4. Transportation

A. Introduction

When we plan for “transportation,” or even “mobility” (the word used in transportation circles to generally signify movement along roads), the primary goal is access. We may drive to the store by ourselves to get groceries, but what we need are the groceries, not the drive. If the groceries were delivered, that would provide access to groceries just as well. Most of us need to physically go to work, but if we live close, we can walk or bike there instead of driving. We can carpool if we live near enough to workmates, and we can take transit if there is a suitable route. All of these are means of access. If our job can be done online, all we need is good broadband to telecommute. Business and tourism needs are much the same as for households; they need access, not a specific means of transport.

The regional transportation system is not just the built network of roads. It also includes railways, airports, sidewalks, and even rivers and trails. Even the Internet can be considered part of the built network. However, the transportation system is much more than this; it includes both public and private transit services. And it also includes our feet, wheelchairs, bikes, cars, and all the fuel we buy. It includes the wider built system outside the Region that connects us to other areas, as well as a whole slew of support services, from gasoline tankers to road salt suppliers.

It is important that we understand our system in its full complexity, context, and cost as we head into the future. This way, we can adjust to changes and craft a

system that has the most access and the fewest negative impacts, all while trying not to spend more money.

B. Regional Transportation Characteristics

Highways

The Region contains several key transportation corridors, including Interstates 89 and 91 as well as several state routes that are utilized for statewide trucking. Of the state and federal highways in the Region, Interstates 89 and 91 carry the bulk of traffic (over 10,000 vehicles a day), followed by U.S. Route 4 and U.S. Route 5 (roughly 5,000 to 10,000 vehicles a day). The Region rarely encounters traffic congestion, even during peak hours. Population growth may exacerbate existing congestion along U.S. Route 5 in Hartford, VT-10A in Norwich, and the Route 4 corridor during peak hours.

Although the National Scenic Byways program is no longer funded, there remains three designated Scenic Byways in the Region: the Connecticut River Scenic Byway, the Crossroad of Vermont (Route 4) Byway, and the Scenic Route 100 Byway. There is also one Vermont Scenic Road designated in the Region, the Route 125 Middlebury Gap Road. The Scenic Road designation places strict development restrictions on the road corridor to preserve the scenic nature of the road.

The Vermont Agency of Transportation (VTrans) collects and publishes State Highway pavement conditions in our Region. VTrans prioritizes paving based on their asset management system which looks at implementing the right paving treatment at the right time of the pavement lifecycle.

In addition to the state system, our communities have extensive road networks of their own (see the Regional Transportation Map). The bulk of residential development in our towns is located outside of village areas on rural roads, which increases the need for well-connected roads and road improvements. As more people move into towns locating on Class 3 and Class 4 roads, additional traffic on these roads can lead to additional maintenance or costly upgrades to widen the road or make it a passable school bus route. (Towns are not responsible for maintaining Class 4 roads, only bridges and culverts.) Highway budgets are typically the second largest local expenditure after school budgets, averaging several thousand dollars per mile to plow and maintain, and typically are still insufficient for maintaining the level of service expected by residents.

In 2021, vehicles in Windsor and Orange Counties travelled more than 1259 million miles, with almost 50 million gallons of gasoline consumed (estimate derived from EPA's evaluation of model 2020 vehicles' Average Fuel Economy, which is 25.4 Miles per Gallon (mpg)). Much of the travel in our Region is done using our personal vehicles. While this is convenient for many, it can be expensive, time consuming and contribute to air pollution. A significant percentage of car-dependent commuters in Orange and Windsor Counties drive to work alone (87%), while over ten percent carpool. Around 18 percent of commuters either walk, bike, or use public transportation.

The Regional Plan notes that rural sprawl continues to expand, and commercial development has taken the form of automobile-dependent strip development along highways. These land use decisions limit people's transportation options while increasing their transportation costs, both in terms of direct costs (e.g., gas

and ownership costs) and opportunity costs (e.g., time spent driving instead of addressing other priorities like family needs). Ultimately, this translates into a higher overall cost of living for households.

TRORC's longstanding priorities are maintaining the existing and diversifying modes of transportation by expanding bicycling, walking, and transit.

Walking and Biking

Acknowledging the importance of varying transportation choices for people, the Vermont Legislature passed a Complete Streets law in 2011. This bill requires that all users be considered in the planning, design, construction, and maintenance of our roadway system. To learn more about Complete Streets, refer to Vermont Department of Health's Complete Streets: A Guide for Vermont Communities.

Walking and bicycling infrastructure is an important component of the Region's goals for sustainable transportation and economic development. Higher use of these modes will have numerous benefits for the Region, including lower traffic volumes, lower emissions, and improved public health. There are additional considerations that can further the Region's goals. Land use planning that concentrates growth in areas of existing development, particularly village centers, supports the utility of pedestrian and bicycle infrastructure. The Region has also been supportive of federal and state initiatives that incorporate safe routes programs primarily for schools in or near the larger Regional Growth Areas. Although national Safe Routes to School funding has been curtailed, TRORC continues to support related planning work. Lastly, increasing bicycle and pedestrian travel will require continued community outreach and education.

However, bike infrastructure presents many challenges for towns, such as feasibility studies and construction costs.

Passenger and Freight Rail

The rail industry is an important transportation mode for passenger and freight. The Amtrak "Vermonter" passenger rail (running from St. Albans, VT, to Washington, DC) is subsidized by Vermont and has stops in Randolph and White River Junction, traveling on the New England Central Railroad. This rail service is utilized more for tourism purposes than commuter service. It has benefited from track upgrades in recent years that have shaved off travel time along the corridor and improved fuel efficiency. In 2022, the White River Junction station had the third highest ridership out of all 14 stations in Vermont.

Many residents in the Region would welcome the opportunity to access regional and local passenger train services in areas closer to home. In 2016, the Northern New England Intercity Rail Initiative (NNEIRI) study recommended the expansion of the existing "Vermonter" passenger rail services to connect Boston and New Haven to Montreal, Quebec. The proposed daily round-trip service would stop at all existing stations and would require several infrastructure improvements. The study estimated the projected future ridership from New Haven to Montreal would be 343,000 riders annually, and from Boston to Montreal would be 103,000 riders per year. Unfortunately, the current passenger train infrastructure is equipped for travelling short ranges efficiently, and

VTrans has a map of railroad corridors in the State, including freight corridors. In our Region, the White River Junction station serves as a freight rail interchange

point. The Washington County Railroad Company (WACR) line connects from the New England Central Railroad (NECR) at White River Junction north into Newport. This train line runs parallel to the Connecticut River within the Region, with twelve designated stops in the river valley: White River Junction, Wilder, Norwich, Kendall (Strafford), Thetford, Northboro (Thetford), Ely, Fairlee, Bradford, Hooker (Bradford), Newbury, and Wells River. Additionally, the towns of Hartford and Bradford have industrial parks onsite. During times of emergency, VTrans has coordinated with the rail companies to ship needed materials on the Vermonter passenger rail route.

Freight rail complements other transport modes, namely tractor trailers, although it can serve as a more efficient, economical, and environmentally friendly means of transportation for heavy and bulky goods. Increases in freight rail service can only occur if service enhancements are carried out in conjunction with necessary safety improvements.

C. Background Trends and Challenges

The Region has a network of roadways and supporting infrastructure that emanates from town and village cores, roughly mirroring historical settlement patterns.

Many of our Region's current roadways and bridges date back to the 1970s. With traffic volumes and vehicle miles traveled continuously increasing, road infrastructure requires investment. However, significant shortfalls in federal and state transportation dollars stymie statewide efforts to maintain and improve roadways and infrastructure. According to the VTrans 2022 Transportation Asset

Management Plan, the funding gap projection for pavements and bridges for the next ten years is roughly $451 million. Costly repairs in the wake of flood disasters have further strained local budgets. Towns have had to increase the resiliency of their infrastructure at a pace and cost that outstripped local capital budget planning.

Transportation Impacts

Roads and their runoff, as well as vehicle emissions have a variety of detrimental effects on recreational activities, wildlife migration, and natural resource conservation by fragmenting our landscapes. Undersized or poorly placed bridges and culverts block aquatic and amphibious passage, reducing habitat or reproduction as well as restricting the flow of water and can inflict road damage further downstream or downhill.

Impervious surfaces; undersized, blocked, or failing culverts; improperly designed or nonexistent roadway ditches; road salt, brine, and sand usage; and the release of petroleum and other chemicals into the environment from vehicular travel have a direct impact on our Region's air and water. Stormwater is a major contributor to sediment and nutrient loading in the Region. Transportation facilities such as roads and parking lots create enormous amounts of impervious surface. These structures generate swift-moving stormwater runoff that carries pollution and exacerbates flood risk. Evaluating the full effect of existing and proposed transportation facilities and working to install detention areas or other measures will reduce both flood peaks and water pollution.

Per requirements of Act 64 and the Vermont Clean Water Act, municipalities are required to apply for the Municipal Roads General Permit coverage on all town

roads. The goal is intended to achieve significant reductions in stormwater-related erosion from municipal roads, paved and unpaved. Each municipality will implement a customized, multi-year plan to stabilize their road drainage system. The plan will include updating road drainage systems to meet basic permit standards and other measures to increase infiltration into soil and reduce erosion to meet a total maximum daily load (TMDL).

Our transportation system has a huge energy demand, and consequently an enormous amount of greenhouse gas emissions as that demand is largely met by fossil fuels. The Region has been making strides toward reducing its transportation energy usage, and the use of fossil fuels to supply that energy. Hybrid buses have been introduced into public transit fleets, and electric school buses have been acquired. Track upgrades have improved the fuel efficiency of the Amtrak "Vermonter" passenger rail service. Park and ride lots continue to be built and expanded throughout the Region, and some are outfitted with electric vehicle charging stations. Some employers offer van services or incentives for carpooling or public transit to reduce their employees' single-occupant vehicle trips.

Nevertheless, significant changes in our transportation systems are still needed if the Region is to meet its targets. Meeting the regional target for electric vehicle fleet growth (mentioned in the Energy chapter) will be a particular challenge; the Region currently lacks sufficient charging station infrastructure to support consumers in making the transition. VTrans is working to install charging infrastructure in state-operated park and rides lots where practicable.

In rural, sparsely settled areas, ride sharing allows people to mitigate the cost and environmental impacts of their commutes. Within the Region, around one in ten commuters share rides to work. To encourage more people to travel together (either by ridesharing or using public transit), the Region contains 20 park and rides. Of these, eleven are supported by municipalities and nine are supported by the State. TRORC evaluates park and ride capacity and has collected regional data to better understand statewide needs.

Driving is an inherently sedentary activity. For most of us, it is the common means of travel to work, school, activities, shopping, and other routine needs. Heavy reliance on this mode of travel comes at the expense of physical activity. Land use patterns that emphasize smart growth principles around compact town and village centers with pedestrian and bike opportunities promote healthy lifestyles.

Equitable Access

As discussed in the Community Health chapter, our Region's population is aging. To ensure that the older population has safe access to services, we must prioritize accessibility. This means having well-lit, functional sidewalks, improving road signage, having more options for carpooling, and increasing transit opportunities and adequate broadband service to allow older adults to age in place. Strengthening the Region's multi-modal transportation networks may also help to attract and retain younger residents.

Transportation equity in our Region's rural areas can be considerably improved. Those who are under legal driving age, those who cannot afford the costs of vehicle ownership and maintenance, the disabled, the elderly, and others find it

hard to find safe, affordable transportation options within their towns and between towns. Ubiquitous public transit would provide such access.

Transit access is key to creating healthy communities. People who cannot operate a vehicle have limited mobility, constraining their access to goods and services such as high-quality food and medical care. While some towns in the Region have small numbers of potential transit riders, large percentages of their populations may be transit dependent. Despite servicing relatively low numbers of transit riders, smaller towns still exhibit a high need for public transit. However, the rural character of the Region presents challenges for a traditional public transit system. Long distances between homes and employment centers strain commuter bus routes, while high transit dependency in low population density areas presents a serious challenge for the system. Currently, public transit provides less than 0.5 percent of the overall population with transport to work. Despite this adherence to single-occupant automobile travel, the Vermont Agency of Health and Human Services and the Vermont Agency of Transportation have extensively studied public transportation usage and all projections indicate demand for these services will increase.

The Region has a few public transportation services which are increasingly important to its transportation system. Fixed route services to the employment and commercial centers allow residents to work and shop. Transportation services for older adults and persons with disabilities give alternatives to people who wish to live independently but who are less able to drive themselves.

The Region depends on two public transportation providers: Tri-Valley Transit and Advance Transit. These two agencies are recognized by the State to provide public transportation services within the Region. Tri-Valley Transit and Advance Transit both operate fixed route commuter buses in the Region. To connect transit-dependent residents with shopping and social centers, Tri-Valley Transit offers weekly deviated fixed routes to Lebanon and Randolph, serving the towns of Hancock, Rochester, Stockbridge, and Bethel. Upon passenger request, deviations of up to ¾ mile can be made for pick-ups or drop-offs. Tri-Valley Transit also operates weekday transit circulators in the Randolph and Bradford areas.

Transportation services for older adults and persons with disabilities are a unique asset to the transportation system and one that operates almost invisibly to most citizens. These services, funded by Medicaid and the Federal Transit Administration, offer transportation to eligible individuals for accessing medical appointments, senior meal sites, adult day programs, and commercial service and shopping centers. While medical rides typically are a priority, transportation to shopping and social interaction are also important factors to the quality of aging in place. The Region's senior centers and adult day programs provide transportation for their older adults and persons with disabilities clients both through Tri-Valley Transit and through their own network of vehicles and volunteer drivers. Although it appears the Region has redundancy in service areas, there remains a large percentage of unmet needs and service area gaps. The partnering transportation groups continue to coordinate services to maximize each provider in addressing service gaps.

Social service providers who work with transit-dependent populations including older adults, persons with disabilities, and people living below the poverty line have identified two primary unmet public transport needs. The first is the need for extended hours of public transit operation. Currently, buses operate generally between 6AM and 7PM. This schedule does not accommodate people who work evening or night shifts, or seniors who wish to attend social events in the evenings. The second need is for weekend bus service. Transit buses in the Region generally operate Monday through Friday; this presents a significant challenge for those who work on the weekend. Advance Transit recently launched weekend service for their main routes and have seen significant positive ridership numbers. In addition to these unmet needs associated with the existing bus service, there is a need to have a bus service along Route 4 to connect communities in the Ottauquechee Valley to the Upper Valley.

Private sector intercity bus transportation is provided by Greyhound, which has a regional service hub in White River Junction. The Greyhound route operates several daily round-trip runs between Boston, MA, and Montreal, QC, with stops in White River Junction, Montpelier, and Burlington. In 2014, Vermont Translines began operation of an intracity route along Route 4 from Rutland to Lebanon, NH to Dartmouth Coach. The route has since been discontinued due to low ridership. In addition to Greyhound, Dartmouth Coach provides service between Hanover, NH, and Boston, MA, and Boston Logan International Airport with stops in between at Lebanon and New London, NH. Dartmouth Coach also offers service between Hanover, NH, and New York City. Supplementing these bus services,

Amtrak offers intercity commuter rail transportation with two stations in the Region: White River Junction and Randolph.

Housing in Relation to Transportation

Housing availability has pushed residents farther from historical downtowns and job centers in recent decades, increasing personal vehicular reliance. While housing in areas outside of town centers may, on the surface, appear more affordable to residents, increased distance from work, retail, and recreational opportunities significantly increase costs of living compared with in-town housing. Average transportation costs in Orange and Windsor Counties are 26 percent of annual median household income ($14,233), nearly as much as housing costs (30 percent of annual median household income). For context, transportation costs are considered affordable if they do not exceed 15 percent of a household's annual income. Sprawl doesn't just hurt household budgets; it also negatively impacts the economic health of our Region's villages and community centers. (For policies related to Housing and transportation, read Homes in the Region chapter).

Goals, Policies, and Recommendations: Transportation

Goals

1. Our Region's transportation systems follow context-sensitive designs with climate resiliency features, and are consistently funded, constructed, and well-maintained.
2. The Region's transportation system encourages a strong regional economy.
3. Public transportation options are diverse and easy to utilize throughout the Region.

4. Single occupancy vehicle dependency is reduced.

Policies

1. Future road and parking projects should prioritize improving existing infrastructure over building new ones, in addition to adding flood resilient features (i.e. using permeable materials).
2. Development that encourages strip development and sprawl are not consistent with this Plan.
3. Public transportation should serve high density development to reduce single occupancy vehicles.
4. New development that generates daily truck traffic in Rural Areas shall only locate along paved roads immediately adjacent to Regional Growth Areas (as defined by this Plan), and only if existing infrastructure is sufficient to maintain traffic safety.
5. High density development shall not result in a degradation of the roadway level of service (LOS) to D or worse in Rural Areas. If the impact is LOS C or greater, a traffic study may be required to mitigate impacts
6. Public and private transportation infrastructure investments in Interchange Areas shall not enable development that will have the effect of eroding the economic vitality and quality of life of Regional Growth Area.
7. New development in Regional Growth Areas subject to Act 250 shall be designed to connect internal roads and walkways with adjacent lots to minimize access points with main highways and maximize services that can be accessed from the same parking areas.

8. Large-scale developments that have “substantial regional impact,” whether they are located within the TRORC Region or in a neighboring region, shall include transportation impact studies for each phase of development and shall mitigate any impacts identified as part of their permit.
9. Multi-unit housing developers creating more than 25 units in a single project shall make reasonable provisions for sidewalks where a sidewalk system is present or likely, and coordinate with public transit agencies on possible stops during site design for potential transit service access.
10. Major highways should minimize barriers to movement of wildlife, terrestrial or aquatic, especially in high priority wildlife crossings (as mapped by the Vermont Agency of Natural Resources), through more wildlife-friendly culverts, bridges, railings, and signage designed to avoid collisions.
11. Developments subject to Act 250 shall demonstrate that they have taken or will take steps to incorporate electric vehicle charging stations in parking spots.
12. Traffic calming projects are encouraged in Regional Growth Areas, and any place where speed safety concerns exist alongside active pedestrian and biking activity with vehicles.
13. Increased paratransit and demand-response transit services (transportation services without fixed routes, unlike bus routes) for elders and persons with disabilities are strongly encouraged.
14. The number and design of park and rides should support regional public transportation needs.

15. Strategies reducing total vehicle miles travelled are encouraged such as employers allowing telecommuting and teleconferencing options.
16. Town construction projects should accommodate bicyclists and pedestrians by improving pavement and bike lane conditions such as adding street trees, signage, pavement plantings, benches, and lighting.
17. TRORC supports improved rail service along the I-91 corridor and will assist the State in improving service.
18. Downtown parking areas should be increased.

Recommendations

1. Towns should identify dead-end Class 3 town roads that serve few structures and consider reclassification to Class 4 to reduce town expenses.
2. TRORC will work with towns during plan and bylaw revisions to connect housing needs to transportation systems.
3. TRORC will work with local highway departments, as requested, to assist with compliance with the Municipal Roads General Permit to minimize stormwater runoff, minimize road/river conflicts, and minimize roadway erosion.
4. TRORC will assist the towns in minimizing the use of impervious surfaces for parking through shared parking, reduced parking requirements when supported by data, or phased parking development when demand arises.
5. TRORC will continue to ensure that regional transportation planning activities are integrated with land use planning and economic development planning efforts.

6. TRORC will offer support to towns in capital budgeting for transportation facilities and related equipment.
7. TRORC will work with towns and Vermont Agency of Transportation to identify poor pavement conditions for paving projects.
8. TRORC will continue to work with towns to identify and address road safety risks through the Vermont Agency of Transportation's Strategic Highway Safety Plan and through town requested Road Safety Audits.
9. TRORC shall assist interested communities with studies and planning designed to improve multi-modal networks in Regional and Town Centers, such as the development of the Upper Valley U.S. Route 4 commuter bus service.
10. TRORC will assist public transit providers in assessing unmet transit needs and developing strategies to meet those needs. Strategies could include, but are not limited to, improving coordination between providers to identify and address underutilized capacity of existing services.
11. The Transportation Advisory Committee (TAC) shall continue to identify park and rides which are in need of state investments and improvements.
12. TRORC will work with towns and the Vermont Agency of Transportation to implement pedestrian and bicycle accommodations (including transit connectivity) in all its planning, engineering, and construction related activities. This may include the development of free-standing Bicycle and Pedestrian Plans.
13. TRORC will work with towns to support land use regulations (i.e. increasing the density and mixed-use development pattern) that improves walking and bicycling conditions.

14. TRORC will continue to support municipal planning for safe routes to school, especially within densely settled villages or town centers.