

Resilience

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 inappropriate land use and development practices
3. Improve or maintain natural riparian functions along streams and rivers in Norwich to prevent or minimize future flood and erosion hazards
4. Increase the use of flood insurance for structures within the Special Flood Hazard Area

Policies

1. Guide structures and impervious areas away from surface waters and encourage landowners to maintain or establish riparian buffers
2. Site critical facilities (including municipal) outside of floodplains where feasible
3. Ensure that any development within the Special Flood Hazard Area fully conforms to the National Flood Insurance Program
4. Provide support to Norwich property owners through membership of the Community Rating System 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. Complete the CRS certification process to qualify for maximum state reimbursement for flood events and assist homeowners
2. Update and re-adopt the Norwich All Hazards Mitigation and Emergency Operations Plan (expires August 2020), and ensure they are consistent with the goals, objectives, and policies of this plan
3. Implement the hazard mitigation programs, projects and activities identified in Norwich's 2015 All Hazard Mitigation Plan and subsequently adopted plans
4. Continue to participate and meet the requirements of the National Flood Insurance Program, so that owners within floodplains are eligible for flood insurance

5. Adopt revised land use regulations that will implement the objectives and policies of this plan related to flood hazards, riparian areas and stormwater management

Floodplains

The landform of Norwich is similar to many other communities in the Upper Valley – featuring winding streams draining narrow valleys and backwater riparian features created as a result of flood control/energy generation dams installed in the early twentieth century. Roads and development compete with streams for space on valley floors introducing inevitable conflict. It is expected that this conflict will increase in magnitude and frequency as the climate crisis advances.

On August 28, 2011 TS Irene swept through Vermont, the resulting damage to public infrastructure in Norwich exceeded \$1 million. On July 1, 2017 a severe storm impacted Norwich and caused an estimated \$3 million in damage. Both events impacted roads, bridges and culverts.

Flooding while frequently portrayed as a disaster is better understood as a natural process that would occur with less damage to public infrastructure and private property if the following human activities were avoided:

- Tree clearing, compaction of soil, and addition of impervious surfaces all cause higher volumes and velocities of stormwater runoff. This increases the scouring of stream banks and sediment load, ultimately leading to more rapid downstream flooding.
- Development in floodplains conflicts with natural forces which in turn leads to engineered protections of the poorly located investments. Such 'protections' include stream straightening, berming, and bank armoring to prevent erosion. These measures increase volume and velocity of flood waters causing even greater damage because floodwaters can no longer slow through meanders and access their floodplains, dissipating energy naturally.
- Undersized bridges and culverts contribute to ice jams, debris jams and blocked flow causing unanticipated localized flooding

Flood damage can be avoided by conscious human action. The principles of mitigation require understanding natural processes and forces at work in a stream or river so that development in flood-prone areas can be appropriately sited and designed to avoid flood damage and contributing to flooding downstream.

Norwich is a member of the National Flood Insurance Program (NFIP) a federal program operated by the Federal Emergency Management Agency (FEMA). The purpose of the program is to improve floodplain management, and to assist communities and property owners when severe flooding occurs. Property owners in Norwich can purchase flood insurance because the town enrolled in the NFIP. To maintain eligibility Norwich must continue to regulate development in the mapped floodplain, according to federal standards.

Norwich has 56 structures in the Special Flood Hazard Area (SFHA) (see map #). 25% of these structures have flood insurance. Approximately 50 of these structures are dwelling units. There are no repetitive loss properties identified by the NFIP in Norwich. There are no critical or public facilities located in the SFHA.

The Community Rating System (CRS) is a program that recognizes communities for exceeding the minimum NFIP standards. Participation in this program earns insurance policy holders a five percent discount on flood insurance products. Belonging to CRS would also qualify Norwich for a higher state contribution through the Emergency Relief Assistance Fund (ERAF) in the case of a federally declared disaster, thus reducing the local pay-out for damage to public infrastructure. Joining the CRS is a key action of this plan.

Mitigation Plans

The risk to life and property associated with flooding in Norwich can be reduced through hazard mitigation. Norwich has an adopted Local hazard Mitigation Plan (developed with TRORC) most recently approved in August 2015. The Local Mitigation Plan is adopted into this plan by reference, including the Hazard Mitigation Strategies: Programs, Projects and Activities on p38-39 of the 2015 plan. Persevering with the implementation of this plan will make Norwich more resilient, more adaptive to climate crisis changes and more responsive to disasters and disruptions, thus minimizing hardship.

Land Use

Objectives

1. Plan development to maintain the historic settlement pattern of compact village and urban centers separated by rural countryside
2. Increase the total stock of housing in Norwich. Diversify the housing stock and guide residential growth to areas of town either serviced by transit or near the existing village area
3. Preserve rural character and working lands throughout the existing rural areas of town
4. Maintain the priority forest blocks in Norwich
5. Expand an interconnected system of trails for access to wilderness area and as potential alternate commuter paths for Norwich residents and visitors
6. Identify, protect and preserve the important natural and historic features that contribute to Norwich's scenic landscapes and community character

Policies

1. Increase Norwich's resilience by avoiding, minimizing and mitigating conflict between land development and natural riparian functions along streams and rivers
2. Guide development away from priority forest blocks, and discourage fragmentation or subdivision of land within those blocks that would adversely impact natural resource values
3. Guide development away from visually prominent locations on ridgelines and hills as viewed from public vantage points
4. Guide development away from primary agricultural soils and encourage conservation of those soils for current and future agricultural use
5. Guide development away from steep slopes, and require appropriate erosion control and stormwater management practices to protect water quality and avoid increased downstream flooding
6. Encourage use of conservation subdivision design and low-impact development practices in the rural areas of town in order to protect and conserve natural resources, open space and rural character
7. Encourage and support continued permanent conservation of farmland, forest land and natural areas

8. Encourage landowners to maintain or establish riparian buffers with native woody plants.
9. Support the work of the Historical Society

Actions:

1. Implement the recommendations made in [this chapter section xx.x] when revising the Norwich Zoning and Subdivision Regulations to:
 - a. Maintain the rural character of Norwich by preserving working lands and forests
 - b. Facilitate appropriate scale mixed-use development in areas currently zoned commercial-industrial
2. Participate in state, federal and other efforts to protect the Connecticut River
3. Develop a plan to address any potential conflicts between existing or proposed development on the edge of the village and mapped forest blocks
4. Complete a historic preservation and brownfield assessment of Lewiston in conjunction with Dartmouth
5. Consider incentive programs to encourage adaptive reuse of historic structures
6. Update the inventory of barns at risk, and support owners in obtaining state grants to offset rehabilitation costs
7. Ensure the participation of the Historic Preservation Commission in any study of improving bike-ability and walkability in the village

Norwich's current land use pattern (see map #) includes a densely settled village with a commercial core in the southeast corner with low density residential development accounting for the remainder. Union Village in the north and a few other hamlets hint at an earlier agrarian settlement pattern. There are significant areas of conserved land (Appalachian Trail lands along the southern border, riverine lands on the Ompomponoosuc River and higher elevation forest lands along the western border with Sharon, see Map #). Outside of the village there is some commercial development along Route 5 South an expanse of conserved woodlands along the Connecticut River associated with the Montshire Museum gives way to school playing fields on the border with Hartford to the south.

Since the 1970s the predominant pattern of development has been subdivision of farm/forest tracts into lots for residential use some distance from the village. The

rate of development has slowed significantly since the 1990s (see map #). The rural character (wooded hillsides and hayfields) has largely been maintained, despite the continued loss of productive farms. There has been a recent resurgence in small-scale farming and rural enterprise (need data). [*maybe 9? Farm to Plate, Hogwash Farm, Kildeer Farm, NOFA*]

Norwich has limited commercial development, dominated by small retail, banking and professional services in the village, and retail oriented to tourists and passing traffic on Route 5 South. The municipalities of Hanover, Lebanon and Hartford are major employment and commercial centers providing employment, cultural and retail opportunities for Norwich households.

Key Findings

Transportation: The current settlement pattern is predicated on high levels of personal car use. Norwich currently supports Advance Transit to service the village on a limited schedule. It is not feasible to extend transit routes or increase the schedule because of the low population density beyond the village. Norwich devotes considerable resources to road maintenance and repair, and low-density residential development increases maintenance and repair costs without significantly increasing the tax base to fund them. Increased commitments to improving transit and non-vehicular commuting are needed to support a different settlement pattern.

Community Facilities & Services: The existing complement of facilities and services is adequate to serve the current (very low) level of development. Marion Cross School has some capacity for additional students and is an asset for the community (although wastewater management is an unresolved problem). Childcare is in short supply and limited, however. Potable water is supplied to homes and businesses in the village. Extensive recreation facilities, including playing field a trail network for hiking and mountain biking support an active community. Absence of a wastewater system limits growth and expansion of the village and established commercial districts (Route 5 South).

Energy: As in much of Vermont, auto dependence due to low-density settlement and the age of the housing stock make achieving state energy planning goals very challenging. Large-scale wind energy generation is unlikely given current technology (due to wind speed) and site-scale topographical challenges limit the size of solar installations. About 16 acres of solar panels (given current technology) could satisfy current electricity demand in Norwich. Working on achieving denser,

more compact development to reduce auto-dependence and improving the energy efficiency of buildings are crucial in addressing the climate crisis.

Housing: The very low growth in new housing stock is unlikely to change within the life of this plan, given broader patterns and economic conditions. More effort to obtain compact development will be needed to achieve the energy and housing objectives of this plan. Increasing the variety of housing by type and price is needed to stem demographic changes apparent in the past twenty years (see p#). This plan supports exploring how to provide for an expansion of the housing stock in the village, immediately adjacent to the village and along Route 5 South.

Economic Development: Norwich has a very small commercial base, which limits the number of in town jobs. The existing commercial industrial district is well serviced by road and electricity infrastructure and transit but requires on-site water and wastewater for development. The existing land use controls allow for traditional highway strip development and need to be amended to better reflect community values and standards. Growing employment opportunities in town can be a strategy for reducing auto-dependence. Diversifying the tax base can also contribute to offsetting the residential property tax burden. Lastly, a broader range of economic development can encourage a more diverse community.

Future Land Use

Land Capability: A key principal of land use planning is to guide development towards land best suited to the purpose and away from unsuitable landscapes. Measuring capability accounts for the landform attributes which constrain future development. The following factors are some that influence future land use decisions.

Steep Slopes: are poorly suited to development. The landform of Norwich is dominated by narrow valleys and steep slopes (see map #). As severe weather events increase in frequency and intensity, reviewing land use regulations as they pertain to development on steep slopes will be needed.

Soil Type: is a major determinant of development in the absence of municipal wastewater systems. Norwich does not operate a municipal wastewater system. Norwich does provide potable water in the village district through the Fire District (accessing aquifers to the north of the village) which allows for denser settlement in the village area.

Riparian Areas (including floodplains): These sensitive environments are often subject to flooding. Historically these areas have been used for agriculture (fertile silt deposits from stream action) and industrial power generation (for mills prior to the advent of electricity). Today, increasing conflict causing loss of private property and public infrastructure due to flooding and erosion from severe storms is best resolved by avoiding continued development in these areas.

Forest Blocks and Habitat Connectors

Municipal 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 has mapped and assessed the habitat value of forest blocks in Norwich.

The Town of Norwich considers the mapped forest blocks that are 500 acres or more in area as shown in Map # to be priorities for protection through this plan and any implementing regulations. The impact of proposed development on forest blocks may be considered during state regulatory processes. Due to the scale of the state forest block mapping, the boundaries of priority forest blocks should be more precisely delineated based on a site-level assessment before being used for regulatory purposes by the town or state. The mapped priority forest blocks occur in the rural residential district. Although Norwich subdivision regulations include consideration of natural resources including steep slopes and forest cover alternative approaches could be explored, including the creation of a rural zoning district with a significantly higher minimum parcel size to better protect against fragmentation of forest blocks.

Village Center Designation

Norwich village obtained center designation in 20xx (see map #). The designation expired in 2018. It cannot be renewed until Norwich has a duly adopted plan subsequently approved by TRORC.

Village center designation supports 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 in the village. State designation offers both the town and property owners within the designated area benefits including:

- Owners of income-producing buildings can access tax credits for eligible improvements
- Land in or within ¼ mile of the village center could be eligible for the state's Neighborhood Development Area program
- The town is more competitive when seeking state grant funding for projects in the village center.

Compatibility

Norwich is part of the Claremont-Lebanon micropolitan area (as defined by the US Census Bureau) which takes in two counties in New Hampshire and two in Vermont. The town is a member of the Two Rivers Ottauquechee Regional Planning Commission (TRORC) which comprises 30 towns in Orange and Windsor counties in Vermont. The history of Norwich is tied closely with Hanover and Lebanon, NH. Norwich is part of a bi-state school district, and Norwich residents depend on Hanover, Lebanon and Hartford for employment opportunities and access to retail and service functions. Many planning issues including housing supply, transportation (including bike-pedestrian accommodations) will involve a regional response.

Neighboring Towns There are no proposed changes to zoning districts or land use policies that will affect the neighboring towns of Thetford or Sharon. This plan identifies constraints to development in the Route 5 South Commercial Industrial district which borders Hartford to the south caused by the need for on-site potable water and wastewater systems. The development potential of this district would change if municipal wastewater was provided. This plan is recommending that wastewater options for the village, adjacent areas and the commercial-industrial district be explored.

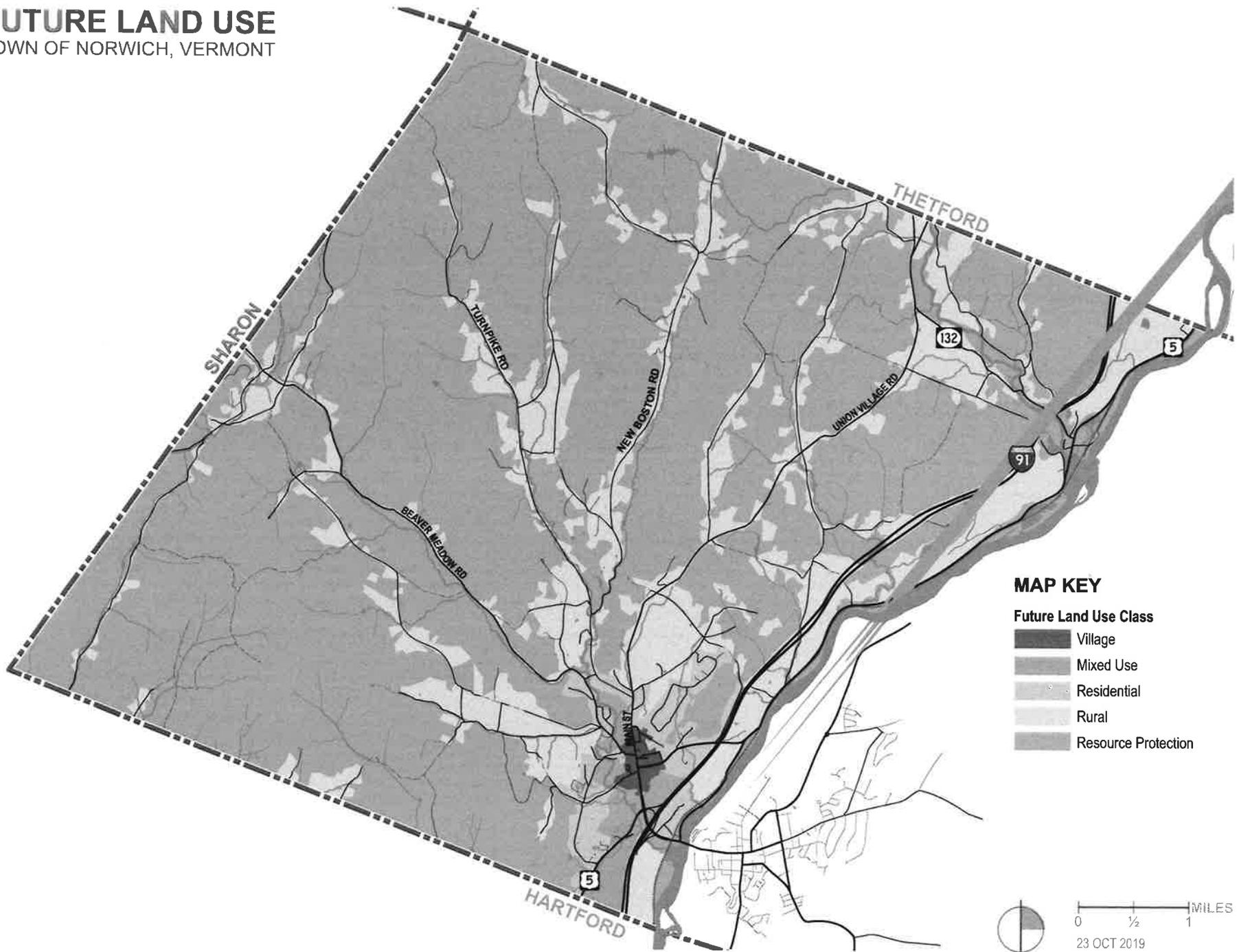
TRORC Land Use Areas In previous regional plans the area east of I91 (Lewiston neighborhood and lands to the east of Route 5 South) were identified as an 'interchange area'. In the draft 2019 TRORC regional plan this designation has been dropped for Norwich and been replaced with mixed use and rural land use areas. Other adjustments were made, including defining principal retail, and allowing for mixed use development with some retail when combined with housing. These amendments followed discussion with Norwich. There is now a greater degree of compatibility between this plan and the regional plan. Norwich appreciates the greater flexibility and an application of regional land use areas that more closely resembles current land use patterns.

 Future Land Use Recommendations

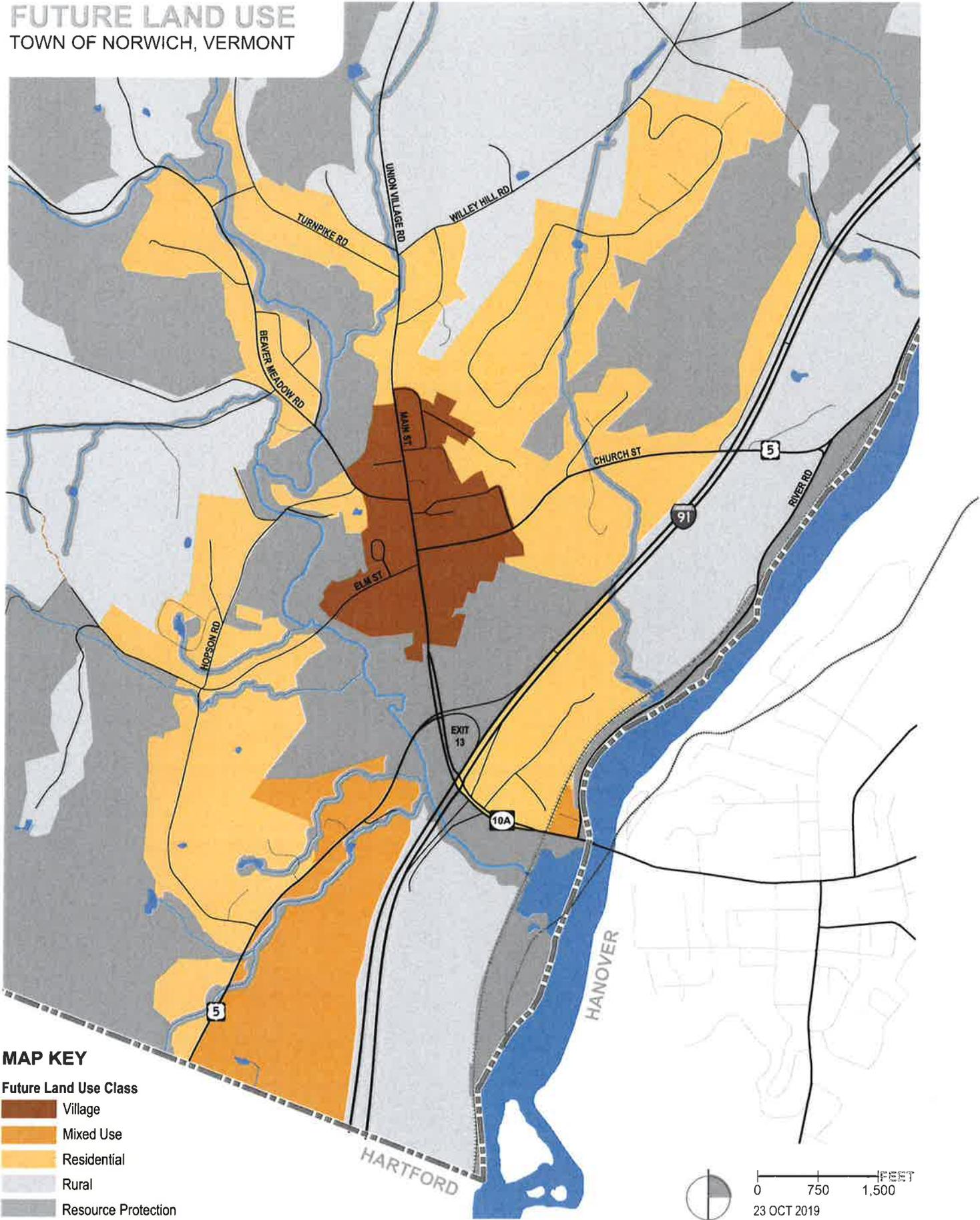
Land Use Type		Recommendation
Village Business	1	Reapply for Village Designation
	2	Assess current wastewater conditions
	3	Improve public infrastructure downtown to improve walkability, access management and stormwater management
	4	Explore expanding the district boundaries (dependent on wastewater assessment)
	5	Assess current wastewater conditions
Rural	1	Review subdivision regulations role in low density residential development occurring in areas remote from village
	2	Explore creation of a rural district that would take in lands with forest blocks of 500 acres or more to reduce possibility of fragmentation
Commercial-Industrial	1	Explore changing this to a mixed use district with performance and design standards governing scale of development, site plan etc. to mitigate impact
	2	Ensure adequate provision for housing is made in this new mixed use district

FUTURE LAND USE

TOWN OF NORWICH, VERMONT



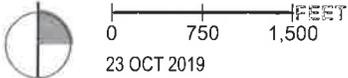
FUTURE LAND USE TOWN OF NORWICH, VERMONT



MAP KEY

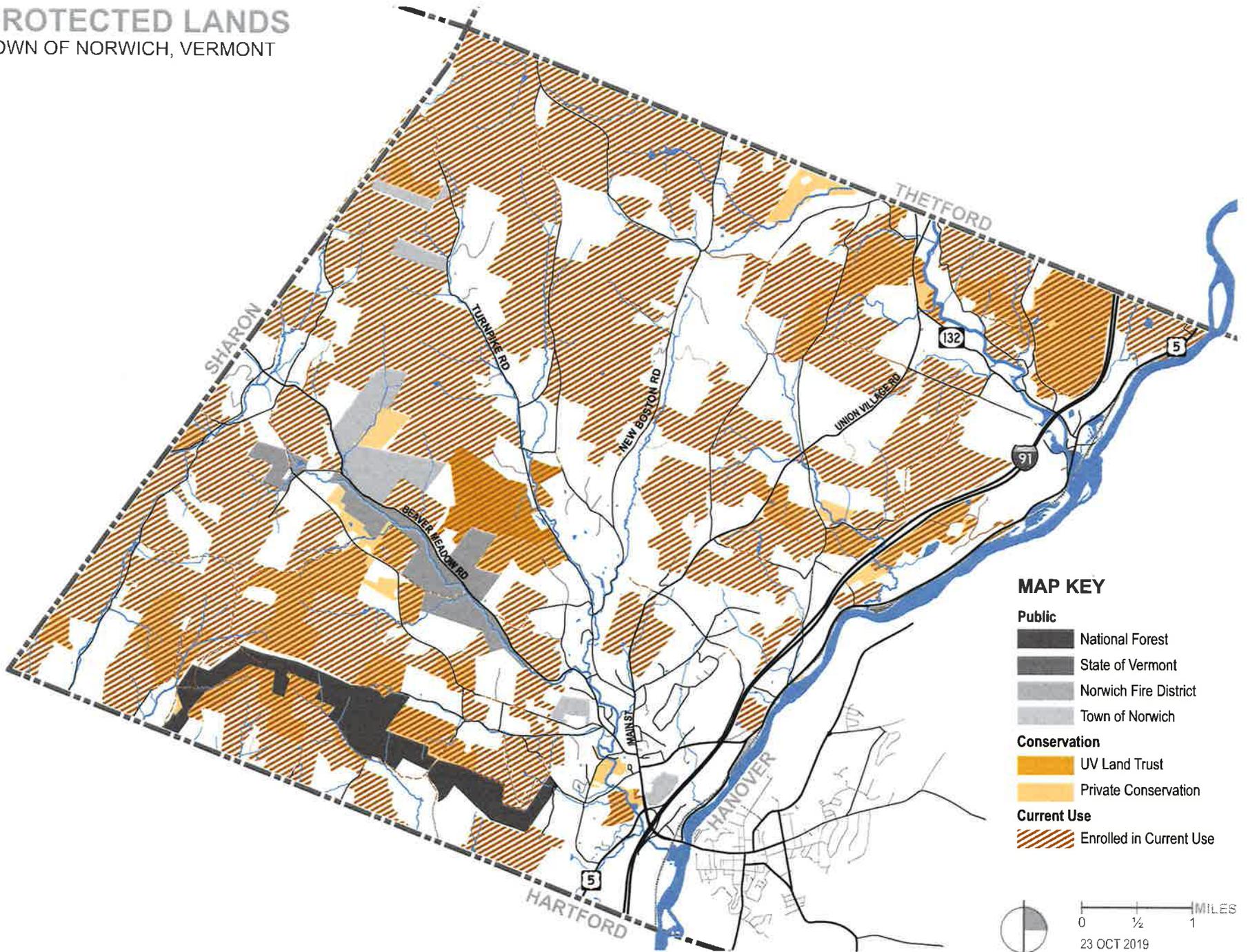
Future Land Use Class

- Village
- Mixed Use
- Residential
- Rural
- Resource Protection



PROTECTED LANDS

TOWN OF NORWICH, VERMONT



MAP KEY

Public

- National Forest
- State of Vermont
- Norwich Fire District
- Town of Norwich

Conservation

- UV Land Trust
- Private Conservation

Current Use

- Enrolled in Current Use



23 OCT 2019

PROTECTED LAND

TOWN OF NORWICH, VERMONT

