This plan combines the Regional Plan, the Metropolitan Transportation Plan (MTP), and the Comprehensive Economic Development Strategy (CEDS) into one integrated plan.

For a healthy, inclusive, and prosperous community.

Adopted 6/19/2013

Chapter 2
Chapter 2 - Regional Analysis

2.0 INTRODUCTION
This Chapter describes the goals that have been developed through ECOS and the indicator data that shows us how we are doing relative to achieving our goals. Key issues/trends/insights are summarized for each of 17 topics. At the end of this Chapter is a summary of the conclusions drawn from the data, the form of 31 high-priority concerns.

This Chapter and these topics are grouped according to the four Broad Goals (see Section 1.5) as follows and as shown in more detail on the following pages:

2.1 Demographics
2.2 Natural Systems
   2.2.1 Ecological Systems (Habitats, Water Quality, Air Quality)
   2.2.2 Scenic and Recreational Resources
   2.2.3 Climate Change

2.3 Social Community
   2.3.1 Education, Knowledge and Skills
   2.3.2 Health
   2.3.3 Public Safety and Criminal Justice
   2.3.4 Social Connectedness
   2.3.5 Arts, Culture and Recreation
   2.3.6 Civic Engagement and Governance

2.4 Economic Infrastructure
   2.4.1 Economy
   2.4.2 Household Financial Security
   2.4.3 Working Lands

2.5 Built Environment
   2.5.1 Land Use
   2.5.2 Housing
   2.5.3 Transportation
   2.5.4 Infrastructure
   2.5.5 Energy
2.1 REGIONAL CONTEXT

Chittenden County is located in northwestern Vermont between Lake Champlain and the highest peaks of the Green Mountains (see Figure 1-1). The County’s nearly 350,000 total acres have a rich diversity of landscapes: forests, farms, water bodies, small cities, suburban areas, and villages.

Founded in 1787, Chittenden County has about 156,000 residents living in 19 municipalities that range in size from 20 to almost 40,000 residents. The County is the heart of the Burlington – South Burlington Metropolitan Statistical Area (the economic engine of Vermont); home to the State’s largest higher education institution, health care facility, and private sector employer; and nationally recognized as having an outstanding quality of life.

Unlike many rural regions which have experienced population decline in the past 30 years, Chittenden County is growing, and at a rate higher than the rest of Vermont, higher than the New England region, and higher than the U.S. as a whole. Indeed, residents who were born in Vermont now constitute only half the population of the state. And the influx is increasingly diverse: Chittenden County’s diversity is growing at a higher rate than the rest of the state.

The challenges of a growing population and growing diversity are many, and will touch on every aspect of our quality of life. This ECOS Plan aims to address those challenges in a holistic, integrated way.

Information about the people in Chittenden County helps us to understand the nature of our community and how we are changing. It can help decision makers anticipate potential pressures on the wider social, economic and physical environments. Factors such as population growth (it is important to note that college students are counted by the Census and are therefore included in our population numbers), age, ethnicity, migration and household makeup are often key determinants of conditions across a whole range of issues affecting quality of life.
FIGURE 2 - PROJECTED POPULATION CHANGE IN CHITTENDEN COUNTY


FIGURE 3 - HOUSEHOLD AND EMPLOYMENT FORECAST FOR CHITTENDEN COUNTY

Source: 2035 Woods & Poole Forecast for Chittenden County, Endorsed by CORPC
**FIGURE 4 - POPULATION GROWTH RATE COMPARED TO VT AND NEW ENGLAND**

![Population Growth Chart](image)

*Source: US Bureau of the Census*

**FIGURE 5 - PERCENT OF RESIDENTS BORN IN VERMONT IN CHITTENDEN COUNTY AND VERMONT, 1960 - 2010**

![Birth Percentage Chart](image)

Age

FIGURE 6 - PERCENT OF RESIDENTS UNDER 18, PERCENT OF RESIDENTS OVER AGE 65, 1960 - 2010, AND MEDIAN AGE IN CHITTENDEN COUNTY, 1960-2010

Families and households
**FIGURE 7 - PERCENTAGE OF TOTAL HOUSEHOLDS THAT ARE SINGLE PERSON HOUSEHOLDS IN CHITTENDEN COUNTY AND VERMONT, 1960 - 2010, AND AVERAGE HOUSEHOLD SIZE IN CHITTENDEN COUNTY 1960 - 2010**

- **Source**: U.S. Bureau of the Census.

**FIGURE 8 - PERCENTAGE OF NON-WHITE HOUSEHOLDS IN EACH MUNICIPALITY**

- **Source**: 2010 Census

*This percentage is high because there are very few households in Buel’s Gore.*
Race/Ethnicity

**FIGURE 9 - PERCENTAGE OF HOUSEHOLDS IN EACH MUNICIPALITY WHERE LANGUAGE OTHER THAN ENGLISH SPOKEN**

- Burlington: 11.90%
- Shelburne: 11.33%
- Charlotte: 10.96%
- Shelburne: 10.65%
- Hinesburg: 7.78%
- Shelburne: 6.57%
- Middlebury: 5.97%
- Shelburne: 8.17%
- Milton: 9.35%
- Shelburne: 14.45%
- Williston: 13.61%
- Winooski: 17.85%

Source: 2006-2010 American Community Survey

**FIGURE 10 - PERCENT OF RESIDENTS WHO ARE NON-WHITE OR HISPANIC IN CHITTENDEN COUNTY, VERMONT AND THE U.S., 1960 - 2010**

- Chittenden County: 23.40%
- Vermont: 18.90%
- United States: 7.10%

Source: U.S. Census
Disabilities

Disability status of Chittenden County residents (relative to VT and US)

About 14,000 people in Chittenden County were identified as having a disability in 2010. Income of people with disabilities is far below that of people without disabilities, reducing their ability to afford housing and further limiting their housing choices.
2.2 NATURAL SYSTEMS

Broad Goal: Design and maintain a strategically planned and managed green infrastructure network composed of natural areas, working lands, wildlife habitat, scenic views and air quality that help to conserve ecosystem values and functions (including climate change adaptation and mitigation), and provide associated benefits to our community.

INTRODUCTION: A sustainable community preserves natural systems in order to maintain quality of soil, air and water and because they offer a richness that nurtures the human spirit. Healthy landscapes are necessary to sustain the complex myriad of plant and animal species that share our habitat. We are dependent on the surrounding landscapes for many resources such as food, water and fuel; for recreational opportunities and aesthetic values; and for vital natural processes such as water retention and recycling, air cleansing, carbon sequestration, and nutrient cycling. Preservation of our natural systems can help guide new growth into existing developed areas. In addition, a network of healthy natural systems and green infrastructure can make very important contributions to the overall prosperity of the region.

As a result of our topography and historic development patterns the eastern side of Chittenden County contains large intact habitat blocks, while the western side does not; however many important habitats exist throughout the entire County. Therefore, this plan calls for efforts to maintain the existing natural systems throughout the County, and minimize fragmentation of habitats and maintain wildlife corridors. The Conserving Vermont’s Natural Heritage Guide (Vermont Fish and Wildlife Department and the Agency of Natural Resources, 2004) identifies the following seven mechanisms by which current development patterns degrade Vermont’s natural heritage: 1. direct loss of diversity; 2. destruction of habitat; 3. habitat fragmentation; 4. disruption of movement, migration, and behavior; 5. introduction of invasive exotic species; 6. degradation of water quality and aquatic habitat; and 7. loss of public appreciation for the environment. Methods to combat or mitigate these mechanisms are crucial to the sustainability of the County as we continue to grow.

This section also touches on the local impacts of a changing climate. Our region’s climate is already changing; warmer, wetter conditions are expected to increase this century (Chittenden County Climate Change Trends and Impacts). These changes will adversely impact forest and aquatic communities, water quantity and quality, public health, agriculture, winter sports businesses, and buildings and infrastructure in flood and fluvial erosion hazard areas. Curbing climate change will require planet-wide actions to reduce greenhouse gas emissions; and preparing locally so that we can be resilient in light of these changes is imperative.

This Plan uses a multidisciplinary, holistic ‘ecological systems’ approach to understanding our natural and built environment, in which we look at the complex relationships between living elements (such as vegetation and soil organisms) and nonliving elements (such as water and air) of a particular area to understand the whole ecosystem. In that same way, we must look beyond our municipal, county and state political boundaries to understand the impacts, both positive and negative, we have on each other.
We need to collaborate with each other and adjust our actions in a measured fashion in support of ecosystem health.
2.2.1 Ecological Systems

**Ecological Systems Goal:** Conserve, protect and improve the health of native species habitats, water quality and quantity, and air quality.

Key Issues/Trends/Insights
[Data for this section drawn from Natural Systems Analysis Report and Lake Champlain Basin Program’s State of the Lake Reports]

- **Wildlife and Native Species** Chittenden County continues to see fragmentation and loss of habitat and connectivity largely due to mounting development pressures. Increasing land parceling and subsequent habitat conversion, lack of local regulations responsive to wildlife habitat concerns, and construction of transportation infrastructure (including roads and trails) continue to adversely impact habitat integrity. In addition, acid deposition from air pollution, migration of invasive species including destructive insect species, and climate change continues to threaten native forest plant and animal habitat.

- **Water Quality** Vermont water bodies continue to face mounting pressures from unsustainable development, farm and forest activities. Cumulative impacts from these land use activities have degraded water quality, aquatic habitat and altered the stability of river corridors and lakeshores. Issues that predominate in the County include disappearing wetlands, increasing impervious surfaces, steady high pollutant loads (mainly from nonpoint sources such as unmanaged stormwater), that result in nutrient enrichment and sedimentation, as well as other impairments. In addition, aquatic nuisance species continue to enter our waterways, contributing to the degradation of both habitat and recreational opportunities. Climate change is expected to bring us more intense storms at a higher frequency, which will only exacerbate the problem.

- **River Corridors** *River corridor resilience* is also critical to the health of our ecological systems as well as protection of nearby infrastructure. Channelization of streams and rivers, reduction and alteration of natural floodplains, river corridor encroachment, stormwater runoff and reduction and elimination of vegetative buffers are practices that lead to river corridor instability causing excessive erosion of river channels, pollution and additional fluvial erosion hazards. Of the river miles assessed in Vermont, 74% have become confined to deeper, straighter channels and no longer have access to historic floodplains essential to stable streams and sustainable water quality management.

- **Groundwater** As of 2005, 22,120 residents of Chittenden County (almost 15% of the population) relied on groundwater sources for their drinking water (Source: USGS Water Use Compilation). Protection of groundwater resources from failing septic systems and petroleum spills/leaks is critical.

- **Regulations** *Local zoning lags behind town plans.* There is a disconnect between the vision for natural systems as expressed in Municipal Plans, and the Zoning Regulations that implement those plans. In addition, many zoning regulations have vague review standards and definitions, a situation that complicates enforcement and opens the town to due process legal challenges. Conversely, local bylaws protect the majority of Fluvial Erosion Hazard areas in the County with stream setbacks and floodplain regulations from new development. However, agriculture and forestry practices are exempt from local review and without State enforcement of accepted agricultural practices fluvial erosion hazard areas are subject to degradation.

- **Air Quality** *Outdoor air pollution* in significant concentrations can raise aesthetic and nuisance issues such as impairment of scenic visibility; unpleasant smoke or odors; and can also pose human health problems, especially for more sensitive populations like children, asthma
sufferers, and the elderly. While Chittenden County’s air quality meets current National Ambient Air Quality Standards (NAAQS), we are close to the limits for ground-level ozone and fine particulates. We are also subject to pollution from the mid-west that we cannot control. If the NAAQS are revised to be more stringent - or air pollutant levels increase - so that we exceed the NAAQS, additional and costly environmental regulations will apply to our region (Source: http://www.anr.state.vt.us/air).

- **Climate Change Mitigation** — Plants are able to remove carbon from the atmosphere and store it in biomass and soils – a process called carbon sequestration. Maintaining forests, wetlands, agricultural lands and vegetated spaces in developed areas is important for ensuring current and future carbon sequestration. Vegetated landscapes are also important for the natural absorption of stormwater, reducing runoff and the potential for flooding. By concentrating development we can protect vegetative cover throughout the County.

### Key Indicators

- **Chittenden County Land Cover Losses (Source: USGS 2001 and 2006 National Land Cover Data):**
  - .19 net acres of agricultural land and natural resource land lost annually to development per new resident between 2001 and 2006.
  - 210,619 acres or 61% of the land are covered by forest.
  - Between 2001-2006, 241 acres or .11% of barren land, deciduous forest, evergreen forest, mixed forest, shrub, grassland, woody wetlands, and emergent herbaceous wetlands were converted to development. These land cover categories are being used as a surrogate for wildlife habitat as there is currently a lack of a better, more accurate data source.
  - In particular, 55 acres or .5% of wetlands were developed in Chittenden County.

![FIGURE 12 - CHITTENDEN COUNTY LAND COVER LOSSES](source:national_land_cover_data)
Number and Length of Degraded Rivers/Streams (See the Water Quality and Safety Map with Strategy 3.2.3 in Chapter 3):

- 8 miles or 1% of all stream miles, Shelburne Pond, and Lake Champlain (Malletts Bay, Northeast Arm, Shelburne Bay, and Burlington Bay) are considered impaired for a variety of reasons (Source: Vermont Dept. of Environmental Conservation, 303d List Part A, August 2012 USGS, Vermont Hydrography Dataset, 2001-2004) and require a total maximum daily load management strategy.
- The 2012 Vermont List of Priority Surface Waters also includes:
  - 8 miles or 0.53% of all stream miles and Burlington Bay, Muddy Brook and Unnamed Tributary of Winooski River are impaired and do not require development of a total maximum daily load (TMDL) because attainment is expected in a reasonable time (Part B).
  - 26 miles or 2% of all stream miles are in need of further study to confirm the presence of a violation of one or more criteria of the Vermont Water Quality Standards (Part C).
  - 93 miles or 6% of all stream miles and Lake Champlain (Burlington Bay, Mallets Bay, and Shelburne Bay) and Arrowhead Mountain Lake have completed and approved TMDLs in place, though they are not meeting water quality standards yet (Part D).
  - 41 miles or 3% of all stream miles and Lake Champlain (Burlington Bay, Mallets Bay, and Shelburne Bay), Arrowhead Mountain Lake, and Lake Iroquois are altered by invasive aquatic species (Part E).
  - 15 miles or 1.03% of all stream miles are altered by flow regulation (e.g., Dams) (Part F).

Phosphorus level concentrations in several areas of Lake Champlain have remained relatively steady since 2007; however the non-point loads are consistently above the target in the Main Lake and Mallets Bay. Non point phosphorus loading from streams to the main section of Lake Champlain are recorded at 3.3 times the target of 51.3 metric tons, and to Mallets Bay almost twice the target of 25.4 metric tons. Though it is important to note that the Lamoille River drains to Mallets Bay and is located largely outside of Chittenden County. (Source: State of the Lake and Ecosystem Indicators Report 2012, Lake Champlain Basin Program).

Percent of Impervious Surface by Watershed (Source: 2008 Impervious Surface Data, ANR):

- 8,267 acres or 7% of the Lake Champlain Direct Watershed is impervious.
- 3,145 acres or 3% of the Lamoille River Watershed is impervious; and within Chittenden County 3.6 % impervious.
- 7,779 acres or 6% of the Winooski River Watershed is impervious; and within Chittenden County 5.6% impervious.
- Chittenden County is 5.63% impervious.

Chittenden County’s Air Quality is close to National Ambient Air Quality Standards (NAAQS) for ground-level ozone and fine particulate:

- Ozone air quality samples taken since 1995 consistently show the County being below (though often close to) National Standards.
FIGURE 13 - OZONE TREND, BURLINGTON, VT

FIGURE 14 - OZONE TREND, UNDERHILL VT
2.2.2 Scenic, Recreational, and Historic Resources

Scenic and Recreational Resources Goal: Conserve, protect and improve valued scenic, recreational, and historic resources and opportunities.

Key Issues/Trends/Insights
[Data for this section drawn from Natural Systems Analysis Report]

- Chittenden County is rooted in its scenic, recreational, and historic resources. These provide residents a place to relax, play, gather, and learn about nature, conservation, and our heritage. They also provide important ecological functions including wildlife habitat, and water and air quality protection. These are supplemented by indoor and outdoor recreation facilities. An extensive system of shared-use paths, on-road bike lanes, and off-road trails connect the County’s recreational facilities and areas (this data can be found under the Natural Systems section of the online map located here: http://maps.ccrpcvt.org/ChittendenCountyVT/).

- Scenic resources represent an important element of the region’s landscape and contribute directly to sense of place, quality of life and economic vitality through tourism and by attracting new residents and businesses.

- Historic resources include buildings, structures, landscapes, and archeological sites, both on land and under water. There are over 4,400 designated historic sites in Chittenden County and over 80 designated historic districts (this data can be found under the Natural Systems section of the online map located here: http://maps.ccrpcvt.org/ChittendenCountyVT/).

- The recreational value of our water bodies (swimming, fishing, boating, etc.) is critically dependent on water quality. E-coli and algal blooms lead to beach closures, while invasive species threaten our native fish populations. Events and encroachments such as these are exacerbated by the effects of climate change.

- As we work toward encouraging future development in areas planned for growth to maintain VT’s historic settlement pattern of villages and urban centers, surrounded by rural countryside, access to valued scenic, recreation and historic resources should also be maintained and improved for all residents and visitors.

- Eight of the County’s municipalities (Milton, Colchester, Essex Junction, Winooski, Burlington, South Burlington, Shelburne and Charlotte) are member communities of the Lake Champlain Byway, a State-designated Scenic Byway that extends from Alburg in the Champlain Islands through Chittenden County on U.S. 7 and south into several towns in Addison County. Since 2002 these communities have secured competitive grants from the National Scenic Byway Program to improve the visitor experience by implementing projects such as wayfinding signage, interpretive panels, brochures, kiosks, and other amenities. In particular, the Byway focuses on improving interpretation and information about municipal and non-profit intrinsic resource sites such as parks, town forests, natural areas, trails and smaller museums.

- There is low compatibility between municipal plan recommendations for natural and scenic resources and the implementation of those recommendations through zoning bylaws and subdivision regulation. Further, there are often contradictory goals within municipal plans regarding natural and scenic preservation and new infrastructure for energy generation and
transmission. Reconciliation of these is necessary to meet community visions and bring predictability to the development process.
Key Indicators

- **50,789 acres or 15% of Chittenden County's land area is protected from development.** Source: UVM SAL Conserved Land Database and municipalities.

- **56,450 acres or 17% of Chittenden County's land area is available for recreation in the form of town & state parks, athletic fields, and natural areas.** Source: CCRPC

- **Local Zoning Lags behind Plans** (Source: ECOS Natural Resources Analysis Report, Landworks). Municipal Zoning Regulations vary.
  - 16% of towns provide specific standards and guidelines for protecting identified scenic resources.
  - 68% of towns provide general recommendations for protecting scenic resources (e.g., views and landscapes along scenic roads should be protected).
  - 16% of towns reference scenic resources but provide no goals, standards, guidelines, or recommendations.
  - 57% of scenic resources identified are of roads or views from roads.
  - The majority (74%) of towns reference scenic resources in relation to their value as open space.
  - 42% of towns recognize that woodlands provide scenic as well as ecological values.
  - About 40% of towns consider historic structures and settlement patterns a scenic resource.
  - 21% of towns have a scenic overlay/preservation district.
2.2.3 Climate Change

*Climate Change Goal:* Reduce greenhouse gas emissions contributing to climate change and adapt to become more resilient to a changing climate.

**Key Issues/Trends/Insights**

[Data for this section drawn from *Chittenden County Climate Change Trends and Impacts*. Another reference that is currently under development is the *Chittenden County Regional Climate Action Plan.*]

- Temperature and precipitation records for the latter half of the 20th century show that Chittenden County's climate has changed: winters became warmer and summers became hotter. Lake Champlain freezes over later and less frequently and the growing season lasts longer. Annual precipitation has increased, but more falls as rain instead of snow.
- Scientists overwhelmingly agree that changes in climate worldwide are a result of human activities, mainly the burning of fossil fuels. Climate model forecasts for the Northeast US predict that during this century temperatures will continue to increase, as will extreme heat days and heat waves. More precipitation and extreme precipitation events are expected to increase, although short-term summer droughts may also become more frequent.
- These current and predicted changes in climate have broad implications for our region:
  - **Environmental Quality** - Summer air quality will deteriorate, as warmer temperatures promote the formation of smog. More intense rainfall will increase storm water runoff and the potential for flooding. Increased rain and runoff will wash pollutants into our waterways, and warmer waters and nutrients will encourage growth of bacteria and blue-green algae.
  - **Natural Communities** - Cold-water aquatic species, such as brook trout, will struggle to survive in warmer waters and in competition with better-adapted species. Our forests will change: maple, beech and birch trees will gradually be replaced by oak and hickory trees that are better adapted to warmer, wetter conditions. Invasive species, like the hemlock wooly adelgid, will further affect change in forest composition.
  - **Public Health** - Warmer temperatures allow the spread of insect-borne diseases, such as West Nile virus and Lyme disease. Air pollution and higher pollen production will increase problems for people with allergies, chronic respiratory diseases and asthma. High temperatures and heat waves will increase the risk of heat stress for the elderly, very young children and other vulnerable populations.
  - **Built Environment** – Flooding will put homes, businesses and public infrastructure in flood-prone areas at risk. Flooding may impact the safety of the water supply; droughts will also threaten water supplies. Although warmer winters will require less fuel for heating, hotter summers will increase electricity demands for cooling.
  - **Local Economy** - Warmer temperatures will hurt maple sugar production. Farmers can expect declining yields for cool-weather crops and depressed milk production from heat-stressed dairy cows. Less-colorful foliage seasons will hurt fall tourism. Less predictable snow will jeopardize winter sports and recreation and compromise Vermont’s image as a winter sports destination.

- We can respond to climate change in two different ways.
  - **Climate mitigation** strategies will reduce the region’s contribution of greenhouse gases. Although Chittenden County may be a small part of global greenhouse gas emissions, it is important that Chittenden County do its part to help solve the problem. More
specifically Chittenden County should do what we can to help the State reach the goal of reducing 50% of greenhouse gas emissions from the 1990 baseline by 2028.

- **Climate adaptation** strategies help individuals, businesses and communities be able to withstand and bounce back from – or even take advantage of – the impacts of climate change.

**Key Indicators**

- **Greenhouse Gas Emissions** - In 2010, Chittenden County emitted approximately 1,193,000 metric tons of carbon dioxide equivalents (MTCO2e).

![FIGURE 15 - CHITTENDEN COUNTY GREENHOUSE GAS EMISSIONS BY CATEGORY](image)

Source: Draft 2010 Chittenden County Greenhouse Gas Emissions Inventory Data rounded to three significant figures.
- **Major Disaster Declarations** - Major disaster declarations are made for natural events causing damage so severe that it is beyond the combined capabilities of state and local governments to respond.

![Major Disaster Declarations - Chittenden County](image)

**FIGURE 16 - MAJOR DISASTER DECLARATIONS, CHITTENDEN COUNTY**

- **Vegetated Landscapes.** Vegetated landscapes are an important supporting indicator for both climate mitigation and climate adaptation. Plants are able to remove carbon from the atmosphere and store it in biomass and soils – a process called carbon sequestration. Maintaining forests, wetlands, agricultural lands and vegetated spaces in developed areas is important for ensuring current and future carbon sequestration. Vegetated landscapes are also important for the natural absorption of stormwater, reducing runoff and the potential for flooding. In 2006, Chittenden County was 95% vegetated, approximately equal to the vegetated area in 2001. This indicator is related to the impervious surface indicator in Ecological Systems. Based on 2001 landcover data, the carbon sequestration rate was about 761,000 MTCO\(_2\)e.

- **Climate-Related Infectious Diseases.** Increased transmission of vector-borne diseases is a key supporting indicator associated with climate change. The Health Department tracks the number of new Lyme disease, West Nile virus (WNV) and Eastern Equine Encephalitis (EEE) cases each year. From 2003 to 2009, Chittenden County had one case of WNV and no cases of EEE. Data for Lyme disease are presented below.
Vermont Residents Discharged from Vermont, NH, NY, and MA Hospitals
Hospital Visits for Primary Diagnosis of Lyme Disease: Years of Admission 2003-2009

<table>
<thead>
<tr>
<th>Year of Admission</th>
<th>Statewide</th>
<th>Chittenden County</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>17</td>
<td>6</td>
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<tr>
<td>2004</td>
<td>17**</td>
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<td>2006</td>
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<tr>
<td>2007</td>
<td>52**</td>
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<td>2008</td>
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<tr>
<td>2009</td>
<td>82**</td>
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</tr>
</tbody>
</table>

* all inpatient and outpatient visits, * Visits less than 6. Source: The Annual Vermont Uniform Hospital Discharge Data Sets (VUHDDS), inpatient and outpatient. VUHDDS does not include Emergency Department data prior to 2003. Data for 2010 is not available at this time.

FIGURE 17 - NUMBER OF HOSPITAL VISITS FOR LYME DISEASE

Heat Stress Hospitalizations

FIGURE 18 - HEAT STRESS HOSPITALIZATIONS
2.3 SOCIAL COMMUNITY

Broad Goal: All community members have the skills, resources, and assurances needed to participate in the workforce and in family, civic, and cultural life within and among neighborhoods and in the larger community.

INTRODUCTION:
Our region’s economic, social and intellectual well-being depends on the strength of its people. What is more integral to any municipal or regional plan than the people who live, work and play in the region? Just as we identify desired goals and benchmarks to measure progress for natural and physical capital, we need to do the same for social (civic engagement, social connectedness, arts and culture) and human capital (education, health, safe people). Similar to the rest of the country, Census data demonstrates that Chittenden County is aging, becoming more racially and ethnically diverse, and experiencing growing income inequality. To counter disparities that will inevitably grow, equity must be at the core of our plans for the future. Ensuring that all – especially low-income and people of color - can fully participate in all aspects of a community is essential to our long-term success. Equity is both a means to a healthy, resilient community and an end from which we all benefit.

Educational achievement is essential for effective participation in society and to maintain a region’s economic prosperity. Increasingly, urban societies are becoming knowledge-based and urban economies require innovative solutions to meet market demands. People’s ability to learn new skills and reskill during their working lives is important if they are to keep pace with rapidly changing work environments. Access to life-long learning opportunities is also related to people’s need for self-fulfillment and self-determination.

The health of a population is inextricably linked to the design of the community in which it lives, works and recreates. All people of Chittenden County deserve the opportunity to make choices conducive to living a long, healthy life, regardless of their income, education, race, or ethnic background. Approaching community design from a public health perspective marks the reunification of two disciplines long separated by narrowly focused Euclidean planning. The design of a community can buttress certain behaviors while it undermines others, and impact social circumstances, access to healthcare, and environmental exposures. The determinants of health must be addressed from a holistic approach; no discipline cuts across these domains as broadly as community design. Investments in the region’s human and social capital are investments in the future of the region’s economic and social prosperity.

Another key to a vibrant, engaged community is access to arts, culture, and recreational opportunities. Both structured and unstructured recreational activities, especially outdoors, provide opportunity for physical activity, social development, and appreciation of the natural environment. In addition to enriching lives personally, arts and cultural experiences -- in the form of public events, performances, exhibitions and classes -- enhance the attractiveness of a community to employers looking to attract and retain a skilled and creative workforce.

The health and overall well-being of people significantly determines a region’s resiliency and ability to create equitable, prosperous and sustainable communities. The concept of community is fundamental to people’s overall quality of life and sense of belonging. Confident and connected communities support social and economic development in our cities. Strong communities have fewer social problems, are
more adaptable in the face of change and when they do experience difficulty they have internal resources to draw upon. Equity is a cross-cutting issue that impacts the quality of an entire region. There is no greater resource to invest in than a community’s people, all of its people.
2.3.1 Education, Knowledge and Skills

*Education, Knowledge, and Skills Goal*: All Chittenden County children and adults have the education, skills and opportunities necessary to meet their full economic and social potential and well-being.

**Key Issues/Trends/Insights**

[Data for this section drawn from *Education Analysis Report* and references as incorporated below.]

- Chittenden County requires a well-educated workforce and well-educated individuals to attract good employers and livable wage jobs, to engage in civic affairs and the arts, and to take responsibility for the welfare of ourselves, each other and the natural environment we cherish. Our region’s economic, social and intellectual well-being depends on educational attainment through a continuum of accessible and affordable educational opportunities from the early years through adulthood.

- The first five years of life are critical to a child’s lifelong development. Young children’s earliest experiences and environments set the stage for future development and success in school and life. Children from families that are economically secure and have healthy relationships are more likely to get a good start in kindergarten and maintain that advantage as they progress through school. The larger the gap at school entry, the harder it is to close. (National School Readiness Indicators Initiative)

- Research shows that children who are not performing proficiently in reading by the end of third grade are at very high risk for poor long-term outcomes, such as dropping out of school, teen pregnancy and juvenile crime. (National School Readiness Indicators Initiative)

- While Vermont can boast of a solid K-12 system which benefits from strong community support, small class sizes and high graduation rates (2nd in nation), it ranks 48th in its college-going rate. (Nation’s Report Card, 2009)

- Though the educational level of Chittenden County residents 25 and older with four year bachelor’s degree or higher exceeds state (32.6%) and national (27.5%) levels at 42%, of every 100 high school 9th graders, only 26 will complete a college program within 150% of normal time. (6 years for a 4-year degree and 3 years for a 2-year degree) (New England Board of Higher Education, 2006 data)

- Student achievement measures show clear performance gaps for low-income and students of color. If we are to remain an economically and socially viable community, all of our youth need the skills and education to participate as they are the future drivers of our region. A high quality public education can be the “great equalizer,” ensuring the democratic ideal of equal opportunity. The Vermont PreK-16 Council and the Lake Champlain Regional Chamber of Commerce have identified goals to close the achievement gaps and create a seamless PreK-16 student-centered, performance-based learning system framed by rigorous standards and high expectations for all students, regardless of racial/ethnic background or socioeconomic status. The system will provide not just content learning but —21st century skills. These include (1) information and technology skills, (2) life and career skills, and (3) learning and innovation skills such as critical thinking, collaboration, and creativity. Ensuring for equity so that all members of our community can reach their fullest potential is assuring for a more inclusive, prosperous and sustainable region.
- We need to close the lingering achievement gaps and work to create a seamless PreK-16 education system framed by rigorous standards and high expectations for all students.
- About 45% of matriculated first-year students at the Community College of Vermont (CCV) are taking non-credit remedial classes in writing or mathematics. At other Vermont State Colleges, the number ranges from 5%-45%, with an overall average of 22% taking remedial courses. (VT PreK-16 Council, 2012)
- 38 of Vermont’s 50 fastest-growing occupations — including six of the 10 fastest-growing jobs — require significant postsecondary education. (Vermont Business Roundtable)
- 30% of employers (largely within the skilled machine trades) report that they have training needs that are not met by local resources. (WDGT Chittenden Employer Survey, 2011)

### Key Indicators
- % of children entering kindergarten school ready according to developmental domains 
  (Source: Statewide Assessment of Kindergarten Readiness across 5 domains - AHS, United Way)

<table>
<thead>
<tr>
<th>Year</th>
<th>Approaches to learning</th>
<th>Cognitive. Dev./General Knowledge</th>
<th>Communication</th>
<th>Socio-emotional Development</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>State of Vermont 2009</td>
<td>66%</td>
<td>61%</td>
<td>81%</td>
<td>67%</td>
<td>n/a</td>
</tr>
<tr>
<td>Colchester (2007 data; 2009 not available) 2008</td>
<td>81%</td>
<td>64%</td>
<td>91%</td>
<td>67%</td>
<td>86%</td>
</tr>
<tr>
<td>Milton 2009</td>
<td>67%</td>
<td>73%</td>
<td>81%</td>
<td>77%</td>
<td>n/a</td>
</tr>
<tr>
<td>Chittenden East 2009</td>
<td>75%</td>
<td>67%</td>
<td>88%</td>
<td>77%</td>
<td>n/a</td>
</tr>
<tr>
<td>Chittenden Central 2009</td>
<td>62%</td>
<td>70%</td>
<td>84%</td>
<td>55%</td>
<td>n/a</td>
</tr>
<tr>
<td>Chittenden South 2009</td>
<td>75%</td>
<td>74%</td>
<td>90%</td>
<td>83%</td>
<td>n/a</td>
</tr>
<tr>
<td>Burlington 2009</td>
<td>70%</td>
<td>66%</td>
<td>82%</td>
<td>75%</td>
<td>n/a</td>
</tr>
<tr>
<td>South Burlington 2009</td>
<td>71%</td>
<td>61%</td>
<td>82%</td>
<td>70%</td>
<td>n/a</td>
</tr>
<tr>
<td>Winooski 2009</td>
<td>32%</td>
<td>50%</td>
<td>51%</td>
<td>49%</td>
<td>n/a</td>
</tr>
<tr>
<td>Essex Town 2009</td>
<td>70%</td>
<td>61%</td>
<td>86%</td>
<td>72%</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**FIGURE 19 - SCHOOL READINESS ACCORDING TO DEVELOPMENTAL DOMAINS**
Percent of Chittenden County's students scoring proficient or above on 2011-2012 state assessments

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>READING</th>
<th>MATH</th>
<th>SCIENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>4</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>All Students</td>
<td>78%</td>
<td>76%</td>
<td>69%</td>
</tr>
<tr>
<td>Female</td>
<td>83%</td>
<td>83%</td>
<td>68%</td>
</tr>
<tr>
<td>Male</td>
<td>72%</td>
<td>69%</td>
<td>70%</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>85%</td>
<td>75%</td>
<td>68%</td>
</tr>
<tr>
<td>American Indian or Alaskan Native</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Asian</td>
<td>65%</td>
<td>61%</td>
<td>59%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>59%</td>
<td>33%</td>
<td>29%</td>
</tr>
<tr>
<td>Native Hawaiian or other Pacific Islander</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>White</td>
<td>80%</td>
<td>79%</td>
<td>72%</td>
</tr>
<tr>
<td>Not FRL</td>
<td>87%</td>
<td>84%</td>
<td>79%</td>
</tr>
<tr>
<td>FRL</td>
<td>57%</td>
<td>44%</td>
<td>39%</td>
</tr>
<tr>
<td>ELL</td>
<td>20%</td>
<td>9%</td>
<td>8%</td>
</tr>
<tr>
<td>Not ELL</td>
<td>80%</td>
<td>79%</td>
<td>72%</td>
</tr>
</tbody>
</table>

Based on 2011-2012 testing year. Reading and Math tests evaluate prior year's learning.
* = data suppressed because of an N<11

FIGURE 20 - STUDENT PROFICIENCY BY RACE

Cohort Drop Out Rates - % of students who do not complete high school

<table>
<thead>
<tr>
<th>School</th>
<th>Four-year Drop Out Rate</th>
<th>Five-year Drop Out Rate</th>
<th>Six-year Drop Out Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burlington Senior High School</td>
<td>13.0%</td>
<td>13.5%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Champlain Valley UHS #15</td>
<td>7.2%</td>
<td>2.9%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Colchester High School</td>
<td>6.9%</td>
<td>3.9%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Essex High School</td>
<td>10.4%</td>
<td>6.8%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Milton High School</td>
<td>9.9%</td>
<td>4.5%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Mt. Mansfield US #17</td>
<td>2.9%</td>
<td>6.0%</td>
<td>5.8%</td>
</tr>
<tr>
<td>South Burlington High School</td>
<td>7.4%</td>
<td>4.6%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Winooski High School</td>
<td>37.8%</td>
<td>29.0%</td>
<td>29.2%</td>
</tr>
<tr>
<td>Total</td>
<td>9.5%</td>
<td>7.1%</td>
<td>6.0%</td>
</tr>
</tbody>
</table>

FIGURE 21 - COHORT DROP-OUT RATE

Note: Cohort dropout rates track individual students who enrolled for the first time in ninth grade in 2008 for the four-year rate, 2007 for the five-year rate, and 2006 for the six-year rate. Students are considered dropouts if they left high school permanently at any time during the four-year, five-year, or six-year period prior to receiving a regular diploma, GED or other completion certificate. Source: VT Dept. of Education

Highest level of education attained for those 25 and over.
### Figure 22 - Highest Level of Education Attained (25+)

<table>
<thead>
<tr>
<th></th>
<th>Vermont</th>
<th>Chittenden County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent high school graduate or higher</td>
<td>91.3%</td>
<td>93.6%</td>
</tr>
<tr>
<td>Percent bachelor's degree or higher</td>
<td>34.0%</td>
<td>46.1%</td>
</tr>
</tbody>
</table>

Source: 2011 ACS 3-year

- # of internship grants from the State of Vermont Department of Labor offered in Chittenden County (7/1/09-6/30/10)

<table>
<thead>
<tr>
<th># of internship grants from the State of Vermont Department of Labor offered in Chittenden County FY period of 2010 (7/1/09-6/30/10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>185 internship grants</td>
</tr>
<tr>
<td>93 secondary</td>
</tr>
<tr>
<td>92 post-secondary</td>
</tr>
<tr>
<td>Total of 7 programs</td>
</tr>
</tbody>
</table>

**Figure 23 - Internship Grants from State Dept. of Labor**
2.3.2 Health

*Health Goal: All Chittenden County residents are healthy.*

Key Issues/Trends/Insights

[Data for this section drawn from See Public Health Analysis Report and Healthy Vermon ters 2020]

- Similar to national statistics, the leading causes of death in Chittenden County are cardiovascular disease (32%), followed by cancer (26%). Tobacco use, diet, physical inactivity, and excessive alcohol consumption are modifiable, behavioral risk factors associated with these diseases.

- Behaviors are the most important contributors to health outcomes. The healthcare system, with its successes and failings, receives a disproportionate amount of attention. While it is undeniable that all Chittenden County residents should have access to affordable healthcare, the healthcare system’s impact on population health is nominal compared to behavior, genetics and social circumstances. On the other hand, the healthcare system exerts significant effect after chronic disease is manifest.

- Health begins in our families, in our schools and workplaces, in our playgrounds and parks, and in the air we breathe and the water we drink. The conditions in which we live and work have an enormous impact on our health. Behaviors can be influenced, supported, or undermined by community design. Community design can also impact social circumstances, healthcare, and environmental exposures. Chittenden County residents should have the opportunity to make the choices that allow them to live a long, healthy life, regardless of their income, education or ethnic background.

- Community design can influence the overall well-being of a community by making healthy lifestyle choices easily available and accessible to all community members. Healthy Community Design links public health themes (such as physical activity, public safety, healthy food access, mental health, air and water quality, and social equity) with traditional planning concepts (such as land use, transportation, community facilities, parks, and open space). The overall health of a community is underpinned by the planning strategies employed in its design. Community design can positively impact population health by increasing physical activity, reducing injury, increasing access to healthy food, improving air and water quality, minimizing the impact of extreme weather events due to climate change, decreasing mental health stresses, strengthening the social fabric of a community, reducing exposure to tobacco and alcohol advertising, increasing smoke-free indoor and outdoor policies, and providing fair access to livelihood, education, and resources.

- Interventions at the community, policy, and systems levels are critical to achieving individual level behavior changes that will improve health.

- Tobacco use, poor nutrition, physical inactivity, and excessive alcohol consumption are the leading causes of death in that they are the factors underlying the disease labels traditionally used to present this metric. Community design elements that support eliminating tobacco use, increasing physical activity levels, improving nutrition, and decreasing excessive alcohol consumption are the priorities on which focus must be brought to bear. Research shows that healthy community design is associated with improvements in these health behaviors.
- There are significant differences in prevalence of cancer by age. A higher proportion of adults 65 years and older (15%) have ever had cancer compared to all other age groups. There are no other statistically significant differences by demographic characteristics.
- There are no statistically significant differences in prevalence of overweight or obesity by grade in school or race/ethnicity. However, compared to males, a significantly lower proportion of females are obese (5% vs. 11%) and a lower proportion are overweight (10% vs. 14%).
- Within Chittenden County, there are several identified populations who experience health disparities (i.e., people of color, low-income, homeless) These populations suffer disproportionately from poor health outcomes. For example, low income people who suffer with food insecurity are more likely to be obese. The distribution of the data supports the link between poor health outcomes and low socioeconomic status. It is material to note that while county-wide data for a specific indicator may not indicate a problem, that same indicator sorted by economic status or education level, may reveal a significant public health issue, in a particular community.

### Key Indicators

**Chittenden County**

<table>
<thead>
<tr>
<th></th>
<th>Cardiovascular Disease</th>
<th>All Cancers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adults</strong>*</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7%</td>
<td>5%</td>
</tr>
<tr>
<td>Female</td>
<td>4%</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>1%</td>
<td>--</td>
</tr>
<tr>
<td>25-34</td>
<td>0%</td>
<td>--</td>
</tr>
<tr>
<td>35-44</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>45-64</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>65+</td>
<td>19%</td>
<td>15%</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Racial-Ethnic Minority</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Federal Poverty Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;250%</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>≥250%</td>
<td>4%</td>
<td>5%</td>
</tr>
</tbody>
</table>

* BRFSS 2008-2010; Age- adjusted to the U.S. 2000 population with the exception of All Cancers

**FIGURE 24 - PERCENT OF CARDIOVASCULAR DISEASE AND CANCER BY POPULATION**
There are significant differences in smoking prevalence by age. A lower proportion of Vermonters 65 and older (5%) are current smokers compared to all other age groups. A higher proportion of adults 25-34 years old (18%) are current smokers compared to adults 45-64 years old (11%). Though a higher proportion of people of color (18%) are current smokers compared to white, non-Hispanic Vermonters (11%), this does not reach the level of statistical significance. There is a statistically significant difference in the proportion of Vermonters under 250% of the Federal Poverty Line (22%) who smoke compared to those above 250% (8%).

There are significant differences in the prevalence of cardiovascular disease (CVD) by gender, age, and Federal Poverty Level. A higher proportion of males (7%) have CVD compared to females (4%). A higher proportion of adults 65 years and older (19%) have CVD compared to all other age groups. A higher proportion of adults living below 250% of the Federal Poverty Line (8%) have CVD compared to those above 250% (4%). There was no statistically significant difference by race/ethnicity.
2.3.3 Public Safety, Criminal Justice & Hazard Mitigation

Public Safety, Criminal Justice Goal: **Improve the safety of the public including the loss of life and property from natural and manmade hazards.**

Key Issues/Trends/Insights
[Data for this section drawn from 2011 Chittenden County Multi-Jurisdictional All Hazards Mitigation Plan]

- Feeling safe and secure in our homes, communities and urban areas is key to overall health in the community. Safety and perceptions of safety feature highly in people’s view of their living environment, their sense of well-being and quality of life. As urban areas grow, the need for safe social and physical environments, where people are able to participate fully in their communities, becomes an increasing challenge.
- The cost of emergency response and multiple law enforcement agencies is a challenge to municipalities.
- The lack of volunteers for volunteer fire departments is causing concerns about the ability and timeliness of response and is resulting in the need to hire firefighters.
- As identified by the 2011 Chittenden County Multi-Jurisdictional All Hazards Mitigation Plan, the highest ranked county-wide hazards are severe winter storm, flooding, telecommunications failure, power loss, major transportation incident, fluvial erosion and epidemic. Three of the top hazards are natural hazards, three are technological hazards, and one is a societal hazard.
- Flooding and fluvial erosion can damage or destroy homes, businesses and transportation infrastructure.
- Winter storms, flooding, transportation incidents and epidemics can cause human injury, illnesses and even death.
- Winter storms, telecommunications failure, power loss and transportation incidents can cause serious disruption of public safety services.
- Flooding, fluvial erosion and possibly epidemics may be made worse by projected climate changes. While Incident Command System training has continuously been offered throughout the state, post-Irene analysis has shown that previous ICS training was positively correlated with increased ability to respond to the challenges posed by Irene. This increase was due to the ability to organize a unified command structure within the town and work more efficiently.
- Emergency Management Planning of all types needs to be kept up to date to best be able to respond, recover, and mitigate disasters. These plans include Basic Emergency Operations Plans (BEOP) for each municipality, implementing improvement plans from exercises, and hazard mitigation plans.
Key Indicators

- **Violent Crime Rate**

![Graph showing Chittenden County Per Capita Violent Crime Rate from 2005 to 2010](image)

**FIGURE 26 - VIOLENT CRIME RATE PER CAPITA**

- **Rate of adult abuse and neglect victims** (AHS list) - The data needed for this indicator is not yet available, the intent is to include this information in the Annual Indicator Reports.

- **Incarceration rates by race compared to general population** (Source: Dept of Corrections). “The largest proportion of both male and female inmates were prosecuted in the largest District Court (Chittenden county) with the fewest inmates from the smallest counties. But on a per capita basis, Chittenden was close to average in its use of incarceration bedspace; only Bennington (176%) significantly exceeded expectations for use of prison/jail based on its population” (Source: DOC Fact and Figures FY2011, Page 38). “Although the residents of Vermont are predominantly characterized by race as “white”, on a per capita basis, the utilization of DOC services by “black” residents is about 7 times higher for incarceration and 2.5 times higher utilization of DOC services by “black” residents for field supervision. Native Americans and Asians use DOC resources at about half the rate of “whites”” (Source: DOC Fact and Figures FY2011, Page 38).

- **Emergency Incidents - 2011**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1779</td>
<td>1938</td>
<td>855</td>
<td>321</td>
<td>252</td>
<td>63</td>
<td>145</td>
<td>37</td>
<td>17</td>
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<tr>
<td>Cancelled</td>
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<tr>
<td>Other</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Outside</td>
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<tr>
<td>Vehicle</td>
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<tr>
<td>Other Fire</td>
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<tr>
<td>Explosion</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grand Total Fire</td>
<td>5491</td>
<td>5586</td>
<td>509</td>
<td>595</td>
<td>153</td>
<td>26</td>
<td>14</td>
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<td>EMS call</td>
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<td>Motor Vehicle Accident</td>
<td>889</td>
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<td>Extrications</td>
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<tr>
<td>Water Rescues</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Other</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td>Search</td>
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<td></td>
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<td>Electrical</td>
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<td>Grand Total EMS</td>
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<tr>
<td>Grand Total Fire and EMS</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FIGURE 27 - 2011 EMERGENCY INCIDENTS**

Source: Division of Fire Safety Annual Report
% and number of structures in special flood hazard areas in Chittenden County (based on GIS analysis, Source: CCRPC and/or State NFIP.) 1.5% of structures or 866 structures out of 58,598 structures are within the Special Flood Hazard Area and Fluvial Erosion Hazard Area in 2012.

Vaccination rates (Source: Vermont Immunization Registry) – There is a clear increase in the % of children receiving influenza immunizations from 2010 to 2012. Younger children have better influenza immunization coverage than teens – which do not see their providers as regularly as the young ones. Coverage in all groups needs to be improved. Note that actual rates may be higher than indicated since the use of the registry is not universal among practitioners.

Proportion of Chittenden County children by age immunized against influenza per year, 2010-2012

American Red Cross # of incidents and persons where shelter was needed - The data needed for this indicator is not yet available, the intent is to include this information in the Annual Indicator Reports.

EMS aging calls (Health Dept) - The data needed for this indicator is not yet available, the intent is to include this information in the Annual Indicator Reports.
2.3.4 Social Connectedness

Social Connectedness Goal: Increase opportunities for people of all backgrounds to engage in the multicultural social fabric and activities of the community.

Key Issues/Trends/Insights

[Data in this section is drawn from references as indicated below. The data for the Key Indicators need to be developed through primary data collection, and is therefore not yet available for this Plan.]

- Social connectedness provides an indication of community strength and resiliency. The concept of community is fundamental to people’s overall quality of life and sense of belonging. Informal networks and how people connect with others are important for strong communities and social cohesion. Confident and connected communities suffer less social problems, are adaptable to challenges, and support social and economic development. There are major health, economic and environmental benefits in developing opportunities for and participation in social interactions, recreation and leisure, arts and cultural activities.

- Resident attachment describes the emotional connection residents feel towards a geographic community. Research conducted by the Knight Foundation and Gallup discovered that the main drivers that influence attachment to a place are how accepting a community is of diversity, its wealth of social offerings, and its aesthetics. A correlation was also discovered that tied stronger resident attachment to better local economic growth (GDP). (Knight Foundation, http://www.soulofthecommunity.org/)

- Social connectedness has been identified as a social determinant for individuals’ health and well-being. Individuals who experience disenfranchisement and social exclusion suffer greater risk of depression, illness and addiction. (Minnesota Dept of Health)

- While Chittenden County continually ranks high for its quality of life, there are segments of our community who persistently suffer exclusion, or are at risk of suffering disenfranchisement. Underrepresented communities (low-income, people of color, foreign born, seniors, youth) have identified barriers such as lack of reliable transportation, the inability to meet one’s basic needs due to low incomes, discrimination, and exclusion from governance as significant threats to their quality of life and sense of well-being. In addition, people of color, New Americans and English language learners have identified cultural and structural racism, xenophobia, and exclusion from social networks, education, and governance as the greatest threats to their quality of life. (ECOS’ outreach efforts, 2011-12; Legacy Project outreach, 2010-12; Plan BTV outreach, 2012)

Key Indicators

Because the data needed for these indicators is not yet available, the intent is to collect primary data by surveying residents about quality of life and disaggregate the data by race and income.

- % of residents who say that they mostly have positive interactions in their communities (neighborhood, school/work, larger community).
- % of residents who feel positive about the increasing ethnic diversity of our region.
- % of residents who feel that there are enough:
  - opportunities to connect with others;
-gathering places to connect with others

- **Index of Dissimilarity** - Neighborhoods differ in their racial composition. The Index of Dissimilarity is a measure of the evenness with which two groups are distributed across neighborhoods (or census tracts). It helps to answer the following questions: are racial groups evenly distributed throughout neighborhoods, or are some racial groups concentrated more in certain neighborhoods? The Census divides areas into census tracts that contain on average, about 4,000 residents. A score of 0 corresponds to even distribution across census tracts, while a score of 100 represents total segregation. Values between 30 and 60 indicate moderate segregation. According to the DRAFT Chittenden County Fair Housing and Equity Assessment (FHEA), the Hispanic, Black, and Asian populations are low to moderately integrated (the Draft FHEA can be found here: www.ecosproject.com/analysis).
2.3.5 Arts, Culture and Recreation

Arts, Culture and Recreation Goal: Increase access to, and participation in, arts, culture and recreational opportunities.

Key Issues/Trends/Insights
[Data in this section drawn from the Vermont Arts Council]

- This section looks at both attendance at artistic and recreational programs and events in the community, as well as active participation in creative endeavors.
- There is a diminishing amount of time in school dedicated to arts and recreation; after school programs and are picking up the slack, but are not accessible to all (for a variety of reasons).
- Arts, culture and recreation are a major contributor to the overall quality of life of residents and visitors, and are a key factor in attracting businesses who see arts, culture and recreational opportunities as key elements to attracting and retaining a talented workforce.
- Participation in arts, culture and recreation activities by both residents and visitors contributes to a strong sense of shared community, as well as the economic vitality of the community.
- Attention needs to be paid to developing programs and events that attract and engage residents from diverse backgrounds, ages and income levels.
- Use of arts in education is a critical pedagogical tool for developing critical thinking skills, do better at math and science, develop insights on cultural diversity and the human experience, and build self-esteem through self-expression.
- In order to increase participation in arts, culture and recreational activities by underserved populations, organizations need to remove barriers to participation (including transportation, costs, and cultural differences).
- As the needs and interests of residents change, the nature and uses of our parks are evolving as well. This is particularly evident as new comers to the community bring cultural traditions of recreation with them, and seek appropriate venues.

Key Indicators

- **Participation at arts and cultural events.** Potential Source: Vermont Cultural Data Project.
  Because the data needed for these indicators is not yet available, the intent is to collect it in the future.

- **Arts in Education.** Because the data needed for these indicators is not yet available, the intent is to collect it in the future.
  - Number of FTE Art Teachers in County schools
  - Ratio of school arts specialists to students

- 66% of the Chittenden County population resides within 1/2 mile of parks or publicly accessible natural areas in urban areas and 1 mile in rural areas. (Source: Park, Open Space: CCRPC, Population, U.S. Census (2010))
2.3.6 Civic Engagement

Civic Engagement Goal: People from diverse backgrounds feel that they have a say in political and non-political decisions that affect their lives, neighborhoods and communities.

Key Issues/Trends/Insights

- Civic engagement consists of political and nonpolitical activities that help identify and address community concerns. Being able to participate in, express views and influence decisions that affect one’s life, neighborhood and community are essential for a true democracy. Effective civil and political systems allow our communities to be governed in a way that promotes justice and fairness and supports people’s quality of life.

- Enabling democratic local decision making is one of the key purposes of local government and is also important in promoting the social, economic, environmental and cultural wellbeing of communities. Vermont and Chittenden County have a long held tradition of “local rule.” Sometimes this supports to maintain local traditions and pride; and sometimes it is an impediment to collaboration and integrating new ideas.

- The population in our area is becoming increasingly ethnically diverse. For example, at least 56 languages (other than English) are spoken by students in Burlington (Burlington School District 2010-11 Annual Report, pg. 3). It is important that we understand how our institutions and processes need to evolve in order to remove barriers that limit people’s ability to exercise their civic rights and decision making.

- New Americans, U.S born people of color, and low-income participants shared that their unfamiliarity with how local democratic systems work deters them from participating, though they’d like to. And when they are occasionally outreached to participate in a program, it feels as if it is just part of a regulatory requirement or grant opportunity, and not for the intention of truly incorporating their input. (ECOS’ outreach efforts, 2011-12; Legacy Project outreach, 2010-12; Plan BTV outreach, 2012)

- Youth and adults of diverse cultural backgrounds do not feel that they are involved in decisions that affect their lives, neighborhoods and communities and therefore feel that they cannot participate and fully give back and improve the community’s well-being.

Key Indicators

- % of eligible voters that vote

<table>
<thead>
<tr>
<th>% General Election Voter Turnout</th>
<th>2004</th>
<th>2006</th>
<th>2008</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chittenden County</td>
<td>69%</td>
<td>60%</td>
<td>70%</td>
<td>52%</td>
</tr>
<tr>
<td>Vermont</td>
<td>71%</td>
<td>61%</td>
<td>72%</td>
<td>54%</td>
</tr>
</tbody>
</table>

FIGURE 29 - PERCENT OF ELIGIBLE VOTERS WHO VOTE

➢ % of students who spend 3+ hours/week volunteering

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2003</th>
<th>2005</th>
<th>2007</th>
<th>2009</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>13.0%</td>
<td>12.0%</td>
<td>12.0%</td>
<td>12.0%</td>
<td>12.0%</td>
<td>13.0%</td>
</tr>
</tbody>
</table>

**FIGURE 30 - PERCENT OF STUDENTS WHO SPEND 3+ HOURS/WEEK VOLUNTEERING**

Source: 2011 Youth Risk Behavior Survey, Dept. of Health

➢ Local elected officials by race, gender. Because the data needed for these indicators is not yet available (with the exception of the City of Burlington), the intent is to collect the data. Efforts to do primary data collection need to happen in order to be inclusive and understand where the gaps are.

➢ Municipally-appointed commissions and boards by race, gender. Because the data needed for these indicators is not yet available (with the exception of the City of Burlington), the intent is to collect the data. Efforts to do primary data collection need to happen in order to be inclusive and understand where the gaps are.

➢ % of residents that feel they have a meaningful voice in the decision-making processes that affect their life, neighborhood and community. Because the data needed for these indicators is not yet available, the intent is to collect primary data by surveying residents. Efforts to do primary data collection need to happen in order to be inclusive and understand where the gaps are.
2.4 ECONOMIC INFRASTRUCTURE

**Broad Goal:** Build the region’s capacity for shared and sustainable improvements in the economic wellbeing of the community through support of both local and globally competitive initiatives.

**INTRODUCTION:** There is a direct relationship between a region’s economic prosperity and the ability of residents to thrive: by gaining a higher income, residents have the ability to purchase needed items and lead a healthy lifestyle. In general, this leads to greater social connectedness, educational advancement, increased life expectancy, and happiness. Furthermore, if businesses are prospering, they are better able to continue to provide philanthropic and volunteer support for the community.

Over the past several decades, it is apparent that Chittenden County enjoys a competitive advantage relative to the balance of the state, based on the findings presented in the Economic Base and Competitive Assessment reports: the County’s share of population, Gross Domestic Product, jobs and income, among other economic indicators, has increased.

Despite the advantages the region has enjoyed in many areas, however, there are some disquieting trends that need to be acknowledged. If recent trends continue, there will be additional loss of jobs in high-wage industries and slow growth in lower-wage industries. Job growth has been slow over the past decade and this is likely to continue into the future. However, the Chittenden County region has a highly desirable quality of life by many measures and there will continue to be growth pressures. Our challenge is how to manage and shape these larger external growth pressures to improve our job opportunities and incomes while also improving our quality of life.

This section of the ECOS Plan looks at three goals related to our economy: Economy, Household Financial Security, and Working Lands. Under each of these goals, a quick review of key issues and trends including a short list of selected indicators is presented. There are many specific and smaller measures that, while important, are not included so that we can focus on the biggest and most important trends that will affect the long term ability of our residents and our children and grandchildren to have a range of opportunities for jobs, income growth, and be able to afford not only their basic needs (housing, food, clothing), but also be able to fully enjoy their life in Chittenden County.

Our economy is typically looked at in terms of farm and non-farm employment. Therefore, this section includes an Economy section that looks at our non-farm employment and jobs and the opportunities for employment outside of agriculture. The Working Lands section focuses on agriculture as an industry and land use. The Household Financial Security section looks at the result of having a job (or not): income and pressures on income that impact our families’ ability to enjoy their lives.
2.4.1 Economy

*Economy Goal:* Retain and support existing employers and job growth, grow target sector employers and entrepreneurs, and work to attract a greater diversity of employers and employees.

**Key Issues/Trends/Insights**
[Data in this section drawn from *Economic Base Analysis, and the Economic Competitive Assessment Analysis Reports*]

- Chittenden County’s employment base is largely within five private industry sectors: Healthcare and social assistance; retail trade; manufacturing; accommodation and food service; and professional, scientific and technical services.
- Chittenden County is a mix of urban, suburban and rural areas, with a rural character that is important to many residents. Similarly, the economy includes the largest for-profit employer in the state (the major IBM complex); the largest retail area in Vermont with four communities ranking in the top five in the state based on preliminary 2011 retail sales tax reports (Williston – #1; South Burlington – #2; Burlington– #4; and Colchester - #5 (source: Vermont Department of Taxes); and significant agricultural, recreational and open space areas. This mix of uses results in a character cherished by its residents and appealing to prospective residents. The challenge is to plan and manage future growth, including economic development, so that it sustains and enhances this community character.
- Employment in the private sector declined between 2000 and 2010. Total non-farm employment in Chittenden County decreased from 95,354 to 93,231 between 2000 and 2010 – a loss of 2,123 jobs, or -2.2 percent. This was offset in part by an increase in public sector employment, but it was not sufficient to offset private sector losses (private sector: -4,386 + public sector: 2,263 = net -2,123).
- Chittenden County is currently modestly-supplied with buildings and land for business expansion. In the future, additional “shovel-ready” sites with good access, full utilities and proper zoning will be necessary if the County is to be competitive in attracting larger projects or retaining local businesses seeking to expand.
- Educational levels among residents 25 years old and older exceed state and national norms. (See Section 2.5 Education for more detail.) However, due to our aging demographics and available workforce, we need more individuals with postsecondary training and experiences.
- The County is blessed with a highly desirable quality of life. The notable exception is the affordability of housing, which was both rated the lowest quality of life factor in the Employers Survey (can be found in the Analysis Reports referenced above) as well as being the most commonly observed weakness of the area in interviews of employers.
- Based upon the results of the Employers Survey, recreational opportunities, safety from crime, and cultural opportunities all scored Very Good or higher, while the quality of the K – 12 educational system scored just below Very Good.
- The County’s labor force has a relatively low unemployment rate and high labor participation rate, with many skills categories, particularly technical skills, reported as difficult to find or
unavailable by area employers. While some of these needs are for skills that are unique to specific companies, several employers surveyed reported similar training needs for skilled manufacturing occupations particularly in the machine trades. Interviewed manufacturers emphasized the strong need for local training programs in machining and other skilled occupations to support their growth and sustainability. They also expressed concern and frustration over a lack of proficiency in math and writing skills.

Key Indicators

- **Recent Chittenden County job growth** has been stronger than the U.S., New England and Vermont.

![Figure 31 - Recent Chittenden County Job Growth, Since 1990](source)

**Total number of businesses in Chittenden County:** Since peaking in 2008 the County’s business count has dropped by 101.

![Figure 32 - Total Number of Businesses in Chittenden County](source)
The unemployment rate in the greater Burlington area (Burlington New England City and Town Area (NECTA)) has declined faster than the New England and US rates over the past two years.

![Unemployment Rates in the Greater Burlington Area]


FIGURE 33 – UNEMPLOYMENT RATES IN THE GREATER BURLINGTON AREA

Professional and technical services and Manufacturing jobs pay significantly higher salaries than our other major employment sectors.
FIGURE 34 - AVERAGE WAGES BY INDUSTRY SECTOR

Source: Vermont Department of Labor Covered Employment and Wages
2.4.2 Household Financial Security

**Household Financial Security Goal:** Improve the financial security of households.

INTRODUCTION: Levels of income and wealth are key determinants of individual or family wellbeing. Economic standard of living involves a complex combination of factors such as income, living costs, and household size and composition.

Key Issues/Trends/Insights
[Data in this section drawn from Housing Analysis Report]

- In 2008, 21% of Chittenden County residents were living at less than 200% of the federal poverty level and many receive state and federal assistance to meet basic needs.
- Lower income Vermonters report higher rates of depression and chronic conditions, such as obesity, asthma, heart disease, stroke and diabetes.
- The County’s ability to grow its economy in the future will be closely tied to its ability to provide available labor, particularly once the currently unemployed are absorbed back into the ranks of the employed as much as their skills will allow. A broad-based strategy of skills upgrading, new methods of recruiting and alternative working arrangements will be necessary.
- More focus is needed on education and workforce development to train employees for the opportunities in the technologies needed for manufacturing, professional services and health care. See more under the “Education” topic.
- Household financial security influences a family’s ability to access enough food to fully meet basic needs at all times. Lack of financial resources can cause food insecurity.
  - 15,401 Chittenden County residents participate in 3SquaresVT (formerly known as Food Stamps).
  - 6.6% increase in 3SquaresVT participation since 2010.
  - 1 in 7 children in Chittenden County are food insecure.
  - 26% of grade school and high school students are eligible for free or reduced-price meals (Hunger Free VT – www.hungerfreevt.org).

Key Indicators

- Chittenden County household income is higher than both VT and the US. However, median household income in the County has declined for two consecutive years, approximately back to 2006 levels.
Household income varies significantly by race

<table>
<thead>
<tr>
<th>Race of Head of Household</th>
<th>Median Income</th>
<th>Margin of Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>$60,297</td>
<td>+/- $1,376</td>
</tr>
<tr>
<td>African-American</td>
<td>$40,865</td>
<td>+/- $5,687</td>
</tr>
<tr>
<td>Asian</td>
<td>$54,417</td>
<td>+/- $10,580</td>
</tr>
<tr>
<td>Two or more races</td>
<td>$52,358</td>
<td>+/- $12,820</td>
</tr>
</tbody>
</table>

Percentage of Families whose Income in the Last 12 Months is Below Poverty Level

<table>
<thead>
<tr>
<th></th>
<th>ACS 2007 3-year Estimates</th>
<th>ACS 2010 3-year Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chittenden County</td>
<td>6.10%</td>
<td>6.70%</td>
</tr>
<tr>
<td>Vermont</td>
<td>6.90%</td>
<td>7.60%</td>
</tr>
<tr>
<td>US (2010)</td>
<td>15.10%</td>
<td></td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, American Community Survey 2005-9
Average Combined Housing + Transportation Costs in 2010 is 53% of County median income (derived from the H+T Affordability Index, Center for Neighborhood Technology). 45% is considered the threshold of affordability.
2.4.3 Working Lands & Land Based Industries

**Working Lands Goal:** Support the growth and vitality of working farms and managed forests; and sustainably manage sand and gravel extraction operations.

Key Issues/Trends/Insights
[Data for this section drawn from Natural Systems Analysis Report; Farm to Plate Annual Reporting; Informing Land Use Planning and Forestland Conservation Through Subdivision and Parcelization Trend Information – Vermont Natural Resources Council, September 2010; The Action Plan of the VT Working Landscape Partnership.]

- Working lands and resource extraction industries are critical components of a self-reliant and diverse economy, making a region less vulnerable to market crises. Local food and fuel production is preferred since the transportation to import these products consumes tremendous amounts of energy and generates pollution. In addition, when food is imported from far-away places, nutrient value is reduced during the transport time.

- Working lands and resource extraction industries are economically viable within the constraints of our natural landscape. Sustainably managed farmland and forest land means less developed land, fewer impervious surfaces, and thus a greater presence of the natural ecosystem’s features and functions. Conversely, high quality food and productive forests are dependent upon clean water and clean, nutrient-rich soils. It is imperative that we maintain high quality water and soils for healthy and viable food and forest product industries.

- A major challenge to forest and farm businesses is the value of the land in these industries versus the value of the land for development. Often when these industries are no longer economically viable, the land is sold and developed, resulting in forest fragmentation and increased parceling of land. The number of parcels has gone up, while their size has gone down, diminishing their economic viability and the ecological services they provide. This situation has far-reaching potential consequences for the future of Vermont’s local economies, including tourism.

- Markets for forest products are necessary to ensure that landowners can afford to hold and manage their forest land (Vermont Forest Resource Plan, page 57). Unfortunately, the Vermont forest products industry is in slow and unheralded decline which has resulted in dramatic reductions in wood processing and manufacturing (Action Plan of the Vermont Working Landscape Partnership, page 14)). In the face of increasing gas prices and international trade, the importance of local products and processing cannot be overstated. Markets for forest products are often influenced on regional scales beyond the county level, though support of opportunities to develop and take advantage of markets must occur at the local scale.

- In recent decades, farm enterprises in the County have been employing new forms of business ownership, engaging in non-farm employment, limiting the size of farm operations to control the growth of farm production expenses, producing different types of farm products, producing more farm-related products, and engaging in more direct sales to consumers. These trends present a new set of challenges for farmers and communities, including access to markets and access to affordable land. Difficulties acquiring the proper equipment, or accessing to a certified processing facility are also a common problem for some new farmers. We will need to adjust our regulations and programs to ensure that we are not unnecessarily prohibiting agricultural
enterprises from diversifying as well as continue efforts to ensure that agricultural enterprises remain economically viable. It is not just about growing more or different things—it is also about creating higher value products from what is grown. An example is helping dairy farms by increasing production of yogurt, ice cream, artisanal cheeses, and other dairy based products.

- Extraction industries are associated with different land management issues than farms and forests; these are included here for lack of a better location at this time. These nonrenewable resources are used to produce building materials (such as concrete and railroad ballast), to use as landscaping materials, and to maintain roads. The earth resources in Chittenden County that currently are commercially viable are sand (over two billion cubic yards available) and gravel (430 million cubic yards available). Chittenden County contained 3 primary producing construction sand and gravel areas, and a total of 10 producing mines within those areas (Vermont Geological Survey/U.S. Geological Survey and USGS Mineral Resource Data System). While these resources are limited they play an important role in our land development practices and economy and it is important to manage them carefully.

Key Indicators

- **Use Value Appraisal (UVA) Enrollment:** UVA is a State program allowing land to be taxed based on its income producing potential from agriculture or forestry, rather than its—typically higher—fair market (development) value. (Source: UVA program and the USGS National Land Cover Data)
  - In 2010, 66,411 acres and 789 parcels of UVA Forest Land enrollment.
  - In 2010, 16,895 acres and 311 parcels of UVA Agricultural Land enrollment.
  - From 2001 to 2006, 514 acres or 1% of agricultural land was converted to development; and 140 acres or .07% of forest land was converted to development.

- The number of farms has increased, while the acreage of farmland has decreased.

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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>1,000 or More</td>
<td>7</td>
<td>10</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>500 to 999</td>
<td>44</td>
<td>23</td>
<td>25</td>
<td>-19</td>
</tr>
<tr>
<td>180 to 499</td>
<td>140</td>
<td>123</td>
<td>203</td>
<td>63</td>
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<tr>
<td>50 to 179</td>
<td>134</td>
<td>137</td>
<td>178</td>
<td>44</td>
</tr>
<tr>
<td>10 to 49</td>
<td>99</td>
<td>123</td>
<td>143</td>
<td>44</td>
</tr>
<tr>
<td>Under 10</td>
<td>28</td>
<td>40</td>
<td>81</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>452</td>
<td>456</td>
<td>641</td>
<td>189</td>
</tr>
</tbody>
</table>

**FIGURE 38 - NUMBER OF FARMS OF DIFFERENT SIZES IN CHITTENDEN COUNTY, 1987 - 2007**

The average property taxes per acre for farms in Chittenden County increased 82 percent (adjusted for inflation) from 1987 to 2007, from $18.60 to $33.86. (Source: U.S. Census of Agriculture)

The net farm income per acre for farms in Chittenden County increased from $102.49 in 2002 (adjusted for inflation) to $110.17 in 2007 (compared with Vermont’s increase from $93.93 to $129.20). However the income trends vary depending on the product: there were decreases in the value of “dairy, cattle and calves” and “all other farm products” and increases (in some cases dramatic) in the value of other types of farm products (farm income from products made on the farm such as cheese or for services provided on the farm such as farm equipment repair). (Source: U.S. Census of Agriculture)

2.5 BUILT ENVIRONMENT

Broad Goal: Make public and private investments in the built environment to minimize environmental impact, maximize financial efficiency, optimize social equity and benefits, and improve public health.

INTRODUCTION: The built environment comprises the physical buildings of the County combined with supporting infrastructure necessary for travel, waste, water, and energy for living, working, and playing. Strategic investments to Chittenden County’s built environment and development centers are necessary for promoting a high quality of life that is hinged on economic development, affordability, and environmental stewardship. Significant regional planning for sidewalks, housing, transit choice, and cultural and recreational resources can make more homes and businesses in our centers the key to allowing growth to happen more sustainably.

Other vital infrastructure updates are also needed to support livability in these centers. Sewer capacity and water supply investments are necessary to accommodate new residents and employers. Renewable energy sources for buildings and alternatives to driving need to be planned to reduce the consumption of fossil fuels and decrease carbon emissions.

This section focuses on the promotion of higher density, mixed use development in Center, Metro, Suburban, Enterprise, and Village Planning Areas – while de-emphasizing development outside of these areas. These actions would result in reduced energy for transportation and land use by promoting increased car pooling, pedestrian/bicycle travel, availability of transit, reduction in vehicle miles traveled, and the need for smaller homes that maximize efficiency. Consolidating households and employers in these Planning Areas also makes for providing other infrastructure more efficient. A description of the Planning Areas can be found in Chapter 4, Section 4.4.1.
2.5.1 Land Use

Land Use Pattern Goal: Encourage future growth in the Center, Metro, Enterprise, Suburban, and Village Planning Areas to maintain Vermont’s historic settlement pattern and respect working and natural landscapes.

Key Issues/Trends/Insights

[Data from this section drawn from Historic Development and Future Land Use/ Transportation Analysis Report]

- Over the past 60 years development trends, zoning regulations, and consumer preference have shifted growth away from the metropolitan areas around Burlington, to more suburban and rural locales. This shift has resulted in scattered development at low densities that consume large amounts of land, high infrastructure costs, with little opportunity for social interactions, and less ability to walk to services.
- Overall, Chittenden County is moving in the right direction of developing and implementing policies that encourage more growth in these areas. As of 2012, Chittenden County includes 10 Villages, 2 Downtowns, 2 Growth Centers, 2 New Town Centers, and 1 New Neighborhood that are part of the State Designation Program that promotes smart growth principles. Recent studies and surveys indicate that households are choosing to live in areas with shorter commute times, nearby shops and services, and more transit options. This growing demand indicates that the small lot and attached accessible housing stock may be in short supply.
- Forest and agricultural land fragmentation and increased parceling have meant that the number of parcels in rural areas has increased while their size has decreased, diminishing their economic viability, scenic, and the ecological services they provide.
- Future land-based opportunities for farming and forest-based products, recreation and tourism may become more limited as suitable open land becomes less available. This possibility has far reaching consequences for the future of Vermont’s local and tourism economies.
- There are over 4,400 designated historic sites in Chittenden County (over 2,500 in Burlington alone) and over 80 designated historic districts (see historic resources map here: http://maps.ccrpcvt.org/ChittendenCountyVT/).
- A sustainable society operates without contributing new contaminants to the environment, but also cleans up old contaminants and returns those lands into productive use. Contamination impairs the environment, poses risks to human health, and discourages productive use or reuse of the property. Of 702 Chittenden County sites with reported contamination, 476 (68%) have completed corrective action (VT DEC Waste Management Identification Database).
Key Indicators

- % of Acres in Major Land Use Categories, Chittenden County 2008

**Figure 40 - Land Use Categories by Percentage**

- Percent of New Structures in Areas Planned for Growth: 1950 – 2010

**Figure 41 - Percent of New Structures in Areas Planned for Growth, 1950 - 2010**

Source: CCRPC, Land Based Classification System, 2008

Source: 1953-2005, UVM Year Built Data, 2005-2010, VT e911 board esites, 2035 Target, CCRPC
Note regarding Figure 41: The best available data at the time of this report related to e911 structures. Going forward, CCRPC seeks to regularly track dwelling units and the non-residential square footage in the Areas Planned for Growth to better represent the development that is occurring in the County.

- **75% of private property investment is going into the Areas Planned for Growth and 25% in the Rural Planning Area** (Source: CCRPC from parcel and grand list data).

- **Development Density by Planning Area, 2010**

  ![Development Density by Planning Area, 2010](image)

  ![Development Density by Planning Area, 2010](image)

  *Source: CCRPC 2010 Employment Data, 2010 Housing Data, and Planning Area layers.*
2.5.2 Housing

*Housing Goal:* Increase the opportunities for safe, decent, energy efficient, affordable, accessible and fair housing for all types of households in all neighborhoods.

**Key Issues/Trends/Insights**

[Data for this section drawn from Housing Analysis Report Analysis Report. Another reference that is currently under development is the Fair Housing Equity Assessment.]

- Adequate and affordable housing is central to a sustainable community. A healthy community is made up of households with a variety of incomes and affordable housing is needed to satisfy residents’ wide range of needs. Lack of affordable housing contributes to many social stresses, including homelessness.

- The financial burden of paying a mortgage, homeowner’s insurance, property taxes, utility expenses and other housing fees is unaffordable when these costs consume more than 30% of the household’s income. Further, paying more than half of income on housing expenses creates a severe strain on a household’s budget. These households are at much higher risk of foreclosure, eviction, homelessness, and frequent moving—all of which harm residents and the community. Approximately 4,000 owner households and 6,000 renter households living in Chittenden County pay more than half of their incomes for housing expenses. Cost burdens are highest for the lowest income residents, especially those living on fixed incomes or public assistance and those working at low-wage jobs.

- Approximately 500 people in Chittenden County were homeless during the January 2011 one-night count, clearly demonstrating gaps in the access to the types of housing options and services that could have kept these people housed.

- Some Chittenden County residents do not have equal access to housing opportunities. Members of the County’s growing population of non-White residents, residents with disabilities, and single-parent families are more likely to experience poverty and less likely to become homeowners than other types of households. Insufficient housing options for all residents, regardless of their race, disability status, or membership in other protected classes, help prevent those residents from reaching their potential as contributing community members.

- Nearly 60% of the County’s housing stock was built before 1980—when lead-based paint was widely used, when most home insulating/heating/energy technology was inefficient, and when building and accessibility codes did not yet accommodate all types of residents. (Note: Lead was banned from paint in 1978.)

- More than 11% of Chittenden County residents commute 25 or more miles to work—with potential adverse effects on both the health of the driver and the environment. In addition, with the exception of some neighborhoods in Burlington and Winooski and a few other Census blocks in the County, the vast majority of the County’s working residents pay more than 45% of their income for the combined cost of housing and transportation.

- The County’s population is expected to continue growing, albeit at a slower pace than in the past decade. Between 2010 and 2015, demand for additional owner homes is likely to be lower
than prior levels of home building in the County. However, demand for renter homes is predicted to increase. Tools to ensure adequate housing supply for renters include renovation and conversion of existing buildings as well as new construction. Looking further out roughly 4,000 additional housing units (rental and ownership combined) will be needed from 2010 to 2020.

**Key Indicators**

- **% households spending over 30% of income on housing expenses (owners and renters).**

![% of Households spending 30% of income on housing expenses](https://www.housingdata.org)

**FIGURE 43 - PERCENT OF HOUSEHOLDS SPENDING 30% OF INCOME ON HOUSING EXPENSES**

- **# of new housing units in 2010 by Municipality.** This data will be collected going forward.

- **Metro and non-metro vacancy rate for renters.** A healthy vacancy rate needs to be based on local circumstances, and long-term local averages (setting a national standard is not effective). The target for Chittenden County may be somewhere between 3% and 5%, though more analysis would need to be done to find a more accurate target. In Burlington and Winooski the average rental housing vacancy rate has been well below this, at 1.5% from 2004 to 2011 (Source: VHFA Allen and Brook report). For the suburban areas the average rental housing vacancy rate from 2004 to 2011 is 2.6% - still lower than a healthy rate but not as low as Burlington and Winooski (Source: VHFA Allen and Brook report).
Months of inventory for Condos and Single Family Homes. A healthy housing market is one in which housing units for ownership are on the market for no more than 6 months. The average for condos from 2004 to 2010 has been 4.4 months; and the average for single-family homes from 1998 to 2010 has been 5.1 months. However, in 2008 (at the beginning of the recession) the single-family housing units were on the market for 9.6 months. More recently, this trend has corrected itself. (Source: VHFA Allen and Brook report)

Homeless at point in time, 3 year average. Average from 2008 to 2011 is 497. Source: Chittenden County Continuum of Care (Burlington CEDO 2011)

Increased inventory of affordable rental housing. As of 10/22/2012 there were 120 properties and 4,520 subsidized units. Source: Vermont Directory of Affordable Rental Housing (www.housingdata.org/doarh).
2.5.3 Transportation

**Transportation Goal:** Provide accessible, safe, efficient, interconnected, secure, equitable and sustainable mobility choices for our region’s businesses, residents and visitors.

**Key Issues/Trends/Insights**

[Data for this section drawn from Historic Development and Future Land Use/Transportation Analysis Report and MTP Supplemental Documents in Chapter 4]

- Congestion is worsening with potential negative consequences on economic development, the environment and human health.
- The 2008-2009 Scenario Planning Process undertaken by the Chittenden County Metropolitan Planning Organization resulted in a clear surveyed preference for future growth to be concentrated into higher density, mixed use centers – this preference is also demonstrated in the policy direction outlined in municipal plans and ordinances throughout the County. Directing transportation investments to serve mobility and accessibility in compact settlements will result in a more cost effective and efficient transportation system.
- Continued low-density development in rural areas will increase Vehicle Miles Traveled (VMT) and likely increase potentially harmful air pollutants and greenhouse gases.
- Higher fuel prices will lead to an increase in the percentage of household income needed to meet transportation expenses; rural residents are disproportionately impacted by household transportation costs.
- Some population segments – youth, the elderly, low-income and communities of color – lack access to viable public and private transportation options. The lack of safe, reliable, and complete connections within the transportation system and between transport modes reduces access to employment, social, economic, and recreation opportunities; and limits access to basic needs by means other than a personal vehicle.
- More robust investment in transportation options – transit, walking/biking, carsharing and ridesharing – could reduce congestion, vehicle miles traveled, use of single occupancy vehicles, social exclusion, and could improve public health, and enhance the economic well-being of our residents, businesses and visitors.
- While access to public transit is widely available in the region’s more urbanized areas, there are days and times when service is not available; some suburban and most rural populations lack access to transit.
- Roadway condition of over half of the arterial highway mileage in Chittenden County is rated poor or worse. Compounding our poor roadway conditions and inadequate investment, transportation funding in general is overly reliant on the state and federal gas taxes which are decreasing in value as inflation lowers purchasing power and revenues decline due to improving vehicle fuel efficiency and fewer VMT.
- Transportation costs exceed our capacity to maintain, operate, and improve our current system. Nor do we have adequate funds needed to grow transit, walking/biking, and Transportation Demand Management (TDM) programs. The prospect of less funding in a time of increasing transportation investment need is a worrisome trend and needs to be addressed.
- The MTP must be fiscally constrained to the funding anticipated for investment in the planning horizon through 2035. The following chart outlines the funds anticipated to be available for the next 25 years. The chart highlights the fact that we will not be able to afford everything that may be needed and that investments will need to be selected which promote future sustainability.
Estimated Transportation Funding for Chittenden County: 2010 - 2035

<table>
<thead>
<tr>
<th>COSTS in Millions (2010$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate of future funds                                     $1,177</td>
</tr>
<tr>
<td>Cost to maintain/preserve the transportation system           $754</td>
</tr>
<tr>
<td>Committed projects (TIP and Circ Alternatives)                $113</td>
</tr>
<tr>
<td>Total available to address new transportation needs           $310</td>
</tr>
<tr>
<td>Estimated cost of anticipated new projects (the sum of all items on the MTP Project List - Transportation Need)</td>
</tr>
<tr>
<td>Funding deficit (Transportation Need minus Total Available)    ($540)</td>
</tr>
</tbody>
</table>

While our rate of driving alone to work increased by 36% between 1980 and 2000 (to 76% of all work trips), in more recent years this trend has shown improvement to 71% in 2010. We’ve also seen a nearly 60% increase in transit ridership the past decade. Vehicle Miles of Travel (VMT) per person is also on the decline, down 8% between 2000 and 2010. It is imperative that we maintain these positive recent trends in order to reduce congestion, decrease greenhouse gas emissions, and more efficiently utilize all of our transportation resources.

- Note: Aviation transportation is planned for by the Burlington International Airport (BIA) according to Federal Aviation Administration procedures. Air to ground transportation planning is coordinated between CCRPC, BIA, and the City of South Burlington and is considered in this Plan.

### Key Indicators

- **Percent of workers commuting by non-Single Occupant Vehicle (SOV) mode (walk, bike, transit, carpool, telecommute).** Recent data suggests the reversal of a negative trend going back at least 30 years and probably longer.
VMT Per Capita. Less driving per person can have positive environmental, transportation, economic, health and social impacts. Our most recent data may portend a positive trend.
2.5.4 Infrastructure & Facilities

**Infrastructure & Facilities Goal:** Ensure adequate infrastructure and facilities (i.e. water supply, wastewater treatment, stormwater treatment, broadband coverage and solid waste recovery and recycling) to support areas planned for growth while conserving resources.

**Key Issues/Trends/Insights**

[Data for this section and more information can be found in the: Section 2.2.1 Ecological Systems Topic for water quality; Broadband Action Plan; Stormwater websites: [http://www.ccrcpcvt.org/stormwater/](http://www.ccrcpcvt.org/stormwater/) and [www.smartwaterways.org](http://www.smartwaterways.org); and other sources listed below.]

- The majority of the residents in the County get their drinking water from Lake Champlain, via two utilities: the Champlain Water District and the City of Burlington’s DPW Water Division. Both Champlain Water District and the City of Burlington’s DPW Water Division utilities have received Phase III Director’s Awards from the USEPA’s Partnership for Safe Water Program; and Champlain Water District was the first in the United States to receive the Phase IV Excellence in Water Treatment Award in 1999, and is one of 11 in the US to presently maintain this award status following required annual reviews. In addition, Richmond, Hinesburg, Underhill and Jericho have smaller public water supply utilities – some of which are facing capacity and water quality challenges (Hinesburg for example).

- Currently, there are 12 municipal wastewater treatment plants in the County; together they have a treatment capacity of 21 million gallons per day (MGD) (Source: State of Vermont Wastewater Management Division). As of 2010, CCRPC estimated an aggregate reserve capacity of 9 MGD (this does not account for unconnected committed capacity and capacity limitations of individual facilities.). The estimated future demand for wastewater capacity in 2035 is 7 MGD. While these figures indicate that there is sufficient sewage treatment capacity to absorb anticipated growth in housing and employment county-wide, this does not account for location specific limitations. Colchester, Essex Junction, Huntington, Hinesburg, Westford, and Williston were among the municipalities in need of more wastewater capacity.

- Management of our storm water is critically important to maintaining and improving water quality throughout the County. Stormwater treatment is challenging in both urban and rural areas of the County for a variety of reasons: existing urban areas need to retrofit old infrastructure, financing new infrastructure in areas planned for growth when development is incremental, and impacts from agriculture and forestry practices that don’t follow best management practices. Stormwater is managed at a variety of levels including EPA’s National Pollutant Discharge Elimination System (NPDES) permits; VT’s discharge permits; and some municipalities have additional stormwater regulations and programs. VT’s discharge permits are structured to address site level development for projects over 1 acre of disturbance; therefore, incremental and cumulative impact of development is not addressed through this program. The municipalities are facing the challenges of dealing with the cumulative impact – and most are regulating stormwater through local regulations. In addition, nine municipalities and three public entities are subject to MS4 permitting (a NPDES program) in Chittenden County: Burlington, Colchester, Essex, Essex Junction, Milton, Shelburne, South Burlington, Williston, Winooski, Burlington International Airport, UVM and VTrans. A new MS4 permit was issued by the State in December 2012. There are two additional requirements: each permittee/municipality must develop and implement a Flow Restoration Plan (FRP) for the stormwater impaired waters within their jurisdiction (current estimates for restoration of
individual impaired streams ranges in the millions); and each permittee/municipality must now pay for the annual operation of stream flow gauges (formally funded by the State/UVM/USGS).

- Broadband technology is widely available throughout Chittenden County: as of December 2011, approximately 99% of Chittenden County residents and 99.5% of non-residential structures (analysis included commercial, industrial, municipal structures) have access to Broadband. The federal definition of broadband is 768 kbps download/200 kbps upload speeds. It will be important to ensure that we are on par with other urban areas in the realm of number of service providers, service tiers, and affordability as the technology is constantly improving and we must keep up. Specifically, the defined broadband speeds are quite slow and will need to improve.

- A sustainable society minimizes the amount and toxicity of the waste it generates, reuses materials, recycles, and composts. The Chittenden Solid Waste District (CSWD) is responsible for the management of solid waste in Chittenden County. The system in the County is a combination of public, private, and public/private programs. CSWD has established a range of programs and facilities to manage waste through reduction, diversion, and proper disposal. CSWD also has identified the need for and is in the process of developing a regional landfill site. The tons of refuse disposed in Chittenden County have been declining over the last 5 years, while the amount of recycled materials has increased. While those trends are positive, there is room for improvement. It is estimated that 27% of the municipal solid waste sent to the landfill is comprised of recyclable materials and 32% is comprised of organic materials that could be composted (Source: CSWD Estimate of the Components of Solid Waste Disposed for FY 2012). A State law passed in 2012 (Act 148) bans disposal of certain recyclables (effective July 1, 2015), yard debris and clean wood (effective July 1, 2016), and food scraps (phased in over time) from disposal. Residents and businesses in CSWD have been required to separate yard debris and recyclables from waste destined for disposal since 1993. The additional bans on food scraps and clean wood will have a significant impact on waste diversion in Chittenden County.

Key Indicators

- **Current Water Capacity and Reserve for Large Water Utilities** The reserve capacity below equates to 39,000 new homes (as a comparison there are 65,722 housing units in Chittenden County in 2010).

<table>
<thead>
<tr>
<th>Utility</th>
<th>Capacity</th>
<th>Reserve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Champlain Water District</td>
<td>20 mgd</td>
<td>6.5 mgd</td>
</tr>
<tr>
<td>City of Burlington</td>
<td>7.5 mgd</td>
<td>1.3 mgd</td>
</tr>
<tr>
<td>Total:</td>
<td>27.5 mgd</td>
<td>7.8 mgd</td>
</tr>
</tbody>
</table>

**FIGURE 47 - CURRENT WATER CAPACITY AND RESERVE FOR LARGE WATER UTILITIES**

- **Current Wastewater Capacity v. Capacity Needed for Growth Projections in Areas Planned for Growth** Source: ANR and CCRPC Municipal Growth Projections. Chittenden County has the capacity to treat an additional 7 million gallons per day of wastewater. In 2035, it is estimated that the anticipated demand will be 7 MGD which is adequate capacity to accommodate 80% of the future development within the various sewer service areas. However, capacity varies for each treatment plant and some facilities may have a narrow margin of additional capacity.
- **16.9% of impervious area is under storm water management through operational stormwater permits countywide.** Source: ANR VTDEC Stormwater Permit database, ANR’s 2008 NDVI Impervious Surface Layer.

- **52% of the impervious area in Chittenden County is covered by the Municipal Separate Storm Sewer System Permit (MS4).** Source: MS4 Boundary, ANR’s 2008 Impervious Surface Layer.

- **Pounds of Waste Disposed/Capita/Day for MSW (Municipal Solid Waste) and C&D (Construction Debris).**

![Figure 48 - Pounds of Waste Disposed/Capita/Day for Municipal Solid Waste (MSW)](source: Chittenden Solid Waste District, Waste Diversion Report: Calendar Years 2001-2011)
2.5.5 Energy

Energy Goal: Reduce Chittenden County’s consumption of energy and reliance on non-renewable, energy. Improve the cost-effectiveness, efficiency and reliability of the energy production, transmission, and distribution system.

Key Issues/Trends/Insights

[Data for this section drawn from: Energy Analysis Report and Climate Change Trends and Impacts Report.]

- Chittenden County citizens, businesses, and industries spent about $617 million on energy in 2009 (25% of Vermont’s total). Much of this money leaves the County and state immediately. This outflow of energy dollars acts as a drain on the local economy.
- The price of energy is forecasted to continue increasing in the future, which will result in an additional burden on the County’s residents and businesses, unless energy consumption can be reduced.
- Chittenden County has a long history of electrical and natural gas energy efficiency programs, dating back to 1990, which have provided significant energy savings and economic benefits to the state and County. These programs along with improvements in federal standards have led to a reduction in per household and per employee energy consumption of electricity and natural gas. Reduction in energy consumption directly results in a reduction in energy bills.
- While efficiency programs targeting electricity and natural gas have been largely successful, there is an urgent need to fund and develop similar programs for non-regulated thermal fuels and for the transportation sector.
- Fossil fuel combustion increases the atmospheric concentration of carbon dioxide and other greenhouse gases, which are the causes of global climate change. Climate change will have profound impacts on the environment, public health, infrastructure, and economy of Chittenden County.
- Vermont, and the County, relies heavily on fuel oil for building heat and on gasoline and diesel for transportation. Gasoline consumption has increased as more residents drive to and from work, run errands, and consume for goods.
- Vermont’s rural nature offers challenges for the transmission and distribution of energy. It is important to maintain and develop an energy production, transmission, and distribution infrastructure in Chittenden County that is efficient, reliable, cost-effective, and environmentally responsible.
- The cost of electricity is related to the distance it travels. When electricity is transmitted over long distances, a significant amount of electricity is lost. Improving line efficiency or encouraging distributed generation (such as locally sited small scale renewable projects) reduces losses and could result in more cost effective rates.
- Every three years, Vermont Systems Planning Committee (VSPC) launches a process to update and identify constrained areas and reliability needs for the electric transmission grid. Chittenden County has areas identified as needing improvement.
- Electric efficiency programs have always worked to reduce electrical demand especially during peak periods but the development of the Smart Grid will provide a powerful tool to address this issue. Smart Grid coupled with education, behavior change, and load control technologies can help reduce peak demand and defer substation upgrades which can result in substantial cost saving.
- Chittenden County has many non-fossil fuel based, renewable energy production sites owned by utilities, private parties, and municipalities. Reliable, cost effective, and environmentally sustainable energy availability is critical to support the economy and natural resources of Chittenden County.
- The more widespread adoption of electric vehicles should reduce the total energy consumption in the County, due to better efficiency (an EV gets the equivalent of 100 miles/gallon). To prepare for widespread adoption of electric vehicles, charging infrastructure should be developed. In addition, policies and pricing structures to encourage off peak charging need to be considered to mitigate grid constraints.
- Chittenden County is home to an international airport and a National Guard base, therefore the transportation fuel consumption in the County not only includes gasoline, diesel, and compressed natural gas, but also aviation gasoline and jet fuel.

Key Indicators

- Energy Consumption Estimates and Population Trend in Chittenden County

![Energy Consumption Estimates and Population Trend in Chittenden County](figure49.jpg)

![Figure 49 - Energy Consumption Estimates and Population Trend in Chittenden County](figure49.jpg)

- 2009/2010 Total energy consumption per person (per household for the residential sector) and by sector (transportation, residential, commercial, and industrial). Reduction in consumption will lead to a reduction in energy bills, relative to what they would be without that reduction in consumption.
Percent of natural gas saved in 2010 from building weatherization and heating equipment upgrades.

Electricity Efficiency Savings as a percent of total electricity consumed.

FIGURE 50 – 2009/2010 TOTAL ENERGY CONSUMPTION PER CAPITA

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Energy (MMBTU)</strong></td>
<td><strong>Gallons of Gas</strong></td>
<td></td>
</tr>
<tr>
<td>Residential Energy per Household</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>Commercial and Industrial Energy per Employee</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Transportation Energy per Person</td>
<td>420</td>
<td></td>
</tr>
</tbody>
</table>

FIGURE 51 - 2010 NATURAL GAS EFFICIENCY SAVINGS AS A PERCENTAGE OF THE NATURAL GAS CONSUMED

<table>
<thead>
<tr>
<th>Natural Gas (McF)</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumed</td>
<td>6,363,760</td>
</tr>
<tr>
<td>Savings</td>
<td>82,151</td>
</tr>
<tr>
<td>% Efficiency Savings</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: VT GAS, 2010

FIGURE 52 - ELECTRICITY EFFICIENCY SAVINGS AS A PERCENT OF TOTAL ELECTRICITY CONSUMED

Source: Efficiency VT Town Data — Consumption (MMBtu) — % Savings
According to the Vermont Energy Atlas, in 2009, 0.06% of electricity consumed in Chittenden County is from privately owned renewable energy sources. Utility renewable energy generation is excluded because utility energy generated may not be used in Chittenden County.

Number and capacity of renewable energy production sites in the County (Source: VT Energy Atlas, Oct. 12, 2011)

<table>
<thead>
<tr>
<th># of sites</th>
<th>Capacity (kW)</th>
<th>MWh</th>
<th>Capacity (Thousand Btu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar Photovoltaic</td>
<td>297</td>
<td>6,101</td>
<td></td>
</tr>
<tr>
<td>Solar Thermal</td>
<td>42</td>
<td></td>
<td>2,975</td>
</tr>
<tr>
<td>Combined systems</td>
<td>12</td>
<td>86</td>
<td>588</td>
</tr>
<tr>
<td>Wind</td>
<td>28</td>
<td>491</td>
<td></td>
</tr>
<tr>
<td>Hydro(^1)</td>
<td>6</td>
<td></td>
<td>152,000</td>
</tr>
<tr>
<td>Wood Thermal(^2)</td>
<td>9</td>
<td></td>
<td>3,900</td>
</tr>
<tr>
<td>Wood Electric(^3)</td>
<td>1</td>
<td>50,000</td>
<td>665,760</td>
</tr>
</tbody>
</table>

1- Six utility owned hydro stations generate electricity for Chittenden County and surrounding area. 2-Thermal capacity not recorded, only tons of wood consumed as a proxy for system size is available. 3-McNeil Power
2.6 Recent Accolades and Concerns for the Future

Accolades
As we look to the future, Vermont, Chittenden County, and Burlington have gained a national reputation for our high quality of life. These can be summarized by looking at some of the accolades that we have received over the past few years. For more detail, please see the Lake Champlain Regional Chamber of Commerce webpage at http://www.vermont.org/About_Burlington/accolades.aspx.

- 2012 - Vermont is second most peaceful place to live
- 2012 - Forbes: Burlington is One of America’s Best Downtowns
- 2012 & 2011 – Healthiest County in the US, Univ. of Wisconsin Population Health Institute County Health Rankings
- 2011- Burlington ranked #1 place for guys by Men's Health
- 2012- Vermont ranked #1 healthiest state by the United Health Foundation for 4th year in a row
- 2011- Top 10 Cities for Outdoor Recreation - Outside Magazine
- 2011- Top 10 for "Volunteering in America"
- 2011- HUD’s HOME Program "Door Knocker Award" for exceptional contribution to affordable housing
- 2011- #1 "Top Ten Small Cities" State of Well-Being
- 2011- Top 10 Real Estates Markets to Watch in 2011 - Inman News
- 2010 - Kiplinger’s (Magazine) Best Cities 2010: Burlington, Vt.
- 2010 - New England's Most Enjoyed Secret - Vitality Cape Cod Magazine
- 2010 - Burlington, Vermont rated #2 in the best college towns survey by MSN Local Edition.
- 2010 - Burlington, Vermont receives Home Depot Foundation Award of “Excellence for Sustainable Community Development”
- 2010 - #1 Bass Fishing Capital - Outdoor Life
- 2010 - Prettiest Town in America - Forbes.com
- 2010 - Arbor Day Foundation: Tree City USA
- 2010 - One of Best Cities for New Jobs This Spring - Forbes.com
- 2010 - Top 100 Places to Live in America - RelocateAmerica.com
- 2010 - First Wave City - Carbon War Room
- 2009 - Burlington, Vermont named the number 1 healthiest place by women
- 2009 - Children’s Health Magazine has named Burlington the #1 place to raise a family.
- 2008 - #2 in “Greenest Small City in America” contest by Organic Gardening magazine.
- 2008 - Church Street Marketplace named one of 10 Greatest Places in America by the American Planning Association.
- 2008 - BusinessWeek magazine named Burlington Vermont one of the best places to raise your kids & Family Circle named South Burlington one of the 10 best towns for Families.

These accolades reflect many of the positive things we see in our community and our neighbors. They highlight many of the reasons why so many of us love this community and want to keep seeing it improve for ourselves and future generations.
Concerns
While we celebrate the positive aspects of our community, we also owe it to our children and their children to look to the future and work on addressing problems and aspire to do better. There are many questions that we heard from our community reflecting real concerns for the future. These questions include:

- Will my children and their children:
  - Be able to find good paying jobs here?
  - Be able to afford a home here?
  - Enjoy a cleaner Lake Champlain, streams, and rivers?
  - Breathe cleaner air?
  - See and use our rural landscape, farms, and mountains?
  - Have more transportation options?
  - Have to drive twice as far and long to get to their jobs?
  - Want to live in this community?
  - Be part of an equitable community?
  - Retain our small town neighborliness?
  - Be healthier?
  - Be better educated and successful?

These questions reflect many of the concerns that were identified in developing Chapter 2. These concerns require improvement to realize our goals. These are not prioritized, but rather follow the outline of the topics as discussed in Chapter 2 above. We should all understand that these concerns are based on today’s assessment of trends rooted in our current values and will change over time; either as we improve in certain areas or as our values shift over the generations. The current concerns are grouped by broad goal area below.

Natural Systems

1. Habitat Loss - We are experiencing a loss of habitat quality and quantity due to roads, invasive species and development patterns.
2. Unstable Rivers - River corridors are unstable due to alterations and encroachments leaving us susceptible to costly damage from flood events
3. Non-point Source Water Pollution - While we have addressed point sources of pollution, non-point sources are still contributing pollutants to our water bodies.
4. Climate Change - Climate change is a global phenomenon with local impacts. Our region’s climate is already changing; warmer, wetter conditions are expected to increase this century. These changes will adversely impact forest and aquatic communities, water quantity and quality, public health, agriculture, winter sports businesses, and buildings and infrastructure in flood and fluvial erosion hazard areas.
5. Greenhouse Gas (GHG) Emissions - Chittenden County emits 1,177,000 metric tons of greenhouse gases (measured as carbon dioxide equivalents). Fossil fuel consumption for transportation and heating accounts for almost 88% of our emitted greenhouse gases.
6. Climate Health Impacts - We can expect hotter summers that increase the frequency and severity of heat-stress illness and vector-borne diseases (such as Lyme disease, West Nile virus and Eastern Equine Encephalitis).

Social Community
7. Tobacco Use and Substance abuse - Rates of tobacco use have decreased from 20% in 1999 to 13% in 2008. Despite this significant decrease, exposure to second-hand smoke is high among youth and adults. Rates of substance abuse are increasing; meanwhile access to mental health services is inadequate.
8. Obesity - The prevalence of obesity is uniformly high across economic groups and has increased dramatically over the last 20 years.
9. Emergency Preparedness – Improvements need to be made in the areas of emergency planning, training, and operations centers.
10. K-12 proficiency - Improvements need to be made pre-K-12 to increase proficiency in reading, writing, math and science.
11. Workforce Development – We must support and expand existing programs to address labor pool and training gaps. We must also design a specific approach to assist current workforce education and training partners to assure that the required skill sets and workplace readiness skills are widely available to business.
12. Inclusion – There is a concern that members of underrepresented communities are not well connected and involved with governmental decisions. This includes the concern about their knowledge of the different government processes.
13. Disparities - Disparities in educational results, health, incarceration, and income exist for people of color and low income populations.
14. Aging – There is a general concern that we focus on and address the aging of our community and what that means for us in the future.

Economic Infrastructure
15. Job Opportunities – We need to keep encouraging our existing and new employers to grow so that our children have employment opportunities here and do not have to leave to find work.
16. Manufacturing Diversity - Our manufacturing sector lacks diversity leaving us susceptible to changes.
17. Industrial Sites - There is a lack of industrial sites to accommodate future economic growth.
18. STEM - We have a strong innovation economy, but increasing the labor force skills in science, technology, engineering and technology (STEM) remains a high need.
19. Housing Cost - Decreasing the cost of housing would help in attracting workers to our region.
20. Working Lands Loss - Sustaining our working lands is a challenge because there is greater monetary value in developing land than maintaining it as a farm or productive forest; in addition some local products are undervalued (i.e. milk, saw timber).

Built Environment
21. Sprawl - Over the last 60 years development trends, zoning regulations, and consumer preference have shifted growth away from metropolitan areas around Burlington to more suburban and rural locales resulting in large amounts of land consumed and high infrastructure costs. This trend seems to have reversed since 2005 and we need to stay on this new course.

22. Lack of Rental Housing – An increase of 1,000 rental housing units is needed in the County by 2015 to maintain a conservative vacancy rate of 1.4%. We will not reach that number based on currently approved developments. In addition, a healthier vacancy rate may be much higher to increase housing choices and lower rents, while maintaining a vibrant economy. This would result in a need much greater than 1,000 rental units by 2015. However, this must be balanced by a viable market – developers will build more units when most of the existing units are occupied.

23. Affordable Homes - An increase of 1,000 homeownership units in the County priced under $300,000 is needed by 2015 to increase housing choices and lower costs. This need could be met through existing permitted developments, however many are not being built due to challenges with condominium financing. For the same reason as mentioned above, the 1,000 units is based on a conservative vacancy rate figure.

24. Maintenance of Existing Housing – There is a need to adequately maintain existing housing stock to preserve it as a viable option for the future.

25. Supportive Housing - There is a need to increase the number of units of permanent supportive housing throughout the County in addition to Burlington. Supportive housing is a combination of housing and services intended as a cost-effective way to help people live more stable, productive lives. Supportive housing is widely believed to work well for those who face the most complex challenges—individuals and families who have very low incomes and/or disabilities, and/or may suffer from substance abuse, addiction or alcoholism, mental illness, HIV/AIDS, or other serious challenges to a successful life.

26. Mode Share - While our rate of driving alone to work increased by 36% between 1980 and 2000 (to 76% of all work trips), in more recent years this trend has shown improvement to 71% in 2010. We’ve also seen a nearly 60% increase in transit ridership the past decade. Vehicle Miles of Travel (VMT) per person is also on the decline, down 8% between 2000 and 2010. It is imperative that we maintain these positive recent trends in order to reduce congestion, decrease greenhouse gas emissions, and more efficiently utilize all of our transportation resources.

27. Road System & Funding - Roadway condition is rated poor or worse for over half of the arterial highway mileage in Chittenden County. The costs associated with maintaining and improving this infrastructure exceeds our fiscal capacity to fully address it. Nor do we have adequate funds needed to grow transit, walking/biking, and Transportation Demand Management (TDM) programs. Compounding our poor roadway conditions and inadequate investment, transportation funding in general is overly reliant on the state and federal gas taxes which are decreasing in value as inflation lowers purchasing power and revenues decline due to improving vehicle fuel efficiency and fewer VMT. The prospect of less funding in a time of increasing transportation investment need is a worrisome trend and needs to be addressed.
28. Energy Conservation - Vermont and Chittenden County lead the nation with respect to initiatives that support efficiency and renewable energy, however, more efficiency programs are needed for non-regulated thermal fuels and energy for transportation to keep costs down and to reduce GHG emissions.

29. Renewables Siting - With the rise of renewable energy sources, municipalities are struggling with being left out of the conversation and are making specific recommendations within their Town Plans regarding how they want the Public Service Board to review petitions in their Towns.

30. Water and Wastewater – In order for municipalities to implement their plans for future growth in their urban or village improved water and wastewater services (both on-site, community systems, and sewer) are often necessary, including financial assistance. Colchester, Essex Junction, Huntington, Hinesburg, Westford, and Williston were among the municipalities raising this concern.

31. Stormwater Investments – Municipalities are committed to making improvements in storm water quality, but are concerned about the costs and how to pay for them.

We are at a time of choice. Do we allow things to keep going the way they are? Do we take steps to achieve the best future possible?

See Chapter 3 for strategies and actions to address these concerns.