when a quorum is present. A quorum shall be at least a majority of the total membership of the Board including alternate members sitting in place of regular members.

- 5.3 ORDER OF BUSINESS.** For each regular meeting the order of business, unless otherwise ordered by the Chair, shall be as follows, and shall be shown on the agenda:

1. Call to Order
2. Notice of Regional Impact
3. Continued Applications – Public Hearings
4. New Applications – Completeness Reviews and Public Hearings
5. Approval of Minutes
6. Other Business
7. Adjournment

For each planning session, the order of business shall be as follows:

1. Call to Order
2. Study Items
3. Committee Reports
4. Approval of Minutes
5. Other Business
6. Adjournment

- 5.4 PRESENTATIONS DURING PUBLIC HEARINGS.** The Chair shall request that before the start of each Public Hearing a representative of the proposal give a brief presentation of the request before the Board. The brief presentation shall be adequate so as to inform all abutters and members of the public as to the nature of the project in order that they may comment on the proposed project.

- 5.5 PERMISSION REQUIRED TO ADDRESS THE BOARD.** Persons other than members of the Board shall not be permitted to address the Board except by consent of the Chair. Anyone wishing to address the Board during Open Discussion should indicate their intent and subject matter to the Chair prior to the meeting. A time limit of 3 minutes shall normally be in effect. The speaker shall not enter into any debate with anyone present and shall speak only to the subject matter indicated. A group may have one person act as its spokesperson and shall follow the same rules.

- 5.6 MINUTES.** The minutes of previous meetings shall be submitted for approval at the next regular meeting or planning session. The Chair shall call for any corrections to the minutes. Following the discussion of corrections, if any, the minutes shall be approved by motion duly passed by majority vote of the members present.

- 5.7 RECESS OF THE MEETING.** The Chair may order a temporary halt to the proceedings of the meeting. Said recess should normally not exceed 30 minutes. Upon ordering the recess, the Chair shall state the time and place for reconvening.

- 5.8 CONTINUANCE OF THE HEARING.** The Board may continue a hearing if the application cannot be disposed of on the day set. No further public notice shall be necessary provided that the date, time, and place of the continued hearing shall be announced before adjournment.
- 5.9 ADJOURNMENT OF MEETING.** The Board shall adjourn each meeting to its next scheduled meeting or to a special meeting specifying time, date, and place. If the order of business has not been concluded by 9:30 PM, the Chair shall poll the attending Board members to determine if the Board should continue beyond 9:30 PM or continue the matters on the agenda to the next appropriate meeting, or continue to a special meeting specifying time, date, and place.

ARTICLE VI VOTING

- 6.1 MOTION TO BE STATED BY THE CHAIR.** When a motion is made and seconded, it shall be stated by the Chair before debate. At the request of the Chair or any member of the Board, the motion shall be in writing. A motion may not be withdrawn or amended by the mover without the consent of the second.
- 6.2 MAJORITY VOTE REQUIRED.** Determinations on any matter before the Board shall require the concurrence of a majority of the regular members present.
- 6.3 TIE VOTE OR DECISION BY LESS THAN A MAJORITY.** A tie vote or an approval or denial by less than a majority of the regular members present constitutes no action. If the Board is unable to obtain concurrence of a majority of regular members present on a request because of the absence of one or more Board members from the vote, it shall continue the discussion or may continue the matter to a subsequent meeting pursuant to Section 5.8 above.
- 6.4 CONFLICT OF INTEREST or PREJUDGEMENT.** In accordance with RSA 673:14, no Board member shall participate in deciding or shall sit upon the hearing of any question if that member has a direct personal or pecuniary interest in the outcome which differs from the interests of other citizens, or if that member would be disqualified for any cause to act as a juror upon the trial of the same matter in any action at law.

Reasons for disqualification include, but are not limited to, when a Board member:

- A. Is an abutter
- B. Is related to the applicant or any abutter;
- C. Has assisted or advised the applicant or any abutter; or,
- D. Is biased or prejudiced in any manner or to any degree which would, in the eyes of a reasonable and prudent person, prevent the member from acting impartially with respect to the application before the Board.

Reasons for disqualification also include prejudgment which occurs when a Board member has directly or indirectly taken a position, formed a conclusion, or has prejudged the application to be decided by the Board. Prejudgment includes, but is not limited to, a position taken either for or against an application expressed at a public meeting, by letter, by ex parte communication, or by comment made in some public forum. Prejudgment does not include questions or statements made by Board members in response to the details of the application expressed during the public hearing held on that application or during the Board's deliberations.

When an uncertainty arises as to whether a Board member is disqualified in particular circumstances, the Board shall, at the request of that member or another Board member, vote on the question of his/her disqualification, but such vote shall be advisory and non-

binding. Any person with a direct interest in the outcome may voice an objection to a Board member's participation, setting forth specific reasons, and may also request such a vote, but such a request shall be non-binding. Any such request or objection shall be made either prior to or at the commencement of the public hearing, or at such later time as the facts claimed to warrant disqualification first become known. No such vote shall be taken if the Board member involved steps down voluntarily.

A Board member who is disqualified shall remove himself/herself from the Board and shall sit with the public until such time as the Board has completed its consideration of the application at that meeting. The member may then return to the Board. If, as a result of disqualification, the Board loses its quorum, then there shall be an adjournment or recess of consideration of the matter until there is a quorum either at the same meeting or the next available meeting.

6.5 VOTE OF ABSENT MEMBERS. Unless a Board member has attended the meetings on a matter or has stated publicly that he or she has examined the record and become familiar with the evidence presented from a transcript of the proceedings, he or she shall not cast a vote essential to the decision.

6.6 EXTENSION OF TIME. Any three Board members may request an extension of time before voting on any proposal before the Board. If such an extension is requested, the Board shall schedule a special meeting not more than two weeks from the date of the request to take action on the proposal or otherwise such special meeting may be scheduled for a date agreeable by all requestors. There shall be no new business placed on the agenda of any special meeting scheduled under this section.

ARTICLE VII **COMMITTEES**

7.1 AUTHORIZATION. The Chair is authorized to appoint Committees to study and to report upon such matters as directed by the Chair which are germane to the purpose of the Board.

7.2 DEFINITION OF COMMITTEE. A group of Board members delegated by the Chair to perform a function.

7.3 MEMBERSHIP. All Committees shall consist of not more than four (4) Board members.

7.4 DUTIES. The duties of any Committee shall be defined by the Board at a regular meeting.

7.5 COMMITTEE CHAIR. The first Board member named on the Committee shall be the Chair thereof.

7.6 MEETINGS. The Chair of a Committee shall call the same at such time and place as he or she may deem proper whenever there is any business requiring the attention of the Committee.

7.7 INVESTIGATIONS. If necessary for the proper consideration of any matter referred to the Committee, the Committee is authorized to make investigations and call upon the City staff for such surveys, plans, estimates, and recommendations as may be deemed necessary.

ARTICLE VIII **E-MAIL AND OTHER COMMUNICATIONS BETWEEN MEETINGS**

8.1 PURPOSE. The aims of this Article are:

- A. To ensure compliance with the letter and spirit of the Right-to-Know Law, RSA 91-A, and with the Due Process rights of parties before the Board;
- B. To clarify Board members' ability, between meetings, to research issues and prepare motions or other potential Board actions, thus promoting efficient use of meeting time, but only to the extent allowed by law; and,
- C. To clarify the role of electronic media, such as E-mail, in achieving these goals.

8.2 DEFINITIONS. In this Article:

- A. **Communication** means a transfer of information, objective or subjective, from one person to another. It includes face-to-face or phone conversations, letters, memos, E-mails, web sites, or any other medium, regardless of the location or ownership of any device or equipment used.
- B. **Distribution** is a one-way communication between meetings involving more than one Board member where no between-meeting response (except acknowledgment of receipt) occurs or is expected.
- C. **Exchange** is a communication between meetings, or series of communications, involving more than one Board member which includes a between-meeting response, or expectation of a response.
- D. **Ex Parte Communication** is communication, other than at a legally-noticed meeting, between a Board member and a person with an interest in, or affected by, a pending or future case.

8.3 ACTIVITIES BETWEEN MEETINGS OF INDIVIDUAL MEMBERS. Individual Board members may, between meetings, prepare drafts of motions or other potential Board actions. They may also research or investigate general or specific factual issues. However, if the research pertains to a case, the Board member shall, at the public hearing, report all findings to the Board, and parties to the case shall be given a meaningful opportunity to respond.

8.4 DISTRIBUTIONS. A Distribution may be made to any number of Board members, so long as it does not become an Exchange. Whenever a Board member makes a Distribution concerning a pending or future case and it involves a quorum of the Board (counting all senders and recipients):

- A. A copy shall be forwarded to the Director of Planning & Zoning, who shall determine, under RSA 91-A or other applicable law, whether the Distribution is subject to public disclosure and shall place the copy in the appropriate file;
- B. The Board member making the Distribution shall report on it, and its contents, at the public hearing on the case unless the information is exempt from disclosure under RSA 91-A; and,
- C. Parties to the case shall be given a meaningful opportunity to respond to the information in the Distribution.

8.5 EXCHANGES. Exchanges involving a quorum or more of the Board or of any Planning Board Committee are prohibited. Such Exchanges shall be considered deliberations and shall occur only at meetings noticed in accordance with RSA 91-A. An Exchange pertaining to any activity allowed under Subsection 8.3 is permitted if the number of Board or Committee members involved is less than a quorum; however:

- A. Each Board member involved shall be responsible for preventing the number of members involved from reaching a quorum;
- B. Information discussed in, or generated by, an Exchange between Board members shall not be subject to further Distribution; and
- C. No Exchange shall include any vote or straw vote, or any Ex Parte Communication.

- 8.6 EX PARTE COMMUNICATIONS.** Board members shall not initiate Ex Parte Communications. If an Ex Parte Communication is initiated by another person, the Board member contacted shall:
- A. Refrain from discussing the substance or merits of a case;
 - B. Inform the person, if necessary, that such a discussion could lead to disqualification;
 - C. Refer the person to the Department of Planning & Zoning or to a Board meeting, as appropriate; and
 - D. Report on the conversation to the Board at a public meeting.
- 8.7 SCHEDULING AND AGENDA.** Notwithstanding Subsections 8.4, 8.5, and 8.6, nothing in this policy prevents any Distributions, Exchanges, or Ex Parte Communications which pertain solely to:
- A. Scheduling of meetings or hearings;
 - B. The determination or ordering of agenda items or topics to be taken up at meetings or hearings; or
 - C. General procedural requirements pertaining to such scheduling and agenda matters.
- 8.8. PLANNING BOARD COMMITTEES.** A Planning Board Committee shall be considered a public body, and all provisions of RSA 91-A and this Article, applicable to a quorum of the Board, shall also apply to a quorum of a Committee.

ARTICLE IX **ADMINISTRATION**

- 9.1 ADOPTION.** Upon adoption, the Clerk shall file a copy of these Rules and all amendments with the City Clerk as a public record and post a copy in one or more public places for 15 days.
- 9.2 AMENDMENTS.** These rules may be amended at any regular meeting by an affirmative vote of a quorum of the Board provided that such amendment has been presented in writing to each member of the Board at least 15 days preceding the meeting at which the vote is taken.

These Rules of Procedure were adopted by the Planning Board on November 21, 1989 and amended on:

December 9, 1996	Section 5.6 - MINUTES
January 11, 1999	Section 5.3 - ORDER OF BUSINESS
September 11, 2000	Section 4.1 - ANNUAL MEETINGS
September 11, 2000	Section 4.2 - REGULAR MEETINGS
January 28, 2002	Section 5.3 - ORDER OF BUSINESS
May 7, 2003	Section 2.7 (new) - ASSISTANCE BY THE CITY PLANNER & PLANNING OFFICE
May 7, 2003	Section 6.5 - CONFLICT OF INTEREST OR PREJUDGMENT
May 7, 2003	Article VII (new) - E-MAIL AND OTHER COMMUNICATIONS BETWEEN MEETINGS.
December 13, 2010	Section 4.2 - REGULAR MEETINGS
December 13, 2010	Section 4.3 - PLANNING SESSIONS
July 11, 2016	Article II (new) - MEMBERS AND ALTERNATES;
July 11, 2016	Section 5.9 - ADJOURNMENT OF MEETING;
July 11, 2016	General updates and reformatting;
January 28, 2019	Section 5.6 - MINUTES, General updates
August 26, 2019	Section 5.3 – ORDER OF BUSINESS
June 28, 2021	Section 1.4 – RULES OF DECORUM and Addendum

These Rules of Procedure supersede all other Rules and By-Laws.

ADDENDUM

LEBANON BOARDS, COMMITTEES, AND COMMISSIONS

RULES OF DECORUM AND COMMITMENT TO CIVIL BEHAVIOR

It is acknowledged that:

1. Civil, respectful, and courteous discourse and behavior are conducive to the democratic and harmonious airing of concerns and decision making.
2. Uncivil discourse and/or discourteous and inappropriate behavior have a negative impact on the character and productivity of the decision-making process.
3. Anger, rudeness, ridicule, obscene or profane language, impatience, and lack of respect for others and personal attacks are not acceptable behavior.
4. Demonstrations in support or opposition to a speaker or idea are not permitted by members of the Board. The Chairman is responsible for maintaining order. Failure to abide by this requirement may result in the forfeiture of the speaker's right to speak.

To maintain a cohesive, productive working environment, the members of the Lebanon Boards, Committees, and Commissions commit to:

1. Supporting the Board's mission.
2. Showing respect to each other as appointed members and staff representatives to the Board.
3. Promoting civility during Board meetings and tolerating nothing less.
4. Demonstrating reflective listening and not displaying negative body language (for example eye rolling, pencil tapping, shrugging of one's shoulders, hand gestures, etc.)
5. Allowing uninterrupted speech by those recognized as "having the floor" and refraining from speaking until recognized by the Chair.
6. Bringing appropriate committee-related concerns, issues, and conflicts to the Board for discussion.
7. Offering alternative solution(s) when addressing a problem or issue.
8. Maintaining the confidentiality of material discussed during closed Board meetings.

PLEDGE OF CIVILITY

The manner in which we govern ourselves is often as important as the positions we take. The City's collective decisions will be better and truer to our mission when differing views have had the opportunity to be fully vetted and considered. All those who appear before the City's boards, committees, and commissions have the right to be treated with respect, courtesy, and openness. We value all input.

Accordingly, we commit to conduct ourselves at all times with civility and courtesy, to both those with whom the Board interacts and to each other. We also pledge to endeavor to correct ourselves, should our conduct fall below this standard.

DRAFT

LEBANON PLANNING BOARD
Regular Session
Monday, April 24, 2023, 6:30 PM
Council Chambers, City Hall
or Remote Via Microsoft Teams
LebanonNH.gov/Live

MEMBERS PRESENT: Matthew Hall (Chair), Jeremy Rutter (Vice Chair), Kim Chewning, Bruce Garland, Kathie Romano, Laurel Stavis

MEMBERS ABSENT: Karen Zook (City Council Rep)

STAFF PRESENT: Nathan Reichert (Planning Director), Tim Corwin (Deputy Planning Director), Brian Vincent (City Engineer), Mark Goodwin (GIS Coordinator)

1
2 **1. Call to Order**
3

4 Chair Hall called the meeting to order at 6:31 PM.
5

6 **2. Notice of Regional Impact**
7

8 The following application was received by the Planning and Development Department on or before April
9 10, 2023:
10

11 **Upper Valley Technology Park LLC, 0 Plainfield Road (Tax Map 131, Lot 3) zoned IND-L:**
12 Request for a Conditional Use Permit per Section 501.4 of the Zoning Ordinance and for Minor
13 Subdivision approval of a proposed 3-lot Industrial Planned Unit Development (IPUD). The proposal
14 is intended to supersede and replace the 3-lot IPUD approved on December 19, 2022 (PB2022-51-
15 CUPMIN). **PB2023-16-CUPMIN**
16

17 Mr. Corwin stated that Staff determined the above application has no potential for regional impact.
18

19 ***A MOTION by Bruce Garland that the application of Upper Valley Technology Park LLC, 0 Plainfield***
20 ***Road (Tax Map 131, Lot 3) zoned IND-L, has no potential for regional impact.***
21

22 ***The motion was seconded by Jeremy Rutter.***
23 ***The MOTION was approved (6-0).***
24
25

26 **3. Study Items**
27

28 A. Review of Draft Miracle Mile Corridor Study
29

30 Mr. Corwin introduced the study and provided background information. There was a written memo and
31 plan set provided to the Board members.
32

Mr. Vincent gave a review of the findings and stated that Staff is looking for feedback on the study. Visuals of the plans were shown to the Board and the proposed changes were described. The Board members commented about the islands in the parking areas, which are hard to see in the dark. Entrances and exits from shopping areas were discussed. The Board members provided feedback on the study. Mr. Corwin provided additional information regarding the timeline and public input.

B. Review of proposed amendments to the Site Plan Review Regulations re: electric vehicle (EV) charging infrastructure - continued from March 27, 2023 - Postponed

C. Review of Master Plan update process - continued from March 27, 2023

Mr. Garland opened the discussion of the Master Plan by providing background for the proposal he shared with the Board. The Board members commented on the process and goals for updating the plan. Mr. Goodwin provided insight on the role of the Master Plan in the development of the City. Chair Hall proposed reviewing the energy chapter in addition to natural resources. Mr. Reichert explained the capacity of the Planning Staff as it relates to the delay in reviewing the chapters and provided an overview of new, technical updates to the format of the chapters.

D. Review draft update of Master Plan Chapter 5 (Natural Resources) - continued from March 27, 2023

Mr. Corwin stated that it would be best for the Board to finalize the chapter and to then send it to the City Council. Chair Hall noted that the Board's next step would be to hold a public hearing, and it would be helpful to make it a joint meeting with the Conservation Commission. Mr. Garland noted that it would be most effective to have the Conservation Commission invite public comment during the formulation of the chapter update. The Board members discussed the purpose and goals of the Master Plan.

A MOTION by Laurel Stavis that the Planning Board schedule a Public Hearing on the draft update of Master Plan Chapter 5, Natural Resources, for May 22, 2023, at 6:30 PM.

The motion was seconded by Bruce Garland.

****The MOTION was approved (6-0).***

4. Committee Reports

A. City Council Subcommittees:

--Class VI Roads Advisory Committee

--Lebanon Energy Advisory Committee

B. Other Subcommittees:

--City Council Representative

--**Heritage Commission** – Mr. Rutter noted that a new book on Lebanon would be released soon.

Chair Hall suggested inviting the author to a meeting to discuss the book.

--Pedestrian & Bicyclist Advisory Committee

--**Upper Valley Lake Sunapee Regional Planning Commission** – Mr. Garland reported that there is an opportunity for residents to gain information for creating ADU's.

--UV SubCommittee of the Connecticut River Joint Commissions

--Upper Valley Transportation Management Association

--Mascoma River Local Advisory Committee

--West Lebanon Revitalization Advisory Committee
--Planning & Development Department – Task Status

5. Other Business

- A. **Robert J. Oakes, 00 LaPlante Road, (Tax Map 138, Lot 27), zoned R-3, RL-1, RL-3:** Conceptual review per Section 7.3 of the Subdivision Regulations and Section 501.1.D of the Zoning Ordinance of a proposed six (6)-lot Planned Unit Residential Development (PURD). **PB2023-17-CON**

Dan Nash of Advanced Geomatics & Design appeared in support of the proposal.

Mr. Nash provided the background for the proposed development of single-family homes and discussed specific details for the project. The Board members commented on the septic systems and several aspects of the property.

3. Minor Site Plan Committee – No report

4. Other Business

5. Approval of Minutes

- A. March 27, 2023

A MOTION by Bruce Garland to approve the Planning Board Minutes of March 27, 2023, as amended.

The motion was seconded by Jeremy Rutter.

**The MOTION was approved (6-0).*

Mr. Corwin provided a preview of the topics for the next meeting.

6. Adjournment

A MOTION by Bruce Garland to adjourn the meeting.

The motion was seconded by Kathie Romano.

**The MOTION was approved (6-0).*

The meeting was adjourned at 8:36 PM.

Respectfully submitted,

Holly Howes

Recording Secretary