

# 2013 Chittenden County **ecos** Plan



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 2.5



## 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.*

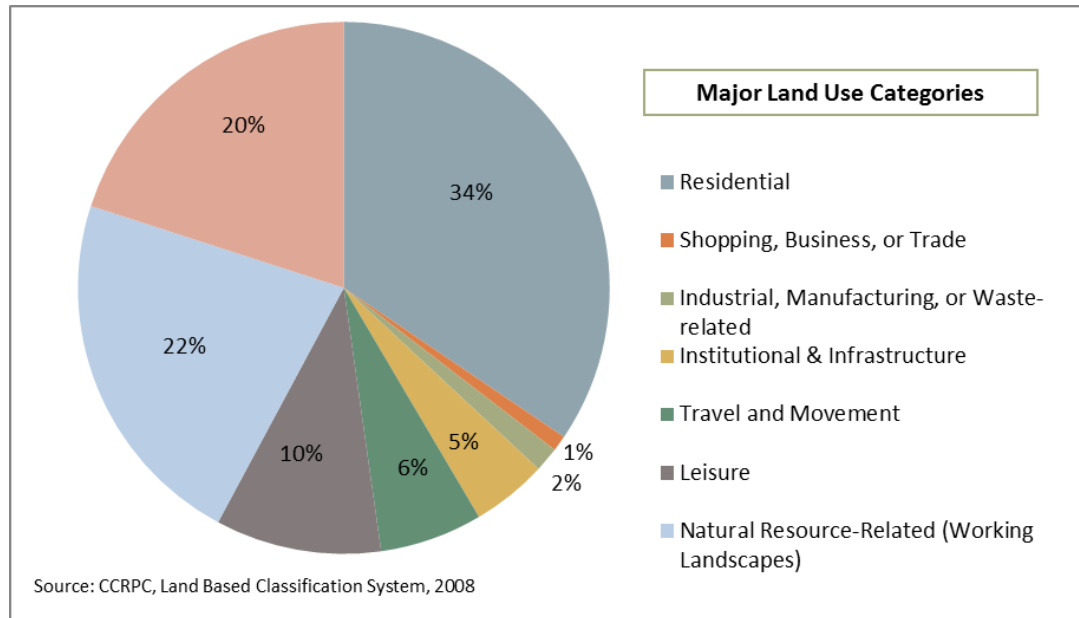
### Key Issues/Trends/Insights

[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).

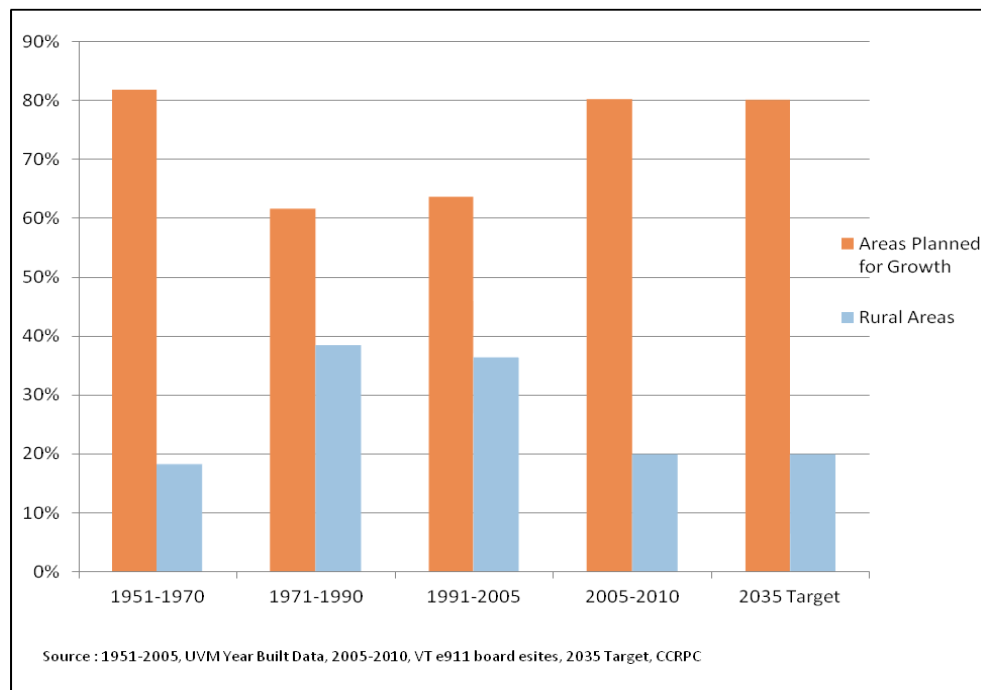
## Key Indicators

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



**FIGURE 40 - LAND USE CATEGORIES BY PERCENTAGE**

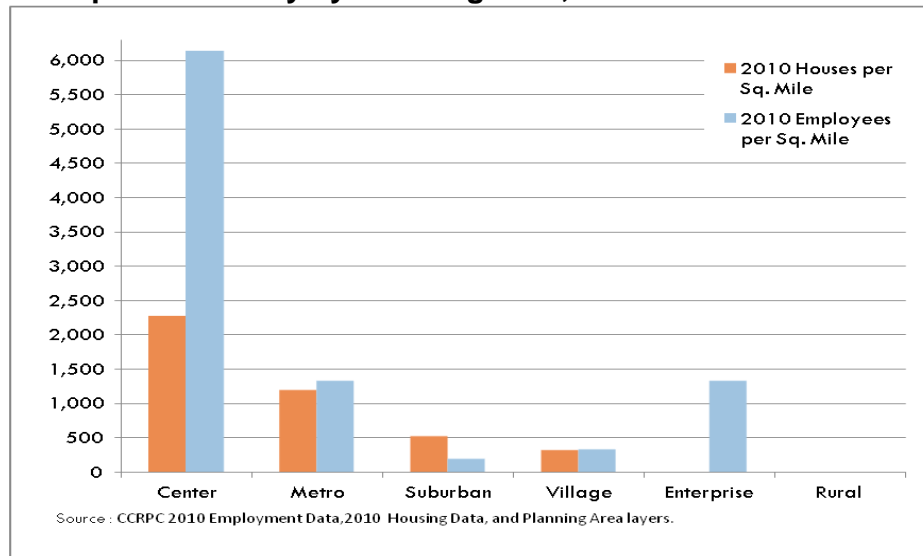
### ➤ Percent of New Structures in Areas Planned for Growth: 1950 – 2010



**FIGURE 41 - PERCENT OF NEW STRUCTURES IN AREAS PLANNED FOR GROWTH: 1950 - 2010**

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.

- **71% of investment is going into the Areas Planned for Growth and 29% in the Rural Planning Area** (Source: CCRPC from parcel and grandlist data).
- **Development Density by Planning Area, 2010**



**FIGURE 42 - DEVELOPMENT DENSITY BY PLANNING AREA, 2010**

### 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 diverse neighborhoods.

#### Key Issues/Trends/Insights

[Data for this section drawn from [Housing Analysis Report Analysis Report](#) and 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).**

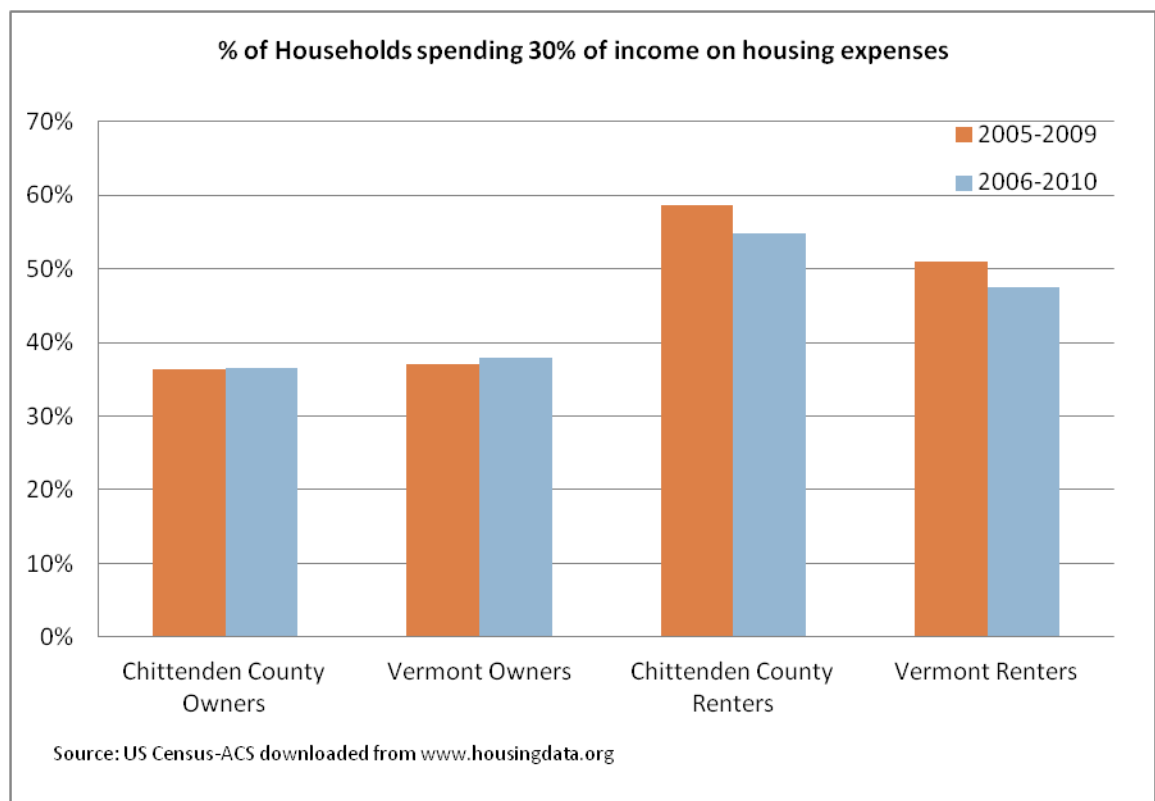


FIGURE 43 - PERCENT OF HOUSEHOLDS SPENDING 30% OF INCOME ON HOUSING EXPENSES

- **# 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 has been trending back in the right direction. (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)
- **Increased inventory of affordable rental housing.** As of 10/22/12 there were 120 properties and 4,520 subsidized units. Source: Vermont Directory of Affordable Rental Housing ([www.housingdata.org/doarh](http://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, minorities, refugees, the poor – 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**

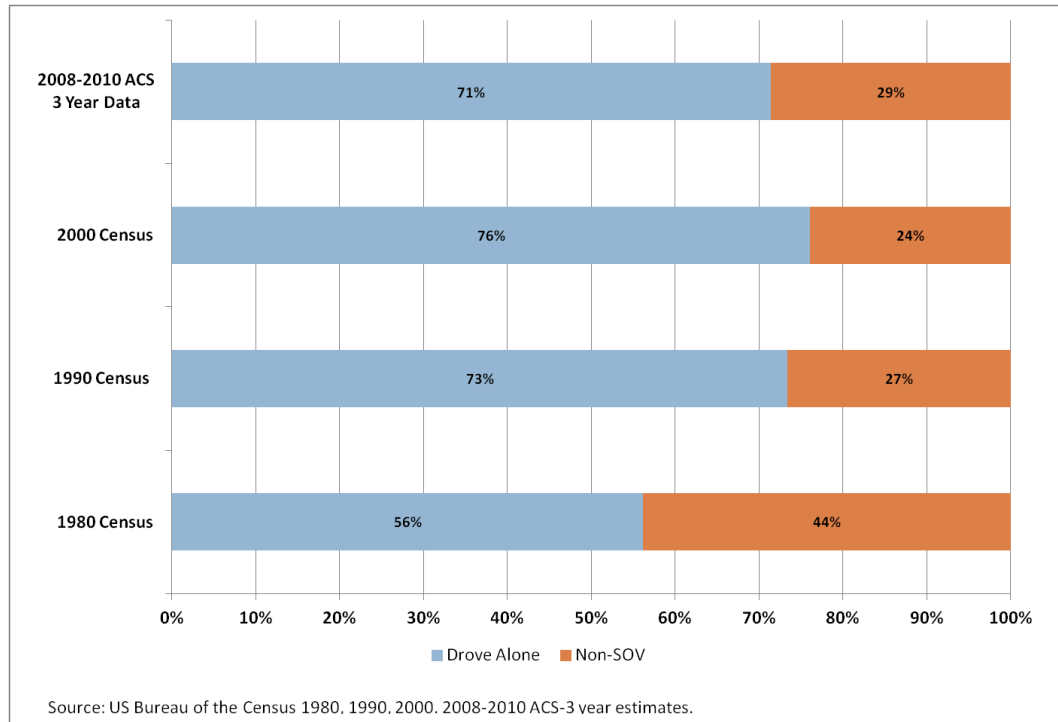
	<b>COSTS in Millions (2010\$)</b>
<b>Estimate of future funds</b>	<b>\$1,177</b>
<b>Cost to maintain/preserve the transportation system</b>	<b>\$754</b>
<b>Committed projects (TIP and Circ Alternatives)</b>	<b>\$113</b>
<b>Total available to address new transportation needs</b>	<b>\$310</b>
<b>Estimated cost of anticipated new projects (the sum of all items on the MTP Project List - Transportation Need)</b>	<b>\$849</b>
<b>Funding deficit (Transportation Need minus Total Available)</b>	<b>(\$540)</b>

FIGURE 44 - ESTIMATED TRANSPORTATION FUNDING FOR COUNTY: 2010-2035

- 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.

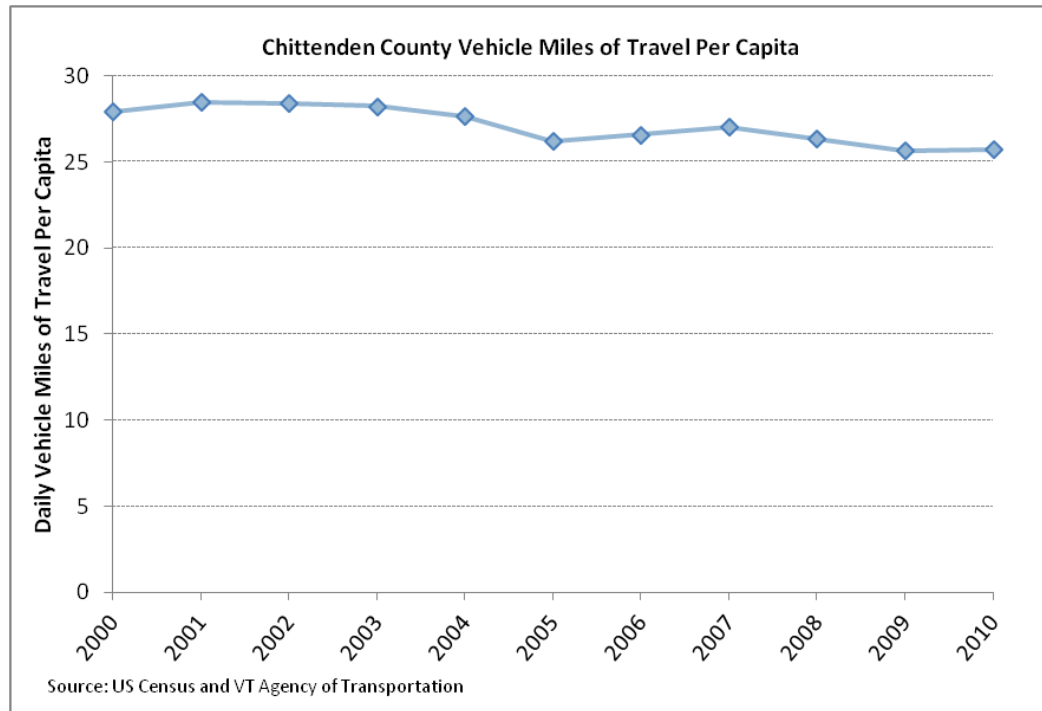
#### **Key Indicators**

- **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.



**FIGURE 45 - PERCENT OF WORKERS COMMUTING BY NON-SINGLE OCCUPANT VEHICLE (SOV) MODE (WALK, BIKE, TRANSIT, CARPOOL, TELECOMMUTE).**

- **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.



**FIGURE 46 - VEHICLES MILES OF TRAVEL PER CAPITA**

#### 2.5.4 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.ccrpcvt.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 (CWD) and the City of Burlington's DPW Water Division. Both Champlain Water District (CWD) 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 9MGD (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 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 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).

Utility	Capacity	Reserve
Champlain Water District	20 mgd	6.5 mgd
City of Burlington	7.5 mgd	1.3 mgd
<b>Total:</b>	<b>27.5 mgd</b>	<b>7.8 mgd</b>

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).**

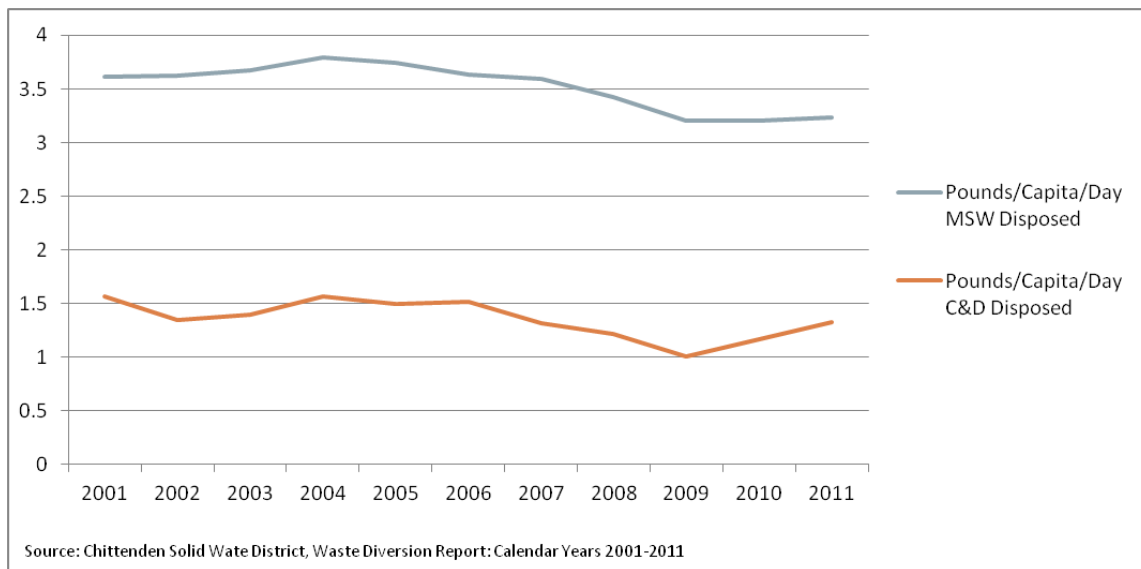


FIGURE 48 - POUNDS OF WASTE DISPOSED/CAPITA/DAY FOR MSW (MUNICIPAL SOLID WASTE) AND C&D (CONSTRUCTION DEBRIS).

### 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 jet fuel.

### Key Indicators

- Energy Consumption Estimates and Population Trend in Chittenden County

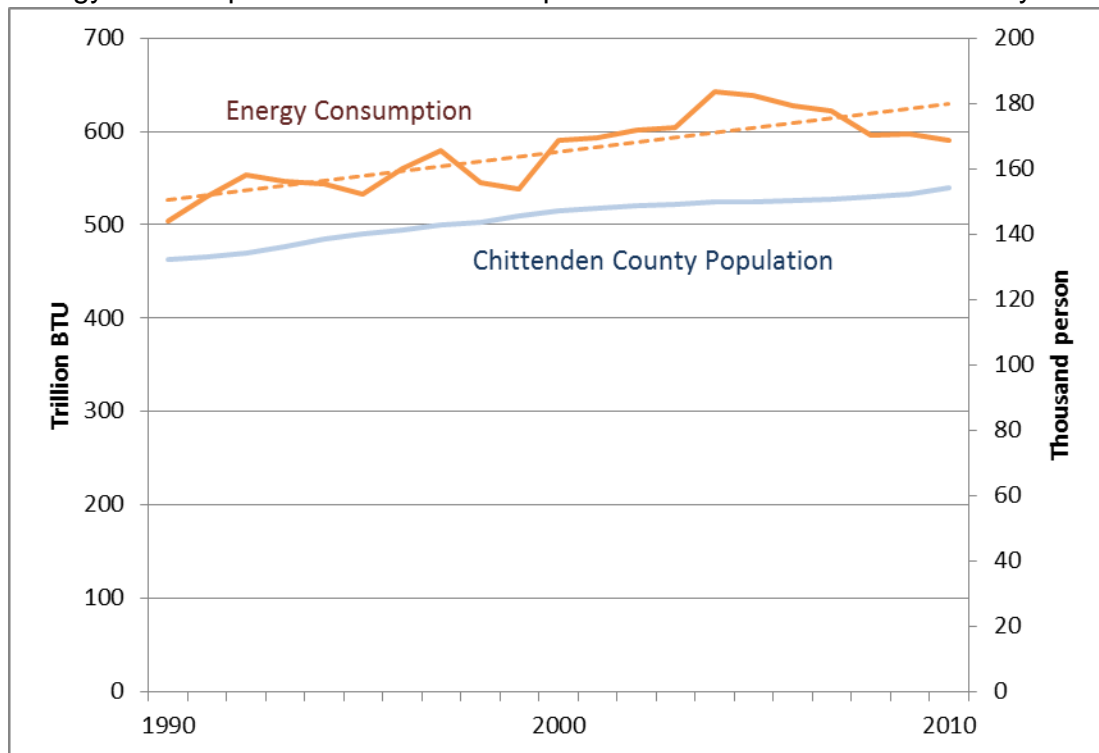


FIGURE 49 - ENERGY CONSUMPTION ESTIMATES AND POPULATION TREND IN CHITTENDEN COUNTY

- **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.

	Total Energy (MMBTU)	Gallons of Gas
Residential Energy per Household	89	
Commercial and Industrial Energy per Employee	120	
Transportation Energy per Person		420

Source: Efficiency VT, Energy Information Administration, CCRPC, UVM VT Transportation Energy Report (2009, 2010)

FIGURE 50 - 2009/2010 TOTAL ENERGY CONSUMPTION PER PERSON

- *Percent of natural gas saved in 2010 from building weatherization and heating equipment upgrades.*

Natural Gas (McF)	2010
Consumed	6,363,760
Savings	82,151
% Efficiency Savings	1%

Source: VT GAS, 2010

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

- **Electricity Efficiency Savings as a percent of total electricity consumed.**

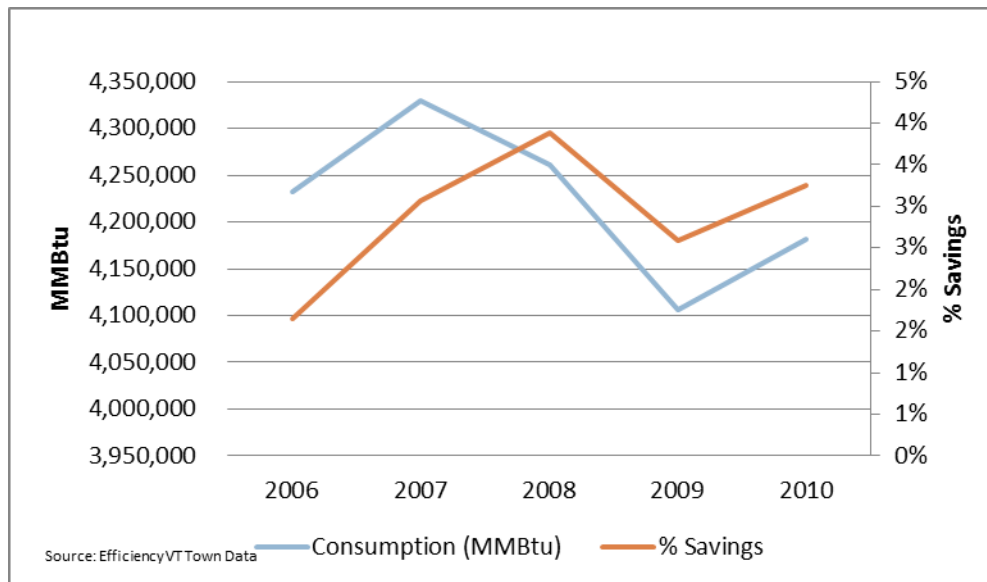


FIGURE 52 - ELECTRICITY EFFICIENCY SAVINGS AS A PERCENT OF TOTAL ELECTRICITY CONSUMED

According to the Vermont Energy Atlas, in 2009, .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)**

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

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 Plant. Source: Vermont Renewable Energy Atlas

Figure 53 - Number and capacity of renewable energy production sites in the County