2.1 NATURAL RESOURCES & PHYSICAL GEOGRAPHY

The Town of Charlotte is located in northwestern Vermont on Lake Champlain about 10 miles south of the urban center of Burlington in Chittenden County. The Town encompasses approximately 50 square miles (32,320 acres), almost 20% (5,700 acres) of which is water. Situated in the Vermont Lowlands physiographic region, Charlotte is relatively flat with a few gently rolling hills and elevations ranging from 98 feet at Lake level to 968 feet on the top of Mount Philo. Lake Champlain has a significant effect on this region as it modifies temperatures resulting in a longer growing season as compared to the rest of the state.

Geology and Groundwater (Map 2)

Charlotte's bedrock geology is largely characterized by the presence of the Champlain thrust. Areas west of the thrust (lower plate) are mainly Ordovician black shales and carbonates while areas east of the thrust (upper plate) consist of Lower Cambrian to Ordovician quartzites, dolostones and limestones. Surficial, lacustrine silts and clays overlie most of the town with some sand and gravel deposits scattered throughout. These latter deposits are thought to be from stream sediments deposited in tunnels or fans beneath the ice sheet that once covered the area.

In 2010, the Vermont Geological Survey completed a study of the geology and hydrogeology of Charlotte[1]. The conclusions as stated in the final report of the study are as follows:

- Looking at all of the 1,027 water wells in the water well database for Charlotte (located and unlocated), 72 % have a yield of greater than or equal to 2 gallons per minute (GPM) and 85 % have a yield greater than 1 GPM. Yield and depth statistics for the 336 located water wells are as follows: Located bedrock wells: number of wells = 306; mean yield = 12 GPM, mean depth = 417 feet. Located gravel wells: number of wells = 30, mean yield = 28 GPM, mean depth = 149 feet.
- Five bedrock hydrogeologic units were delineated based on rock properties and mean and median yields. See Table 1 of the 2010 report for statistics and Plate 3 of Open File Report VG10-1 for the distribution of the units. The 5 hydrogeologic units are summarized briefly below.
    - Unit I includes predominantly carbonate rocks with some interbedded quartzites on the upper plate of the Champlain thrust fault. The rocks are generally fractured with resultant secondary permeability due to the interconnected nature of these fractures. Median yield is 4 gallons per minute for 112 bedrock wells.
    - Unit II is similar to Unit I except that the carbonate rock outcrops reveal evidence of dissolution, and the fractures are solutionally enlarged resulting in open channels in the rock. Outcrop exposure is relatively abundant. The median yield is 23 GPM for 9 bedrock wells. This is the highest median yield of any of the hydrogeologic units.
    - Unit III occurs in the flat lowlands west of Rte. 7. The rock is mainly black shale with interbedded limestone and is on the lower plate of the Champlain thrust. Outcrop is not abundant, with most exposures occurring either along Rte. 7 or the lake shore. The bedrock is overlain by impermeable clay, silt and/or clayey-till so that water

[1] Vermont Geological Survey, *Geology and Hydrogeology of Charlotte, Vermont*, June 3, 2010. http://dec.vermont.gov/geological-survey/groundwater/town-gw/charlotte

likely does not readily infiltrate the underlying bedrock. The median yield is 2 GPM for 132 bedrock wells. Wells drilled in this unit have the lowest mean and median yields in town.
    - Unit IV is mainly carbonates near the lake shore on the lower plate of the Champlain thrust. Rocks are highly fractured and bedrock is exposed. Median yield is 6 GPM for 52 bedrock wells.
    - Unit V is an igneous intrusive rock and only one bedrock well (with a yield of 50 GPM) is located in the unit.
- Overburden thickness is shown on Plate 4 of Open File Report VG10-1 and varies from zero to 300 feet as reported in the well logs. Although areas of thick permeable sediments may be good prospects for overburden aquifers, in Charlotte the thick materials are largely impermeable clay and silt. Therefore, the thick overburden does not generally correspond to possible high yield aquifers. See the next paragraph for discussion of areas of buried sand or gravel deposits.
- Plate 5 shows an interpretation of the favorability of surficial materials based on a classification of the stratigraphy of the surficial deposits in the bedrock and surficial wells. As shown on Plate 5, the high-yielding wells in surficial materials are generally in buried sand or gravel below thick clays. These wells are scattered throughout much of the town. However, concentrations of wells with buried sand and/or gravel occur on the south flank of Mt. Philo, about 2 km west-southwest of Mt. Philo, south-southeast of Barber Hill, and in the northern part of town along Orchard Road and the northern portion of Greenbush Road.
- The blanket of thick clays in the lowlands impedes direct recharge to the underlying bedrock. Static water levels in the wells suggest that the piezometric surface roughly follows the topography and groundwater flow is generally from the hills (where surficial materials are thinner, more permeable, and commonly absent) down into the lowlands. There does not appear to be significant groundwater flow from Lake Champlain eastward, although pumping of wells near the lake shore could certainly induce local flow from the lake toward the well being pumped. Note that on the uplands, groundwater flow appears to most closely follow the topography (see the areas labeled I on Plate 6). In the clay lowlands, flow is not so closely related to the surface topography, as this surface is separated by a barrier of silty clay and clay that commonly exceeds 40 feet in thickness.
- This general pattern of flow of groundwater from the uplands into the lowlands should be taken into account in any bedrock or surficial aquifer protection plans. Note that more detailed studies would be needed to accurately define an aquifer recharge area for any specific location in the town.
- Although direct groundwater recharge appears to be limited in the clay lowlands, this does have the benefit of largely isolating bedrock aquifers and buried surficial aquifers from surface waters. This could reduce the chance of surface contamination reaching these aquifers.
- Our analysis of the water well logs indicates that in general, bedrock wells with the greatest yields tend to have intermediate depths of between 200 and 500 feet. Yield per foot of depth is generally highest in wells that are located near the contact between till uplands and the fine- grained lacustrine and marine deposits (Springston and others, 2010).

- Because of the presence of carbonate-bearing lithologies, groundwater throughout Charlotte tends to be hard.
- Iron, manganese, and fluorine tend to be most abundant in the groundwater of the Lower Plate rocks.
- Although we did not find any elevated levels of fluoride, the Vermont Dept. of Health (VDH) found that some wells in Charlotte and Ferrisburgh had fluoride levels exceeding primary and secondary standards (Figure 7 on Plate 7, Open File Report VG10-1). All of these wells were located in or near shales. Long term consumption of water with fluoride levels >2 can cause brown staining and pitting of teeth in children whereas levels > 4 ppm can result in bone disease.[2]
- One well out of the 27 tested was above the Arsenic standard and another well exceeded the Uranium standard (Figures 8 and 9 on Plate 7, Open File Report VG10-1).

Soils (Map 3)

The Natural Resource Conservation Service (NRCS) has classified the soils in the Town as part of the *Soil Survey of Chittenden County, Vermont* (www.nrcs.usda.gov). The information in the survey is valuable for identifying soils that are suitable for agriculture, forestry, recreation, and other land development. Extreme stoniness, shallow depth to bedrock, high water table, and low permeability create limitations for buildings, roads, and septic systems. Much of Charlotte consists of silts and clays – predominantly Covington Silty Clay and Vergennes Clay - with very low permeability. Though generally poor for sewage disposal systems, these soils have been classified as having statewide agricultural significance.

THE LAKE AND ITS SHORELINE

The Town of Charlotte has approximately 14 miles of shoreline and seven islands in Lake Champlain. The shoreline varies from marshy wildlife areas to rocky cliffs and promontories, to stony and, more rarely, sandy beaches. It is cut by three drainage systems comprised of numerous brooks which drain the interior lands. Charlotte's shoreline on Lake Champlain is very beautiful, a source of pleasure to its residents, seasonal homeowners, and visitors and a priceless asset to the Town.

Scenic Beauty and Environmental Quality

The scenic beauty of the shoreline area is enhanced by the undisturbed natural shoreline and evolving pattern of working farm lands and shoreline communities. Changes in this landscape and ecology are occurring every year. This section will briefly discuss how the shore lands have evolved, describe some of the changes, and highlight some of the values Charlotte is working to preserve.

The present shape of the shoreline reflects the local geologic setting. Beginning with the deepest part of Lake Champlain, about 400 feet off McNeil Cove, the lake bottom quickly rises in the near shore areas along the points of and at the mouth of the many bays. These bays have continued to erode into the shorelines, as they have over the last ten thousand years, at

[2] United States Environmental Protection Agency, "Ground Water & Drinking Water: Fact Sheets". http://www.epa.gov/safewater/hfacts.html

varying rates depending on the resistance of the shoreline materials. The most resistant points of land are made of bedrock and typically rise 10 to 30 feet above the lake. Lesser resistant glacial tills support banks up to 15 feet and where in their natural state are mapped as eroding at moderate rates. Least resistant clays, silts and sands are found in the ends of many of the deeper bays and may have the highest erosion rates. These shorelines, where unprotected, continue to have significant losses of shore banks and their vegetation. The many streams which reach the lake have developed deltas with well vegetated wetland areas and may have more stable shorelines.

Historically the lake line area is thought to have been completely forested until the late 1700s. Subsequent agricultural practices led to the development of fields and orchards on the more tillable shore lands. Around the turn of the 20th century, summer homes became fashionable and many can still be seen along with at least two historic steamship docks at Cedar Beach and Thompson's Point. Today, continued development of the shoreline areas for year-round homes is occurring.

The environmental quality of the shoreline and lake are often adversely impacted by activities on the land, in streams and from other parts of the lake. A recent State report lists exotic species and nutrients as major problems facing Lake Champlain's waters.

Exotic species in Charlotte include zebra mussels, water chestnuts, Eurasian milfoil and purple loosestrife. While little can be done to control the spread of the non-native zebra mussels, actions can be taken to lessen the effects of the nuisance aquatic plants. Water chestnuts represent the greatest threat to the lakeshore environment and were mapped in McNeil Cove and Northern Converse Bay in the summer of 1998 as the northern most extent in Lake Champlain. Bays to the south of Charlotte are currently harvested mechanically in attempts to control the weeds which carpet the bays and reduce almost all uses of the lake. State contractors will likely be available to continue hand pulling water chestnut plants in Charlotte, either on annual visits to our shore line or as requested by individuals who have reported new areas of infestation. Eurasian milfoil and purple loosestrife can be hand-pulled without a permit. Purple loosestrife should not be planted as an ornamental flower as it spreads and replaces valuable wetland species. Those interested in learning more about identification and removal of these species can contact the Charlotte Conservation Commission.

Nutrients can accelerate the growth of aquatic weeds and in some cases carry pathogens to the lake. Nutrients may reach the lake from use of fertilizers at home and farms, and from animal wastes and poorly operating household septic systems. Continued work is needed to control excessive use of fertilizers both for home-lawn care and for agricultural activities. Steps taken to control erosion also help in reducing nutrient loading as many nutrients are bound to topsoil particles.

The significant named tributaries that discharge to the lake along the shoreline are Pringle Brook, which combines with Holmes Creek and discharges south of the Town beach, and Thorp Brook in Town Farm Bay. Other brooks, the LaPlatte River, and Lewis Creek discharge directly or indirectly into the lake but in adjacent Towns. Due to water current systems in the lake, these discharges could still impact water quality on the shoreline in Charlotte. Therefore, nutrients

and waste products that discharge to water bodies anywhere in the Town have the potential for impacting the lake water quality.

In 1989, a complete inventory of shoreline conditions was mapped from a visual inspection. An updated inventory of shoreline conditions should be conducted in the next three years to help identify problem areas and prioritize areas in need of further protection measures. The fourteen miles of shoreline vary from steep cliffs, rock ledges, natural stone, slope, artificially filled stone, some sand, man-made walls, wetland strips, and emergent vegetation. This inventory identified several areas as wetland management zones, including the mouth of Holmes Creek, McNeil Cove, Converse Bay by the fishing access, Converse Bay along its southeast shoreline, and Town Farm Bay west of Point Bay Marina to the southern edge of the Thorp Brook wetland area. Along most of the shoreline the nuisance aquatic plant, Eurasian milfoil, was observed.

The following is a summary of the 1989 inventory by region.

Hill's Point Region: Much of the natural scenic beauty of Hill's Point has been altered. There is still an undisturbed region at the extreme northern section where cliffs and natural stone landscapes still exist.

Town Recreational Area to Wings Point: South of the Town recreational area to Wings Point the landscape and shoreland have retained much of their scenic beauty. This is due in part to many steep cliffs that extend directly into the water or end with narrow natural stone and small sections of filled stone. The area also contains some large tracts of land in single ownership, one of which is protected by a 1,683-foot shoreline conservation easement held by the Lake Champlain Land Trust.

Wings Point: The west shore of Wings Point has segments of rock interfaces, small bays with natural stone, and cliffs. Subdivision and residential development has resulted in the cutting of trees in the Shoreland District to increase views for the new landowners.

McNeil Cove: This cove, from the jetty at the northwest entrance to the south cove, has many areas of emergent vegetation and valuable wetland. The wetland provides habitat for waterfowl and other birds, as well as wildlife and fish, and also affects water quality, shoreline stabilization, and recreational opportunity. These wetlands are presently impacted by the Lake Champlain Ferry dock and Fischers Landing. In the southern section recent development has resulted in clear-cutting of trees to the edge of the water.

Cedar Beach: The numerous trees surrounding and in front of the camps at Cedar Beach greatly reduces the adverse visual impact of development, and Cedar Beach retains much of its scenic beauty. Cedar Beach north cove areas has evidence of man-made modifications: cuts in natural stone cliffs, a small concrete pier, a concrete ramp, and stairways.

Converse Bay, North Cove: The northern portion of Converse Bay west of the fishing access to the rock ledge to the south forms a significant shallow cover wetland

habitat with much emergent vegetation. Alterations along this shoreline and use of the fishing access has dramatically changed the appearance of this area.

Converse Bay, South Cove: This area has a significant shallow cove wetland habitat. The shoreline has been adversely altered in several locations by a concrete retaining wall and the destruction of cattails and bulrushes for boat docking facilities.

Thompson's Point: This area consists of a mosaic of natural and cultural features. Although Thompson's Point is heavily developed, it has retained much of its scenic beauty. Camps for the most part are hidden by trees. The north-facing region and the point itself have very steep rock banks; access to the water is generally by stairways, some with high visual impact. On the south-facing side the banks are gradual.

Town Farm Bay: From the west emergent vegetation appears in Town Farm Bay, indicative of a wetland. This wetland has been altered and degraded by several clear cuts through the bulrush stands for individual docks. The south side of Williams Point forms a significant wetland habitat that extends to Thorp Brook.

The following values should be preserved through volunteer efforts, incentives and, where needed, regulatory actions to restore, maintain and enhance the scenic beauty and environmental quality of the shore lands.

1. Restore, maintain and enhance vegetated areas along the lake. It is noted that some limited development will continue to occur along the shore lands and continued efforts will be needed near existing homes and new development to minimize future impacts. In several areas of cleared shorelines, new plantings could add greatly to preserving the vegetated cover along the shore.
2. Encourage man-made structures to blend into the natural landscape. This applies to shoreline docks, stairs, and buildings in the shoreline area as well as new facilities beyond the 1,000-foot zoning boundary placed on exposed ridgelines closest to the lake.
3. Maintain reasonable control of lakeshore wetlands. Current zoning bylaws prohibit any docks within wetlands, and about 75% of the shoreline is mapped as wetlands. The Town should study the existing bylaws and consider making them more consistent with existing state wetland rules which contain appropriate restrictions in wetland.
4. Continue existing controls on commercial development relating to near-shore facilities such as boat yards, boat maintenance and ferry service. Controls are needed to maintain environmental quality and scenic beauty.
5. Encourage shoreline stabilization methods which can be vegetated and/or blend in with the natural surroundings in areas of highly erodent soils.

There are existing water-related environmental and zoning statutes designed to protect the scenic beauty and environmental quality of the lake and its shoreline. The Charlotte Shoreline Committee for the 2002 Town Plan reviewed these statutes and made an assessment of some

of them with regard to their efficacy, which are listed below along with more recently enacted statutes and policies.

State Water Quality Standards: These standards regulate point discharges to the lake. Application of individual home septic tank effluent to farm fields is also regulated.

Agriculture Nonpoint Source Pollution Reduction Program: These standards apply to agricultural nonpoint sources of contamination.

State Environmental Protection Rules: Designed to protect public health from sewage disposal; direct and indirect sewage disposal systems need permits. The Town now administers the Wastewater System and Potable Water Supply Rules.

State Management of Lakes and Ponds: Regulates land below 95.5 feet mean sea level (MSL) only.

State Wetlands Rules: Regulates activities in wetlands.

Corps of Engineers: Regulates activities in or affecting navigable waters and associated wetlands below 98 feet MSL.

Charlotte Zoning: The Shoreland zoning district covers 1,000 feet inland from low water mark. It offers a good opportunity to protect scenic beauty, recreational opportunities and environment. Zoning Bylaw amendments to improve shoreline protection were added in the 1995 bylaw revisions and are adequate. The amendments removed deficiencies from the standards. Conditional uses were more clearly identified, setbacks from the shoreline for septic systems were established, height restrictions were added, special requirements for shoreline districts were added to protect shoreline vegetation, enhance erosion control and add more restrictions to shoreline wetlands. In addition, the bylaws improved language to preserve existing public access. In the past the Charlotte shoreland bylaws have not always been enforced, especially regarding cutting of vegetation, but resident awareness of the bylaws and enforcement is improving.

2014 Vermont Shoreland Protection Act: Provision of Lake Shoreland protection standards.

Public Access to the Lake

There are 11 existing points of public access to the lake on the shoreline in Charlotte. These points of access vary in their accessibility and use potential due to roads, parking, fees, and owner preferences. The following is an inventory of these areas:

- Town Beach: Available for swimming, picnicking, and sail boarding. Adjacent ball field and tennis court. Parking available. Open to public. Fee charged.
- McNeil Cove Marina: Boat launch and mooring facilities available for a fee. Also boat storage and parking.
- McNeil Cove-Town: Use is limited by parking and available mooring space. The Town should explore means to find parking and make the launch useable on a limited basis for Charlotte residents.

- Cedar Beach: Townspeople's suggested right to use private pier at Cedar Beach requires clarification. A legal opinion sought by Cedar Beach Association determined that Cedar Beach Dock is not required to be open to the public.
- State Fishing Access on Converse Bay: State-owned boat launching site limited by statute to use for fishing purposes, but the launching of pleasure boats is generally permitted. Parking is limited. Used in winter for ice fishing and skating.
- Converse Bay South (Deer Point): Town access point; no parking available. Lack of clarification of adjacent leaseholders lot lines. Appropriate for mooring access and canoe launching. A bicycle path point of interest.
- Whiskey Bay-Thompson's Point: Town access point; no parking available but could be developed on adjacent Town land. Used extensively for ice fishing. Appropriate for controlled, pocket-sized park for swimming, picnicking, and ice fishing access. Will require stabilization of bank and walkway leading to the beach, provision of picnic tables and trash receptacles as well as monitoring and servicing by Town employees.
- Old Dock-Thompson's Point: Town access point; no parking immediately available but within short walking distance from proposed Whiskey Bay parking area.
- Gibb's Lot-Thompson's Point: Town access point; no parking available. Expansion of use would have adverse impact on adjacent leaseholders.
- Caretaker's Lot-Thompson's Point: Town access point, no parking immediately available but could be developed nearby at Whiskey Bay site. Potential use as limited boat launch facility.
- Lane's Lane-Thompson's Point: Town access point; no parking available but could be easily developed on adjacent Town land. Potential use for small boat launch facility and/or picnic area.
- Point Bay Marina (private): Individuals are permitted use of the ramps to launch or retrieve boats whenever they are not in use by Marina staff.

The current access to Lake Champlain for townspeople needs improvement in the future to meet the needs of the Town's growing population.

Mooring Management

Parts of the shoreline have experienced explosive growth in moorings for boats owned by both townspeople and the public at large. This situation has created the following problems:

- Location of moorings in areas unsuitable because of navigational concerns, extreme exposure, protection of wildlife, maintenance of natural areas, and protection of public swimming areas.
- Lack of a procedure to deal with the demand for mooring to assure good and reasonable access to boating on the lake for residents and the public.
- Parking problems to serve the users of the boat moorings
- Lack of designated anchorage areas for overnight use
- Concern for unreasonable use of the lakeshore by transient boaters

The Shoreline Committee has identified five areas where moorings may be designated and managed by the Town should the situation warrant:

- McNeil Cove
- Converse Bay, North
- Converse Bay, South
- Caretaker Access, Thompson's Point
- Lane's Lane, Point Bay Marina area on Thompson's Point

Thompson's Point

The Town of Charlotte purchased the 230 acres of lakeshore, woods, and meadowland on Thompson's Point in 1839 for $4,200. The Town originally derived income from this land from the lease of hunting and fishing rights from 1839-1874. In 1874, the Town began leasing camp lots to individuals for a modest fee. During the following century, approximately 120 camps were built on lakeshore lots averaging a half acre. The camps occupy 50 acres; the remaining 180 acres has been maintained for farming and woodland. A Poor Farm was operated on the point until the 1930s, where the official use of the land for agriculture (including farm animals) continued through the 1940s.[3] Thirty-four of the outbuildings on Thompson's Point are listed on the Vermont State Register of Historic Places.

Thompson's Point has been identified as a significant feature of the Town that was recommended by town committees for further study since at least 1987. The 1990 Charlotte Town Plan incorporated these recommendations, which stated that a *"long range plan should be developed for use of the town-owned land that is in the Conservation-Recreation District"* (known since the adoption of the 1997 Charlotte Zoning Bylaws as the "Shoreland Seasonal Home Management District").

The soils on Thompson's Point are heavy clay and poorly drained. The interior land is rolling to gently sloping in all directions. The woods are a mixture of hardwoods and conifers. The lakeshore varies from steep rock cliffs with limited water access to gently sloping ledges and shale beaches and marshy land in Town Farm Bay.

Even though the camps are relatively close together, one has the feeling of privacy and open space at Thompson's Point, due to the large amount of undeveloped land in the center of the Point, dense woods, and the lake.

The camps themselves vary in size and value. Their style is representative of 1880s and 1890s resort architecture. The camps are well-placed within this landscape. Their design harmonizes with the setting, incorporating irregular plans and projecting gables or turrets. The camps located in an area from the tennis courts west and south back to the western part of Town Farm Bay are within the Thompson's Point Historic District, which is listed on the State Register of Historic Places.

[3] Harris, Paula Millar. "A Natural & Cultural Resource Inventory & Planning Recommendations for Thompson's Point, Charlotte, Vermont", Department of Botany, University of Vermont, Burlington, Vermont, *September 1990*.

Originally most of the camp owners were local residents. As of March 1999, 14% of leaseholders were residents; 36% reside in other Vermont towns; and 50% live out-of-state. Further, 22% of the leaseholders reside in Chittenden County. Although most camp owners are from out-of-state, many of them can trace ownership of their camps back through several generations of family to the original owners.

The meadowland is leased for agricultural purposes, and the forest is managed under guidelines recommended in 2000 by a Selectboard-appointed advisory committee.
New dwellings, whether seasonal or year-round, are not allowed. The soils have severe limitations for on-site sewage disposal, and therefore a community wastewater treatment system was permitted and constructed in 1994 as a “best fix” system to serve only the existing camps on Thompson's Point. Water supply comes from the lake for most camps. Many of the pipes run overland and are not suitable for winter use. Roads in the area have charm and character, although their narrow and tree-lined condition sometimes pose problems for motorists and emergency vehicles. To date, the general consensus is that improvements to the roads would diminish the character of the area.

The leases permit only seasonal use of the camps due to the limitations of soils, wastewater system permit conditions, water supply, and roads.

In 1984 a committee appointed by the Selectboard to study the relationship between the Town and the camp owners issued the following findings and recommendations:

- There is no need in the foreseeable future for increased public access to Thompson's Point
- The open space should be maintained in perpetuity.
- No additional lots should be leased.
- The seasonal-use-only rule should be strictly enforced.
- In 1983 the Town derived an income of $111,184 from Thompson's Point.
- The Town should retain ownership of Thompson's Point in its entirety.
- The Town should continue leasing lots to the camp owners.

The 1999 Lake and Shoreline Committee reviewed the report and updated Thompson's Point information. It found that seasonal use only with no further camp development continues to be appropriate. However, the Committee found that there is a need for increased and enhanced public access for Townspeople, as detailed in Section 4.5.2 above.

<u>Cedar Beach</u>
Cedar Beach is a summer colony founded as the Jolly Club by Burlington business men in 1873. Today there are 19 cottages in the Cedar Beach Association. Several cottages are owned by descendants of the original owners.

Originally the Cedar Beach Association had two boat houses, several ice houses, and its own electric company. The Association still operates a pump house for water distribution to members. It also operates a club house, tennis courts, dock, and trash pick-up service. The

Association owns the land and approves all sales and rentals of cottages; it prohibits the use of camps for year-round occupancy.

The cottages were built in the 1870s and 1880s and are representative of resort architecture of the period. The cottages are in the Cedar Beach Historic District on the State Register of Historic Places.

Cedar Beach has some of the same limitations for expanded residential development as Thompson's Point. Roads are narrow and tree-lined; water supply is from the lake; and septic systems are on-site, in some cases on problem soils. Unlike Thompson's Point, however, portions of Cedar Beach have adequate soils for on-site sewage disposal. The Lake and Shoreline Committee has recommended that septic disposal regulation be routinely monitored in this area of the shoreline

Lake Champlain Islands

The Lake Champlain Islands are an important feature of Lake Champlain. They serve as significant wildlife habitat for nesting birds, recreation areas, and seasonal home sites, in addition to contributing to the scenic beauty of the lake. The Lake Champlain Islands in Charlotte include Sloop Island, Pickett Island, Garden Island, Cedar Island, and the Dean Islands. Sloop Island (less than 1 acre) is owned by the Vermont Agency of Natural Resources; it is a popular picnic, swimming and fishing site. Pickett Island (less than 1 acre) is in private ownership; a proposal for building on it was defeated several years ago. It is also a popular picnic and swimming site. Garden Island (25 acres), is in private ownership and has several camp lots and one large land holding. It is used primarily for nine seasonal homes. Cedar Island (2 acres) is in private ownership and has three dwellings on it. The Dean Islands (1 acre in total) are in private ownership; one island has a seasonal home; another a boathouse; and the third is undeveloped. The islands are very vulnerable to human abuse and environmental degradation due to shallow soils, nesting sites for birds, and the prominence of the islands on the lake.

Surface Waters, Wetlands, & Flood Hazards (Map 4)

Charlotte's waters drain into two 'Tactical Basin Planning Areas' as defined by the State Agency of Natural Resources, Department of Environmental Conservation:

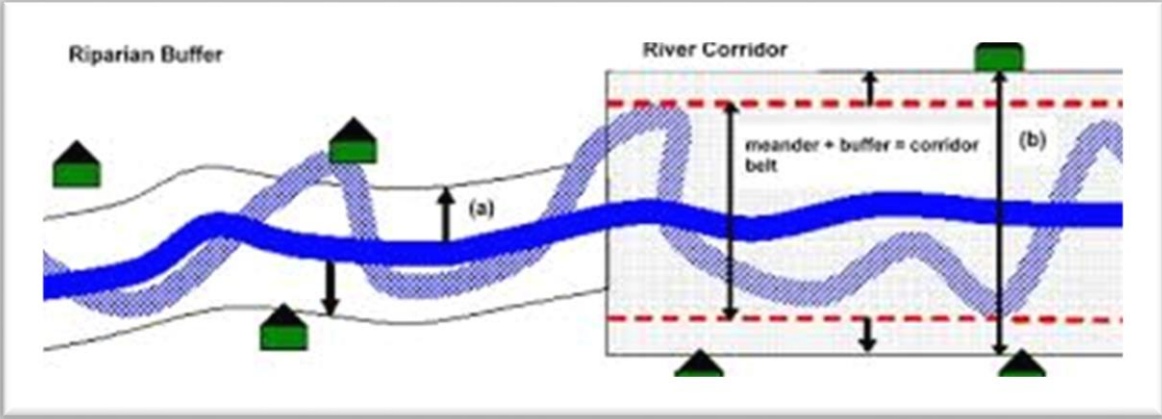
- The Northern Direct to Lake Basin Area, basin 5 receives direct drainage from the northern border of Charlotte to the southern border and Kimball Brook. It includes small direct to lake tributaries, Pringle Brook and Holmes Creek, Thorp Brook, Kimball Brook and the LaPlatte River with McCabe's Brook, Bingham Brook, and Mud Hollow Brook. The LaPlatte River from its mouth to Hinesburg is listed as impaired by the State of Vermont (Vermont Priority Waters List Part D draft 2016) due to high levels of *E. Coli*.
- Other portions of these streams have documented high levels of phosphorus and solids and warrant water quality improvement investment to avoid impairment status (South Chittenden River Watch and VT DEC LaRosa Program 2015). Kimball Brook from Town Farm Bay upstream approximately 1 mile is listed as stressed (high turbidity and nutrient content) due to agricultural operations and lack of a riparian buffer.

- The Otter Creek Basin Area receives drainage from Lewis Creek. A portion of Lewis Creek mainly east of Spear Street is listed as impaired by the State of Vermont (Vermont Priority Waters List Part D draft 2016) due to high levels of *E. Coli*.

Figure 6. FLOOD RESILIENCE & HAZARD MITIGATION

In 2013, the Legislature passed Act 16 - An act relating to municipal and regional planning and flood resilience. The Act established a goal to encourage flood resilient communities by restricting development in known flood hazard areas, otherwise known as "River Corridor Protection Areas", which include the meander belt of a stream or river and a buffer of 50 feet from the top of its bank. By 2015, River Corridors had been re-delineated by the State to encompass the meandering of a river in its least erosive form, including its floodplain geometry with which it would be expected to change over time.

Act 16 encourages the restoration of floodplains and upland forested areas that attenuate and moderate flooding and fluvial erosion, and **requires municipal plans to contain a flood resilience element that identifies the above areas and recommends policies and strategies to protect these areas and mitigate risks to public safety, critical infrastructure, historic structures, and municipal investments.** An inventory of known inundation and fluvial erosion hazard areas and state river corridors is presented in the Natural Resources & Physical Geography inventory section. Related policies and strategies are presented in **Chapter 1** through incorporation into other plan elements most notably Natural Resources; Lake & Shoreline; and Utilities, Facilities & Services. Charlotte also has effective local hazards mitigation plan, which is a multi-jurisdictional plan prepared by the Chittenden County Regional Planning Commission.



"River Corridor" means the land area adjacent to a river that is required to accommodate the dimensions, slope, planform, and buffer of the naturally stable channel and that is necessary for the natural maintenance or natural restoration of a dynamic equilibrium condition, as that term is defined in section 1422 of this title, and for minimization of fluvial erosion hazards, as delineated by the Agency of Natural Resources in accordance with river corridor protection procedures.
10 V.S.A. Chapter 32 § 752. Definitions

Inundation and Fluvial Erosion Hazard Areas (Map 4)

Charlotte has experienced inundation hazards (flooding) along Lake Champlain and inland along tributaries draining directly into the Lake, along the LaPlatte River in the northeastern part of town, and along Lewis Creek. The area along the LaPlatte, portions of Mud Hollow Brook, Lewis Creek and portions of smaller streams including Kimball Brook and Thorp Brook also experience fluvial erosion hazards.

Inundation flooding is characterized by rising and falling water and damage to low-lying structures. Mapped areas have a 1% chance of being inundated in any given year (commonly referred to as the 100-yr or base flood). Fluvial erosion is erosion in a stream corridor caused by unstable rivers and streams, and can range from gradual bank erosion to adjusting changes in river channel location and dimension during flood events. The Agency of Natural Resources has developed river corridor maps that depict a zone for the avoidance and management of water quality and erosion hazard areas.

Wetlands Advisory Layer and Significant Wetlands (Map 4)

As defined in the *Vermont Wetland Rules*, wetlands are defined as:

> *"Those areas of the state that are inundated by surface or ground water with a frequency sufficient to support significant vegetation or aquatic life that depend on saturated or seasonally saturated soil conditions for growth and reproduction. These areas are commonly known as ponds, bogs, fens, marshes, wet meadows, shrub swamps, and wooded swamps. Wetlands often occur in association with lakes, ponds, rivers, and streams, creating transitional areas between dry land and open water. However, wetlands can also be isolated from any obvious connection to water when they occur where the topography collects surface water, or where ground water surfaces."* **(~ Vermont ANR, DEC, Watershed Management Division)**

Although not all of the State regulated Class 2 wetlands have yet been identified, Map 4 nevertheless displays all identified Class 2 wetlands as documented thus far by the Agency of Natural Resources within its Vermont Significant Wetland Inventory (VSWI), known as the regulatory dataset (indicated in blue grasslike symbology on Map 4). An additional VSWI 'advisory' dataset (i.e. not used for regulatory purposes) was developed from aerial photographic interpretation and mapped by the Town of Charlotte Conservation Commission is indicated in green on Map 4. Wildlife Habitat (Map 6)

While most of the Town can be considered wildlife habitat, this Plan is concerned primarily with locally and regionally significant wildlife habitat, particularly that which is in short supply, such as wetland and contiguous forest including upland forest. Locally and regionally significant wildlife habitat in Charlotte includes 18 Vermont Natural Heritage Communities and several habitat blocks as identified by the Agency of Natural Resources, Department of Fish & Wildlife. The largest habitat blocks in Vermont are at higher elevations in the Green Mountains and other remote areas. The Champlain Valley, as well as the Vermont Valley and most of the piedmont biophysical regions, have very few large habitat blocks remaining because of concentrated development in these areas. These regions are also some of the most biologically diverse in the state.

As part of the 1990, 1995, and 2000 Town Plan, wildlife habitat was identified and mapped by the Charlotte Conservation Commission and other interested individuals in the Town. Technical assistance was provided by local experts as well as consulting ecologists, University of Massachusetts air photo interpreters, University of Vermont faculty and graduate students in the School of Natural Resources and the Field Naturalist Program, the Vermont Agency of Natural Resources, the Natural Resources Conservation Service, The Nature Conservancy and

the Chittenden County Regional Planning Commission (CCRPC). In 2000, the previously hand drawn layers were digitized and linked to a database for the collection and storage of field information and for future accessibility. Information available includes descriptions of existing and historical land use, natural plant communities (particularly wetlands and upland forests), wildlife species (or signs observed), small-scale habitats or features (e.g. vernal pools, mast trees, inactive dens), recognized ecological principles and habitat value relative to the Town and region.

In 2008, the Charlotte Conservation Commission and a habitat working group sought to refine and strengthen the 2000 map by describing the framework used for the classification and identification of Charlotte's wildlife habitat. The framework used is consistent with the "coarse filter-fine filter" approach utilized in *Vermont's Wildlife Action Plan.*[4] The underlying concept is that if examples of all coarse-filter features are conserved at the scale at which they naturally occur, many of the species they contain may also be conserved. The State framework focuses on three scales of conservation: landscape, habitat and natural community, and species / groups of species. The Charlotte framework is largely a habitat-based, or coarse filter, approach to maintaining viable animal and plant populations in the Town and surrounding area.[5] Here, animal and plant species of conservation need are not singly protected. Instead, the habitats and natural communities these species are associated with are the priorities for conservation.

Charlotte's framework evaluates land based on its ability to support one or more of the following seven ecological principles identified in the Vermont Biodiversity Project (VBP).[6]

1. Maintain large, intact patches of native vegetation. ***(Core Habitat)***

   The VBP group has comprehensively mapped "Core Habitat" within the State, which they had defined as land that is:

   "...at least 100 meters distant from a zone of human disturbance. Human disturbance zones were defined as developed, industrial, or residential areas, agricultural openings, and roads." [7]

2. Protect habitats that are key to the distribution and abundance of priority species (priority species habitat is based on the *Vermont Wildlife Action Plan*)[8]. ***(Priority Species Habitat)***
3. Protect exemplary natural communities and aquatic features. ***(Rare Landscape Features)***
4. Maintain connections among wildlife habitats for movement and gene flow. ***(Connectivity)***

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[4] Vermont Wildlife Action Plan Team. 2015. Vermont Wildlife Action Plan 2015. Vermont Fish & Wildlife Department. Montpelier, VT. http://www.vtfishandwildlife.com

[5] Six of the eight landscape ecology principles evaluated address coarse-filter conservation needs, with rare and high public value species protection being the exceptions.

[6] Vermont Biodiversity Project, The Nature Conservancy of Vermont, Vermont Land Trust, VT Fish & Wildlife Department, US Fish & Wildlife Service, Green Mountain National Forest, US Forest Service, VT Department of Forests, Parks & Recreation, *1999*.

[7] Vermont Biodiversity Project – Core Habitats (Database), University of Vermont – School of Natural Resources, Capen, D., 2000

[8] Vermont Wildlife Action Plan Team, *op. cit.*

5. Maintain significant ecological processes (such as those associated with wetlands and floodplains for recharging groundwater and filtering surface water). ***(Maintenance of Ecological Process)***
6. Contribute to the regional persistence of rare species by protecting their habitat locally. ***(Rare Species Protection)***
7. Represent the full diversity of Charlotte's ecosystems. ***(Representation)***

As a result of this project, the four categories of habitat were refined using updated orthophotography and revised state data layers: forest, aquatic, shrubland, and linkage habitat areas. As part of this process, the term 'Critical' was replaced with 'Significant' when describing Charlotte's habitat areas to avoid confusion with the term "critical habitat," which is more commonly associated with the Federal Endangered Species Act.

The 2008 Significant Wildlife Habitat map categorizes wildlife habitat as follows:

- **Forest Habitat** where trees are the dominant vegetative life form. Forest habitat includes forests (with canopy cover of 60% or more) and woodlands (canopy cover of 25%-60%). Core habitat areas were also incorporated into the Significant Habitat Map. Core areas were defined as part of the VT Biodiversity project that was completed in 2000.
- **Aquatic Habitat** defined as areas inundated or strongly affected by surface water. Aquatic habitat includes streams, rivers, lakes, and wetlands, and their adjacent water- and sediment-affected lands. Note that these water influenced and influencing adjacent lands (buffer zones) actually vary in width and location due to topography and stream meandering. However, for practical purposes when mapping, uniform 100-foot buffers are indicated on each side of wetlands and named streams in Charlotte. Buffers of 330 feet are indicated on each side of Thorp Brook, Lewis Creek and the LaPlatte River, in keeping with state and international standards.
- **Persistent Shrubland Habitat** where shrubs and young trees are the dominant vegetative life form. Note that only areas likely to persist as shrubland for 10 years or more due to natural conditions that prevent tree establishment (such as beaver-maintained wetlands, floodplains, shrub swamps, and the margins of rock outcrops) are considered persistent enough to assess as Significant Wildlife Habitat. Since other Shrubland Habitat in Charlotte is maintained only through human intervention (periodic brush-hogging), it is not stable enough to be classified as persistent and included on this map.
- **Linkage Habitat** which consists of areas in addition to the above that provide corridors or connections for animal movement and plant dispersal among forest, aquatic, and shrubland habitat areas across the larger region. This may include hedgerows, fields, small lawns, vegetated drainage ways, and fallow lands that provide needed links to feeding, denning, and breeding grounds. Note that since wildlife species vary in their tolerance of activity of humans and domestic animals within their linkage habitat, these areas are generally swaths or vegetative zones rather than narrow paths. Furthermore, functional linkages, or those

being used, should be differentiated from structural linkages, or those that may be used, in the field. Functional linkage should be preserved wherever possible.

A "*Technical Guide for Identifying and Classifying Habitat in Charlotte"*[9] and the Charlotte Conservation Commission's "Ecologist Site Assessment Protocol"[10] were also developed as part of the Significant Wildlife Habitat Map update project. The purpose of these documents is to provide consistent development review guidelines and data collection standards for use by Town groups, consultants and the broader community. The Significant Wildlife Habitat map (Map 4) is available as an interactive map through the Chittenden County Regional Planning Commission website.

Special Natural Areas (may overlap with AHPV)

Natural areas are areas of land or water that retain their natural character and contain unusual or significant flora, fauna, geological, or related features of ecological and educational interest. Information on special natural areas in Charlotte has been obtained by the Charlotte Conservation Commission from the Vermont Natural Areas Inventory, the Vermont Natural Areas Map, the Nature Conservancy, the Vermont Non-Game and Natural Heritage Program, and citizens of the community. Details are available to property owners, but only the general locations of the less fragile areas are provided below:

- **Charlotte Road Cut**: unique geological feature;
- **Charlotte Park and Wildlife Refuge**: a 290-acre natural, agricultural, and recreational Town-owned feature intended to serve as a sanctuary for a variety of birds, mammals, reptiles, and insects[11];
- **Pease Mountain**: geological feature (Champlain Overthrust), aquifer recharge area, location of rare plants and natural communities;
- **Barber Hill**: geological feature, aquifer recharge area, rare plant community;
- **Mount Philo**: geological feature (Champlain Overthrust), exceptional views, aquifer recharge area, location of rare plants and natural communities, deer wintering area;
- **Town Farm Bay and Thorp Brook**: unusual fossil evidence, wetland, rare animal and natural community; waterfowl area;
- **Lewis Creek**: whitewater rapids, historic bridges; sport fishing, scenic stretches;
- **Old Landfill**: geologic features (fossils, Champlain Sea Beach);
- **Railway site**: fossils;
- **McNeil Cove**: fossils;
- **Monkton Cave**: unique geological feature;
- **Scenic Overlook**: panoramic view of Adirondack High Peaks and Champlain Valley;
- **Garden Island**: rare plant community;
- **Cedar Island**: rare plant community;

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[9] "Technical Guide to Classifying, Identifying, and Justifying Significant Wildlife Habitat in Charlotte, Vermont", Jesse Mohr (Native Geographic, LLC), Matthew Kolan (University of Vermont), and The 2008 Charlotte Significant Wildlife Habitat Working Group, 23 April 2009.

[10] "Protocol for Assessment of Impacts of Proposed Development on Significant Wildlife Habitat in Charlotte, Vermont", *Charlotte Conservation Commission*, March 2008.

[11] Town of Charlotte, Charlotte Park & Wildlife Refuge - Comprehensive Management Plan, June 1999.

- **Thompson's Point site**: rare plant community;
- **Vermont Wildflower Farm**: rare plant community; and
- **Williams Woods**: rare plants and significant natural community.

There are several parcels of land in the Town under public or private non-profit ownership as conservation reserves, or in private ownership with conservation easements in order to protect and steward their natural features with high public value. Map 13: Conserved & Public Lands, which indicates these conserved areas as well as public lands is updated annually by the Charlotte Planning & Zoning Office in cooperation with the Chittenden County Regional Planning Commission.

2.2 CULTURAL & HISTORIC RESOURCES (MAP 7)

The 1990 Town Plan Town Environment Committee, and other committees since then, listed the types of special features that contribute to the character of the Town. Several of these features were classified into Areas of High Public Value and the Town, through its regulations, strives to protect these areas from undue, adverse impacts associated with land development. The following features are considered important cultural and historic resources within Charlotte: historic structures, districts and settlement patterns; scenic views and vistas; a dark night sky; working farms, meadows and pastures; and archaeological sites.

Historic structures, districts and settlement patterns

The Charlotte Historical Society has brought Town attention to the importance of Charlotte's historic resources. The Historical Society maintains a museum at the former Town Meeting House and sponsors town-wide events at the museum. The Historical Society helped the Conservation Commission and the Charlotte Quinlan School Corporation to relocate and restore the old Quinlan School to the Town Green. The Society also published a report on the history of the Town's roads, partnered with the Charlotte Community School during 1999-2000 to conduct an inventory of homes in Town, and assisted with the nomination of the *"Charlotte Center Historic District"* to the National Register of Historic Places.[12]

Charlotte has significant historic resources, including the villages, the summer camp communities, unique structures such as the covered bridges, sites such as the ferry landing, buildings which currently or formerly served for public uses, and homes, barns, and farmsteads. These resources represent the Town's heritage and contribute to the character and culture of the community.

During the summer of 1976, the Vermont Division for Historic Preservation conducted an inventory of the Town's historic resources, known as the Historic Sites and Structures Survey (HSSS).[13] As a result of this inventory, 64 sites and/or districts were placed on the State Historic Register on April 9, 1980. Additional sites, such as the Vermont Railway Guesthouse were added to the State Register on December 17, 2004. These sites have been mapped on the Historic and Cultural Resources Map (Map 7). The identified historic sites and districts are considered an Area of High Public Value within the subdivision, site plan review and conditional use review permitting processes. The Thompson's Point Historic District is also considered during the design review process required for proposed development within the Shoreland Seasonal Home Management Zoning District.

The Town's historic districts and complexes include (See Map 7: Cultural & Historic Resources);

- **Baptist's Corners (H1):** A historic business and social center of the Town around the intersection of Hinesburg Road and Spear Street which contains a unique concentration of

[12] *National Register of Historic Places*, US Department of the Interior, National Park Service, 2018. https://www.nps.gov/nr

[13] Cramer, Adele. Vermont Historic Sites and Structures Survey. Montpelier: Agency of Commerce & Community Development, Vermont Division for Historic Preservation, 1976. (Town of Charlotte). http://accd.vermont.gov/historic-preservation/identifying-resources/hsss

Greek Revival style residences and public buildings, including two churches (one now a residence) and the Grange Hall.

- **Old Route 7 Historic District (H2):** The former transportation center on the main stage road between Burlington and Vergennes providing services to travelers and now a residential district with two key buildings providing fine examples of Federal style architecture-the *Rayta House* and the *Swenor House* (otherwise known as the *"Tavern on Mutton Hill"* or the misnamed *"1812 Tavern"),* which was added to the National Register of Historic Places on December 10, 1982 (NRHP Reference ID# 82001763).
- **Charlotte Center Historic District (H3)**: The geographic center of the Town and a focal point for early settlement where public buildings, such as the Congregational Church and the Meeting House, and businesses were established for the convenience of residents. The district contains buildings of distinctive architecture, dating from the 1780s to the 1900s, including examples of Federal, Greek Revival, and Queen Anne styles. The 27-acre district was added to the National Register of Historic Places on July 19, 1984 (NRHP Reference ID# 84003460).
- **Four Corners Historic District (H4):** The largest of the Town centers, its position between the ferry landing and the main stage road and its physical setting on a ridge with magnificent views of the lake and the Adirondack Mountains contributed to its settlement and early growth. Development was further stimulated by a railroad station half a mile west. By the 1880s the district contained a church, school, two stores, a shoe shop, blacksmith shop, and about 20 dwellings. The architecture consists of buildings constructed between 1811 and 1900 in Federal, Greek Revival, and Queen Anne styles.
- **Cedar Beach Historic District (H5):** The earliest resort area in Charlotte, started in the 1870s and 1880s and containing numerous examples of resort architecture of the period.
- **Thompson's Point Historic District (H6):** A significant concentration of 1880s and 1890s resort architecture located on the old Town poor farm. The architecture harmonizes with the setting, incorporating irregular plans and projecting gables or turrets. The district includes 33 cottages and their related outbuildings, garages, ice houses, boat houses and club house. Until 1924 the side wheel steamships, the Chateaugay and the Ticonderoga made scheduled stops at Thompson's Point and Cedar Beach.
- **Bucklin Estate (H7):** Added to the State Register of Historic Places on April 9, 1980, the complex hosts a variety of architecturally notable structures from different historical periods, including a stone house that was constructed circa 1792, a Queen Anne-style water tower built around 1895, and a number of other outbuildings.
- **Mt. Philo Inn Complex (H8):** A historical scenic summer resort facility with a number of buildings dating from 1896 to the 1930s, the venue includes the Mt. Philo Inn building (constructed in 1896) and the Terrace Cottage constructed in 1904. The property abuts *Mount Philo State Park* to the east; a 237-acre State park surrounding a 968' summit that is endowed with one of the most scenic and sweeping views within the Champlain Valley, in addition to trails, a 1930s lodge, covered pavilion, picnic areas, and a small camping area. Created in 1924 as the Vermont's first State park, *Mount Philo State Park* was added to the National Register of Historic Places on November 29, 2001 (NRHP Reference ID# 01001286).

Other significant historic resources within the Town include; the residential properties listed on the National Register of Historic Places, such as the *McNeil Homestead* that was added to the

NRHP on June 17, 1982 (NRHP Reference ID# 82001700), as well as the Quinlan's, Seguin, and Holmes Creek covered bridges (each added to the NRHP in September of 1974); properties, farms, and former public buildings listed in the Vermont State Historic Register of Historic Places or recorded in the HSSS,[14] some of which today are used for private purposes; and other historic farmhouses, barns, and farm buildings, such as the 138-acre *Clemmons Family Farm*, a historic landmark on the Vermont African American Heritage Trail, which in 2017 received national recognition and funding to develop a multicultural heritage center, and was added to the National Register of Historic Places in August 2025 (NRHP Reference ID #100012087).".[15] Each dot the landscape and contribute to the cultural and agricultural character of the Town.

As part of the Town's heritage, it is important that these resources be protected and retained in their current locations.

Scenic Views and Vistas (including Scenic Roads)

In 1990 and again in 1999, the Town assessed scenic views and vistas. The 1999 work was organized by the Charlotte Tree Warden and Conservation Commission and focused on scenic and conservation values of Charlotte's roadsides.[16] Locational data from each of these assessments has been merged into one map with assets listed within the Historic (see Map 7: Cultural and Historic Resources).

Adirondack Mountains from US Route 7, 2016

Photo by Niranjan Arminius (CC BY-SA 4.0), via Wikimedia Commons

[14] Cramer, Adele. Vermont Historic Sites and Structures Survey, *op. cit.*

[15] National Creative Placemaking Fund, *ArtPlace America*, Brooklyn, NY, 2017. https://www.artplaceamerica.org

[16] Hamilton, Larry, "*Assessment of Scenic and Conservation Values of Charlotte Roadsides:* A Joint Project of the Charlotte Tree Warden and Conservation Commission", Fall 1998. Town of Charlotte, Vermont

The Charlotte Roadside Tree Restoration project, which was started in 2006, continues to be funded through generous donations. The goal of this project is to plant trees along public rights-of-way where appropriate and to encourage property owners to do the same. Since its inception in 2006, the project has resulted in the planting of over 450 roadside trees.

Views and Vistas (Based on 1990 information - *direction of view from location*):

- Northwest to southwest from Mt. Philo State Park (V1);
- West off Mt. Philo Road, south of the base of Mt. Philo State Park (V2);
- West off Route 7, vicinity of the north end of Old Route 7 (V3)Town scenic overlook);
- East and north off Route 7, north of Nordic Farm (V4);
- West off Lake Road at the Town beach (V5);
- Southeast off Mt. Philo Road, north of Spear Street (V6);
- Southeast off lower Spear Street, north of the covered bridge (V7);
- Southeast at the intersection of Greenbush Rd. and Thompson's Pt. Rd. (V8);
- Guinea Road near the intersection with Bingham Brook Road (360 degrees) (V9);
- East and north on Spear Street, west of the covered bridge (V10);
- South off of Spear Street on the south side of Mt. Philo (V11);
- East on Hinesburg Road, near Dorset Street and Bean Road (V12);
- East off Mt. Philo Road, just north of One Mile Road (V13);
- West on Lake Road, descending towards Orchard Road (V14);
- East on Prindle Road between Spear Street and Bean Road(V15);
- North on Roscoe Road, vicinity of Lewis Creek Road (V16);
- Both sides of Spear Street, between Hinesburg Road and Prindle Road (V17);
- East on Ferry Road, near Lake Road (V18); and
- West on Garen Road at top of the hill (V19).

Westward view of the Adirondacks from Greenbush Road, 2015 - *Photo by Lee Krohn*

This information was updated in 1999 and is also shown in Map 7: Cultural and Historic Resources. Ubiquitous overhead utility lines for power, telephone and cable television have the impact of diminishing the Town's scenic vistas, views and general landscape quality. These are important services, but the vision for an aesthetically beautiful Charlotte includes the replacement of overhead lines with underground lines and requires the installation of new lines underground. It is the objective of the Town that all utilities will be underground.

The Charlotte Roadside Beautification Fund was created in 2006 with a generous endowment and the possibility of on-going matching funds from the William Rutter Jr. family. Under the leadership of the Town Tree Warden and an advisory committee appointed by Selectboard, this Fund will result in tree planting along public rights-of-way, starting with higher use areas, and will also encourage property owners to plant trees to beautify their land along public roads. (The Road Commissioner's advice will be included regarding how to avoid interference with road and utility maintenance and line-of-sight distance issues).

Dark Night Sky

One of Charlotte's special features is its dark, rural night sky. While still relatively undisturbed, Charlotte's natural darkness at night, augmented by a brilliant array of stars, is beginning to be threatened by light pollution and glare. Light pollution is the upward and outward distribution of light projected directly from fixtures or reflected off the ground or other surfaces. Glare is direct light shining from a fixture that makes it difficult to see or causes discomfort. Light pollution, in particular, comes from the cumulative effect of individual exterior lights within the Town, as well as from development and associated night lighting outside of Town. Charlotte has adopted Outdoor Lighting standards which apply to new and existing development. In general, the standards state that 1) outdoor lighting be kept to the minimum required for safety, security and intended use, consistent with the character of the neighborhood in which it is located and 2) permanent outdoor lighting fixtures shall be designed to minimize glare, and shall not direct light upward or onto adjacent properties, roads, or public waters or result in

"Nordic Farms Roof" *by Laurel Waters*

excessive lighting levels that are uncharacteristic of the surrounding neighborhood area.

Agriculture

As the brief Town history notes, from early settlement to today, agriculture has been a significant part of the landscape, rural character, and economy of the Town of Charlotte. Beers Atlas in 1869 stated that *"the superior adaptation of the Town to agricultural pursuits was one cause of its rapid settlement."* Child's Gazetteer in 1882 mentions that the industry of the people of Charlotte has always been devoted to agriculture due to its rich fertile soil.

Community input received during the Town Plan update process, as well as during other community initiative meetings indicate the preservation of working farms and natural areas

continues to be a clear priority for Charlotte residents. Soils, including prime and statewide primary agriculture soils, are discussed in the Natural Resources section. Agriculture as a land use is discussed in that section. This section will focus on the cultural element of Charlotte's farms by identifying those that have shaped the landscape and thus represent Charlotte's 'way of life'.

Merriam – Webster defines a farm as 'a tract of land dedicated to agricultural purposes'. Agriculture is defined as 'the science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products.' Charlotte has a growing myriad of farms producing a diversity of agricultural products and services.

2.15 Farming means:
(a) the cultivation or other use of land for growing food, fiber, Christmas trees, maple sap, or horticultural and orchard crops; or
(b) the raising, feeding, or management of livestock, poultry, fish, or bees; or
(c) the operation of greenhouses; or
(d) the production of maple syrup; or
(e) the on-site storage, preparation, and sale of agricultural products principally produced on the farm; or
(f) the on-site storage, preparation, production, and sale of fuel or power from agricultural products or wastes principally produced on the farm; or
(g) the raising, feeding, or management of four or more equines owned or boarded by the farmer, including training, showing, and providing instruction and lessons in riding, training, and the management of equines.

The United States Department of Agriculture (USDA) uses a fairly broad definition, defining a farm as any place that sells or normally could sell, at least $1,000 of agricultural commodities. This definition is used to measure statistics on agricultural activity at the national level and to determine eligibility for Federal aid. The USDA acknowledges that this broad definition can be misleading and that narrower definitions may help policymakers achieve goals "such as establishing price and farm income support, providing support to beginning farmers to increase U.S. agriculture's future viability, and protecting and preserving natural resources."[17]

The State of Vermont through its *Required Agricultural Practices Rule*[18] defines a farm as "a parcel or parcels of land owned, leased, or managed by a person and devoted primarily to farming as defined in Section 2.15 of this rule and that meets the threshold criteria as established in Section 3 of this rule, provided that the lessee controls the leased lands to the

[17] O'Donoghue, Erik J., Robert A. Hoppe, David E. Banker, and Penni Korb. *Exploring Alternative Farm Definitions: Implications for Agricultural Statistics and Program Eligibility*. EIB-49, U.S. Department of Agriculture, Economic Research Service, March 2009.

[18] Vermont Agency of Agriculture, Food, and Markets, Required Agricultural Practices (RAP) Proposed Rule, May 2016. http://agriculture.vermont.gov/rap

extent they would be considered as part of the lessee's own farm. Indicators of control may include whether the lessee makes day-to-day decisions concerning the cultivation or other farming-related use of the leased lands and whether the lessee manages the land for farming during the leased period."

By and large, farms must be 4 or more contiguous acres in size. Smaller areas may be considered farms if they produce an annual gross income from the sale of agricultural products of $2,000.00 or more in an average year or are managed by a farmer filing a 1040(F) income tax statement in at least one of the past two years. The primary purpose of this narrower definition, as compared to that of the USDA, is to protect and preserve Vermont's natural resources including Lake Champlain.

3.1 Persons engaged in farming and the agricultural practices as defined in Section 3.2 of this rule and who meet the minimum threshold criteria for applicability of this rule as found in Section 3.1(a) – (g) must meet all applicable **Required Agricultural Practices** conditions, restrictions, and operating standards. Persons engaged in farming who are in compliance with these conditions, restrictions, and operating standards, as applicable, shall be presumed to not have a discharge of agricultural wastes to waters of the State. Compliance with the Required Agricultural Practice Rule is required if a farm:

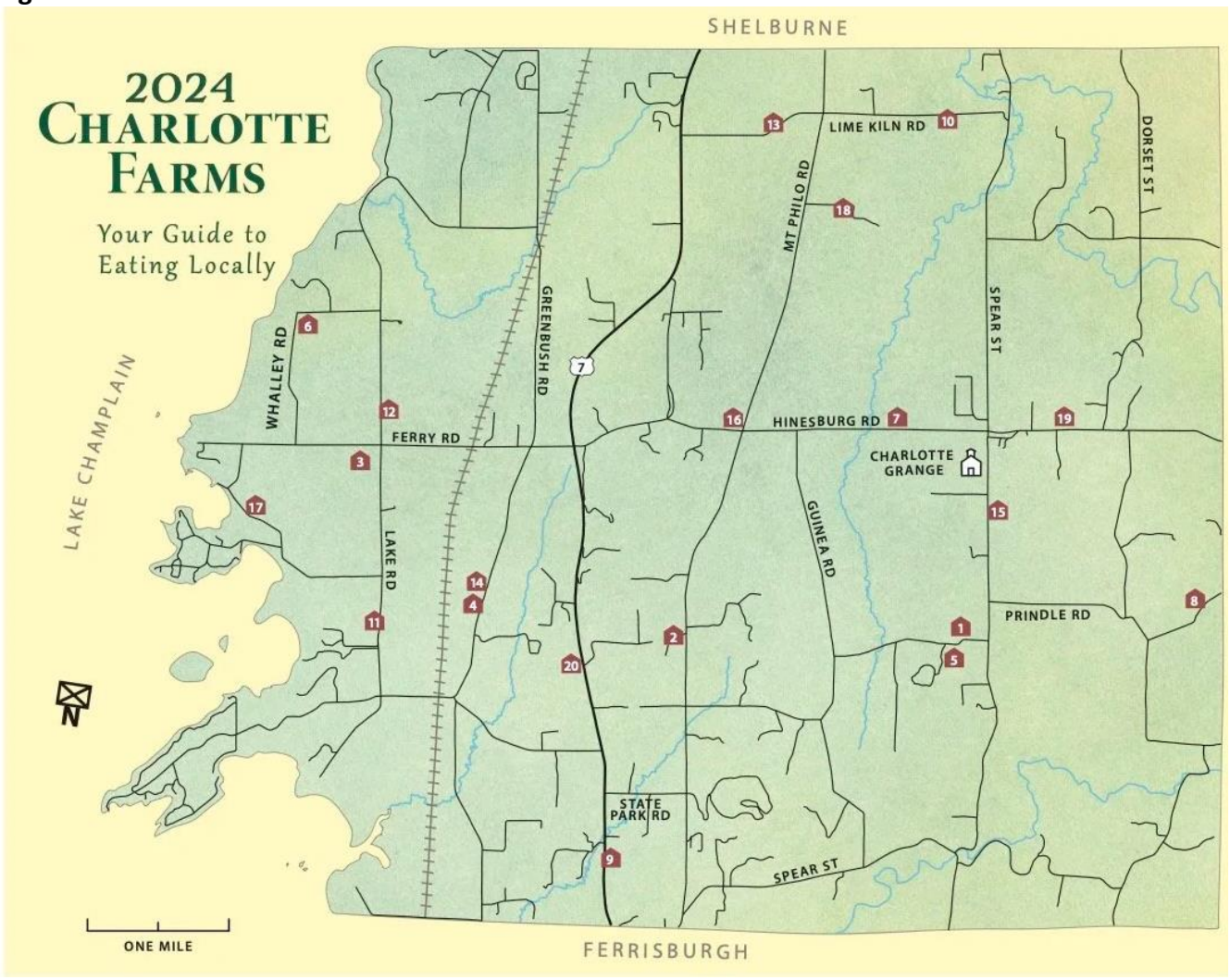
(a) is required to be permitted or certified by the Secretary, consistent with the requirements of 6 V.S.A. Chapter 215 and this rule; or
(b) has produced an annual gross income from the sale of agricultural products of $2,000.00 or more in an average year; or
(c) is preparing, tilling, fertilizing, planting, protecting, irrigating, and harvesting crops for sale on a farm that is no less than 4.0 contiguous acres in size; or
(d) is raising, feeding, or managing at least the following number of adult livestock on a farm that is no less than 4.0 contiguous acres in size:

> (1) four equines; (2) five cattle, cows, or American bison; (3) 15 swine; (4) 15 goats; (5) 15 sheep; (6) 15 cervids; (7) 50 turkeys; (8) 50 geese; (9) 100 laying hens; (10) 250 broilers, pheasant, Chukar partridge, or Coturnix quail; (11) three camelids; (12) four ratites; (13) 30 rabbits; (14) 100 ducks; (15) 1,000 pounds of cultured trout; or (16) other livestock types, combinations, or numbers as designated by the Secretary based upon or resulting from the impacts upon water quality consistent with this rule; or

(e) is raising, feeding, or managing other livestock types, combinations, and numbers, or managing crops or engaging in other agricultural practices on less than 4.0 contiguous acres in size that the Secretary has determined, after the opportunity for a hearing, to be causing adverse water quality impacts and in a municipality where no ordinances are in place to manage the activities causing the water quality impacts; or
(f) is managed by a farmer filing with the Internal Revenue Service a 1040(F) income tax statement in at least one of the past two years; or
(g) has a prospective business or farm management plan, approved by the Secretary, describing how the farm will meet the threshold requirements of this section.

In 2017, there were over forty working farms in Charlotte. In the winter of 2022 an idea was born when the Charlotte Grange held a roundtable discussion with local farmers asking how the Grange might help them. The result is the map and directory below, now in its second edition. The Charlotte Farm Map below highlights Charlotte farms selling food directly to consumers. Copies were inserted into the July 25th, 2024 edition of the Charlotte News and additional maps are available at the Town Hall, Library, local businesses, farm stands, and at upcoming Grange on the Green music concerts.

Figure 7: 2024 Charlotte Farms



1. Adam's Berry Farm
2. Allen Family Maple
3. Ceres Gardens
4. Charlotte Village Winery
5. Fat Cow Farm
6. Golden Apple Orchard and Family Farm
7. Grass Cattle Company
8. Greylaine Farm
9. Head Over Fields
10. LaBerge Brothers
11. Nitty Gritty Grain Co. of Vermont
12. Paradiso Farm
13. Patalin's Sugarworks
14. Pelkey's Blueberries
15. Phields of Philo Apiary
16. Philo Ridge Farm
17. ShakeyGround Farm
18. Sobremesa
19. Stony Loam Farm
20. Sweet Roots Farm

Archaeological Sites

The lands on either side of the following water bodies are areas of *known archaeological sensitivity*, according to the State Archaeologist as are areas in the vicinity of The Tavern At Wings Point: Mud Hollow Brook, Bingham Brook, LaPlatte River, Lewis Creek east of Scott Pond.

The lands on either side of the following water bodies are areas of expected archaeological sensitivity, according to the State Archaeologist: Thorp Brook, Kimball Brook, Holmes Creek, Pringle Brook, McCabe's Brook, and Lewis Creek west of Scott Pond.

2.3 DEMOGRAPHICS

The Town of Charlotte is proud of its diverse population which is a product of many years of change in the character of the community and the economy of the region. In 1790 the Town, with 635 people, was the most populated in the county. Charlotte held this position until sometime between 1800 and 1810 when it was surpassed by Burlington. In 1840, Charlotte reached a peak in its population for that century of 1,702 people. However, over the next 100 years the Town experienced a decline in population to a low of 1,082 in 1940. This pattern was consistent with that of the state during that period when there was a large migration of Vermonters to the west. This situation turned around over the next 40 years as the population steadily increased (see Table 1). Resident surveys undertaken with several Town Plan updates have identified growth pressures and rate of growth as one of the biggest challenges currently confronting the Town.

Table 1: Population in the Town of Charlotte: 1790-2020

Year	Population
1790	635
1800	1,231
1810	1,679
1820	1,526
1830	1,702
1840	1,620
1850	1,634
1860	1,589
1870	1,430
1880	1,342
1890	1,240
1900	1,254
1910	1,163
1920	1,160
1930	1,089
1940	1,082
1950	1,215
1960	1,271
1970	1,802
1980	2,561
1990	3,148
2000	3,569
2010	3,754
2020	3,912

Source: U.S. Decennial Census 2020

Charlotte's population consists of both seasonal and year-round residents. There are no estimates of the number of seasonal residents in the Town although the Vermont Health Department estimated there were 184 seasonal housing units in 1992, 166 seasonal housing units in 1996, and 174 seasonal housing units in 2000. Some seasonal housing units have been renovated to year-round residences over the past 15 years, although the zoning regulations restrict conversions on Thompson's Point, where many seasonal houses are located. Due to the

limited number of overnight accommodations and large tourist attractions in the Town, the number of transients is estimated to be very low. Therefore, the Town's Service Population is comprised almost entirely of year-round and seasonal residents.

Charlotte exhibits the characteristics of many of the "outer ring" towns of the county - a relatively small but growing population. Table 2 compares Charlotte's growth from 1960 to 2020 with that of Chittenden County as a whole.

Table 2: Population Growth in the Town, Region, and State: 1960-2020

	Charlotte		Chittenden County		Vermont	
	# Increase	Ave. Annual %	# Increase	Ave. Annual %	# Increase	Ave. Annual %
1960-70	531	4.18%	24,706	3.32%	54,850	1.41%
1970-80	759	4.21%	16,403	1.65%	66,735	1.50%
1980-90	587	2.29%	16,227	1.40%	51,301	1.00%
1990-2000	421	1.34%	14,810	1.12%	46,060	0.82%
2000-10	185	0.52%	9,974	0.68%	16,914	0.28%
2010-20	158	0.42%	11,778	0.75%	17,336	0.28%

Source: U.S. Decennial Census 2020

Population trends serve as an important indicator of the potential pressures and demands a community must consider in planning for future facilities, services, housing, and land use patterns. However, forecasted population trends should be regarded with caution. Between the years 1990 and 2000, Charlotte received approximately 421 of the 14,810 new county residents, or 2.8% of the county's growth, which represented an average annual growth rate for the Town of 1.34% and 1.12% for the County. Growth rates for Charlotte continued to decline between the years 2000 and 2020, while still growing at an annual average rate greater than that of the whole of Vermont.

During the late 1990s, the Chittenden County Regional Planning Commission (CCRPC) had projected Charlotte's population to reach 4,062 persons by 2010, a growth totaling about 2.8% of the county's growth and representing an average annual growth rate of 1.5%. In this period, several companies had either located or expanded within the region, including Husky and IDX. At that time these companies felt that their labor needs would not be filled by the existing county labor pool. For example, the IDX projection included within its Act 250 application indicated that its expansion could result in approximately 95 new Charlotte residents and the need for 37 new homes in the Town by the year 2008. As the proprietary data seemed to suggest that the CCRPC projections were underestimating growth, the 2010 Census proved that their estimate was too high. Nevertheless, the expansion of these firms has yet to occur as they have predicted.

Consistent with regional trends between 1970 and 1980, Charlotte saw a growing share of its population in the 25-34 age category and a smaller share in the school-age category as the "baby-boom" generation matured. As this generation in turn created its own families, the "baby-boom echo" affected the demographics of the school-age population. In 1980, the percentage of the Town's population under five years old was 7.3%. This percentage grew to almost 10% in 1990. This percentage then dropped to 5.6 % in 2000, and to 4.3% in 2010. The

American Community Survey (ACS) estimated this figure to be 3.75% in 2014.[19] This undulation has impacted elementary school enrollment.

In contrast, between 1980 and 2000 there was a steady increase in the absolute population in the 65-and-over age group. The number of persons 65 or older increased from 181 in 1980, to 199 in 1990, to 275 in 2000. In percentage terms, the percent of Town residents aged 65 or older was 7.1% in 1980; it was 6.3% in 1990; 7.7% in 2000; and rose to 11.7% in 2010. The ACS estimated the figure to have leveled off for 2014. This situation has continuing implications for the provision of community services and housing for seniors, especially as the large middle-aged group of residents move into older age.

Table 3: Racial and Ethnic Make-up of Residents

	2010	Percent	2020	Percent
White alone	3,658	97.4%	3,571	91.28%
Black or African American alone	18	0.5%	25	0.64%
American Indian or Alaska Native alone	5	0.1%	4	0.1%
Asian alone	32	0.9%	26	0.66%
Other Race alone	8	0.2%	42	1.07%
Population of two races	26	0.7%	235	6.01%
Population of three races	4	0.1%	9	0.23%
Hispanic or Latino (any race)	71	1.9%	94	2.4%

Source: U.S. Decennial Census 2020

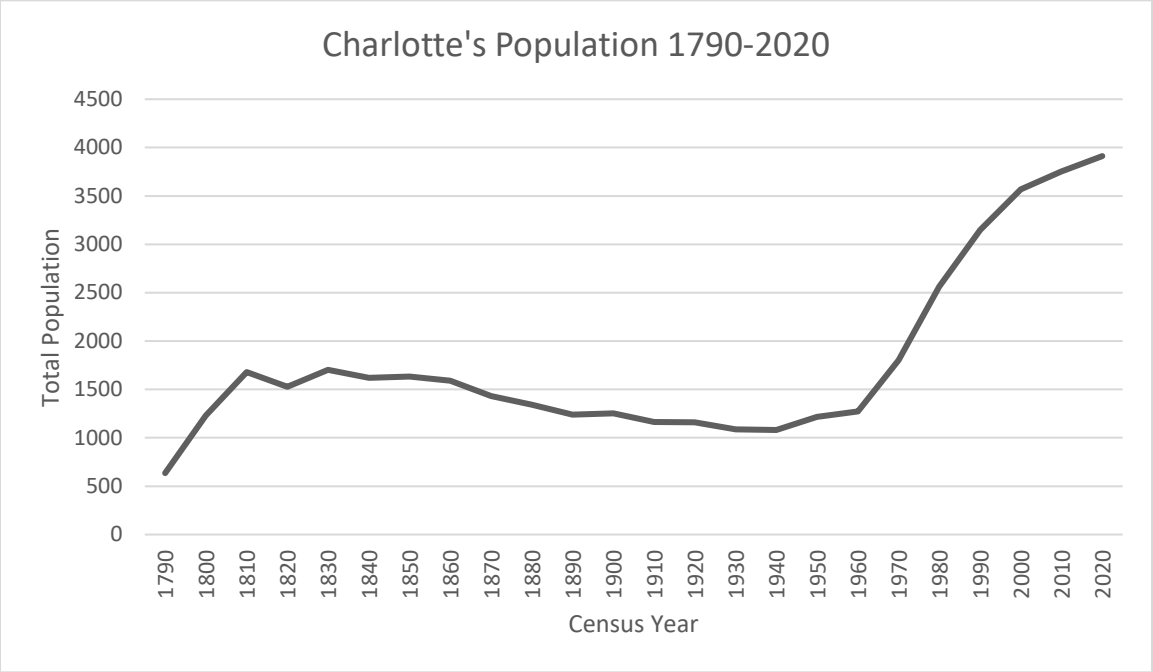
The Town has witnessed dramatic changes in the composition of its residents from the early settlers of the 18th century who were primarily farmers or people engaged in local Charlotte businesses and industries. Today, most of the Town's workforce commutes to jobs outside the Town, although 12% work at home (according to the 2000 Census). In 2000, 52% of Charlotte residents in the work force were employed in management or professional occupations, while 1.8% were employed in farming or forestry occupations. The Town has also seen a small increase in its ethnic diversity in recent years, although about 91% of residents were classified as white in 2020.

Population

Charlotte ranks 14th in population in Chittenden County with a 2020 (US Census) population of 3,912. This accounts for approximately 3.3% of Chittenden County's total population and this percentage of county population has remained consistent over the past thirty years.

[19] 2010-2014 American Community Survey 5-Year Estimates, US Census Bureau.

Figure 8. Charlotte's Population 1790-2020

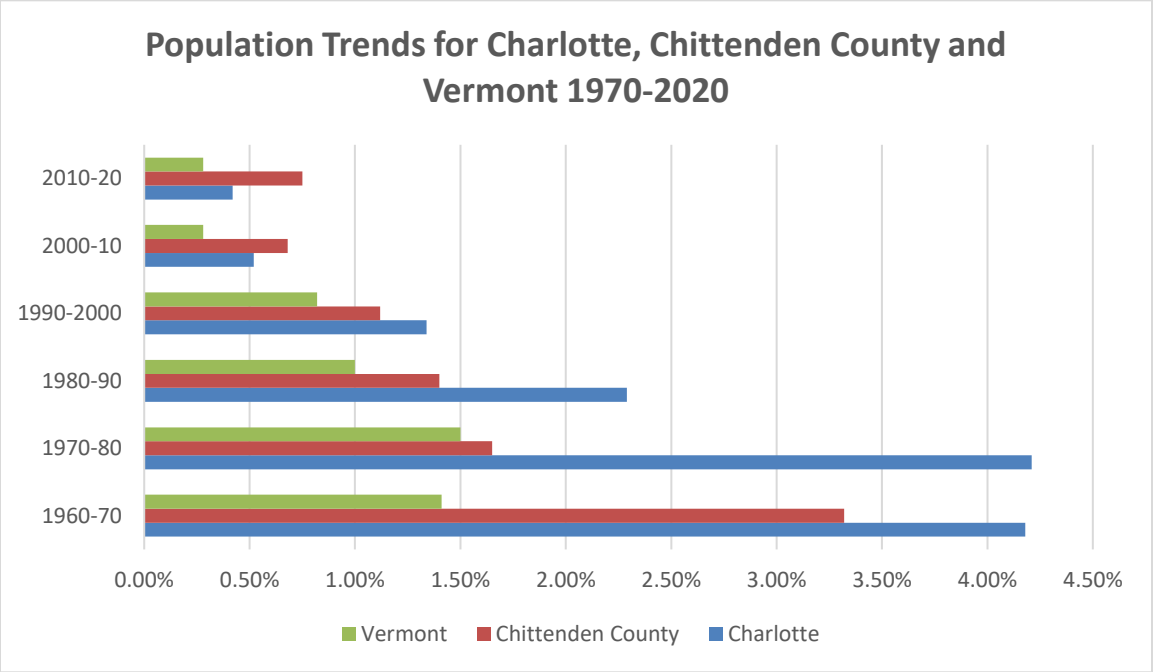


Source: US Census

Between 1980 and 2000, Charlotte experienced a higher percentage of population growth compared to Chittenden County and the State. More recent trends indicate lesser growth as compared to the county but higher growth when compared to the state overall.

Charlotte's population as a percentage of the County's population has remained fairly consistent over the past 30 years and is equal to the average percentage of growth for other 'outer ring' communities.

Figure 9. Population Trends for Charlotte, Chittenden County and Vermont 1970-2020



Source: US Census; VT Dept of Health Intercensal Population Estimates 2000-2010, January 2013.

Population Characteristics

The median age in Charlotte in 2010 was 44.8 years of age. The median age in Chittenden County and the State was 36.2 and 41.5 years of age, respectively. A younger demographic residing in Burlington largely influences Chittenden County's median age. Charlotte's population is older than both the county and state median. The age distribution chart depicts lesser numbers of individuals in the 20-39 age range in 2010. If this trend is projected to today, this indicates that this same group of individuals would be 25-45 years of age, a demographic comprised of young, working families.

Figure 10. Median Age in 2010

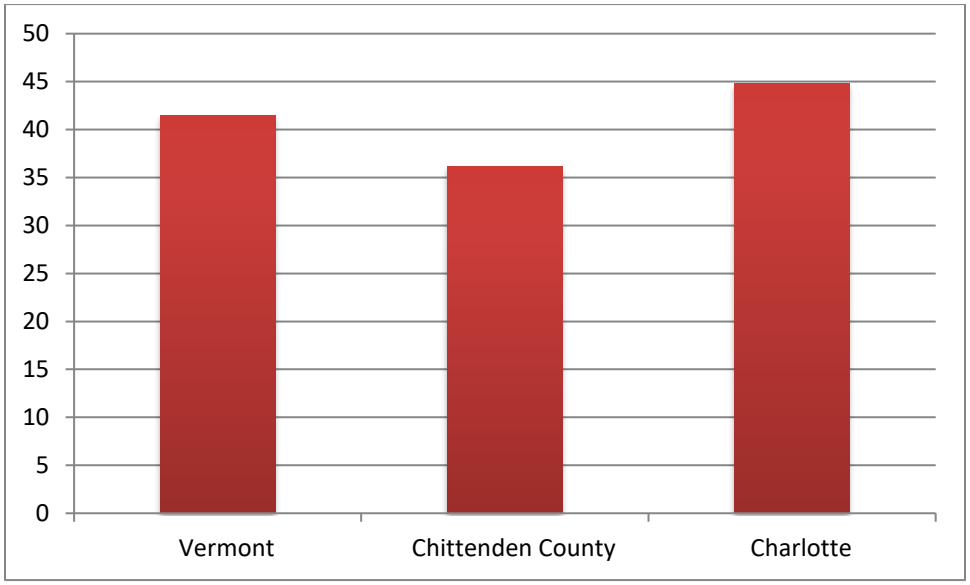
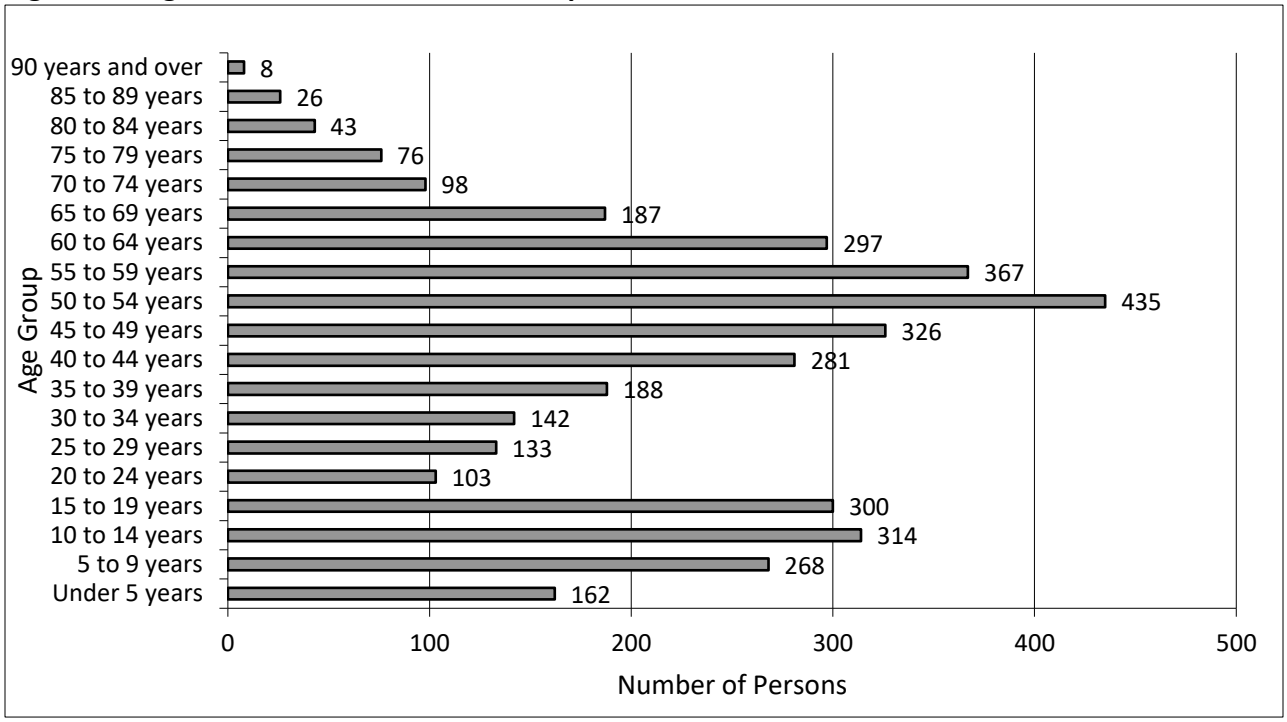


Figure 11. Age Distribution of Charlotte Population, 2010



Source: US Census Data 2010 Summary File 1.

The median household income in Charlotte has been consistently higher than incomes within the County and State as a whole with Charlotte's household incomes averaging 65% higher than state incomes between 1990 and 2010 and 41% higher than county incomes during that same timeframe.

Households

Table 4: Total Number of Dwelling Units 2000-2020

	2000	2010	2020	Percent Change 2000-2010	Percent Change 2010-2020	Percent Change 2000-2020
Charlotte	1,500	1,706	1,763	13.7%	3.3%	17.5%
Chittenden County	58,864	65,722	73,085	11.7%	11.2%	24.1%
Charlotte as % of Chittenden County	2.5%	2.6%	2.5%			

Source: US Census Data 2010 Summary File 1.

Housing Trends

Table 5: Market Conditions

	Charlotte	Chittenden County	Vermont
Number of primary residences sold, 2024	11	205	6,258
Median price of primary residences sold, 2024	$820,000	$500,000	$352,934

	Charlotte	Chittenden County	Vermont
Number of primary residences sold, 2015	43	2,138	6,473
Median price of primary residences sold, 2015	$369,000	$270,000	$198,000

Source: Vermont Department of Taxes: Property Transfer Tax (PTT) records accessed through Housingdata.org

Table 6: Vacant Units

Year	Charlotte Total		Chittenden County		Vermont	
1990	233		3,656		60,564	
2000	213		2,412		53,748	
2010	287		3,895		66,097	
2020	303	16%	3,982	5.7%	74,362	22.1%

Source: US Census, ACS Table DP04 Selected Housing Characteristics 5-year estimates.

Due to the rise of remote work, the desire for more space and safety, and flexibility and lifestyle changes in the post Covid era, Charlotte like many other areas saw an increase in homes used seasonally.

Table 7: Homes Used Seasonally

Year	Charlotte Homes for Seasonal Use
1990	184
2000	174
2010	238
2020	207
2023	297

Source: US Census, ACS Table B25004 5-year estimates.

Short-term rentals (STRs) are typically furnished apartments rented for short periods of time, as opposed to annually leased apartments. They are often used as an alternative to a hotel. Vermont Housing Finance Agency pays AirDNA (industry analyst) to access data about these rentals. AirDNA aggregates listings from several platforms including Airbnb, HomeAway, and VRBO. As of 2025, there are 39 STRs in Charlotte with a 45.1% occupancy rate.

Source: AirDNA shirt-term rental listings accessed through Housingdata.org

Housing Stock

Table 8: Types of Housing - 2023

	Charlotte		Chittenden Co.		Vermont	
Total housing units, 2023		2,098		74,025		337,072
... owner-occupied	1,656	94.4%	44,771	63.6%	196,162	72.8
... renter-occupied	98	5.6%	25,672	36.4%	73,304	27.2%

Source: US Census, ACS Table DP04 Selected Housing Characteristics 5-year estimates.

Housing

The type, location, and price of housing affects the social, economic, and physical character of the Town. Historically, housing in Charlotte has been concentrated in village settlements, clustered in summer camp areas along the shoreline, or located in a dispersed pattern on farms and in the surrounding countryside. It is this dispersed pattern that has become prevalent in the last 30-40 years. Subdivisions in the rural areas have increased the percentage of "rural residents," while the village settlements have grown only slightly, and the summer camp areas have increasingly been converted to year-round residences.

While this dispersed pattern has offered many people a desirable rural lifestyle, it has eroded the open spaces and viable farmland so important to the Town's landscape, and it has created strips of development along the Town's roads and highways. As important, it has failed to locate housing more convenient to services and prospective public transportation.

Since at least 1990, the Town Plan has discouraged these dispersed patterns of development. During the Town Plan 2002 update, the 100+ residents attending community meetings, others working on Town Plan Update Committees and the 215 people completing written surveys reinforced the importance of curtailing these development patterns. They generally recommended that clustered housing and well-designed, integrated, viable Planned Residential Developments should be even more strongly encouraged by Town regulations to help better protect natural resources and large undeveloped parcels of land.

The majority of respondents to the 2006 survey and those attending public sessions for the 2008 Town Plan update continue to want the Town to remain rural and to protect the working farms. Although homeowners choose to live in Charlotte for its rural character and open farmland, the increase of residents is diminishing the character that makes Charlotte so attractive. Furthermore, in some parts of Town conflicts have surfaced between farming operations and their residential neighbors, as residents become concerned about the impacts of farming, such as surface and groundwater pollution, odor from manure, noise and light from

night-time work, and oversized farm vehicles on Town roads.

Affordability of Housing (Median sales price, Rental rates in relation to income)

Housing prices in Charlotte are high relative to the County and State. The 2000 Census indicated that the median value of dwellings in Charlotte was $203,100, compared with $136,500 for Chittenden County and $111,200 for the State. These indicators were not collected for Census 2010. Notwithstanding that Census 2000 has a limited level of comparison with American Community Survey 5-year estimates, **Table 9** (below) indicates housing units have more than doubled in value since 1999.

Table 9: Median Value of Owner-Occupied Housing Units

Year	Charlotte		Chittenden Co		Vermont	
	Result	MOE±	Result	MOE±	Result	MOE±
2000*	$203,100	*N/A*	$136,500	*N/A*	$111,200	*N/A*
2005-2009	$424,600	$60,771	$246,000	$2,972	$200,600	$1,478
2007-2011	$477,300	$59,450	$263,200	$3,646	$213,000	$1,574
2009-2013	$490,700	$41,761	$267,500	$3,281	$216,800	$1,536
2023	$659,800	$56,285	$404,500	$9,815	$290,500	$2,466

Source: US Census, ACS Table DP04 Selected Housing Characteristics 5-year estimates.

Table 10: Owner-Occupied Housing Costs, 2023 (for homes with a mortgage)

	Median Household Income	Median value of owner-occupied housing unit	Percentage of owner-occupied households spending at or above 30% of household income in the past 12 months on housing costs for all income brackets
Charlotte	$159,536	$688,100	27.9%
Chittenden Co	$133,901	$413,600	23.5%
Vermont	$110,006	$301,300	28.2%

Source: US Census, ACS Table S2506 Financial Characteristics for Housing Units With a Mortgage 5-year estimates, 2023

Owner-Occupied Housing Costs, 2023 (for homes without a mortgage)

	Median Household Income	Median value of owner-occupied housing unit	Percentage of owner-occupied households spending at or above 30% of household income in the past 12 months on housing costs for all income brackets
Charlotte	$76,641	$626,300	28.6%
Chittenden Co	$90,923	$386,200	18%
Vermont	$69,159	$271,200	18.9%

Source: US Census, ACS Table S2507 Financial Characteristics for Housing Units With a Mortgage 5-year estimates, 2023

Table 11: Rental Housing Costs, 2023

	Median Gross Rent (All Units)	As percentage of household income	Percentage of Households Spending At Or Above 30% of Household Income On Rent
Charlotte	$1,520	21.1%	42.9%
Chittenden Co	$1,590	31.6%	53.1%
Vermont	$1,193	30%	50.5%

Source: US Census, ACS Table B25064, B25071, DP04 5-year estimates, 2023

Average sale prices increased almost 84% between 2006 and 2024, and almost 444% since 1986. Some of the increase may be influenced by sales of waterfront properties; nevertheless non-waterfront properties have increased significantly as well.

Table 12: Average Housing Sale Prices in Charlotte 1986-2024

Year	1986	1993	1998	2000	2006		2024
All Sales	$163,906	$230,000	$331,094	$347,040	$483,400	**All Sales**	$891,457
Residential					$567,000	**Residential**	
<5 acres	$101,048		$254,803	$258,144	$585,900	**<6 acres**	$881,887

Source: *Vermont Department of Taxes: Property Transfer Tax (PTT), 2024.*

There are a limited number of dwellings that are available for families with a median-level income, as well as incomes that are lower than median. For example, based on the 2000 Census, 89% of homes in Charlotte are single-family dwellings, while approximately 9% are attached, and 2% are mobile homes. Furthermore, there are a limited number of rental properties available (approximately 13%), and most of these are single-family dwellings or seasonal dwellings.

Many factors play a role in the price of housing, including the desirability of the Town as a place to live. The predominance of poor quality soils for on-site sewage disposal, the lack of municipal sewer or water systems, and the five acre density requirement for residential dwelling units are all contributing factors. Additionally, many building sites require mound systems to overcome the limitations for sewage disposal, which contribute to the cost of housing.

As a result of these factors, most new housing in Charlotte is considerably above what is considered “affordable” or even “moderate” (based on Chittenden County thresholds) even when the Planning Commission has required clustered developments. For example, homes that were built in a recent subdivision, which was approved (as a planned residential development) with building lots of one acre and less and a restriction on dwelling sizes of 2,500 square feet, have sold in the range of $350,000 to $450,000.

This situation has contributed to a lack of affordable housing for low- and moderate-income families, and a concern for the Town's ability to achieve social, economic, and cultural diversity in Town.

The Town took a big step towards addressing the lack of affordable housing when it adopted new Land Use Regulations in March 2006. The new regulations provide a much higher density allowance — 1/4 acre in village areas, ½ acre for adaptive reuse, and 1 acre in rural areas — for housing that is permanently affordable. The regulations are the culmination of a several-year effort by the Charlotte Affordable Housing Committee, the Planning Commission, the Selectboard, and many others who worked on this provision, as well as an earlier provision that the Town voted down the previous year.

In November 2006, a non-binding ballot item was approved supporting implementation of the master plan for the Town-owned Burns parcel, which included the creation of up to nine affordable dwellings. In preparing for Town Meeting 2007, the Selectboard initially planned on asking voters to approve the conveyance of five acres of the Burns parcel to a non-profit housing organization, but ultimately decided against warning this ballot item because of new information that was recently generated regarding the use of the wastewater disposal capacity on the parcel. The Selectboard is still analyzing information and options for the parcel.

The Charlotte Affordable Housing Committee has also been working with interested landowners to identify sites for either the conversion of existing dwellings or the development of new dwellings for affordable housing. The Committee has worked on several other initiatives as well, including the creation of a dedicated Town fund to be funded by the municipal property tax, similar to the Conservation Fund. The fund, named the Charlotte Housing Trust Fund, was approved by voters at Town Meeting 2007, as was initial funding of $40,000 per year for three years from the municipal budget.

In the summer and fall of 2006, with the assistance of a grant from the Vermont Housing and Conservation Board, the Town contracted with Douglas Kennedy of LandVest to conduct an Affordable Housing Needs Assessment. The study had several purposes:

1. To compare the availability of affordable housing to the need, in order to obtain a rough estimate of the number of affordable dwellings that are needed in Town;
2. To determine the type of dwellings that are needed, e.g. the number of bedrooms, and rental or owned; and
3. To conduct a survey of residents and those who work in Town which will assist with analyzing the above questions by querying residents about whether their offspring or parents are in need of affordable housing, and also by querying people who work but do not live in Town whether housing affordability is a factor in their decision to not live in Town.

Below are excerpts from the Executive Summary of the study, which used a market-based approach:

For purposes of the needs assessment, three 'market areas' were defined for analysis:

1. *The Town of Charlotte;*
2. *The 'Primary Market Area' – defined as the area within seven to eight miles of the center of Charlotte—this is the geographic area from which the majority of residents of a Charlotte-based affordable housing project would most likely be drawn; and*
3. *The 'Region' - defined as the area within 17 to 18 miles of the center of Charlotte—this area was used to identify some of the broader demographic changes occurring in the Charlotte area.*

The demand side of the analysis focused on estimating the number of households that might be eligible for and interested in moving to an affordable dwelling. These estimates were performed at a number of levels – ranging from rental housing (oriented toward very low income households) to ownership housing (oriented toward moderate income households). Affordable demand is summarized below – broken down by rental/ownership and income level in terms of number of households. The figures are for the Primary Market Area, the most realistic area from which to estimate demand for affordable housing in Charlotte.

The supply side of the analysis looked at existing housing supply, with a focus on housing that is affordable to – or specifically targeted to – households with low to moderate incomes. It is estimated that in the Primary Market Area the current supply of affordable housing is approximately 245 in the rental market and 209 in the ownership market.

Rental housing vacancy is low and market rents have moved up at a strong pace in recent years.

The median price of R1 residential properties sold in Charlotte increased at an annual rate of 12.5 percent between 2000 and 2005. The number of lower value (less than $200,000) homes available on the market has declined significantly in the town in recent years. Although the grand list indicates that properties in this price bracket remain, sales and listing data make it clear that few are available on the market.

Seasonal housing accounts for 12 percent of Charlotte's housing stock. The seasonal housing stock in combination with significant waterfront real estate has tended to push pricing upward in the community. We note that comparatively high housing values in Charlotte act to prevent some households from living in the town.

There are several recent rental and ownership housing projects oriented toward the affordable market in the area. All of these projects have experienced strong demand and are either at or near 100 percent occupancy or completely sold out.

The findings indicate a combined gap (family and elderly, all income groups) in rental categories is approximately 46 units; the gap for families alone is 36. Findings also show a need for 16 ownership units at the primary market area level. Overall, these findings are relatively consistent with the Regional Housing Targets (see below) of approximately 40 affordable and moderate units in Charlotte between 2000 and 2010, although the LandVest study is seemingly based on more specific analysis than the Regional Housing Targets.

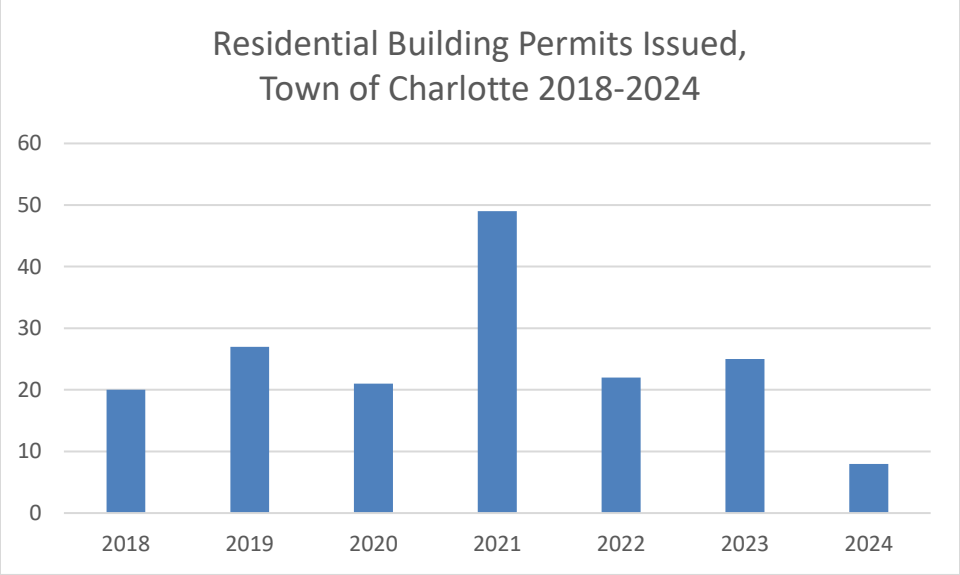
Table 13. Residential Housing Values—2024

	2024
Value	Units
Up to $100,000	59
$100,000-$200,000	87
$200,000-$300,000	95

$300,000-$400,000	125
$400,000-$500,000	197
$500,000-$600,000	205
$600,000-$700,000	251
$700,000-$800,000	227
$800,000-$900,000	175
$900,000-$1,000,000	115
$1,000,000-$1,250,000	130
$1,250,000-$1,500,000	56
$1,500,000-$1,750,000	50
$1,500,000-$2,000,000	23
$2,000,000-$3,000,00	39
$3,000,000-$4,000,000	14
$4,000,000-$5,000,000	5
Greater than $5million	8
TOTAL	1536

Source: Town of Charlotte, Planning & Zoning Office

Figure 12. Residential Building Permits Issued, Town of Charlotte, 2018-2024



Source: Town of Charlotte, Planning & Zoning Office

2.5 ECONOMIC CONDITIONS

Employment: Employment refers to the number of individuals at work. Employees mean only wage and salary workers, and excludes the self-employed. The labor force means individuals who are either working or not working but actively looking for work (the unemployed).

Compensation: Compensation means all monetary and in-kind benefits (including health insurance, sick leave, etc.) that a worker receives. Earnings mean all monetary compensation. Wages are monetary compensation paid by an employer (i.e., excluding self-employment earnings) and may exclude irregular pay such as bonuses. Benefits are non-monetary forms of compensation.

Industry and Occupation: For more information, see the Census Bureau's Frequently Asked Questions on Industries and Occupations, contact the industry and occupation statistics branch, and Comparisons of ACS-CPS Data on Industry, Occupation, and Class of Worker.

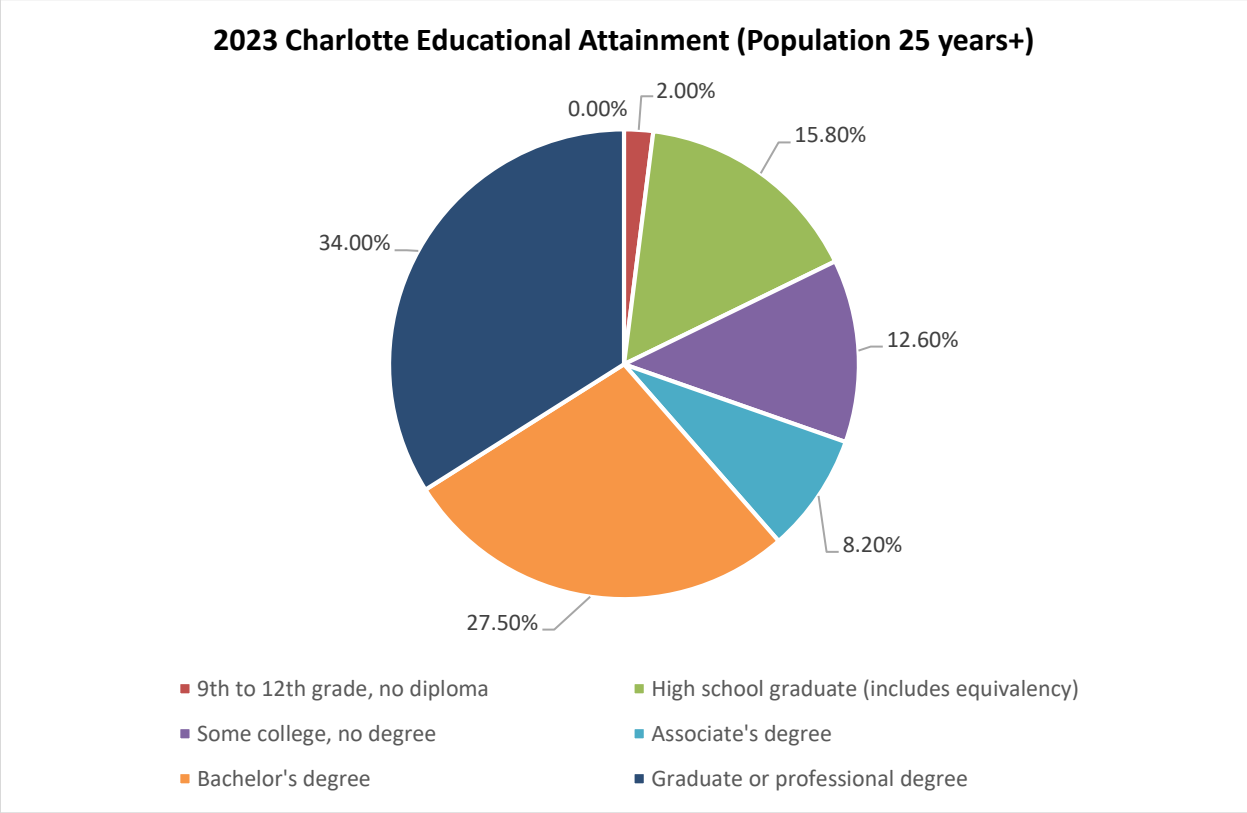
Workforce

Table 14: Civilian Labor Force

	2000	2010	2015	2024
Charlotte				
Total	1,980	2,110	2,170	2,174
Employed	1,940	2,030	2,130	2,136
Unemployed	40	80	50	38
Unemployment Rate	1.9	4.0	2.2	1.7
Chittenden County				
Total	85,250	91,050	95,250	100,160
Employed	83,350	86,450	92,700	98,245
Unemployed	1,850	4,600	2,600	1,915
Unemployment Rate	2.2	5.0	2.7	1.9
% County				
Total	2.3%	2.3%	2.3%	2.2%
Employed	2.3%	2.3%	2.3%	2.2%
Unemployed	2.2%	1.7%	1.9%	2.0%
Vermont				
Unemployment Rate	2.7	6.2	3.7	2.3

Source: Vermont Department of Labor, Labor Market Information

Figure 13. Educational Attainment, Charlotte



Source: US Census, ACS Table S1501 Educational Attainment 5-year estimates, 2023.

Charlotte has a population comparably educated to the rest of Chittenden County. Two exceptions to this statement include a lower percentage of those 25 years and younger without a high school diploma which is estimated at 0.8% for Charlotte and 6.1% for the county and those with an Associate's degree or higher which is estimated at 69.4% for Charlotte and 56.6% for the county.

Establishments, Worksites and Employers:

An establishment is an economic unit, such as a farm, factory, or store, which produces goods or provides services at a single physical worksite and engaged, predominantly, in one type of economic activity. Most employers operate only one establishment or place of business so all of their activity is reported under one reporting unit. Employers who operate more than one establishment in the state are requested to report each worksite separately.

In some cases the employer aggregates the worksites into several units, though not at the establishment level. Occasionally, a single physical location encompasses two or more distinct and significant activities that, if possible, are reported as separate units. In these cases, a reporting unit is only one worksite, or a group of worksites, or part of a worksite and not all of an employers' activity in the state.

Table 15: Establishments

Ownership	Industry	Establishments	Average Wage
Total Covered	Total, All Industries - Total Covered	254	$80,619
Private	Total, All Industries - Private	249	$85,367

	Goods Producing	37	$52,302
	Natural Resources and Mining	11	$42,518
	Construction	22	$61,309
	Manufacturing	5	$54,675
	Service Providing	212	$93,693
	Trade, Transportation, and Utilities	34	$88,961
	Information	19	$134,718
	Financial Activities	15	$182,022
	Professional and Business Services	97	$130,158
	Education and Health Services	15	$51,062
	Leisure and Hospitality	6	$31,023
	Other services	27	$78,466
All Government	Total, All Industries - All Government	5	$56,001
Federal Government	Total, All Industries - Federal Government	1	$58,987
	Service Providing	1	$58,987
	Trade, Transportation, and Utilities	1	$58,987
State Government	Total, All Industries - State Government	1	$28,402
	Service Providing	1	$28,402
	Leisure and Hospitality	1	$28,402
Local Government	Total, All Industries - Local Government	3	$56,586
	Service Providing	3	$56,586
	Education and Health Services	1	$66,316
	Public administration	2	$38,866

Source: Quarterly Census of Employment and Wages Program (QCEW) produced by the Economic and Labor Market Information Division of the Vermont Department of Labor in cooperation with the U.S. Bureau of Labor Statistics.

Table 16: Employment

	Charlotte			Percent Change	As Percentage of Total in Charlotte	As Percentage of Total in Chittenden Co.
	2010	2014	2024	2014-2024	2024	2014
Total	**441**	**524**	**671**	**28.1%**	**100.0%**	**0.65%**
Private	322	417	563	35%	83.9%	0.65%
Goods	57	68	113	66%	16.8%	0.78%
Natural Resources			50		7.5%	
Construction	34	43	52	20.9%	7.7%	
Manufacturing			11		1.6%	
Services	265	349	449	28.7%	66.9%	0.62%
Trade, Trans, Util			76		11.3%	
Information	38		27		4%	
Financial			14		2.1%	
Prof/Bus	73	86	159	84.9%	23.7%	
Educ/Health	40	50	37	-26%	5.5%	

Leisure/Hospitality		69	87	26.1%	13%	
Other	29	30	49	63.3%	7.3%	
Government	119	108	109	0.9%	16.2%	0.66%
Federal	9	2	6	50%	0.9%	0.24%
State	0		3		0.4%	0.05%
Local	110	106	100	-5.7%	14.9%	1.30%
Public Admin	14	16	35	119%	5.2%	
Education	96	90	65	-27.8%	9.7%	

Source: Quarterly Census of Employment and Wages Program (QCEW) produced by the Economic and Labor Market Information Division of the Vermont Department of Labor in cooperation with the U.S. Bureau of Labor Statistics.

Table 17: Wages and Earnings

	Charlotte			Chittenden Co	State	% Difference Town / County	% Difference Town / State
	2010	2014	2024	2024	2024	2014	2014
Average Wage							
Total	**$44,527**	**$46,238**	**$80,619**	**$73,192**	**$64,466**	**9.21%**	**20.04%**
Private	$45,344	$47,336	$85,367	$73,251	$64,005	14.19%	25.02%
Goods	$38,195	$42,796	$52,302	$80,175	$69,211	-53.29%	-32.33%
Natural Resources	NA	NA	$42,518	$39,456	$47,805	7.20%	-12.43%
Construction	$41,141	$41,879	$61,309	$79,234	$70,362	-29.24%	-14.77%
Manufacturing	NA	NA	$54,675	$82,372	$71,831	-50.66%	-31.38%
Services	$46,889	$48,218	$93,693	$71,869	$62,807	23.29%	32.97%
Wholesale Trade	$93,578	$166,136	NA	$93,092	$88,241		
Retail Trade	$17,564	$20,243	NA	$43,815	$42,057		
Trade, Trans Util	NA	NA	$88,961	$58,059	NA	34.74%	
Utilities	NA	NA	NA	$145,520	$132,026		
Information	$71,782	NA	$134,718	$91,568	$90,851	32.03%	32.56%
Fin/Ins/Real	NA	NA	$182,022	$138,718	$100,373	23.79%	44.86%
Prof/Bus+A75	$51,538	$63,526	$130,158	$105,655	$97,547	18.83%	25.05%
Edu/Health	$34,603	$38,790	$51,062	$71,825	$62,053	-40.66%	-21.52%
Leisure/Hospitality	NA	$16,769	$31,023	$30,684	$31,899	1.09%	-2.82%
Other	$38,918	$37,107	$78,466	$52,072	$49,642	33.64%	36.73%
Government	$41,316	$41,987	$56,001	$72,884	$66,684	-30.15%	-19.08%
Federal	$43,269	$55,729	$58,987	$102,488	$101,926	-73.75%	-72.79%
State	NA	NA	$28,402	$71,195	$73,563	-150.67%	-159.01%
Local	$41,148	$41,738	$56,586	$64,678	$55,035	-14.30%	2.74%
Public Admin	$22,025	$24,320	$38,866	$69,216	$53,760	-78.09%	-38.32%
Education	$43,985	$44,770	$66,316	$63,032	$54,924	4.95%	17.18%

Source: Quarterly Census of Employment and Wages Program (QCEW) produced by the Economic and Labor Market Information Division of the Vermont Department of Labor in cooperation with the U.S. Bureau of Labor Statistics.

Despite the changes in the Town's population and the composition of its workforce, continued presence of a farming population and the Town's relatively low population density help keep Charlotte's rural character.

Table 18: Population Density (Persons per Square Mile)

	1960	1970	1980	1990	2000	2010	2020	
Charlotte	30.7	43.5	61.7	76.2	86.1	91.0	94.7	
Chittenden County	138.0	183.9	214.3	244.4	271.9	291.7	313.4	
Vermont	40.5	46.2	53.2	58.5	65.8	67.9	69.5	

Source: Calculated from U.S. Census data

Charlotte's density grew from 62 persons per square mile in 1980 (or about one person for every 10 acres), to 76.2 persons per square mile in 1990, and to 86.1 persons per square mile in 2000, and 91 persons per square mile in 2010. Several of the aforementioned trends in the socioeconomic data raise some issues that the Town must address in order to accomplish town-wide goals:

- How to maintain the social and economic diversity of the Town in the face of increasing incomes of residents and the declining farm population;
- How to identify and address the needs of the low and moderate income persons and the over age-65 population in the Town;
- How to monitor and address the Town's growth rate in order to provide efficient delivery of Town services while maintaining the Town's rural character and primarily volunteer form of government; and
- How to plan for energy-efficient and economical transportation for the commuting workforce.

2.6 UTILITIES, FACILITIES, & SERVICES

Local Government

Local government in Charlotte is primarily a volunteer form of government. Volunteers serve as elected board members and on appointed boards, commissions and committees. Following is a list of current boards, commission and committees: Board of Auditors, Cemetery Commission, Conservation Commission, Design Review Committee, Energy Committee, Planning Commission, Recreation Commission, Trails Committee, Village Wastewater Committee, and Zoning Board of Adjustment.

Town employees include the Town Clerk / Treasurer, Assistant Clerk / Treasurer, Town Administrator, Town Planner, Zoning Administrator (who is also the Health Officer), Recreational Director, Senior Center Coordinator, Senior Center Activities Director, Library Director, Library Assistants, Youth Librarian, and Listers. The following services are provided contractually: engineering services (primarily review for water supply/wastewater permits, and subdivision permits), highway maintenance, professional assessor, and legal services.

Local Schools and Childcare

Due to both its fiscal and social significance, education is perhaps the single most important community service *provided by the Town of Charlotte. Socially, the education services have a critical impact on the lives of Charlotte's youth. In addition, the school provides a focus for community activities. In 1995 school expenditures were $4,704,162, which accounted for 79% of all municipal expenses. In 1999 fiscal year budget, expenditures for schools ($5,764,861), increased to 81.8% of total municipal expenses, representing a 22.5% increase over 1994-1995. In FY06 total expenditures were $8,908,560.*

Charlotte children are served by the Charlotte Central School (PK-8th Grade) and Champlain Valley High School (9th-12th grade).

In response to state incentives for voluntary school district consolidations and mergers (Act 46, 2015), the Chittenden South Supervisory Union voted in 2016 to form a Unified District, which became known as the Champlain Valley School District (CVSD).

Childcare in Charlotte is offered by the Charlotte Central School (early childhood (capacity = 12) and school-age care (35)), the Charlotte Children's Center (early childhood program (12)) and 2 registered, private residences (10 each). The State of Vermont, Department for Children and Families maintains the 'Building Bright Futures Child Care Information System' which allows parents to search for licensed and registered providers in their area.

Charlotte Central School

Charlotte has one public school, Charlotte Central School, which provides education for kindergarten through eighth grade. It also serves as a place for large gatherings, such as Town Meeting. The school is centrally located on Hinesburg Road just west of the intersection with Mt. Philo Road. Charlotte Central School was constructed in 1949 and added to in 1969, 1987, and 1996. The 1987 improvement added a multi-purpose gym, five classrooms, a lab, and spaces for technical education, art, and living arts to the school. In 1996 a second story and a full size gym facility was added. There are 44 classrooms, a gym, cafeteria, and library within the building. Outside there is a playground and playing fields, which were improved in 2000, and provide recreational space for the entire Town.

In previous years the former Charlotte School Board (known today as the Champlain Valley School District [CVSD]) projected that physical expansion and renovation projects would be necessary. Since then, the Town has completed an expansion of the facility. However, the CVSD does not currently anticipate a need for expansion in the near future. The capacity of the school is 620 students; in 2005 enrollment was 506. Over the past ten years, the highest enrollment was 535 students, which was in 1999. The School Board and Chittenden South Supervisory Union had forecasted that enrollment would continue to decline, reaching approximately 375 students in 2016. However, this decline did not prove to be quite as dramatic, only dropping to 405 students in 2016.

Table 19: Charlotte Central School Enrollment Trends, 1980-2025

Year	Students	Year	Students	Year	Students	Year	Students	Year	Students

1980	435	**1990**	473	**2000**	529	**2010**	462	**2020**	354
1981	425	**1991**	467	**2001**	517	**2011**	451	**2021**	369
1982	392	**1992**	479	**2002**	533	**2012**	473	**2022**	350
1983	374	**1993**	488	**2003**	521	**2013**	465	**2023**	346
1984	350	**1994**	501	**2004**	521	**2014**	452	**2024**	352
1985	341	**1995**	498	**2005**	506	**2015**	423	**2025**	350
1986	369	**1996**	514	**2006**	476	**2016**	405		
1987	392	**1997**	514	**2007**	470	**2017**	389		
1988	425	**1998**	525	**2008**	462	**2018**	353		
1989	450	**1999**	535	**2009**	470	**2019**	375		

Champlain Valley Union High School

High school students attend Champlain Valley Union High School (CVU) in Hinesburg along with students from Shelburne, Williston, St. George, and Hinesburg. CVU was built in 1962 and added to in 1979, 1983 and 2005. Site improvements were made in 1987 and 2005.

1,266 students were enrolled in the 2024-25 school year, 15% of which were from Charlotte.

In addition to CVU, high school age students may attend the Center for Technology in Essex or the Burlington Technical Center. CVU also provides educational opportunities for adults through the Access Program.

Child Care

Title 24 VSA Section 4302(13) states that towns' planning processes include the following goal: "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."

Existing Services

There are currently four known facilities that provide child care in Town, based on a 2005 inventory conducted by Child Care Resources (a consulting firm located in Williston) and supplied by Chittenden County Regional Planning Commission. The Deer Path School on Greenbush Road discontinued its operation in 2003.

The Charlotte Children's Center is located in the West Charlotte village, and is run as a not-for-profit organization. The Children's Center opened in 1984. It runs a daytime program for children between six weeks old to Kindergarten age, and an after-school program for Kindergarteners. It is licensed to serve 38 children. The program has positive relationships with the Senior Center, the Charlotte Fire and Rescue, and the Library. Crossing Ferry Road from the Children's Center to the Library can be difficult because of the speed of car traffic. The cost of the program is offset by an EEE. According to a former Director, the main limiting factor for accepting more children had been limited wastewater disposal capacity. However, recently more children have been able to enroll in the program by using space at the Charlotte Congregational Church. Historically, the Center has not had a problem finding employees, most of whom are not from Charlotte.

The YMCA, which is also a not-for profit organization, uses the Charlotte Central School facility. It is a licensed child care program, and serves school-age children with after-school activities

until 6 p.m. The program has a capacity for 50 children, but usually serves 20-25 children who tend to be from Kindergarten through third grade ages. A summer program is run in Shelburne, and an infant/toddler program is run in Burlington. Management (Marsha Faryniarz) has indicated that additional infant/toddler services are needed throughout the county, but it requires a higher ratio of staff to children (1 staff person to every 3 children) than higher ages, so is more expensive to run. A subsidy is provided by the state to families that meet income criteria, and the YMCA makes scholarships available to families who don't qualify for the state subsidy but still need some assistance. Except for additional infant/toddler services, management did not indicate that the Charlotte program has any particular needs. The program has not had a problem finding staff, most of whom are from Burlington.

The two other facilities are privately run for-profit businesses: Creative Explorer's Daycare is located on One Mile Road, and Kid Zone on Dorset Street near the Shelburne Town line.

Charlotte Volunteer Fire & Rescue - *Photo by Lee Krohn*

Public Safety: Fire, Rescue, and Police

Public safety services are provided by Charlotte Fire and Rescue Services, Inc. (CVFRS) and the Vermont State Police. The State Police provide police service to the Town, with the exception of dog complaints, which are handled by the Town's Animal Control Officer.

The State Police currently have one officer assigned to the "South Patrol" which includes Charlotte, Huntington and St. George, although staffing has been reduced in the past few years. The Shelburne Police also respond to incidents in Charlotte. Both the State Police and Shelburne do not charge Charlotte for their service, although this may change in the future. The Town has also hired the Chittenden County Sheriff to enforce speed limits. Speeding vehicles on local roads is an important safety issue that should be addressed in the near future. The Town has, on occasion, undertaken traffic studies to determine appropriate speeds, and adopted and updated a Traffic Ordinance to establish speed limits. To obtain local police protection service the Town has four options in the near term: 1) employ our own police force; 2) establish a volunteer police department; 3) contract for police services with an adjoining town; or 4) enable the Town Constable to have law enforcement authority. Over the next five years it is not expected a full-time police department will be required.

CVFRS is a private, not-for-profit corporation run by its volunteer members and governed by a 10 person Board of Directors. It is comprised of two agencies – the Charlotte Volunteer Fire Department and the Charlotte Volunteer Rescue Squad.

As of 2015 there were 36 volunteers in the Fire Department which responds to fires, hazard conditions, mutual aid calls to neighboring departments, and false alarms. Assistance is also provided to the rescue squad. In addition the department is responsible for training its members, maintaining the facilities and equipment, fire prevention, and participation in community events.

As of 2015 there were 5 volunteers on the Rescue Squad (a sharp decline from past years) and 18 paid staff. In the past, a varying number fire-fighters have also been qualified to drive the ambulance. Paid Emergency Medical Technicians (EMTs) are on duty six days per week, 7 a.m. to 5 p.m. The Town expects to continue to rely on the volunteer fire department and rescue squad.

In November 1998, the Town voters approved a $450,000 bond to finance the reconstruction of the fire station and the purchase of a new ambulance.

During 2000-2001, the Fire Department and the Rescue Squad rebuilt the fire station now consisting of a four-bay station and a second building consisting of meeting and training rooms and enhanced facilities located on Vermont Route F-5 (Ferry Road) just west of the US Route 7 intersection. Charlotte Fire and Rescue has considered the need for a Fire-Rescue sub-station to be located on the east side of Town, preferably near the Spear Street-Hinesburg Road intersection to ensure adequate protection for this area.

Table 20: Emergency Response Volunteers for Charlotte

Year	Fire Department Volunteers	Rescue Squad Volunteers	Rescue Squad Paid-Staff
2025	15	3	14
2024	16	6	20
2015	36	5	18
2014	23	15	15

Source: Town Annual Reports

Table 21. Emergency Responses, CVFRS 2009-2025

Year	Fire	Rescue	Total
2009	98	292	390
2010	130	287	417
2011	135	>300	>435
2012	122	315	437
2013	109	362	471
2014	212	391	603
2015	186	380	566
2016	202	385	587
2017	195	421	616
2018	214	417	631
2019	167	473	640
2020	169	476	645
2021	163	535	698
2022	153	595	748
2023	165	656	821
2024	164	504	668
2025 through 7/31		323	

Source: CVFRS, 2024

CVFRS has planned for the replacement of the 1980 pumper, 2006 Ambulance, and 1993 tanker over the next 5 years. They have also planned for the replacement of a thermal imagery camera, airpack bottles and bunker gear and the addition of airpack bottles, a stretcher, lifepacks and airbags over this same timeframe.

The Charlotte Volunteer Fire Department oversees 67 dry hydrants in town, inspecting regularly and working with owners if maintenance problems exist.
Source: Charlotte Town Administrator

The Town has completed an Emergency Response Plan and a Hazard Mitigation Plan.

Municipal Tax Base

Town grandlist (tax base) and tax rate values are provided in the following table:

Table 22: Grand List and Tax Rates

Fiscal Year	Grandlist	Town Tax Rate	Education Tax Rate (Nonresidential / Homestead)	Total Tax Rate
2016	$9,190,421	0.1767	1.5655 / 1.6272	1.7422 / 1.8039
2017	$9,210,149	0.1719	1.5505 / 1.4301	1.7224 / 1.6020
2018	$9,267,817	0.199	1.6077 / 1.4866	1.8067 / 1.6856
2019	$9,304,218	0.2026	1.6322 / 1.4831	1.8348 / 1.6857
2020	$9,326,411	0.2016	1.7008 / 1.5335	1.9024 / 1.7351
2021	$9,369,919	0.2021	1.6970 / 1.5409	1.8991 / 1.7430
2022	$9,444,078	0.2421	1.5866 / 1.5062	1.8287 / 1.7483
2023	$13,710,046	0.1804	1.1664 / 1.0911	1.3468 / 1.2715
2024	$13,792,084	0.1835	1.3312 / 1.2921	1.5147 / 1.4756
2025	$13,938,275	0.1892	1.3222 / 1.2572	1.5114 / 1.4464

Source: Charlotte Town Clerk, Town Reports

Over the past four years, the town's grand list continued to grow. In 2025 Charlotte had a lower overall tax rate than Shelburne but higher than Hinesburg.

Table 23 Town Land and Facilities (see Map 8)

Property Id	Facilities	Services / Uses	Other Amenity	Funding Sources	5-10 Year Projects
Town Beach	Bath house	Recreation		Town Budget, Fees	
	Beach	Natural Resource			
	Picnic tables				
	Tennis Courts				
	Volleyball Courts				
	Disc Golf Course				
	Baseball Field				
Town Landfill	Closed landfill	Open		Town Budget	Trailhead Parking?
	Trails	Recreation			
Whalley Woods	Open			Town Budget	
Barber Hill	Open	Open		Town Budget	
	Trails	Recreation			
Charlotte Park & Wildlife Refuge	Open	Natural Resources		Town Budget	Updating Management Plan
	Trails	Recreation		Donations	Long - range park plan (e.g. access / parking)
	Thorp Barn	Historic / Cultural Resource			
Galbreath Property	Open	Scenic		Town Budget	
Walter Irish Senior Center	Senior Center	Senior Programs	Kitchen	Town Budget, Fees	Addition 2016
		Meeting / Banquet space			Parking
		Meals			
Town Pound	Open			Town Budget	Management Plan
Charlotte Museum	Museum	Cultural / Historic Resource		Town Budget	
Town Hall and Library	Town Hall	Governance/ Administration / Organizational Support	Large screen tv, wifi	Town Budget, Fees	
		Meeting space			

Property Id	Facilities	Services / Uses	Other Amenity	Funding Sources	5-10 Year Projects
Town Hall and Library	Library	Books, ebooks, software Adult and Youth Programs	Computers, wifi	Town Budget, Fees, NPO, Donations	
		Meeting space, Work space			
		Computer hotspot			
		Informational Clearinghouse			
Burns Property	Wastewater / Potable Water Supply	Public works	Flea Market Site	Town Budget	Management plan
	Open	Natural Resource and Agriculture			Future village wastewater
	Trails	Recreation			Private well responsibility
Town Garage	Salt Shed	Storage		Town Budget	
Lewis Creek Access	Open	Fishing access	limited parking	Town Budget	Water quality / parking improvements
Thompson's Point	Leased land	Summer residences	limited parking	Town Budget, Leases	Lane's Lane hookup
	Wastewater Treatment	Recreation	Lake access		Water quality improvements
	Roads	Agriculture			Management Plan
	Trails	Natural Resource			
Charlotte Volunteer Fire & Rescue Service (CVFRS)	CVFRS Station / Adm Bldg	Public Safety		Town Budget, NPO, donations	
		Training Facility			
Charlotte Central School	K-8 Public School	Education	Kitchen	Town School Budget	
	Athletic Fields	Recreation	Skating rink		
	Gym and Multi-purpose Room	Meeting space	Parking		
Other	Trail Network	Recreation		Grants, donations	
	Berry Farm Ballfields	Recreation		Town Budget	
	State owned rail property / station	Transportation, Open		PILOT?	
	Mt. Philo State Park	Recreation, Natural Resource		PILOT?	
	UVM - Pease Mtn	Education, Natural Resource		Private?	

Water / Wastewater

There are 13 public water supplies in Charlotte. Four of these are community water systems, 4 are non-transient non-community (e.g. schools) and 5 are transient non-community systems (e.g. deli / café). A public water system provides water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year. A public water system may be publicly or privately owned. Public water supplies are regulated by the Agency of Natural Resources, Department of Environmental Conservation. Source protection areas (AHPV) are delineated for all public water systems and routine monitoring is also required.

The town is responsible for the maintenance and operation of three wastewater systems and contracts with private entities for this work; Thompson's Point, West Charlotte Village, and the Charlotte Central School.

The Thompson's Point System is operated seasonally and has a design flow of 20,000 *gallons per day (GPD)*. This flow is based on an estimate of water usage for existing seasonal residences and the expected occupancy of those residences. Historical data indicated that the system has utilized up to 80% of its capacity during peak usage times, such as the week of the 4th of July. As of the 2016 annual inspection of the system, the recently replaced flow meters measured the highest *Average Daily Demand* to be 8,356 GPD (recorded for the week ending on July 25, 2016), where the *Average Daily Flow* from May through early August 2016 was measured to be a 5,608 GPD output to the septic mounds.[20] As of 2016, the Town intends to expand the system to include at least seven residences along Lane's Lane. Adding greater capacity to the system may be challenging due to environmental constraints.

The West Charlotte Village System has a design capacity of 6,000 GPD. The Town offices, Library, Fire & Rescue and Senior Center, currently use approximately 3,100 GPD and this is the extent of the current service area. A study Committee created in 2012 recommended an additional 435 GPD be retained for these uses resulting in 1,462 GPD of excess capacity as currently permitted. The 2012 Committee also indicated that an additional 1,500 GPD could be permitted at this location (total design capacity equal to 6,499 GPD) resulting in almost 3,000 GPD of additional capacity. Questions remain as to if and how this excess capacity might be allocated.

The Charlotte Central School is served by an innovative wastewater system with a design flow of 10,250 GPD and a disposal capacity of 6,000 GPD. This represents the upper limit of school capacity, where expansion would prove to be difficult due to environmental constraints.

Charlotte is one of two towns in the State of Vermont to have been delegated the authority to issue State Wastewater and Potable Water Supply permits. Permits are typically reviewed and issued by a Sewage Control Officer in consultation with a technical review consultant.

[20] Marshall, David S.*"Thompson's Point Wastewater Disposal System: 2016 Annual Inspection – System ID-9-0244"*. Civil Engineering Associates, Inc., August 5, 2016.

Table 24: Wastewater and Potable Water Supply Permits Issued, 2008-2017

Year	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24
# Permits Issued	32	24	23	24	22	26	19	28	16	18	20	25	13	51	28	29	30

Source: Town of Charlotte Planning & Zoning Office (2008-2017) and VT Agency of Natural Resources (2018-2024)

Recreation

In addition to the town owned lands and facilities outlined in the table above, Charlotte offers a number of recreation programs including soccer, basketball, lacrosse, drivers education, music lessons and boot camp and pilates for adults. The Town is also working on developing a comprehensive network of trails. Several sections are completed and others are planned as land and money become available (see Transportation section and Trails Vision Map).

Library

Approximately 61 percent of Charlotte's population borrows from the town library. In addition to having a large book (13,389), audiobook (1,424), and DVD (954) collection, members can download ebooks (4,092) and audiobooks (8,627). The library also offers programs including adult book groups, how-to workshops and guest speakers; and youth story times, after school reading programs, and arts & crafts.

The Charlotte Library serves as a repository and information clearinghouse for Charlotte local history resources and provides accessibility to wireless and internet service to all citizens within the community. In addition to serving as quiet space for telecommuting, homework sessions, and proctored testing, the Library is committed to providing digital literacy education so that all users may learn how to safeguard privacy and information when working and communicating online.

The library works with the Charlotte Senior Center, the Charlotte Historical Society, Charlotte Central School, the Charlotte Children's Center and the Charlotte Volunteer Fire & Rescue Squad in coordinating programs and activities to meet community needs.

Solid Waste Management

The town dump closed in August 1992. Charlotte now meets its statutory responsibilities to plan and provide for local solid waste management through its membership and participation in the Chittenden Solid Waste District (CSWD). CSWD is the regional authority responsible for the oversight and regulation of solid waste generated by its members, pursuant to the District's Charter, enacted by the Vermont legislature on March 3, 1987. CSWD maintains materials recovery and composting facilities in Williston, and transports other wastes to landfill facilities outside of the county.

CSWD's solid waste management system is based on the following hierarchical priorities: 1. reduction of the toxicity of the waste stream, 2. reduction of the volume of the waste stream, 3. reuse, 4. recycling and composting, and 5. disposal. Membership in CSWD satisfies the municipal solid waste planning requirements of 24 V.S.A., 2202a.

Currently there are no certified collection or separation facilities located in Charlotte. The Town's institutional, business and household solid waste is disposed of at approved facilities by registered curbside haulers or by households going to directly to area Drop-Off-Centers, according to the ordinances and regulations of CSWD. Household hazardous waste and paint can be delivered to a permanent hazardous waste facility in South Burlington or at the "Rover", a mobile collection facility. CSWD manages many special wastes at its Drop-Off-Center facilities.

The Town has a Policy Regarding Waste Management at Town Facilities as adopted in 2014. Currently, commercial on-farm composting operations (as they are expected to manage food waste) are not currently addressed under local regulations.

Telecommunications

Waitsfield – Fayston Telephone Co., Inc. provides telephone service to Charlotte residents. Green Mountain Access and Xfinity provide broadband service. The State of Vermont Department of Public Service has published a map indicating that all of Charlotte is covered by wireless service.

Other Service Programs / Organizations

The town routinely appropriates monies to the following entities: Lewis Creek Association, Visiting Nurses Association, Champlain Valley Agency on Aging, Women Helping Battered Women, Vermont Center for Independent Living, HOPE Works, Vermont Association for the Blind, Howard Human Services, Chittenden Food Shelf, Committee on Temporary Shelter, American Red Cross, Vermont Rural Fire Protection, Front Porch Forum (new in 2016), Charlotte News and Lund Family Center.

2.7 TRANSPORTATION (Map 9)

Charlotte's transportation routes are considered part of Chittenden County's Southern Corridor as identified in the *2025 Chittenden County Metropolitan Transportation Plan* initially adopted in 2005 and integrated into the *2013 Chittenden County ECOS Plan* which is the Regional Plan mandated under state law.

Roads

US Route 7 is the primary north / south arterial on the western side of the state and was under construction during 2016-18 to improve traffic congestion and safety concerns from south of Ferry Road extending to the Ferrisburgh town line. Spear Street, Mt. Philo Road, and Dorset Street also serve as north / south travel routes and there are ongoing concerns as to their increased use as alternatives to Route 7. The primary east / west travel route in Charlotte is Church Hill Road / Hinesburg Road which extends from Route 7 to the eastern town boundary with Hinesburg. Ferry Road (Vermont Route F-5) also serves as the east / west travel route originating from Route 7 extending westward to the ferry dock in McNeil Cove on Lake Champlain. Access to Mt. Philo State Park, the most heavily visited park in the state, is generally via State Park Road, another east / west travel route which runs from US Route 7 to Mt. Philo Road.

The Town maintains approximately 74 miles of highways. The Town contracts for its road maintenance and owns no equipment of its own. Highways are perennially the largest item within the Town (non-school) budget.

Quinlan Covered Bridge, 2016 - *Photo by Niranjan Arminius (CC BY-SA 4.0), via Wikimedia Commons*

Projects in the last 5-10 years included the following:

- 2018-2019 Charlotte received grants for Municipal Roads on Carpenter Rd, Guinea Rd, Converse Bay Rd and Prindle Rd in the amount of $10,340. We also received a $9,500 Better Back Roads Grant for Lime Kiln Rd.
- 2019-2020 Charlotte received grants for paving of Ferry Road ($104,000), engineering for Monkton Road repair ($29,600), a FEMA grant for East Thompson's Point Road culvert and for bridge abutments for bridges on Dorset Street and at the Rule Sequin Covered Bridge ($72,150) and a Municipal Roads Grant-in-Aid for the long culvert on Lane's Lane ($11,750).
- 2020-2021 Charlotte received a grant for rock lining on Prindle Road from Garen Road north ($8,143.65).
- 2021-2022 Charlotte experienced a fire in December decimating its road building/shop on Church Hill Road. Recovery efforts ensued.

- 2022-2023 We received a paving grant for the Spear Street location of $88,000. We also received $4,657.62, a Municipal Assistant Grant in Aid for Town Way Road at Thompson's Point listed under the Clean Water Funds.
- 2023-2024 Town unveils new town garage in December 2023.
- 2024-2025 Charlotte saw nearly 5.3 inches of rain overnight on July 10 last year and a 10-foot by 60-foot culvert on Spear Street was washed away, leaving the road completely unpassable. Additionally, roughly 10 feet of the road just south of the culvert that channels Muddy Hollow Brook eroded when the ground became oversaturated by the torrential rains. Due to the culvert replacement Spear Street closed for 9 months. Spear Street reopened in April 2025. Charlotte received a paving grant for the Spear Street location of $88,000. Charlotte also received $4,657.62, a Municipal Assistant Grant in Aid for Town Way Road at Thompson's Point listed under the Clean Water Funds.

The following figure depicts traffic count and speed information as well as high accident locations as collected the Vermont Agency of Transportation. Speed is an ongoing concern as communicated by residents particularly along Greenbush Road, Ferry Road, Hinesburg Rd., Mt. Philo Road, and Spear Street. In 2015, the Town upon recommendations from the Community Safety Committee purchased a SMART cart to remind motorists of the posted speed limit.

Table 25 Traffic Volumes on major roadways, 2024

Road Segment	Average Annual Daily Traffic (AADT) Volumes	Year
Spear Street	1,702	2024
Ferry Road	1,484	2024
Church Hill Road	3,171	2024
Hinesburg Road	2,042	2024
US 7 (North of Church Hill Road Intersection)	12,357	2024
US 7 (South of Church Hill Road Intersection)	11,294	2024

Table 26: High Crash Location (HCL) data for US Route 7 near the Intersection of Ferry Road

Years	AADT	Crashes	Fatalities	Injuries	PDO	Severity Index
2012 - 2016	11,720	18	0	7	15	$43,843
2010 - 2014	12,580	21	0	7	17	$33,505
2008 - 2012	11,735	24	0	12	16	$41,033
2006 - 2010	12,153	25	0	9	19	$29,168

2003 - 2007	11,200	15	0	10	8	$39,267

5-year period data collected on US Route 7 in Charlotte between milemarkers 3.360 to 3.520. **PDO** = Property Damage Only, **Severity Index** = Severity and economic loss considerations unique to this location related to 5 components identified by the National Safety Council (Source: HCL data, *VTrans – Office of Highway Safety Division - Data Section).*

Bus

While there is bus service to the north and south of Charlotte and along Route 7, there is currently no dedicated bus stop to take people to Burlington, Middlebury, or other regional destinations. When the route was operated by Green Mountain Transit there was a stop located on the southeast corner of the intersection of US Route 7/Ferry Road/Church Hill Road where an informal parking area was located. With the sale of the informal parking area property there is no longer dedicated space for the bus to turn around, whether at a permanent park and ride or other location with the West Village.

Rail

Parallel to US Route 7 is the railroad line owned by the State of Vermont and operated by Vermont Railway, Inc. The primary role of this line is in providing freight services to its Burlington yard and moving some cargo to the New England Central line via the Winooski Branch. The *2015 Vermont State Rail Plan* lists several goals including the implementation of a "new intercity passenger rail service along western corridor (Burlington, Vergennes, Middlebury, Rutland, Manchester, Bennington) and extend *Vermonter* to Montreal" and increasing "the use of rail by shippers and receivers currently using the rail" and attracting "new rail shippers and receivers to locate along rail lines."[21]

Additional rail related infrastructure located in Charlotte includes a passenger station and an extended side rail. The station was built in the early 2000's when for a short period; there was passenger service between Charlotte and Burlington. The *Champlain Flyer* still provides some passenger rail service on holidays; however, the Charlotte station and associated park and ride are not utilized and the station has become a target for vandalism in recent years. The side rail parallels portions of the main track in Charlotte. With the dissolution of the *Champlain Flyer*, the side rail has shifted in use from being primarily a turnoff to allow passing of trains to a location for the storage of freight cars including fuel tank cars.

There are a total of five railroad crossing locations in Charlotte, three of which are public with the remaining two providing private access to farm properties. With the exception of one roadway underpass, all of the crossings are 'at grade' meaning they are level with the road. At grade crossings with public roads require warning / control devices under Federal Law. Increasing safety at rail-highway grade crossings by decreasing collisions is another goal outlined in the *Vermont State Rail Plan* as is participation in disaster planning with local, state, and federal authorities.

Ferry Service

[21] Vermont State Rail Plan 2015, prepared for the Vermont Agency of Transportation by Parsons Brinckerhoff, Cambridge Systematics, and Fitzgerald & Halliday, Inc., October 2015. http://vtrans.vermont.gov/rail/reports

Ferry transportation between Vermont and New York has been operating in Charlotte since 1801. Today the Lake Champlain Transportation Company operates the ferry service between Charlotte and Essex, New York. This crossing remains open year-round as weather permits. During the winter months, it may be closed temporarily due to bad ice conditions or high northern winds. During the summer months two ferries run providing service every half hour. The ferry serves tourists as well as commuters and people on business.

An extra ferry slip and an upgraded parking facility were added in 1998, which increased the ferry's capacity. The road serving the ferry, Vermont Route F-5, is narrow, steep, and winding near the ferry dock. Ferry traffic on Route F-5 is heavy especially in summer months and excessive speed has been an ongoing concern as voiced by residents. Parking contiguous to the ferry is limited given the topography of the area. Soils are poor for on-site sewage disposal and sanitary facilities are currently provided by portable facilities. Any future expansion of ferry service must address these issues as well as traffic safety, including pedestrian safety, and impacts on Charlotte's West Village.

Bikes, Pedestrians and Other (Maps 9 and 10)

An integrated trail system that links each area of the Town for pedestrian, bicycle, ski, and equestrian travel has been supported by a variety of community groups and planning documents for over 20 years. In 1998, the Recreation Commission sponsored a study by LANDSCAPES with the assistance of the National Park Service. The resulting *"Trail Vision Map"* is included in the current Town Plan as **Map 10**, which indicates generally desirable routes, but not the specific alignments, which remain to be determined until the easements become possible through donation or purchase. The *Trail Vision Map* has been modified over the years to reflect additional information, including easements that have been obtained, impediments that have been discovered, and components of the integrated Trails system that have been constructed.

Development of the system is anticipated to continue as a multi-year effort integrated with other planning activities as relevant opportunities arise. In 2003, a Trails Committee was appointed by the Selectboard to provide leadership for the effort, facilitating the linkage of new and established neighborhoods throughout the Town by monitoring for opportunities to acquire trail easements that may occur during the subdivision review process.
Courts have generally upheld requirements by Planning Commissions that developers convey trail easements to the municipality when there is clear relation between those who will use the proposed development (residents or customers) and the trail network. Additionally, the Vermont legislature passed a law in 1998 that protects landowners who allow public trails on their property from liability for injuries to those who use the trail.

While the "Charlotte Trail System" is considered to consist primarily of Town-owned easements and town land, other trail organizations may be encouraged contribute to the overall trail network. Although most trails are intended for non-motorized uses, the Vermont Area Snow Travelers (VAST) trails, which accommodate winter travel by snow machine and Nordic skiers, it is recognized that multi-modal paths can serve a wide variety of the Town's and region's population, and therefore should be encouraged.

The Charlotte Town Link Trail (CTLT) is being created to fulfill the Town Plan goal of a multi-use path connecting Charlotte's major features and village centers. The first full phase of the CTLT is currently designed to originate from Mount Philo, passing via the US Route 7 underpass, continuing towards the West Charlotte village, and terminating at the Charlotte Town Beach. This approximately 8 mile path should allow safe, non-motorized travel between neighborhood, business and regional transportation access points, connecting Charlotte's villages, trailheads, farm stands, vineyards, ball fields, and the lakefront. Future phases of the CTLT are anticipated to include a path from Mount Philo to the East Charlotte Village, thereby connecting the two villages via Mount Philo. In 2017, the Trails Committee completed a trail scoping study to connect the completed portion of the Charlotte Town Link Trail to Mt. Philo State Park and the West Charlotte Village, an effort funded by a $45,000 grant from the VTrans, Bicycle and Pedestrian Grant Program that was received in FY 2016.[22]

Two US Route 7 underpasses have been planned for Charlotte to link East and West Charlotte bike, pedestrian and equestrian traffic; a southern location at the Berry Farm and Mount Philo State Park that was constructed in 2017, and a northern location at the Town Park and Galbreath land, which has not yet been planned for construction.

The Lake Champlain Bikeway is an on-road route that follows Greenbush Road south to Lake Road west and south thence turning left (east) onto Ferry Road and then back onto Greenbush Road headed south into the Town of Ferrisburgh. Variations of this route as well as routes along Mount Philo Road, Spear Street and to a lesser extent Dorset Street provide for sought after opportunities for biking outside of the more urbanized areas in Chittenden County. With the exception of portions of Spear Street, shoulder widths on these roads are inadequate for safe bicycle travel. Mount Philo Road and Spear Street serve as a Route 7 alternative for automotive traffic and thus safety concerns are ongoing as different user groups attempt to share the road.

2.8 ENERGY

This section of Chapter 2: *Charlotte* Today includes the data required for the Charlotte Town Plan to meet the State of Vermont's energy planning standards. The data show one path Charlotte could take to meet state energy goals, in concert with the rest of Chittenden County's municipalities. To meet the State of Vermont's energy goals, the region and town are planning to conserve energy through efficiency and conservation in transportation, heating and electricity, while making a major shift away from fossil fuels and towards renewable sources of energy for all sectors.

The current data and projections in this section are intended to provide an overview of current energy use and a sense of the trajectories and pace of change needed to meet the State's energy goals. Projections for each sector demonstrate milestones along the way toward meeting 90% of total energy needs with renewable energy. The projections are a demonstration of one possible scenario to reach 90% renewable by 2050 and are not intended to prescribe a single future path. These projections are drawn from the Long-Range Energy

[22] Charlotte Bicycle and Pedestrian Scoping Study – Final Report STP BP15(14), prepared by DuBois & King, Inc., Randolph, Vermont, October 2017.

Alternatives Planning (LEAP) analysis for Chittenden County, completed by the Vermont Energy Investment Corporation (VEIC). The LEAP model is an accounting framework that shows one possible path for Chittenden County and its municipalities to meet the state energy goals. For a detailed explanation of the assumptions and methodology for the LEAP model and for the methodology used by Chittenden County Regional Planning Commission (CCRPC) to distribute county-wide data to each municipality, please see Supplement 6 of the *draft 2026 Chittenden County ECOS Plan*.[23]

Energy Planning Background & History

In 2011, the State of Vermont had released a Comprehensive Energy Plan (CEP) which set a goal of obtaining 90 percent of our total energy from renewable sources by 2050. The most recent (2022) CEP expanded upon the statutory goal of 25% renewable by 2025 (10 V.S.A. § 580(a)) by incorporating the greenhouse gas emission reductions set by the Global Warming Solutions Act of 2020. These collectively establish the following set of goals:

- Reduce greenhouse gas emissions by:
  - 26% from 2006 levels by 2025;
  - 40% from 1990 levels by 2030;
  - 80% from 1990 levels by 2050.
- Obtain 90% of all energy across all sectors from renewable sources by 2050, with interim goals of 25% renewable by 2025 and 45% renewable by 2035.
  - In the transportation sector, meet 10% of energy needs from renewable sources by 2025, and 45% by 2035.
  - In the thermal sector, meet 30% of energy needs from renewable sources by 2025, and 70% by 2042.
  - In the electric sector, meet 100% of energy needs from carbon-free resources by 2032, with at least 75% from renewable sources.

Legislation adopted over the past several years authorizes municipalities to adopt solar development screening bylaws, and to address 30 VSA § 248 project issues in Town Plans in such a way as to warrant greater consideration and deference by the Public Utility Commission.

Act 174: Integrated land use & energy planning

Act 174 (24 V.S.A. 4352), the Energy Development Improvement Act of 2016, established a new set of municipal and regional energy planning standards to support the integration of energy and land use planning. Act 174 is further intended to support the state's efforts to make efficient use of energy, provide for the development of renewable energy resources, and reduce emissions of greenhouse gases[24]. Act 174 provides an opportunity for regions and municipalities – from the planning commissions and selectboards to energy committees and citizens – to shape and inform their own energy future, as well as the energy future of the entire state. Municipalities and regions that plan to the enhanced standard of the Act (including the standards set by the Department of Public Service) will receive substantial deference before

[23] *2026 Chittenden County ECOS Plan*, Supplement 6 – Energy Analysis, Targets, & Methodology, Chittenden County Regional Planning Commission.

[24] Act 174 of 2016, Energy Development Improvement Act, "An act relating to improving the siting of energy projects."

the Public Utility Commission with respect to both land conservation measures and specific policies included in their plans when the Commission reviews the orderly development criterion of 30 V.S.A. §248(b)(1). The Act defines substantial deference as: "a land conservation measure or specific policy shall be applied in accordance with its terms unless there is a clear and convincing demonstration that other factors affecting the general good of the State outweigh the application of the measure or policy."

Plan Review

The Public Utility Commission is required to evaluate regional plans submitted for a determination of energy compliance against published standards. Municipal plans must have been approved by their regional planning commission to be eligible for an affirmative determination of energy compliance.

Determination Standards for Energy Compliance

Municipal determination standards measure whether the submitted plan meets the statutory requirements for enhanced energy planning and demonstrates local commitment toward meeting the State's energy goals. The determination standards apply to the entirety of the submitted plan, not only to the energy element.

The standards are divided into three parts: 1. Analysis & Targets, 2. Pathways, and 3. Mapping. Analysis & Targets standards are meant to demonstrate the town's or region's understanding of the magnitude of the changes in the energy sector that will be required to meet the state's energy and climate goals, and to create waypoints between the present and the planned-for future. Pathways (or Implementation Actions) provide an opportunity for the identification of specific strategies and actions to meet targets that are appropriate for regions or towns and consistent with the actions required to meet statewide goals. Mapping turns the attention to the overlap of energy infrastructure planning with land use planning in the context of the targets, including the generation potential for electricity and other useful energy from various sources. Plans are required to identify potential areas for the development and siting of renewable energy resources and are also expected to identify any unsuitable areas. This geographic analysis will enable the comparison of the energy that can be generated on potential and preferred sites with the energy required to meet energy goals over time. Given that siting decisions depend on the independent actions of developers and landowners, plans are expected to show that potential sites significantly exceed the required area to meet state goals.

<u>Current Status of Renewable Energy Planning</u>

The renewable energy generation targets contained in Supplement 6 of the *draft 2026 Chittenden County ECOS Plan*[25] show Charlotte's share of the additional renewable energy generation that will be needed to meet the 2050 county-wide generation targets. These targets account for existing generation currently sited or permitted within Charlotte's boundaries and are technology neutral—that is, they can be met through any type of renewable energy generation technology (biomass, solar, wind, etc.). For more information on how these targets were determined, please see the draft Chittenden County Regional ECOS Plan Supplement 6.

[25] *2026 Draft Chittenden County ECOS Plan*, Supplement 6 – Energy Analysis, Targets, & Methodology, Chittenden County Regional Planning Commission.

A. Current Energy Use and Generation

The data below are from various sources and represent actual current consumption and generation, rather than estimates from the Long-Range Energy Alternatives (LEAP) model. Estimates from the LEAP model are shown in **Section B** (below).

Table 27 provides an overview of the passenger/light duty vehicle fleet composition by fuel source in Charlotte. The number of electric vehicles includes all electric and plug-in hybrid vehicles, both of which have increased significantly since 2013 when there were only four electric vehicles registered in Charlotte. However, fossil fuel burning vehicles still make up 89% of vehicles in Charlotte.

Table 27. Current Household Transportation Energy Use in Charlotte, Metric Million British Thermal Units (MMBTU)		
1	Total Energy Consumption for Light Duty Vehicles (LDVs) (2022)	125,417 MMBTU
2	Total Energy Consumption for Fossil Fuel LDVs (2022)	121,853 MMBTU
3	Total Energy Consumption for Electric LDVs (2022)	3,564 MMBTU
4	Fossil Fuel Burning LDVs Registered to Households (2022)	2,364
5	All-Electric (Battery) LDVs (2023)	291
6	Plug-in Hybrid LDVs (2023)	107
7	Total Electric Light Duty Vehicles (2023)	291
8	Total Electric LDVs as % of Municipality's Total Vehicles	11.0%
Sources: Transportation Research Center, Drive Electric Vermont		

Table 28 and Table 29 below describe how homes are heated in Charlotte. Charlotte is outside of the Vermont Gas service area, and therefore many homes rely on delivered fuels for space heating such as fuel oil, kerosene, or propane. About 75% of residents heat their homes with one of these fuel sources.

Table 28. Home Heating by Fuel Type in Charlotte, 2022

	Heat Source	# of Homes	Margin of Error	% of Homes	% Margin of Error
1	Utility gas	0	+/- 10	0%	+/- 0.6%
2	Fuel oil, Kerosene	816	+/- 179	48%	+/- 9.5%
3	Propane	467	+/- 161	27%	+/- 9.1%
4	*Subtotal Oil, Kerosene, Propane*	*1,283*	*+/- 241*	75%	*+/- 12.3%*
5	Wood	258	+/- 99	15%	+/- 5.6%
6	Electricity	135	+/- 71	8%	+/- 4.1%
7	Non-PV solar energy	22	+/- 26	1%	+/- 1.5%
Sources: American Community Survey 2022 5-Year Estimate, Table B25040. Data are associated with a margin of error.					

The best available data source for home weatherization is Efficiency Vermont; data for weatherization and efficiency projects in Charlotte are shown in Table 29. Efficiency Vermont only monitors home weatherization programs done through the Home Performance with ENERGY STAR® (HPwES) program. HPwES is a comprehensive whole-house approach to diagnosing and addressing thermal and health and safety issues in the home to ensure a more energy efficient, comfortable, safe, and healthy home. Total Residential Projects includes both

ENERGY STAR® projects and other projects, such as replacing an appliance or improving the thermal shell of a building.

A project is a collection of one or more energy efficient measures that have been implemented at a customer's residence. A customer can be associated with one or more projects and in some cases, a project may be associated with multiple customers. Efficiency Vermont's data does not capture do-it-yourself projects or projects that do not go through the HPwES program.

Table 29. Recent Residential Energy Efficiency Projects	2021	2022	2023	Total
Total Residential Projects (includes projects below)	244	219	186	**649**
Home Performance with ENERGY STAR® Projects	11	6	10	**27**
Other Weatherization Projects	2	0	5	**7**
Residential New Construction Projects	7	6	2	**15**
Other Selected Measure and Engagement Counts				
Home Energy Visits	10	4	7	**21**
Heat Pump Water Heater Installations	34	12	13	**59**
Cold Climate Heat Pump Installations	176	201	184	**561**
Wood Heating Installations	22	0	7	**29**
Source: Efficiency Vermont, RPC Report Produced 6/2024				

An estimate of current electricity consumption by residential and commercial/industrial sector in Charlotte is shown in Table 30.

Table 30. Electrical Energy Use in Charlotte (kWH)

Sector	2021	2022	2023
Commercial & Industrial	3,065,572	3,076,241	3,262,823
Residential	18,536,042	19,131,214	19,862,863
Total	21,601,614	22,207,455	23,125,686
Count of Residential Premises	1,874	1,883	1,893
Average Residential Usage	9,891	10,160	10,493
Source: Efficiency Vermont, 2024 RPC Report Produced 6/21/2024			

As shown in Table 31, Charlotte's current renewable generation capacity is 7.15 MW, resulting in approximately 9,429 MWh of generation each year. The vast majority of this generation comes from solar panels, which includes both rooftop and ground-mounted (data distinguishing between these types is tracked but not published by the Public Utility Commission).

Table 31. Existing Renewable Electricity Generation	Sites	Power (MW)	Energy (MWh)
Solar	357	7.10	9,332.47
Wind	7	0.05	96.68
Hydro	0	0	0
Biomass for Electric Generation	0	0	0
Total	364	7.15	9,429.15
Source: Vermont Department of Public Service, Generation Scenarios Tool, Distributed Generation Survey + data as of 1/31/2023			

Table 32 breaks down existing renewable energy generation by system size and by program type.

Table 32. Existing Renewable Generation by System Size and Program.

System Type / Size	Number of Systems	Percent of Total Systems	Annual Energy Produced (kWH)	Percent of Total Energy
Net-Metered Solar ≤ 15 kW	334	82.3%	2,663.45	35.3%
Net-Metered Solar 150-500kW	3	0.7%	1,500.00	19.9%
Net-Metered Solar 15-150kW	19	4.7%	738.89	9.8%
Net-Metered Wind ≤ 15 kW	7	1.7%	49.05	0.7%
Standard Offer Solar > 500kW	1	0.2%	2,200.00	29.2%
Total	406	100%	7,543.39	100.0%
Source: VT Dept. of Public Service Distributed Generation Report, 1/31/2021				

B. Modeled Energy Use

A potential future energy use model draws from the Low Emissions Analysis Platform (LEAP) analysis by the Vermont Energy Investment Corporation (VEIC). LEAP is an accounting framework that shows one possible path for Chittenden County and its municipalities, including Charlotte, to meet the State's energy goals required for enhanced energy plans. LEAP aggregates existing energy use data and forecasts the demand for the amount and sources of energy over time, based on a set of anticipated economic conditions and potential policy changes. For example, demographic projections are one component of projecting and modeling future energy use. LEAP is well suited for examining how energy systems might evolve over time to meet certain goals (in this case, Vermont's goal to gain 90% of energy from renewable sources by 2050). These models show the direction and magnitude of change needed to meet local, regional and state energy goals.

It is also important to remember that the models established by LEAP represent only one way to achieve each municipality's energy goals. As work continues to meet these goals, it may become clear that different strategies may allow the municipality to meet its goals (for example, switching some projected wood heating systems to heat pump systems).

To meet Vermont's energy goals, it will be necessary to transform the transportation sector to no longer rely on fossil fuels. The LEAP model calls for most light duty vehicles to be electric by 2050 (Table 33). Though it is not modeled in the latest edition of LEAP, prior editions called for most heavy-duty vehicle fuel use to come from biodiesel.

	Table 33. Projected Light Duty Vehicle (LDV) Transportation Energy Demand	2025	2035	2050
1	**Estimate of total light-duty vehicles***	3,188	3,511	4,059
2	**Estimate for number of area battery electric and plug-in hybrid LDV (passenger cars and light trucks)**	175	1,839	3,986
3	**Light Duty Electric and Hybrid Electric Vehicles (% of Vehicle Fleet)**	5.5%	52.4%	98%
4	**Non-Electric Light Duty Energy Demand (gas, diesel, ethanol, CNG, biodiesel) (MMBtu)**	189,435	89,861	11,997
5	**Electricity Demand for Light Duty (passenger cars and light trucks) Transportation (MMBtu)**	2,973	31,168	58,871

6	**Biofuel share of biofuel-blended LDV transportation energy consumed**	8%	10%	10%

Source: LEAP Model, UVM Transportation Research Center
**Growth rate for LDV is based on the municipality's 10-year average annual change of new homes built between 2012-2022, annual rate is 0.61%*

Commercial and Industrial thermal energy is also projected to decrease as efficiency increases and establishments are weatherized, according to the model. Additionally, heat pump installations for commercial and industrial buildings are expected to increase (Table 34).

Table 34. Projected Commercial Thermal Energy Use, 2025-2050		**2025**	**2035**	**2050**
1	**Projected Number of future commercial establishments***	239	259	293
2	**Percent of Commercial Establishments Weatherized**	23%	46%	68%
3	**Energy Saved by Weatherization (MMBtu)**	10,802	23,853	39,854
4	**Number of Heat Pumps installed in Commercial Buildings****	446	1,348	1,724
5	**Commercial Establishments Using Wood Heating (%)**	8%	10%	12%
6	**Commercial Thermal Energy Use Attributable to Wood Heating (MMBtu)**	14,945	18,297	22,664

Sources: VT Department of Labor, ECOS Plan Forecasts, CCRPC Bottom-Up Approach for Commercial Sector
**Growth rate for future commercial establishments is based on the ECOS Plan employment forecast rate of 0.82%*
**** Contemplates multiple mini split heat pumps per commercial establishment. However, larger commercial establishments would likely use a centrally ducted system.

The LEAP model also calls for a decrease in thermal energy use in residential buildings. In addition, the model calls for a major shift towards heat pumps for home heating, as well as for most homes to undergo weatherization (Table 35). Note: The data in Table 35, line 5 represents percent of all homes weatherized (not just new homes, or homes not yet weatherized). This modeling changed from 2016 due to input from weatherization agencies, who provided more realistic assessments of what they can achieve. The scaling back of this target is compensated for by more ambitious targets in other areas of the LEAP modeling.

Table 35. Projected Residential Thermal Energy Use, 2025-2050		**2025**	**2035**	**2050**
1	**Projected number of future residences***	1,823	1,936	2,120
2	**Residential thermal energy use (MMBtu)**	176,565	102,633	63,191
3	**Energy saved by weatherization or other thermal efficiency improvements (MMBtu)**	21,210	54,275	72,172
4	**Estimated number of Homes weatherized**	412	891	1,441
5	**Percent of residences weatherized**	21%	46%	68%
6	**Heat pump energy consumed by residences (MMBtu)**	24,343	26,959	29,574
7	**Estimated number of heat pumps in homes**	555	1,433	1,977
8	**Percent of residences using heat pumps**	30%	74%	93%
9	**Wood heat (cord wood + wood pellets) consumed by residences (MMBTU)**	25,593	17,619	9,645
10	**Estimated number of residences using wood heat**	247	181	106
11	**Residences using wood heat (%)**	13.5%	9.3%	5.0%
12	**Utility gas Heat Energy consumed by residences (MMBtu)**	0	0	0
13	**Estimated number of residences using utility gas**	0	0	0
14	**Percent of residences using utility gas**	0%	0%	0%

Sources: LEAP Model, Department of Public Service
**Growth rate for future residences is based on municipal 10-year average annual change of new homes built between 2012-2022, annual rate is .61%. This may not align with growth rates anticipated for housing targets required under 24 V.S.A. § 4382(a)(10).*

The LEAP model calls for a major increase in electricity use because all sectors are predicted to shift towards electricity, displacing fossil fuel use. This shift is discussed in the previous sections. By 2050, total energy use and total energy use per capita will have decreased, but electricity consumption will increase because it will make up a larger percentage of the remaining energy use. According to the model, almost all residences and commercial and industrial establishments will increase their electric efficiency (Table 36).

Table 36. Electric Efficiency Targets, kilowatt hours (kWh)		2025	2035	2050
1	**Total cumulative electric energy saved from improvements in area residential equipment efficiency, in kWh**	447,805	2,490,255	4,502,458
2	**Residences that have increased their Electric Efficiency**	120	666	1,204
3	**Total cumulative electric energy saved from improvements in area commercial equipment efficiency, in kWh**	103,928	507,428	419,159
4	**Commercial and Industrial Establishments that have Increased Their Electric Efficiency**	22	110	110
Source: Energy Efficiency Utility Potential Study, CCRPC, and the Department of Public Service				

C. Renewable Energy Generation Potential

This chapter also reports how much wind and solar generation potential exists in the municipality, and sets targets for additional renewable energy generation within each municipality. However, the generation targets are technology neutral, meaning a municipality can use any form of renewable generation (wind, solar, biomass, hydroelectric, etc.) to meet its goals.

Prime solar or wind areas are areas where models show the appropriate conditions for electricity generation, and where there are no constraints. Base solar or wind areas are areas where models show the appropriate conditions for electricity generation, but where there are possible constraints, which must be considered during development and may reduce the development potential of a site. Please see "Charlotte Tomorrow" for a discussion of constraints.

A municipality's reported land available for wind and solar generation and generation potential are based on models that consider the elevation, slope, and aspect of land, and the modeled wind speed. These models do not remove existing impervious surfaces (see footnote in Table 36).

Table 37. Land Available for Wind and Solar Generation		
	Prime Potential	**Base Potential**
Solar	199 acres (0.8% of town)	10,465 acres (39.6% of town)
Wind	297 acres (1.1% of town)	19,106 acres (72.3% of town)
Rooftop Solar	48 acres (0.2% of town)	
Source: CCRPC and the Department of Public Service, Vermont Center for Geographic Information		

Table 38. Estimated Renewable Electricity Generation Potential		
	Power (MW)	**Energy (MWh)**
Rooftop Solar*	22.6	27,277
Ground-Mounted Solar – Prime**	28.5	37,410
Ground-Mounted Solar – Base**	199.3	261,930
Wind – Prime	7.4	14,614
Wind – Base	477.7	941,451
**Rooftop solar potential is estimated based on a VCGI LiDAR analysis of building footprints and rooftop slope and aspect. The model does not directly incorporate shading, rooftop layout, or other factors that may affect viability of rooftop solar, but does apply an inefficiency factor to account for these limitations. **Ground-mounted solar potential reports how much land could be developed with solar based on its aspect and elevation, and does not remove space taken up by impervious surfaces like roofs. Therefore, land-based generation potential may be overestimated for municipalities with a high percentage of impervious surface cover.*		
Sources: CCRPC and the Department of Public Service; Vermont Center for Geographic Information (VCGI)		

Table 39. New Renewable Electricity Generation Targets in Megawatt hours (MWh)	2032	2040	2050
Total Target (MWh)	15,448	38,226	48,762
Incremental Generation Target – Any Technology (MWh)	6,019	28,797	39,333
Grid Distribution Headroom (MW)	26.9	14.3	8.4
Sources: CCRPC and the Department of Public Service			

D. Mapping

Maps 15 and 16 identify potential areas for development and siting of solar and wind generation. These maps account for areas that are unsuitable for siting renewable energy generation because of the presence of state/local known and possible constraints as identified in Section 1.2, Policy 8 and Section 1.12, Policy 9.a and as shown on Maps 17-19. Map 14 shows existing renewable generation facilities and preferred sites for new facilities.

These maps should be used in conjunction with the policies in the town plan. The maps identifying constrained areas are a visual representation of the constraints referenced above. The maps are not sufficient for delineation of features on the ground and are not a replacement for surveyed information or engineering studies.

2.9 EXISTING LAND USE

It is important to understand how land and other resources are used before recommendations can be developed regarding future land uses since the type and intensity of existing land uses have a strong influence on future development patterns.

Many factors influence a community's land use patterns including natural resources constraints and opportunities, agricultural and forestry practices and the development of residences, commercial and light industry. Regulations have also been a factor in shaping development since the inception of zoning in Charlotte over fifty years ago.

Land Use Categories

Towns commonly employ two types of instruments to guide and enact legislation – policy documents, such as this comprehensive plan, and regulatory documents such as land use regulations (aka zoning). Both are intentionally distinct but must be coordinated and complementary. Land use designations included in the comprehensive plan are plans for the future. Whereas zoning designations more specifically define what use is currently allowed on a specific parcel, and outline design and development guidelines for those intended uses such as setbacks, minimum lot sizes, buffering and landscaping requirements, etc. Zoning designations are what you can legally do with your parcel today; land use designations, in conjunction with development guidelines, describe how you may be able to use your parcel in the future.

In general, land is categorized according to its physical characteristics and the present use occurring on it. Following is a listing and purpose for the current, broad land uses found in Charlotte:

Natural – To provide for effective long-term management of tracts of land consistent with their significant, limited or irreplaceable natural or scenic resources essentially undisturbed by human occupancy. Characteristics: major wetlands, undeveloped shoreland; lands that are unique, fragile, or hazardous for human development (Significant Natural Communities; Rare and Irreplaceable Natural Areas; Rare, Threatened or Endangered Species; River Corridors; Flood Hazard Areas; steep slopes (greater than or equal to 15%); large, intact tracts of forest habitat and connecting habitat.)

Rural – To provide for agriculture and forest management and various other low intensity uses on large sites, including residences where community services will not be provided and natural resources will not be unduly impaired; to encourage preservation of scenic resources and guard against the premature or unreasonable alteration of irreplaceable, limited or significant natural, scenic, historic, or other resources not otherwise classified. Characteristics: large tracts of farm plus smaller integrated sites.

Developed / Community – To provide for clustered uses to fulfill housing, employment and public and private service needs within the Town. Characteristics: villages, hamlets, crossroads, clustered residential.

Historic Development Patterns

Charlotte's development pattern can be described as having three components: 1) village nodes, 2) frontage along town roads and 3) clustered developments or neighborhoods. As described in greater detail in Part 3 of this Plan entitled Charlotte Yesterday, Charlotte has always had a somewhat dispersed settlement pattern largely due to its agricultural heritage. Water also played a critical role - necessary for powering early gristmills and sawmills (Holmes

Creek, Lewis Creek and LaPlatte River), transporting goods and people along the Lake and providing potable water sources (Church Hill Road at Hinesburg Road). Three distinct 'villages' emerged early in Charlotte's history: Charlotte Four Corners (now West Charlotte Village), Charlotte Center (at the intersection of Hinesburg Road and Church Hill Road), and Baptist Corners (now East Charlotte Village). Thompson's Point and Cedar Beach have been summer 'colonies' since the late 19th century.

The first Comprehensive Plan, written in 1969, identified two villages: Charlotte Village (now West Charlotte Village) and East Charlotte Village; summer residential and recreation at Thompson's Point and Cedar Beach and along the Lake; a proposed State Park adjacent to Town Farm Bay and an expansion of Mt. Philo State Park; a residential community near Mutton Hill; and "Low Density, Agricultural and Rural Residential Cluster Developments" in spaces between. Limited access and the prevention of strip development along Route 7 were also called out in this first plan and that guiding principle has been a consistent component of Charlotte's Town Plan since that time.

The general land use pattern today is not appreciably different from that of 1969. Development along town roads and in clusters has been occurring; however, the size of lots within clustered developments and developable areas within those lots has been a concern in some instances. Clustering is a relative term and dispersed clusters can incrementally eat away at both farm and forestland and other *Areas of High Public Value*.

Charlotte Land Trust

The Charlotte Land Trust (CLT) was originally formed in 1986 as an outgrowth of an agriculture committee appointed by the Planning Commission to assist in developing a new town plan. Members of the committee were concerned about increasing development in town and decided to form a local land trust. In the early years, the organization assisted in an impressive number of local conservation projects, primarily resulting in conservation easements that are held by the Vermont Land Trust. In 1995 the board filed for incorporation to become a non-profit, 501(c)(3) corporation in order to be able to hold easements and make it possible to raise money for conservation projects. In the last 6 years, CLT has welcomed numerous "Friends of the Land Trust" who support the land trust's work through contributions to the organization.

From the start, CLT's focus has been to conserve farmland and to make affordable farmland available to farmers. Other notable goals are to preserve land for wildlife habitat and corridors, public recreation, scenic vistas and significant natural areas.

CLT helped educate town residents in 1995 about the proposed Town Conservation Fund, which was voted on and approved at Town Meeting in March 1996, and renewed for another ten years in March 2006. This fund has been extremely helpful in making local conservation projects possible and has been used towards the funding of ten conservation projects in town totaling 702 acres—some of the easements on these properties are held by the Charlotte Land Trust and others are held by the Vermont Land Trust.

Since 1995, CLT has acquired 11 easements on local land, totaling 360 acres. They have assisted the Vermont Land Trust on numerous other projects in town. As of 2007, the amount of

conserved land in Charlotte totals approximately 3,812 acres (out of the 26,530 acres in town). In addition, the Town holds approximately 1,308 acres in open space agreements.

In 1995 the Town sponsored an inventory of agricultural land to inform the Town's agricultural district planning and land conservation priorities. The Charlotte Land Trust oversaw the consultant who mapped existing and potential farmland, agricultural uses of each farm unit, conservation lands, agricultural management districts, and agricultural soils. This information has been incorporated into the Town Plan, and is used by the Charlotte Land Trust and the Planning and Zoning Office.

During the 2002 Town Plan Update, discussion participants felt that it is important that the Charlotte Land Trust initiate more contact with farm landowners. They also indicated the need for the Land Trust to educate the public more clearly about how the Land Trust can help property owners protect farmland and natural areas. In addition, residents recommended that the Land Trust focus more on making land affordable for farmers.

Existing Land Use Analysis

This section examines the land use categories above and identifies those uses based on tax records, aerial photography, visual surveys, and zoning information. Categories are presented graphically on the Existing Land Use Map.

To establish boundaries for 'Natural', the component layers of the 2008 Significant Wildlife Habitat Map – Forest, Aquatic, Shrubland and Additional Linkage - were merged into one layer. This wildlife mapping project and the layers that resulted used individual layers of data matching the purposes for the category defined above. These individual layers included surface waters, wetlands, and associated buffers; State Significant Natural Communities (SNCs), State Rare, Irreplaceable Natural Areas (RINAs), areas containing Rare, Threatened and / or Endangered Species (RTE); Flood Hazard Areas; steep slopes; and contiguous forest. The 'Natural' layer was compared to the State's Habitat Block Layer, 2011 and boundaries were similar. Use of this information is consistent with the *Vermont's Wildlife Action Plan*, 2016 which summarizes the multiple scale approach to conservation planning (see Natural Resources Section for more information).

'Rural' boundaries were established by starting with the Agricultural Land Use map that was created in 2000 by the Planning Commission, the Charlotte Land Trust and staff from the Vermont Housing and Conservation Board.

During the 1999/2000 inventory, observational surveys of properties were completed and deference was given to the agricultural use of a property in instances where multiple uses existed on a property. The 2000 Agricultural Land Use map layer was reviewed against the 2015 tax map to identify areas which were recently delineated into parcels. These areas were subcategorized as transition (for further review) but were retained on the Agricultural Land Use map layer and the consequent Rural layer. Known managed forested parcels were denoted as such and were removed from the Rural layer as they were already properly captured in the 'Natural' category.

'Developed / Community' boundaries were identified by creating a 'heat map' of E911 building points, identifying 'hotspots' (areas of point intensity) and turning the 'hotspot' polygons into a map layer.

An Existing Land Use Map was created by bringing together the 'Natural', 'Rural', and 'Developed / Community' layers. Though broad in effect, it provides a snapshot of how development has been occurring in Charlotte.

<u>Review of Earlier Plans and Planning Related Efforts</u>

As noted earlier in this section, the general land use pattern today is similar to that prescribed in Charlotte's first Comprehensive Plan in 1969 as well as subsequent plans. Notable subsequent plans include the 1990 Charlotte Town Plan, the first plan adopted following the State's passing of Act 200 -- the Growth Management Act in 1988 -- and the 2002 Charlotte Town Plan, which defined policies and strategies for each of the State's required planning elements, with an increased focus on the village areas for both housing and services (private and public).

Act 200 was an amendment to the Vermont Municipal and Regional Planning and Development Act (Chapter 117), first enacted in 1967. The amendment sought to improve the effectiveness, coordination, and comprehensive view of planning at the local, regional, and state level. While the original (1967) purpose and guiding principles of Chapter 117 were left largely intact, a major achievement of Act 200 was to create a new framework of land use goals. The Act also sought broader public participation in the planning process, with a goal to press for land use decisions "*to be made at the most local level possible commensurate with the impact of the decision.*"

Several smaller planning related studies resulted in the principles outlined in the 1990 and 2002 plans including the mapping of wildlife habitat, scenic views and roads, and wetlands. In 1996 the Town established a Town Conservation Fund to help with local conservation projects administered by the Charlotte Land Trust which was originally formed in 1986 and incorporated in 1995.

The 2002 Plan was revised in 2008 and again in 2013. These revisions incorporated new statutory requirements including affordable housing and safe and affordable childcare protections, but other elements of the plan were not changed. In 2016, the plan was amended to include 1) language recommending consideration of village designation and 2) an updated energy section.

Since adoption of the 2002 Plan (revised / readopted in 2008 and 2013), the Town completed a West Charlotte Village Planning Project (2002), an East Charlotte Village Planning Project (2010), a Report on Potential Community Wastewater Service to the West Charlotte Village (2011), and a Report on the Geology and Hydrogeology of Charlotte (2010). Recommendations from the West Charlotte Village Planning Project were not adopted by the Planning Commission due to a lack of endorsement by the broader community. It's important to note that this effort relied heavily on the premise of commuter rail serving Charlotte, a premise that has since been dissolved at that State level. The other planning projects were conducted to further the vision of reinforcement of historic settlement patterns – villages surrounded by rural areas – a component of Charlotte's vision that remains today. Public input associated with these studies simultaneously stressed the need to balance this reinforcement with preservation of historic resources and Charlotte's small town characteristics.

Development Trends

In 2014 the Town worked with PlaceSense in preparing materials and facilitating outreach workshops as part of this planning process. A Land Use Workshop was held in September of 2014 and the following trends and patterns were presented as observed between 2004 and 2013:

- Approximately 140 residential lots were created[26]
- Approximately 1,300 acres of undeveloped or farm land was converted to residential land[27]

[26] Residential lots were defined as those categorized as R1 or R3 in the grand list so may include farm properties.

[27] Ibid

- 70 percent of new residential development occurred on parcels containing primary agricultural soils[28]
- 58 percent occurred on parcels containing wildlife habitat[29]
- 25 percent of Charlotte's land is conserved
- 48 percent of Charlotte's land is enrolled in the Use Value Appraisal (aka Current Use) Program

In 2024, 30 percent of Charlotte's land is protected, and conserved, a total of 7,819 acres.

Table 40: Charlotte's Conserved Land

	Acres	Percentage
Town (not including lake)	26,505	
Total Protected	7,819	30%
Protected broken down into following categories		
Open Space Agreement with Town	1,855	24%
Town Owned, State Owned	699	9%
Easement or Conservation Agreement	5,108	65%
VLT or TNC Owned	157	2%

[28] A cursory review indicates most of the structures are on primary agricultural soils but this does not preclude use of the land for farming which may still occur or be occurring on some properties. Approximately 70 percent of Charlotte's land area is considered primary agricultural soil (18,478 acres).

[29] Actual structure may not be within mapped wildlife habitat and thus actual impacts to wildlife habitat were not determined. Approximately 43 percent of Charlotte's land area is mapped wildlife habitat (11,438 acres). There are approximately 3,325 acres of land that is mapped as both primary agricultural soil and wildlife habitat.

Figure 14. Existing Land Use, 2025