



BERLIN, VERMONT

A TOWN PLAN FOR

being a hub of commerce and industry
developing an identifiable and vibrant town center
preserving rural character and working lands

ADOPTED 14 AUG 2018 & AMENDED 6 JUN 2022



Credits

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Prepared by:

Berlin Planning Commission

Karla Nuisl, Chair
Clara Ayer, Secretary
Geoff Farrell
David Huber
Gary Laroche
Polly McMurtry
Shane Mispel
Tony Snow
Amanda Smith

With support from:

Thomas Badowski
Assistant Town Administrator & Zoning Administrator



COVER PHOTOS: TOBY TALBOT

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1. INTRODUCTION

1A. Vision

The vision below expresses Berlin's overall direction and is intended to help town government and community members connect many small actions and measure achievement towards larger objectives. Having a shared vision will allow townspeople to come together, set goals and evaluate progress over time.

Berlin will be a town:

- ⌚ That is a **hub of commerce and industry** for the region with revitalized commercial areas and a diverse economic base;
- ⌚ With an **identifiable and vibrant town center** – a place where people can live, work, eat, shop and gather – that promotes a greater sense of community and attracts new residents; and
- ⌚ That **preserves its rural character and working lands** – the open spaces, viable farms, working forests, low-density settlement pattern, natural resources and scenic views that characterize most areas of town.

1B. Purpose

The Berlin Town Plan states the town's objectives, policies and actions for guiding future land use and development in the community consistent with the vision expressed above. The plan allows decisions to be made by considering the future of the community as a whole. Planning can help manage the cost of public services and ensure that investments benefit everyone.

This plan will help Berlin continue to provide and maintain infrastructure, attract residents and businesses, and protect natural resources and rural character. More people can choose to live and work anywhere and more are looking for places that offer a high quality of life. More people want to live in walkable, connected, distinctive communities, rather than in generic subdivisions or on remote house lots. This plan outlines the deliberate steps needed to maintain, improve and revitalize Berlin so that it can be a great place to live and work now and into the future.

The primary purpose of this plan is to establish and communicate public policy. When guided by this plan, local decision-making should be transparent and predictable. The plan serves as a foundation for Berlin's land use and development regulations. Those regulations must implement the vision expressed above and the objectives found throughout this plan.

1C. Authority to Plan

The Vermont Planning and Development Act ([24 V.S.A. Chapter 117](#)) grants municipalities the authority to prepare and implement a comprehensive plan. It establishes minimum requirements for what must be included in such plans, and requires plans to be consistent with the state's planning goals (*see "1G. State Planning Goals" on page 3*). Town plans also must be compatible with the regional plan (*see "Central Vermont Region" on page 15*). Once adopted, town plans remain in effect for eight years. Having a current, adopted town plan is required for Berlin to apply for grants and other assistance to fund improvements.

1D. Planning Process

Berlin adopted its first town plan in 1971. This plan has been regularly updated and re-adopted since. The town plan was most recently re-adopted in 2012. This 2018 plan represents a significant change to the format of the plan, but not a substantial change in the vision and goals.

The Berlin Planning Commission worked on a comprehensive revision of the town's land use regulations for all of 2015 through 2017. That process included numerous public meetings and work sessions where residents discussed future land use and development in Berlin. Those community conversations indicated that:

- ⌚ The vision to **transform** the Berlin Mall and surrounding area into a town center, which was first expressed in the 2005 town plan, remains valid and strongly supported by residents;
- ⌚ Residents generally want future growth to be focused in the northeast quadrant and want the remainder of town to **maintain** its rural character and working landscape; and
- ⌚ There is interest in seeing the existing commercial corridors along Route 2 and Route 302 **evolve** so that they are economically competitive and attractive locations for commercial and light industrial activities as shopping and lifestyle preferences change.

The Planning Commission conducted additional public meetings and a community survey while working to prepare this 2018 town plan that further confirmed ongoing support for the overall vision expressed in the 2012 plan. Responses to the community survey are presented throughout this plan.

The Vermont Planning and Development Act establishes the process by which town plans must be adopted, which includes public hearings by both the Planning Commission and Selectboard. That process was followed to re-adopt this 2018 plan.

1E. Using the Plan

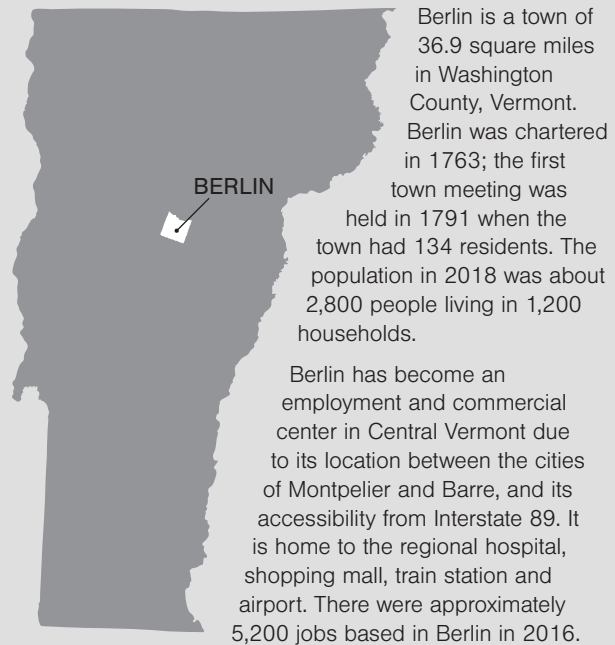
The Berlin Town Plan provides a framework for attaining the vision expressed above through capital budgeting and public investments, the town's land use and development regulations, participation in various state programs, and other implementation measures. In addition to guiding local decision-making, the plan is considered by regional and state agencies as they plan, develop and fund programs, provide services, locate facilities, and enact regulations. It is also used in state regulatory proceedings such as Act 250 and Section 248 permitting processes to determine whether proposed development is consistent with community goals and standards.

When using this plan for a regulatory purpose, the objectives, policies and actions found throughout must be considered in context as part of a whole rather than as individual statements meant to stand alone. Berlin, as all communities, has competing objectives that must be balanced on a case-by-case basis using this plan as a guide for those decisions.

This plan is organized into seven chapters. Each chapter includes a series of objectives, policies and actions.

- ⌚ **Objectives** are attainable targets for accomplishing one or more goals. They should be specific and measurable so that the community can determine when they have been met.
- ⌚ **Policies** are definite courses of action to attain (or contribute to attaining) one or more objectives. They are intended to guide all relevant decision-making by town government, and in those circumstances where the plan is intended to influence regional or state decision-making.
- ⌚ **Actions** are the next steps – concrete activities or programs intended to attain (or contribute to attaining) one or more objectives that town government will implement during the 8-year planning period.

Goals are not listed in each chapter because this plan incorporates the state's planning goals as Berlin's planning goals. The objectives and policies from each chapter are intended to further those goals (*see "1G. State Planning Goals" on page 3*).



On the 2017 Community Survey, residents described Berlin as...



1F. Other Plans and Studies

This plan references a number of prior planning studies and other plans, both municipal and regional, as well as a wealth of data provided by organizations and agencies at the state or federal level. When other plans, studies or data sources are referenced in this plan, those documents or resources should be considered in their original and full context.

2018

Scoping Report for US 302 Bridge 3 over Stevens Branch

VT Agency of Transportation

2017

Basin 8 - Winooski River Watershed Water Quality and Aquatic Habitat Assessment Report

VT Agency of Natural Resources Watershed Management Division

Source Protection Plan Update: Montpelier Water System

Dufresne Group Consulting Engineers

Berlin Park and Ride: Alternatives Analysis Memo

Green International Affiliates, Inc.

Berlin Stormwater Master Plan

Watershed Consulting Associates, LLC

2016

A New Town Center for Berlin Presentation

Land Strategies

2015

US 302 Berlin Bicycle and Pedestrian Scoping Study

Dubois & King, Inc.

Solid Waste Implementation Plan

Central Vermont Solid Waste Management District

2014

Memorandum of Decision on Montpelier's Petition in re Berlin Pond

VT Agency of Natural Resources, Dep't of Environmental Conservation

2012

Winooski River Basin Water Quality Management Plan

VT Agency of Natural Resources Watershed Management Division

Town of Berlin Local Mitigation Plan

Central Vermont Regional Planning Commission

City of Montpelier v. Barnett, Sanborn & Natural Resources Board

Vermont Supreme Court (2012 VT 32 re Berlin Pond)

2011

Forest Management Plan for the Berlin Town Forest

2009

Dog River Corridor Plan: Roxbury, Northfield, Berlin & Montpelier, VT

Bear Creek Environmental, LLC

Edward F. Knapp State Airport Business Plan

Vermont Agency of Transportation

2008

Town of Berlin Economic Development Plan

devonomics

2007

Draft Conceptual Plan for the Town Center

2004

The Berlin Mall Village Center Study

Wilbur Smith and Associates

2002

Berlin Pond Watershed Conservation Plan

Vermont River Conservancy

1999

Citizens Vision of Berlin

Berlin Planning Commission

1997

Berlin Pond Natural Area

Berlin and Montpelier Conservation Commissions

1992

Waterfowl Management Handbook: Human Disturbances of Waterfowl:

Causes, Effects and Management

US Fish and Wildlife Service

1990

Berlin State Register Nomination Forms

Vermont Division for Historic Preservation



PHOTO: TOBY TALBOT

1G. State Planning Goals

The 2018 Berlin Town Plan is consistent with the 14 state planning goals listed in the Vermont Planning and Development Act as demonstrated below. To be ‘consistent with a goal’ requires that one or more objectives identified in this plan will result in Berlin making substantial progress towards attaining the stated goal. This plan incorporates the state’s planning goals as Berlin’s planning goals. The table below states each goal and identifies the related objectives and policies established in this plan.

<p>1 To plan development so as to maintain the historic settlement pattern of compact village and urban centers separated by rural countryside.</p>	<p>LAND USE, page 5. Objectives 1, 2, 3, 4, 5 UTILITIES & FACILITIES, page 21. Objective 3 HOUSING, page 25. Objective 3 ECONOMIC DEVELOPMENT, page 27. Objective 1</p>	<p>LAND USE, page 5. Policy 1 TRANSPORTATION, page 19. Policies 1, 2 UTILITIES & FACILITIES, page 21. Policy 1 ENERGY, page 23. Policies 1, 2, 9 HOUSING, page 25. Policies 1, 5, 6</p>
<p>2 To provide a strong and diverse economy that provides satisfying and rewarding job opportunities and that maintains high environmental standards, and to expand economic opportunities in areas with high unemployment or low per capita incomes.</p>	<p>LAND USE, page 5. Objectives 1, 3, 5, 8 HOUSING, page 25. Objective 1 ECONOMIC DEVELOPMENT, page 27. Objectives 1, 2, 3, 4</p>	<p>LAND USE, page 5. Policy 1 TRANSPORTATION, page 19. Policies 2, 3 UTILITIES & FACILITIES, page 21. Policy 1 ENERGY, page 23. Policy 2 HOUSING, page 25. Policies 1, 2 ECONOMIC DEVELOPMENT, page 27. Policies 1, 2, 3</p>
<p>3 To broaden access to educational and vocational training opportunities sufficient to ensure the full realization of the abilities of all residents.</p>	<p>UTILITIES & FACILITIES, page 21. Objective 1</p>	<p>UTILITIES & FACILITIES, page 21. Policy 4 ECONOMIC DEVELOPMENT, page 27. Policy 1</p>
<p>4 To provide for safe, convenient, economic and energy efficient transportation systems that respect the integrity of the natural environment, including public transit options and paths for pedestrians and bicyclers.</p>	<p>TRANSPORTATION, page 19. Objectives 1, 2 ENERGY, page 23. Objective 1</p>	<p>LAND USE, page 5. Policy 1 TRANSPORTATION, page 19. Policies 1, 2, 3, 5, 6, 7, 8 ENERGY, page 23. Policy 1 HOUSING, page 25. Policies 1, 6</p>
<p>5 To identify, protect, and preserve important natural and historic features.</p>	<p>LAND USE, page 5. Objectives 4, 6, 7 ENERGY, page 23. Objective 2 HOUSING, page 25. Objective 4 FLOOD RESILIENCE, page 29. Objective 3</p>	<p>LAND USE, page 5. Policies 1, 2, 4, 5 ENERGY, page 23. Policy 9 HOUSING, page 25. Policies 5, 6 FLOOD RESILIENCE, page 29. Policies 2, 6</p>
<p>6 To maintain and improve the quality of air, water, wildlife, forests, and other land resources.</p>	<p>LAND USE, page 5. Objectives 6, 7 UTILITIES & FACILITIES, page 21. Objective 4 HOUSING, page 25. Objective 4 FLOOD RESILIENCE, page 29. Objective 3</p>	<p>LAND USE, page 5. Policies 1, 2, 3, 4, 5 UTILITIES & FACILITIES, page 21. Policy 2 ENERGY, page 23. Policy 9 HOUSING, page 25. Policies 5, 6 FLOOD RESILIENCE, page 29. Policies 2, 5, 6</p>
<p>7 To make efficient use of energy, provide for the development of renewable energy resources, and reduce emissions of greenhouse gases.</p>	<p>LAND USE, page 5. Objectives 1, 2 TRANSPORTATION, page 19. Objectives 1, 2 ENERGY, page 23. Objectives 1, 2, 3 HOUSING, page 25. Objective 3</p>	<p>LAND USE, page 5. Policy 1 TRANSPORTATION, page 19. Policies 1, 2, 4, 6, 7 UTILITIES & FACILITIES, page 21. Policy 1 ENERGY, page 23. Policies 1, 2, 3, 4, 5, 6, 7, 8, 9 HOUSING, page 25. Policies 1, 6</p>



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<p>8 To maintain and enhance recreational opportunities for residents and visitors.</p>	<p>UTILITIES & FACILITIES, page 21, Objective 1</p>	<p>LAND USE, page 5, Policies 1, 2, 5 TRANSPORTATION, page 19, Policies 6, 7 UTILITIES & FACILITIES, page 21, Policy 4</p>
<p>9 To encourage and strengthen agricultural and forest industries.</p>	<p>LAND USE, page 5, Objectives 4, 5 ENERGY, page 23, Objective 2 HOUSING, page 25, Objective 4 ECONOMIC DEVELOPMENT, page 27, Objective 4</p>	<p>LAND USE, page 5, Policy 1 ENERGY, page 23, Policy 9 HOUSING, page 25, Policies 5, 6 ECONOMIC DEVELOPMENT, page 27, Policies 1, 3</p>
<p>10 To provide for the wise and efficient use of Vermont's natural resources and to facilitate the appropriate extraction of earth resources and the proper restoration and preservation of the aesthetic qualities of the area.</p>	<p>LAND USE, page 5, Objectives 4, 5 ENERGY, page 23, Objective 2</p>	<p>LAND USE, page 5, Policies 1, 7 ENERGY, page 23, Policies 3, 5, 6, 9 HOUSING, page 25, Policies 5, 6</p>
<p>11 To ensure the availability of safe and affordable housing for all Vermonters.</p>	<p>LAND USE, page 5, Objective 2 HOUSING, page 25, Objectives 1, 2, 3 ECONOMIC DEVELOPMENT, page 27, Objective 3 FLOOD RESILIENCE, page 29, Objectives 4, 5</p>	<p>LAND USE, page 5, Policy 1 TRANSPORTATION, page 19, Policies 1, 8 UTILITIES & FACILITIES, page 21, Policy 1 ENERGY, page 23, Policies 1, 5, 8 HOUSING, page 25, Policies 1, 2, 3, 4 FLOOD RESILIENCE, page 29, Policies 3, 5</p>
<p>12 To plan for, finance and provide an efficient system of public facilities and services to meet future needs.</p>	<p>LAND USE, page 5, Objective 8 UTILITIES & FACILITIES, page 21, Objectives 1, 2, 3 ECONOMIC DEVELOPMENT, page 27, Objective 5 HOUSING, page 25, Objective 3</p>	<p>LAND USE, page 5, Policies 1, 6 TRANSPORTATION, page 19, Policies 2, 3, 4, 5, 6, 7 UTILITIES & FACILITIES, page 21, Policies 1, 3 ENERGY, page 23, Policies 1, 2, 3, 7 HOUSING, page 25, Policies 1, 6 FLOOD RESILIENCE, page 29, Policies 3, 5</p>
<p>13 To ensure the availability of safe and affordable child care and to integrate child care issues into the planning process, including child care financing, infrastructure, business assistance for child care providers, and child care work force development.</p>	<p>UTILITIES & FACILITIES, page 21, Objective 1</p>	<p>UTILITIES & FACILITIES, page 21, Policy 4</p>
<p>14 To encourage flood resilient communities.</p>	<p>HOUSING, page 25, Objective 4 FLOOD RESILIENCE, page 29, Objectives 4, 5</p>	<p>LAND USE, page 5, Policies 1, 3, 4 TRANSPORTATION, page 19, Policy 8 UTILITIES & FACILITIES, page 21, Policy 2 ENERGY, page 23, Policies 1, 2, 3, 7 HOUSING, page 25, Policies 4 FLOOD RESILIENCE, page 29, Policies 1, 2, 3, 4, 5, 6</p>



PHOTO: TOBY TALBOT

OBJECTIVES

- 1 Focus commercial and industrial development in the northeast quadrant.
- 2 Increase the amount of housing in Berlin, diversify the housing stock, and guide most residential growth to the northeast quadrant.
- 3 Revitalize existing commercial areas in the northeast quadrant to improve aesthetics, access, and economic competitiveness.
- 4 Preserve rural character and working lands in the areas of town outside the northeast quadrant.
- 5 Maintain the base of working farm and forest land outside the northeast quadrant necessary to support viable farm and forestry businesses.
- 6 Prevent adverse environmental impacts resulting from irresponsible land use and development practices.
- 7 Improve or maintain the health of Berlin's surface waters as necessary to meet water quality standards.
- 8 Maintain a balanced tax base that generates the revenue necessary to provide municipal services without overburdening residential property owners.

POLICIES

- 1 Implement the recommendations for maintaining, evolving and transforming land use set forth in Section 2D of this plan.
- 2 Support the permanent conservation of publicly owned land around Berlin Pond, and maintain low-impact public recreation use commensurate with the pond's function as a public water supply and its natural resource values.
- 3 Ensure that stormwater run-off from developed land is managed at the source so it will not place an undue burden on public infrastructure, increase flood hazards or reduce water quality.
- 4 Guide development away from surface waters and encourage landowners to maintain or establish riparian buffers.
- 5 Encourage and support continued permanent conservation of farmland, forest land and natural areas outside the northeast quadrant.
- 6 Prioritize conservation efforts that would connect to existing public and conserved lands on Irish Hill, Paine Mountain and Berlin Pond.
- 7 Seek PILOTs for tax-exempt properties that are commensurate with demand on town services.
- 8 Allow resource extraction in rural and industrial areas of town that is undertaken in accordance with town and state regulations to avoid or mitigate off-site and environmental impacts.

2. LAND USE

2A. Current Land Use

Berlin's current land use pattern is evident from the land cover map to the right:

- Most development is focused in the northeast quadrant in proximity to Exit 7 and state highways, the airport, and the adjoining urban centers of Montpelier and Barre City.
- There are less intense concentrations of development along the Route 12 and Junction Road corridors, and at Exit 6.
- Forested hillsides and ridgelines dominate the landscape in most areas of town.
- Small pockets of agricultural land remain in productive use in the valleys.

This land use pattern began to emerge in the 1960s as commercial activity expanded out along the Route 2 and Route 302 corridors, and more fully developed following construction of Interstate 89 in the 1970s and the resulting growth in the Central Vermont region during the 1980s and 1990s. It was during this period that Berlin went from being an agricultural community to an employment and commercial center in the region. Berlin's overall land use pattern has changed little during the past 25 years.

Commercial and Industrial

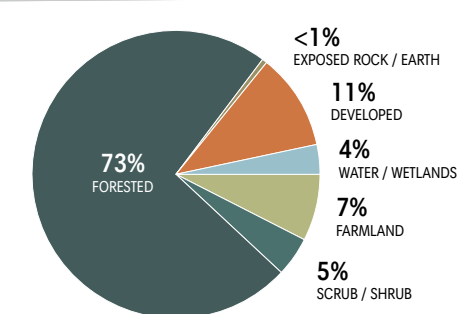
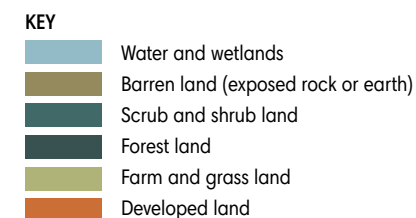
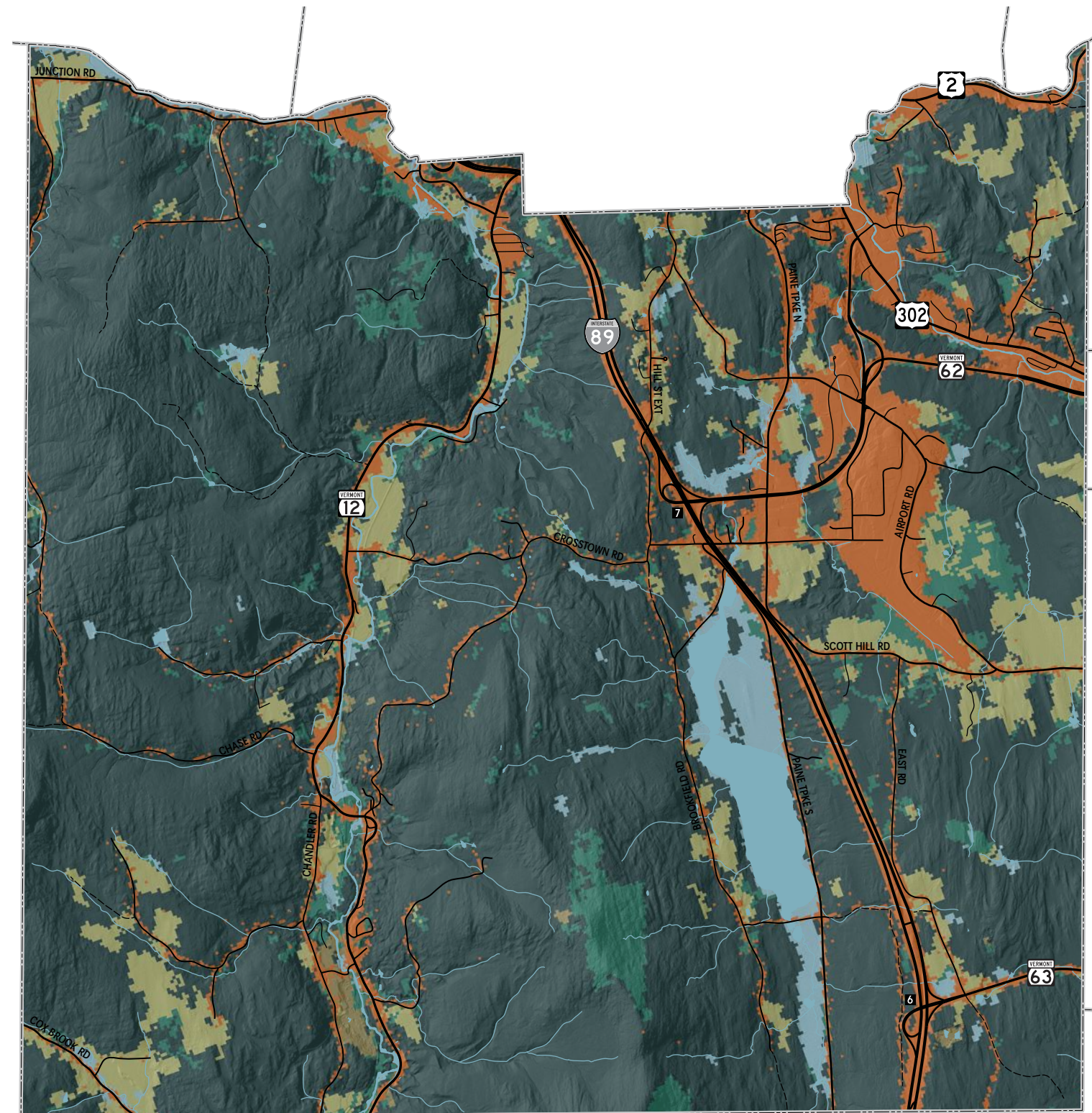
Commercial and industrial uses are concentrated in the northeast quadrant (see "Commercial and Industrial Areas" on page 28), although there are some businesses located in the Junction Road - Dog River Road area, dispersed along Route 12, in Riverton and at Exit 6. Chapter 7. Economic Development (page 27) provides more information about commerce and industry in Berlin.

Residential

Chapter 6. Housing (page 25) provides more information about Berlin's housing stock. Residential development is dispersed throughout town (see "Housing Map" on page 25) and:

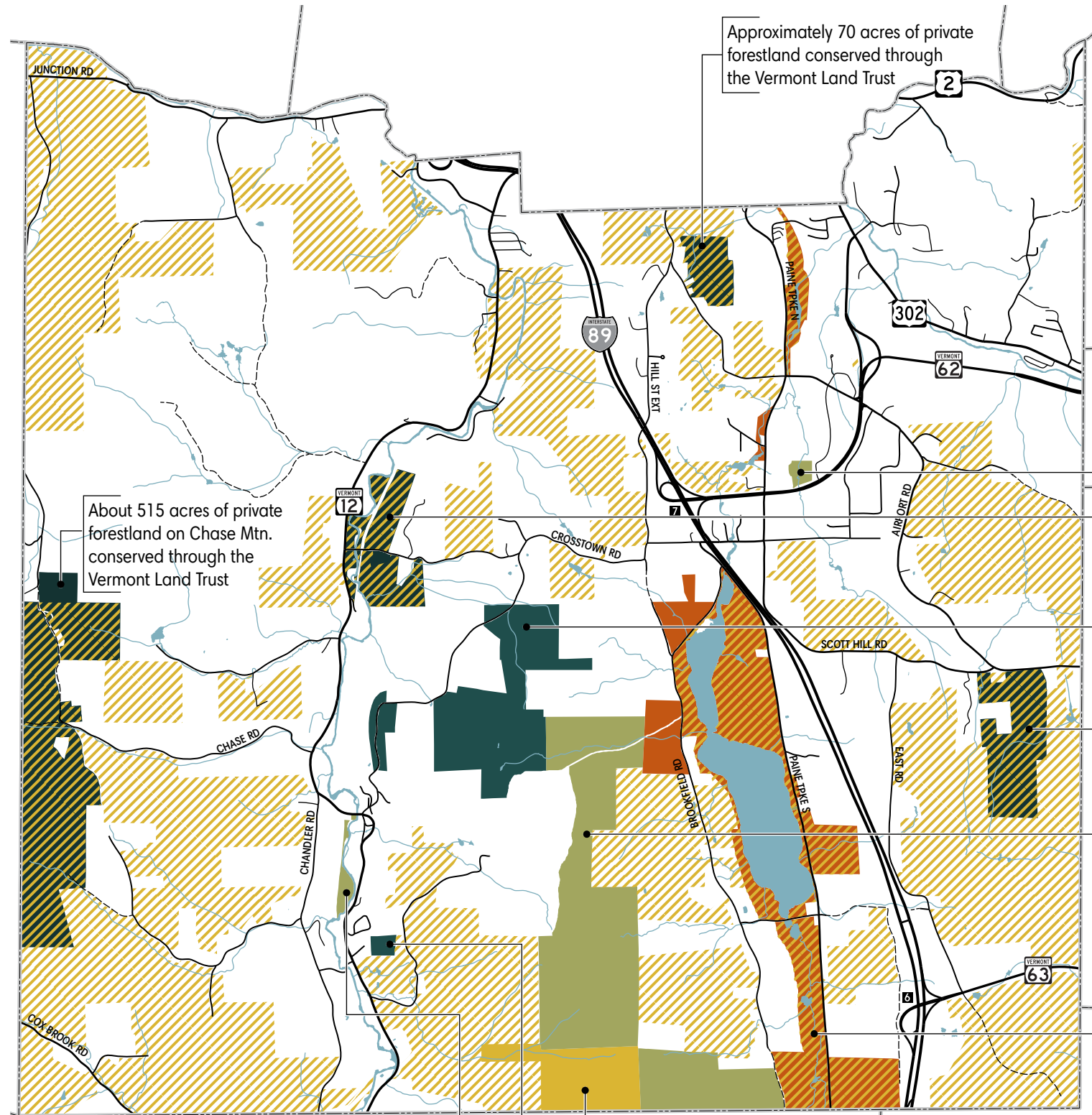
- Fewer than 10 homes were built per year in Berlin on average between 2002 and 2016. During that period, about 25% of the new homes in town were built in the Partridge Farm subdivision.
- Single-family homes located on an acre or more of land predominate, accounting for 64% of the 738 homestead (owner-occupied residential) properties on Berlin's 2016 Grand List.

Berlin Land Cover, 2011



SOURCE: 2011 Land Cover, VCGI

Berlin Conservation and Open Space Map



Approximately 70 acres of private forestland conserved through the Vermont Land Trust

About 515 acres of private forestland on Chase Mtn. conserved through the Vermont Land Trust

11-acre Berlin Elementary School Forest

130-acre Rogers Farm, including 40 acres along the Dog River conserved through the Vermont River Corridor Easement Program

355-acre Boyer State Forest, which the state uses for workshops and tours demonstrating multiple resource management techniques to private landowners. It also provides a variety of recreational opportunities including hiking, mountain biking, cross-country skiing, snowshoeing, hunting and wildlife viewing.

190-acre Thompson Farm, conserved through the Vermont Land Trust

Berlin owns approximately 720 acres of Town Forest, which includes the Irish Hill Conservation Area encompassing the prominent ridgeline along Irish Hill and Paine Mountain. These forest lands are open for public recreation and have extensive trail networks.

The City of Montpelier owns nearly 730 acres of undeveloped land in the Berlin Pond watershed, including nearly all the shoreland (with the exception of two parcels owned by the Town of Berlin). The pond is the source of drinking water for the city, which has controlled use of the pond and the surrounding land in order to prevent contamination of the water supply (access to the pond over the city's land is prohibited and the only access is from roadways and town-owned land). While the land remains city owned, it is effectively protected from development. If Montpelier were to develop an alternative water supply, it is possible that the city would seek to sell the land. Berlin residents strongly support permanent conservation of the land around Berlin Pond, along with maintaining low-impact public recreational access.

About 170 acres of the Northfield Town Forest extends into Berlin

10-acre Perry Pond property owned by Vermont Department of Fish and Wildlife

Berlin owns about 16 acres and nearly 4,000 feet of frontage on the Dog River in Riverton

- KEY**
- Enrolled in Current Use Program (2016)
 - Town of Berlin
 - City of Montpelier
 - Town of Northfield
 - State of Vermont
 - Conserved private land

SOURCE
2017 Vermont Protected Lands, VCGI
2016 Grand List, Town of Berlin
2015 Parcels, Town of Berlin

Current Use Program

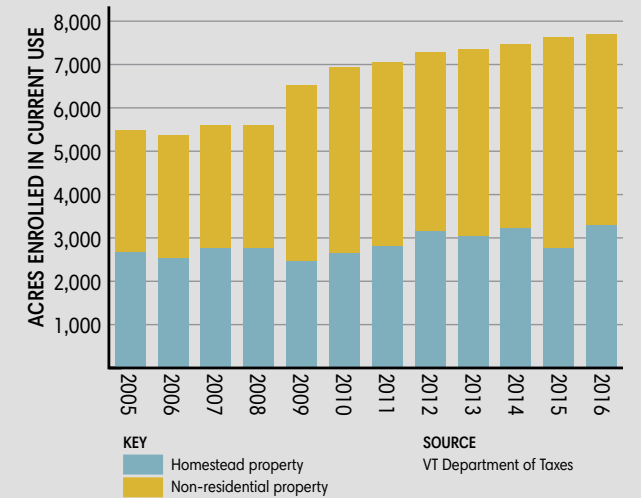
Vermont's Use Value Appraisal (UVA) Program, commonly known as 'Current Use' enables private landowners engaged in long-term forestry or agricultural practices to have their land appraised based on the property's value of production of wood or agricultural products rather than its residential or commercial development value. If land is removed from the program and is developed, the landowner must pay a land use change tax. The goal of this program is to encourage owners to keep land in productive use by reducing their tax burden.

More information on the Current Use Program is available from:

- [Vermont Department of Forest, Parks and Recreation](#)
- [Vermont Agency of Agriculture](#)
- [Vermont Department of Taxes](#)

The Current Use Program has been in place since 1980 but enrollment continues to increase steadily following changes to state education funding in the early 2000s that resulted in the establishment of the statewide education property tax.

Total Acres in Berlin Enrolled in Current Use, 2005-2016



Approximately 7,700 acres of forest land and farm land in Berlin were enrolled in the state's Current Use Program in 2016. The total amount of land enrolled in Current Use increased 40% between 2005 and 2016 and most of the additional land enrolled was non-residential property.

ACTIONS

- 1 Adopt revised land use and development regulations that will implement the vision, goals, objectives and policies of this plan.
- 2 Seek a new town center designation from the state for the Berlin Mall and surrounding area, which will require the following actions by the town: adopt an official map, adopt a capital improvement program, execute a community investment agreement with town center property owners, and dedicate water/wastewater reserves to the town center.
- 3 Seek village center designations from the state for Riverton and Berlin Corners.
- 4 Continue to extend municipal water and sewer in the northeast quadrant to support future economic growth and residential development in a manner consistent with smart growth principles and as necessary to protect public health.
- 5 Work with Vermont state and federal elected representatives to again petition the U.S. Postal Service to re-establish a post office and zip code for Berlin.
- 6 Continue to work with Montpelier, Barre City, Central Vermont Regional Planning Commission and VTrans to complete the Central Vermont Regional Bike Path in Berlin.



PHOTO: TOBY TALBOT

- 54% of the town's land area was identified as a residential property according to the 2016 Grand List. Those properties included a significant amount of forest land. There were 242 residential parcels 50 acres or larger in size.

Civic

Approximately 1,600 acres of land were used for a civic purpose according to Berlin's 2016 grand list. This included 830 acres of town-owned and 650 acres of state-owned land. Other civic land uses include the Berlin Elementary School, nonprofits such as Central Vermont Medical Center, federal facilities and religious institutions. *Chapter 4. Utilities & Facilities (page 21)* provides more information about civic facilities and services.

Berlin hosts a regional medical center, two skilled nursing facilities and a growing array of associated nonprofit healthcare and other service providers. While the nonprofit sector is a major component of Berlin's economy, it does not offer the municipal tax benefits that businesses in the private sector could. The extent to which Berlin's property taxpayers subsidize nonprofits that serve the larger region remains an ongoing concern, particularly as the healthcare sector continues to expand. As of 2016, approximately 20% of the total value of real property on the grand list was tax exempt (real and personal property used for charitable purposes is exempt from local property taxes under state law). Berlin did receive PILOTs (payments in lieu of taxes) totaling around \$120,000 in 2016, but this is significantly less revenue than the town would have received if the state and nonprofits were paying their full property taxes.

Working Lands

There were 10 farm parcels accounting for about 1,400 acres of land and 44 woodland parcels totaling about 2,300 acres of land on the 2016 grand list. Approximately 7,700 acres of land in town were enrolled in Current Use in 2016 (see *"Current Use Program" on page 6*). *Chapter 7. Economic Development (page 27)* provides more information about Berlin's agricultural and forestry sectors.

Conservation and Open Space

There are nearly 2,000 acres of public conservation land and 900 acres of private conservation lands in Berlin (see *"Berlin Conservation and Open Space Map" on page 6*).

2B. Natural Resources

Surface Waters and Riparian Areas

Three surface waters – the Dog River, Berlin Pond and the Winooski River (main stem and the Stevens Branch) – are significant features in Berlin's landscape (see *"Water Resources Map" on page 8*):

- More information about the Dog River is available in the [2009 Dog River Corridor Plan](#).
- More information about Berlin Pond is available in the [2002 Berlin Pond Watershed Conservation Plan](#) and the [2017 Source Protection Plan Update](#) and elsewhere in this plan (see *"Berlin Conservation and Open Space Map" on page 6*).
- More information about the Winooski River (main stem and Stevens Branch) is available in the [2017 Basin 8 -Winooski River Watershed Water Quality and Aquatic Habitat Assessment Report](#) and the [2012 Winooski River Basin Water Quality Management Plan](#).

The small streams and brooks in Berlin are tributaries to one of those three features. Most originate and flow primarily through forested areas. Small streams and brooks are highly sensitive to changes in land cover and use within their watersheds. Maintaining or establishing upland forest cover and riparian buffers along stream banks is an effective means to avoid increased downstream flooding, erosion and sedimentation, resulting in reduced water quality (see *"Riparian Buffers" on page 8*).

Ponds larger than 10 acres in area are subject to the Vermont Shoreland Protection Act (Berlin Pond is the only such water body in town). A state permit may be required for development, redevelopment or clearing within 250 feet of the shoreline of Berlin Pond. While Montpelier owns most of the land immediately surrounding Berlin Pond, there are 12 residential parcels and 3 homes within 250 feet of the pond. More information is available from ANR's [Shoreland Permitting](#) program.

Wetlands and Vernal Pools

The Vermont Agency of Natural Resources has mapped 567 acres of Class 2 and 446 acres of Class 3 wetlands and approximately two dozen vernal pools in Berlin (see *"Water Resources Map" on page 8*). There are extensive areas in the northeast quadrant with hydric soils, which suggests that there may be wetlands in those areas that have yet to be identified. It is also likely that additional vernal pools exist in the hollows and depressions of the town's forested hillsides.

The [Vermont Wetland Rules](#) protect significant wetlands (Class 1 or 2), vernal pools and a buffer zone directly adjacent to them (50' for Class 2 wetlands). Any activity within a significant wetland, vernal pool or buffer requires a state permit, which is only issued if the Agency of Natural Resources determines that the activity will have no undue adverse impacts on wetland or habitat functions. The Wetland Rules do not apply to Class 3 wetlands. Wetlands, including Class 3, may also be subject to federal regulation. More information is available from ANR's [Wetlands Program](#).

Rare, Threatened or Endangered Species

Vermont's [Protection of Endangered Species](#) law prohibits the taking, possessing, or transporting of threatened and endangered plants and animals. Vermont Department of Fish and Wildlife reviews development subject to state permitting for impacts on RTE species and significant natural communities. Applicants may be required to complete an environmental assessment on a proposed development site as part of the review and permitting process.

The Vermont Agency of Natural Resources maintains a [Natural Heritage Database](#) documenting plant and animal species that are rare, threatened or endangered in Vermont and significant natural communities, which is used for planning, conservation and regulatory purposes (see *"Ecological Resources Map" on page 9*).

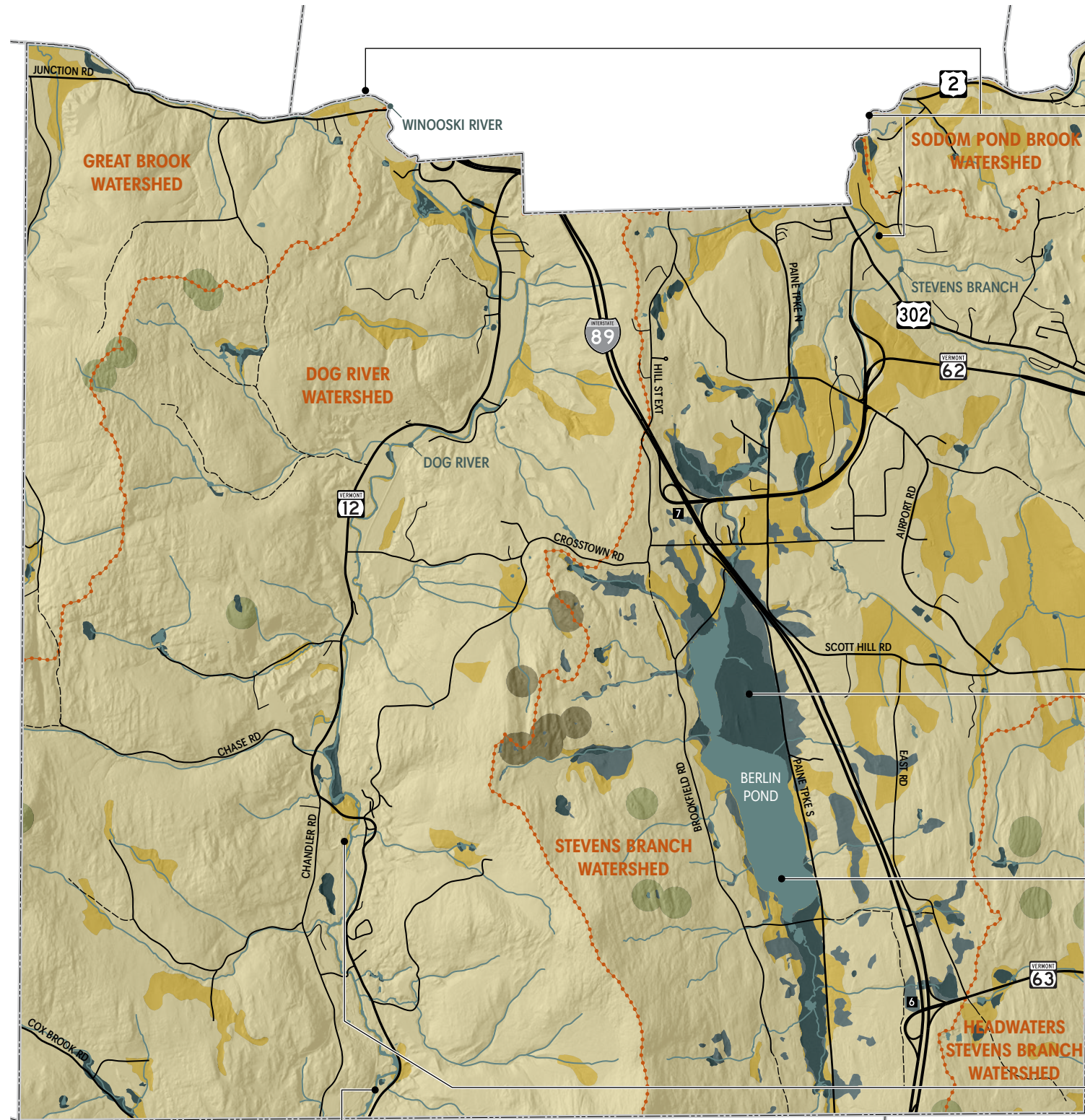
Approximately 15 locations with RTE plant and animal species have been documented in Berlin. The known locations of RTE species generally coincide with public or conserved lands where natural resource inventories have been conducted or with land subject to state or federal permitting where an environmental assessment has been required.

The Natural Heritage Database also includes three significant natural communities in Berlin:

- Northern white cedar swamp at the northeast corner of Berlin Pond.
- Rich northern hardwood forest in the vicinity of the Irish Hill Conservation Area.
- Rich fens (a type of wetland) on private land south of Scott Hill Road.

Berlin has never undertaken a town-wide natural resource inventory, so additional data about potential locations of RTE species or significant natural communities is not available. However, it should be assumed that such resources exist in many areas of town, particularly in the upland forests and in riparian areas.

Water Resources Map



Three segments of the Winooski River flow through Berlin. In two stretches, the main stem serves as the town boundary with Middlesex, Montpelier and East Montpelier, and the Steven's Branch runs parallel with Route 302. Originating in Cabot and flowing 90 miles to Lake Champlain, the Winooski River drains more than 1,080 square miles, including some of the most densely developed land in Vermont. As of 2016, the portions of the Winooski River in Berlin were not listed as impaired waters (not meeting water quality standards), but the the Vermont Agency of Natural Resources did consider them 'stressed' or showing some degree of impact from land use activities. If water quality continues to decline and any portion of the river in Berlin was to become impaired, corrective action could be required on the part of private landowners within the watershed.

The most significant mapped wetlands in town are associated with Berlin Pond and Pond Brook, and are largely protected through public ownership.

Berlin Pond as it presently exists has a surface area of approximately 250 acres. It is fed by Pond Brook and the current water level is controlled. The pond is the source of drinking water for Montpelier and a portion of Berlin. As such, access to and recreational use of the pond is heavily restricted in order to prevent contamination of the water supply.

There are five unmapped vernal pools located within the town-owned Dog River Natural Area that support Blue-Spotted, Jefferson and Spotted salamanders. These pools are regularly studied and assessed by the Vermont Agency of Natural Resources.

KEY

- Class 2 wetlands
- Class 3 wetlands
- Hydric soils (potential wetlands)
- Known vernal pools (500' buffer)
- Potential vernal pools (500' buffer)
- Watershed boundary

SOURCE
 2015 VSWI Wetlands, VTANR
 2016 County Soil Survey, USDA NRCS
 2017 VT Vernal Pool Mapping, VTANR
 2013 Watershed Boundaries, USDA NRCS

Riparian Buffers

Preserving and establishing riparian buffers adjacent to surface waters is the most effective way to improve or maintain water quality. Riparian buffers, particularly forested buffers and those along small, upland streams, provide significant benefits. They:

- ⌚ Reduce erosion;
- ⌚ Filter sediment, nutrients and pollution;
- ⌚ Shade and moderate water temperatures;
- ⌚ Offer wildlife habitat and travel corridors; and
- ⌚ Store runoff, replenish groundwater and reduce flooding.

While riparian buffers as narrow as 10 feet can improve water quality, a buffer 50 feet or more in width is needed to more fully provide all of the benefits listed above. Watch this [video](#) to learn more about how riparian buffers work to stabilize Vermont streams and reduce potential for flooding and erosion during severe storms.

Interested in establishing or improving riparian buffers on your property? Check out the following resources:

- ⌚ [Friends of the Winooski River](#) works on multiple sites throughout the watershed, planting up to 3,000 trees and shrubs in riparian areas each year.
- ⌚ [Winooski Conservation District](#) works with private landowners to install forested riparian buffers and has an annual plant sale each spring that includes trees and shrubs suitable for conservation planting.
- ⌚ [Conservation Reserve Enhancement Program \(CREP\)](#) offers incentives to farmers who establish riparian buffers.
- ⌚ [Vermont Trees for Streams Resource Guide](#)



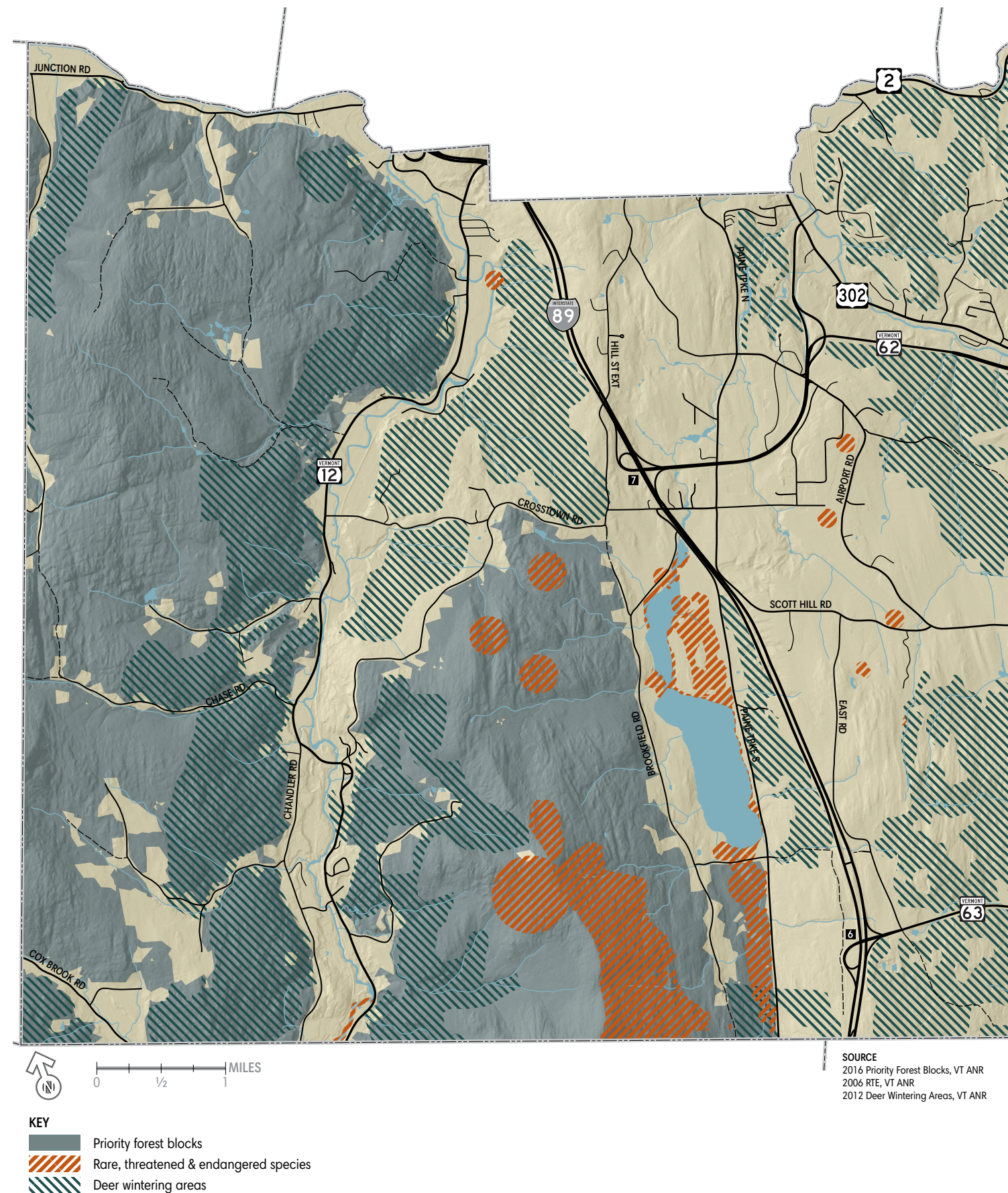
Forest Blocks

Maintaining large blocks of interior forest is a simple biodiversity conservation strategy that can help sustain viable populations of native plant and animal species for future generations. These blocks are large enough to withstand and recover from catastrophic events like storms or wildfires, to support breeding populations, to provide habitat for species sensitive to human disturbance, and to include a variety of landscape features and habitat types.

To learn more about conserving forest on your property, check out the following resources:

- ◉ [Vermont Coverts](#) helps landowners meet forest management goals and enhance diverse wildlife habitat and healthy ecosystems.
- ◉ [Foresters for the Birds](#) helps landowners integrate the practices of timber and songbird habitat management.
- ◉ [Managing your Woodlands](#) (VT Dep't of Forests, Parks and Recreation)
- ◉ [Community Strategies for Vermont's Forests and Wildlife: A Guide to Local Action](#)
- ◉ A Landowner's Guide to Wildlife Habitat Management for Lands in Vermont (available for purchase from the [VT Dep't of Fish and Wildlife](#)).

Ecological Resources Map



Wildlife Habitat and Travel Corridors

The Vermont Agency of Natural Resources has mapped deer wintering areas in Berlin (see “*Ecological Resources Map*” on page 9). The Department of Fish and Wildlife will review proposed development subject to state permitting for impacts on deer wintering areas and may require conservation or mitigation so that there will be no net loss of habitat.

Due to the variable degree of accuracy of the various statewide data sets, mapped habitat resources should be confirmed and more precisely delineated based on current, accurate field data before being applied to an individual property for regulatory purposes.

Brownfields and Hazardous Sites

Brownfields are previously developed sites that are or have the potential to be polluted by hazardous materials. The fear of legal liability for pre-existing environmental contamination is an impediment to redeveloping brownfields. Owners of contaminated property may be legally liable for cleanup regardless of whether or not they caused the contamination. There are programs in place to assist the town and property owners with cleaning-up brownfields. More information is available from ANR's [Brownfields Program](#). As of 2017, there were no identified brownfield sites in Berlin.

Berlin hosts many businesses that store hazardous materials (materials that have properties or contain chemicals which make them dangerous or capable of having harmful effects on public health or on the environment) on-site for their own use or for sale. The Vermont Agency of Natural Resources maintains a [spill database](#) that provides the public with information about releases of hazardous materials, potential contamination and remediation actions.

Due to the potential for water contamination, transport and storage of hazardous materials is of particular concern within the Berlin Pond watershed (see “*Berlin Conservation and Open Space Map*” on page 6), the source protection areas for the town wells (see “*Utilities and Facilities Map*” on page 21), and floodplains and river corridors (see “*Floodplain and River Corridor Map*” on page 29). Storage of certain materials in proximity to the airport is also restricted by state and federal law. Berlin's Local Mitigation Plan identifies the transport of hazardous materials as a potential threat and points to the Montpelier Junction area as being particularly vulnerable due to the proximity to surface waters, industrial land uses that include a propane terminal, and the railroad siding where railcars carrying propane or other hazardous materials are stored.



PHOTO: JIM DONOVAN

2C. Cultural Resources

Archaeological Resources

There are no designated archaeological landmarks or publicly identified archaeological sites in Berlin. Potential archaeological resources that could be located in Berlin include artifacts and sites providing evidence of thousands of years of Paleo-Indian and Native American activity prior to European settlement, and the 250 years of agricultural or industrial activities that followed.

The Vermont Division for Historic Preservation can assist in determining whether there are any known archaeological resources or potential for archaeological resources in a given area. Proximity to surface waters, particularly major rivers and lakes, is a strong indicator of potential archaeological sensitivity.

Other than burial sites (which are protected by state law), archaeological resources on private land belong to and are solely under the control of the property owner. It is only when development subject to state or federal permits, or undertaken with state or federal funding, is proposed that the state may impose requirements to investigate, document and/or preserve archaeological resources on private land.

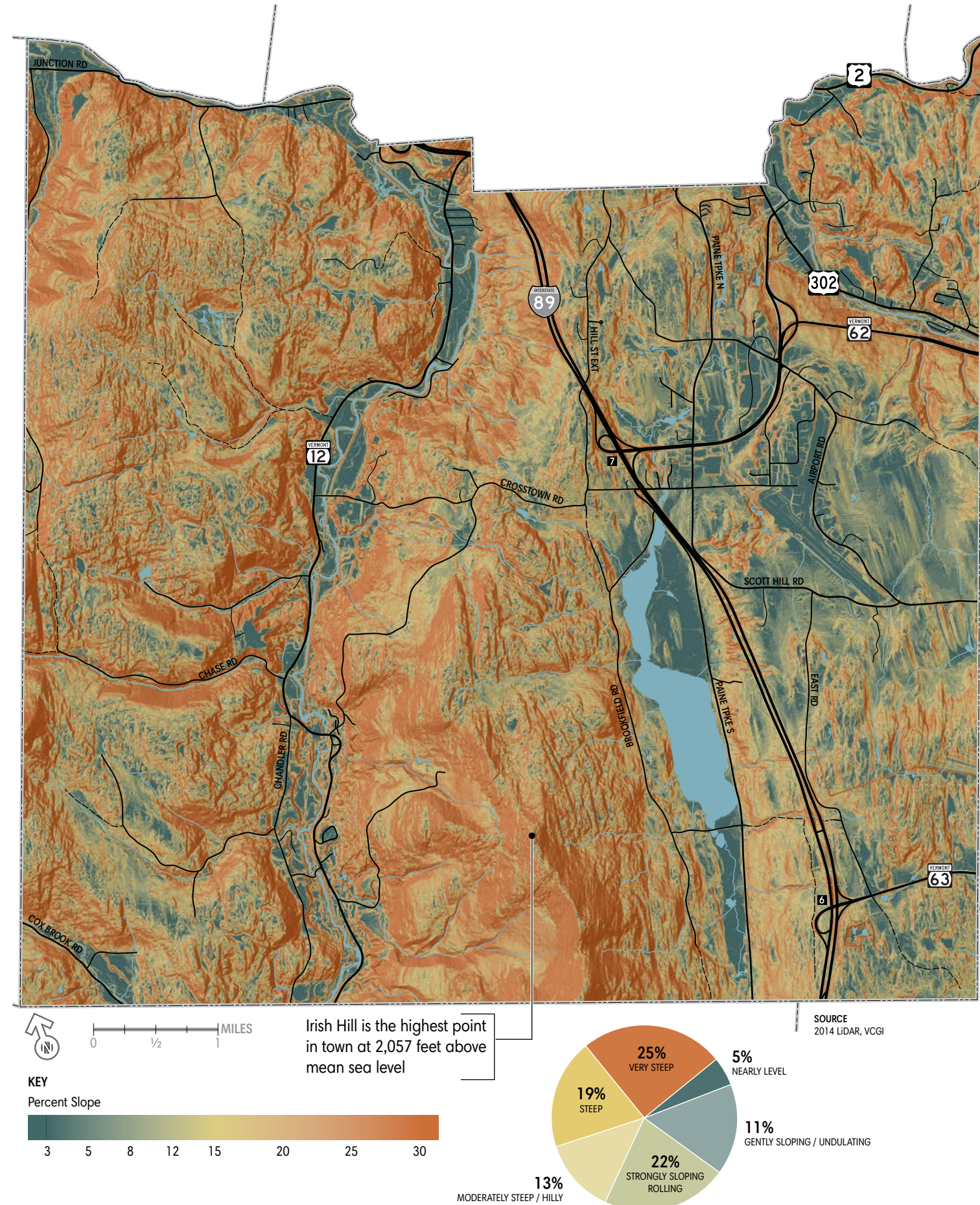
Historic Resources

The Vermont Division for Historic Preservation conducted a Historic Sites and Structures Survey in Berlin in the 1980s, which resulted in more than 50 structures being listed on the State Register of Historic Places in 1990 (see [Berlin State Register Nomination Forms](#) for detailed information on each historic site or structure). This survey needs to be updated to determine whether the listed structures still exist and remain eligible for inclusion on the State Register, and whether there are additional sites and structures that have become eligible since the original survey that should be nominated to the State Register. Property owners interested in learning more about having property listed on the State Register can review two fact sheets prepared by the Division for Historic Preservation – [Criteria for Evaluation](#) and [Nominating Historic Resources to the State Register](#).

There are two structures in Berlin on the National Register of Historic Places: Bridge #27 (Lover’s Lane Bridge) listed in 2005, and the Chauncey B. Leonard House (corner of Shed Road and Crosstown Road) listed in 1995 (see “[Structures Listed on the National Register](#)” on page 11).

Being listed on either the State or National Register does not, in itself, impose any obligation on the property owner. It is only when development subject to state

Slope Map



Steep Slopes

Slope is one of the factors that needs to be considered when determining the suitability of land for future use or development. Berlin’s landscape is characterized by rolling to steep terrain, which presents challenges for land development. Protecting steep slopes preserves the natural scenic beauty and rural character intrinsic to many areas of town.

Potential ecological consequences of clearing, disturbing and building on steep slopes can include increased erosion, landslides, sedimentation and flooding. It is more complicated to develop, install septic systems and build on steep slopes, resulting in higher development and housing costs.

Development on steep slopes, particularly in remote areas, is also more expensive for the town and others to service. It is more difficult for emergency, utility and service vehicles to access development on steep hillsides. Steep roads and driveways increase the likelihood of car accidents. Steep roads and driveways are more likely to suffer wash-outs or other damage in severe storms.

The land use recommendations of this plan call for maintaining forest cover and a low density of development in areas characterized by steep to very steep slopes.

USDA Natural Resource Conservation District classifies slopes and their suitability for development as follows:

up to 3%	nearly level subject to flooding or poor drainage
>3% to 8%	gently sloping or undulating generally suitable for development
>8% to 15%	strongly sloping or rolling suitable for development with appropriate stormwater management practices
>15% to 20%	moderately steep, hilly may be developed with professional design and engineering
>20% to 30%	steep poorly suited for development, minimize land clearing and disturbance
>30%	very steep not suitable for development, avoid land clearing and disturbance

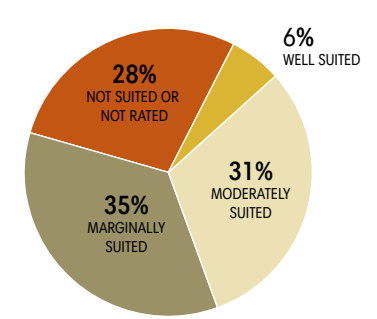
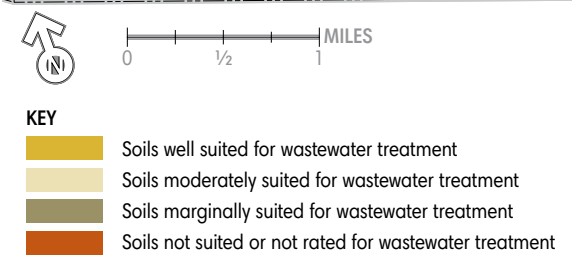
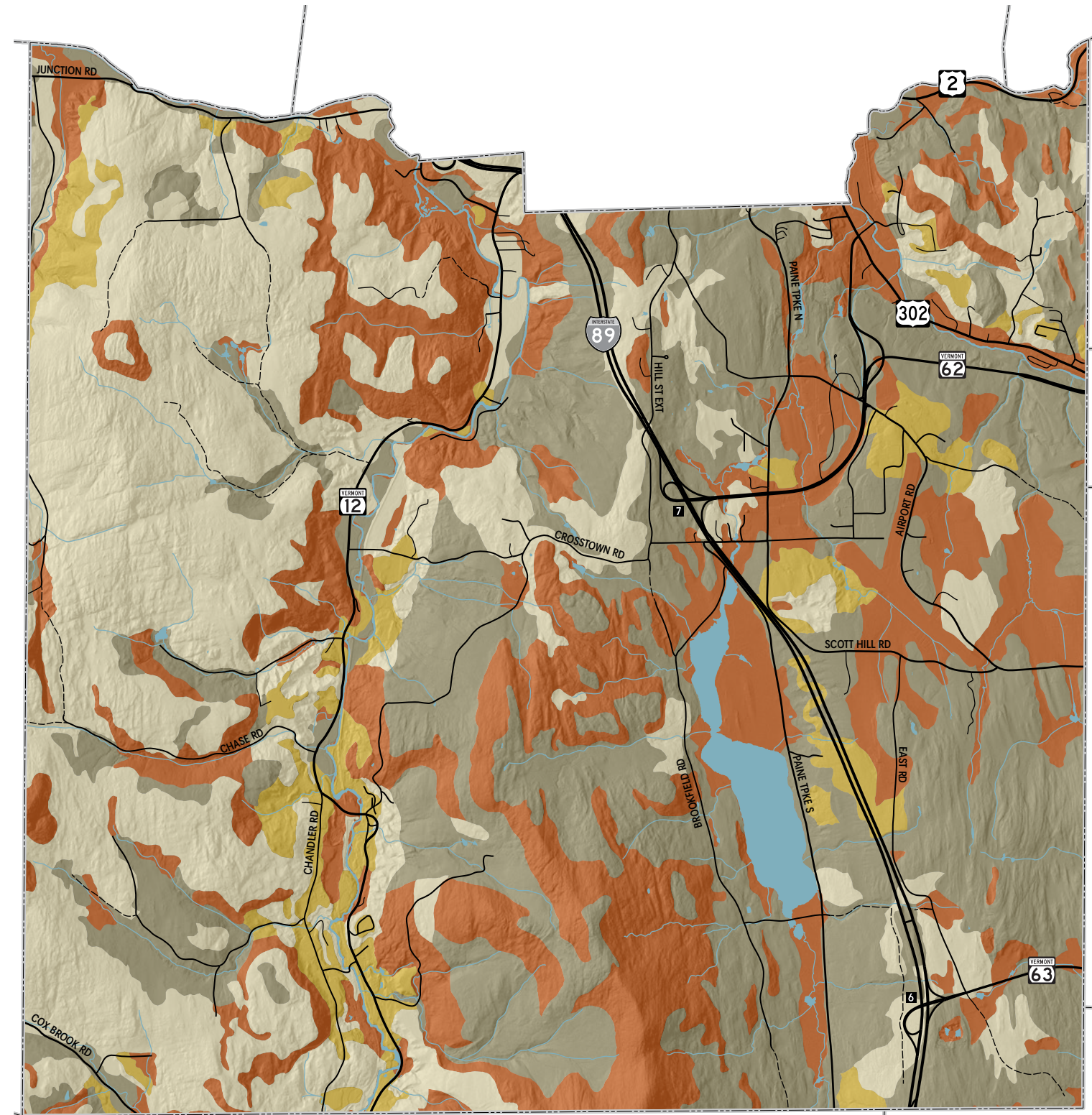




Structures Listed on the National Register
 The Chauncey B. Leonard house (above) on the corner of Crosstown Road and Shed Road was built in 1845 and significantly renovated in 1892.
 Lover's Lane Bridge (below) is a rare example of a Warren pony truss bridge. It was built in 1918 spanning the Dog River and joining Chandler Road to Route 12.



Septic Suitability Map



SOURCE
 2016 County Soil Survey, NRCS

or federal permits, or undertaken with state or federal funding, is proposed that the state may require specific actions to preserve a historic resource. For example, development subject to Act 250 must demonstrate that there will be no undue adverse impact to historic resources. Property owners can learn more about how best to preserve or rehabilitate a historic structure from the Secretary of the Interior's [Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings](#).

Berlin has an active [Historical Society](#) that maintains a collection of historic materials and databases, and can provide more information about town history and historic resources.

Scenic Resources

Berlin has not conducted a scenic resource or road inventory. It is evident from the many public comments at meetings and surveys over the years that residents value the scenic character of the rural areas of Berlin such as: views over farmland in the Dog River Valley to the wooded hillsides and ridgelines beyond; views of Berlin Pond and the surrounding hills; and the expansive views of the Green Mountains from the interstate and elsewhere in town. Approximately 85% of respondents to the 2017 community survey rated the ability to enjoy scenic views in Berlin as excellent or good.

Recreational Resources

The *Berlin Conservation and Open Space Map* (page 6) identifies the conserved and public lands available for recreational use in Berlin and discusses recreational use of Berlin Pond. Other public recreation facilities in Berlin include the playground and ballfields at the elementary school, and the ice rink at the municipal building. More than 80% of respondents to the 2017 community survey rated their ability to enjoy nature and outdoor recreation in Berlin as excellent or good.

Walking and biking are popular recreational activities in Berlin, but nearly all roads in town lack sidewalks, bike lanes or paths, and/or adequate shoulders to safely accommodate pedestrians and bicyclists (see *"Bicycle and Pedestrian Network"* on page 20). More than 60% of respondents to the 2017 community survey rated the safety of walking or biking on town roads as poor or fair.

Berlin does not have a recreational department or offer recreation programs to residents. There was a Recreation Board as of 2018, but it was inactive due to a lack of members. The Conservation Commission was fulfilling the duties of the Recreation Board, which included organizing the town's winter skating rink. Town

residents also have access to recreation programs and facilities in Montpelier and Barre City, but are typically charged higher non-resident rates for those services. The town does offset the cost of swim lessons for children living in Berlin.

Many private landowners in Berlin allow people to access their property for recreational uses. [Vermont law](#) allows people to hunt, fish, and walk on private property without permission unless the land is legally posted. Permission is required before people may ride motorized vehicles or trap animals on private property. The state's [Landowner Liability](#) law protects property owners who allow recreational use on their land without charging a fee from liability for property damage or personal injury. Property owners are protected under this law irrespective of whether the land is posted.

Recreational access to private land is often lost as large tracts of rural land are subdivided and developed into smaller house lots. Berlin's land use regulations do not require owners to protect existing trails or other recreational access on property being subdivided or developed, but that may be required by the state if the project requires an Act 250 permit.

2D. Future Land Use

Land Capability

A fundamental principle of land use planning is to guide development towards the land best suited to accommodate the proposed use and away from unsuitable land. Some of the factors affecting land capability include:

- ⌚ Steep slopes are poorly suited for development (see *"Steep Slopes"* on page 10). Large areas of Berlin are characterized by steep slopes (see *"Slope Map"* on page 10).
- ⌚ Development in the rural areas of Berlin outside the northeast quadrant will be dependent on on-site septic systems for wastewater disposal (see *"Wastewater Disposal Infrastructure"* on page 22). Many areas of Berlin have soils that are poorly suited for on-site wastewater systems (see *"Septic Suitability Map"* on page 11).
- ⌚ Riparian areas, including floodplains and river corridors, pose hazards for development (see *"8. Flood Resilience"* on page 29). Historically, development in Berlin has been located close to rivers and streams. Looking to the future, this plan recommends siting development further away from surface waters.

- ⌚ Vast areas of Berlin are remote and not currently accessible from maintained public roads. The cost of providing infrastructure and services to development in these areas would be significantly higher than for those located in and near developed areas of town or along main roads. Extending roads into currently inaccessible areas would fragment forest blocks and increase impervious surface coverage along with the potential for erosion, sedimentation and downstream flooding.

Future Land Use Map

The *Future Land Use Map* (page 13) is intended to illustrate Berlin's desired future land use pattern, which can be broadly summarized as:

- ⌚ Development of a town center anchored at the Berlin Mall site;
- ⌚ Preservation and revitalization of the historic centers of Berlin Corners and Riverton;
- ⌚ Continued build out of the business park near the airport with light industrial and office uses;
- ⌚ Revitalization and infill of commercial, mixed use and residential areas on previously developed and suitable undeveloped land in the northeast quadrant;
- ⌚ Preservation of rural character outside the northeast quadrant;
- ⌚ Continued use of rural land primarily for agriculture and forestry; and
- ⌚ Protection and conservation of Berlin Pond and surrounding land, and the Irish Hill ridgeline.

The *Future Land Use Map* (page 13) also divides the town into a series of land use planning areas in the northeast quadrant and rural areas of town. More specific guidance on the desired future land use for each land use planning area is presented in *Future Land Use Recommendations* (page 17). The land use recommendations use the maintain-evolve-transform approach described in *Maintain | Evolve | Transform* (page 13). The recommendations are intended to be implemented through the town's land use regulations.

In addition to those land use recommendations and this plan's goals, objectives, policies and actions, the town's land use regulations should be consulted and considered whenever future land use in Berlin will be affected by a regulatory, judicial or legislative decision.

New Town Center

Historically, Berlin was a rural town with several small hamlets but without a traditional center. Residents

accessed goods and services in the nearby urban and village centers of Montpelier, Barre City, Northfield and Middlesex. Since the construction of Interstate 89, Berlin has grown and the land use pattern in the northeast quadrant has changed dramatically. Yet, the town still lacks an identifiable center. It is clear from public comments at meetings and on surveys over the years that residents want such a center to create a sense of community, enhance the quality of life, and support economic development in Berlin.

As a result, Berlin has been planning for a town center since the late 1990s. Following the 2004 Berlin Mall Village Center Study and 2007 Draft Conceptual Plan for the Town Center, the town amended its zoning regulations to establish a town center district. The envisioned redevelopment did not materialize, largely as a result of the recession in the latter half of the 2000s. In the mid-2010s, however, interest in the town center project re-emerged. The town has proposed further zoning changes to allow for development of a compact, walkable, mixed-use center anchored at the Berlin Mall site that would:

- ⌚ Reinforce the area as a regional service center;
- ⌚ Offer higher-density housing;
- ⌚ Reduce the area devoted to surface parking; and
- ⌚ Infill undeveloped land, and underutilized parcels and parking lots.

The potential approach to developing Berlin's town center is further described in [A New Town Center for Berlin](#), a presentation made on behalf of Berlin Mall LLC (the mall owner) to the Selectboard in 2016. To further their shared goals, the Town of Berlin and Berlin Mall LLC have agreed to seek a [New Town Center](#) designation for the area from the state (see *"New Town Center Map"* on page 14). State designation would offer both the town and property owners within the designated area benefits including:

- ⌚ Berlin would be more competitive when seeking grant funding for projects benefiting the new town center.
- ⌚ The town could create a special taxing district for the purposes of financing capital and operating costs associated with infrastructure or other public improvements in the designated area.
- ⌚ Land within and near the designated area would be eligible for the state's [Neighborhood Development Area](#) program.
- ⌚ The number of housing units that could be built on a property without requiring an Act 250 permit would increase, and proposed

What does Berlin need to change?

Residents were asked that question on the 2017 Community Survey and responses included:

Needs more community activities and a town center with a post office. It does not feel like an actual town.

Identity with a zip code. Attract more residents with new home construction. Develop town center and continue to attract good commercial growth.

I would like to see Berlin creating villages or community centers. The proposed zoning seems to work towards this. Riverton should be a community center and the Mall would be another good one.

We need a geographic town center that is walkable and contains local shopping and dining options.

Berlin needs a cohesive identity, a core. It is not just a place to pass through or a suburb of Barre and Montpelier.



Maintain | Evolve | Transform

The Future Land Use Recommendations (page 17) are organized as follows:

- Recommendations to maintain are intended to preserve or strengthen the element described with limited change from the existing or historic condition.
- Recommendations to evolve are intended to promote incremental change that builds on an existing strength or asset.
- Recommendations to transform are intended to lead to substantial change that will alter the future character or use of an area.

development may be eligible for other Act 250 relief as well.

Village Centers

RIVERTON. Riverton or West Berlin is a historic hamlet along the Dog River on Route 12 that developed as a small industrial center due to the availability of water power and later access to the railroad. Town residents have expressed support for revitalizing this area, which formerly supported more businesses, homes and civic buildings than it does today. The town has proposed creating a new mixed-use zoning district for Riverton that would recognize and maintain its historic settlement pattern.

BERLIN CORNERS. Berlin Corners is a historic hamlet that formed around the intersection of Crosstown Road (the only road connecting the eastern and western sides of town) and Paine Turnpike. While it has been overshadowed by development around Exit 7 and the airport, it continues in its role as a civic center. Town residents have expressed an interest in retaining the historic scale and character of Berlin Corners, and in preventing the commercial development near Exit 7 from extending further south along Paine Turnpike. The town has proposed zoning changes that would allow for additional housing, but that would limit the scale of commercial activity in Berlin Corners.

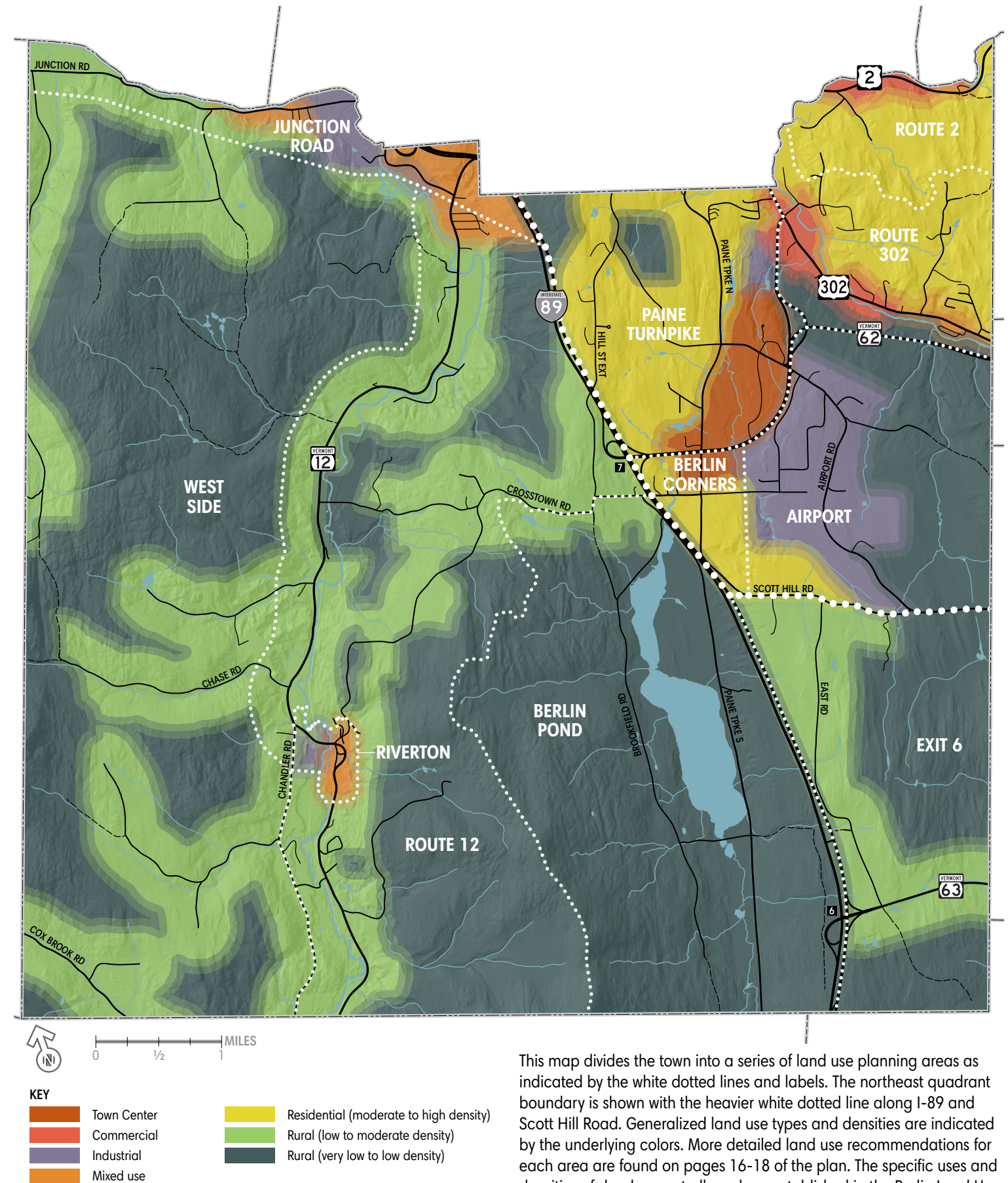
DESIGNATION. The town plans to seek Village Center designations for these two historic hamlets from the state (see “Village Centers Map” on page 15). Designation would support the town’s land use policies related to maintaining the historic scale and pattern of development, encouraging private investment in historic buildings, and promoting infill and improving the walkability of the town’s existing and planned centers. State designation would offer both the town and property owners within the designated area benefits including:

- Owners of income-producing historic buildings could access tax credits for eligible improvements.
- Land within and near village centers would be eligible for the state’s Neighborhood Development Area program.
- Berlin would be more competitive when seeking grant funding for projects in the village centers.

Forest Blocks and Habitat Connectors

Town plans are required by state statute to identify forest blocks and habitat connectors and to plan for land development in those areas to minimize forest fragmentation and promote forest health and ecological function. The Vermont Agency of Natural Resources

Future Land Use Map



This map divides the town into a series of land use planning areas as indicated by the white dotted lines and labels. The northeast quadrant boundary is shown with the heavier white dotted line along I-89 and Scott Hill Road. Generalized land use types and densities are indicated by the underlying colors. More detailed land use recommendations for each area are found on pages 16-18 of the plan. The specific uses and densities of development allowed are established in the Berlin Land Use and Development Regulations.

has mapped two priority forest blocks in Berlin (see “Ecological Resources Map” on page 9).

The impact of proposed development on priority forest blocks will be considered during Berlin regulatory reviews and state regulatory processes such as Act 250. Due to the scale and degree of accuracy of the state maps, the boundaries of priority forest blocks should be more precisely delineated based on current, accurate field data before being applied to an individual property for regulatory purposes.

The state-mapped forest blocks generally align with the areas designated as conservation, open space or working lands in this plan (see “Future Land Use Map” on page 13). A large portion of the forest block between the Dog River valley and Berlin Pond is conserved or public land. Much of the land in both mapped forest blocks was enrolled in the Current Use Program as of 2016 (see “Berlin Conservation and Open Space Map” on page 6).

2E. Compatibility

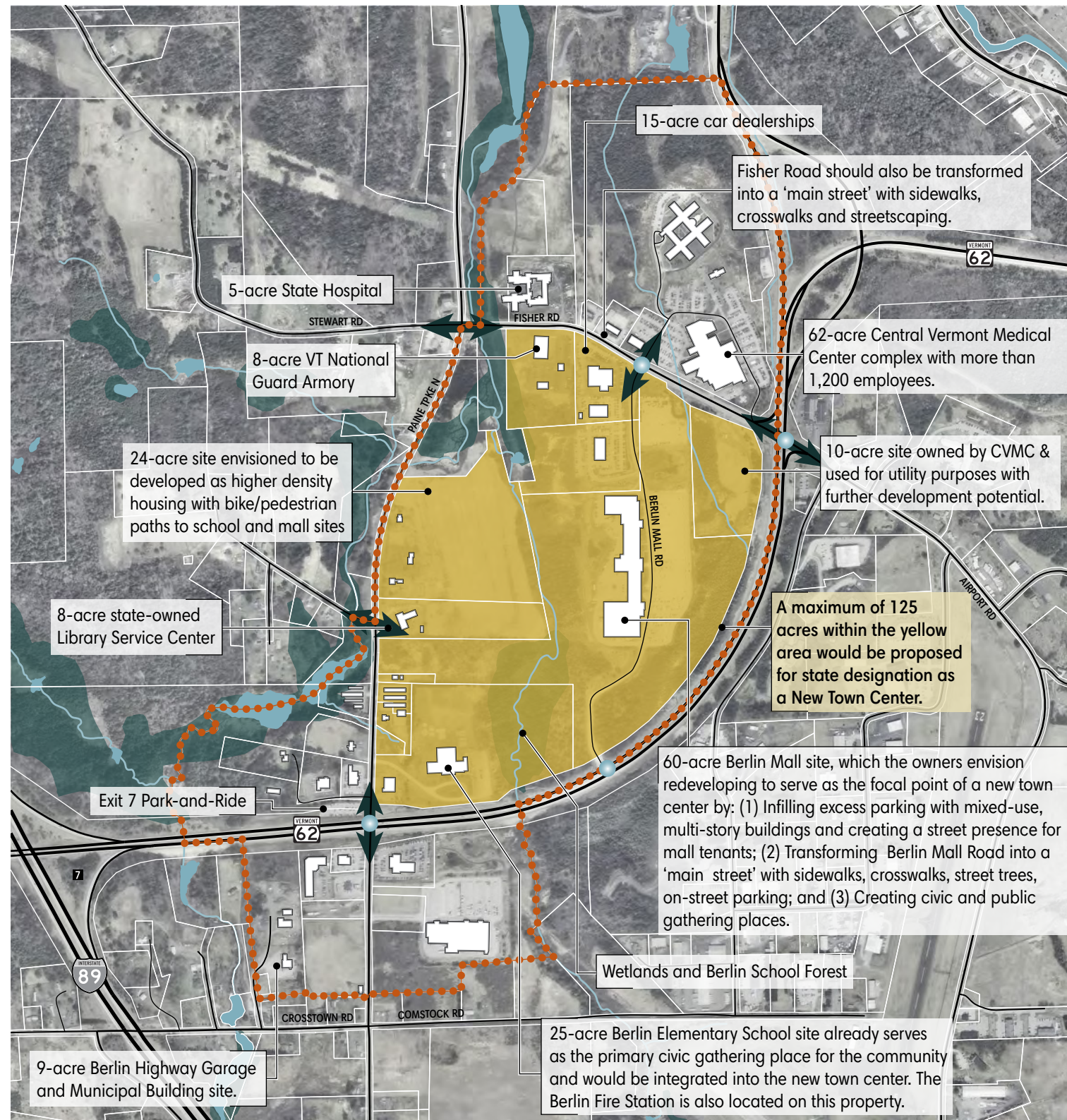
Berlin is part of the Central Vermont region and its land use and development trends are both influenced by and affect the land use and development trends of neighboring municipalities and the region as a whole. Many planning issues such as transportation improvements along the major highway corridors - traffic calming, access management, transit and bike/ped improvements - will need to be addressed jointly by Montpelier, Berlin, and Barre Town and Barre City. Similarly, property owners on both sides of the Winooski share risks associated with flooding and related contamination due to the presence of a variety of industrial uses within or adjacent to the floodplain that can only be mitigated through coordinated action.

Neighboring Municipalities

Berlin’s future land use plan is largely compatible with plans in neighboring municipalities:

- Montpelier’s Master Plan does not express a clear vision for future land use in its ‘eastern gateway’ along the Route 2 and 302 corridors and ‘western gateway’ near Exit 8. The plan notes that these areas have developed in an unplanned manner, but it does not recommend specific strategies for evolving or transforming the development pattern.
- Barre City’s and Berlin’s future land use plans along the shared boundary are very similar. Barre City envisions neighborhood commercial, mixed use and residential uses along the Route 302 corridor, and conservation and open space uses along and south of the Route 62 corridor.

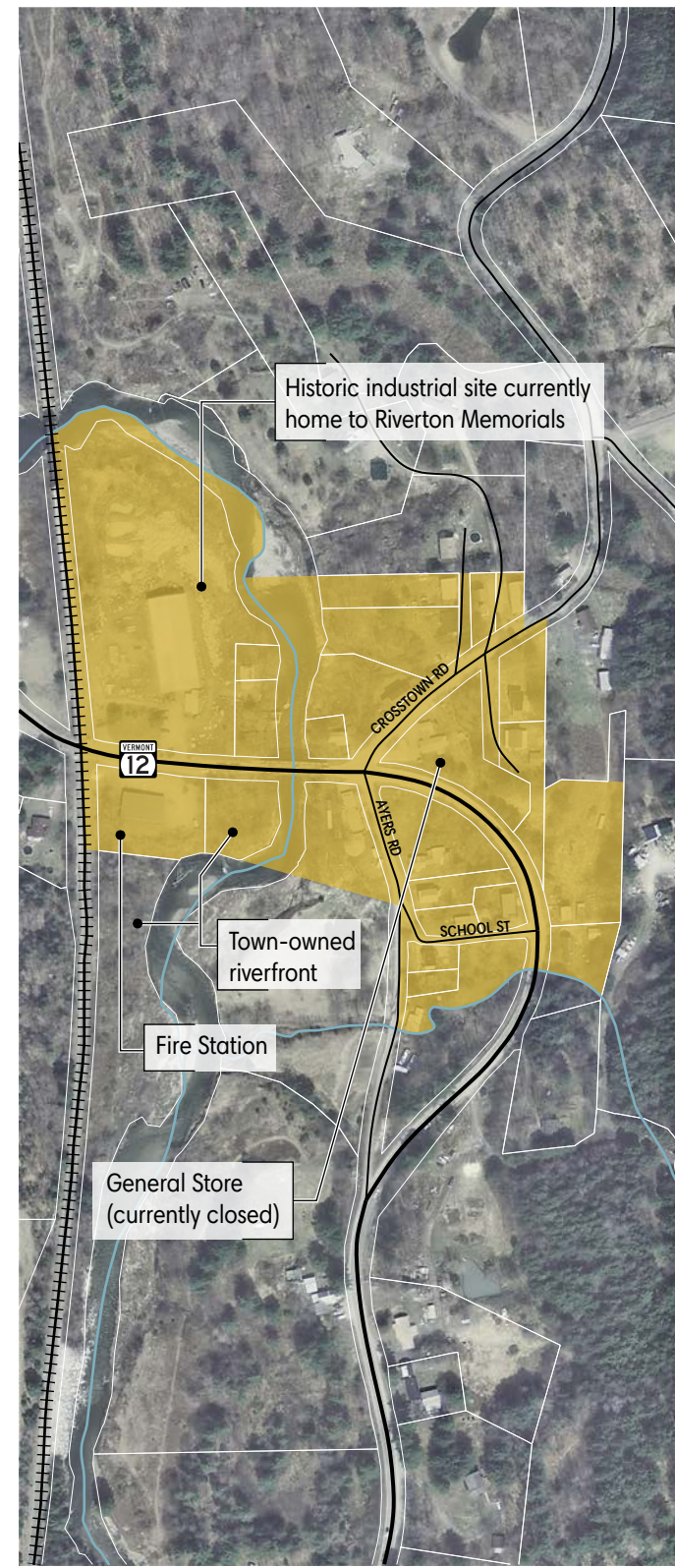
New Town Center Map



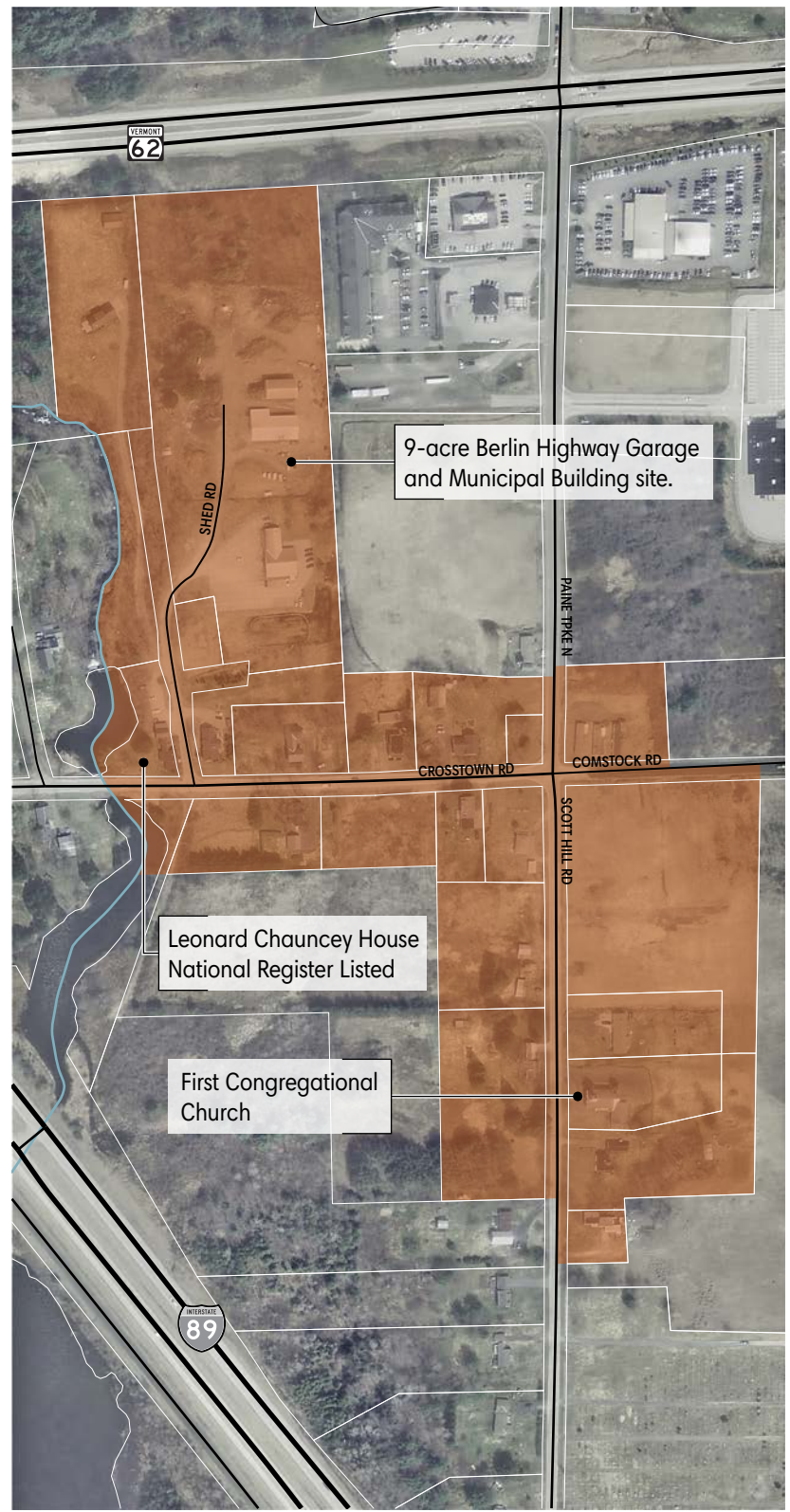
Berlin has been planning for a pedestrian-friendly town center anchored at the Berlin Mall for more than a decade. The town historically had several small hamlets but never had a traditional downtown / central business district. The mall site has ample opportunity for mixed-use infill and redevelopment with multi-story buildings built at or close to the edge of the sidewalk and curbed streets with on-street parking. Adjacent parcels are well-suited for higher-density housing and the area is already home to the Berlin Elementary School, the town’s primary civic gathering place and focal point. The area is or can readily and efficiently be served by water, sewer, stormwater, transportation, energy and communications infrastructure. It is located adjacent to CVMC – a major employer and traffic generator.



Village Centers Map

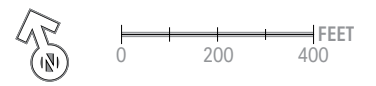


RIVERTON



BERLIN CORNERS

KEY
 Proposed Riverton Village Center Boundary (20 acres)
 Proposed Berlin Corners Village Center Boundary (38 acres)



- Barre Town’s future land use plan along the town line is very similar to Berlin’s – medium to high density residential uses north of Barre City and low density residential and conservation uses south of Barre City.
- Northfield’s village center is approximately two miles south of the town line on Route 12. It serves as employment and service center for the southwestern portion of Berlin. Northfield’s town plan calls for moderate to high density residential uses along the Route 12 corridor and low density residential uses along the remainder of the shared border with Berlin, which reflects the existing development pattern and is compatible with this future land use plan.
- Moretown and Berlin share a long border along the western side of town characterized by steep, wooded terrain. Roads travel through several narrow valleys along this border with more recent residential development in these areas. Both town plans call for low density residential and open space uses in this area.
- The Middlesex Town Plan does not specify what areas of town should be used for particular purposes, rather it defers to the zoning regulations. Middlesex has zoned the land across the river from Berlin for industrial use.
- Williamstown Town Plan calls for low-density rural uses along the town boundary with Berlin. The Williamstown plan discourages commercial/industrial development near Exit 6, which could negatively impact the economic viability of Williamstown Village. The policies of this plan and the proposed zoning changes at Exit 6 also seek to guide commercial/industrial development away from Exit 6 and towards the northeast quadrant.
- The Winooski River and steep terrain separate East Montpelier and Berlin. East Montpelier’s future land use plan calls for the small area along the town boundary with Berlin to remain largely undeveloped resource land.

Central Vermont Region

The overall land use and development pattern called for in this plan is consistent with the pattern envisioned in the Central Vermont Regional Plan’s future land use policies and map. The regional map indicates support for Berlin’s planned town center, industrial and mixed-use commercial areas in the northeast quadrant, and for maintaining rural character in the outlying areas of town.



PHOTO: TOBY TALBOT

Future Land Use Recommendations

Northeast Quadrant

	DESCRIPTION	MAINTAIN	EVOLVE	TRANSFORM
PAINE TURNPIKE	The Paine Turnpike area is bounded by Interstate 89, Route 62 and the Berlin State Highway. It includes the Berlin Mall, Central Vermont Medical Center and adjoining development. There is a large extraction operation to the north, and rural residential and undeveloped land to the west.	<ol style="list-style-type: none"> Maintain the civic functions (school and fire station) already located in this area and seek opportunities to site additional public uses and gathering places within the town center. Maintain a buffer between the existing extraction operation north of Fisher Road and surrounding development. 	<ol style="list-style-type: none"> Evolve the development pattern from a suburban, auto-oriented commercial and service center to a more urban, pedestrian-oriented, mixed-use town center. Evolve the built form through: infill development with multi-story, mixed-use buildings; more efficient use of land by reducing, redesigning and relocating surface parking; and improved walkability with sidewalks, crosswalks, paths, streetscaping, greens and pocket parks. Evolve the mix of uses to create a well-defined center for Berlin where people live, work, shop and play. Evolve and expand the medical campus anchored by CVMC to enhance the availability of healthcare services in the region, attract new businesses and increase employment in Berlin. 	<ol style="list-style-type: none"> Transform suitable undeveloped land into high density residential neighborhoods that offer a range of housing choices. Transform existing roads into complete streets so that people can safely walk or bike, including crossing Route 62 to link this area with Berlin Corners and the airport business park. Transform the existing intersections with Route 62 to expand their capacity as needed to accommodate planned development, reduce congestion and maintain traffic flow, and better accommodate pedestrians and bicyclists.
BERLIN CORNERS	The Berlin Corners area is bounded by Interstate 89, Route 62 and the airport. The area around the intersection of Paine Turnpike, Scott Hill Road, Crosstown Road and Comstock Road is one of the town's historic hamlets and continues to function as a civic center. North from the intersection to Route 62, the Paine Turnpike North corridor has become a commercial strip with both regional retail and traveler services associated with Exit 7.	<ol style="list-style-type: none"> Maintain the historic character and traditional village development pattern of the area around and south from the Crosstown Road intersection. Maintain the traveler service function of the area close to Exit 7 without extending high-traffic commercial uses further south along Paine Turnpike. Maintain the existing traffic pattern so that most truck traffic associated with the airport business park does not travel through this area. 	<ol style="list-style-type: none"> Evolve the development pattern, character and built form of the corridor from Route 62 to the Crosstown Road intersection to become a pedestrian-friendly commercial node serving both travelers and locals with distinctive architecture, attractive landscaping, well-designed signs, and other quality site design features. 	<ol style="list-style-type: none"> Transform Paine Turnpike and Scott Hill Road into complete streets so that people can safely walk or bike, including crossing Route 62 to the proposed new town center and going east to the airport business park.
AIRPORT	This area includes the Edward F. Knapp State Airport (see "Airport" on page 20) and lands to the east between Route 62 and Scott Hill Road. A business park with a mix of office and industrial uses has developed and continues to expand around the airport. There is ample open land to accommodate future growth of the business park.	<ol style="list-style-type: none"> Maintain and improve the airport as needed so that it continues to support economic development in the region. Maintain a pattern of land use and development near the airport and along the flight paths that does not adversely impact or conflict with airport operations. Maintain and grow the business park around the airport as a prime location for light industry, office, shipping and professional service uses in the region. Maintain and protect the groundwater recharge area for the town wells and guard against contamination of the water supply. 	<ol style="list-style-type: none"> Evolve and upgrade the infrastructure serving the airport business park as needed for the area to retain and attract high-quality firms and jobs. Evolve and enhance the character of the airport business park with attractive streetscaping, landscaping and screening, signage and other site design elements to retain and attract investment and job growth by high-quality firms. Evolve and grow the aviation services available at the airport, including passenger air service. 	<ol style="list-style-type: none"> Transform existing roads to serve truck traffic, safely accommodate pedestrians and bicyclists, avoid congestion, and minimize traffic and trucking impacts on the Berlin Corners area.
ROUTE 302	The Route 302 corridor area is bounded by Route 62 to the south and the ridgeline that separates Route 302 from Route 2 to the north. Route 302 has developed as an auto-oriented, highway commercial strip with regional-scale retail uses that serve the larger Central Vermont market. The eastern end of the corridor towards Barre City retains a more residential character with a mix of homes and smaller scale businesses. The Partridge Farms development, which accounts for much of the new housing built in Berlin in recent years, is located at the far western end of the corridor near Montpelier. Suitable land along the highway is largely developed, but there is opportunity for more efficient use and infill development of previously developed sites.	<ol style="list-style-type: none"> Maintain this area as a prime location for retail and service uses serving the Central Vermont region, particularly uses that are not appropriate in a downtown setting due to their scale, intensity or site needs. 	<ol style="list-style-type: none"> Evolve the development pattern from a suburban, auto-oriented commercial strip to a more attractive and walkable retail district through traffic calming and redevelopment with high-quality building, site and sign design. Evolve the built form through: infill development; more efficient use of land by reducing, redesigning and relocating surface parking; traffic calming and cross access between properties; and improved walkability. Evolve the siting and design of buildings and other development within the flood hazard area to reduce potential risk to life and property, and improve resiliency. 	<ol style="list-style-type: none"> Transform suitable underutilized or undeveloped land off the highway into high density residential neighborhoods that offer a range of housing choices. Transform the river corridor by relocating high-risk structures out of the floodplain, particularly mobile homes, storage tanks, and critical facilities. Transform the auto-oriented character of the Route 302 corridor by completing the Central Vermont Regional Path linking this area to downtown Montpelier and Barre City. Transform access to the Partridge Farm development to improve flood resiliency and emergency response.

Future Land Use Recommendations

Northeast Quadrant

	DESCRIPTION	MAINTAIN	EVOLVE	TRANSFORM
ROUTE 2	The Route 2 corridor area is bounded by the Winooski River to the north and the ridgeline that separates Route 2 from Route 302 to the south.	<ol style="list-style-type: none"> Maintain the eastern portion of the corridor as open space. Generally, the remaining undeveloped land along the corridor is poorly suited for development because of the lack of depth of buildable land along the highway, floodplains, and/or steep terrain. Maintain the existing scale and intensity of commercial development along the Route 2 corridor. 	<ol style="list-style-type: none"> Evolve the existing development pattern along Route 2 to improve access management through aligning, narrowing and/or eliminating curb cuts. Evolve the siting and design of existing development within the flood hazard area to reduce potential risk to life and property, and improve resiliency. 	<ol style="list-style-type: none"> Transform suitable underutilized or undeveloped land off Marvin and Goodnow roads into moderate density residential neighborhoods.



Future Land Use Recommendations

Rural Berlin

PHOTO: TOBY TALBOT

	DESCRIPTION	MAINTAIN	EVOLVE	TRANSFORM
JUNCTION ROAD	The Montpelier-Berlin Train Station anchors an industrial area along the eastern end of Junction Road that also extends across the river into neighboring Middlesex and Montpelier. West of the rail line, industrial uses give way to a mix of residential properties and small businesses. A series of transmission lines join at the substation on Nelson Drive, where there is also a solar facility. All the land between Junction Road and the Winooski is floodplain and/or river corridor, as is the land along the Dog River (see "Floodplain and River Corridor Map" on page 29).	<ol style="list-style-type: none"> Maintain the existing pattern of low-density rural residential properties in the western portion of the area. Generally, the land in this area is poorly suited for additional residential development because of: the Winooski and Dog River floodplains and river corridors; established railyard, industrial and business uses, utility corridors and infrastructure; and steep slopes. 	<ol style="list-style-type: none"> Evolve the mix of uses in the eastern portion of the area towards industrial and away from residential to avoid future and mitigate existing conflicts. 	<ol style="list-style-type: none"> Transform open space not suitable for development for uses such as flood storage or renewable energy production.
BERLIN POND	The immediate shorelands around Berlin Pond are almost entirely owned by the City of Montpelier (see "Berlin Conservation and Open Space Map" on page 6 and see "Surface Waters and Riparian Areas" on page 7). The landscape along Brookfield Road and Paine Turnpike South, which ring the pond, retains an agricultural character but is largely converted to rural residential use. Where the steeper terrain comes close to the road, the land is forested and largely undeveloped. While recreational use of the pond is strictly controlled and limited, the roads around the pond are popular places for walking, biking and nature observation. The Irish Hill Conservation Area west of Brookfield Road is also a destination for trail-based recreation.	<ol style="list-style-type: none"> Maintain the existing pattern and density of rural residential development. Maintain forest cover in the upland portions of the watershed to protect wildlife habitat, water quality and scenic character. Maintain the scenic, agricultural character through ongoing small-scale farming (hobby farms, homesteading, keeping horses, etc.) and preserving existing fields and meadows. 	<ol style="list-style-type: none"> Evolve and expand the non-motorized trail network on public land to interconnect existing trail systems. Evolve the land use and vegetative cover in the Berlin Pond watershed to provide improved riparian buffers, stabilize the shoreline and streambanks, filter run-off and remove invasive species. 	<ol style="list-style-type: none"> Transform the Berlin Pond, its shorelands and surrounding roads into a low-impact recreation destination while ensuring such activities are commensurate with the use of the pond as a public water supply and prioritizing the watershed's natural resource values. Should that use terminate, all efforts should be made to preserve public use and access to the pond and its shorelands for low-impact, non-motorized recreation.
RIVERTON	Riverton is a historic hamlet along the Dog River on Route 12 that developed as a small industrial center. Some industrial and commercial activity remains, but the area is now predominately residential. It retains its historic settlement pattern – a small cluster of buildings on small lots distinctive from the agricultural pattern typical along most of the Route 12 corridor.	<ol style="list-style-type: none"> Maintain the historic character and traditional village development pattern of the area. Maintain industrial use at a scale and intensity compatible with Riverton's historic character. 	<ol style="list-style-type: none"> Evolve the mix of uses to include additional small businesses or civic functions as formerly existed in Riverton. Evolve the design and function of Route 12 to slow and calm traffic in recognition of the change in land use and the built environment within the hamlet. 	

Future Land Use Recommendations

Rural Berlin

	DESCRIPTION	MAINTAIN	EVOLVE	TRANSFORM
ROUTE 12	Route 12 travels through the Dog River valley, which remains predominately agricultural in character. North of Riverton, where the valley floor is broader, a substantial amount of farmland remains in productive use. South of Riverton, the valley narrows and there are more homes tucked into the forested hillsides. There are some small businesses scattered along the Route 12 corridor, most of which are home- or farm-based.	<ol style="list-style-type: none"> 1. Maintain the existing pattern and density of rural residential development. 2. Maintain forest cover in the upland portions of the watershed to protect wildlife habitat, water quality and scenic character. 3. Maintain and discourage fragmentation or conversion of productive farm and forest land. 	<ol style="list-style-type: none"> 1. Evolve the land use and vegetative cover along the Dog River to provide improved riparian buffers, stabilize the streambanks, filter run-off and remove invasive species. 	
EXIT 6	The Exit 6 area encompasses the southeastern corner of town bounded by I-89 and Scott Hill Road. Much of this area is currently undeveloped forestland. Development potential is limited by a lack of public infrastructure.	<ol style="list-style-type: none"> 1. Maintain the rural character and low-density development pattern. Further commercial or industrial development at Exit 6 is not consistent with the overall goal of focusing growth in the northeast quadrant, and would compete with the established commercial and industrial areas at Exit 7, around the airport, and along Route 302. 2. Maintain working farm and forest land in productive use. 		
WEST SIDE	This area begins west of the Route 12 corridor and continues to the town line. These lands are largely forested with low-density, large-lot residential development scattered along several roads that extend up into the hills from Route 12. Most of the roads in this area dead-end or are not maintained year-round, with the exception of Cox Brook Road that connects to Route 100B through Moretown. More than 1,800 acres remains part of a single parcel currently managed for timber production.	<ol style="list-style-type: none"> 1. Maintain forest cover, rural character and a very low-density development pattern. 2. Maintain working farm and forest land in productive use. 3. Maintain and discourage fragmentation of large tracts of farm and forest land. 4. Maintain existing public rights-of-way but avoid expanding the amount of publicly maintained road in remote areas. 5. Maintain and expand recreational trail networks. 6. Maintain riparian buffers and forest cover in upland portions of the town's watersheds to protect water quality and attenuate downstream flooding and erosion hazards. 		



PHOTO: TOBY TALBOT

OBJECTIVES

- 1 Provide a multi-modal transportation system that is capable of supporting further growth in the northeast quadrant.
- 2 Increase the number of commuters traveling in or out of Berlin by means other than single-occupancy vehicles (transit, biking, carpooling).

POLICIES

- 1 Promote compact, walkable, higher density neighborhoods in the northeast quadrant to reduce the distance residents need to travel for work, shopping and services, and to encourage greater transit use.
- 2 Focus commercial and industrial development in the northeast quadrant where it can be served by existing transportation infrastructure and transit service.
- 3 Call upon the state and town to maintain and improve highways as necessary to foster growth and development as envisioned in this plan.
- 4 Avoid increasing the total length of roads maintained by the town unless it will improve the efficiency of maintenance operations and/or support development that generates adequate tax revenue to offset increased costs.
- 5 Encourage improved access management on state highways and other high-traffic roads.
- 6 Support and advocate for construction of the Central Vermont Path through Berlin.
- 7 Seek improved accommodation for bicyclists and pedestrians on state highways and other high-traffic roads in the northeast quadrant.
- 8 Require private roads to be constructed in accordance with town road standards and developers to provide a maintenance agreement or equivalent for new private roads.
- 9 Maintain town ownership of Class 4 roads and legal trails as a public recreation resource.

ACTIONS

- 1 Continue to actively participate in the Central Vermont Transportation Advisory Committee to advocate for the state-funded transportation projects needed to further the objectives and policies of this plan.
- 2 Adopt revised land use regulations with adequate standards for access management, curb cuts, driveways and roads to promote a safe and efficient transportation network.
- 3 Develop and adopt a policy regarding the construction and maintenance of sidewalks along public roads.
- 4 Seek implementation of the priority projects listed in Section 3B of this plan.

3. TRANSPORTATION

3A. Existing Conditions

Streets and Highway Network

INTERSTATE 89. Interstate 89 travels through town with Exits 6 and 7 located in Berlin and Exit 8 just across the town line in Montpelier. Construction of I-89 commenced in 1960, but the interstate was not opened in Berlin until 1970 as part of the final segment that completed the full length of the interstate through Vermont and New Hampshire.

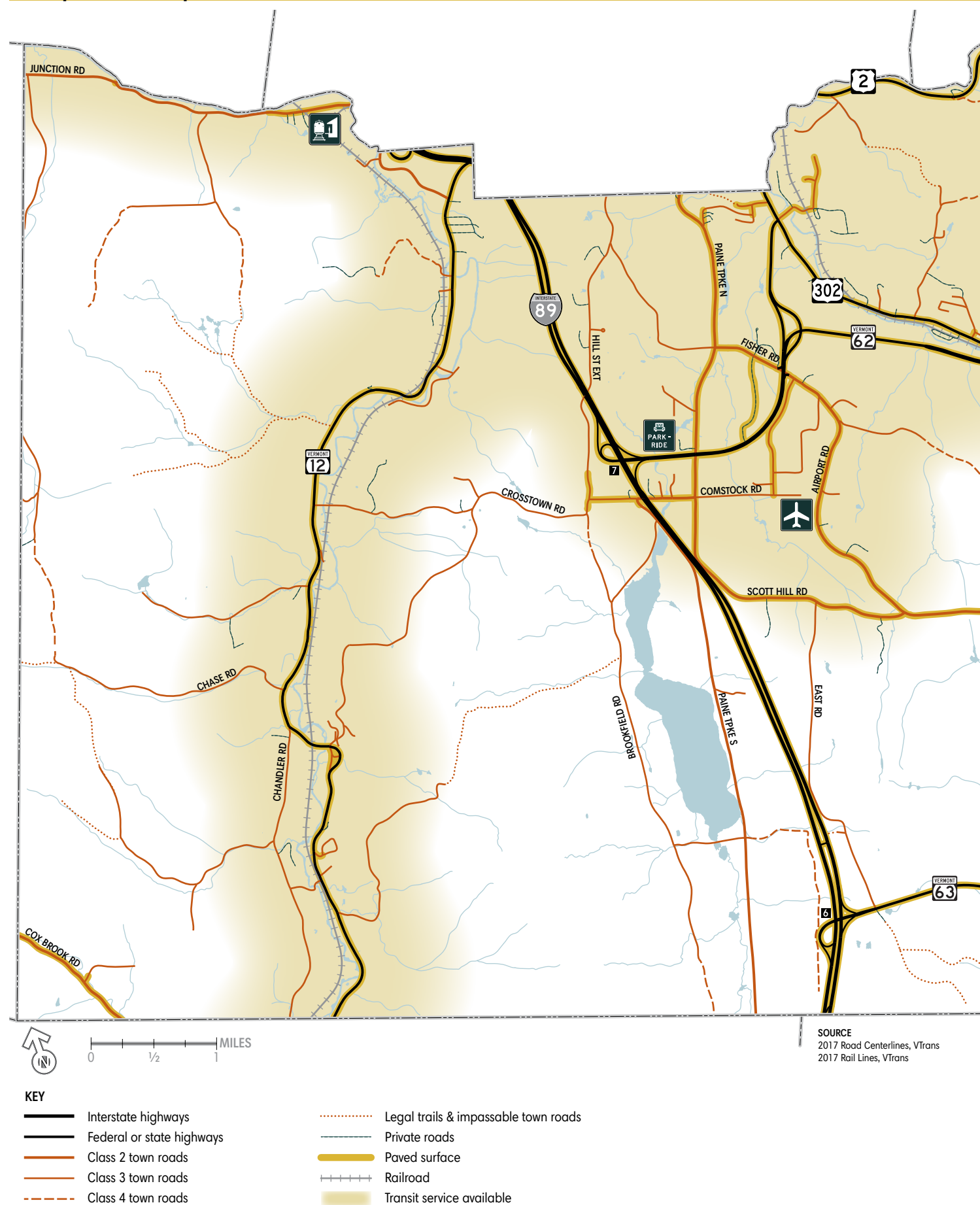
The construction of I-89 has shaped and continues to influence Berlin's land use patterns, particularly the commercial and industrial development in the northeast quadrant. Access to the interstate is clearly an important factor differentiating the eastern and western portions of town. The land west of I-89 is not readily accessible from the interstate and has remained rural, while the land to the east served by Exit 7 has been developed.

FEDERAL AND STATE HIGHWAYS. Federal and state highways form the backbone of Berlin's transportation network and have made it possible for the town to become a regional employment and service center (see "Transportation Map" on page 19). The capacity of these highways to accommodate additional traffic directly affects Berlin's growth potential and the ease with which businesses can locate or expand in town.

There is limited information about the current condition and capacity of these highways. The Vermont Agency of Transportation last updated their highway sufficiency ratings in 2008. The amount of traffic on the highways in Berlin generally declined between 2000 and 2015 (see "Average Annual Daily Traffic Statistics" on page 20) suggesting that there is adequate capacity to accommodate growth. However, according to recent traffic studies undertaken in conjunction with proposed development projects, several key intersections have a level of service of D or E, indicating problems with congestion and safety. These intersections create bottlenecks that restrict the amount of additional traffic the highways can accommodate. The state may require developers to pay for intersection and highway improvements to mitigate traffic impacts of proposed projects through the Act 250 process.

TOWN ROADS. Berlin maintains approximately 51 miles of town road, less than 10 miles of which are paved (see "Transportation Map" on page 19). About 900 residences and businesses were accessed from town roads in 2017. The town has approximately 7.5 additional miles of Class 4 roads that are not maintained for year-round travel and 4 miles of legal trails no longer

Transportation Map



maintained but available for recreational use (see [Berlin General Highway Map](#)). These roads cannot provide access for development unless they are upgraded to at least Class 3 standards.

Severe terrain, water bodies and the interstate have resulted in Berlin being divided into distinct areas with few to no road connections between them. Many town roads travel up into the hills and dead-end. Only one road connects the east and west sides of town – Crosstown Road. This fragmented and discontinuous system of roads reduces the efficiency and increases the cost of road maintenance.

The amount spent on town highways each year represents nearly 40% of Berlin’s operating budget (not including capital expenses). That amounted to approximately \$19,000 in highway costs per mile of town road in 2017. Given the dispersed, low-density land use pattern in most of Berlin, it is possible for the cost of maintaining a town road to exceed the taxes paid by the properties it serves. As a result, the town seeks to avoid further expansion or substantial upgrades of the town road network in low-density areas.

PRIVATE ROADS. Private roads serve much of the residential development that has occurred during the past 30 years in Berlin. There were 55 private roads in Berlin totaling more than 9 miles, serving more than 300 residences and businesses as of 2017. It is likely that most future development not accessible from the existing road network would be accessed from private roads. Berlin should ensure that new private roads are built to basic standards and that there is a formal maintenance agreement between the owners of the properties served by the road. This could avoid damage to public infrastructure caused by poorly constructed or maintained private infrastructure or liability for taking over and repairing failed private infrastructure.

Transit Service and Public Parking

TRANSIT. [Green Mountain Transit](#) (GMT) is the public transit provider in central and northwestern Vermont. GMT offers commuter, deviated fixed routes and demand response shuttle service. Various GMT bus routes directly served or traveled through Berlin in 2017. Generally, GMT can provide demand response service within ¾ of a mile of its established routes (see [“Transportation Map” on page 19](#)). The town appropriates a small amount of funding each year to support Green Mountain Transit (about \$11,000 in 2017). As of 2017 there was also a commuter bus linking Montpelier to Randolph along the I-89 corridor that stopped at the Exit 7 park-and-ride.

PARKING. The town does not provide any public parking, but VTrans owns and maintains a 76-space park-and-ride lot at Exit 7. Connecting bus service on several routes is available from the lot. As of 2017, VTrans had identified several deficiencies at this facility as documented in the [2017 Berlin Park-and-Ride Alternatives Analysis Memo](#).

Bicycle and Pedestrian Network

Bicycle and pedestrian facilities are severely limited in Berlin, but there has long been considerable community support for improved bicycle and pedestrian facilities in town (see [“Recreational Resources” on page 11](#)). Given that many of the major roadways where bicycle and pedestrian facilities are most needed are state highways, any improvements will require the approval and participation of VTrans.

The roughly 150 feet of sidewalk along the Hospital Loop Road is the only public sidewalk in town (there are internal walkways within the hospital and mall sites). It ends at a crosswalk across Fisher Road to Berlin Mall Road. It is maintained by the hospital, not the town, and was a condition of a recent Act 250 permit. As of 2018, the sidewalk did not continue along Berlin Mall Road (a marked walkway was installed in 2017). VTrans added dedicated bike lanes to a portion of Route 302 in 2016 as a trial road diet project. It is anticipated that the new configuration will be made permanent.

Airport

Berlin hosts the Edward F. Knapp State Airport, a state-owned general aviation airport located on 242 acres in the northeast quadrant of town. The 2009 [Edward F. Knapp State Airport Business Plan](#) provides a detailed description of the airport facilities and operations. The [Development Plan](#) for the airport was last updated in 2010 and shows taxiway and apron improvements in progress at that time and now in place.

The Planning Commission has drafted an Airport Overlay District intended to “ensure a compatible relationship between the airport and other development in the vicinity.” The proposed district would refer development applications to the Airport Manager for review to avoid hazards or adverse impacts to aircraft operations.

Rail

The New England Central Railroad (NECR) operates approximately 7 miles of track through Berlin generally paralleling the Dog River. The Washington County Railroad Company spur also travels through Berlin from Barre to Montpelier, joining the NECR line at Montpelier Junction. Daily passenger service via Amtrak’s

Vermont line is available from the Montpelier-Berlin Station and is the only passenger rail service in the Barre-Montpelier area.

3B. Priority Needs

There was one highway project in Berlin on the VTrans project list as of 2017, the [replacement of Bridge #3 on Route 302 over the Stevens Branch](#) (VTrans project #: BF 026-1(43)). The alternative recommended in the scoping study was a full bridge replacement with construction not anticipated to occur before 2022.

Berlin had several transportation projects on the priority list developed by CVRPC’s Transportation Advisory Committee in 2017 that it will call upon the state to fund or undertake:

- An enlargement and upgrade to the existing park-and-ride lot at Exit 7 (Route 62). VTrans was studying various alternatives as of the writing of this plan (see [2017 Berlin Park-and-Ride Alternatives Analysis Memo](#)).
- Construction of the Central Vermont Regional Path. The previously planned alignment within the railroad right-of-way is no longer considered a viable option and further planning is needed to develop a new route for the path.

It is anticipated that stormwater-related improvements will be required on town roads to comply with Municipal Roads General Permit requirements, which take effect in 2018 with at least 15% of non-compliant segments upgraded to meet standards by 2021-22 and full compliance by 2036. Central Vermont Regional Planning Commission was in the process of inventorying and assessing Berlin’s town roads for compliance with the new permit requirements in 2018. Further work will also be needed to identify and address road erosion.

Enhancing the walkability of the planned town center is another transportation priority for the town. Most of those improvements will be completed by the private sector as part of development projects. As the pedestrian network develops within the town center, Berlin should be working with the developers, CVRPC and VTrans on getting pedestrians safely across Route 62 to Berlin Corners and the airport business park. The impact of town center development on the Route 62 intersections will also have to be studied and addressed in coordination with the town center developers, CVRPC and VTrans.

VTrans had classified the pavement condition on several segments of Route 12 through Berlin as poor or very poor as of 2017. These segments should be repaired as needed and repaved. Adequate shoulders for bicycling should be provided wherever feasible on Route 12.

Average Annual Daily Traffic Statistics

HIGHWAY	AADT 2015	CHANGE		
		2000- 2015	1990- 2015	
I-89	Exit 5 to Exit 6	20,400	+31%	
	Exit 6 to Exit 7	18,500	+23%	
	Exit 7 to Exit 8	22,100	+7%	
US RT 2	9,700	+18%	+29%	
US RT 302	Montpelier line to Berlin St Hwy	13,300	-6%	-13%
	Berlin St Hwy to Vt Shopping Ctr	13,400	-11%	-6%
	Vt Shopping Center to Ames Dr	12,000	-12%	
	Ames Dr to Barre City line	10,800	-16%	-17%
VT RT 12	Northfield line to Crosstown Rd	3,800	-3%	
	Crosstown Rd to Dog River Rd	3,700	-14%	+32%
	Dog River Rd to Montpelier line	3,300	-8%	
VT RT 62	Exit 7 to Paine Turnpike	13,800	+9%	
	Paine Tpke to Berlin Mall Rd	13,600	0%	+37%
	Berlin Mall Rd to Fisher Rd	11,400	-7%	
	Fisher Rd to Berlin State Hwy EB	17,500	-6%	
	Berlin St Hwy EB to BSH WB	14,000	-8%	
BSH WB to Barre City line	11,000	-8%		
VT RT 63	5,400	+20%		
BSH	Airport Rd to Granger Rd	3,000	-6%	
	Granger Rd to US Rt 62	6,600	+8%	
	US Rt 62 to US Rt 302	7,000	-1%	+25%
PAINE TPKE	Montpelier line to Fisher Rd	6,300	+3%	+232%
	Fisher Rd to Route 62	2,800		+133%
	Route 62 to Crosstown Rd	4,900		

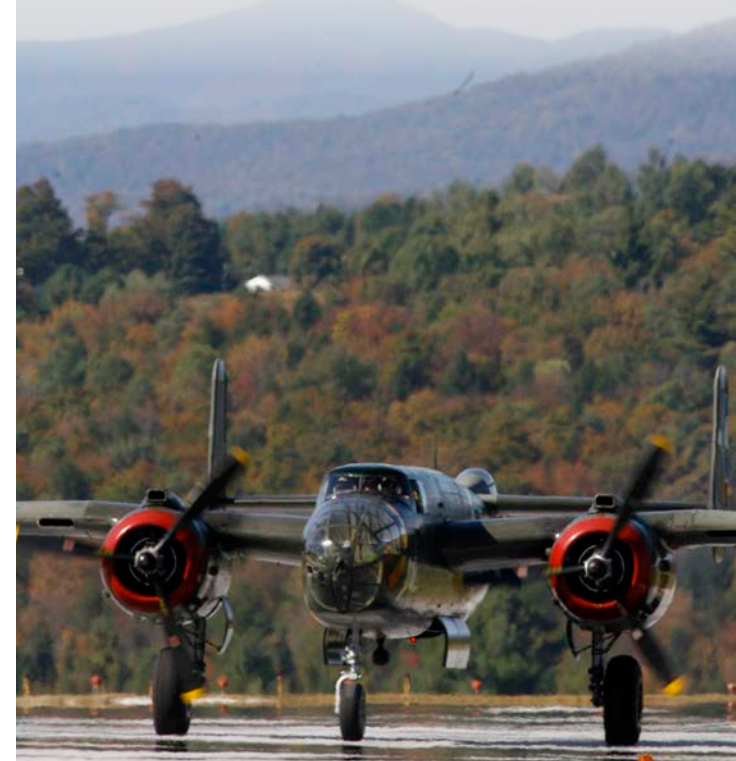


PHOTO: TOBY TALBOT

OBJECTIVES

- 1 Provide the utilities and facilities necessary to support further residential, commercial and industrial growth in the northeast quadrant.
- 2 Have full cell phone coverage throughout town and affordable access to high-speed internet in the northeast quadrant and rural residential areas of town.
- 3 Integrate civic buildings and functions into planned town and village centers.
- 4 Meet the town's obligations under Vermont's Clean Water Act (Act 64).

POLICIES

- 1 Focus higher-density housing, educational, commercial and industrial development in the northeast quadrant where it can be efficiently served from existing or planned utility networks, and where the availability of that infrastructure will reduce development costs.
- 2 Ensure that stormwater run-off from developed land is managed at the source so it will not place an undue burden on public infrastructure.
- 3 Fund new or extended utilities and facilities primarily through user fees, grants or other financing mechanisms to avoid overburdening property taxpayers.
- 4 Support provision of quality childcare, education and recreation services so Berlin will be an attractive community for families.

ACTIONS

- 1 Maintain a capital improvement program that is aligned with the goals and objectives of this plan, and meets the requirements for the proposed new town center designation.
- 2 Continue to extend municipal water and sewer in the northeast quadrant to support future economic growth and residential development in a manner consistent with smart growth principles, and dedicate reserve capacity to support development within the proposed new town center.
- 3 Implement the stormwater practices and projects recommended in Berlin's 2017 Stormwater Management Plan.
- 4 Explore the feasibility and potential cost savings of partnering with neighboring communities to regionalize public safety and emergency response services.
- 5 Call upon the state and supervisory union to continue efforts to control education costs, including via shared services & consolidation.
- 6 Seek funds to undertake a childcare needs assessment to define the specific needs of Berlin residents and employees.

4. UTILITIES & FACILITIES

4A. Existing Conditions

Educational Facilities

The Berlin Elementary School is located on a 26-acre site at the corner of Route 62 and Paine Turnpike North shared with the Berlin Volunteer Fire Department. It serves students from pre-kindergarten through grade 6.

There were 215 children enrolled at Berlin Elementary School during the 2017-18 school year. Enrollment peaked at about 300 students in the 1990s. The school district has completed several major building upgrades in recent years and no additional improvements or expansions of the elementary school were being considered as of 2018.

Older students attend the regional Union 32 Middle and High School in East Montpelier, which had a total enrollment of 740 children (165 from Berlin) during the 2017-18 school year. Enrollment peaked at nearly 900 students in the mid-2000s. The last major upgrades to the Union 32 High School were completed in 2002. There were no plans for significant facility improvements being considered as of 2018.

There are no institutions or organizations in Berlin which provide traditional higher education or vocational training opportunities in Berlin. Residents seeking these services may enroll in programs offered in nearby municipalities such as Montpelier or Barre City or access classes remotely.

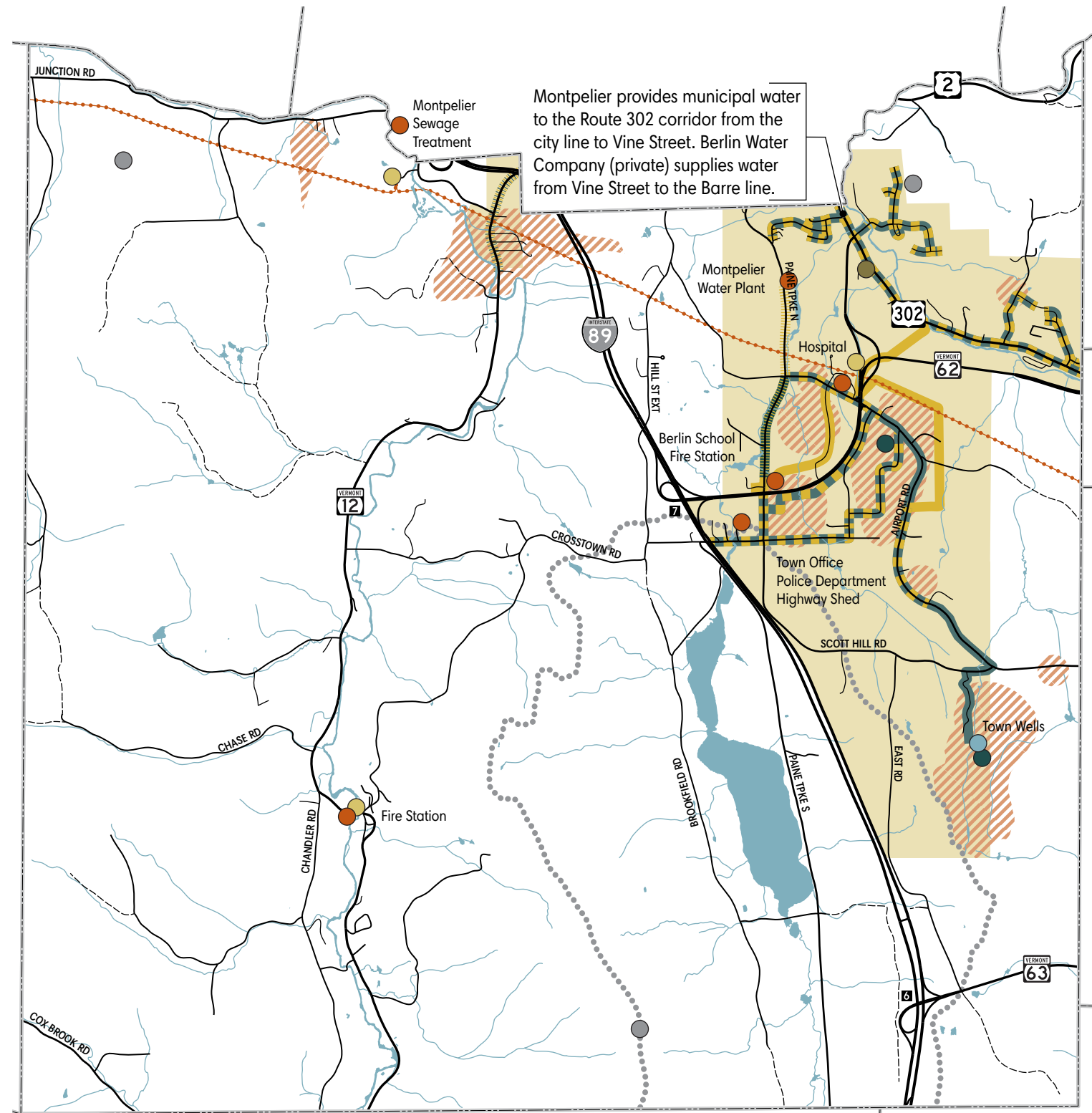
Town Government Facilities

Berlin's town government is based at the Municipal Building located on Shed Road, which shares the 9.7-acre site with the highway garage. The Municipal Building houses the town administration, police department, public works department and historical society. It was most recently expanded and renovated in 2006. While meeting most of the town's needs, it does not provide space for large meetings. The town highway garage and surrounding land house the town's road maintenance vehicles, equipment and materials. No plans for major improvements to either facility were being considered as of 2018. The Town of Berlin also owns and maintains nine historic cemeteries. The Berlin Corner Cemetery Association operates that cemetery, which is still active.

Public Safety Facilities and Services

Berlin has a police department with 7 full-time officers. The police department budget in 2017 was approximately \$960,000 (38% of town expenditures) not including capital expenses. The department's budget had been offset by approximately \$100,000 in revenue from contract services for providing police protection at Central Vermont Medical Center, a contract that was not renewed in 2018. The department is based in the Municipal Building and there were no identified needs for facility improvements or additional staffing as of 2018.

Utilities and Facilities Map



KEY

- Existing municipal water
- Existing municipal sewer
- Existing municipal water and sewer
- Existing municipal water & planned sewer
- Planned municipal water & sewer
- Planned municipal sewer
- Telecommunication tower
- Substation
- Water tower
- Pump station
- Municipal or civic facility
- Planned water and sewer service area
- VELCO transmission line
- Groundwater source protection areas
- Surface water source protection areas

SOURCE
 2017 e911 Sites, VCGI
 2018 Berlin town infrastructure mapping
 2003, VT Electric Transmission Line Corridors
 2018 Source Protection Areas, VTANR

See Commercial and Industrial Areas (page 28) for more information on the availability of three-phase power in the northeast quadrant and Public Water Systems (page 22) for more information on public water supplies and their source water protection areas.

The Berlin Volunteer Fire Department provides fire protection and emergency response from a primary fire station located adjacent to the elementary school and a secondary station in Riverton. There is an ongoing need to replace vehicles and equipment, but there were no identified needs for facility improvements as of 2018. In 2017, the department had approximately 20 active volunteer firefighters who responded to more than 500 calls (65% were rescue and emergency medical, only 5% were fires). As with all-volunteer departments elsewhere, the Berlin Volunteer Fire Department is finding it increasingly difficult to attract and retain responders. In 2017, each active firefighter volunteered approximately 120 hours in training and response time.

Berlin residents receive emergency medical response and transport from ambulance services based in Barre Town and Northfield. Barre Town EMS, which serves six communities in the region, operates a substation out of the Berlin fire department building and serves the eastern and northern portions of town, while Northfield serves the southwestern quadrant. The Town of Berlin makes an annual payment to each service.

Healthcare Facilities

Berlin is home to Central Vermont Medical Center, the regional hospital, and associated medical practices, as well as the Vermont Psychiatric Care Hospital. This concentration of healthcare providers represents a significant portion of the town's employment base and ensures residents have convenient access to healthcare services. The hospital and related healthcare providers and businesses also serve as an anchor for the planned town center – generating customer traffic for businesses and demand for workforce housing in the town center.

Childcare Services

There is one licensed childcare provider in Berlin. With 8 infant slots and 10 toddler slots, it is operating at capacity with zero vacancies. Berlin residents and employees may find limited openings in surrounding towns or may rely on a neighbor or family member. There are no licensed or registered childcare providers in the region providing services on the weekends or during the evening or nighttime hours to serve families which work extra hours, second shifts or on the weekends. These schedules are often required for those working in healthcare or in the retail or industrial sectors. Recognizing the reality that most families require full or at least part-time childcare outside of their homes, childcare is critical to Berlin residents and is also vital to the stability and sustainability of the local economy especially considering the towns substantial employment base.

Electricity Infrastructure

Green Mountain Power provides electricity in most of Berlin with a small area of town served by Washington Electric Cooperative (see *“Utilities and Facilities Map”* on page

21). There was three-phase power available in most of the northeast quadrant of Berlin and in Riverton as of 2018 (see *“Commercial and Industrial Areas”* on page 28). GMP had substations in Riverton and at their facility off Nelson Drive. A VELCO 115 kV transmission line passed through the northern portion of town. As of 2018, there were no plans to significantly upgrade the electricity infrastructure serving Berlin.

Telecommunications Infrastructure

Fairpoint provided landline phone service throughout Berlin and DSL internet service in many areas of town as of 2018. Several companies provided cable television and internet service along the major road corridors and in the northeast quadrant. Remote areas of town had limited access to high-speed internet service. There were at least three telecommunication towers in Berlin (see *“Utilities and Facilities Map”* on page 21). Given the terrain, there remain areas of town lacking adequate cell service.

Water Supply Infrastructure

A combination of public and private systems provide potable water to development in parts of Berlin (see *“Public Water Systems”* on page 22). There were 12 public drinking water systems in Berlin as defined and regulated by the Vermont Agency of Natural Resources that have source protection areas (see *“Water Resources Map”* on page 8) as of 2018.

Wastewater Disposal Infrastructure

Municipal sewer service is available in portions of Berlin (see *“Utilities and Facilities Map”* on page 21 and see *“Municipal Sewer Service”* on page 22). Through an inter-municipal agreement, Berlin purchases sewer capacity from Montpelier. The town had approximately 200,000 gallons of unused capacity in 2018.

Stormwater Infrastructure

Municipal stormwater infrastructure consists primarily of open drainage ditches and culverts along town highways. Upgrades to this infrastructure and improved stormwater management on municipal sites will be required over the next decade under new state clean water and general road permit requirements (Act 64). Berlin's 2017 Stormwater Management Plan includes specific recommendations for improving stormwater management on municipal sites and town roads.

Until very recently, most private development in Berlin was constructed with minimal stormwater management infrastructure, which has resulted in untreated stormwater discharging directly to roadside drainage systems or surface waters. In response, the Planning Commission has drafted new stormwater requirements for private development that it recommends be incorporated into the town's land use regulations.

The Vermont Agency of Natural Resources has listed the Stevens Branch from Barre City to the Winooski mainstem, and

the segment of the Winooski mainstem between the Montpelier sewage treatment plant and the Middlesex dam as ‘stressed’ due to urban runoff. If runoff from developed land and roadways continues to reduce water quality, ANR may classify one or more of the watersheds in Berlin as ‘impaired’ due to stormwater, which would lead to enhanced stormwater permitting requirements for new development requiring a state stormwater permit.

Solid Waste Disposal Facilities and Services

Berlin is a member of the Central Vermont Solid Waste District (CVSWD). The district's Solid Waste Implementation Plan as most recently adopted is incorporated into this plan by reference. By belonging to CVSWD, Berlin is meeting its obligation under state law to plan for the community's solid waste disposal needs.

As of 2018, there were no transfer stations or drop-off locations in Berlin. A number of haulers provide pick-up service or residents can take their trash to a transfer station or drop-off location in a neighboring community.

4B. Planning Considerations

Co-locating higher education and vocational training programs and facilities that support and enhance existing local employment sectors in Berlin would both increase resident's access to broader educational opportunities and support local economic development.

The Town of Berlin will need to continue its efforts to provide water and sewer in the northeast quadrant and to address stormwater management to further the land use, housing and economic development goals of this plan. Provision of this infrastructure in those areas planned for service will be primarily the responsibility of the town.

Berlin should explore alternative approaches to providing emergency response and public safety services that would avoid escalating costs and maintain high-quality service. The town should work with neighboring municipalities to study and plan for regionalization of these services.

Berlin should explore private-public partnerships with advocacy groups and large employers to expand the availability of quality childcare in town. Through the administration of grant funds (through the allocation of municipal funds) the town may help alleviate high childcare start-up or operational costs by lowering building construction costs or facility rental costs.

Electricity and telecommunications infrastructure will need to be maintained and upgraded on an ongoing basis to provide state-of-the-art, reliable, high-quality service to Berlin residents and businesses as technology advances and evolves. This infrastructure is essential to both economic development and quality of life. Necessary repairs and improvements will be primarily the responsibility of the utilities and service providers.

Public Water Systems

Vermont classifies any water system with 15 or more service connections or that serves 25 or more people as a public water supply. There were around 20 active public water supplies in Berlin as of 2017. The number of public water supplies has been decreasing as Berlin expands municipal water, and it is anticipated that more will connect to town water in the future. This opens up land previously unavailable for development or other use due to well buffer requirements, particularly in the airport business park.

Three of these systems comprise what is commonly considered municipal water in Berlin:

- The Berlin Municipal Water System served 95 customers in the northeast quadrant as of 2018. The town's three wells went online in 2015 and together supply 150 gallons per minute. The system was at capacity as of 2018. The town was planning to drill a fourth well to expand capacity.
- The Berlin Water Company is a private company that provides water along the eastern portion of the Route 302 corridor. The town was discussing acquisition of the company in 2018 and incorporating it into the municipal system.
- The Montpelier city water system provides service along the western portion of the Route 302 corridor. It is anticipated that Montpelier will extend their water service to the northern segment of Route 12 in 2018.

Municipal Sewer Service

Berlin operates a municipal sewer system, but does not have its own treatment plant. The town purchases sewage treatment capacity from Montpelier. Berlin had an allocation of 600,000 gallons per day of treatment capacity, 200,000 gallons of which was unused, as of 2018. Further, Montpelier's sewage treatment plant was operating at less than 30% of capacity as of 2018 suggesting that it could accommodate any additional capacity Berlin may need for the foreseeable future.



PHOTO: TOBY TALBOT

OBJECTIVES

- 1 Increase the number of commuters traveling in or out of Berlin by means other than single-occupancy vehicles (transit, biking, carpooling).
- 2 Increase the amount of renewable energy being produced in Berlin in a manner that is consistent with the goals, objectives and policies of this plan.
- 3 Reduce overall energy use in Berlin through conservation and efficiency measures.

POLICIES

- 1 Promote compact neighborhoods with energy-efficient housing in the northeast quadrant in proximity to transit, employment, shopping and services to reduce household energy use.
- 2 Focus commercial and industrial development in the northeast quadrant in proximity to major transportation corridors, transit and existing population centers.
- 3 Guide ground-mounted commercial solar projects to sites that are not within existing or planned water or sewer service areas.
- 4 Encourage large-scale development or redevelopment projects to install solar collectors on rooftops and within parking lots.
- 5 Support individual or residential renewable energy projects that are compatible with the goals, objectives and policies of this plan.
- 6 Oppose commercial wind projects in the vicinity of the Irish Hill Conservation Area and ridgeline.
- 7 Consider life cycle costs (initial construction + ongoing operation) when planning to construct or upgrade municipal facilities.
- 8 Support programs that assist owners with weatherizing and improving the efficiency of existing buildings, and/or provide incentives for energy-efficient construction or renovation.
- 9 Encourage owners to manage forestland for long-term, sustainable harvesting of wood as a renewable fuel source.

ACTIONS

- 1 Participate in the Section 248 process and call upon the Public Utilities Commission to make decisions that further the goals, objectives and policies of this plan.

5. ENERGY

5A. Current Energy Use

Energy use in Berlin reflects the community’s role as an employment and service center for the region. The commercial and industrial sector represents a much larger percentage of total energy used in Berlin than the residential sector. While accurate data is not available to determine how total energy use (electricity, thermal, transportation) is split between the sectors, the data available for electricity use provides evidence that energy usage in Berlin is driven by the commercial and industrial sector, which is not typical of most Vermont towns (see *“Electricity Use by Sector, 2015”* on page 24).

The best available estimate of the total amount of energy being used in Berlin suggests that in 2015 nearly 824 billion BTUs of energy were consumed for electricity, thermal (heating and cooling buildings), and transportation (see *“Berlin Total Energy Use, 2015 Actual”* on page 24). The figures for thermal and transportation energy are rough estimates based on statewide averages and Census data, while detailed statistics are kept about electricity use by the utilities. More accurate data may become available in the future that will provide a clearer picture of how energy is being used in Vermont and how that use is changing over time.

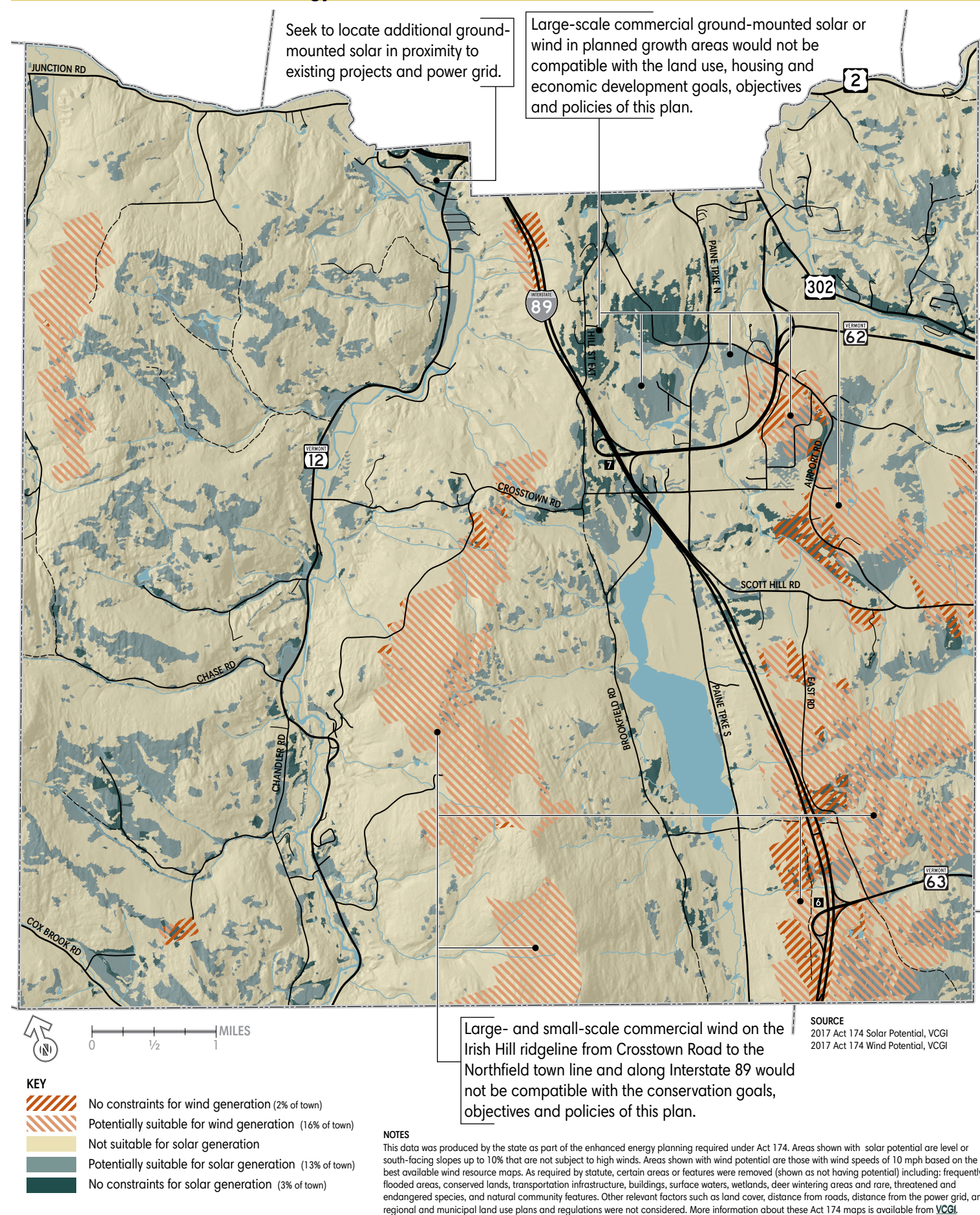
Information about energy use in Berlin is available from:

- The Energy Action Network’s [Community Energy Dashboard](#), which tracks the progress of each Vermont community towards the state’s goal of meeting 90% of local energy needs through efficiency and renewable energy by 2050.
- The Central Vermont Regional Planning Commission’s [energy maps and data](#), which provide current and future energy use data and targets, and energy resource and constraint maps that were developed to assist municipalities with enhanced energy planning under Act 174.

5B. Renewable Energy Resources

Renewable energy sources – hydro, solar, wind, biomass, geothermal – are constantly replenished unlike fossil fuels, which are finite. To reduce the greenhouse gas emissions leading to climate change, Vermont adopted a goal in 2011 to obtain 90% of the total energy used in the state (electricity, thermal, transportation) from renewable sources by 2050. Berlin was meeting 28% of its total energy use from renewables in 2015 (see *“Berlin Total Energy Use, 2015 Actual”* on page 24).

Potential for Wind or Solar Energy Generation in Berlin



Renewable energy projects in Vermont are classified based on type and scale as follows:

- ◉ **Individual or Residential** projects generate electricity primarily for their own use. These on-site installations are typically tied into the grid. Most of these projects have a capacity of less than 15 kW, which roughly equates to up to 50 3'x5' solar panels or a wind turbine up to 80 feet tall with blades 18 feet in diameter.
- ◉ **Small-Scale Commercial or Community** projects may generate up to 500 kW of electricity to offset the power used by multiple properties through group net-metering. This allows electricity customers who cannot or do not want to install an individual, on-site project to buy renewable power produced off-site.
- ◉ **Large-Scale Commercial or Utility** projects are like conventional power plants with the electricity produced going directly into the grid. These include solar projects with a capacity up to 2.2 MW (this could range from 2 to 20 acres of solar panels) and wind projects where each turbine typically has a capacity of 2 MW (such turbines may be up to 450 feet tall with blades up to 350 feet in diameter).

There are limited areas of Berlin that have potential for commercial solar generation (see *“Potential for Wind or Solar Energy Generation in Berlin” on page 23*) due to the combination of landform, forest cover, inaccessibility of much of the rural land in town, and limitations of the power grid and lack of electricity transmission infrastructure in most rural areas of town. There are two existing commercial solar generation sites in Berlin:

- ◉ A 200-kW solar installation on Nelson Road owned by Green Mountain Power. It is located on an approximately 4.5-acre site adjacent to a substation and transmission corridor. GMP owns more land in this vicinity that could potentially be used for commercial solar generation.
- ◉ A 150-kW community solar project on Muzzy Road operated by SunCommon, which provides electricity to Community Solar Array members.

The remainder of the solar energy being generated in Berlin is net-metered, individual installations that generate electricity primarily for on-site use. There were 31 homes and 5 businesses with net-metered solar in Berlin as of 2017 with a total capacity of about 545 kW. Several of the businesses with net-metered solar have large roof-top arrays. Given the square footage of commercial and industrial buildings, as well as parking lots, in Berlin there is substantial potential for roof-top solar and solar canopies within parking lots.

There is virtually no potential for commercial wind generation (see *“Potential for Wind or Solar Energy Generation in Berlin” on page 23*) in Berlin given current turbine technology. Only 25% of the land shown as having any wind potential has wind speeds high enough to support commercial wind and much of that land is part of the Northfield Village Forest, Berlin Town Forest or Boyer State Forest where commercial wind development would be at odds with the conservation goals for those public lands. There are also restrictions on constructing tall structures such as wind turbines, in the vicinity of the airport and its flight paths.

Berlin is well-suited to produce another form of renewable energy – biomass. While it is not known how much wood is harvested for fuel in Berlin on an annual basis, it is clear that there is considerable potential for sustainable biomass production given that the town is nearly 75% forested. Wood is a renewable source of thermal energy and technological improvements have greatly increased the efficiency and reduced the pollution associated with burning wood.

5C. Siting Standards

This plan calls for increased renewable energy production in Berlin, but those goals and objectives must be balanced with goals and objectives related to:

- ◉ Protecting natural resources, environmental quality, scenic resources and rural character.
- ◉ Maintaining viable agricultural and silvicultural operations, and the working lands needed to sustain them.
- ◉ Making efficient use of public infrastructure.
- ◉ Focusing growth and development in the northeast quadrant of town.

The availability of three-phase power and proximity to the transmission grid are important considerations for siting renewable energy projects. Three-phase power, which is needed to transport electricity from renewable projects to the power grid, is generally only available in the northeast quadrant and in the vicinity of Junction Road (see *“Commercial and Industrial Areas” on page 28*). To generate and transmit electricity efficiently and cost-effectively, commercial projects should be located where they will be served by and maximize the use of existing infrastructure rather than requiring significant infrastructure upgrades.

There should be no limitation on the siting of individual or residential scale renewable energy projects provided that the owner will take reasonable measures to site and/or screen ground-mounted installations to minimize any visual or noise impacts beyond the property line, particularly on sites where there is one or more neighboring homes in close proximity to the installation.

Roof-top solar and solar canopies in parking lots, and use of land with other development limitations (such as brownfields and former gravel pits) for renewable energy production should also be encouraged throughout town.

Large-scale commercial projects that are land consumptive should be guided away from sites that have a higher use value such as land served or planned to be served by public infrastructure and suitable for compact residential, commercial or industrial use, or high-quality, productive farmland. Large-scale commercial projects should be required to meet equivalent standards for setbacks and site design (landscaping, screening, lighting, stormwater, etc.) as other light industrial uses in the same area of town.

5D. Energy Conservation

Efficiency Vermont offers homeowners and businesses various programs and incentives for efficiency (see www.encyvermont.com). Opportunities for energy efficiency and conservation include:

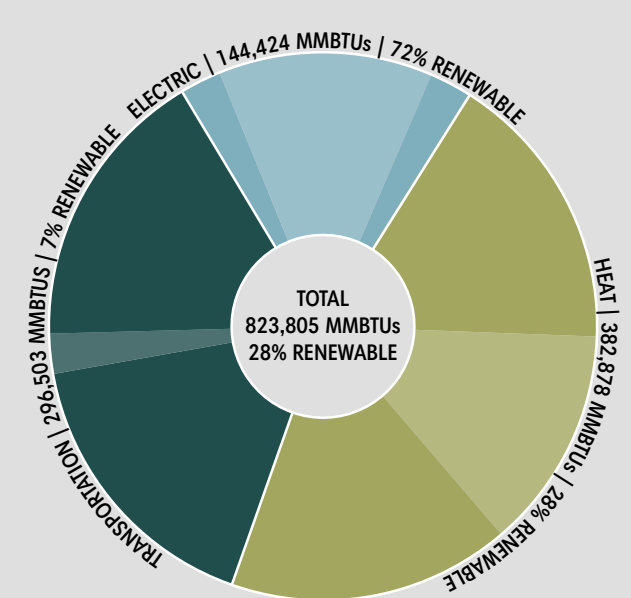
- ◉ Weatherization of existing buildings.
- ◉ Replacement of inefficient mechanical systems, equipment and vehicles.
- ◉ Siting and designing buildings to take advantage of passive solar.
- ◉ Construction that meets or exceeds state residential or commercial energy standards.
- ◉ Reducing vehicle miles driven for commuting and for daily activities.

5E. Future Energy Use

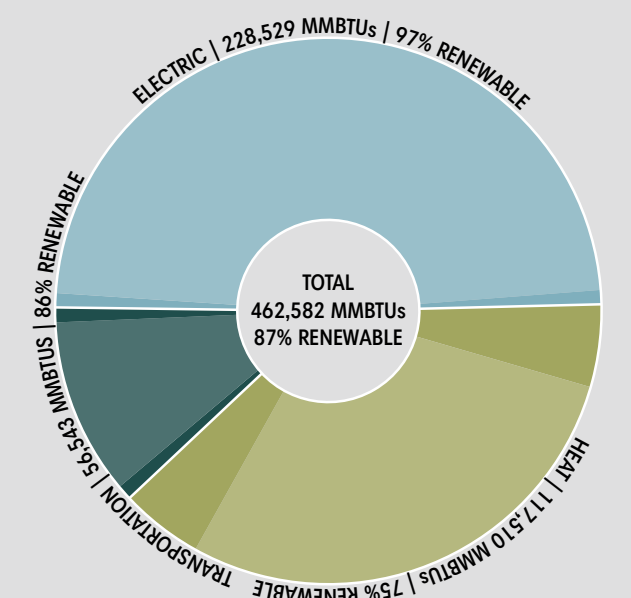
Future targets for energy use and conservation have been set for all Vermont municipalities as part of the state’s enhanced energy planning under Act 174 (see *“Berlin Total Energy Use, 2050 Target” on page 24*). This planning scenario envisions that total energy consumption in Berlin will decrease more than 40% between 2015 and 2050, and that use of fossil fuels for heating and transportation will be almost entirely phased out.

This plan’s land use, housing and transportation goals, objectives and policies call for new housing and economic development to be focused in the northeast quadrant of town where the availability of public infrastructure will allow it to be built at densities that will support transit, and where people can live close to employment, shopping and services in order to reduce energy used for transportation. Encouraging such a development pattern through the town’s land use regulations and provision of public infrastructure are the most effective and direct measures Berlin can take to move towards meeting the state’s energy goals.

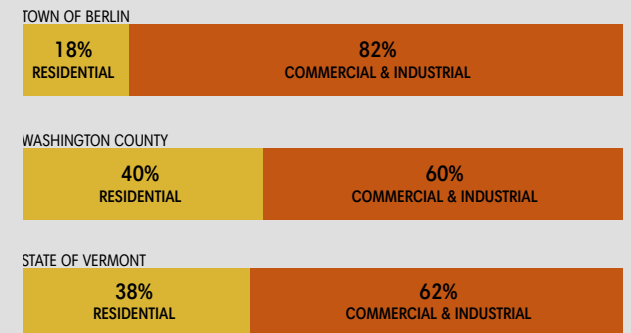
Berlin Total Energy Use, 2015 Actual



Berlin Total Energy Use, 2050 Target



Electricity Use by Sector, 2015



Source: 2015 actual energy use and 2050 energy use target from the Energy Action Network’s Community Energy Dashboard expressed in million of British Thermal Units (MMBTUs). 1 MMBTU = 293 kWh.

OBJECTIVES

- 1 Increase the amount of workforce housing in Berlin so that more people who work in town can live in town.
- 2 Diversify the housing stock and offer quality housing choices so that households across age and income ranges will be able to live in Berlin.
- 3 Guide most residential growth to the northeast quadrant where public infrastructure can support efficient, compact development patterns.
- 4 Discourage residential development on high-quality productive farmland, floodplains and river corridors, ridgelines and steep slopes, and ecologically sensitive lands.

POLICIES

- 1 Promote compact, walkable neighborhoods with a range of housing in the northeast quadrant in proximity to transit, employment, shopping and services.
- 2 Support and facilitate development of quality, affordable and workforce housing in Berlin.
- 3 Support and facilitate development of senior housing and in-home care programs in Berlin that will allow residents to remain living in the area as they age.
- 4 Seek the removal of mobile homes from flood hazard areas through either relocation or replacement with other forms of affordable housing.
- 5 Guide any new housing in rural areas to sites that minimize the conversion and fragmentation of working lands and forest blocks.
- 6 Discourage new housing on land not readily accessible from maintained public roads.

ACTIONS

- 1 Continue to extend municipal water and sewer in the northeast quadrant to support future residential development in a manner consistent with smart growth principles.
- 2 Adopt revised land use and development regulations that will implement the housing objectives and policies of this plan, including allowing for higher-density and multi-unit housing in the northeast quadrant.
- 3 Call upon the state to develop a program to facilitate the relocation of those homes within mobile home parks that are located in flood hazard areas.

6. HOUSING

6A. Current Conditions

Single-Family Housing

Owner-occupied, single-family homes comprise most of the housing in Berlin. The 2016 Grand List included 843 single-family homes (77% of those were homestead properties) and the median assessed value of a single-family home was \$223,100.

Approximately 60% of the homes in Berlin were built between 1960 and 2000. Growth was most rapid during the 20-year period following construction of Interstate 89. There has been less than 10 homes built per year in Berlin since 2000 (see "Housing Units in Berlin, 1990-2016" on page 26). Most of the housing built since 2000 has been in the Partridge Farms development.

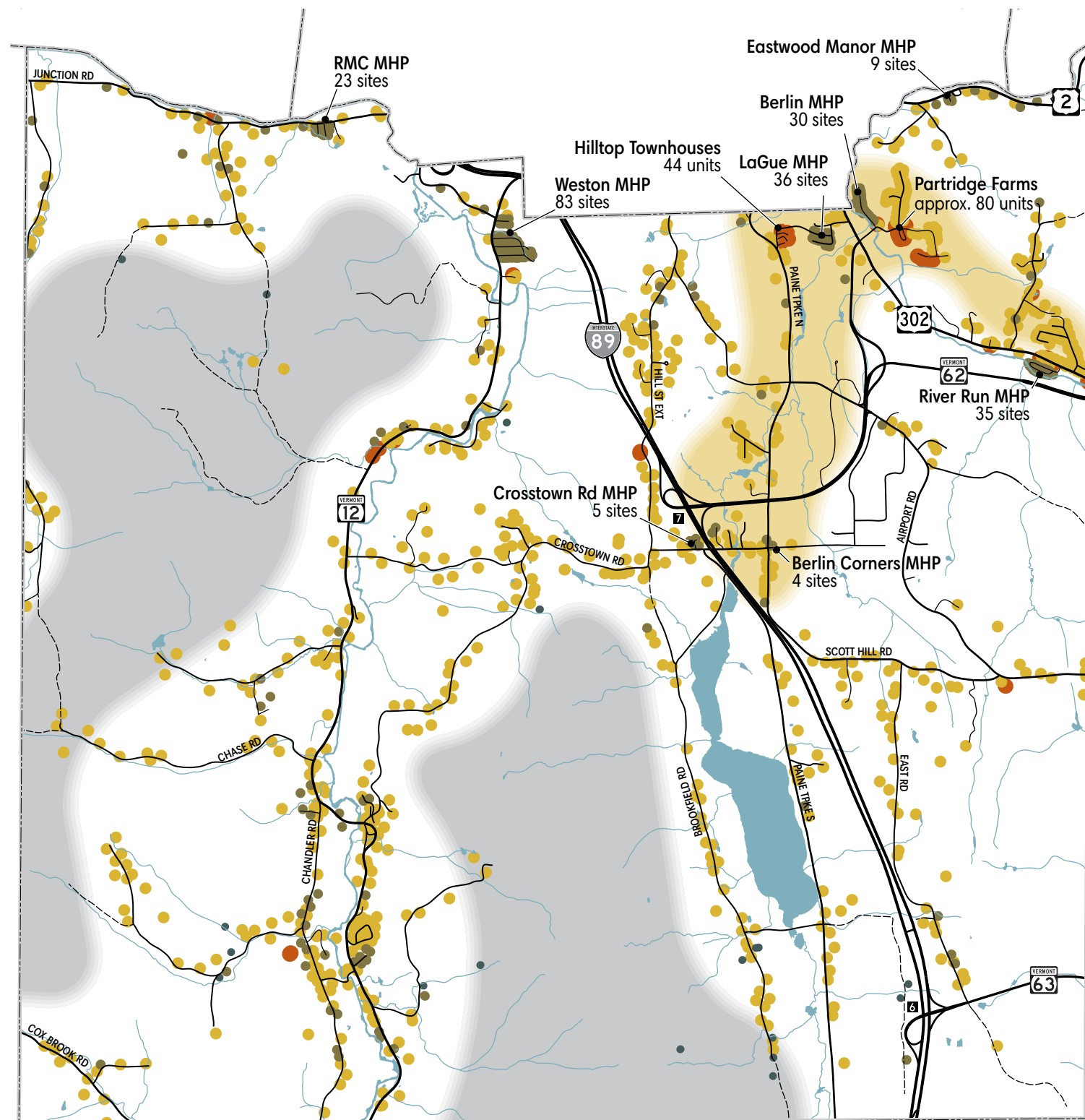
Mobile Home Parks

Mobile homes accounted for approximately 25% of the housing units in town according to the 2016 Grand List, and the majority (about 200) of those homes were located in one of eight mobile home parks in Berlin (see "Housing Map" on page 25). As of 2017, approximately 200 of the 225 available sites in the mobile home parks were occupied. Most of the vacant sites were in the River Run MHP where mobile homes were removed from the flood hazard area following Tropical Storm Irene in 2011. The average site rent (excluding utilities) in 2017 was approximately \$400 per month. The median assessed value of a mobile home in the parks was \$26,450 in 2016.

All of the mobile home parks in Berlin were privately owned prior to 2017 when the residents of Weston's MHP formed a cooperative and purchased the park. State laws and programs promote and facilitate formation of such cooperatives when private owners want to sell mobile home parks. It is likely that other parks in Berlin could ultimately become resident-owned cooperatives. This model can be effective if the cooperative is able to generate the revenue necessary to pay off the purchase and maintain the park. However, cooperatively-owned parks elsewhere in Vermont have struggled to maintain financial viability, particularly when faced with failing infrastructure.

The mobile home parks in Berlin were developed in the 1960s. They pre-date town zoning and most state and federal regulations that would apply if they were to be constructed today. The age, quality and condition of the infrastructure serving the parks presents a future liability

Housing Map



KEY

- Mobile home
- Single-family dwelling
- Multi-family dwelling
- Camp
- Residential development encouraged
- Residential development discouraged

SOURCE
2017 e911 Sites, VCGI

Central Vermont Housing Distribution Plan

The Central Vermont Regional Housing Distribution Plan found on pages 6-16 to 6-18 of the 2016 Regional Plan is incorporated into this plan by reference. It called upon Berlin to plan for the addition of 376 housing units between 2000 and 2015, and for 116 between 2015 and 2020. The plan was based on a projection that has proven to be significantly higher than actual growth rates in the region. While the targets are unrealistic, the goals, objectives, policies and actions outlined in this plan are consistent with the regional goal of providing needed housing within or adjacent to developed areas that are or can be efficiently served by public infrastructure and transportation.

for both park residents and the town as evidenced in other communities when the private infrastructure has failed and the municipality has had to act to protect public health and safety.

Several of the mobile home parks have homes that are located in the special flood hazard area (see “8. Flood Resilience” on page 29). Mobile homes are often not adequately anchored and therefore are at greater risk of being swept downstream or otherwise substantially damaged during a flood. Most owners of mobile homes in the special flood hazard area cannot afford to purchase high-cost flood insurance. As illustrated by the aftermath of Tropical Storm Irene, mobile homes in flood hazard areas are an issue statewide.

Multi-Unit Housing

Only about 5% Berlin’s housing is in multi-unit buildings. Most of those units are located either in:

- ◌ Hilltop Townhouses, a 44-unit affordable housing complex constructed in 1972, or
- ◌ Partridge Farm subdivision, which includes approximately 20 condominium units and 10 duplex units.

Zoning requirements and a lack of infrastructure has made construction of multi-unit housing infeasible in most areas of town. Proposed changes to the land use regulations are intended to encourage construction of multi-family housing in the northeast quadrant. The town is also working to provide infrastructure to the northeast quadrant to support higher-density, compact development.

Rental Housing

As typical of many Vermont towns, there is a limited supply of rental housing in Berlin. There was almost no change in the number of rental units between 2000 and 2016 (see “Housing Units in Berlin, 1990-2016” on page 26). There is unmet regional demand for rental housing, so this stagnation in rental housing development is likely due to the limited availability of developable land served by infrastructure and zoned for higher-density, multi-family housing in Berlin.

The lack of rental units may be preventing younger or lower income households from being able to find housing in Berlin. County-wide in 2016, 62% of households headed by someone 34 or younger rented, as did 50% of households earning less than \$35,000 per year. More than half the jobs in Berlin pay less than \$35,000, suggesting that one of the reasons many of those workers do not live in town may be that they cannot find housing.

Senior Housing

Approximately 25% of Vermont’s population is expected to be age 65 or older by 2030. Berlin’s population is older than the population of the state as a whole. The 2012-2016 American Community Survey estimated that 26% of Berlin residents were age 65 or older (as compared to 17% residents statewide). It is likely that many of Berlin’s current residents will want to ‘age-in-place’ over the next 20 years. Some will opt to stay in their current homes, but others will need or want an alternative to a single-family home on several acres or more of land that is smaller, more affordable, is served by transit, requires less maintenance and/or is accessible.

As of 2018, there is limited housing in Berlin available to meet the needs of seniors. The only dedicated senior housing was the 153-bed Woodbridge Rehabilitation and Nursing facility associated with Central Vermont Medical Center and the 141-bed Berlin Health and Rehabilitation Center. There were no independent living communities or assisted living facilities as of 2018. Looking forward, a continuum of housing from small rental or condo units suitable for active, healthy seniors through assisted living facilities that provide varying levels of support and care will be needed to allow people to remain in the area as they age.

6B. Housing Affordability

Based on the state definition of affordable housing, approximately 78% of ownership units and all of the mobile homes in the parks were ‘affordable’ in 2016. However, this basic calculation does not necessarily reflect the ability of households in the area to afford housing in Berlin. Nearly 80% of households in Washington County with an annual income less than \$35,000 were living in ‘unaffordable’ housing in 2016, as were more than one-third of those with incomes between \$35,000 and \$75,000. (see “Housing Affordability” on page 26).

The lack of affordable housing has been a statewide concern since the late 1990s. It is a problem that is affecting not only low-income households who have traditionally struggled to find decent, affordable housing, but middle-income households. All areas of the state need workforce housing – both rental and ownership units that are affordable to households earning the average wages for the jobs available in the area.

Living costs are further increased when transportation is considered. People may be able to find less expensive housing in outlying communities but any savings are often consumed by increased costs associated with commuting further to work. There are multiple financial,

social, environmental and quality of life benefits when people can live close to where they work.

6C. Future Housing Needs

Finding housing that is suitable, affordable and located near jobs and needed services is a challenge for many households already – or who would consider – living in Berlin. Nearly all of the people working in Berlin live elsewhere and for many that is likely because they cannot find housing in town (see “Commuting Patterns” on page 28).

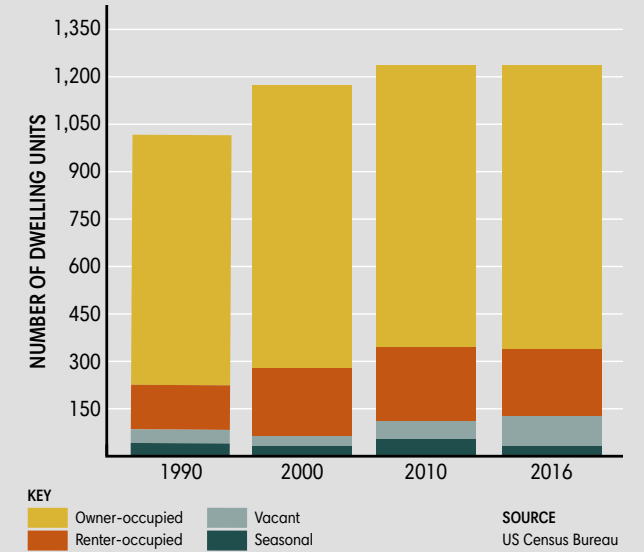
Average household size has declined and lifestyle preferences have changed in recent decades leading to a mismatch between what is available and what people want for housing. Berlin’s housing stock is dominated by single-family homes on rural lots an acre or more in size. A greater diversity of housing options (apartments, townhouse/condo units, cottage/small homes on small lots, etc.) will allow households of various sizes, ages and income levels to live in Berlin.

Berlin has a substantial senior population that is expected to increase during the next two decades as discussed above. Seniors from surrounding rural communities may also look to Berlin for housing that is more accessible and closer to services. Berlin will need both independent and assisted living senior housing options so that residents can remain in the area as they age.

As a centrally-located employment center, Berlin is well-situated to accommodate additional housing with reduced transportation costs for those working in town or the greater Barre-Montpelier area. The northeast quadrant is accessible from major highways, is served by public transit and is close to shopping and services including medical care – making it a suitable location for both senior and workforce housing. The town is working to provide the infrastructure needed to facilitate residential development in the northeast quadrant (see “4. Utilities & Facilities” on page 21).

In conjunction with encouraging residential development in the northeast quadrant, Berlin is seeking to discourage housing in the remote areas of town not currently served by public roads and utilities. Dispersed, low-density, rural housing costs more to service than compact, centrally-located housing and increases the amount of infrastructure that must be maintained. Often such housing pays less in taxes than it costs to provide with municipal and educational services, increasing the tax burden on all property owners in town. Further, building more rural housing would not be consistent with the goal of diversifying Berlin’s housing stock.

Housing Units in Berlin, 1990-2016



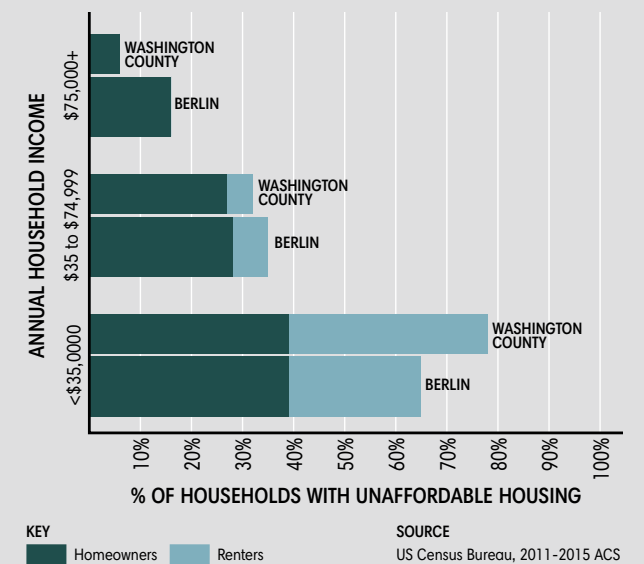
Housing Affordability

Under Vermont statute affordable housing means:

- ◌ Owner-occupied housing with costs (mortgage, taxes, insurance & condo fees) that do not exceed 30% of the gross annual income of a household earning 120% of the county median income; or
- ◌ Renter-occupied housing with costs (rent, utilities & condo fees) that do not exceed 30% of the gross annual income of a household earning 80% of the county median income.

That definition equated to a owner-occupied home valued at up to \$300,000 (\$2,175/month housing costs) or a rental unit with costs not to exceed \$1,450/month for Washington County in 2016.

The American Community Survey also provides estimates of the percentage of households spending more than 30% of their income on housing costs as shown in the chart below:



OBJECTIVES

- 1 Focus commercial and industrial growth in the northeast quadrant.
- 2 Revitalize existing commercial areas in the northeast quadrant to enhance aesthetics, improve access, and increase economic competitiveness.
- 3 Increase the amount of workforce housing in Berlin so that more people who work in town can live in town.
- 4 Maintain the base of working farm and forest land outside the northeast quadrant necessary to support viable farming and forestry businesses.
- 5 Maintain a balanced tax base that generates the revenue necessary to provide municipal services without overburdening property owners.

POLICIES

- 1 Ensure that town government supports economic development, maintains a strong relationship with the town's business community, and assists business growth and development.
- 2 Work with prospective developers and entrepreneurs to identify suitable sites for new or expanded businesses in Berlin and navigate the permitting process.
- 3 Support proposed development projects seeking state permits that conform to the objectives and policies of this plan and Berlin's land use and development regulations.

ACTIONS

- 1 Continue to implement the 2008 Economic Development Plan's recommended strategies, including pursuing a local option tax.
- 2 Seek a new town center designation from the state for the Berlin Mall and surrounding area.
- 3 Continue to extend municipal water and sewer in the northeast quadrant to support future economic development in a manner consistent with smart growth principles (as defined in statute).
- 4 Adopt land use and development regulations that will implement the economic development objectives and policies of this plan.
- 5 Maintain an up-to-date inventory of property available for commercial and industrial development, infill and redevelopment.
- 6 Work with Vermont state and federal elected representatives to again petition the U.S. Postal Service to re-establish a post office and zip code for Berlin.

7. ECONOMIC DEVELOPMENT

7A. Current Conditions

The availability of developable land, convenient highway, rail and airport access, and a central location between Montpelier and Barre have made Berlin into a regional employment and service center. There were more than 5,200 jobs based in Berlin in 2016 according to the Vermont Department of Labor (*see "Jobs & Business Establishments" on page 28*). Commercial and industrial property accounted for approximately 45% of the town's 2016 grand list value.

Berlin's economy has long been dominated by three sectors – healthcare, insurance and retail. More information about current economic conditions can be found in Berlin's [2008 Economic Development Plan](#).

Healthcare and Insurance

Central Vermont Medical Center was built in 1968 and is now the largest employer in town with approximately 1,500 workers in 2018. The hospital has served as a magnet attracting other healthcare providers and related businesses to locate in Berlin including the offices of Blue Cross and Blue Shield Vermont, the largest health insurance provider in the state. Approximately 30% of job in Berlin were in the healthcare sector in 2016.

Retail

The retail sector accounted for more than 20% of jobs and business establishments in Berlin, and generated \$68 million in taxable receipts in 2016. Retail activity in Berlin reflects larger economic trends with growth in the early 2000s, followed by contraction during the Great Recession, and recovery back to the levels seen in the early 2000s by 2015. Retail is focused along Route 302 and the Berlin Mall off Exit 7 (*see "Commercial and Industrial Areas" on page 28*).

Route 302, a connecting highway between two urban centers, has been a preferred location for national and regional retailers serving the Central Vermont market for more than 50 years. In recent years, there has been some turnover in the businesses located along Route 302 and redevelopment, but little overall growth. The corridor is largely built-out, but proposed changes to the town's land use and development regulations are intended to facilitate infill, redevelopment and revitalization (*see "Future Land Use Recommendations" on page 17*).

Berlin Mall was constructed in 1986 as a regional shopping destination. The Berlin Mall has been more

successful than many others in adapting to changes in the retail sector. The Wal-Mart, which opened in 2000, serves as major anchor that generates customer traffic for the mall. The addition of Planet Fitness and the freestanding Kohl's department store in the last several years suggests that the location is viable for new businesses. The mall owner is currently planning to transform the Berlin Mall site into a walkable, mixed-use town center (*see "New Town Center" on page 12*).

Light Industry

Much of the recent job growth in Berlin has been in industrial sectors such as wholesale trade, transportation and distribution, and construction and in businesses based in the airport business park. These businesses have chosen to locate in Berlin primarily for two reasons: the availability of suitable land for development and transportation access. The airport business park is now fully served by infrastructure, which has opened up the possibility for higher density development, and a significant amount of buildable land remains available to accommodate future growth (*see "Utilities and Facilities Map" on page 21*).

Agriculture and Forestry

While the northeast quadrant of Berlin has become a regional center of commerce and industry, much of the remainder of town remains rural with a working landscape that supports agriculture and forestry businesses. There were 10 farm parcels and 44 woodland parcels on the 2016 grand list accounting for nearly 20% of the land in town. Approximately one-third of the land in town is farm or forest land enrolled in Current Use (*see "Berlin Conservation and Open Space Map" on page 6*).

Agriculture in Berlin, once dominated by dairy farms, has diversified. Berlin is home to poultry farms, horse farms, vegetable farms, and a vineyard. Managed forests are producing timber and other forest products like maple syrup. Agri-tourism and agri-education businesses are a growing market segment building upon the success of Vermont-branded farm and food products. There are also many hobby and homesteading farms that are not primary income sources for their operators but which are essential to supporting Berlin's agricultural economy and maintaining rural character.

7B. Planning Considerations

Taxes

Berlin's [2008 Economic Development Plan](#) recommended that Berlin enact a local option tax and consider eliminating the business equipment and inventory tax the town currently imposes. A local option tax would have the greatest impact on larger retail businesses due to their sales volume. A 1% local option tax would have raised about \$535,000 and could have reduced the amount raised through property taxes by more than 20% in 2016. If town center plans are realized, the amount to be raised through a local option tax would likely increase.

Development Regulations

The [2008 Economic Development Plan](#) also recommended that Berlin adjust zoning district boundaries to better align with the town's vision (*see "1A. Vision" on page 1*), revise zoning district standards to allow for higher-density workforce housing in appropriate areas, and strengthen the regulation's site, building and sign design standards to enhance the quality and aesthetics of new development and redevelopment. The Planning Commission's proposed zoning changes are intended to implement those recommendations.

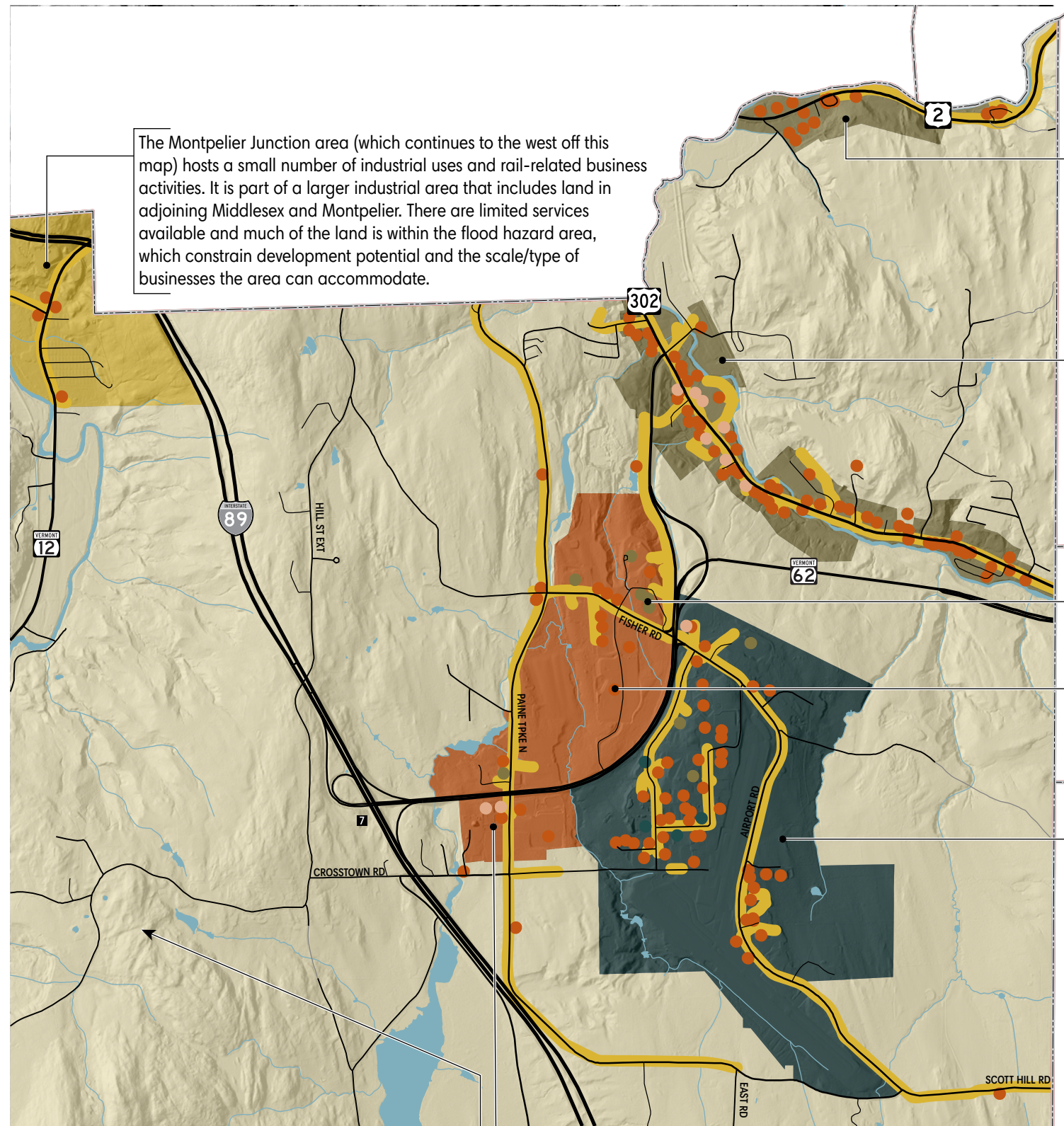
Infrastructure Improvements

Berlin's economic success is dependent on the provision of high-quality infrastructure. The town is actively working to provide water and sewer to support future growth in the northeast quadrant of town. As discussed in [Chapter 3. Transportation \(page 19\)](#) and in [Chapter 4. Utilities & Facilities \(page 21\)](#), improvements to transportation infrastructure – particularly major state highway intersections – along with ensuring adequate availability of safe and affordable childcare, will also be necessary to further the town's economic development objectives.

On-Farm Businesses

The proposed changes to Berlin's land use regulations would allow for expanded on-farm businesses in recognition that agriculture is diversifying and nontraditional agricultural businesses improve the economic viability of farming and contribute to maintaining working lands and the town's rural character.

Commercial and Industrial Areas



The Montpelier Junction area (which continues to the west off this map) hosts a small number of industrial uses and rail-related business activities. It is part of a larger industrial area that includes land in adjoining Middlesex and Montpelier. There are limited services available and much of the land is within the flood hazard area, which constrain development potential and the scale/type of businesses the area can accommodate.

The Route 2 corridor is constrained by the river on the north side of the highway and steep terrain on the south side, which limits opportunities for expansion and growth. The area is not served by public water or sewer, but does have three-phase power. Traffic volume on Route 2 is approximately 10,000 vehicles per day. As of 2018, there were about 20 businesses in the area.

Route 302 is a primarily retail corridor that serves as a shopping and service destination for the larger region. Its predominate development pattern is that of a typical commercial strip with single-story retail buildings set back from the highway and large parking areas in front. There is not a significant amount of land remaining that is suitable for development, but many of the existing developed sites have potential for infill or redevelopment. The Route 302 corridor is served by water and sewer infrastructure, three-phase power and high-speed internet. Route 302 is a high-traffic corridor linking downtown Montpelier and Barre City that is traveled by more than 12,000 vehicles per day. As of 2018, there were approximately 70 businesses in this area.

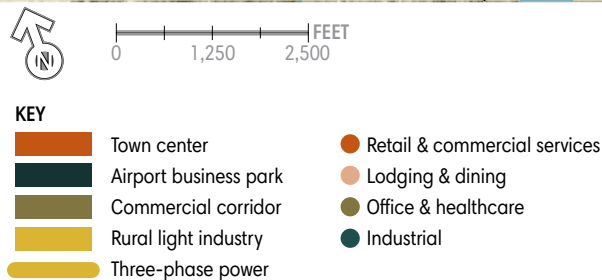
Central Vermont Medical Center complex

Berlin Mall was constructed in 1986. The approximately 250,000 square feet of retail space was occupied by 17 retail and service businesses in 2018.

The Airport Road business park is developed with a mix of office, storage and distribution, manufacturing and other industrial uses. This area is still building out and there remains undeveloped land available for additional growth. As of 2018, there were approximately 70 businesses in this area, which was fully served by municipal water and sewer, three-phase power and high-speed internet, and had convenient highway and airport access.

Lodging, dining and traveler service businesses clustered near Exit 7

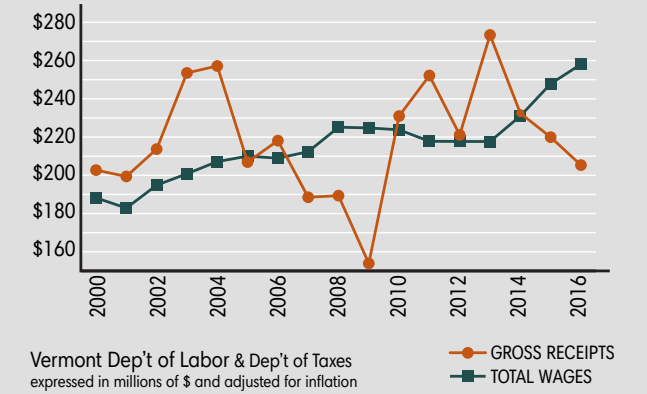
There are a few small industrial and commercial properties in Riverton, and dispersed along the Route 12 corridor (off this map).



SOURCE
2017 E-Sites, VCGI

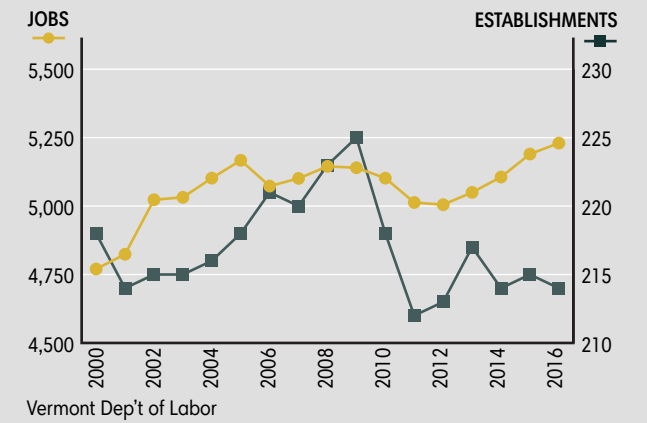
Economic Activity

Total wages paid by Berlin employers increased due to job growth, while gross receipts were variable.



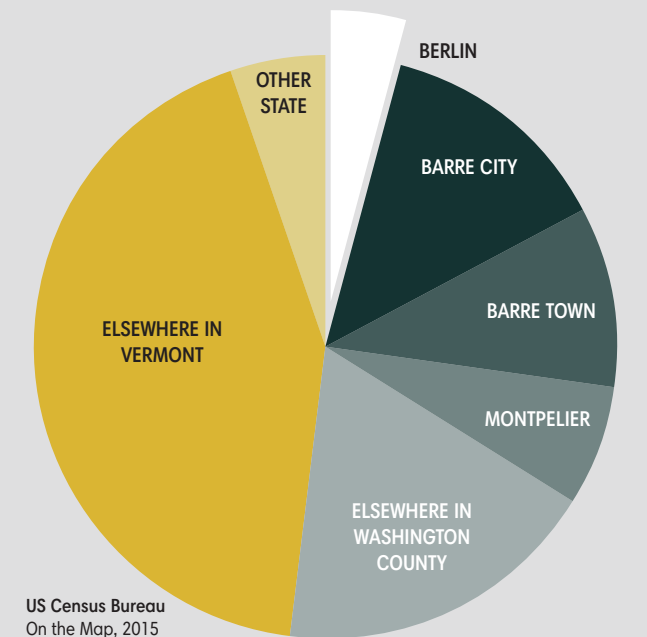
Jobs & Business Establishments

Approximately 500 jobs were created in Berlin between 2000 and 2016, with little change in the number of business establishments.



Commuting Patterns

96% of jobs in Berlin were held by someone who lived outside of town in 2015 as shown below:



US Census Bureau
On the Map, 2015

OBJECTIVES

- 1 Mitigate potential flood and erosion hazards, and increase the community's resilience to flooding and other disasters.
- 2 Prevent increased flood and erosion hazards resulting from irresponsible land use and development practices.
- 3 Improve or maintain natural riparian functions along streams and rivers in Berlin to prevent or minimize future flood and fluvial erosion hazards.
- 4 Encourage more property owners to purchase flood insurance for buildings within the Special Flood Hazard Area.
- 5 Reduce the number of repetitive loss properties and residential buildings in the floodway in Berlin through means such as buyouts.

POLICIES

- 1 Guide future housing to locations outside floodplains and river corridors.
- 2 Locate structures and impervious areas away from surface waters and encourage landowners to maintain or establish riparian buffers.
- 3 Locate new, and relocate existing, public infrastructure and facilities out of floodplains and river corridors whenever feasible.
- 4 Ensure that any development within the Special Flood Hazard Area fully conforms to the minimum requirements of the National Flood Insurance Program.
- 5 Ensure that stormwater runoff from developed land is managed at the source so it will not place an undue burden on public infrastructure, increase flood hazards or reduce water quality.
- 6 Support efforts to reduce the severity of future floods such as allowing rivers to access their floodplains, providing compensatory flood storage, and replacing/removing infrastructure constricting water flow.

ACTIONS

- 1 Update and re-adopt Berlin's All Hazards Mitigation and Emergency Operations plans, and ensure they are consistent with the goals, objectives and policies of this plan.
- 2 Implement the hazard mitigation programs, projects and activities identified in Berlin's All Hazards Mitigation Plan.
- 3 Maintain eligibility and continue to participate in the National Flood Insurance Program.
- 4 Adopt revised land use regulations that will implement the objectives and policies of this plan related to flood hazards, riparian areas and stormwater management.

8. FLOOD RESILIENCE

8A. Hazard Areas

Floodplains

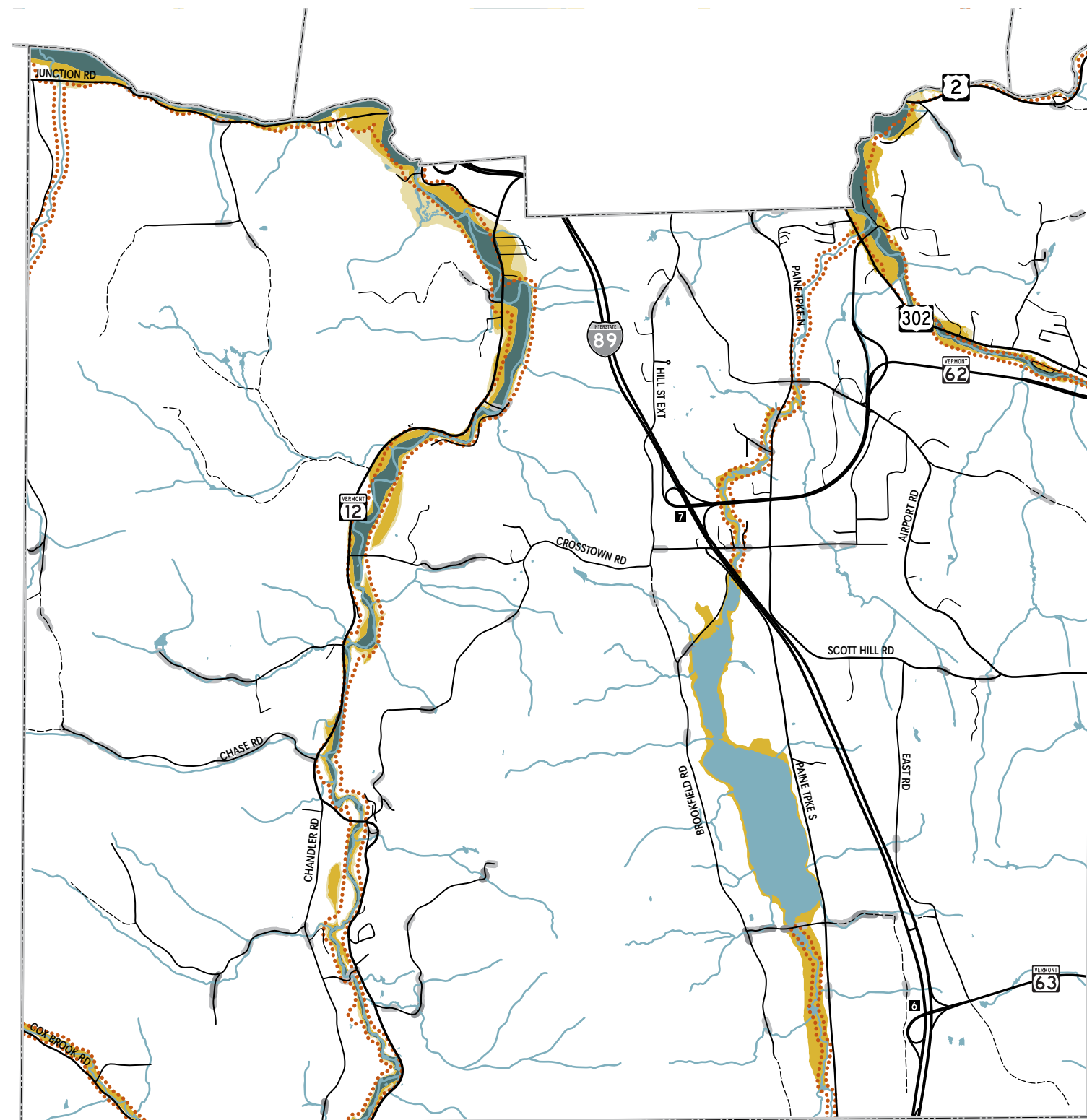
Berlin's landform has resulted in roads and development sharing relatively narrow valleys with streams and rivers in many areas of town. Flood conditions regularly occur in Berlin during major storms and as a result of rapid snowmelt and ice jams. Flooding is often minor or affects only a limited area. However, the frequency and intensity of major floods may have increased during the past two decades as a result of climate change leading to more severe storms that can cause widespread, catastrophic property damage and potential loss of life (see "Major Floods in Berlin, 1927-2017" on page 30).

Tropical Storm Irene in 2011 resulted in severe flooding in Berlin with up to five feet of floodwaters in some areas resulting in total damages that exceeded \$2.5 million. It was largest storm to occur in Vermont since the devastating 1927 flood. While Irene was remarkable because of its statewide impact, it was only one of a number of storms that caused significant local damage in Berlin since the late-1990s. There was also severe flooding in Berlin in May 2011 (see "Damage in Berlin from Recent Storms" on page 30).

Flooding is often described as a natural disaster, but it is actually a natural process that would occur with little damage if it were not for human activities such as:

- Tree removal, compaction of soil and construction of impervious surfaces within watersheds. This can cause higher quantities of stormwater runoff to flow into streams and rivers more quickly during storms, leading to rapid downstream flooding.
- Construction of buildings and infrastructure within flood-prone areas, which is often followed by efforts to protect that investment from flood damage by straightening, berming or armoring the adjacent stream or river. This can increase the volume, speed and power of the stream or river during a storm by preventing it from meandering, accessing its floodplains and dissipating its energy naturally.
- Building infrastructure such as bridges or culverts within or over rivers or streams that constricts the channel. This can reduce the carrying capacity of the river or stream and lead to ice or debris jams that block water flow resulting in unanticipated localized flooding.

Floodplain and River Corridor Map



KEY

- River corridor
- Small streams with 50-foot buffer
- Road segment with significant erosion potential
- Road segment with moderate erosion potential
- Floodway (1% or 100-year floodplain)
- Special flood hazard area (1% or 100-year floodplain)
- 0.2% or 500-year floodplain

SOURCE
 2015 River Corridors, VTANR
 2017 Hydrologically Connected Road Segments, VTANR
 2015 National Flood Hazard Layer, FEMA

Flood damage can be mitigated by human actions. Mitigation requires an understanding of the natural processes and forces at work in a stream or river corridor so that development in flood-prone areas can be appropriately sited and designed to avoid or withstand flooding, and to not contribute to increased flooding downstream.

Berlin participates in the National Flood Insurance Program (NFIP), which is a federal program intended to improve floodplain management, and to assist communities and property owners when severe flooding occurs. Property owners in Berlin can purchase flood insurance because the town is enrolled in the NFIP. To maintain eligibility for the NFIP, Berlin must regulate development in mapped floodplains as required by federal regulations. In 2017, Berlin met the requirements for the Federal Emergency Management Administration's Community Rating System, which recognizes that the town is exceeding minimum NFIP requirements, resulting in a 5% reduction in flood insurance rates for Berlin property owners.

FEMA has mapped the town's floodplains. A floodplain is the area of land alongside a water body that is naturally subjected to flooding during periods of high water. FEMA categorizes floodplains into three distinct areas (see *"Floodplain and River Corridor Map"* on page 29):

- **Floodway**, which includes the stream or river channel and the adjacent land where there will be flowing water during a flood.
- **100-Year Floodplain**, which is the area where floodwaters will accumulate during the 100-year storm. The 100-year storm statistically has a 1% chance of occurring in any given year. In Berlin, it is a storm that produces approximately 5.5 inches of rain in a 24-hour period.
- **500-Year Floodplain**, which is the area that will flood during a 500-year storm (statistical 0.2% chance of occurring in any given year).

As of 2017, there were approximately 160 buildings in Berlin located within the Special Flood Hazard Area (the floodway and the 100-year floodplain):

- 111 of those buildings were mobile homes located in the Weston, Berlin and River Run mobile home parks.
- 72 of those buildings were in the floodway (including 47 mobile homes).
- Only 45 (28%) of those buildings had flood insurance policies.

○ 3 of those buildings were critical or public structures (VTrans Central Garage Complex on Route 302).

○ 1 was a repetitive loss property (a building that has sustained \$1,000 or more in flood damage on at least 2 occasions in any 10-year period) remaining. The town purchased the only other repetitive loss property in Berlin through FEMA's Hazard Mitigation Buyout Program in 2017.

An additional 28 buildings and the solar facility on Nelson Drive were located in the 500-year floodplain as of 2017.

River Corridors

The NFIP applies to areas at risk of inundation flooding. That is not the only flood hazard in Berlin, however. Many small streams flow down Berlin's hillsides to the major rivers, which can become powerful torrents of water during heavy storms or rapid snowmelt. They can erode their banks or even cut new channels causing massive damage in the process.

This type of flood hazard is known as fluvial erosion. While it may be likely in floodplains also subject to inundation, there are areas in Berlin that are not FEMA mapped flood hazard areas that are at risk of flood-related damage due to fluvial erosion. Much of the property and infrastructure damage that has occurred during severe storms in Berlin since the late 1990s has been more a result of fluvial erosion than inundation flooding.

To address fluvial erosion hazards, the Vermont River Management Program has defined and mapped 'river corridors' along all streams and rivers (see *"Floodplain and River Corridor Map"* on page 29). The river corridor is intended to encompass land adjacent the stream or river needed to accommodate its meandering, floodplain and riparian functions so that it can remain in, or be restored to, a naturally stable condition thus reducing future erosion hazards. This approach is based on giving rivers room to move rather than seeking to armor or berm them to prevent their movement.

As of 2017, there were 172 structures (including 85 mobile homes) in Berlin located within mapped river corridors or within 50 feet of small streams. 70 (41%) of those were outside the Special Flood Hazard Area.

There were also 17.5 miles of roads located within mapped river corridors or within 50 feet of small streams, 13.5 of which were town roads. The state has further identified and classified roads at risk of erosion (see *"Floodplain and River Corridor Map"* on page 29). In 2018, Berlin will need to obtain a Municipal Roads

General Permit from the state that will require improved stormwater management on those road segments in proximity to rivers and streams.

The state is seeking to conserve land within mapped river corridors through its Vermont River Corridor Easement Program, which offers landowners a financial incentive to allow for restoration of channel stability and reduction in the natural erosive forces of the river over time. Approximately 40 acres of land along the Dog River have been conserved through this program (see *"Berlin Conservation and Open Space Map"* on page 6).

Berlin does not regulate development within mapped river corridors in a manner similar to development within mapped floodplains. However, the state regulates development within river corridors for projects that require an Act 250 permit.

Further, the town's zoning regulations effectively prevent development within much of the mapped river corridor area, and include a requirement to maintain naturally vegetated riparian buffers on all rivers and streams. Proposed revisions to the zoning regulations are intended to address previously developed properties that lack riparian buffers. The goal is to guide development away from rivers and streams and allow riparian buffers to become established along their banks over time.

8B. Mitigation Plans

The risks to life and property associated with flooding in Berlin can be reduced or eliminated through hazard mitigation. Specific hazard mitigation projects in Berlin are identified in the two plans described below:

- Berlin has an adopted [Local Mitigation Plan](#). That plan was most recently approved by FEMA in 2013 and the town intends to update the plan in 2018. The Local Mitigation Plan (as most recently adopted) is adopted into this plan by reference, including the Proposed Hazard Mitigation Programs, Projects and Activities (listed on pages 27-29 in the 2013 plan), a number of which are intended to mitigate hazards from flooding and severe storms.
- The 2009 [Dog River Corridor Plan](#) identifies potential projects to improve channel stability in the Dog River and its tributaries. That plan is adopted into this plan by reference, including the projects listed in Table 7.1 on pages 90-91.

Through implementation of those plans, Berlin would also become more resilient – able to adapt to changing conditions and rapidly recover from disruptions due to disasters.

Major Floods in Berlin, 1927-2017



Historic floods (prior to 1980) are identified from USGS river gauge and NOAA weather data. Since 1980, floods have been assessed to determine whether they qualify as federally-declared disasters based on the amount of damage to buildings and infrastructure and the current threshold is \$1 million across the county.

Damage in Berlin from Recent Storms

29 OCT 2017	Flood
29 JUN 2017	Flood, 2-3" of rain
15 APR 2014	Flood, 4-6" of rain and rapid snowmelt
25 JUN 2013	Flash flood, 1-2" of rain
27 AUG 2011	Tropical Storm Irene, 3-7" of rain, Winooski crested at 19.05' in Montpelier
27 MAY 2011	Flash flood, 3-5" of rain, Winooski crested at 17.59' in Montpelier
23 APR 2011	Flash flood, 1-2" of rain and rapid snowmelt
21 JUL 2008	Flash flood, 2-5" of rain
9 JUL 2007	Flash flood, 3-6" of rain
14 APR 2002	Flood, 1-3" of rain, Winooski crested at 10.37' in Montpelier
17 DEC 2000	Flood, 3" of rain
16 SEP 1999	Tropical Storm Floyd, 5-7" of rain
27 JUN 1998	Flash flood, 3-6" of rain
15 JUL 1997	Flash flood, 2-4" of rain
19 JAN 1996	Flood and ice jam, Winooski crested at 14.64' in Montpelier



PHOTO: MARK COLLIER

9. IMPLEMENTATION PROGRAM

The actions identified in each chapter, which are intended to be the means by which the Town of Berlin will implement vision, goals and objectives of this plan, are summarized below with an indication of when the action is currently anticipated to occur (some actions are an ongoing part of town government and are therefore not assigned to a particular year) and the parties involved. While this plan can be in place for up to eight years, specific actions are assigned only for the next five years with the expectation that needs and priorities may evolve over time and that several of the actions, once underway or completed, are likely to generate a need for follow-up actions not currently identified. Not all of the 20 actions listed below may be fully completed within the 8-year planning period, but the Town of Berlin recognizes the actions assigned to a specific year as top priorities for the community and intends to make as much progress as possible on their successful implementation.

<p>1 Adopt revised land use and development regulations that will implement the vision, goals, objectives and policies of this plan.</p>	<p>LAND USE, page 7, Action 1 TRANSPORTATION, page 19, Action 2 HOUSING, page 25, Action 2 ECONOMIC DEVELOPMENT, page 27, Action 4 FLOOD RESILIENCE, page 29, Action 4</p>	<p>2019 Planning Commission, Selectboard, town voters</p>
<p>2 Update and re-adopt Berlin’s All Hazards Mitigation and Emergency Operations plans, and ensure they are consistent with the goals, objectives and policies of this plan.</p>	<p>FLOOD RESILIENCE, page 29, Action 1</p>	<p>2019 Emergency Management Team, Planning Commission, Selectboard, Central Vermont Regional Planning Commission</p>
<p>3 Maintain a capital improvement program that is aligned with the goals and objectives of this plan, and meets the requirements for the proposed new town center designation.</p>	<p>UTILITIES & FACILITIES, page 21, Action 1</p>	<p>2020 Town Administrator, Assistant Town Administrator and department heads, Selectboard, Planning Commission, town voters</p>
<p>4 Seek a new town center designation from the state for the Berlin Mall and surrounding area, which will require the following actions by the town: adopt an official map, adopt a capital improvement program, execute a community investment agreement with town center property owners, and dedicate water/wastewater reserves to the town center.</p>	<p>LAND USE, page 7, Action 2 ECONOMIC DEVELOPMENT, page 27, Action 2</p>	<p>2020 Planning Commission, Selectboard, town center property owners</p>
<p>5 Seek village center designations from the state for Riverton and Berlin Corners.</p>	<p>LAND USE, page 7, Action 3</p>	<p>2021 Planning Commission, Selectboard</p>
<p>6 Maintain an up-to-date inventory of property available for commercial and industrial development, infill and redevelopment.</p>	<p>ECONOMIC DEVELOPMENT, page 27, Action 5</p>	<p>2022 Town Administrator and Assistant Town Administrator, Central Vermont Economic Development Corporation, Central Vermont Regional Planning Commission</p>
<p>7 Develop and adopt a policy regarding the construction and maintenance of sidewalks along public roads.</p>	<p>TRANSPORTATION, page 19, Action 3</p>	<p>2023 Highway Superintendent, Selectboard</p>
<p>8 Continue to extend municipal water and sewer in the northeast quadrant to support future economic growth and residential development in a manner consistent with smart growth principles (as defined in statute) and as necessary to protect public health, and dedicate reserve capacity to support development within the proposed new town center.</p>	<p>LAND USE, page 7, Action 4 UTILITIES & FACILITIES, page 21, Action 2 HOUSING, page 25, Action 1 ECONOMIC DEVELOPMENT, page 27, Action 3</p>	<p>ONGOING Town Administrator, Assistant Town Administrator, Sewer Commission, Selectboard, town voters</p>



PHOTO: TOBY TALBOT

9 Work with Vermont state and federal elected representatives to again petition the U.S. Postal Service to re-establish a post office and zip code for Berlin.	LAND USE , page 7 , Action 5 ECONOMIC DEVELOPMENT , page 27 , Action 6	ONGOING Selectboard, Town Administrator, state and federal elected representatives
10 Continue to work with Montpelier, Barre City, Central Vermont Regional Planning Commission and VTrans to complete the Central Vermont Regional Bike Path in Berlin.	LAND USE , page 7 , Action 6	ONGOING Planning Commission, Selectboard, Central Vermont Regional Planning Commission
11 Continue to actively participate in the Central Vermont Transportation Advisory Committee to advocate for the state-funded transportation projects needed to further the objectives and policies of this plan.	TRANSPORTATION , page 19 , Action 1	ONGOING Central Vermont Regional Planning Commission Transportation Advisory Committee representatives, Planning Commission, Selectboard
12 Seek implementation of the priority transportation projects listed in Section 3B of this plan.	TRANSPORTATION , page 19 , Action 4	ONGOING Central Vermont Regional Planning Commission Transportation Advisory Committee representatives, Planning Commission, Selectboard
13 Explore the feasibility and potential cost savings of partnering with neighboring communities to regionalize public safety and emergency response services.	UTILITIES & FACILITIES , page 21 , Action 4	ONGOING Selectboard, Town Administrator, Assistant Town Administrator and department heads
14 Call upon the state and supervisory union to continue efforts to control education costs, including via shared services & consolidation.	UTILITIES & FACILITIES , page 21 , Action 5	ONGOING School Board representatives, Selectboard, state elected representatives, VT Department of Education, town voters
15 Continue to implement the 2008 Economic Development Plan's recommended strategies, including pursuing a local option tax.	ECONOMIC DEVELOPMENT , page 27 , Action 1	ONGOING Selectboard, Town Administrator and Assistant Town Administrator, Central Vermont Economic Development Corporation, town voters
16 Implement the stormwater practices and projects recommended in Berlin's 2017 Stormwater Management Plan.	UTILITIES & FACILITIES , page 21 , Action 3	ONGOING Selectboard, Town Administrator, Highway Superintendent
17 Implement the hazard mitigation programs, projects and activities identified in Berlin's All Hazards Mitigation Plan.	FLOOD RESILIENCE , page 29 , Action 2	ONGOING Emergency Management Team, Planning Commission, Selectboard
18 Maintain eligibility and continue to participate in the National Flood Insurance Program.	FLOOD RESILIENCE , page 29 , Action 3	ONGOING Zoning Administrator, Development Review Board, Planning Commission, Selectboard
19 Call upon the state to develop a program to facilitate the relocation of those homes within mobile home parks that are located in flood hazard areas.	HOUSING , page 25 , Action 3	ONGOING Selectboard, Planning Commission, state elected representatives
20 Participate in the Section 248 process and call upon the Public Utilities Commission to make decisions that further the goals, objectives and policies of this plan.	ENERGY , page 23 , Action 1	ONGOING Selectboard, Planning Commission



PHOTO: TOBY TALBOT