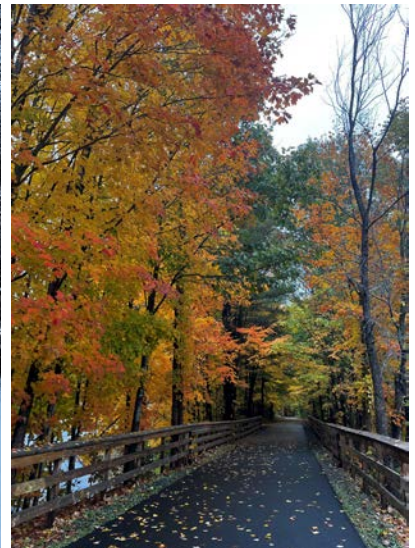
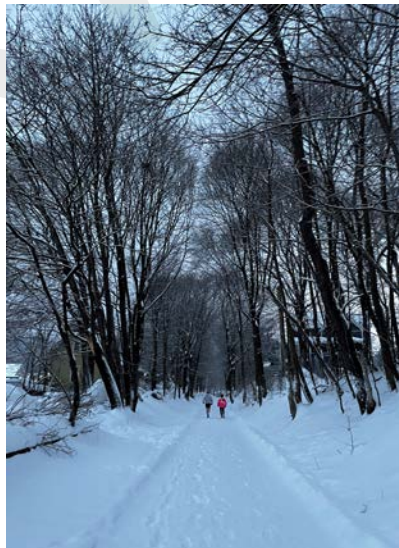




Upper Valley Lake Sunapee Region *Draft Long-Range Transportation Plan*



Upper Valley Lake Sunapee Regional Planning Commission
2024

Acknowledgements

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Transport icons courtesy Freepik.

Adoption Notice [To be complete once adopted]

Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) is one of nine Regional Planning Commissions (RPC) in New Hampshire enabled through state legislation (RSA 36:45). RPCs were created to coordinate all aspects of planning, act as a liaison between local and state/federal governments and provide advisory technical assistance. Regional Planning Commissions (RPCs) seek to promote intergovernmental collaboration and coordination throughout the regions they serve. UVLSRPC serves in advisory role to 27 towns in New Hampshire across Grafton, Sullivan, and Merrimack Counties.

This plan is funded in part by the New Hampshire Department of Transportation and the Federal Highway Administration (FHWA), U.S. Department of Transportation. The contents of this plan do not necessarily reflect the official views or policies of the funding agencies.

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Executive Summary

The *Long-Range Transportation Plan (LRTP)* is an evaluation of the region's current transportation system and resulting recommendations for future actions and considerations over the next 15-20 years. Updated every five years, the *LRTP* acknowledges and accounts for the ways in which transportation can promote or hinder populations' successes.

The LRTP comprises both this document and the [*Regional Corridor Transportation Plan \(Corridor Plan\)*](#). The *Corridor Plan* focuses on the region's major transportation corridors to present a 15-year vision for an improved transportation system, highlighting specific infrastructure or capital projects of need. Conversely, this document uses a systemic, non-capital approach to consider current conditions within the 27 municipalities of the Upper Valley Lake Sunapee Region and propose projects that are actionable by municipalities and organizations throughout the region. This document also includes a close look at inter-regional travel options and various modes that interact with the region's transportation network.

The *LRTP* includes twelve goals, or top priorities, that are applicable across the region. Each goal has both capital and non-capital aims and subsequent action items. This document also includes community evaluations of those goals, as well as an overview of current transportation conditions. This overview likewise discusses barriers and opportunities to achieving the goals of the *LRTP*, as well as an analysis of the transportation networks within the region.

At its conclusion, the *LRTP* offers an Action Plan that lists the defined, implementable projects that regional and local entities can pursue to improve the region's transportation system for the long-term. Grouped by strategies for implementation, the Action Plan also presents means to undertake projects, prioritizes tasks, and notes the identified goals that the tasks achieve.

In all, the *LRTP* addresses current transportation needs and successes, using community conditions and input to inform regional goals and proposed projects. The *LRTP* ultimately considers the impacts of transportation on individuals, communities, and the environment to identify the actions that can help lead to a well-informed, well-designed future of transportation in the region.

1 - Introduction

1.a What Is the *L RTP*?

The movement of people and goods weaves the fabric of our region's social and economic vibrancy. **Transportation is an agent of democracy. It enables people to participate in civic life, pursue job opportunities, improve their quality of life, and meet their basic needs. However, it can also be the very barrier that excludes people from these activities, especially marginalized communities.** Rethinking transportation is necessary to support and repair communities that continue to be harmed by divisive infrastructure and car-dependent design. The rural and scattered nature of our region creates unique challenges. However, micro-networks of walkability, bicycle suitability, and public transit are essential for reshaping mobility in the region. The increasing threat of warming temperatures and flooding threatens these transportation networks, underpinning the need for proactive adaptation and mitigation measures.

Updated every five years, the *Long-Range Transportation Plan (L RTP)* is a vision for the future and a comprehensive evaluation of the region's transportation system. The *L RTP* strives to ensure all communities have access to a safe, reliable, affordable, and equitable transportation system. The *L RTP* comprises the 2022 Phase 1 [Regional Corridor Transportation Plan \(Corridor Plan\)](#) and Phase II, a “non-capital” complement to the *Corridor Plan*. The



Corridor Plan focuses on regional transportation networks (e.g., roads, sidewalks, bike lanes) and services (e.g., local public transit), and, with public input, identified the highest-priority, infrastructure-related, transportation improvement projects for the region by corridor, as well as an implementation plan for these projects. The following non-capital Phase II considerations and analysis within the *L RTP* build upon the findings of the *Corridor Plan* via using plans, policies, equity, education, outreach, engagement, pilot projects, workforce, trainings, networks, partnerships, and data analysis to increase understanding of transportation needs and solutions. The *L RTP* consequently provides both specific and big-picture perspectives on the regional transportation system and transportation goals.

The Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) is a rural planning organization that serves 27 New Hampshire municipalities and interregional efforts. The *L RTP* will address the United States Federal Highway Administration's (FHWA) and Federal Transit Administration's (FTA) planning emphasis areas for New Hampshire and National Transportation Performance Goals. The *L RTP* also incorporates the goals of the Bipartisan Infrastructure Law/Infrastructure Investment and Jobs Act (IIJA).

The planning process of this document included goal setting, gathering data, analyzing data, and developing the plan via public engagement activities. Our public engagement efforts followed the practices and principles outlined in UVLSRPC's Public Involvement Plan and UVLSRPC's [Title VI Plan](#). Some activities of the plan development included virtual and in-person surveys, focus groups, public events, and interviews.



Aerial snapshot of roadway. Source: NHDOT

1.b Goals of the *L RTP*

Throughout the *Corridor Planning* process and the Phase II process for the *L RTP*, the following 12 goals were identified as top priorities throughout the region. Each goal

described below has a different meaning or “lens” depending on whether one views it as an infrastructure or capital goal (*Corridor Plan* lens) or a systematic or non-capital goal (*L RTP* lens).

| SAFETY | |
|--|---|
| <i>Improve safety for all motorized and non-motorized users, using a Complete Streets approach.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Identify specific roadway design improvements and priority locations | Examine behavior, visibility, speed, wildlife, roadway condition, environment, and density |
| ACCESSIBILITY | |
| <i>Improve access to public destinations for all users through transportation choice.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Identify specific roadway design improvements and opportunities for additional services | Examine availability of mobility options, ease of access, needs analyses, location of new public sites, and demographics |
| ELECTRIFICATION | |
| <i>Decarbonize the transportation sector and build out electric vehicle charging infrastructure.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Identify specific electric vehicle infrastructure improvements, locations, and funding | Upgrade municipal and private fleets to electric vehicles, electrify freight vehicles, support transit fleets to electric buses transitions, identify economic benefits of electrification, update site plan regulations to include EV infrastructure, include E-bikes in transportation decisions |
| INCREASE FUNDING & RESOURCES | |
| <i>Ensure the region strongly and equitably competes for funding and resources.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Create a detailed project list and action plan for capital projects to ensure each project is "application ready" when funding sources are announced | Understand funding allocation formulas, data gaps, workforce and training gaps at the local and regional level, state and federal funding allocations and distribution, policy and funding mode focuses, and cost of materials |
| EQUITY & HEALTH | |
| <i>Prioritize diversity, equity, public health, and environmental justice in transportation investments and planning.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Highlight multi-modal users in each of the eight corridors, environmentally-focused infrastructure projects, and active transportation improvements | Understand diverse populations and geographies, consider environmental factors, encourage active transportation, understand marginalized communities, ensure a strong and inclusive public process, understand transportation access to health care, food deserts, and partner with diverse organizations |

| RESILIENCY | |
|--|---|
| <i>Prepare the region to respond to and recover from natural hazards that threaten the transportation network.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Prioritize infrastructure improvements to adapt to natural hazards and to mitigate impacts to roadway infrastructure | Conduct climate change projections, vulnerability assessments of the network, prioritize emergency response in transportation, planning, and cross-sectoral partnerships |
| COVID-19 RECOVERY | |
| <i>Address impacts of the COVID-19 pandemic on regional travel needs.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Address changes in travel patterns and traffic data throughout the region pre- and post- COVID-19 | Analyze data and identify gaps, understand transportation for health care-related needs, policies and reliability on the existing transit network, and behavioral change |
| BALANCED MOBILITY | |
| <i>Balance local versus regional mobility needs in downtown areas and Main Streets.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Identify specific corridors that would benefit from inter-regional travel options and improvements | Identify gaps in local to regional networks, education and knowledge of existing inter-regional transportation options, costs of various options, the movement of people versus the movement of goods, and access management to minimize traffic conflicts |
| LIVABLE COMMUNITIES | |
| <i>Align transportation investments with community planning goals.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Identify specific infrastructure projects that overlap with other sectors such as land use, economic vitality, natural resources, housing, energy, and quality-of-life | Build partnerships with various stakeholders in making decisions, connect housing and transportation planning before making decisions, improve policies and toolkits to mitigate impacts to other sectors, and identify whether investments in transportation are supported by the public |
| MANAGE DEMAND | |
| <i>Reduce the need for single occupant vehicle travel, especially in congested areas.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Identify specific projects and locations that may reduce congestion such as roadway design and traffic signal improvements | Manage demand by considering employment start times, carpooling, carshares, parking, increased transit needs, and new development locations |

| EMISSIONS REDUCTION | |
|---|--|
| <i>Promote reduced fossil fuel consumption and fewer vehicle miles traveled.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Identify multi-modal solutions and electrification that would promote the reduction of fossil fuel consumption and fewer vehicle miles traveled | Reduce the number of trips to various locations, by considering telecommuting, emissions policies, fleet electrification, electric vehicle charging infrastructure, and freight technology |
| MAINTENANCE | |
| <i>Prioritize maintenance and improvement of existing infrastructure; reduce the number of Red List bridges.</i> | |
| Corridor Plan Lens | Long-Range Plan Lens |
| Identify many transportation improvements due to deferred maintenance or other related challenges | Create infrastructure inventories and condition analyses, understand local maintenance and operational policies, municipal budgets and funding, utilize best practices for maintenance, and develop pavement capital improvement plans |

A key element to the *L RTP* is the emphasis on planning assistance to member communities so transportation projects and policy decisions can be formulated at the local level, prioritized at the regional level, and finalized and implemented at the state level.

The Bipartisan Infrastructure Law/ Infrastructure Investment and Jobs Act (IIJA) Compliance assures a broad range of public involvement in the project planning and development process.

The development of the *L RTP* was guided both by the United States Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) Planning Emphasis Areas (PEAs) for New Hampshire and the goals of the Bipartisan Infrastructure Law/Infrastructure Investment and Jobs Act (IIJA). These connections are detailed in the tables below.

| FHWA/FTA Planning Emphasis Areas for New Hampshire | |
|---|-------------------------------|
| Emphasis Area | Connected L RTP Goals |
| Increasing Safe and Accessible Transportation Options | Safety, Accessibility |
| Housing Coordination | Livable Communities |
| Urbanized Area Sub Allocation and Project Selection | Corridor Action Plan |
| Census 2020 Designation and Function Reclassification | Maintenance, Increase Funding |
| Congestion Management Process Implementation | Accessibility, Manage Demand |
| Freight Planning | Balanced Mobility |
| Fiscal Constraint and Financial Planning | Increase Funding |
| Data Collection for HPMS Maintenance and Monitoring | Maintenance |
| Emerging Technologies | Electrification |
| Project Monitoring | Maintenance |

| National Transportation Performance Goals | |
|---|--|
| Performance Goal | Connected LRTP Goals |
| Safety | Safety |
| Infrastructure Condition | Corridor Action Plan |
| Congestion Reduction | Accessibility, Manage Demand |
| System Reliability | COVID-19 Recovery, Resiliency |
| Freight Movement and Economic Vitality | Balanced Mobility, Accessibility |
| Environmental Sustainability | Resiliency, Emissions Reduction, Equity and Health |

| Planning Factors | |
|-------------------------------------|---|
| Process and Factors | Connected LRTP Goals |
| Economic Vitality | Livable Communities |
| Safety | Safety |
| Security | Safety, Resiliency |
| Accessibility | Accessibility |
| Environment and Energy Conservation | Electrification, Resiliency, Emissions Reduction |
| Integration and Connectivity | Livable Communities, Accessibility, Balanced Mobility, Equity and Health, Manage Demand |
| System Management and Operation | Manage Demand, Maintenance |
| Preservation | Maintenance, Resiliency |
| Resiliency and Reliability | Resiliency, Equity and Health |
| Travel and Tourism | Accessibility, Balanced Mobility |

1.c How Is the Region Doing?

From January 2023 through March 2023, UVLSRPC conducted a 36-question online ArcGIS survey to evaluate how well the region is currently meeting our regional transportation goals. **One-hundred respondents provided an average-to-below-average report card, indicating all goals have areas for improvement.** (Note: only nine of the 12 goals were ranked based on the public's ability to assess. Increase Funding and Resources, Balanced Mobility, and Maintenance were not included.) Survey questions can be found in Appendix 2.i. A summary of respondents' additional comments on the survey can be found in Appendix 2.ii.

Beginning with existing conditions and trends, the *LRTP* assesses current transportation services, different modes, and travel behaviors. Considerations include single-occupant travel, carpooling, active transportation, school transportation, bus transit, volunteer transportation, interregional transportation, and on-demand transportation. Then, the *LRTP*

- C- Safety
- C+ COVID-19
- D Manage Demand
- D+ Accessibility
- C- Equity & Health
- D Emissions Reductions
- D+ Electrification
- C- Resilience
- C- Livable Communities

Respondents' average grades of how well the region is meeting its regional transportation goals.

considers opportunities and barriers to achieving the regional transportation goals, incorporating public opinions and suggestions. The following sections provide a data and network analysis map to highlight communities' transportation gaps. The final section illuminates related transportation topics and introduces strategies, actions, and performance measures to implement the *LRTP*.

2 - Existing Conditions and Trends

2.a Transportation Modes and Services

This section used U.S. Census, American Community Survey, and National Household Travel Survey data to determine the degree to which transportation modes and services have changed over time. For the most part, many transportation conditions remained the same.

Commuting

Like many other rural regions in New Hampshire, most people travel by automobile.

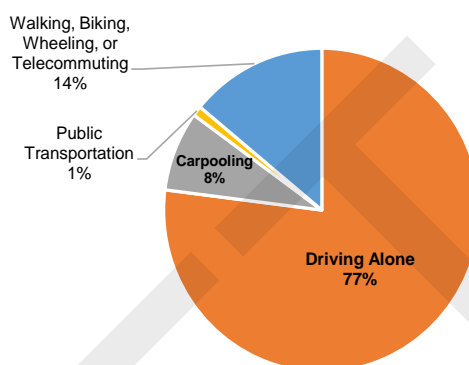
In the Upper Valley Lake Sunapee region, 77% of residents commute by driving alone, 8% carpool, and less than 1% use public transportation according to ACS data from 2015 to 2019. The other 14% of commuters travel via walking, biking, wheeling, or telecommuting. The average commute time is around 26 minutes.¹ According to LODES data, around 40% of the region's workers commute outside the region for jobs.² These trends are consistent with historical trends.

Some of the 8% of residents who carpool utilize park and rides. Park and ride lots are intended for use by people engaged in intermodal (including bus trips) transportation. There are three park and ride lots in the communities of Lyme, Grantham, and New London. Newport will construct a park and ride as part of the Congestion Mitigation and Air Quality (CMAQ)



New London Park and Ride. Source: Commute Smart Rideshare

Commuting % by Mode

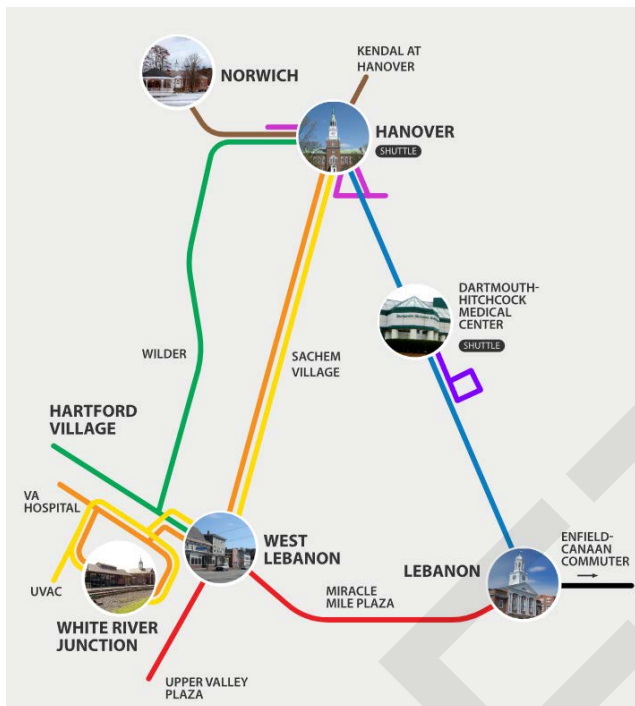


program in the 2025-2034 Ten-Year Plan, increasing the total number of park and rides to four. In 2023, New London added 50 more parking spaces to their park and ride lot.

In recent years, the COVID-19 pandemic fundamentally shifted workplace models and travel behavior. More people are “telecommuting,” or working from home, and others have moved to their seasonal homes full-time. Questions remain about the exact number of people telecommuting because of the pandemic, how telecommuting impacts local economies, and how these patterns will impact regional travel.

Bus Transportation and Volunteer Transportation

Across the country, the COVID-19 pandemic uprooted public transit operations and decreased ridership as public health officials advised residents to isolate and individually travel. While this reduced the spread of COVID-19, **the post-pandemic recovery for public transit has been an uphill battle.** There are three public transit agencies that directly serve the Upper Valley Lake Sunapee region: Advance Transit, Southwestern Community Services (SCS), and Grafton County Senior Citizens Council, Inc. (GCSCC). SCS and GCSCC receive municipal and county funding. Advance Transit receives funding from municipal, state, federal,



Map of Advance Transit Routes in the Upper Valley. Source: Advance Transit

and major employer contributions, donations from foundations and individuals, grants, sponsorships, and earned income through advertising and its repairs for hire program.

Advance Transit is a not-for-profit charitable organization providing fare-free transit in Vermont and New Hampshire. Fare-free transit 1) provides broader access to transit, 2) decreases traffic congestion, 3) reduces local and regional air pollution, 4) reduces parking demand, and 5) creates a more efficient and timely boarding process. Recently, the organization released the Transit Development Plan Interim Report, providing survey data on trip purposes, ridership trends, employment status, automobile usage, and other relevant public transit information. These existing conditions reveal insights into rider behavior and raise regional planning considerations.

While the vast majority of trips are for work (53%), this trend declined since 1999 (72%) and other trip purposes increased according to [Advance Transit's Transit Development Plan Interim Report](#). For example, trips for school or college increased from 10% in 1999 to 23% in 2022.³ Twenty-five percent of survey respondents indicated they are students. Of

the student respondents, 80% were Dartmouth College students, 10% were local high school students, and the other 10% attend various other schools.⁴ These results highlight the importance of partnerships with academic institutions and considerations for extant student transportation. Also, the increasing non-related work trip trends help explain other survey results that showed that riders requested weekend and evening service expansion.

Infrequent riders are less likely to be included in the survey, but the data captures a snapshot of bus goes on any given day. According to the report, most riders (55%) use the bus five days per week and 28% of riders use the bus three to four days per week.⁵ These data show that riders are frequent users of Advance Transit's system. Additionally, out of the respondents, 66% do not have a car available, suggesting the existence of a transit-dependent population of bus riders. As stated in the report, "the percentage of Advance Transit riders who choose to ride instead of drive is 34%. There may be others who chose not to buy a car in the first place because of the availability of Advance Transit service, so the 34% represents a lower bound of 'choice' riders."⁶

Sullivan County Transportation (SCT), managed

through Southwestern Community Services (SCS), is a shared ride service that operates within Charlestown, Charemont, Lebanon, and Newport. Starting in 2021, SCT offers a route from Claremont to Lebanon along Route 120, connecting Grafton and Sullivan Counties. Like many other transportation services, SCT partially depends on volunteers to drive people to essential services like medical appointments, grocery runs, and job interviews. However, across the country, a volunteer driver drought is threatening vulnerable adults' access to care in rural communities.⁷ With rising fuel costs and aging volunteers, it becomes challenging to sustain operations to meet service demands. For example, the business reimbursement rate is \$0.62 per mile but the charitable rate is subject to Congress and must be set by statute.⁸

Another hurdle is auto insurance and differentiating drivers-for-hire (Lyft, Uber, etc.) from volunteers. This microcosm of volunteerism decline across the country highlights the need to

update contingency plans.

Similar to SCT, Grafton County Senior Citizens Council, Inc. (GCSCC) offers door-to-door transportation for older adults and adults with disabilities throughout Grafton County, serving Lebanon, West Lebanon, Hanover, Plainfield, Enfield, and Lyme. In 2022, GCSCC provided 10,852 rides.⁹

Advance Transit provided 518,478 fixed route services and 5,814 paratransit trips in the agency's 2023 fiscal year, and SCS provided 15,147 trips in 2021.¹⁰ Increased state operating funds would allow Advance Transit to provide weekend and evening service. For SCS, additional funding would help bring wages up to market-rate and sustain expansion routes to fill service gaps. As shown below, compared to our neighboring states, New Hampshire only spends \$0.15 per person for public transit operations, which is 19 times less than the second-lowest operating budget.¹¹

State Funding in New England

Source: New Hampshire Transit Association 2022¹²

| State | 2020 Total State Funding (Capital & Operations) | 2020 Population | 2020 Total State Funding Per Capita | 2020 State Funding for Operations | State Funding for Operations per Capita |
|---------------|---|------------------|-------------------------------------|-----------------------------------|---|
| Massachusetts | \$2,333,718,671 | 7,022,220 | \$332.33 | \$1,567,711,731 | \$223.25 |
| Connecticut | \$708,350,572 | 3,600,260 | \$196.75 | \$472,350,572 | \$131.20 |
| Rhode Island | \$63,383,734 | 1,096,229 | \$57.82 | \$54,649,134 | \$49.85 |
| Vermont | \$8,156,111 | 642,495 | \$12.69 | \$7,087,000 | \$11.03 |
| Maine | \$14,732,041 | 1,362,280 | \$10.81 | \$4,061,833 | \$2.98 |
| New Hampshire | \$815,387* | 1,377,848 | \$0.59 | \$200,000 | \$0.15 |

*Does not include turnpike toll revenues used for short-term Spaulding Turnpike construction mitigation projects.

Active Transportation

Active transportation refers to human-powered transportation and low-speed electronic assist devices. Examples include bicycles, tricycles, wheelchairs, electric wheelchairs/scooters, skates, and skateboards. Many studies demonstrate the links between active transportation and health. These connections include improving air quality,

increasing levels of physical activity, decreasing injuries from motor vehicle crashes, and improving mental health. The [Corridor Plan](#) outlined infrastructure needs for sidewalks, bicycle facilities, and roadway intersections to advance active transportation. Non-motorized users of our transportation system are especially vulnerable to crashes with vehicles.

School Transportation

For many districts in the Upper Valley Lake Sunapee region, children travel far distances to reach school and educational resources.

Many towns are part of regional or bi-state districts with multiple communities sharing one school and its resources.

In New Hampshire, school districts spent \$160,643,011 in 2021-2022 on transportation and an estimated \$1,030.51 on average per pupil for transportation.¹³ Based on available information, the cost of school transportation ranges from three percent to seven percent of total district budgets in the UVLS region. Unsurprisingly, **rural districts cover greater geographical distances and spend more on student transportation, exacerbating urban and rural disparities given student transportation funds could otherwise be spent on direct educational programming.**

Interregional Transportation

Amtrak's Vermonter serves our residents at two different stations: Claremont, NH, and White River Junction, VT. In Claremont, the annual ticket revenue was \$116,785 with 2,394 passengers in fiscal year 2022.¹⁴ In White River Junction, it was \$639,964 with 12,310 passengers.¹⁵

Cape Air is a commercial service at Lebanon Airport. Daily flights are offered between 1) Lebanon and Boston and 2) Lebanon and White Plains, New York. The airline also provides service to Hyannis, Martha's Vineyard, Nantucket, and Provincetown in Massachusetts. There were 18,731 passengers (arrivals and departures) at Lebanon Airport in 2022 according to Bureau of Transportation Statistics. Boston remains the top destination airport with 6,570 passengers from June 2022 to May 2023, while White Plains had 3,910 passengers during the same period.¹⁶

Dartmouth Coach provides bus service between 1) the Upper Valley (Hanover and Lebanon) and New York City and 2) the Upper Valley (Hanover, Lebanon, and New London) to Boston (Boston South Station and Boston Logan Airport).

Greyhound's one major stop in the Upper Valley Lake Sunapee Region is located in Hanover and includes direct service to Boston, MA, Concord, NH, Manchester, NH, Montreal, QC, Burlington, VT, Montpelier, VT, and White River Junction, VT. However, service from Hanover is extremely limited with most direct routes being offered once daily. For example, a traveler going to Concord would not be able to return to the Upper Valley on the same day due to infrequency of service.

Community Spotlight:

The Upper Valley E-bike Lending Library (UVELL) hosted by Vital Communities is a pilot project which provides test rides to residents in the Upper Valley. According to participants in the program, 2/3 of respondents either have an e-bike or will have one soon. The program showed almost universal enthusiasm by borrowers, and the survey results demonstrated an increase in e-bike use instead of cars. However, safety and comfort remain important to continue riding for everyday purposes.



Demo E-Bike used in UVELL pilot project. Source: Vital Communities

Tri-Valley Transit services Addison, Orange, and Northern Windsor Counties of Vermont and helps provide connections to Advance Transit and other interregional bus systems. Southeast VT MOOver serves Windham and southern Windsor counties and plays a similar role in connecting service providers in our region.



U.S. Airways Express at Lebanon Municipal Airport

2.b Existing and Historic Conditions to Address for Our Transportation Vision

This section considers less desirable conditions created or exacerbated by transportation, barriers to achieving our transportation vision, and emphasizes the importance of accounting for impacts to various communities.

Communities of Interest

Institutions' actions and inactions create and sustain transportation inequities over time.

Without analyzing how our current regional transportation system impacts different communities of interest, we fail to consider who pays for, benefits from, bears the impact of, and determines transportation investments. These questions compel decision-makers to think about access, ability, and mobility choice as transportation networks connect and disconnect people and goods. For example, investments in additional travel lanes privilege those who drive cars as opposed to walkers, riders, or rollers.

Thus the term "Communities of Interest" refers to traditionally underserved or disadvantaged population groups, such as low-income, persons with disabilities, zero-vehicle households, veterans, and any other persons whose needs are often underserved by the current transportation network. Many populations experience compounding transportation challenges due to their race, ethnicity, gender, age, and sexual orientation.

Low-Income Households

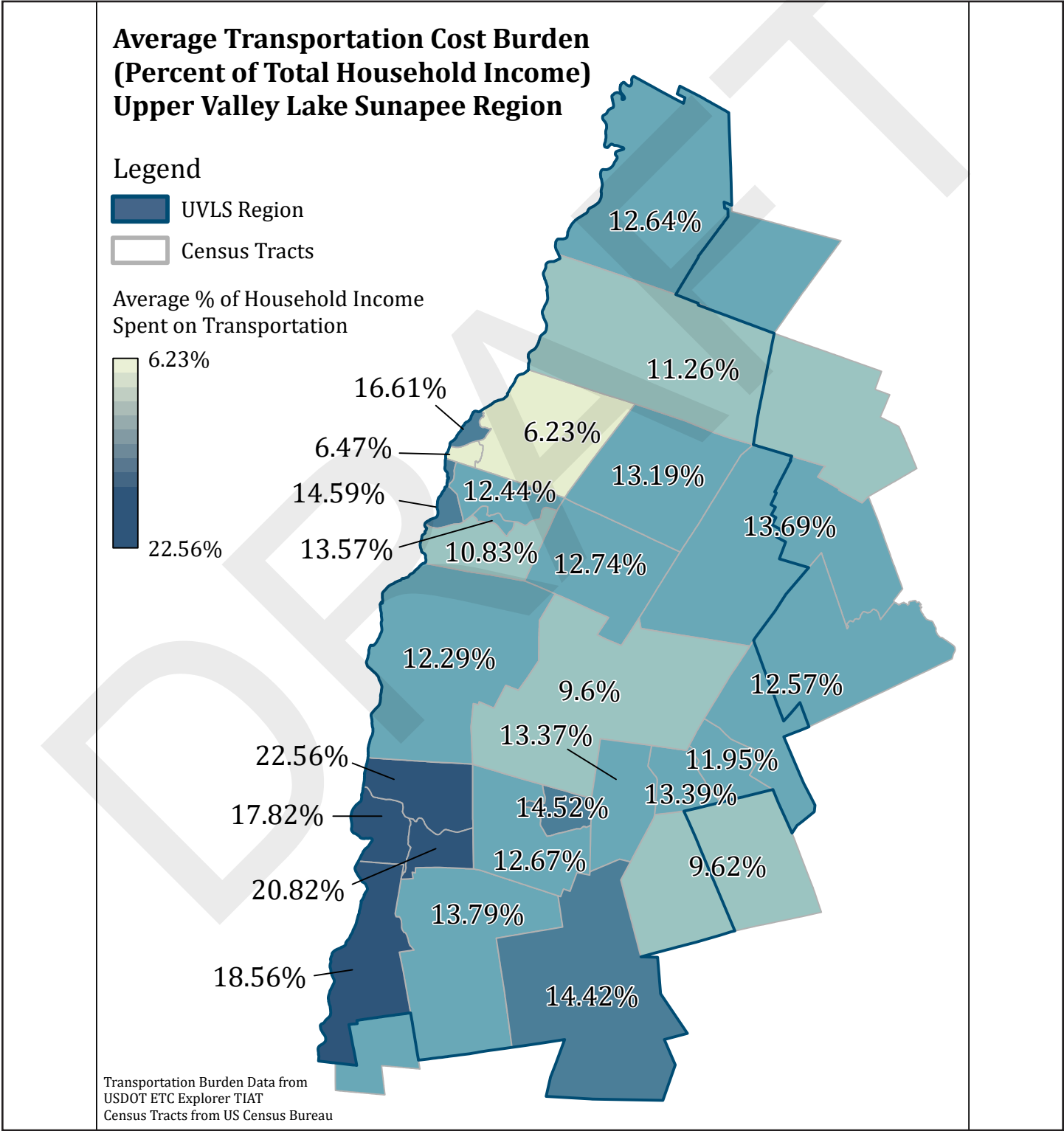
Low-income households' transportation energy burden is defined as the percentage of annual household income spent on the household vehicle fuel cost (excluding public transit) according to the *Affordability of Household Transportation Fuel Costs by Region and Socioeconomic Factors* report.¹⁷ Spending a significant portion of income on transportation costs impedes a household's ability to spend those costs on other necessities like housing, childcare, healthcare, and education.

Transportation burden is calculated at the census tract level by USDOT using transit costs, value of travel time, and vehicle ownership and use costs. A tract with households that spend over an average of 15% of the median annual income on transportation is considered cost burdened by national standards. **According to the ETC Explorer Tool, 19% of tracts in the UVLS region are considered transportation cost burdened.** However, the UVLS region's average costs across sectors reveals compounding cost burdens.

Households are also considered transportation cost burdened if housing plus transportation costs total 45% or more of household income. Seventy-four percent of UVLS tracts spend, on average, more than 12% of household income on

transportation. According to 2020 ACS 5-Year Estimates for the UVLS region, 47% of owners and 31% of renters spend more than 30% of their income on housing costs. In addition, 18% of renters and 9% of owners spend more than 50% of their income on housing costs. Though average transportation cost burden may not be significant at the national level for many UVLS tracts, a 12% transportation burden can

be extremely difficult to manage for those already facing high housing costs. In addition, rural households disproportionately experience transportation energy burdens due to relatively higher vehicle miles traveled (VMT) compared to rural or suburban areas. **The map below shows the spatial distribution of transportation cost burden for tracts in the UVLS region.**

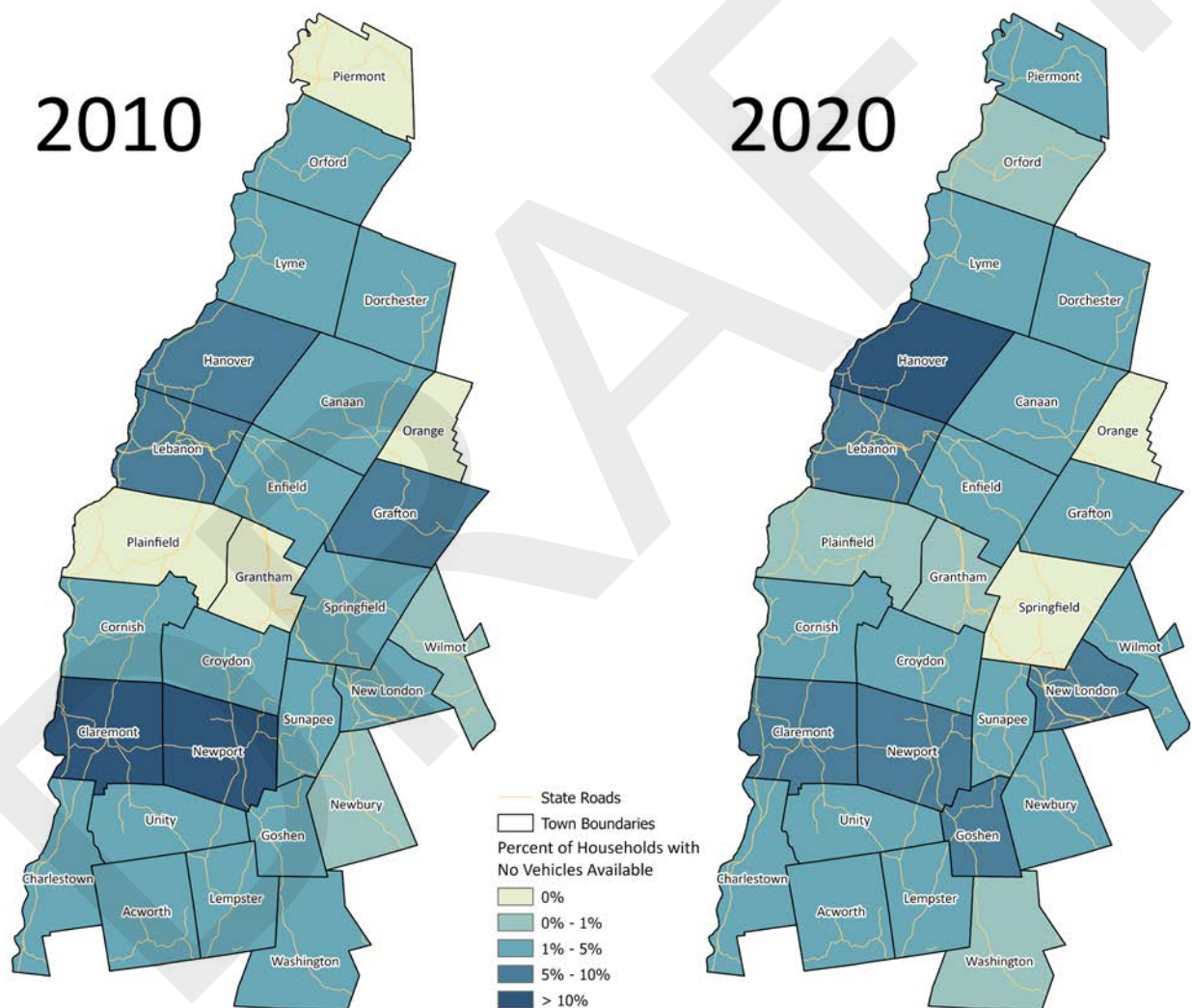


No-Vehicle Households

According to the 2020 Decennial Census, there were 1,975 households without access to one or more vehicles in the UVLS region.

As shown on the map below, many of these households are found in larger cities and towns such as Lebanon, Claremont, and Hanover. These households may comprise residents

without the financial security to obtain a car. Moreover, because reliable transportation is one of the biggest obstacles to finding and maintaining a job, no-car households disproportionately experience financial hardship and other issues in transportation systems that do not account for their needs.



UVLSRPC conducted a social service provider survey as part of the *Regional Housing Needs Assessment (RHNA)*. Out of the 79 respondents, transportation assistance was the second most (61%) essential service to an organization's missions and regularity of use.¹⁸ Respondents shared their capacity-building efforts related to new programs or expansion for their respective organizations, along with their needs to fulfill the vision described. One such potential program included the creation of a Family Resource Center where families could meet with various social service agencies in one location. This project would make it easier for people with transportation issues to identify potential transportation support.

The social service provider survey likewise highlighted several key issues for no-car households in the region, including a lack of New Hampshire Division of Motor Vehicles (DMVs) in the region. This barrier can be a significant inconvenience to people without a car and who need to take time off work, highlighting disparities between more rural and urban communities across the State.

Disability

In our region, 12% of households have one or more persons with a disability.¹⁹ Disabilities that impede physical mobility or the ability to safely navigate alter the travel patterns of disabled peoples. Likewise, those with disabilities make fewer trips per day on average than people with disabilities, and many reduce their



day-to-day travel because of their disabilities.²⁰ Inaccessibility to various modes of transit then exacerbates aversions or inability to travel.

Veterans

There are approximately 6,337 veterans in our region.²¹ Veterans often confront compounding challenges, including that of low-income households, disabilities, and aging populations. As such, they often face limited transportation options, and inaccessibility to affordable, reliable, and disability-informed transportation especially impacts this community of interest.

Age

Age impacts travel behavior. Young children are less likely to make any kind of independent trips whereas young adults may view transportation as a pathway to independence. Adults likely travel for commuting, recreational, and household necessity trips. Families with children are also less likely to use public transit or modes other than cars.

Seniors are often retired and engage in more recreational activities, but physical constraints limit these behaviors. In some cases, older people are completely dependent on caregivers or others for their transportation needs. Aging populations also have slower reaction times, making it more difficult to travel safely. Despite these difficulties, driveway permits and subdivision approvals often do not consider the aging population's needs.



Race & Ethnicity

People who identify as different races may face differing transportation opportunities and challenges. The Census Bureau collects data on race and ethnicity in two questions. Race is split into seven categories: White Alone, Black or African American Alone, American Indian or Alaska Native Alone, Asian Alone, Native Hawaiian or Pacific Islander Alone, Some Other Race Alone, and Two or More Races Alone. People may additionally select "Hispanic or Latino" or "Not Hispanic or Latino" to report their identified ethnicity. **The table below shows the percent of workers over 16 who commute to work by certain modes by race according to 2020 ACS 5-Year Estimates data.** Although the data represent small sample sizes and analysis should be mindful of zero values not being fully

representative, clear trends are present. For instance, people identifying as Black or African American Alone are more likely to walk to work than people of other races, while people identifying as Asian Alone are more likely to use alternative methods such as taxicab, motorcycle, or bicycle.

National legacies of gentrification, displacement, urban renewal projects cutting through minority communities, and geographic disparities in federal funding, amongst other perpetrators of racial transportation inequality, make addressing race and ethnicity in transportation planning essential. Along with direct outreach, analyzing the transportation trends of historically marginalized communities can help planners better support historically mistreated groups.

| Race | Drove alone | Carpooled | Public transportation (excluding taxicab) | Walked | Taxicab, motorcycle, bicycle, or other means | Worked from home |
|--|-------------|-----------|---|--------|--|------------------|
| White Alone | 77% | 9% | 1% | 4% | 1% | 7% |
| Black / African American Alone | 62% | 7% | 1% | 21% | 0% | 9% |
| American Indian / Alaska Native Alone | 66% | 0% | 0% | 5% | 3% | 25% |
| Asian Alone | 69% | 3% | 0% | 8% | 12% | 7% |
| Native Hawaiian / Pacific Islander Alone | 95% | 5% | 0% | 0% | 0% | 0% |
| Some Other Race Alone | 68% | 0% | 0% | 9% | 0% | 23% |
| Two or More Races | 68% | 6% | 2% | 11% | 1% | 12% |

LGBTQ+

Lesbian, gay, bisexual, transgender, and other queer community members often pay hidden costs to travel safely, which takes the shape of identity and visibility compromises and heightened levels of fear while traveling. To avoid the potential for unsafe experiences, queer travelers may also use more expensive travel alternatives or take less direct routes.²²

Gender

Traffic patterns tend to differ based on gender. For instance, women are more likely to engage in "trip-chaining," combining potential smaller trips into one larger trip. Women may also be less likely to use certain modes of travel or make certain trips based on the perceived safety of the mode or trip.²³ Transgender community members may similarly have safety concerns when using public transit and traveling to or through potentially unsafe areas.

| Sex | Drove alone | Carpooled | Public transportation (excluding taxicab) | Bicycle | Walked | Taxicab, motorcycle, or other means | Worked from home |
|---------------|-------------|-----------|---|---------|--------|-------------------------------------|------------------|
| Total | 77% | 8% | 1% | 1% | 4% | 1% | 8% |
| Male | 75% | 8% | 1% | 1% | 4% | 1% | 9% |
| Female | 79% | 8% | 1% | 0% | 4% | 1% | 6% |

The U.S. Census Bureau asks a single question intended to capture current sex; there are no questions about gender, sexual orientation, or sex at birth. Respondents are told to respond either "male" or "female" based on how they currently identify their sex.

Health

Air pollution emitted from transportation contributes to smog and poor air quality, which have negative impacts on health and safety. The Air Quality Index measures ground-level ozone, particle pollution (also known as particulate matter, including PM2.5 and PM10), carbon monoxide, sulfur dioxide, and nitrogen dioxide atmospheric concentrations. Transportation emissions from mobile sources are currently the largest source of air pollutants and greenhouse gases in New Hampshire.²⁴ In addition to immediate impacts, poor air quality caused by transportation can exacerbate poor air quality due to other conditions, as during the 2023 Canadian wildfire season. New Hampshire currently possesses "attainment" status, meaning that the State meets national ambient air quality standards (NAAQS).

Gentrification and Displacement

Infrastructure investment and gentrification are a delicate balance, especially when public transportation can lead to the displacement of people and disconnect communities. **Anti-displacement measures should be included in all transportation infrastructure projects throughout the UVLS region and across the state.** Some of these include considering the quality of transportation service and current residents' journeys to work and access to transit in relation to the current population's demographics and projected future needs.²⁵

Capacity

The ability to successfully plan, review, and implement change requires staff and

community members to have the interest, time, and skills to do so. Municipalities with lower populations typically do not have the workforce to pursue projects and funding alone, requiring them to outsource tasks to other entities (often at a fee) who may have competing priorities. Groups that depend on volunteer participation, such as energy committees, may also suffer from the national, decades-long trend of volunteer decline. However, efforts to create support for transportation initiatives and planning can help generate community interest and establish a demand for change.

Cultural Perceptions

Cultural perceptions of travel modes also affect travel decisions. Assumptions surrounding those who use certain modes, such as public transit, may impact the perceived safety of travel modes. Similarly, travel modes such as single-occupancy vehicles may connote a greater sense of independence or status.

UVLSRPC conducted a public survey as part of the *RHNA*. **Out of the 412 respondents, 21% of respondents indicated that they travel more than 30 minutes from their home for work, childcare, or other daily needs. When asked whether they prefer to live closer to their jobs, 23% of respondents indicated yes, 54% indicated no, and 23% indicated they did not care.** Note that the question implied the distance to jobs instead of commute time. Increased traffic may impact these responses.

2.c Opportunities to Achieve Our Transportation Vision

The section discusses known transportation solutions and considers the extent to which our communities implement these strategies.

Addressing Equity

In our region, the Ten-Year Plan (TYP), Congestion Mitigation and Air Quality (CMAQ), and Transportation Alternatives Program (TAP) funnel transportation investments through NHDOT. While the Ten-Year Plan process considers environmental justice and accessibility, these goals could be weighted higher to increase their prioritization.

Rideshare

Many communities, especially those that are more rural, recognize rideshare as a viable solution toward addressing transportation gaps and reducing dependency on single-occupancy vehicles. In fact, eight communities explicitly mention “rideshare” or “carpooling” in their Master Plans. While most of these communities list available resources for rideshares, other communities incorporate action items like establishing a forum and creating incentives for carpooling.

Ridesharing can reduce costs for households, especially during times of volatile oil prices. However, ridesharing often requires a network of trust and incentives. Formerly known as the Upper Valley Rideshare, Commute Smart New Hampshire provides carpool matching for people in the Granite State. The Central New Hampshire Regional Planning Commission (CNHRPC) administers the program and works with a provider, Agile Mile, to organize and match riders. In addition to rideshares, the program provides resources on alternative commuting options such as transit, biking, walking, and telecommuting. For information regarding the program, visit the [Commute Smart New Hampshire website](#) or utilize the Commute Smart NH mobile app managed by Agile Mile.

Similarly, Go Vermont offers public transportation information and rideshare assistance to those traveling in Vermont. Depending on the trip, residents within our region may use the service.

Complete Streets

Complete Streets is an approach to planning, designing, building, operating, and maintaining streets that supports safe access for all people who need to use streets, including pedestrians, bicyclists, motorists, wheelers, and transit riders of all ages and abilities. The concept of Complete Streets is often spotlighted in urban contexts, but its core objectives extend to rural communities like those in the UVLS region. **The adoption of a Complete Streets policy can lead to safer, more equitable, and walkable communities that improve the quality of life for all.**

In the UVLS region, some planning and community efforts explicitly incorporate Complete Streets to varying degrees. Most of the communities in the region do not include specific provisions around the Complete Streets concept. However, Claremont and Newport included language on Complete Streets within their Master Plans. Municipalities like Hanover and Lebanon have taken steps toward implementing Complete Streets policies. Ultimately, a Complete Streets policy can lead to the adoption of a plan like the *Walk, Bike, Ride Leb Plan* in Lebanon.²⁶ The FHWA’s document *Small Town and Rural Multimodal Networks* provides resources to begin considering Complete Streets plans.



Walk, Bike, Ride Leb Source: City of Lebanon, New Hampshire

National Roadway Safety Strategy

The USDOT *National Roadway Safety Strategy* serves as an action plan to meaningfully reduce roadway deaths. The strategy centers on the adoption of a Safe System Approach, which comprises five objectives: safer people, safer roads, safer vehicles, safer speeds, and post-crash care. The *National Roadway Safety Strategy* simultaneously addresses equity and climate concerns, and it calls on all stakeholders, including government entities, non-profits, and the public to aid in the achievement of the strategy. **The strategy outlines USDOT's plans to increase funding, create programs, and improve its systems to work toward zero roadway fatalities, and stakeholders can refer to the strategy to anticipate future resources from USDOT or to inform their own transportation planning.**



Safe System Approach Source: USDOT

NH Vulnerable Road User Safety Assessment

The [NHDOT Vulnerable Road User Safety Assessment](#) outlines State vulnerable road user (VRU) safety performance and measures to reduce VRU crash frequency and severity. The statewide document uses both a Safe System Approach and "5 E's framework," the latter of which includes engineering, education, encouragement, enforcement, and evaluation as means to improving pedestrian and bicyclist safety. **As an overarching document, The Assessment's strategies, actions, and prioritizations can inform VRU safety plans**



NHDOT Aerial Photo of West Lebanon

across communities.

Parking

Parking is at the crossroads of housing, land-use, and transportation challenges and opportunities. As land is scarce and parking emboldens auto-centric lifestyles, creating policies that centralize parking, encourage mixed-use developments, reduce the amount, size, and appearance of on-site parking, and create a "park-once" environment should be prioritized. For example, parking management districts are areas designated in which parking rates and supply are regulated by a municipal agency to meet the needs of an area. There are also ways the private sector can address parking through property-owner agreements. For example, shared parking is a system where buildings or businesses in an area utilizing parking facilities jointly take advantage of different peak parking characteristics. In other words, employees utilize the parking lot during the day while residents of an adjacent apartment use the parking lot at night. This option is more efficient from a land-use perspective as fewer parking spaces are needed on site.

On the demand side, there are mechanisms to reduce the demand for parking through investments in alternative transportation, transportation demand management programs, pricing policies, policies that support high-density and mixed-use development or transit-oriented

development. Some examples of these include car-sharing programs, employer incentives, peripheral parking with shared transport, time-based pricing, or vehicle-size pricing.

Like many other communities across the country, the City of Lebanon has a minimum number of off-street parking spaces for different types of uses based on a ratio of the number of parking spaces required per square foot, per dwelling unit, or another measure. For example, one-family homes require a minimum of two parking spaces and office retail space requires a



minimum of one space per 250 square feet. The City of Claremont also has minimum parking requirements, such as one space per 300 square feet of gross floor area but not less than five spaces for retail sales. However, there is growing discourse around establishing parking maximums, not minimums. Other variables, like locational factors (for example, high density, served by public transit, existing conditions, ability for nearby facilities to absorb additional demand) and demographics (targeted customer and employee groups) could significantly reduce the need for additional parking spaces.

Electric Vehicle Charging Infrastructure and Regulations

Master Plans are one mechanism to outline and further the electric vehicle transportation goals of the community. Throughout the UVLS region, only four communities (Enfield, Hanover, Lebanon, and New London) include language related to electric vehicle charging infrastructure in their Master Plans. For example, New London's 2021 Master Plan states, "Consider

ways to encourage the installation of electric vehicle charging plugs in new construction and renovations, either in the garage, on the exterior, or both," and Lebanon's 2012 Master Plan states, "The City should consider integrating electric vehicle charging stations in strategic locations." The inclusion of electric vehicle language in Master Plans enables communities to apply for funding and grant opportunities that require local plan support. **As many communities look to update their Master Plans, consideration of electric vehicles will be paramount toward decarbonizing the transportation sector.**

However, there are also other pathways to encourage the use of electric vehicle charging equipment. For example, in Claremont, the planning board waived its site plan requirements to enable public charging stations at a popular café in town. This example demonstrates both **the need for flexibility in the site plan review process as well as the evaluation of regulatory barriers to electric vehicle charging equipment.**

When asked to evaluate the promotion of reduced fossil fuel consumption and fewer miles traveled and the barriers to these efforts, many members of the public noted how there are "next-to-none" electric vehicle public chargers and how they need to be spread across the region. The government plays a role in this realm via addressing non-compliant diesel vehicles, regulations for EV chargers in development proposals, and municipal/school fleet electrification. EVs have a high barrier to entry given their current cost, preventing those from low-to-middle incomes from accessing them.

When asked about building a regional electric vehicle charging network, respondents addressed a variety of themes. Some noted how investor-owned utilities have been a major roadblock as grid resiliency and excessive "make ready" costs are barriers. Regarding the chargers themselves, rural destinations are needed as well as a diversity of chargers (i.e., fast-chargers, non-Tesla chargers). Many noted

a need to consider battery life cycles in the discussion. Some respondents attributed multi-town coordination and shared parking areas as key pieces to advance electrification. However, some mentioned how car usage continues to disincentivize mass transport and other active transportation methods regardless of whether the cars are electric or not.

In February 2022, USDOT a toolkit titled [Charging Forward: A Toolkit for Planning and Funding Rural Electric Mobility Infrastructure](#), which provides guidance for a variety of rural stakeholders on electric vehicle infrastructure development. The document supplies resources on potential partners, available tools, and funding sources for electric vehicle infrastructure.



Neighborhood revitalization



More affordable housing



Public- and private investment



Economic returns to surrounding landowners and businesses



Increased ridership for transit systems



Congestion relief, improved air quality and other environmental benefits



Improved safety for pedestrians and cyclists.

FTA TOD Benefits Source: Federal Transit Administration²⁷

Unlike residents who live in single family homes, residents who live in apartment complexes and multi-unit dwellings often do not have the ability to charge their electric vehicles at home. These individuals are more reliant on public charging infrastructure and often annexed from the electric vehicle market completely.

In addition, safe deployment of electric vehicle charging infrastructure is also paramount given lithium-ion car battery risks. Training for local first responder departments with the National Fire Protection Association or other groups would help

mitigate associated battery fires.

Housing

Transit-oriented developments (TODs) are an approach to shape and encourage development around public transportation hubs. This approach can be achieved through incentives (density, area, or height bonuses) or requiring particular types of development (mixed-use minimums, density minimums, maximum limits on parking, etc.). With transit-oriented developments, landowners can provide transit passes to residents or directly invest in public transit. Bicycle storage and parking is also a key aspect of transit-oriented development.

In the site plan review process, land boards should consider public transit, electric vehicle charging, car shares, and parking requirements to advance transit-oriented developments. For example, enabling more low-rise multi-family developments in residential zones, mid-to-high rise developments near transit, and reducing parking requirements at workforce and affordable housing locations.

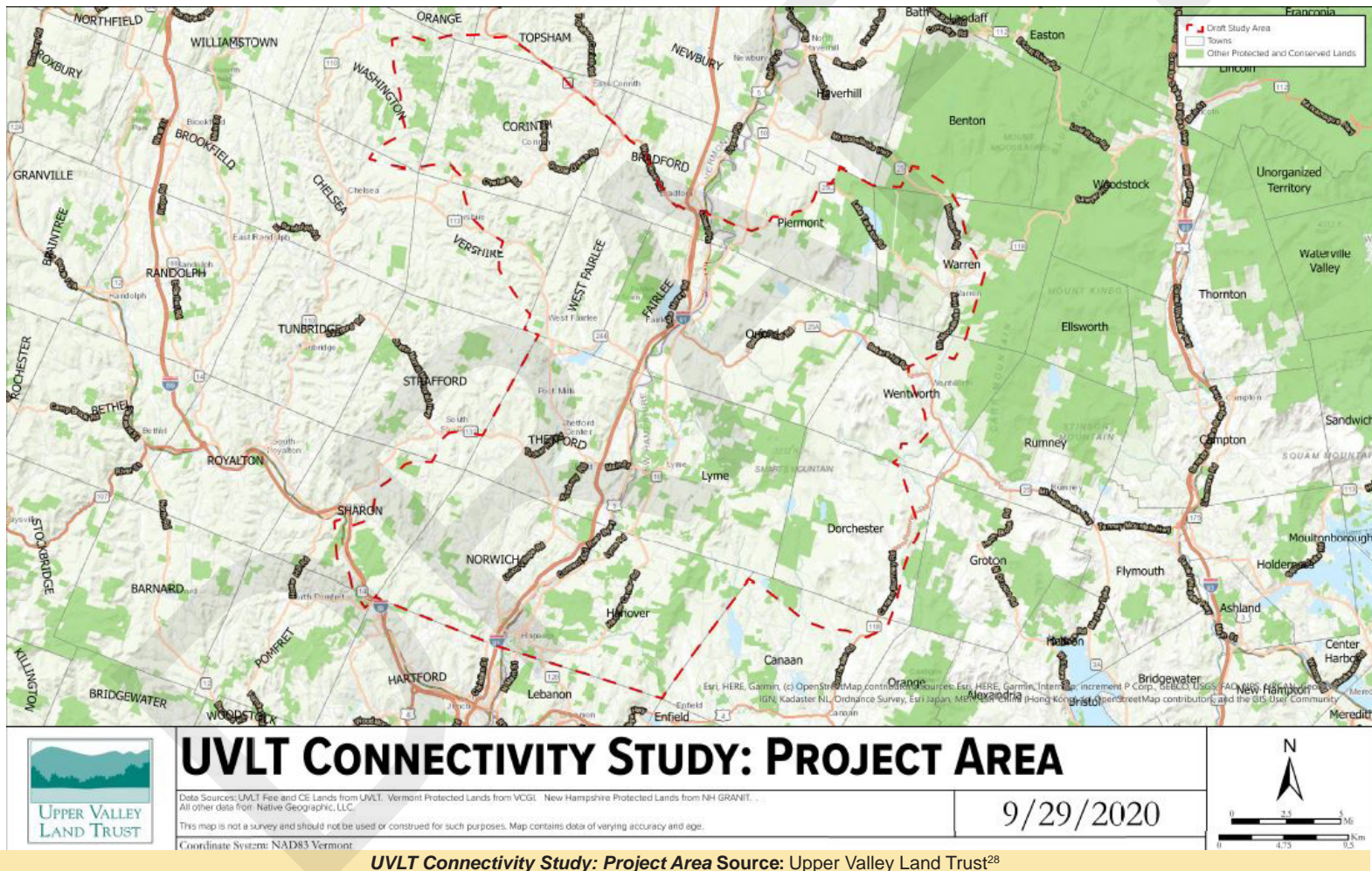
Wildlife Vehicle Collisions and Habitat Fragmentation

Habitat fragmentation stems from human development. For this reason, **transportation planning should account for the protection of wildlife habitats. While roads connect humans, development disconnects wildlife, resulting in negative outcomes such as wildlife vehicle collisions (WVCs).** In our region, there have been 473 wildlife vehicle collisions between 2014 and 2019. These collisions are costly for residents within our region and poses a threat to human lives. The NH Wildlife-Vehicle Collision Mapper 2002-2019 analyzed reported collision records from 2002-2019, curated a suite of GIS layers that summarize WVCs at the road level and supporting spatial information to identify locations for mitigation, identified risk parameters to consider during project evaluation, and developed an ArcGIS Online Wildlife-Vehicular

Collision Mapper to support project prioritization and planning.

The concept of wildlife corridors can help mitigate human-wildlife conflict. Wildlife corridors are like protected bridges, connecting one habitat to another. As fragmented habitats divide species into smaller populations, these smaller, isolated populations are not optimal for long-term survival. Especially with larger animals, like moose, that require more space to live and procreate, wildlife corridors improve threatened species populations.

Like the roads in our region, species' ranges are transboundary and require intentional planning to mitigate the negative impacts of the transportation network. Currently, the Upper Valley Land Trust is conducting a connectivity study using remote sensor data to validate the places where animals may be crossing roads and identifying locations of where the animals are in real time. This study will help prioritize where wildlife crossing signs should exist and generate proactive measures with future roads development.



3 - Network Analysis

A region's transportation services are nothing without a robust, functional network connecting them. We may have excellent providers, infrastructure, and organization, but our transit system must be widespread, built to serve every member of our region equitably or it is

incomplete. To analyze the current state of our various transportation networks and systems, UVLSRPC conducted a multi-part network gap analysis using ArcGIS Pro and ArcGIS Online. A brief summary of the methodology can be found with each section.

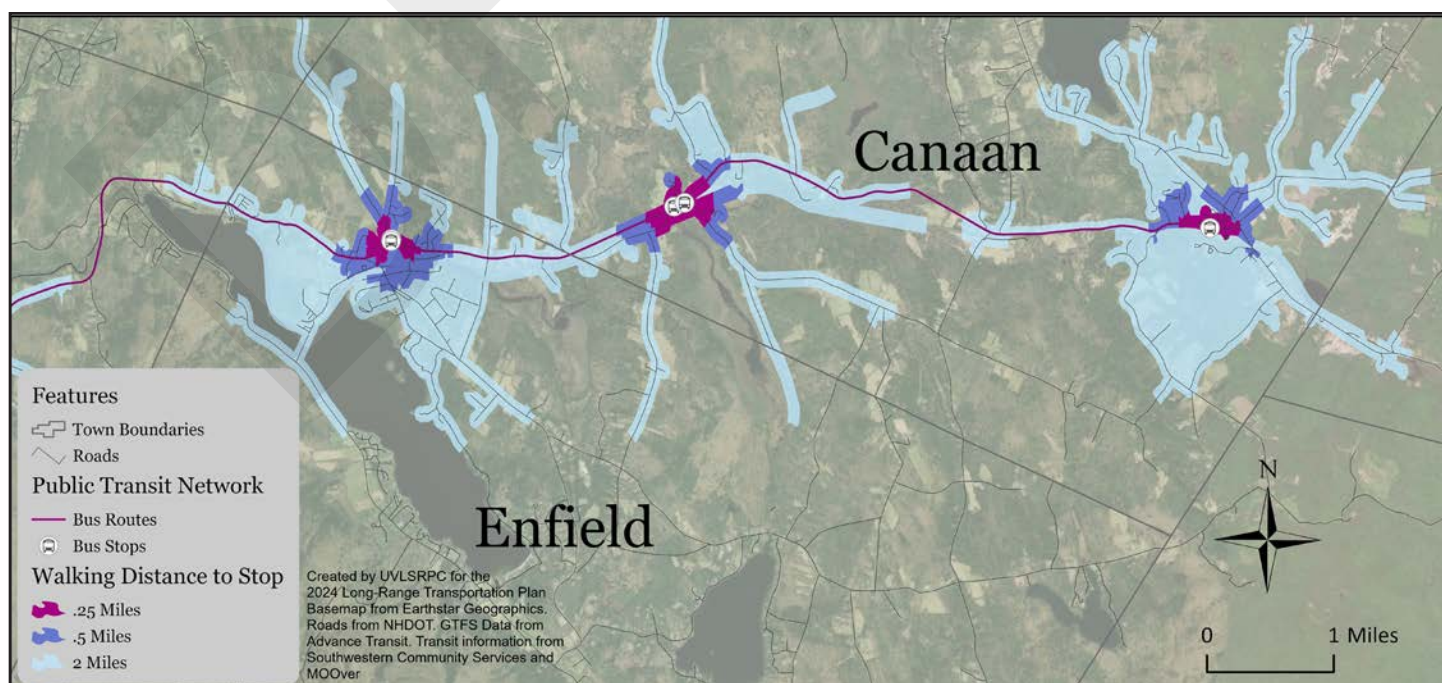
3.a Public Transit Service Network Gap Analysis

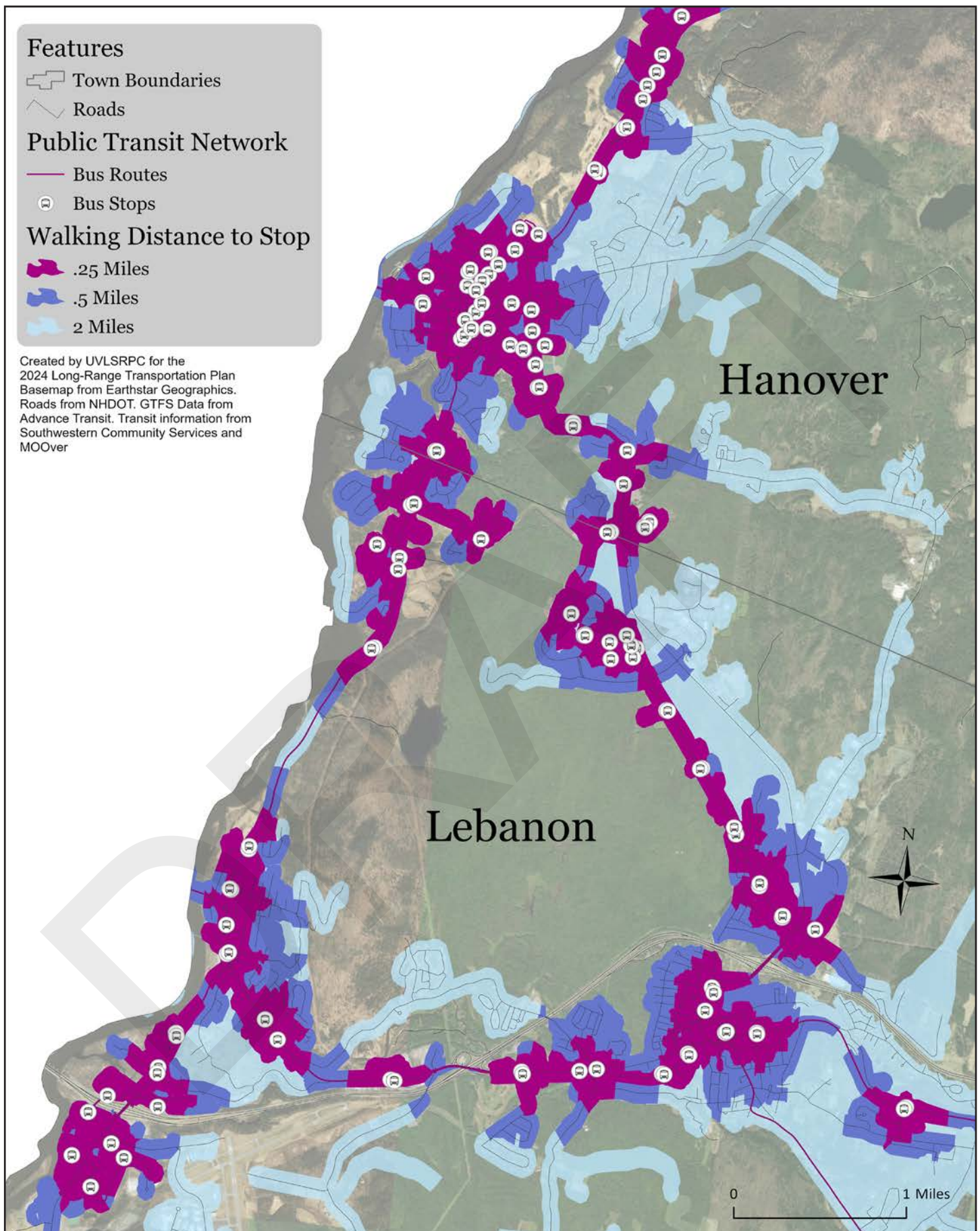
To analyze our network of public transit, which in the Upper Valley region comes in the form of bus service alone, UVLSRPC compiled stop and route data from the region's major transit providers such as Advance Transit, Sullivan County Transit, Tri-Valley Transit, and Vermont's MOOver. We used publicly available GTFS data and existing transit shapefiles, and created new shapefiles where needed to end up with a complete transit dataset.

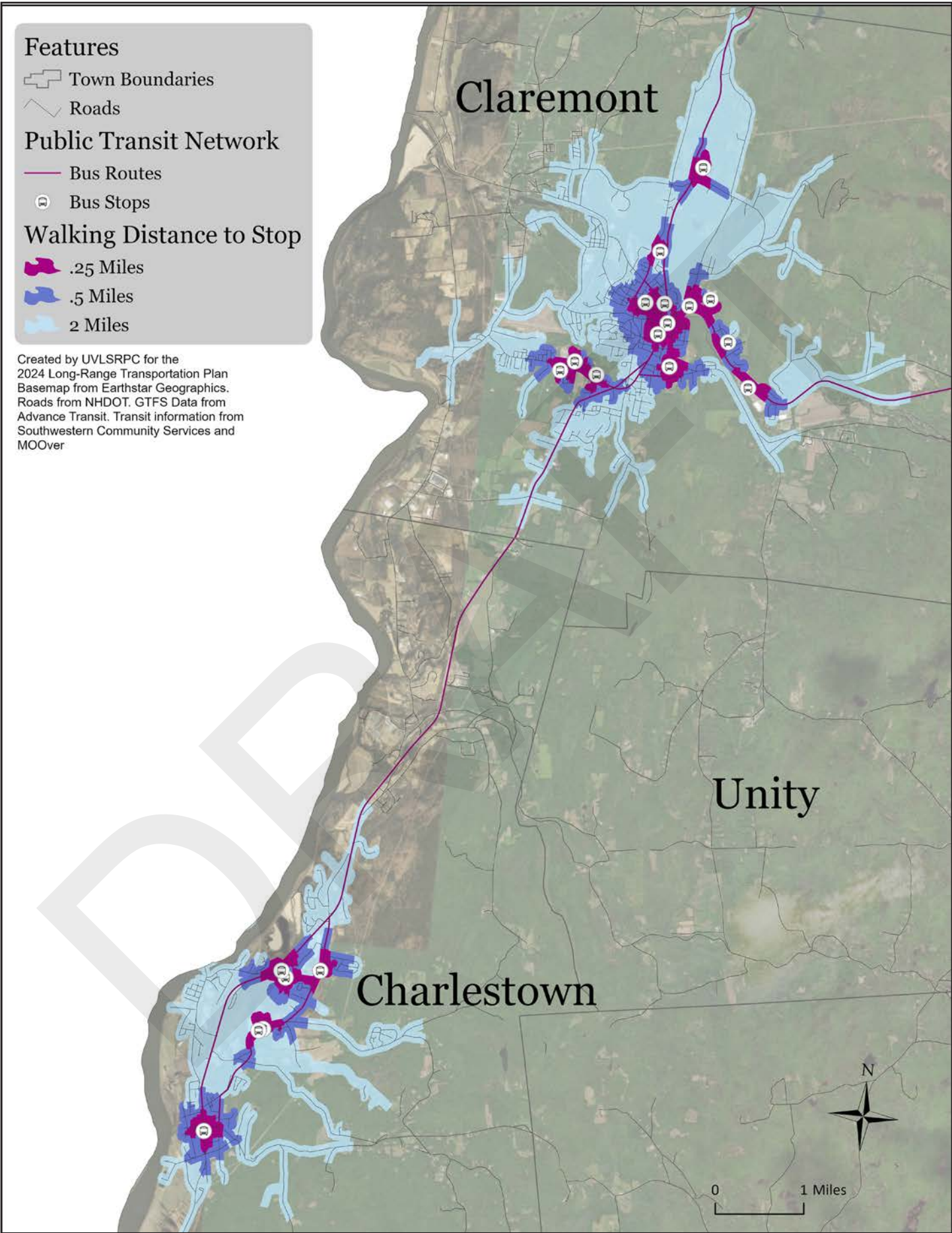
USDOT FHWA information and available research suggests that people are typically willing to walk approximately .25 to .5 miles to a nearby transit stop, and that bicyclists may be willing to ride a much larger distance. For the purposes of our analysis, we chose a reasonable distance of two miles for a typical bicycle ride to the nearest

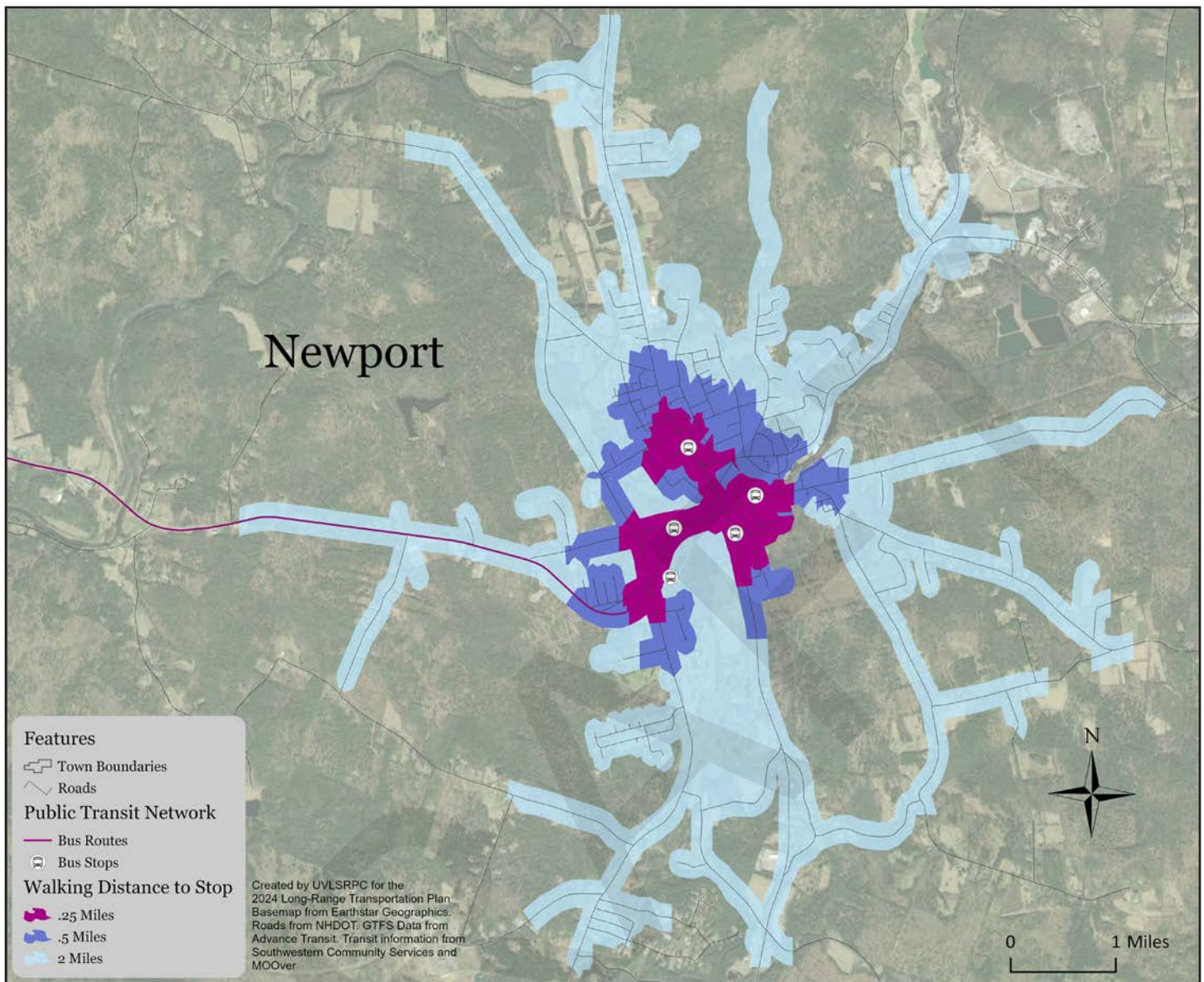
bus stop. Using a basic walking travel distance analysis, we created layers displaying radii of .25 and .5 miles, representing potential walking distances, and 2 miles, representing cycling distance. We then overlaid these layers on US Census Bureau TIGER census block shapefiles and counted the estimated number of census blocks served by public transit stops.

To accurately estimate population served, we chose to select census blocks that had a significant portion of their area within the distance overlay shapefile. This leans towards a lower estimate, but given this analysis' lack of consideration for ability level, safety, and walkability we found it to be appropriate. See below and the next page for one or two-town snapshots, followed by the full regional map.









The results of the analysis were as follows: An estimated 4,452 households and 12,034 people are within .25 miles of a transit stop, while 8,830 households and 21,565 people are within .5 miles of a transit stop. Bicycle analysis reports that approximately 14,987 households and 34,735 people are within a 2 mile bicycle ride to the nearest transit stop.

The map shows clear successes of our transit system, while also highlighting massive disparities. A positive aspect of our system is that it is deeply interconnected. Due largely to Lebanon-Claremont connections, there are no isolated transit routes. This means that someone living at any point within the served area is theoretically able to access any other point within the served area. The negative, however, is that the transit network only serves between 7 and 8 out of 27 UVLS towns.

Upper Valley Lake Sunapee Public Transit Service Network Gap Analysis


Created by UVLSRPC for the 2024 UVLSRPC Long-Range Transportation Plan.
This map is for planning purposes only.

Features

 Town Boundaries

 Roads


Public Transit Network


 Bus Routes

 Bus Stops

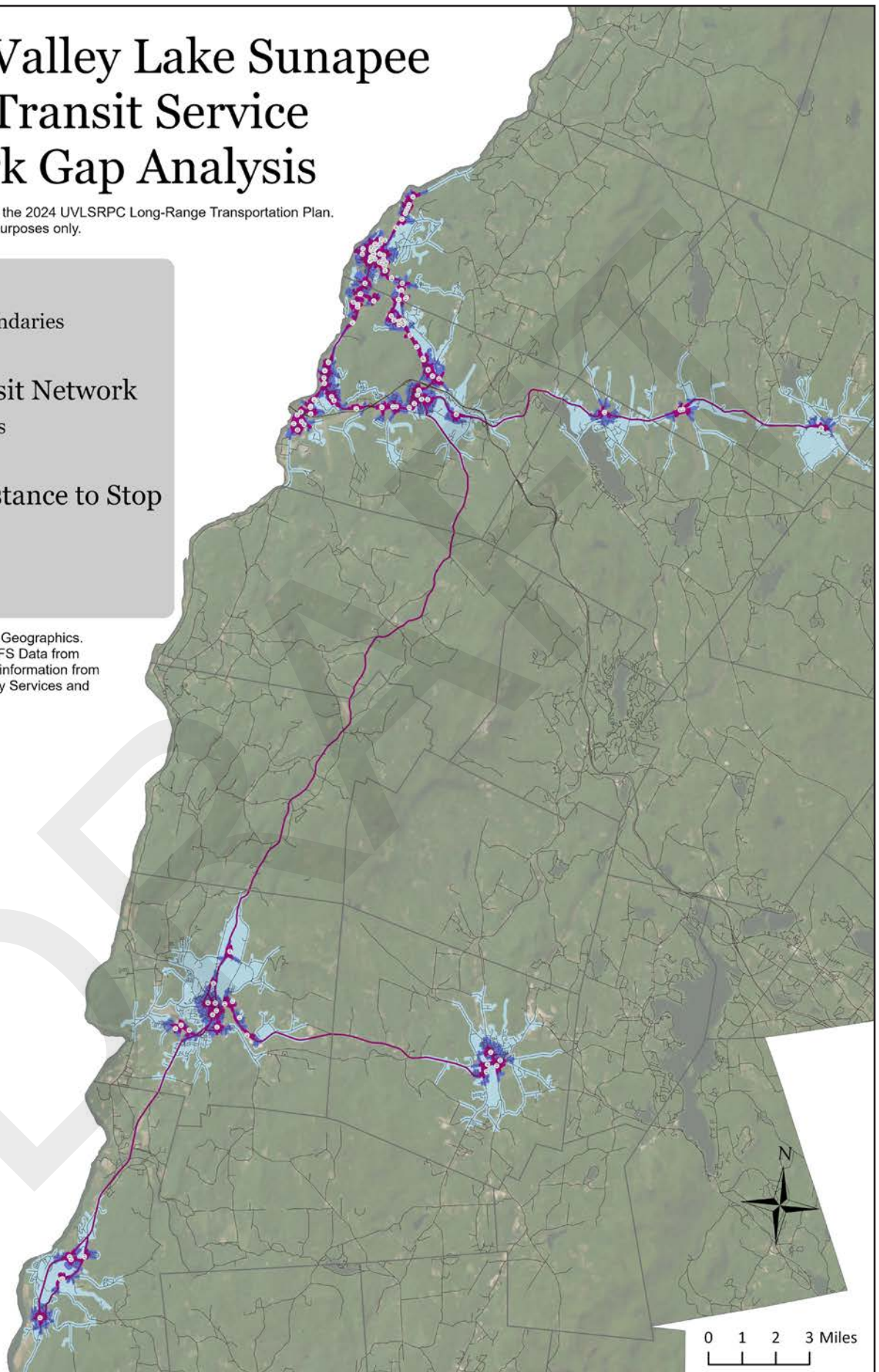
Walking Distance to Stop

 .25 Miles

 .5 Miles

 2 Miles

Basemap from Earthstar Geographics.
Roads from NHDOT. GTFS Data from
Advance Transit. Transit information from
Southwestern Community Services and
MOOver



3.b Interregional Transportation Network Gap Analysis

While travel within our region is of critical importance, it is also important to have adequate opportunities for travel outside of the region, particularly to large hubs with international airports such as Boston and New York City. The UVLS region has a few opportunities for such travel. Dartmouth Coach and Greyhound offer bus service, while the Amtrak Vermonter provides limited rail service. Passenger air is available from the Lebanon Airport, though with limited destinations. In addition, a paid car sharing service is available at several sites in Hanover.

Using a basic travel distance analysis, we created layers displaying radii of .5 miles (walking) and 2 miles (bicycling). We then overlaid these layers on US Census Bureau TIGER census block shapefiles and counted the estimated number of census blocks served by interregional transit. This showed that approximately 2,708 households and 9,175 people are within walking distance of interregional transportation sites, while 6,537 households and 17,186 people are within biking distance. It should be considered,

however, that only a few of these sites are truly accessible by pedestrians or cyclists, especially considering issues of ability and safety, so this number is likely far higher than the number realistically served by our network.

Using a second car travel distance analysis, we created layers displaying radii of 5 and 10 miles. Though people may be willing to drive significantly longer than this to reach bus, rail, and air service, these numbers were chosen to represent ease of access and affordability. We conducted two analyses, one counting only census blocks with centroids within the overlay and one counting all census blocks overlapping the overlay. This provides a range due to the higher variability in driving distance flexibility compared to walking and cycling. The analysis showed that around 15,249-20,731 households and 32,026-46,025 people are within 5 driving miles of interregional transportation, and around 16,526-26,025 households and 34,150-55,510 people are within 10 driving miles. See the following page for the full network map.

3.c Electric Vehicle Charging Station Network Gap Analysis

UVLSRPC gathered available information on public level 2 electric vehicle charging locations in the UVLS region available from the U.S. Department of Energy. We then cross-referenced this data with multiple online databases to create a final shapefile with 31 charging stations that are currently in use or under temporary maintenance. Using a basic car travel distance analysis, we created layers displaying driving radii of 1, 5, and 10 miles. See the map produced by the network gap analysis on page 29.

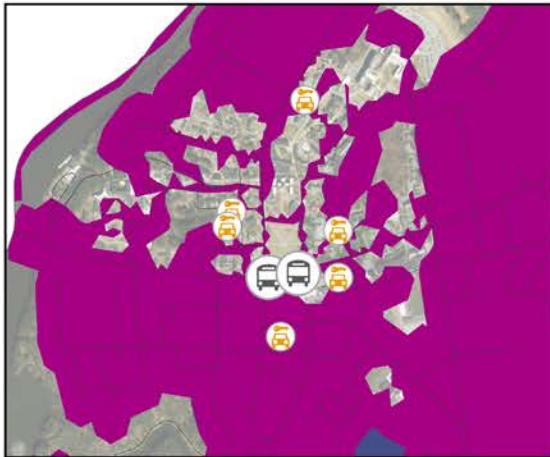
This gap analysis revealed several critical insights. First, the distribution of the 31 stations exhibits a clustering effect in only a few UVLS communities, suggesting a clear disparity in infrastructure and limiting the feasibility of the overall network for regional travel. Furthermore, there is an apparent issue when one considers that each charging station typically has between

1 and 2 charging ports. Insufficient charging capacity at stations results in congestion and long wait times, and is likely to deter potential electric vehicle users. This also means that areas of supposed coverage that have a single station with only one charger, such as in the towns of Grantham and Lyme, are not fully robust parts of the network and cannot withstand serious levels of demand.

Addressing the clear gaps in the charging network is important for fostering electric vehicle adoption. Potential strategies should include both strategic placement of chargers to fill geographic voids and increasing charging capacity at existing locations. In addition, we should consider prioritizing underserved areas to ensure network inclusivity while being mindful of potentially limited electric grid capabilities in smaller communities.




Upper Valley Lake Sunapee Interregional Transportation Network Gap Analysis

Created by UVLSRPC for the 2024 UVLSRPC Long-Range Transportation Plan.
This map is for planning purposes only.





Close-up of Hanover showing Bus and Car Share Services




Interregional Transportation

-  Bus
-  Train
-  Car Share Sites

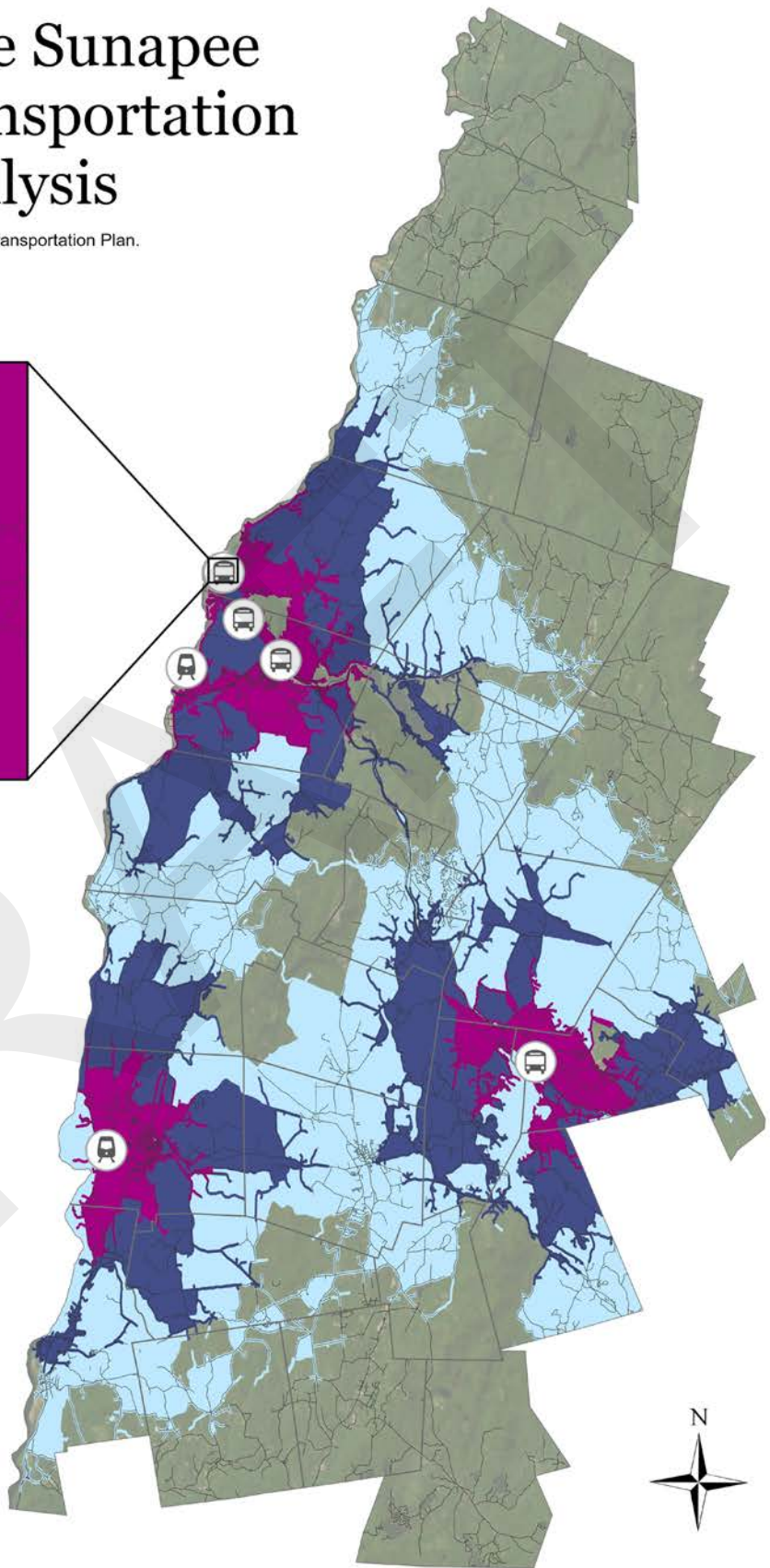
Features

-  Town Boundaries
-  Roads

Driving Distance to Site

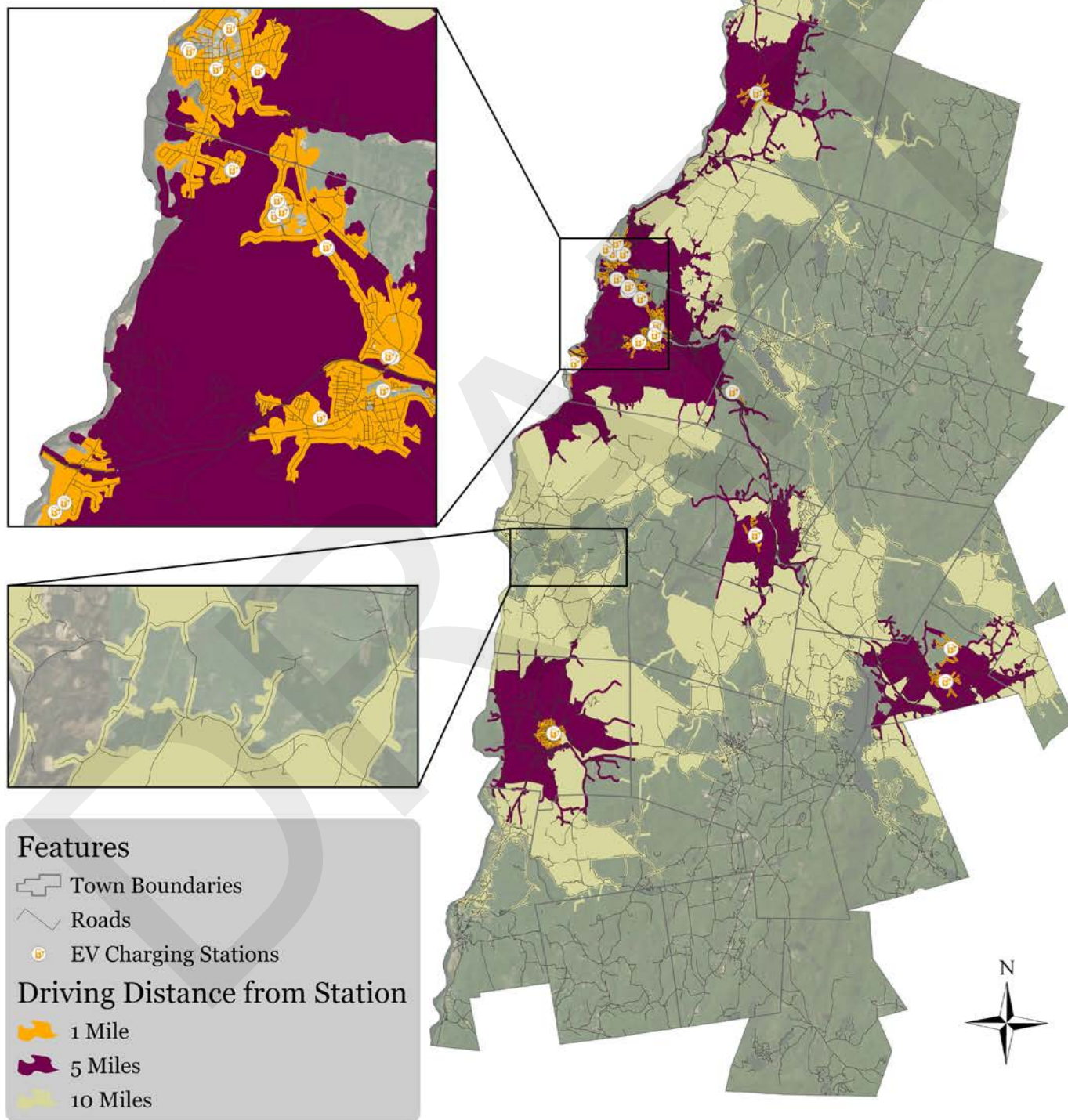
-  5 Mile Range
-  10 Mile Range
-  15 Mile Range

Basemap from Earthstar Geographics. Roads from NHDOT.
Transportation site locations from Amtrak, Dartmouth Coach,
Greyhound, Lebanon Airport.



Upper Valley Lake Sunapee Electric Vehicle Charging Station Network Gap Analysis

Created by UVLSRPC for the 2024 UVLSRPC Long-Range Transportation Plan.
This map is for planning purposes only.



Basemap from Earthstar Geographics. Roads from NHDOT.
Charging stations from US Department of Energy.

4 - Action Plan

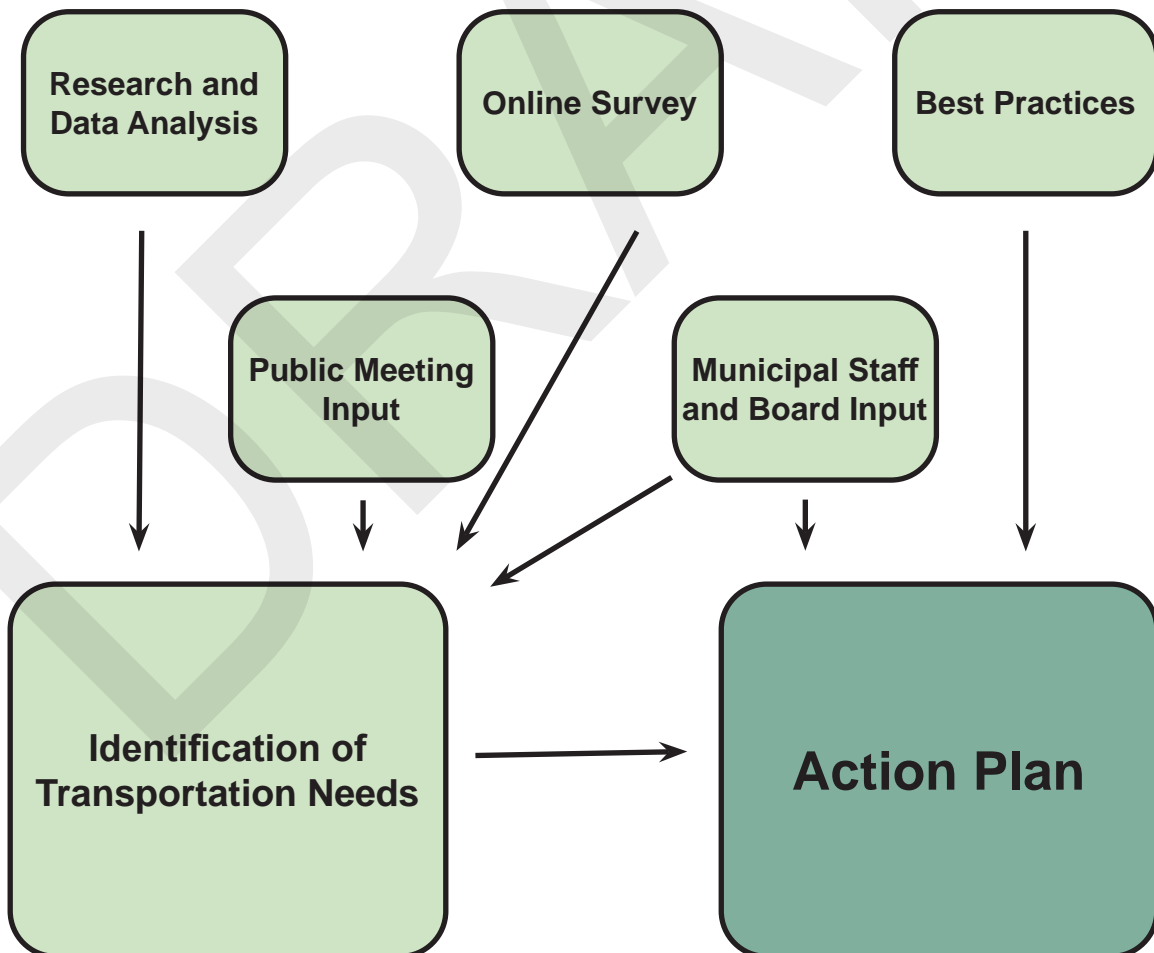
4.a What Is the Action Plan?

The Action Plan turns the broad, conceptual transportation needs of the Long-Range Transportation Plan into defined, implementable projects. The Action Plan comprises strategies for implementation, objectives, tasks, rankings on anticipated Level of Effort, Cost, and Impact, prioritization, and relevant LRTP goals.

The seven strategies for implementation were used to categorize objectives and tasks in this plan. Each objective has recommended tasks

that community leaders, stakeholders, and planners can do to complete the objective. Each objective was given a rank based on anticipated Level of Effort, Cost, and Impact. Each category had a range of Low, Medium, and High. This rank is based on local transportation experts' interpretation of current costs and benefits. The ranking will be used to assist in assigning tasks and prioritizing objectives. Categories and ranks will be reviewed annually based on current conditions.

Development of the Action Plan



Components of the Action Plan

Strategies

The seven strategies for implementation are means to achieving the goals of the LRTP.

Objectives

Categorized by strategy, the Action Plan objectives are more specific methods of pursuing LRTP goals.

Tasks

Tasks are examples of how stakeholders may complete objectives within the Action Plan.

Effort, Cost, and Impact

Each task has a level of effort, cost, and impact on a scale of 1 to 3 (low to high or high to low), which informs project prioritization.

Priority

Calculated based on effort, cost, and impact, task priority identifies project readiness and need on a scale of 3 to 9, with 9 being the highest priority.

Relevant Goals

The relevant goals detail the LRTP goals that each objective achieves. See section 1.b for goals of the LRTP.

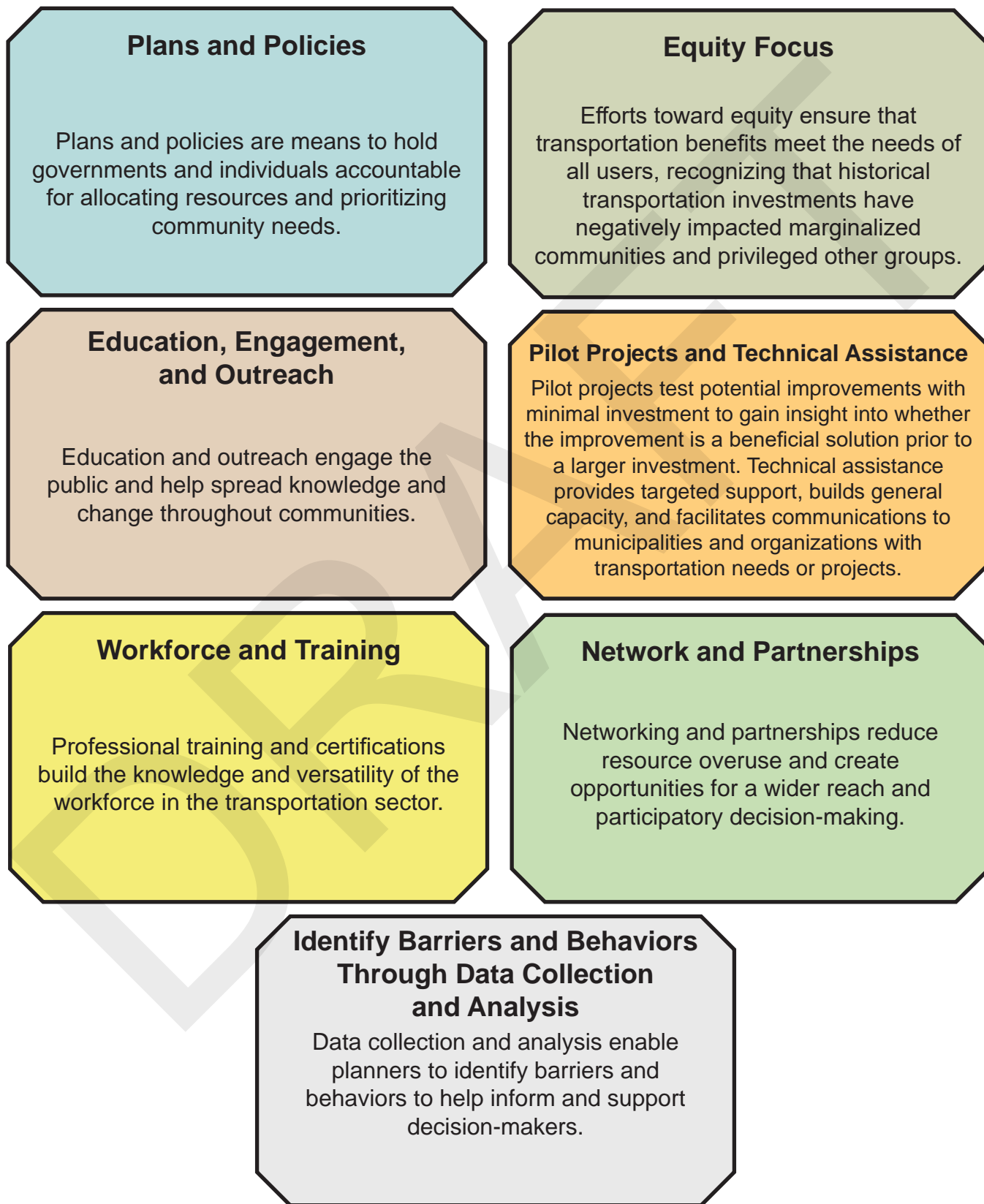
Sample Action Plan Table

Strategy: Action Plan Sample

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|--|-------------------|--------|--------|--------|----------|--------------------------------------|
| Objective 0: Demonstrate the Action Plan Table | 0.1 Sample Task 1 | Low | Medium | High | 8 | Maintenance Equity and Health |
| | 0.2 Sample Task 2 | High | Medium | Low | 4 | |
| | 0.3 Sample Task 3 | Low | Low | High | 9 | |
| | 0.4 Sample Task 4 | High | High | Low | 3 | |

4.b Strategies

Through public outreach and research, **seven themes or strategies** were identified as principal components to achieving systemic transportation goals.



4.c Implementation

Project Prioritization

Each task was scored to assist the region in prioritizing projects. This method of scoring is based on a current view of each task’s level of Effort, Cost, and Impact. The tables below

indicate the score for each category. Scores were then added to create a ranking system with high scores being the priority as projects with low effort and cost and high impact.

| EFFORT | |
|--------|---|
| LOW | 3 |
| MEDIUM | 2 |
| HIGH | 1 |

| COST | |
|--------|---|
| LOW | 3 |
| MEDIUM | 2 |
| HIGH | 1 |

| IMPACT | |
|--------|---|
| LOW | 1 |
| MEDIUM | 2 |
| HIGH | 3 |

Implementation Plan

At the start of each fiscal year, the top five highest ranked tasks from each strategy will be reviewed to determine feasibility and brought to the UVLSRPC Transportation Advisory

Committee. UVLSRPC TAC will advise staff on the top two tasks from each strategy to prioritize in that fiscal year based on **local knowledge** of **current** municipal capacity, support, and measures of success.

Implementation Process (Repeated After 5 Years)



4.d Performance Measures

The following performance measures will be tracked by UVLSRPC to monitor progress towards

implementation of the *Long-Range Transportation Plan*.

Project Development
Number of tasks completed by UVLSRPC for developing projects identified in the *Long-Range Transportation Plan*.

Funds Pursued
Number and monetary amount of funding proposals submitted for state and federal aid programs for projects identified in the *Long-Range Transportation Plan*.

Funds Awarded
Number and monetary amount of local, state, and federal aid funding awards for constructing projects identified in the *Long-Range Transportation Plan*.

4.e Action Plan

Strategy: Plans and Policies

Plans and policies are means to hold governments and individuals accountable for allocating resources and prioritizing community needs.



| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|---|--------|--------|--------|----------|---|
| Objective 1: Encourage adoption of Complete Streets policies in all towns | 1.1 Draft Complete Streets policies | Medium | Low | Medium | 7 | Safety Livable Communities Accessibility Manage Demand |
| | 1.2 Include Complete Streets language in master plans | Medium | Low | Low | 6 | |
| | 1.3 Write multi-modal plans | High | Medium | High | 6 | |
| | 1.4 Present Complete Streets policies to land use boards | Low | Low | Low | 7 | |
| | 1.5 Encourage governing bodies to endorse complete streets approaches | Low | Low | Low | 7 | |
| Objective 2: Encourage adoption of electric vehicle policies and plans | 2.1 Include electric vehicle strategies in master plans | Medium | Low | Low | 6 | Electrification Emissions Reduction |
| | 2.2 Review site plan regulations and update to include “site” or “EV ready” requirements | Medium | Low | High | 8 | |
| Objective 3: Update master plans to include | 3.1 Identify strategies and actions that can reduce single occupant vehicle travel | Medium | Medium | Low | 5 | Manage Demand Equity and Health |
| | 3.2 Maintain and expand participation by communities, particularly those lacking planning staff, and other stakeholders in master plans | Medium | Low | High | 8 | |
| | 4.1 Require “EV-ready” and transit-oriented development for any new construction | Medium | Low | High | 8 | |

Plans and Policies Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|--|--|--------|--------|--------|----------|--|
| Objective 4: Encourage updates of site plan regulations and land use priorities to include transportation strategies | 4.2 Impose parking maximums and density bonuses | Medium | Medium | High | 7 | Manage Demand Resiliency Safety Accessibility Livable Communities Balanced Mobility |
| | 4.3 Encourage relief for carshares and electric vehicles | Medium | Low | Medium | 7 | |
| | 4.4 Ensure that transit stop locations have adequate and safe pedestrian access to adjacent land uses | Medium | Medium | Medium | 6 | |
| | 4.5 Encourage communities to conduct rigorous traffic impact analysis as part of development site review | Low | Low | Medium | 8 | |
| | 4.6 Encourage expanded use of the Developments of Regional Impact process to address concerns regarding the impacts of development beyond community boundaries | Low | Low | Medium | 8 | |
| | 4.7 Promote development of Access Management standards for state highways in communities, and assist communities and NHDOT with the development of Access Management | Medium | Medium | Medium | 6 | |
| | 4.8 Promote strong Access Management in designs for improvements (publicly and privately financed) along state highways and other corridors | Low | Low | Low | 7 | |
| | 4.9 Assist communities with the development of policies and regulations that aid in securing private development funding appropriate to the level of impact expected on adjacent transportation facilities | High | Medium | High | 6 | |

Plans and Policies Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|--|---|--------|--------|--------|----------|-----------------------------------|
| | 4.10 Implement regulatory standards and/or enact enabling legislation to ensure that the best available climate science and flood risk information are used for the siting and design of new, reconstructed, and rehabilitated state-funded structures and facilities | High | Medium | High | 6 | |
| Objective 5: Create plans to increase resiliency and mitigate hazards in the transportation system | 5.1 Develop a Resilience Improvement Plan | High | High | High | 5 | Resiliency Maintenance |
| | 5.2 Establish a Municipal Transition Plan to ensure knowledge is passed on | Medium | Low | Low | 6 | |
| | 5.3 Utilize climate models in planning for future conditions | Low | Low | Low | 7 | |
| | 5.4 Write stormwater management plans | Medium | High | High | 5 | |
| | 5.5 Incorporate transportation network planning into the current work with FEMA and local communities to develop hazard mitigation plans | Medium | Low | High | 7 | |
| Objective 6: Implement existing transportation plans | 6.1 Consider federal and state plans such as State Freight Plan, NH Pedestrian and Bicycle Plan, Strategic Highway Safety Plan, and the NH Long-Range Transportation Plan when drafting and implementing regional and local plans | Low | Low | Low | 7 | Increase Funding and Resources |
| | 6.2 Incorporate outcomes of the Regional Transportation Corridor Plan in local plans | Low | Low | Medium | 8 | |

Plans and Policies Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|--|--------|--------|--------|----------|---|
| | 6.3 Ensure all existing transportation plans have a clear action plan to support implementation | Low | Low | Medium | 8 | |
| Objective 7: Include transportation planning in Capital Improvement Plans | 7.1 Require plans to consider alternative modes of transportation | Low | Low | Low | 7 | Maintenance Balanced Mobility Equity and Health Increase Funding and Resources |
| | 7.2 Include planning funds to ensure proper planning | Low | Low | Medium | 8 | |
| | 7.3 Encourage communities to adopt and maintain pavement management systems to track roadway conditions and plan for future maintenance and preservation needs | Medium | Medium | Medium | 6 | |
| | 7.4 Prioritize transportation investment in the region's existing, developed areas through weighting of project selection criteria | Low | Low | Medium | 8 | |
| | 7.5 Plan for necessary improvements of roadways and their supporting infrastructure to manage additional stormwater runoff from more frequent and extreme storm events | Medium | Medium | High | 7 | |
| | 7.6 Continue to prioritize projects that improve air quality | Low | Low | Medium | 8 | |
| Objective 8: Create and implement stormwater policies | 8.1 Create policy that requires evaluation of stormwater system prior to construction | High | Low | Medium | 6 | Resiliency Equity and Health |
| | 8.2 Create policy to consider green infrastructure strategies in system up-grades | Medium | Low | Medium | 7 | Maintenance |

Plans and Policies Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|---|--------|--------|--------|----------|-------------------------------------|
| Objective 9: Promote local asset management planning | 9.1 Draft asset management plans with identified priorities based on asset data | High | High | High | 5 | Maintenance |
| | 9.2 Draft long-term maintenance plans in asset project proposals | Medium | Low | Medium | 7 | |
| Objective 10: Update, improve, and create regional transportation plans | 10.1 Develop a stand-alone bicycle and pedestrian plan for the Upper Valley Lake Sunapee Region | Medium | High | Medium | 6 | Equity and Health Resiliency |
| | 10.2 Develop an assessment of autonomous vehicle integration needs for the region and establish an action plan | Medium | Medium | Medium | 6 | |
| | 10.3 Develop a Resilience Improvement Plan | High | High | High | 5 | |
| | 10.4 Promote transportation projects in the region that reduce total vehicle miles traveled | Low | Low | Low | 7 | |
| | 10.5 Create Safe Streets for All Plan | High | High | High | 5 | |
| | 10.6 Assist in planning and implementation of a regional network of multi-use trails as traffic-separated transportation and recreation facilities supporting physical activity | Low | Low | Low | 7 | |

Plans and Policies Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|--|---|--------|--------|--------|----------|---------------------------------|
| Objective 11: Create transportation-related policies that support the natural environment with a priority in environmental justice communities | 11.1 Institute practices to reduce impacts on adjacent lands by considering restrictions on road widening | Low | Low | Low | 7 | Equity and Health Resiliency |
| | 11.2 Improve regulations to increase density and reduce sprawl including using transit-oriented development practices | Medium | Medium | Medium | 6 | |
| | 11.3 Consider alternative designs to use sites' natural aesthetics | Low | Low | Medium | 8 | |
| | 11.4 Encourage green infrastructure design in stormwater management at all new and improved sites | Low | Low | Medium | 8 | |

Strategy: Equity Focus

Efforts toward equity ensure that transportation benefits meet the needs of all users, recognizing that historical transportation investments have negatively impacted marginalized communities and privileged other groups.



| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|--|---|--------|------|--------|----------|--|
| Objective 12: Strive for equitable emerging transportation technology distribution and deployment throughout the region including electric vehicle (EV) and electric vehicle supply equipment (EVSE) | 12.1 Identify affordable, accessible, reliable, location and safety-related employment and economic opportunities with EV and EVSE projects | High | Low | Medium | 6 | Electrification Emission Reduction Equity and Health |
| | 12.2 Identify incentives or opportunity areas for EVSEs in communities of color, multi-unit development areas, rural communities, and workforce housing locations | High | Low | Medium | 6 | |
| | 12.3 Prioritize emerging transportation technologies in environmental justice communities | High | High | High | 5 | |
| | 12.4 Work to expand transit access in key underserved communities lacking basic Monday-Friday demand response or volunteer driver transportation services | High | High | High | 5 | |
| Objective 13: Increase diverse representation in transportation projects | 13.1 Ensure representation of diverse users on steering committees, transportation advisory committees, and project advisory committees | Medium | Low | Medium | 7 | Equity and Health Accessibility Electrification Emissions Reduction |
| | 13.2 Ensure project design and implementation support diverse users | Low | Low | High | 9 | |

Equity Focus Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|---|--------|--------|--------|----------|---|
| | 13.3 Reduce barriers to participation for Black, Indigenous, and People of Color and other marginalized groups, especially for committees that make decisions regarding transportation investments through incentives and other means of compensation | High | Medium | High | 6 | |
| | 13.4 Increase access to emerging transportation technologies | High | High | High | 5 | |
| Objective 14: Ensure all plans, policies, and engagement include language that includes all users and defines intended equitable outcomes | 14.1 Include alternative engagement strategies during the planning process to ensure all voices are heard | Medium | Medium | High | 7 | Equity and Health Safety Resiliency |
| | 14.2 Define often-used but unclear terms such as “all user groups” | Low | Low | Low | 7 | |
| | 14.3 Reduce jargon when possible | Low | Low | Medium | 8 | |
| | 14.4 Increase environmental justice criteria percentage in scoring for Ten-Year Plan funding | Low | Low | Medium | 8 | |
| | 14.5 Encourage municipal leaders to adopt equity criteria in capital improvement plans | Medium | Low | Medium | 7 | |

Strategy: Education, Engagement, and Outreach

Education and outreach engage the public and help spread knowledge and change throughout communities.



| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|--|---|--------|--------|--------|----------|--------------------------------|
| Objective 15: Advance user roadway safety education | 15.1 Host a bike rodeo | Low | Low | Low | 7 | Safety |
| | 15.2 Create a walking, biking, and riding social media campaign | High | Low | Low | 5 | |
| | 15.3 Support new driver high school programs focused on multi-modal users | Medium | Medium | Medium | 6 | |
| | 15.4 Work with state and regional partners to reduce distracted driving through a combination of education and enforcement | Low | Medium | Medium | 7 | |
| Objective 16: Communicate emerging technologies | 16.1 Host public information sessions and webinars on emerging transportation technologies like electric micro-mobility and micro-transit | Medium | Low | Low | 6 | Electrification Safety |
| | 16.2 Provide trainings to the public on how to safely and reliably use emerging technologies | Medium | Medium | Medium | 6 | Livable Communities |
| Objective 17: Advocate for regional transportation needs | 17.1 Provide and/or bring trainings on municipal budgeting for transportation investments | Medium | Low | Low | 6 | Increase Funding and Resources |
| | 17.2 Write letters of support for projects that advance the regional transportation goals and strategies | Low | Low | Medium | 8 | |
| | 17.3 Advocate for a regional bicycle cooperative | Low | Low | Low | 7 | |

Education, Engagement, and Outreach Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|---|--------|------|--------|----------|--------------------------------|
| Objective 18: Communicate transportation information via outreach materials | 18.1 Create and distribute infographics of transportation funding cycles and processes | Low | Low | Low | 7 | Increase Funding and Resources |
| | 18.2 Create materials to explain project progression and “shovel ready” characteristics | Low | Low | Medium | 8 | |
| | 18.3 Develop easy-to-replicate data collection materials such as surveys | Low | Low | Medium | 8 | |
| Objective 19: Increase trainings to broad stakeholders | 19.1 Educate private landholders on stormwater improvements | Medium | Low | Medium | 7 | Maintenance |
| | 19.2 Educate municipal boards about programs for asset management and Capital Improvement Plans | Low | Low | Low | 7 | |

Strategy: Pilot Projects and Technical Assistance

Pilot projects test potential improvements with minimal investment to gain insight into whether the improvement is a beneficial solution prior to a larger investment. Technical assistance provides targeted support, builds general capacity, and facilitates communications to municipalities and organizations with transportation needs or projects.



| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|--|--------|--------|--------|----------|--------------------------------------|
| Objective 20: Develop pilot projects to support the integration of electric micro-transit | 20.1 Design and implement an e-bike pilot projects such as lending libraries, rebate programs, rental programs, or municipal employee programs | Medium | Medium | Medium | 6 | Manage Demand Electrification |
| | 20.2 Develop a vehicle-to-grid pilot program to determine feasibility and best practices in our region | High | Low | High | 7 | |
| | 20.3 Design e-scooter pilot projects | Medium | Medium | Low | 5 | |
| Objective 21: Develop pop-up projects to test the effectiveness of potential traffic calming measures to support multi-modal safety | 21.1 Create temporary pop-up projects like bump outs, striping, signage, and grooved pavements | Low | Medium | Medium | 7 | Livable Communities Safety |
| | 21.2 Develop multimodal pop-up projects like crosswalks, bike lanes, bicycle parking, pedestrian streets, and boulevards | Low | Medium | Medium | 7 | |

Pilot Projects and Technical Assistance Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|--|--|--------|--------|--------|----------|---|
| Objective 22: Provide technical assistance to AT, SCT, SCCC, GCCC, and TMA in developing regional community transportation options | 22.1 Expand transit access in key underserved communities lacking basic Monday-Friday demand response or volunteer driver transportation services | High | High | High | 5 | COVID-19 Recovery Accessibility Equity and Health |
| | 22.2 Facilitate local Safe Routes to School programs and safety improvements connecting neighborhoods to schools | Medium | Medium | High | 7 | |
| | 22.3 Facilitate development of volunteer driver program capacity or other transit services to provide access to medical care and other basic life needs in underserved communities | High | Medium | High | 6 | |

Workforce and Training Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|---|--------|------|--------|----------|--------------------------------|
| Objective 23: Prepare region for a build out of a regional public EV charging network | 23.1 Research electrification workforce needs | Medium | Low | Medium | 7 | Electrification |
| | 23.2 Identify needed trainings in the region to develop workforce knowledge | Low | Low | Low | 7 | Emissions Reduction |
| Objective 24: Increase municipal capacity | 24.1 Encourage Local Public Agency (LPA) Training | Low | Low | Low | 7 | Increase Funding and Resources |
| | 24.2 Apply for discretionary federal and state grants on behalf of communities, especially ones without planning staff or grant writers | Medium | Low | High | 8 | |
| | 24.3 Provide technical assistance and develop reports for actionable steps to increase knowledge of funding processes | Medium | Low | Medium | 7 | |
| | 24.4 Increase capacity in municipal positions via increasing employees, circuit riders, or employee share programs | High | High | High | 5 | |

Workforce and Training Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|---|--------|------|--------|----------|---------------------------|
| Objective 25: Provide a variety of workforce training opportunities to promote resiliency, maintenance, and sustainability of the transportation system | 25.1 Provide training in resilience knowledge for decision makers, especially in flood-prone communities | Medium | Low | Medium | 7 | Resiliency Maintenance |
| | 25.2 Provide trainings for contractors and landscapers in best practices for maintaining infrastructure | Medium | Low | Medium | 7 | |
| | 25.3 Connect with local community colleges and trade schools to fill transportation workforce gaps | Low | Low | Medium | 8 | |
| | 25.4 Train municipal staff on best practices for active transportation, clean transportation, maintenance, and green infrastructure | Medium | Low | Medium | 7 | |

Strategy: Network and Partnerships

Networking and partnerships reduce resource overuse and create opportunities for a wider reach and participatory decision-making.



| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|--|--------|------|--------|----------|---|
| Objective 26: Increase partnership collaboration for transportation project implementation | 26.1 Create a list of reputable EV and EVSE contractors | Low | Low | Low | 7 | Electrification Increase Funding and Resources |
| | 26.2 Partner with public and private entities like Dartmouth Health, chambers of commerce, schools, higher education institutions, trade, etc., to create cross-sectoral, co-beneficial, and cross-community collaboration | Medium | Low | Medium | 7 | |
| | 26.3 Establish relationships with utility companies | Medium | Low | Low | 6 | |
| | 26.4 Coordinate public/private partnerships to enhance start-up funding | High | Low | High | 7 | |
| | 26.5 Coordinate municipal joint grant applications and funding initiatives | Medium | Low | High | 8 | |
| Objective 27: Create partnerships and workgroups that can be utilized in an emergency response and recovery efforts | 27.1 Partner with emergency responders and other emergency-focused partners, such as SC Strong, to plan for response to emergencies related to natural hazards and unforeseen events that impact the transportation system | Medium | Low | High | 8 | Resiliency Maintenance |
| | 27.2 Partner with resiliency and climate-related groups to plan for future natural hazards that will impact the transportation system, such as the Upper Valley Adaptation Workgroup | Medium | Low | High | 8 | |

Network and Partnerships Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|--|---|--------|------|--------|----------|-------------------------------------|
| Objective 28: Increase collaboration with state agencies | 28.1 Collaborate with NHDOT District for maintenance and advocacy for local projects | Low | Low | Medium | 8 | Safety Resiliency Maintenance |
| | 28.2 Increase local engagement on state level projects throughout the entire project process | Medium | Low | Medium | 7 | |
| | 28.3 Continue to work with NHDOT to ensure that bridge designs use materials that promote long lifespans, incorporate considerations for bicycle and pedestrian needs, and minimize the impacts of natural hazards and climate change on the structures | Low | Low | Medium | 8 | |
| | 28.4 Continue to encourage the state and communities to provide adequate resources for bridge and culvert maintenance | Low | Low | Medium | 8 | |
| | 28.5 Continue to work with NHDOT on Road Safety Audits and follow-up improvements for crash locations with fatalities and serious injuries | Low | Low | Medium | 8 | |

Network and Partnerships Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|--|--|--------|------|--------|----------|---|
| Objective 29: Increase collaboration and partnerships with local and regional transportation agencies and organizations the region | 29.1 Continue partnership with local transportation advocacy groups including the Upper Valley Transportation Management Association | Low | Low | Medium | 8 | Accessibility Livable Communities |
| | 29.2 Continue and strengthen partnerships with regional public and private transit agencies such as Advance Transit, Sullivan County Transportation, and Dartmouth Coach | Low | Low | Medium | 8 | |
| | 29.3 Collaborate with transportation partners, local businesses, and institutions to expand employment in the transportation sector | Low | Low | Medium | 8 | |
| | 29.4 Collaborate with transportation partners, local businesses, and institutions to encourage employer support for employee transportation needs | Low | Low | Medium | 8 | |
| Objective 30: Work with legislators and other officials to advocate and increase the federal and state funding for the region | 30.1 Work with legislators and other officials to advance Ten-Year Plan projects | High | Low | High | 7 | Electrification Increase Funding and Resources |
| | 30.2 Work with legislators and other officials to advance EVSE and EV implementation | High | Low | High | 7 | |
| | 30.3 Work with legislators and other officials to advocate and increase the federal and state funding for the region | High | Low | High | 7 | |

Strategy: Identify Barriers and Behaviors Through Data Collection and Analysis

Data collection and analysis enable planners to identify barriers and behaviors to help inform and support decision-makers.



| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|--|--------|--------|--------|----------|--|
| Objective 31: Gather information on municipal transportation assets | 31.1 Conduct a fleet inventory and conduct a cost-benefit analysis of fleet upgrades and electrification | High | High | High | 5 | Safety Electrification Maintenance |
| | 31.2 Conduct Road Surface Management Systems (RSMS) of paved roadways using the SADES software | Medium | Medium | High | 7 | |
| | 31.3 Draft Ten-Year Pavement Improvement plan based on RSMS analysis | High | Medium | High | 6 | |
| | 31.4 Conduct SADES pedestrian infrastructure inventory and analysis | High | Medium | High | 6 | |
| | 31.5 Conduct SADES culvert and closed drainage systems (CCDS) assessments | High | Medium | High | 6 | |
| | 31.6 Conduct SADES stream crossing assessments and provide information to communities and state agencies | High | Medium | High | 6 | |
| | 31.7 Assist communities in maintaining an asset database and management system | High | High | High | 5 | |
| | 31.8 Continue to participate in SADES data collection for statewide consistency | Medium | Medium | High | 7 | |
| | 32.1 Identify gaps in local services for Advance Transit and Sullivan County Transportation | Medium | Low | Medium | 7 | |
| | 32.2 Identify paratransit needs | High | Low | Medium | 6 | |

Identify Barriers and Behaviors Through Data Collection and Analysis Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|--|--|--------|--------|--------|----------|---|
| Objective 32: Identify gaps in transportation services | 32.3 Identify need and usage of carpooling and rideshare programs | High | Loq | Medium | 6 | Accessibility Balanced Mobility Manage Demand |
| | 32.4 Identify gaps in air travel network via Lebanon Municipal Airport | Low | Low | Low | 7 | |
| | 32.5 Identify service gaps for car rentals | Low | Low | Low | 7 | |
| | 32.6 Identify service gaps in the Amtrak system | Low | Low | Low | 7 | |
| | 32.7 Identify service gaps in private bus service including, Dartmouth Coach and Greyhound | Low | Low | Low | 7 | |
| Objective 33: Identify gaps in transportation infrastructure | 33.1 Analyze pedestrian infrastructure data to identify infrastructure gaps in the network including sidewalks and cross-ings | High | Medium | High | 6 | Safety Accessibility Equity and Health |
| | 33.2 Identify walksheds in higher density areas to inform future landuse decisions and pedestrian infrastructure needs | High | Medium | High | 6 | |
| | 33.3 Analyze bicycle infrastructure data to identify infrastructure gaps in the network including bike-lanes and multi-use paths | High | Medium | High | 6 | |
| | 33.4 Utilize bicycle level of stress tools to inform future roadway adaptations to improve safety | High | Medium | High | 6 | |
| | 33.5 Identify improvement areas where existing infrastructure is not suitable or accessible for all users including wheelers | High | Medium | High | 6 | |

Identify Barriers and Behaviors Through Data Collection and Analysis Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|--|--------|--------|--------|----------|---|
| | 33.6 Identify “last mile” infrastructure gaps to connect multiple modes of transportation | High | Medium | High | 6 | |
| | 33.7 Conduct transit stop condition assessments | High | Medium | High | 6 | |
| | 33.8 Conduct sign and pavement marking assessments | High | Medium | High | 6 | |
| | 33.9 Expand data collection on bicycle and pedestrian volumes and routes to provide a better basis for evaluating bicycle and pedestrian project needs | High | Medium | High | 6 | |
| | 33.10 Ensure adequate capacity at park and ride facilities in the region | High | Medium | High | 6 | |
| | 33.11 Conduct parking studies in downtown and commercial areas to inform land use decisions | High | Medium | High | 6 | |
| Objective 34: Identify barriers and challenges for users in the current transportation system | 34.1 Analyze social impacts before and after major transportation infrastructure projects (e.g. segregated by design) | High | Medium | High | 6 | Safety Accessibility Equity and Health COVID-19 Recovery |
| | 34.2 Analyze the user groups that have been historically privileged and disadvantaged by transportation investments | High | Medium | High | 6 | |
| | 34.3 Utilize transportation and health tool indicators such as proximity to major roadways, road traffic fatalities by mode, road traffic fatalities exposure rate, and public transportation trips per capita | High | Medium | High | 6 | |
| | 34.4 Analyze pre- and post-pandemic telecommuting behaviors and their impact on user behavior | Medium | Medium | High | 7 | |

Identify Barriers and Behaviors Through Data Collection and Analysis Cont.

| Objective | Task | Effort | Cost | Impact | Priority | Relevant Goals |
|---|--|--------|--------|--------|----------|--|
| Objective 35: Increase understanding and connections between transportation and other sectors | 35.1 Track health impacts and benefits of user groups, especially marginalized communities | Medium | Low | Low | 6 | Safety Accesibility Equity and Health Resiliency Balanced Mobility Livable Communities Manage Demand |
| | 35.2 Ensure health care providers have transportation plans and policies through data support and research | Medium | Low | Low | 6 | |
| | 35.3 Conduct a study to understand relationships between welfare office locations and transportation | Medium | Medium | Low | 5 | |
| | 35.4 Conduct a study of tourism-based travel in the region and the transportation improvements necessary to maintain this economic base | Medium | Medium | Medium | 6 | |
| | 35.5 Analyze relationship housing and destinations (access areas) | Medium | Medium | High | 7 | |
| | 35.6 Expand natural and cultural resource inventory data to guide project planning and mitigation efforts | High | High | High | 5 | |
| | 35.7 Analyze the transportation system for capacity and safety deficiencies that impact security and disaster planning concerns, and incorporate security and disaster planning into the project design and prioritization process | High | Medium | High | 6 | |

Appendix

1 Transportation Advisory Committee Members

- Liz Emerson, **Charlestown**
- Nancy Merrill, **Claremont**
- deForest Bearse, **Claremont** (Alternate)
- Jim Taylor, **Enfield**
- Rob Taylor, **Enfield** (Alternate)
- Peter Kulbacki, **Hanover**
- Christina Hall, **Hanover** (Alternate)
- George Sykes, **Lebanon** (Chair)
- Dick Jones, **Lyme** (Vice Chair)
- Bob Harrington, **New London**
- Todd Cartier, **Newport**
- Allyson Traeger, **Sunapee**
- Bill Chaisson, **Wilmot**
- Adams Carroll, **Advance Transit**
- Candy Reed, **Sullivan County Transportation**
- Dan Nash, **UVLSRPC Commissioner**
- John Haffner, **Vital Communities**
- Ellen Hender, **Vital Communities** (Alternate)

2.i Public Summary Questions

The questions below comprise those presented to the public and described in I.c.

How is the region doing with addressing safety improvements on our transportation network?

What are the barriers to improving safety in the region?

Other - What are the barriers to improving safety in the region? *[Write-in]*

Comments?

How is the region doing with addressing impacts of the COVID-19 pandemic on regional travel needs?

What are the barriers to addressing these negative impacts?

Other - What are the barriers to addressing these negative impacts? *[Write-in]*

Comments?

How is the region doing with reducing single-occupant vehicle travel?

What are the barriers are to reducing single occupant vehicle travel in congested areas?

Other - What are the barriers are to reducing single occupant vehicle travel in congested areas?

[Write-in]

Comments?

How is the region doing with providing access to destinations via multimodal options?

What are the barriers improving access?

Other - What are the barriers improving access? *[Write-in]*

Comments?

How is the region doing with prioritizing equity, public health. and environmental justice in transportation investments?

What are the barriers to this goal?

Other - What are the barriers to this goal? *[Write-in]*

Comments?

How is the region doing with promoting reduced fossil fuel consumption and fewer miles traveled?
What are the barriers reducing emissions with these efforts?
Other - What are the barriers reducing emissions with these efforts? [Write-in]
Comments?

How is the region doing with building a regional electric vehicle charging network?
What are the barriers to this goal?
Other - What are the barriers to this goal? [Write-in]
Comments?

How is the region doing with mitigating and/or adapting to natural hazards that threaten the transportation network?
What are the barriers to reaching this goal?
Other - What are the barriers to reaching this goal? [Write-in]
Comments?

How is the region doing with aligning transportation investments with community planning goals?
What are the barriers to reaching this goal?
Other - What are the barriers to reaching this goal? [Write-in]
Comments?

2.ii Public Summary Responses

Safety (C-)

When asked what the barriers to safety in the region are and how the region is doing at addressing safety improvements, members of the public presented people-focused and infrastructure-related needs and solutions. Many respondents focused on the safety of vulnerable groups: pedestrians, bicyclists, wheelers, and people with mobility challenges. The lack of sidewalks and bicycle facilities, unsafe crosswalks and crossings, current routes, road conditions, intersections, and roadway design were identified as infrastructure-related safety needs. These hazards are compounded by the climate of the UVLS (Upper Valley Lake Sunapee) region with snow, potholes, frost heaves, etc., posing a risk to motorists. Other respondents pointed out how driving behavior, including speeding, speed limits, education, and enforcement were key challenges. Jurisdictional barriers included land permissions for new rail trails, municipal capacity, auto-centric investments, and slow project development periods. Potential solutions included income-tiered or charging a flat rate for public transit and enhanced bus stops with lighting and overhead coverage.

COVID-19 (C+)

When asked about how the region is doing with addressing impacts of the COVID-19 pandemic on regional travel needs and what barriers exist, many respondents did not know or stated it was not a transportation issue. For those who found linkages between transportation and COVID-19, public transit was a popular theme among comments. Many noted how the pandemic hurt ridership and how public transit has not fully recovered. Since public transportation did not operate late into the evening or weekend, this has created additional burdens for essential businesses. Others noted how the lack of mask-wearing on public transit places immunocompromised riders at risk of contracting COVID-19 and with telehealth decreasing, it has become more challenging for people to get to

medical appointments. Many complimented public transit providers on their efforts to keep services running and safe. Another theme related to travel behavior. Respondents noted how telecommuting increased, but more data is needed to assess the pandemic's impact on vehicle miles traveled, new traffic patterns, and how to encourage people to return to public transit. There were also opportunities created out of the pandemic. These included the multi-use of parking spaces and shared streets.

Manage Demand (D)

Respondents were asked to evaluate how the region is doing with reducing single-occupant vehicle travel. Many noted how they perceive flexible working hours and telecommuting as reducing traffic congestion, but more can be done by municipalities and employers to incentivize carpooling. Park and rides along I-89 and other areas were other suggestions to increase carpooling. Many noted how inadequate affordable housing has led employees to travel farther distances. Others commented on competing schedules because of work, personal, childcare, etc., and convenience as limiting factors. Land-use considerations included how zoning should encourage pedestrian-friendly, mixed-use reconstruction, new development should be held to a higher standard, parking should have maximums, not minimums, and buildings should be brought to the street (as opposed to being setback). According to respondents, public transit is a key element in managing demand. Expanding weekend and evening service, extending coverage to feeder towns, creating express routes, and connecting to major transportation hubs outside the region were key solutions to manage demand. Traffic was another topic. Respondents noted how the comfort, safety, and continuity of pedestrian/bicycle facilities helps to manage traffic. Some people noted how single-occupant travel is a choice and nothing can be done given the rural and spread-out nature of the environment.

Accessibility (D+)

When asked to evaluate accessibility and describe the barriers to improving access, many noted how the regional climate and geography present unique challenges. Hills and streams and snow impact maintenance and road condition while rain and cold weather decrease accessibility to public transit. Some respondents provided certain groups that are especially affected by accessibility challenges. These included children, the elderly, people with disabilities, and no-car households. It should be noted these are “visible” groups. It should be noted the marginalized communities that were not mentioned by respondents. These groups include black, indigenous, people of color, and low-income to name a few. Public transit was another common theme. Respondents suggested there needs to be more ways to provide low-volume, off-peak transportation like micro transit. Cost of transportation is also a limiting factor. Others spoke to access to land like private property land-use permissions hold up access points and NHDOT being resistant to community needs.

Equity & Health (C-)

When asked about the barriers to equity and health, many respondents did not understand the linkage between equity, health, and transportation. Many expressed a negative tone regarding the language, specifically “environmental justice” and had different interpretations of the language. Some noted how they had never heard of this before, did not have enough data to provide thoughts, or did not see it as an issue, indicating a knowledge gap in this area. Some members of the public perceive equity and environmental justice as politicized concepts. Others shared their perspectives on the links between transportation and equity and health. Funds concentrate in larger communities as opposed to smaller ones. When investments are made, they often strictly benefit drivers and those outside of the community instead of pedestrians, wheelers, and cyclists. For example, one person noted how

new housing developments should be constructed in places where people do not have access to a car.

Emissions Reductions (D)

When asked to evaluate the promotion of reduced fossil fuel consumption and fewer miles traveled and the barriers to these efforts, many noted how there are “next-to-none” electric vehicle (EV) public chargers and how they need to be spread across the region. The government plays a role in this realm with the non-compliant diesel vehicles, regulations for EV chargers in development proposals, and municipal/school fleet electrification. EVs have a high barrier to entry given the cost, preventing those from low-to-middle incomes from accessing them. Some noted how businesses need to take a more proactive approach with travel demand management programming like incentives, showers/lockers, remote work, etc., that encourage alternative transportation modes. Some noted how current infrastructure does not meet the needs of cyclists, pedestrians, and people with mobility challenges. Also, the location of stores creates challenges. More education is needed regarding public transportation and changing human behavior.

Electrification (D+)

When asked about building a regional electric vehicle charging network, many respondents brought up similar themes to the emissions reductions goal. However, some noted how investor-owned utilities have been a major roadblock as grid resiliency and excessive “make ready” costs are barriers. Regarding the chargers themselves, rural destinations are needed as well as a diversity of chargers (i.e., fast-chargers, non-Tesla chargers). Many noted how officials need to consider battery life cycles in the discussion. Some respondents attributed multi-town coordination and shared parking areas as key pieces to advance electrification. However, some mentioned how car usage continues to disincentivize mass transport and other active transportation methods regardless of whether it is electric or not.

Resilience (C-)

When asked about how the region is doing with mitigating and/or adapting to natural hazards that threaten the transportation system, many people did not know how to evaluate this goal. However, maintenance, natural causes, network, and government were key themes. For example, inadequately sized culverts, understaffed departments of public works, poor maintenance of dirt roads, unplowed snow at park and rides, and excessive potholes were key issues. Natural causes included mitigating flooding and freezing temperatures, erosion, snow melting along river roads, reconnecting floodplains, and protecting sources of drinking water. Some spoke about the transportation network and how there are few alternative networks, there must be redundant routes and systems in place, and detours create unpleasant travel experiences. Others noted the role of government. This included regulations like riparian buffer ordinances, increasing municipal capacity and funding to address resilience changes, and shifting DOT practices.

Livable Communities (C-)

When asked to evaluate the alignment of transportation investments with community planning goals, many spoke about the government. For example, local governments do not have the budgets or budgets to plan for this, and municipal revenue sources are not sustainable. The cost of public-school strains municipal budgets. Some people feel like the state does not listen to communities and towns seem intent on lessening the availability of transportation investments. Some spoke about

how the public transit network is too small and inadequate for rural people and connections outside of the region. Others discussed the relationships between housing and transportation. For example, housing and transportation need to be planned together. Businesses and high-density housing overwhelm roads in high-traffic periods and environmental protection and climate resilience need to be considered. Some noted how public restrooms, parking, centralized grocery stores and shopping areas, and downtown cores all play a role in livable communities.

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Endnotes

- 1 U.S. Census Bureau. *2020 American Community Survey 5-Year Estimates Subject Tables*. Retrieved from <https://data.census.gov>.
- 2 U.S. Census Bureau. (2023). LEHD Origin-Destination Employment Statistics Data (2002-2020). *nh_od_main_JT05_2020.csv*. Washington, DC: U.S. Census Bureau, Longitudinal-Employer Household Dynamics Program, accessed on May 16, 2023, at <https://lehd.ces.census.gov/data/#lodes>. LODES 8.0 (2020).
- 3 Advance Transit. (2023). *Transit Development Plan Interim Report*.
- 4 *Ibid.*
- 5 *Ibid.*
- 6 *Ibid.*
- 7 KFF Health News. (Oct. 24, 2022). "A Volunteer Driver Drought Is Threatening Vulnerable Adults' Access to Care in Rural Communities." *U.S. News & World Report*. <https://www.usnews.com/news/health-news/articles/2022-10-24/volunteer-shortage-complicates-access-to-care-in-rural-america>.
- 8 Southwestern Community Services Transportation Program. "Transportation." Accessed on August 28, 2023, at <https://www.scshehelps.org/transportation/>.
- 9 Grafton County Senior Citizens Council, Inc. 2022. *Annual Report 2022*. Advance Transit. 2023. *Transit Development Plan Interim Report*.
- 10 Federal Transit Administration. 2021. "Agency Profile for Southwestern Community Services Transportation."
- 11 American Association of State Highway Transportation Officials (AASHTO). 2020. *Survey of State Funding for Public Transportation*. (FY2018 Data.)
- 12 New Hampshire Transit Association. 2022. *Public Transportation in New Hampshire*.
- 13 New Hampshire State Department of Education. 2022. *Estimated Expenditures of School Districts 2021-2022*. <https://www.education.nh.gov/sites/g/files/ehbemt326/files/inline-documents/sonh/est-expend-2021-22.pdf>.
- 14 Great American Stations. "Claremont, NH." Accessed on August 30, 2023, at <https://www.greatamericanstations.com/stations/claremont-nh-cla/>.
- 15 Great American Stations. "White River Junction, NH." Accessed on August 30, 2023, at <https://www.greatamericanstations.com/stations/white-river-junction-vt-wrj/>.
- 16 Bureau of Transportation Statistics. "Lebanon-Hanover, NH: Lebanon Municipal (LEB)." Accessed on August 30, 2023, at https://www.transtats.bts.gov/airports.asp?20=E&Nv42146=Y-RO&Nv42146_anzr=Yron010-Un018r4,%20aU:%20Yron010%20Z70vpv2ny&pn44vr4=SNPgf.
- 17 Zhou, Yan, Aeschliman, Spencer, & Gohlke, David. 2021. *Affordability of Household Transportation Fuel Costs by Region and Socioeconomic Factors*.
- 18 Upper Valley Lake Sunapee Regional Planning Commissions. *Regional Housing Needs Assessment*. 2023.
- 19 U.S. Census Bureau. *2020 American Community Survey 5-Year Estimates Subject Tables*. Retrieved from <https://data.census.gov>.
- 20 Brumbaugh, Stephen, Bureau of Transportation Statistics. "Travel Patterns of American Adults with Disabilities." September 2018.
- 21 Amos Weintrob, Luke Hansell, Martin Zebracki, Yvonne Barnard & Karen Lucas. "Queer mobilities: critical LGBTQ perspectives of public transport spaces." *Mobilities*, 16:5, 775-791. 2021. DOI: 10.1080/17450101.2021.1958249.
- 22 Upper Valley Lake Sunapee Regional Planning Commissions. *Regional Housing Needs Assessment*. 2023.

- 23 New Hampshire Department of Environmental Services. "Transportation." Accessed on December 14, 2023, at des.nh.gov/climate-and-sustainability/transportation.
- 24 Strathman, James G. and Kenneth J. Dueker. (1994). "Understanding Trip Chaining: 1990 NPTS Subject Area Report." Center for Urban Studies. Portland State University.
- 25 Metropolitan Area Planning Council. *Managing Neighborhood Change: Selected Anti-Displacement Strategies in Practice*. October 2011.
- 26 Trumm, Doug. "What Upzoning Can Do." *The Urbanist*. February 15, 2017. Accessed October 6, 2023.
- 27 Federal Transit Administration. "Transit-Oriented Development." <https://www.transit.dot.gov/TOD>. Accessed November 20, 2023.
- 28 Upper Valley Land Trust. "Connected Habitats for Wildlife." August 18, 2021. <https://uvlt.org/2021/08/connected-habitats-for-wildlife/>. Accessed November 15, 2023.