August 2006

The Chittenden County Regional Planning Commission (CCRPC) adopted the 2006 Chittenden County Regional Plan on August 28, 2006. The 2006 Regional Plan is intended to guide future development in the County to achieve a wide range of objectives (see pages 1.1 and 1.8-1.9 of the Plan for details).

CCRPC invested two and a half years in the preparation of the 2006 Regional Plan. The Commission designed the process used to prepare the Plan so that municipalities, organizations, and the general public could provide feedback at the earliest stages and continuously throughout the process (see pages 1.10-1.13). CCRPC thanks the many individuals and organizations who provided comments on drafts of the Plan.

People using the 2006 Regional Plan should be aware of its special characteristics:

- **Style** – The Plan is written to help different readers accomplish a variety of purposes. (see page 1.9).
- **Policies** – The Plan’s recommendations are labelled as “policies.” Each policy describes preferable general features of the County’s future, regardless of whether it could be described as a goal, strategy, or action (see page 1.14).
- **Planning Areas** – The Plan designates portions of the County that should share the same general features and characteristics as being in one of five planning areas, then targets various Regional Plan policies to each planning area (see page 1.13).
- **Maps** – Because the Regional Plan’s maps (collected at the back of the Plan) were prepared using CCRPC’s Geographic Information System (GIS), they are limited illustrations of the underlying GIS datasets. Any detailed analysis of mapped data should be based on the GIS source files, which are available from CCRPC staff.
- **Glossary** – A glossary of acronyms and planning terms used in Vermont is included near the back of the Plan.
- **Implementation** – CCRPC intends to implement the 2006 Regional Plan through collaboration with the County’s municipalities, special-purpose regional boards, the private sector, and the public (see page 1.15).

The 2006 Regional Plan is posted on CCRPC’s website, digital copies are available on CD from CRPC, and hardcopies may be purchased from CCRPC. If you have questions about the Plan, please do not hesitate to contact the staff at CCRPC!

Regards,

Garret Mott
Chair, Chittenden County Regional Planning Commission
2006 Chittenden County Regional Plan  
August 28. 2006

Chittenden County Regional Planning Commission

Commissioners

Leslie Pelch  
Bolton  
Garret Mott*  
Buel’s Gore  
William N. Asswad  
Burlington  
Marty Illick  
Charlotte  
Roger Derby  
Colchester  
Todd Odit  
Essex  
Thomas Weaver  
Essex Junction  
Penrose Jackson  
Hinesburg  
Eric Silman*  
Huntington  
Phyl Newbeck  
Jericho  
Louis Mossey, III  
Milton  
Meg Freeber  
Richmond  
Vacant  
St. George  
Vacant  
Shelburne  
Marcel Beaudin  
South Burlington  
Jan deVries*  
Underhill  
Suzanne Blanchard  
Westford  
Terry Macaig  
Williston  
J. Ladd  
Winooski  
Robert Hill  
Agriculture  
Don Meals  
Conservation/Environment  
Dawn Francis  
Industrial/Business  
Justin Dextraud*  
Socio/Economic/Housing  
Michael O’Brien  
Transportation  

Alternate Commissioners

Margot Pender  
Bolton  
Vacant  
Buel’s Gore  
Peter Potts*  
Burlington  
Peter Richardson  
Charlotte  
Richard Paquette  
Colchester  
Jeffrey Carr  
Essex  
Deborah Billado  
Essex Junction  
David Hirth  
Hinesburg  
Vacant  
Huntington  
Robert Penniman  
Jericho  
Vacant  
Milton  
Marvin Carpenter  
Richmond  
Vacant  
St. George  
Jeff Nick  
Shelburne  
Chris Smith  
South Burlington  
Stan Hamlet  
Underhill  
Vacant  
Westford  
Virginia Lyons  
Williston  
Vacant  
Winooski  
Vacant  
Agriculture  
Molly Michaud  
Conservation/Environment  
Frank Cioffi  
Industrial/Business  
Sandy Wynne  
Socio/Economic/Housing  
Andrea Morgante  
Transportation  

Staff

Leslie Bonnette  
Executive Assistant  
Pam Brangan  
GIS/IT Manager  
Greg Brown  
Executive Director  
Terry Cleveland  
Financial Manager  
Tim Fluck  
Deputy Director  
Melanie Needle  
Staff Planner  
Brad Rawson  
Associate Planner  
Dan Senecal-Albrecht  
Special Projects Planner  
Samantha Tilton,  
Staff Planner

* Members of CCRPC’s Plan Review and Update Committee, which guided the preparation of this Initial Draft 2006 Chittenden County Regional Plan.
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1.1</td>
</tr>
<tr>
<td>Vision Statement</td>
<td>1.1</td>
</tr>
<tr>
<td>Chittenden County</td>
<td>1.2</td>
</tr>
<tr>
<td>Overview</td>
<td>1.2</td>
</tr>
<tr>
<td>History</td>
<td>1.3</td>
</tr>
<tr>
<td>Regional Setting</td>
<td>1.5</td>
</tr>
<tr>
<td>The Chittenden County Regional Planning Commission (CCRPC)</td>
<td>1.7</td>
</tr>
<tr>
<td>Overview of Vermont’s Regional Planning Commissions (RPCs)</td>
<td>1.7</td>
</tr>
<tr>
<td>History of CCRPC</td>
<td>1.7</td>
</tr>
<tr>
<td>The 2006 Regional Plan</td>
<td>1.8</td>
</tr>
<tr>
<td>Why Plan?</td>
<td>1.8</td>
</tr>
<tr>
<td>The Purposes of a Regional Plan</td>
<td>1.9</td>
</tr>
<tr>
<td>The Style of the 2006 Regional Plan</td>
<td>1.9</td>
</tr>
<tr>
<td>The Relationships between the 2006 Regional Plan and Other Plans</td>
<td>1.10</td>
</tr>
<tr>
<td>Statement of Compatibility and Consistency</td>
<td>1.10</td>
</tr>
<tr>
<td>How the 2006 Regional Plan was Prepared</td>
<td>1.10</td>
</tr>
<tr>
<td>Overall Process</td>
<td>1.10</td>
</tr>
<tr>
<td>Maps / Geographic Information System (GIS)</td>
<td>1.13</td>
</tr>
<tr>
<td>Differences between the 2001 and 2006 Regional Plans</td>
<td>1.13</td>
</tr>
<tr>
<td>Planning Areas</td>
<td>1.13</td>
</tr>
<tr>
<td>Policy Plan</td>
<td>1.14</td>
</tr>
<tr>
<td>Implementing the Regional Plan</td>
<td>1.14</td>
</tr>
<tr>
<td>Collaboration</td>
<td>1.15</td>
</tr>
<tr>
<td>Act 250 and Section 248 / Substantial Regional Impact</td>
<td>1.16</td>
</tr>
<tr>
<td>Notes</td>
<td>1.21</td>
</tr>
<tr>
<td>Planning Areas</td>
<td>2.1</td>
</tr>
<tr>
<td>Overview of Planning Areas</td>
<td>2.1</td>
</tr>
<tr>
<td>General Description and Purposes</td>
<td>2.1</td>
</tr>
<tr>
<td>Relationship of Planning Areas and Growth Centers</td>
<td>2.2</td>
</tr>
<tr>
<td>Establishing Planning Areas</td>
<td>2.3</td>
</tr>
<tr>
<td>Planning Area Descriptions</td>
<td>2.4</td>
</tr>
<tr>
<td>Metropolitan Planning Area</td>
<td>2.4</td>
</tr>
<tr>
<td>Transition Planning Area</td>
<td>2.5</td>
</tr>
<tr>
<td>Enterprise Planning Area</td>
<td>2.6</td>
</tr>
<tr>
<td>Village Planning Area</td>
<td>2.6</td>
</tr>
<tr>
<td>Rural Planning Area</td>
<td>2.7</td>
</tr>
<tr>
<td>Notes</td>
<td>2.7</td>
</tr>
<tr>
<td>Land Use</td>
<td>3.1</td>
</tr>
<tr>
<td>Existing Land Use</td>
<td>3.1</td>
</tr>
<tr>
<td>Land Use Types</td>
<td>3.1</td>
</tr>
<tr>
<td>Development Densities</td>
<td>3.3</td>
</tr>
<tr>
<td>Historic and Archeological Sites and Districts</td>
<td>3.3</td>
</tr>
<tr>
<td>Future Land Use</td>
<td>3.5</td>
</tr>
<tr>
<td>Regional Build-out Analysis</td>
<td>3.5</td>
</tr>
<tr>
<td>Agricultural Preservation</td>
<td>3.6</td>
</tr>
</tbody>
</table>
Land Use Policies ................................................................. 3.10
General Policies ................................................................. 3.10
Metropolitan Planning Area Policies ................................. 3.11
Transition Planning Area Policies ................................. 3.11
Enterprise Planning Area Policies ................................. 3.12
Village Planning Area Policies ................................. 3.12
Rural Planning Area Policies ................................. 3.12
Resources ................................................................. 3.13
Notes ................................................................. 3.13

Natural Resources ............................................................... 4.1

Air Quality ................................................................. 4.1
Background ................................................................. 4.1
Air Quality Standards ................................................................. 4.1
Acid Deposition (Acid Rain) ................................................................. 4.3
Mercury Deposition ................................................................. 4.4
Climate Change ................................................................. 4.4
Air Quality Policies ................................................................. 4.6

Water Quality ................................................................. 4.6
Background ................................................................. 4.6
Water Quality Concerns ................................................................. 4.7
Wetlands ................................................................. 4.9
Water Quality Policies ................................................................. 4.11

Land Resource Quality ............................................................... 4.12
Earth Resources ................................................................. 4.12
Background ................................................................. 4.12
Earth Resources Policies ................................................................. 4.12
Agricultural Soils ................................................................. 4.12
Background ................................................................. 4.12
Agricultural Soils Policies ................................................................. 4.13
Forest Resources ................................................................. 4.13
Background ................................................................. 4.13
Forest Resources Policies ................................................................. 4.15
Natural Areas ................................................................. 4.16
Background ................................................................. 4.16
Natural Areas Policies ................................................................. 4.18

Resources ................................................................. 4.18
Notes ................................................................. 4.19

Demographics ................................................................. 5.1
Overview ................................................................. 5.1
Recent Trends ................................................................. 5.2
Population Growth ................................................................. 5.2
Household Size ................................................................. 5.2
Aging of the Population and Other Characteristics ................................................................. 5.5
Current Conditions ................................................................. 5.7
Population Density ................................................................. 5.7
Age and Gender Cohorts ................................................................. 5.7
Diversity ................................................................. 5.9
Household Characteristics ................................................................. 5.9
Forecasts ................................................................. 5.12
Background ................................................................. 5.12
Countywide Population Forecast ................................................................. 5.12
# Table of Contents

**Appendix – Population Projection and Forecasting Methods** ............................ 5.16  
  Projection Methods ................................................................................. 5.16  
  Forecasting Methods ............................................................................. 5.18  
**Resources** ............................................................................................. 5.19  
**Notes** .................................................................................................. 5.20  

**Economic Development** ........................................................................ 6.1  
  **Background** ....................................................................................... 6.1  
  Defining “Economic Development” ......................................................... 6.1  
  Existing Conditions and Employment Forecast ...................................... 6.2  
  **Developing the County’s Economy** .................................................... 6.5  
  Adequate Supplies of Land for Future Employers .................................... 6.6  
  Farming and Forestry ............................................................................. 6.9  
  Tourism and Visitation ........................................................................... 6.10  
  Other Parts of the County’s Economic Foundation .................................. 6.11  
  Regulatory Issues .................................................................................. 6.12  
  Brownfields ............................................................................................ 6.12  
  **Economic Development Policies** ....................................................... 6.12  
  **Resources** .......................................................................................... 6.13  
  **Notes** ................................................................................................ 6.14  

**Housing** .............................................................................................. 7.1  
  **Existing Conditions** .......................................................................... 7.1  
  **Housing Needs Forecast** ..................................................................... 7.6  
  **Special Housing Concerns** ............................................................... 7.10  
  Afforable Housing ................................................................................... 7.10  
  Homelessness .......................................................................................... 7.11  
  Housing for Moderate Income Households ............................................. 7.12  
  Housing for Seniors and People with Special Needs .............................. 7.12  
  Housing Discrimination ......................................................................... 7.13  
  **Housing Policies** ............................................................................... 7.16  
  **Resources** .......................................................................................... 7.17  
  **Notes** ................................................................................................ 7.18  

**Infrastructure** ...................................................................................... 8.1  
  **Overview** .......................................................................................... 8.1  
  **Water Supply** .................................................................................... 8.3  
  Background ............................................................................................ 8.3  
  Water Supply Policies ............................................................................ 8.3  
  **Wastewater Treatment** ..................................................................... 8.4  
  Background ............................................................................................ 8.4  
  Wastewater Treatment Policies ............................................................... 8.7  
  **Flood and Stormwater Control** .......................................................... 8.7  
  Background ............................................................................................ 8.7  
  National Flood Insurance Program (NFIP) ............................................. 8.8  
  *Clean Water Act (CWA)* ...................................................................... 8.9  
  Vermont Stormwater Discharge Permits ............................................... 8.9  
  Vermont’s Stormwater-Impaired Watersheds .......................................... 8.9  
  Phase II NPDES ....................................................................................... 8.10  
  Municipal Regulations ........................................................................... 8.11  
  Flood and Stormwater Control Policies ................................................. 8.12
# Table of Contents

- **Flood / Ice Jam** .................................................. 11.7
- **Severe Winter Storm** ........................................... 11.8
- **Erosion / Landslide** ........................................... 11.8
- **Earthquake** ..................................................... 11.9
- **Other Natural Hazards** ....................................... 11.9
- **Societal Hazards** ............................................... 11.9
  - **Crime** ....................................................... 11.9
  - **Other Societal Hazards** .................................. 11.10
- **Technological Hazards** .................................... 11.11
  - **Transportation Incident** .................................. 11.11
  - **Hazardous Materials** ...................................... 11.11
  - **Pollution Event** ........................................... 11.11
  - **Other Technological Hazards** ......................... 11.14
- **Public Safety Policies** .................................... 11.14
- **Resources** .................................................. 11.15
- **Notes** ...................................................... 11.15

# Glossary

- ................................................................. 12.1

# Maps

- **Planning Areas** ............................................. 13.1
- **Existing Land-Use Types** .................................. 13.2
- **Existing Development Densities** ......................... 13.3
- **Historic Sites and Districts** ............................. 13.4
- **2003 Regional Build-Out Analysis** ..................... 13.5
- **Surface Waters and Watersheds** ......................... 13.6
- **Wetlands** ................................................... 13.7
- **Impaired Waters** ........................................... 13.8
- **Bedrock Geology** ........................................... 13.9
- **Surface Relief** ............................................. 13.10
- **Agricultural Soils** ....................................... 13.11
- **Forest Cover** ............................................... 13.12
- **Core Forests** ............................................... 13.13
- **Suitability for Natural Areas** ........................... 13.14
- **Conserved Lands** .......................................... 13.15
- **Population Growth** ....................................... 13.16
- **Population Density** ....................................... 13.17
- **Large Employers** .......................................... 13.18
- **Public Water Supply Systems** ............................ 13.19
- **Public Wastewater Treatment Systems** ................ 13.20
- **Soil Suitability for Septic** .............................. 13.21
- **Solid Waste Management Facilities** .................... 13.22
- **Existing Major Transportation Infrastructure** .... 13.23
- **Major Recommended Transportation Improvements** 13.24
- **Places of Assembly** ....................................... 13.25
- **Community Service Centers** ............................ 13.26
- **Child Care Facilities** .................................... 13.27
- **Indoor Recreation Facilities** ............................ 13.28
- **Outdoor Recreation Facilities and Areas** ............ 13.29
- **Natural Gas Service Areas** .............................. 13.30
- **Electric Power Service Areas** .......................... 13.31
- **Emergency Service Providers** .......................... 13.32
<table>
<thead>
<tr>
<th>#</th>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>Timeline for Preparing the 2006 Regional Plan</td>
<td>1.11</td>
</tr>
<tr>
<td>1-2</td>
<td>Substantial Regional Impact Quantitative Thresholds</td>
<td>1.18</td>
</tr>
<tr>
<td>2-1</td>
<td>Overview of Planning Area Characteristics</td>
<td>2.4</td>
</tr>
<tr>
<td>3-1</td>
<td>2003 Regional Build-out Analysis Results</td>
<td>3.6</td>
</tr>
<tr>
<td>3-2</td>
<td>Number of Farms of Different Sizes in Chittenden County, 1982 and 2002</td>
<td>3.7</td>
</tr>
<tr>
<td>3-3</td>
<td>Acres Devoted to Different Uses on Chittenden County Farms, 1982 and 2002</td>
<td>3.7</td>
</tr>
<tr>
<td>3-4</td>
<td>Value of Farm Products in Chittenden County, 1982 and 2002</td>
<td>3.7</td>
</tr>
<tr>
<td>3-5</td>
<td>Land in Farms in Chittenden County Municipalities, 2003</td>
<td>3.8</td>
</tr>
<tr>
<td>4-1</td>
<td>Revised 1990 Vermont Greenhouse Gas Emissions</td>
<td>4.5</td>
</tr>
<tr>
<td>4-2</td>
<td>Impaired Waterways in Chittenden County</td>
<td>4.8</td>
</tr>
<tr>
<td>4-3</td>
<td>1978 to 1993 Change in Core Forests</td>
<td>4.15</td>
</tr>
<tr>
<td>5-1</td>
<td>1960-2000 Population Growth in Chittenden County</td>
<td>5.2</td>
</tr>
<tr>
<td>5-2</td>
<td>Municipal Population Size and Density, 2000</td>
<td>5.7</td>
</tr>
<tr>
<td>5-3</td>
<td>Disability Status in Chittenden County, Vermont, and United States, 2000</td>
<td>5.10</td>
</tr>
<tr>
<td>5-4</td>
<td>Educational Attainment in Chittenden County, Vermont, and United States, 2000</td>
<td>5.10</td>
</tr>
<tr>
<td>5-5</td>
<td>Predicted Population and Employment Growth in Chittenden County</td>
<td>5.14</td>
</tr>
<tr>
<td>5-6</td>
<td>Predicted Average Annual Rates of Change (%)</td>
<td>5.15</td>
</tr>
<tr>
<td>5-7</td>
<td>Comparison of Woods &amp; Poole, Berger, and MISER Population Forecasts</td>
<td>5.15</td>
</tr>
<tr>
<td>5-8</td>
<td>Forecasted Population of Chittenden County</td>
<td>5.15</td>
</tr>
<tr>
<td>5-9</td>
<td>Average Annual Rates of Change (%) Associated with</td>
<td>5.16</td>
</tr>
<tr>
<td></td>
<td>the Chittenden County Population Forecasts</td>
<td></td>
</tr>
<tr>
<td>6-1</td>
<td>Employment and Establishments in Major Economic Sectors</td>
<td>6.3</td>
</tr>
<tr>
<td>6-2</td>
<td>Establishments by Size in Chittenden County and United States, 2004</td>
<td>6.4</td>
</tr>
<tr>
<td>6-3</td>
<td>2015 Employment Projections by Major Economic Sector</td>
<td>6.5</td>
</tr>
<tr>
<td>6-4</td>
<td>Types of Farm Enterprises in Chittenden County, 1982 and 2002</td>
<td>6.9</td>
</tr>
<tr>
<td>6-5</td>
<td>Value of Farm Products ($1,000) in Chittenden County, 1982 and 2002</td>
<td>6.9</td>
</tr>
<tr>
<td>6-6</td>
<td>Forestry and Forest-Related Economy in Chittenden County</td>
<td>6.10</td>
</tr>
<tr>
<td>7-1</td>
<td>Population and Households, 2000</td>
<td>7.1</td>
</tr>
<tr>
<td>7-2</td>
<td>Housing Supply, 2000</td>
<td>7.2</td>
</tr>
<tr>
<td>7-3</td>
<td>Housing Types, 2000</td>
<td>7.2</td>
</tr>
<tr>
<td>7-4</td>
<td>Housing Types by Municipality, 2000</td>
<td>7.2</td>
</tr>
<tr>
<td>7-5</td>
<td>Housing Inventory in Planning Areas, 2004</td>
<td>7.2</td>
</tr>
<tr>
<td>7-6</td>
<td>Age of Housing Stock, 2000</td>
<td>7.2</td>
</tr>
<tr>
<td>7-7</td>
<td>1990-2000 Growth in Housing Supply</td>
<td>7.4</td>
</tr>
<tr>
<td>7-8</td>
<td>1990-2000 Growth in Factors Affecting Housing Demand</td>
<td>7.4</td>
</tr>
<tr>
<td>7-9</td>
<td>1998-2004 Median Home Prices</td>
<td>7.5</td>
</tr>
<tr>
<td>7-10</td>
<td>Median Rental Housing Costs, 2005</td>
<td>7.5</td>
</tr>
<tr>
<td>7-11</td>
<td>Housing Cost Burden, 1989 and 1999</td>
<td>7.5</td>
</tr>
<tr>
<td>7-12</td>
<td>Initiatives to Promote Greater Housing Production</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>Identified by the 2002 Chittenden County Housing Task Force</td>
<td></td>
</tr>
<tr>
<td>7-13</td>
<td>Recommended Municipal 2000-2010 Housing Targets</td>
<td>7.9</td>
</tr>
<tr>
<td>7-14</td>
<td>Mobile Homes by Municipality, 2000</td>
<td>7.10</td>
</tr>
<tr>
<td>8-1</td>
<td>Service Areas of Wastewater Treatment Facilities, 2000</td>
<td>8.5</td>
</tr>
<tr>
<td>8-2</td>
<td>Service Capacities of Wastewater Treatment Facilities, 2000</td>
<td>8.5</td>
</tr>
<tr>
<td>8-3</td>
<td>2000 Reserve Capacity Versus 2010 and 2030 Forecasted Service</td>
<td>8.6</td>
</tr>
<tr>
<td></td>
<td>Demands of Wastewater Treatment Facilities</td>
<td></td>
</tr>
<tr>
<td>8-4</td>
<td>Suitability of Soils for On-Site Septic Systems</td>
<td>8.6</td>
</tr>
<tr>
<td>9-1</td>
<td>Children Under 18 Years Old with All Parents in the Labor Force, 2000</td>
<td>9.4</td>
</tr>
<tr>
<td>9-2</td>
<td>Estimated Children Under 13 Years Old with All Parents in the Labor Force, 2000</td>
<td>9.4</td>
</tr>
<tr>
<td>9-3</td>
<td>Capacity of Child Care Programs, 2005</td>
<td>9.5</td>
</tr>
</tbody>
</table>
Tables (Continued)

9-4 Estimated Need and Supply of Child Care Services in Chittenden County .......... 9.5
9-5 Weekly Child-Care Services Costs, 2005 .......................................................... 9.6
9-6 Uses of Chittenden County Outdoor Recreation Areas and Facilities ............. 9.8
9-7 Outdoor Recreation Measures Developed for Phase II of the CCRPC Open Space Plan ................................................................. 9.8

10-1 1980-2001 Change in Energy Sources for Vermont ........................................ 10.2
10-2 1980-2001 Change in Total Energy Consumption by Vermont’s Four Major Energy Consumption Sectors ................................................................. 10.4
10-3 1980-2001 Change in Vermont’s Residential Energy Sources ..................... 10.6
10-4 1980-2001 Change in Vermont’s Industrial Energy Sources ....................... 10.7
10-5 1980-2001 Change in Vermont’s Commercial Energy Sources .................... 10.9
10-6 1980-2001 Change in Energy Sources for Vermont’s Electric Power Generation ................................................................. 10.11

11-1 Public Safety Personnel in Chittenden County, 2005 .................................. 11.2
11-2 Fire Fighting Apparatus in Chittenden County, 2005 .................................. 11.3
11-3 Special Public Safety Response Modes in Chittenden County, 2005 .......... 11.3
11-4 Special Public Safety Service Capabilities in Chittenden County, 2005 .... 11.4
11-5 Hazardous Waste Materials Capabilities in Chittenden County, 2005 ...... 11.4
11-6 Existing Public Safety Mutual Aid Agreements ............................................. 11.5
11-7 Types of Fire Department Responses in Chittenden County, 2003 ............. 11.7
11-8 Other Natural Hazards .................................................................................. 11.9
11-9 Type I and Type II Crime Rates in Chittenden County, 2003 .................... 11.10
11-10 Other Societal Hazards .............................................................................. 11.10
11-14 Other Technological Hazards ..................................................................... 11.14

Figures

1-1 Location of Chittenden County, Vermont ..................................................... 1.2
1-2 Burlington – South Burlington MSA, 1990 and 2003 ................................. 1.6
3-1 Portions of the County in Major Land-Use Categories ................................. 3.2
3-2 Portions of the County in Land-Use Density Categories ............................ 3.3
3-3 Summary of 2005 CCRPC Agricultural Futures Forum – Reported Success Factors and Obstacles to Farming in Chittenden County ............ 3.9
4-1 Air Quality (NAAQS Compliance) Trends in Chittenden County ............. 4.2
5-1 Population in Chittenden County, 1960-2000 ............................................. 5.3
5-3 Shares of Vermont’s Population in Chittenden County and Northwest Vermont, 1960-2000 ................................................................. 5.3
5-4 Average Household Size in Chittenden County and Vermont, 1960-2000 .... 5.4
5-5 Average Family Size in Chittenden County and Vermont, 1960-2000 ........ 5.4
5-6 Percentages of Total Households that are Single Person Households in Chittenden County and Vermont, 1960-2000 ............................... 5.4
5-7 Median Age in Chittenden County and Vermont, 1960-2000 .................... 5.5
5-8 Percentages of Residents Aged 65+ in Chittenden County and Vermont, 1960-2000 ................................................................. 5.5
5-9 Percentages of Residents Aged Under 18 in Chittenden County and Vermont, 1960-2000 ................................................................. 5.6
5-10 Percentages of Residents Who were Born in Vermont in Chittenden County and Vermont, 1960-2000 ................................................................. 5.6
5-11 Percentages of Residents Who are White Non-Hispanic in Vermont in Chittenden County and Vermont, 1960-2000 ............................... 5.6

Table of Contents / 0.7
Figures (Continued)

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-12</td>
<td>Population Pyramid for Chittenden County, 2000</td>
</tr>
<tr>
<td>5-13</td>
<td>Race and Hispanic/Latino Ethnicity of Chittenden County Residents, 2000</td>
</tr>
<tr>
<td>5-14</td>
<td>Ancestries of Chittenden County Residents, 2000</td>
</tr>
<tr>
<td>5-15</td>
<td>People in Group Quarters, Households, and Families in Chittenden County, 2000</td>
</tr>
<tr>
<td>5-16</td>
<td>Examples of Different Types of Population Projection Methods</td>
</tr>
<tr>
<td>6-1</td>
<td>The Circle of Prosperity</td>
</tr>
<tr>
<td>6-2</td>
<td>The Multiplier Effect</td>
</tr>
<tr>
<td>6-3</td>
<td>Key Industries and Illustrative Employers Identified in the <em>Long-Term Strategic Economic Development Plan</em></td>
</tr>
<tr>
<td>6-4</td>
<td>Chittenden County’s Economic Development Strengths and Weaknesses Identified in the <em>Long-Term Strategic Economic Development Plan</em></td>
</tr>
<tr>
<td>7-1</td>
<td>Identified Impediments to Fair Housing Choice</td>
</tr>
<tr>
<td>7-2</td>
<td>Examples of Municipal Actions Determined to be Fair Housing Law Violations</td>
</tr>
<tr>
<td>7-3</td>
<td>Potential Municipal Costs to Defend a Fair Housing Law Complaint and if a Fair Housing Violation is Found</td>
</tr>
<tr>
<td>8-1</td>
<td>Vision and Goals of the 2025 <em>Chittenden County Metropolitan Transportation Plan</em></td>
</tr>
<tr>
<td>8-2</td>
<td>Federal Telecom Act of 1996 – Five Major Limitations on State and Local Regulations</td>
</tr>
<tr>
<td>10-1</td>
<td>Vermont Energy Sources, 2001</td>
</tr>
<tr>
<td>10-2</td>
<td>Total Energy Consumption by Vermont’s Four Major Energy Consumption Sectors, 2001</td>
</tr>
<tr>
<td>10-3</td>
<td>Vermont’s Residential Energy Sources, 2001</td>
</tr>
<tr>
<td>10-4</td>
<td>Vermont’s Industrial Energy Sources, 2001</td>
</tr>
<tr>
<td>10-5</td>
<td>Vermont’s Commercial Energy Sources, 2001</td>
</tr>
<tr>
<td>10-6</td>
<td>Consumption of Energy Produced in Vermont, 2001</td>
</tr>
<tr>
<td>10-7</td>
<td>Energy Sources for Vermont’s Electric Power Generation, 2001</td>
</tr>
<tr>
<td>10-8</td>
<td>Wind Resource Potential in Chittenden County</td>
</tr>
</tbody>
</table>

Page

5.8
5.9
5.10
5.11
5.17
6.1
6.4
6.7
6.8
7.13
7.15
7.16
8.15
8.17
10.2
10.4
10.6
10.7
10.9
10.10
10.11
10.13
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1.1</td>
</tr>
<tr>
<td>Vision Statement</td>
<td>1.1</td>
</tr>
<tr>
<td>Chittenden County</td>
<td>1.2</td>
</tr>
<tr>
<td>Overview</td>
<td>1.2</td>
</tr>
<tr>
<td>History</td>
<td>1.3</td>
</tr>
<tr>
<td>Regional Setting</td>
<td>1.5</td>
</tr>
<tr>
<td>The Chittenden County Regional Planning Commission (CCRPC)</td>
<td>1.7</td>
</tr>
<tr>
<td>Overview of Vermont’s Regional Planning Commissions (RPCs)</td>
<td>1.7</td>
</tr>
<tr>
<td>History of CCRPC</td>
<td>1.7</td>
</tr>
<tr>
<td>The 2006 Regional Plan</td>
<td>1.8</td>
</tr>
<tr>
<td>Why Plan?</td>
<td>1.8</td>
</tr>
<tr>
<td>The Purposes of a Regional Plan</td>
<td>1.9</td>
</tr>
<tr>
<td>The Style of the 2006 Regional Plan</td>
<td>1.9</td>
</tr>
<tr>
<td>The Relationships between the 2006 Regional Plan and Other Plans</td>
<td>1.10</td>
</tr>
<tr>
<td>Statement of Compatibility and Consistency</td>
<td>1.10</td>
</tr>
<tr>
<td>How the 2006 Regional Plan was Prepared</td>
<td>1.10</td>
</tr>
<tr>
<td>Overall Process</td>
<td>1.10</td>
</tr>
<tr>
<td>Maps / Geographic Information System (GIS)</td>
<td>1.13</td>
</tr>
<tr>
<td>Differences between the 2001 and 2006 Regional Plans</td>
<td>1.13</td>
</tr>
<tr>
<td>Planning Areas</td>
<td>1.13</td>
</tr>
<tr>
<td>Policy Plan</td>
<td>1.14</td>
</tr>
<tr>
<td>Implementing the Regional Plan</td>
<td>1.14</td>
</tr>
<tr>
<td>Collaboration</td>
<td>1.15</td>
</tr>
<tr>
<td>Act 250 and Section 848 / Substantial Regional Impact</td>
<td>1.16</td>
</tr>
<tr>
<td>Notes</td>
<td>1.17</td>
</tr>
<tr>
<td>Planning Areas</td>
<td>2.1</td>
</tr>
<tr>
<td>Overview of Planning Areas</td>
<td>2.1</td>
</tr>
<tr>
<td>General Description and Purposes</td>
<td>2.1</td>
</tr>
<tr>
<td>Relationship of Planning Areas and Growth Centers</td>
<td>2.2</td>
</tr>
<tr>
<td>Establishing Planning Areas</td>
<td>2.3</td>
</tr>
<tr>
<td>Planning Area Descriptions</td>
<td>2.4</td>
</tr>
<tr>
<td>Metropolitan Planning Area</td>
<td>2.4</td>
</tr>
<tr>
<td>Transition Planning Area</td>
<td>2.5</td>
</tr>
<tr>
<td>Enterprise Planning Area</td>
<td>2.6</td>
</tr>
<tr>
<td>Village Planning Area</td>
<td>2.6</td>
</tr>
<tr>
<td>Rural Planning Area</td>
<td>2.7</td>
</tr>
<tr>
<td>Notes</td>
<td>2.7</td>
</tr>
<tr>
<td>Land Use</td>
<td>3.1</td>
</tr>
<tr>
<td>Existing Land Use</td>
<td>3.1</td>
</tr>
<tr>
<td>Land Use Types</td>
<td>3.1</td>
</tr>
<tr>
<td>Development Densities</td>
<td>3.3</td>
</tr>
<tr>
<td>Historic and Archeological Sites and Districts</td>
<td>3.3</td>
</tr>
<tr>
<td>Future Land Use</td>
<td>3.5</td>
</tr>
<tr>
<td>Regional Build-out Analysis</td>
<td>3.5</td>
</tr>
<tr>
<td>Agricultural Preservation</td>
<td>3.6</td>
</tr>
<tr>
<td>Category</td>
<td>Page</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Land Use Policies</td>
<td>3.10</td>
</tr>
<tr>
<td>General Policies</td>
<td>3.10</td>
</tr>
<tr>
<td>Metropolitan Planning Area Policies</td>
<td>3.11</td>
</tr>
<tr>
<td>Transition Planning Area Policies</td>
<td>3.11</td>
</tr>
<tr>
<td>Enterprise Planning Area Policies</td>
<td>3.12</td>
</tr>
<tr>
<td>Village Planning Area Policies</td>
<td>3.12</td>
</tr>
<tr>
<td>Rural Planning Area Policies</td>
<td>3.12</td>
</tr>
<tr>
<td>Resources</td>
<td>3.13</td>
</tr>
<tr>
<td>Notes</td>
<td>3.13</td>
</tr>
<tr>
<td>Natural Resources</td>
<td>4.1</td>
</tr>
<tr>
<td>Air Quality</td>
<td>4.1</td>
</tr>
<tr>
<td>Background</td>
<td>4.1</td>
</tr>
<tr>
<td>Air Quality Standards</td>
<td>4.1</td>
</tr>
<tr>
<td>Acid Deposition (Acid Rain)</td>
<td>4.3</td>
</tr>
<tr>
<td>Mercury Deposition</td>
<td>4.4</td>
</tr>
<tr>
<td>Climate Change</td>
<td>4.4</td>
</tr>
<tr>
<td>Air Quality Policies</td>
<td>4.6</td>
</tr>
<tr>
<td>Water Quality</td>
<td>4.6</td>
</tr>
<tr>
<td>Background</td>
<td>4.6</td>
</tr>
<tr>
<td>Water Quality Concerns</td>
<td>4.7</td>
</tr>
<tr>
<td>Wetlands</td>
<td>4.9</td>
</tr>
<tr>
<td>Water Quality Policies</td>
<td>4.11</td>
</tr>
<tr>
<td>Land Resource Quality</td>
<td>4.12</td>
</tr>
<tr>
<td>Earth Resources</td>
<td>4.12</td>
</tr>
<tr>
<td>Background</td>
<td>4.12</td>
</tr>
<tr>
<td>Earth Resources Policies</td>
<td>4.12</td>
</tr>
<tr>
<td>Agricultural Soils</td>
<td>4.12</td>
</tr>
<tr>
<td>Background</td>
<td>4.12</td>
</tr>
<tr>
<td>Agricultural Soils Policies</td>
<td>4.13</td>
</tr>
<tr>
<td>Forest Resources</td>
<td>4.13</td>
</tr>
<tr>
<td>Background</td>
<td>4.13</td>
</tr>
<tr>
<td>Forest Resources Policies</td>
<td>4.13</td>
</tr>
<tr>
<td>Natural Areas</td>
<td>4.16</td>
</tr>
<tr>
<td>Background</td>
<td>4.16</td>
</tr>
<tr>
<td>Natural Areas Policies</td>
<td>4.18</td>
</tr>
<tr>
<td>Resources</td>
<td>4.18</td>
</tr>
<tr>
<td>Notes</td>
<td>4.19</td>
</tr>
<tr>
<td>Demographics</td>
<td>5.1</td>
</tr>
<tr>
<td>Overview</td>
<td>5.1</td>
</tr>
<tr>
<td>Recent Trends</td>
<td>5.2</td>
</tr>
<tr>
<td>Population Growth</td>
<td>5.2</td>
</tr>
<tr>
<td>Household Size</td>
<td>5.2</td>
</tr>
<tr>
<td>Aging of the Population and Other Characteristics</td>
<td>5.5</td>
</tr>
<tr>
<td>Current Conditions</td>
<td>5.7</td>
</tr>
<tr>
<td>Population Density</td>
<td>5.7</td>
</tr>
<tr>
<td>Age and Gender Cohorts</td>
<td>5.7</td>
</tr>
<tr>
<td>Diversity</td>
<td>5.9</td>
</tr>
<tr>
<td>Household Characteristics</td>
<td>5.9</td>
</tr>
<tr>
<td>Forecasts</td>
<td>5.12</td>
</tr>
<tr>
<td>Background</td>
<td>5.12</td>
</tr>
<tr>
<td>Countywide Population Forecast</td>
<td>5.12</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Appendix – Population Projection and Forecasting Methods</td>
<td>5.16</td>
</tr>
<tr>
<td>Projection Methods</td>
<td>5.16</td>
</tr>
<tr>
<td>Forecasting Methods</td>
<td>5.18</td>
</tr>
<tr>
<td>Resources</td>
<td>5.19</td>
</tr>
<tr>
<td>Notes</td>
<td>5.20</td>
</tr>
<tr>
<td>Economic Development</td>
<td>6.1</td>
</tr>
<tr>
<td>Background</td>
<td>6.1</td>
</tr>
<tr>
<td>Defining “Economic Development”</td>
<td>6.1</td>
</tr>
<tr>
<td>Existing Conditions and Employment Forecast</td>
<td>6.2</td>
</tr>
<tr>
<td>Developing the County’s Economy</td>
<td>6.5</td>
</tr>
<tr>
<td>Adequate Supplies of Land for Future Employers</td>
<td>6.6</td>
</tr>
<tr>
<td>Farming and Forestry</td>
<td>6.9</td>
</tr>
<tr>
<td>Tourism and Visitasion</td>
<td>6.10</td>
</tr>
<tr>
<td>Other Parts of the County’s Economic Foundation</td>
<td>6.11</td>
</tr>
<tr>
<td>Regulatory Issues</td>
<td>6.12</td>
</tr>
<tr>
<td>Brownfields</td>
<td>6.12</td>
</tr>
<tr>
<td>Economic Development Policies</td>
<td>6.12</td>
</tr>
<tr>
<td>Resources</td>
<td>6.13</td>
</tr>
<tr>
<td>Notes</td>
<td>6.14</td>
</tr>
<tr>
<td>Housing</td>
<td>7.1</td>
</tr>
<tr>
<td>Existing Conditions</td>
<td>7.1</td>
</tr>
<tr>
<td>Housing Needs Forecast</td>
<td>7.6</td>
</tr>
<tr>
<td>Special Housing Concerns</td>
<td>7.10</td>
</tr>
<tr>
<td>Affordable Housing</td>
<td>7.10</td>
</tr>
<tr>
<td>Homelessness</td>
<td>7.11</td>
</tr>
<tr>
<td>Housing for Moderate Income Households</td>
<td>7.12</td>
</tr>
<tr>
<td>Housing for Seniors and People with Special Needs</td>
<td>7.12</td>
</tr>
<tr>
<td>Housing Discrimination</td>
<td>7.13</td>
</tr>
<tr>
<td>Housing Policies</td>
<td>7.16</td>
</tr>
<tr>
<td>Resources</td>
<td>7.17</td>
</tr>
<tr>
<td>Notes</td>
<td>7.18</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>8.1</td>
</tr>
<tr>
<td>Overview</td>
<td>8.1</td>
</tr>
<tr>
<td>Water Supply</td>
<td>8.3</td>
</tr>
<tr>
<td>Background</td>
<td>8.3</td>
</tr>
<tr>
<td>Water Supply Policies</td>
<td>8.3</td>
</tr>
<tr>
<td>Wastewater Treatment</td>
<td>8.4</td>
</tr>
<tr>
<td>Background</td>
<td>8.4</td>
</tr>
<tr>
<td>Wastewater Treatment Policies</td>
<td>8.7</td>
</tr>
<tr>
<td>Flood and Stormwater Control</td>
<td>8.7</td>
</tr>
<tr>
<td>Background</td>
<td>8.7</td>
</tr>
<tr>
<td>National Flood Insurance Program (NFIP)</td>
<td>8.8</td>
</tr>
<tr>
<td>Clean Water Act (CWA)</td>
<td>8.9</td>
</tr>
<tr>
<td>Vermont Stormwater Discharge Permits</td>
<td>8.9</td>
</tr>
<tr>
<td>Vermont’s Stormwater-Impaired Watersheds</td>
<td>8.9</td>
</tr>
<tr>
<td>Phase II NPDES</td>
<td>8.10</td>
</tr>
<tr>
<td>Municipal Regulations</td>
<td>8.11</td>
</tr>
<tr>
<td>Flood and Stormwater Control Policies</td>
<td>8.12</td>
</tr>
<tr>
<td>Topic</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Flood / Ice Jam</td>
<td>11.7</td>
</tr>
<tr>
<td>Severe Winter Storm</td>
<td>11.8</td>
</tr>
<tr>
<td>Erosion / Landslide</td>
<td>11.8</td>
</tr>
<tr>
<td>Earthquake</td>
<td>11.9</td>
</tr>
<tr>
<td>Other Natural Hazards</td>
<td>11.9</td>
</tr>
<tr>
<td>Societal Hazards</td>
<td>11.9</td>
</tr>
<tr>
<td>Crime</td>
<td>11.9</td>
</tr>
<tr>
<td>Other Societal Hazards</td>
<td>11.10</td>
</tr>
<tr>
<td>Technological Hazards</td>
<td>11.11</td>
</tr>
<tr>
<td>Transportation Incident</td>
<td>11.11</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>11.11</td>
</tr>
<tr>
<td>Pollution Event</td>
<td>11.11</td>
</tr>
<tr>
<td>Other Technological Hazards</td>
<td>11.14</td>
</tr>
<tr>
<td>Public Safety Policies</td>
<td>11.14</td>
</tr>
<tr>
<td>Resources</td>
<td>11.15</td>
</tr>
<tr>
<td>Notes</td>
<td>11.15</td>
</tr>
<tr>
<td>Glossary</td>
<td>12.1</td>
</tr>
<tr>
<td>Maps</td>
<td>13.1</td>
</tr>
<tr>
<td>2-1 Planning Areas</td>
<td>13.1</td>
</tr>
<tr>
<td>3-1 Existing Land-Use Types</td>
<td>13.2</td>
</tr>
<tr>
<td>3-2 Existing Development Densities</td>
<td>13.3</td>
</tr>
<tr>
<td>3-3 Historic Sites and Districts</td>
<td>13.4</td>
</tr>
<tr>
<td>3-4 2003 Regional Build-Out Analysis</td>
<td>13.5</td>
</tr>
<tr>
<td>4-1 Surface Waters and Watersheds</td>
<td>13.6</td>
</tr>
<tr>
<td>4-2 Wetlands</td>
<td>13.7</td>
</tr>
<tr>
<td>4-3 Impaired Waters</td>
<td>13.8</td>
</tr>
<tr>
<td>4-4 Bedrock Geology</td>
<td>13.9</td>
</tr>
<tr>
<td>4-5 Surface Relief</td>
<td>13.10</td>
</tr>
<tr>
<td>4-6 Agricultural Soils</td>
<td>13.11</td>
</tr>
<tr>
<td>4-7 Forest Cover</td>
<td>13.12</td>
</tr>
<tr>
<td>4-8 Core Forests</td>
<td>13.13</td>
</tr>
<tr>
<td>4-9 Suitability for Natural Areas</td>
<td>13.14</td>
</tr>
<tr>
<td>4-10 Conserved Lands</td>
<td>13.15</td>
</tr>
<tr>
<td>5-1 Population Growth</td>
<td>13.16</td>
</tr>
<tr>
<td>5-2 Population Density</td>
<td>13.17</td>
</tr>
<tr>
<td>6-1 Large Employers</td>
<td>13.18</td>
</tr>
<tr>
<td>8-1 Public Water Supply Systems</td>
<td>13.19</td>
</tr>
<tr>
<td>8-2 Public Wastewater Treatment Systems</td>
<td>13.20</td>
</tr>
<tr>
<td>8-3 Soil Suitability for Septic</td>
<td>13.21</td>
</tr>
<tr>
<td>8-4 Solid Waste Management Facilities</td>
<td>13.22</td>
</tr>
<tr>
<td>8-5 Existing Major Transportation Infrastructure</td>
<td>13.23</td>
</tr>
<tr>
<td>8-6 Major Recommended Transportation Improvements</td>
<td>13.24</td>
</tr>
<tr>
<td>9-1 Places of Assembly</td>
<td>13.25</td>
</tr>
<tr>
<td>9-2 Community Service Centers</td>
<td>13.26</td>
</tr>
<tr>
<td>9-3 Child Care Facilities</td>
<td>13.27</td>
</tr>
<tr>
<td>9-4 Indoor Recreation Facilities</td>
<td>13.28</td>
</tr>
<tr>
<td>9-5 Outdoor Recreation Facilities and Areas</td>
<td>13.29</td>
</tr>
<tr>
<td>10-1 Natural Gas Service Areas</td>
<td>13.30</td>
</tr>
<tr>
<td>10-2 Electric Power Service Areas</td>
<td>13.31</td>
</tr>
<tr>
<td>11-1 Emergency Service Providers</td>
<td>13.32</td>
</tr>
</tbody>
</table>
Tables

1-1 Timeline for Preparing the 2006 Regional Plan ........................................... 1.11
2-1 Overview of Planning Area Characteristics ................................................. 2.4
3-1 2003 Regional Build-out Analysis Results ................................................ 3.6
3-2 Number of Farms of Different Sizes in Chittenden County, 1982 and 2002 .......... 3.7
3-3 Acres Devoted to Different Uses on Chittenden County Farms, 1982 and 2002 .. 3.7
3-4 Value of Farm Products in Chittenden County, 1982 and 2002 ...................... 3.7
3-5 Land in Farms in Chittenden County Municipalities, 2003 .......................... 3.8
4-1 Revised 1990 Vermont Greenhouse Gas Emissions .................................... 4.5
4-2 Impaired Waterways in Chittenden County ................................................ 4.8
4-3 1978 to 1993 Change in Core Forests ...................................................... 4.15
5-1 1960-2000 Population Growth in Chittenden County ................................. 5.2
5-2 Municipal Population Size and Density, 2000 ........................................... 5.7
5-3 Disability Status in Chittenden County, Vermont, and United States, 2000 .... 5.10
5-4 Educational Attainment in Chittenden County, Vermont, and United States, 2000 5.10
5-5 Predicted Population and Employment Growth in Chittenden County .......... 5.14
5-6 Predicted Average Annual Rates of Change (%) in Population and Employment in Chittenden County .......................................................... 5.14
5-7 Comparison of Woods & Poole, Berger, and MISER Population Forecasts for Chittenden County ................................................................. 5.15
5-8 Forecasted Population of Chittenden County ............................................. 5.15
5-9 Average Annual Rates of Change (%) Associated with the Chittenden County Population Forecasts ............................................................... 5.16
6-1 Employment and Establishments in Major Economic Sectors in Chittenden County and United States, 2004 .................................................. 6.3
6-2 Establishments by Size in Chittenden County and United States, 2004 .......... 6.4
6-3 2015 Employment Projections by Major Economic Sector ......................... 6.5
6-4 Types of Farm Enterprises in Chittenden County, 1982 and 2002 ................ 6.9
6-5 Value of Farm Products ($1,000) in Chittenden County, 1982 and 2002 ..... 6.9
6-6 Forestry and Forest-Related Economy in Chittenden County ..................... 6.10
7-1 Population and Households, 2000 ............................................................. 7.1
7-2 Housing Supply, 2000 .............................................................................. 7.2
7-3 Housing Types, 2000 .............................................................................. 7.2
7-4 Housing Types by Municipality, 2000 ...................................................... 7.2
7-5 Housing Inventory in Planning Areas, 2004 .............................................. 7.3
7-6 Age of Housing Stock, 2000 .................................................................. 7.3
7-7 1990-2000 Growth in Housing Supply .................................................... 7.4
7-8 1990-2000 Growth in Factors Affecting Housing Demand ....................... 7.4
7-9 1998-2004 Median Home Prices ............................................................. 7.5
7-10 Median Rental Housing Costs, 2005 ....................................................... 7.5
7-11 Housing Cost Burden, 1989 and 1999 ..................................................... 7.5
7-12 Initiatives to Promote Greater Housing Production Identified by the 2002 Chittenden County Housing Task Force .............................................. 7.7
7-13 Recommended Municipal 2000-2010 Housing Targets ............................. 7.9
7-14 Mobile Homes by Municipality, 2000 ....................................................... 7.10
8-1 Service Areas of Wastewater Treatment Facilities, 2000 ............................ 8.5
8-2 Service Capacities of Wastewater Treatment Facilities, 2000 .................... 8.5
8-3 2000 Reserve Capacity Versus 2010 and 2030 Forecasted Service Demands of Wastewater Treatment Facilities ........................................... 8.6
8-4 Suitability of Soils for On-Site Septic Systems ......................................... 8.6
9-1 Children Under 18 Years Old with All Parents in the Labor Force, 2000 ....... 9.4
9-2 Estimated Children Under 13 Years Old with All Parents in the Labor Force, 2000 9.4
9-3 Capacity of Child Care Programs, 2005 .................................................... 9.5
9-4 Estimated Need and Supply of Child Care Services in Chittenden County .... 9.5
### Tables (Continued)

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-5</td>
<td>Weekly Child-Care Services Costs, 2005</td>
<td>9.6</td>
</tr>
<tr>
<td>9-6</td>
<td>Uses of Chittenden County Outdoor Recreation Areas and Facilities</td>
<td>9.8</td>
</tr>
<tr>
<td>9-7</td>
<td>Outdoor Recreation Measures Developed for Phase II of the CCRPC Open Space Plan</td>
<td>9.8</td>
</tr>
<tr>
<td>10-1</td>
<td>1980-2001 Change in Energy Sources for Vermont</td>
<td>10.2</td>
</tr>
<tr>
<td>10-2</td>
<td>1980-2001 Change in Total Energy Consumption by Vermont’s Four Major Energy Consumption Sectors</td>
<td>10.4</td>
</tr>
<tr>
<td>10-3</td>
<td>1980-2001 Change in Vermont’s Residential Energy Sources</td>
<td>10.6</td>
</tr>
<tr>
<td>10-4</td>
<td>1980-2001 Change in Vermont’s Industrial Energy Sources</td>
<td>10.7</td>
</tr>
<tr>
<td>10-5</td>
<td>1980-2001 Change in Vermont’s Commercial Energy Sources</td>
<td>10.9</td>
</tr>
<tr>
<td>10-6</td>
<td>1980-2001 Change in Energy Sources for Vermont’s Electric Power Generation</td>
<td>10.11</td>
</tr>
<tr>
<td>11-1</td>
<td>Public Safety Personnel in Chittenden County, 2005</td>
<td>11.2</td>
</tr>
<tr>
<td>11-2</td>
<td>Fire Fighting Apparatus in Chittenden County, 2005</td>
<td>11.3</td>
</tr>
<tr>
<td>11-3</td>
<td>Special Public Safety Response Modes in Chittenden County, 2005</td>
<td>11.3</td>
</tr>
<tr>
<td>11-4</td>
<td>Special Public Safety Service Capabilities in Chittenden County, 2005</td>
<td>11.4</td>
</tr>
<tr>
<td>11-5</td>
<td>Hazardous Waste Materials Capabilities in Chittenden County, 2005</td>
<td>11.4</td>
</tr>
<tr>
<td>11-6</td>
<td>Existing Public Safety Mutual Aid Agreements</td>
<td>11.5</td>
</tr>
<tr>
<td>11-7</td>
<td>Types of Fire Department Responses in Chittenden County, 2003</td>
<td>11.7</td>
</tr>
<tr>
<td>11-8</td>
<td>Other Natural Hazards</td>
<td>11.9</td>
</tr>
<tr>
<td>11-9</td>
<td>Type I and Type II Crime Rates in Chittenden County, 2003</td>
<td>11.10</td>
</tr>
<tr>
<td>11-10</td>
<td>Other Societal Hazards</td>
<td>11.10</td>
</tr>
<tr>
<td>11-14</td>
<td>Other Technological Hazards</td>
<td>11.14</td>
</tr>
</tbody>
</table>

### Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>Location of Chittenden County, Vermont</td>
<td>1.2</td>
</tr>
<tr>
<td>1-2</td>
<td>Burlington – South Burlington MSA, 1990 and 2003</td>
<td>1.6</td>
</tr>
<tr>
<td>3-1</td>
<td>Portions of the County in Major Land-Use Categories</td>
<td>3.2</td>
</tr>
<tr>
<td>3-2</td>
<td>Portions of the County in Land-Use Density Categories</td>
<td>3.3</td>
</tr>
<tr>
<td>3-3</td>
<td>Summary of 2005 CCRPC Agricultural Futures Forum – Reported Success Factors and Obstacles to Farming in Chittenden County</td>
<td>3.9</td>
</tr>
<tr>
<td>4-1</td>
<td>Air Quality (NAAQS Compliance) Trends in Chittenden County</td>
<td>4.2</td>
</tr>
<tr>
<td>5-1</td>
<td>Population in Chittenden County, 1960-2000</td>
<td>5.3</td>
</tr>
<tr>
<td>5-2</td>
<td>Average Annual Rates of Population Growth in Chittenden County, Northwest Vermont, Vermont, and United States, 1960 – 2000</td>
<td>5.3</td>
</tr>
<tr>
<td>5-3</td>
<td>Shares of Vermont’s Population in Chittenden County and Northwest Vermont, 1960-2000</td>
<td>5.3</td>
</tr>
<tr>
<td>5-4</td>
<td>Average Household Size in Chittenden County and Vermont, 1960-2000</td>
<td>5.4</td>
</tr>
<tr>
<td>5-5</td>
<td>Average Family Size in Chittenden County and Vermont, 1960-2000</td>
<td>5.4</td>
</tr>
<tr>
<td>5-6</td>
<td>Percentages of Total Households that are Single Person Households in Chittenden County and Vermont, 1960-2000</td>
<td>5.4</td>
</tr>
<tr>
<td>5-7</td>
<td>Median Age in Chittenden County and Vermont, 1960-2000</td>
<td>5.5</td>
</tr>
<tr>
<td>5-8</td>
<td>Percentages of Residents Aged 65+ in Chittenden County and Vermont, 1960-2000</td>
<td>5.5</td>
</tr>
<tr>
<td>5-9</td>
<td>Percentages of Residents Aged Under 18 in Chittenden County and Vermont, 1960-2000</td>
<td>5.5</td>
</tr>
<tr>
<td>5-10</td>
<td>Percentages of Residents Who were Born in Vermont in Chittenden County and Vermont, 1960-2000</td>
<td>5.6</td>
</tr>
<tr>
<td>5-11</td>
<td>Percentages of Residents Who are White Non-Hispanic in Vermont in Chittenden County and Vermont, 1960-2000</td>
<td>5.6</td>
</tr>
<tr>
<td>5-12</td>
<td>Population Pyramid for Chittenden County, 2000</td>
<td>5.8</td>
</tr>
<tr>
<td>Figures (Continued)</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>5-13 Race and Hispanic/Latino Ethnicity of Chittenden County Residents, 2000</td>
<td>5.9</td>
<td></td>
</tr>
<tr>
<td>5-14 Ancestries of Chittenden County Residents, 2000</td>
<td>5.10</td>
<td></td>
</tr>
<tr>
<td>5-15 People in Group Quarters, Households, and Families in Chittenden County, 2000</td>
<td>5.11</td>
<td></td>
</tr>
<tr>
<td>5-16 Examples of Different Types of Population Projection Methods</td>
<td>5.17</td>
<td></td>
</tr>
<tr>
<td>6-1 The Circle of Prosperity</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>6-2 The Multiplier Effect</td>
<td>6.4</td>
<td></td>
</tr>
<tr>
<td>6-3 Key Industries and Illustrative Employers Identified in the Long-Term Strategic Economic Development Plan</td>
<td>6.7</td>
<td></td>
</tr>
<tr>
<td>6-4 Chittenden County’s Economic Development Strengths and Weaknesses Identified in the Long-Term Strategic Economic Development Plan</td>
<td>6.8</td>
<td></td>
</tr>
<tr>
<td>7-1 Identified Impediments to Fair Housing Choice</td>
<td>7.13</td>
<td></td>
</tr>
<tr>
<td>7-2 Examples of Municipal Actions Determined to be Fair Housing Law Violations</td>
<td>7.15</td>
<td></td>
</tr>
<tr>
<td>7-3 Potential Municipal Costs to Defend a Fair Housing Law Complaint and if a Fair Housing Violation is Found</td>
<td>7.16</td>
<td></td>
</tr>
<tr>
<td>8-1 Vision and Goals of the 2025 Chittenden County Metropolitan Transportation Plan</td>
<td>8.15</td>
<td></td>
</tr>
<tr>
<td>8-2 Federal Telecom Act of 1996 – Five Major Limitations on State and Local Regulations</td>
<td>8.17</td>
<td></td>
</tr>
<tr>
<td>10-1 Vermont Energy Sources, 2001</td>
<td>10.2</td>
<td></td>
</tr>
<tr>
<td>10-2 Total Energy Consumption by Vermont’s Four Major Energy Consumption Sectors, 2001</td>
<td>10.4</td>
<td></td>
</tr>
<tr>
<td>10-3 Vermont’s Residential Energy Sources, 2001</td>
<td>10.6</td>
<td></td>
</tr>
<tr>
<td>10-4 Vermont’s Industrial Energy Sources, 2001</td>
<td>10.7</td>
<td></td>
</tr>
<tr>
<td>10-5 Vermont’s Commercial Energy Sources, 2001</td>
<td>10.9</td>
<td></td>
</tr>
<tr>
<td>10-6 Consumption of Energy Produced in Vermont, 2001</td>
<td>10.10</td>
<td></td>
</tr>
<tr>
<td>10-7 Energy Sources for Vermont’s Electric Power Generation, 2001</td>
<td>10.11</td>
<td></td>
</tr>
<tr>
<td>10-8 Wind Resource Potential in Chittenden County</td>
<td>10.13</td>
<td></td>
</tr>
</tbody>
</table>
Introduction

Assuring a high quality of life for the people who live and work in Chittenden County requires careful planning. The Chittenden County Regional Planning Commission (CCRPC) is charged by the State of Vermont with preparing a regional plan at least every five years to protect the County’s resources and to guide its development. This chapter

- States the Vision for Chittenden County that guides this Plan,
- Provides background about the County and CCRPC,
- Describes why and how the 2006 Regional Plan was prepared, and
- Explains how the Plan will be implemented.

Vision Statement

Chittenden County should be a place

- Where a high quality of life is built on sustainable economic development, affordability, and environmental stewardship;
- That continues to be both Vermont’s economic engine – hosting the highest quality and widest variety of economic opportunities in Vermont – and one of Vermont’s most popular tourist destinations;
- That people are proud to call home because of its environmental diversity, natural beauty, human services, and cultural, social, and recreational amenities;
- Where households that prefer to live in Chittenden County are able to do so because there is a diversity of employment and housing opportunities for all income levels, ages, and special needs, built through consistent, efficient, and equitable review processes; and
- With conveniently located, appropriately scaled, vibrant, and enjoyable development centers surrounded by productive open landscapes. Development centers include established villages and downtowns, as well as new centers whose sizes, densities, land-use mixes, and locations are planned by municipalities and coordinated regionally to promote efficient land use. Open landscapes include areas that provide for thriving agriculture and silviculture, recreation, and habitat networks that sustain a diverse and healthy ecosystem.

Economic prosperity funds our needed community facilities and infrastructure, as well as the social, cultural, and conservation programs that contribute to our high quality of life. Our prosperity and quality of life will continue to result from thoughtful development that sustains healthy businesses and ecosystems, a vital economy that is consistent with stewardship of our natural resources, and a network of safe and healthy communities.

To articulate this vision more clearly, the 2006 Chittenden County Regional Plan provides broad policy direction, rather than detailed requirements, for planning development in locations that sustain Chittenden County’s economic prosperity, environmental integrity and quality of life. The County’s 19 municipalities continue to make the primary, site-specific decisions that determine how this vision is realized.
Chittenden County

Overview

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, waterbodies, small cities, suburban areas, and villages.

Founded in 1787, Chittenden County has about 150,000 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 outstanding quality of life.

Figure 1-1
LOCATION OF CHITTENDEN COUNTY, VERMONT
History

Algonquin and Mohawk Native Americans, who valued the region’s waterways for transportation and used the area for seasonal hunting, were struggling for control of the northern Lake Champlain area when Europeans began exploring and settling there in the 1600s. The Abanaki tribe inhabited the area during the European colonial period.

The French, based in what is now Canada, also valued the region for its strategic waterways. During the Seven Years War in the 1760s, the French and their Native American allies used the region as a staging area for attacks on English colonial settlements in the Connecticut River Valley.  

English colonials also disputed who should control the Lake Champlain region. The colonial governors of both New Hampshire and New York issued land grants for the area. New Hampshire issued grants creating the townships of Charlotte and Hinesburg in 1762 and Bolton, Burlington, Colchester, Essex, Huntington, Jericho, Milton, St. George, Shelburne, Underhill, Westford, and Williston in 1763. A 1770 convention of settlers held in Bennington declared that the “Green Mountain Boys” would resist the enforcement of decisions by New York courts. New York retaliated by issuing the “Bloody Act,” providing for the summary execution of any apprehended Green Mountain Boy.

In 1772-73, Ira Allen and Remember Baker explored along the Winooski River and settled near the lower falls of the Winooski. At the same time, two men bearing New York grants settled on Shelburne Point. By the time of the outbreak of the American Revolution in 1776, about 40 families had settled in the area.

Conventions held in Windsor in January and June of 1777 declared Vermont to be a free and independent republic. At first, Vermont was divided into only two counties (Cumberland in the east and Bennington in the west). Rutland County was established in 1781, Addison County in 1785, and Chittenden County in 1787.

In 1783, families that had fled the area for safety during the American Revolution returned, along with many new settlers. When Vermont joined the United States in 1791, Chittenden County’s population had grown to almost 9,400 and by 1810 it was over 14,600. Over time, settlers cleared the forests for lumber and to create crop fields in the lowlands and pastures in the uplands.

From 1790 to 1814, 30 ships were built and launched in Burlington, including the world’s second commercial steamship, the “Vermont,” in 1808. The opening of the Erie Canal and the construction of the Champlain Canal in 1817 promoted closer commercial ties with New York and a decline in reliance on trade with Canada. In addition to the shipping of lumber, stone, and agricultural commodities, Lake Champlain’s commerce included tourism starting in the mid-1800s.

Railroad companies were started in 1843 to build lines along Lake Champlain and from Lake Champlain to the Connecticut River. Throughout the 1800s, the rail network in Vermont was expanded, so that by 1900, fewer than 100 towns in Vermont were without a rail depot.

The productive soils of the midwest United States lured potential settlers from Vermont in the 1800s. Consequently, Chittenden County’s population growth slowed after 1810, so that the County had just under 18,200 people in 1860 and 39,600 in 1900. Sheep farming shifted to dairy farming through the latter half of the 1800s.
The Industrial Revolution that transformed the nation in the 1800s also transformed the County. By 1909, Burlington alone had 82 manufacturers employing almost 2,400 workers. The County’s manufacturers produced woolen goods, brush and broom fibers, maple syrup, small tools and implements, printing, furniture, and electrical equipment. By 1929, manufacturing employed about 4,500 people in the County.

In November 1927, prolonged heavy rain combined with large-scale deforestation in northern Vermont resulted in catastrophic flooding of the Winooski River and its tributaries. The 1929 stock market crash and the Great Depression of the 1930s demonstrated the region’s economic ties to the nation, leaving many workers idle and stalling the region’s growth for a decade.

America’s entry into World War II increased demand for many of the region’s commodities and the County generally prospered during the 1940s. By 1950, two carriers provided regular commercial airline service at the Burlington airport, which had been constructed in 1930.

However, by the mid-1950s the region again was experiencing major unemployment, due in part to the continued shifting of textile jobs from New England to the South and the decline in defense production at the end of the Korean Conflict. The textile industry’s employment alone dropped from about 2,000 in 1951 to less than 200 in 1958, with the mills closing completely in 1965. Although the majority of the County’s land area was occupied by farms in the 1960s, farming and forestry employed less than six percent of the workforce.

New types of employers began to dominate the region’s economy in the 1960s. The University of Vermont, St. Michael’s College, Champlain College, and other institutions of higher education expanded enrollments. Mary Fletcher and Bishop DeGoesbriand Hospitals merged. IBM, which began production in the County in 1957, became the State’s largest private sector employer.

Chittenden County, historically more urbanized than other parts of Vermont, began to grow in the 1960s and 1970s in ways that accentuated its distinctiveness. In the mid-1960s, completion of I-89 provided for increased auto and truck access within the County, within the emerging multi-county Northwest Vermont region,15 and between the region and other parts of Vermont and the United States. During this period, the County enjoyed lower unemployment and higher wages than the rest of Vermont. Prosperity spawned new housing and nonresidential development, increasingly in the suburban communities around the County’s historic urban core. More non-native Vermonters chose to relocate here because of the region’s opportunities and amenities.

To better manage growth, the State enacted Act 200 and Act 250 and authorized municipalities to adopt a variety of land-use controls. New regional special-purpose entities also were established (CCRPC – 1966, the Champlain Water District – 1971, the Winooski Valley Park District – 1972, the Chittenden County Transit Authority – 1973, the Vermont Housing Finance Agency – 1974, the Vermont Industrial Development Authority – 1974, the Chittenden County Metropolitan Planning Organization – 1983, and the Chittenden Solid Waste District – 1987).

History’s basic lesson is that times change. Over the years, the people of Chittenden County have used the County’s natural resources in different ways, labored at different kinds of jobs, been guided by different social and political values, and developed different types of communities. The future promises to bring new opportunities and challenges. This Regional Plan, the plans of the County’s 19 municipalities, and the plans of the region’s organizations and businesses express our collective commitment to realizing a bright future for Chittenden County.
Regional Setting

Chittenden County is the heart of a multi-county metropolitan region. The conventional concept of a “metropolitan area” or “metropolitan region” is a core area containing substantial population, together with adjacent communities that have a high degree of social and economic integration with that core.

The U.S. Office of Management and Budget (OMB) defines Metropolitan Statistical Areas (MSAs) for the purposes of collecting, tabulating, and publishing federal data. As of 2003, OMB has designated 361 MSAs in the U.S., including the Burlington – South Burlington MSA Vermont’s only MSA.

The Burlington – South Burlington MSA increased in geographic size from 1990 to 2003 (see Figure 1-2). This is because the added areas had become more socially and economically integrated with the areas within the earlier designated MSA. The growing size and integration of the metropolitan region raise several interrelated concerns:

- Chittenden County’s communities are increasingly interdependent: Some problems that historically were regarded as local now increasingly have regional consequences. Success in addressing these problems will require increased cooperation and collaboration among communities.
- The State’s planning goal of maintaining Vermont’s historic settlement pattern of compact village and urban centers separated by rural countryside presents special challenges in the face of regional development pressure. Concentrating development in the County’s core areas will be essential to minimizing development in rural areas.
- Increasingly, people who work in Chittenden County are seeking housing outside of the County for reasons of lifestyle, availability, and/or affordability. Chittenden County is exporting its housing demand to its neighboring counties.

Following World War II, U.S. metropolitan areas became increasingly decentralized. Many economic, social, and technological changes contributed to this era of “suburbanization” such as

- Increased household incomes and social mobility together with a high pace of social change;
- Decentralized systems of economic production and business organization;
- Growing use of automobiles and trucks and the affiliated system of interstate highways and improved roadways that increased the accessibility of outlying areas; and
- The communications revolution that has made digital information “spaceless” and turned areas distant from former information centers into more attractive locations.

Decades of suburbanization have transformed U.S. metropolitan regions so that they now have multiple development centers. These centers range in size and density and may serve either general or various specialized purposes. For example, downtown Burlington continues to serve as a general-purpose employment, commercial, financial, institutional, and cultural center for our region. However, the region also has many other existing and planned general-purpose and special-purpose centers: Winooski’s downtown, Williston’s Taft Corners, Milton’s Town Center, and Essex’s Forestdale Industrial Area.
Figure 1-2
BURLINGTON – SOUTH BURLINGTON METROPOLITAN STATISTICAL AREA, 1990 AND 2003

2003 Burlington-South Burlington, Vermont MSA
Includes all of the municipalities in Chittenden, Franklin, and Grand Isle Counties

1990 Burlington, Vermont MSA
Includes the municipalities of Burlington, Charlotte, Colchester, Essex, Georgia, Grand Isle, Hinesburg, Jericho, Milton, Richmond, St. George, Shelburne, South Burlington, South Hero, Williston, & Winooski
The Chittenden County Regional Planning Commission (CCRPC)

Overview of Vermont’s Regional Planning Commissions (RPCs)

Each of Vermont’s 11 RPCs was created by its member municipalities and approved by the Vermont Agency of Commerce and Community Development as addressing a coherent socio-economic region capable of providing a continuing planning program.

The State calls upon each RPC to fulfill the following duties:

- Promote the mutual cooperation of the RPC’s member municipalities and cooperate with neighboring states, regions, counties, and municipalities;
- Assist and advise municipalities in the preparation of plans, studies, and bylaws regarding the appropriate development and use of the region’s physical and human resources;
- Prepare a regional plan;
- Review proposed State capital expenditures for compatibility with the RPC's regional plan and assist municipalities in assessing compatibility with municipal plans;
- Appear before District Environmental Commissions to aid in Act-250 reviews of proposed developments and appear before the Public Service Board to aid in Section-248 reviews of proposed utilities; and
- Confirm municipal planning programs and approve municipal plans.1.7

In order to fulfill these responsibilities, the State empowers each RPC to

- Prepare studies, plans, and recommendations on a broad set of issues;
- Retain staff and consultant assistance, enter upon land with the prior approval of the owner to make examinations and surveys, hold public hearings, and require municipalities and the State to provide information;
- Carry out, with the cooperation of member municipalities, programs for the appropriate development and use of the region’s physical and human resources; and
- Perform other acts or functions that the RPC deems to be necessary or appropriate.

History of CCRPC

In 1956, the Burlington City Planning Commission commissioned a “Regional Planning Report,” which proposed having Chittenden County’s communities share in the funding of the preparation of a regional plan. The Greater Burlington Industrial Corporation (GBIC) commissioned a 1958 study, Planning for the Burlington Region, Chittenden County, Vermont, which proposed the establishment of a regional planning commission. In the fall of 1965, GBIC, the Chamber of Commerce, and the University of Vermont Extension Service lobbied the municipalities of the County to create a regional planning commission.

On March 1, 1966, 15 municipalities voted to establish CCRPC and adopted CCRPC’s charter and bylaws on May 2, 1966. CCRPC amended its bylaws in 1972 to expand membership beyond one representative appointed by each of the County’s 18 municipalities to include five at-large Commissioners, each representing a special subject area (Agriculture, Business/Industry, Conservation/Environment, Socio-Economic/Housing, and Transportation). In 2001, Buel’s Gore (the County’s 19th municipality) officially joined CCRPC.
The Commission’s formal planning program began on July 1, 1968, funded by federal and state grants as well as locally appropriated contributions. CCRPC’s first planning efforts culminated in a series of working papers that

- Defined the overall objectives and approaches for the planning program;
- Inventoried basic information about the County (such as land use, demographics, the economy, transportation, community facilities, public utilities and open space/recreation);
- Studied key regional issues (housing, community development, and law enforcement); and
- Prepared model ordinances and other tools for use by member municipalities.


In 1983, after nine communities signed a memorandum of understanding, the Governor designated the Chittenden County Metropolitan Planning Organization (CCMPO) to undertake transportation planning under guidelines mandated by the federal government. CCMPO contracted with CCRPC for technical and administrative services. Nine non-CCMPO municipalities formed the Chittenden County Rural Planning Organization (CCRPO) in 1993. CCMPO established separate offices from CCRPC and hired its own staff in 1997 and merged with CCRPO in 1998. In 2002, CCMPO collocated with CCRPC in the offices both organizations share to this day.

The 2006 Regional Plan

The Chittenden County Regional Planning Commission (CCRPC) has a statutory duty to prepare a regional plan at least every five years to protect the environment and to guide the future growth and development of land, public services, and public facilities in Chittenden County. The 2006 Chittenden County Regional Plan captures the most recent vision for the future of Chittenden County and is the result of public hearings and work sessions; feedback from municipalities, regional organizations, and the public; and deliberation by the Commission’s volunteer members and professional staff.

Why Plan?

Community planning and regional planning enable people with different outlooks and awareness to learn about important and sometimes controversial matters, to agree on common objectives, and to collaborate on undertaking coordinated agendas of actions. Public planning should strive to engage people not only because our laws and democratic traditions require it, but also because public engagement makes planning better. Effective public planning promotes

- Greater understanding of key facts,
- Deeper and more widespread appreciation of divergent views,
- Increased consensus on important goals and objectives, and
- Improved collaboration in undertaking complicated sequences of interrelated actions.

Planning for an entire region is especially challenging. While we all agree that Chittenden County should be a “great place to live, work and play,” there are myriad visions of exactly how such a place should look and which actions we should undertake to achieve this goal. CCRPC is statutorily designated as the County’s only official forum for developing public consensus on the future of Chittenden County. The 2006 Regional Plan is intended to articulate the current consensus for our County’s future.
The Purposes of a Regional Plan

Vermont statutes [24 VSA 4347] establish that a regional plan has the general purpose of
... guiding and accomplishing a coordinated, efficient and economic development of
the region which will, in accordance with the present and future needs and resources,
best promote the health, safety, order, convenience, prosperity and welfare of the
inhabitants as well as efficiency and economy in the process of development.

To accomplish this general purpose, the 2006 Chittenden County Regional Plan

- **Aids decision making by**
  - Informing people about past conditions, current circumstances, and likely future trends,
  - Describing how decisions interrelate, and
  - Identifying efforts that have been undertaken, currently are under way, or are planned
    for the future.

- **Documents our collective decisions** on broad policy issues, enabling individuals and
  communities to focus on how best to achieve shared objectives through local decisions.

- **Facilitates the resolution of disputes** by identifying in advance our agreed goals and
  schedule of planned activities.

This *Regional Plan* is written for many users:

- **Residents** – By reading and discussing the *Plan*, residents may participate in shaping our
  Region's future.

- **Businesses and property owners** – The *Plan* provides individuals and business decision
  makers with information about demographic, economic, and land use trends that are
  expected to influence the region over time.

- **Municipalities, special-purpose governments, and nonprofit organizations** – Local
  officials can use this *Plan* as a guide when preparing plans and making decisions.

- **State and federal government officials** – Officials who make regulatory decisions (such as
  Act 250 and Section 248 reviews of proposed developments), public investment decisions
  (such as grant awards to communities), or decisions on policies affecting our region may use
  this *Plan* to learn about past, current, and anticipated conditions and our preferences for the
  future.

The Style of the 2006 Regional Plan

The *Regional Plan* is written to help different readers accomplish a variety of purposes. This
necessarily means that individual readers may find the writing style or content of some *Plan*
sections to be ill-suited or unnecessary for using the *Plan*. For example, the *Plan* includes

- **Explanations of concepts** so that nonprofessional readers may better appreciate discussions
  of more complex issues;

- **Numerous headings and bullet points** so that readers can skim over sections to more easily
  locate the specific material that interests them; and

- **Clearly designated policies** that are differentiated from the background material describing
  issues.
The Relationships Between the 2006 Regional Plan and Other Plans

Vermont statutes establish that each regional plan and the adopted plans of the municipalities in that region should be compatible with one another. The regional plans of adjoining regions also are to be compatible with another. Consequently, no plan “trumps” all other plans.

Each regional plan also must be consistent with goals established by the State to guide all municipal and regional planning. State regulatory proceedings must give each regional plan’s definition of “substantial regional impact” due consideration, where relevant.

Regional planning and municipal planning work best when they work in concert. Regional planning works best when it establishes general policies addressing fundamental matters that affect the well being of many communities. These determinations are made by municipal representatives on the regional planning commission and reflect current municipal plans as well as feedback offered by municipal officials during development of the regional plan. Municipal planning works best when it takes these general regional planning policies and refines and adapts them to suit local needs and circumstances. Municipalities (not regional planning commissions) are authorized by the State to use regulatory and nonregulatory tools to implement their municipal planning policies.

Statement of Compatibility and Consistency

Pursuant to 24 VSA 4302 (f), 4345a (5), 4348a (a), and 4348a (a)(8), CCRPC has

- Reviewed the approved plans of its member municipalities and of its adjoining regional planning commissions and concluded that this Regional Plan is compatible with those plans (that is, this Regional Plan, as implemented, will not significantly reduce the desired effect of the implementation of the other plans) and
- Reviewed the goals of 24 VSA 4302 and concluded that this Regional Plan is consistent with those goals (that is, implementation of this Regional Plan will result in substantial progress toward attainment of the goals established in 24 VSA 4302).

How the 2006 Regional Plan Was Prepared

Overall Process

In early 2004, CCRPC established the following objective:

Prepare and adopt by August 28, 2006 a regional plan for Chittenden County that

- Is consistent with the goals of Chapter 117 (24 VSA 4302),
- compatible with approved municipal plans and adjoining regional plans, and
- conforms with all other statutory requirements and
- Establishes policies with sufficient clarity and specificity to facilitate their use in subsequent decision making and Plan implementation.

In April 2004, CCRPC decided to invest two and a half years in the preparation of the 2006 Regional Plan (see Table 1-1). The overall process provided for the preparation of three draft plans: (1) Initial Draft, (2) Intermediate Draft, and (3) Public Hearing Draft. Each draft was prepared expressly for the purpose of enabling the public to suggest improvements to be incorporated into the subsequent draft. Thus, each successive draft tested public acceptance of a wider range of more refined factual presentations and policy recommendations.

CCRPC initiated the plan development process in July 2004 by asking member municipalities, regional organizations, and the public to provide feedback on needed changes to the 2001
### Table 1-1
**TIMELINE FOR PREPARING THE 2006 REGIONAL PLAN***

<table>
<thead>
<tr>
<th>Timing</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Early 2004</strong></td>
<td><strong>Strategic Planning for the 2006 Regional Plan Update Project</strong></td>
</tr>
<tr>
<td>April – May 04</td>
<td>PRUC** Prepares Recommended 2006 Regional Plan Timeline and Project Description</td>
</tr>
<tr>
<td>April – May 04</td>
<td>Full Commission Reviews and Endorses Recommended Timeline and Description / Distributed to Municipalities</td>
</tr>
<tr>
<td>April – June 04</td>
<td>PRUC Prepares Requests for Municipal, Public, and Regional Partner Feedback on Needed Refinements to 2001 Regional Plan Sections</td>
</tr>
<tr>
<td>May – June 04</td>
<td>Full Commission Reviews and Endorses Requests for Municipal, Public, and Regional Partner Feedback on Needed Refinements to 2001 Regional Plan Sections</td>
</tr>
<tr>
<td><strong>Late 2004</strong></td>
<td><strong>Identify Scope of the 2006 Regional Plan</strong></td>
</tr>
<tr>
<td>July – Sept 04</td>
<td>Staff and Commissioners Solicit Municipal, Public and Regional Partner Feedback on Needed Refinements to 2001 Regional Plan Sections</td>
</tr>
<tr>
<td>Aug – Oct 04</td>
<td>PRUC Receives/Reviews Feedback and Recommend Refinements to be Made during 6-Month Period (Jan.-June 05) for Preparing Initial Draft Plan</td>
</tr>
<tr>
<td>Oct – Nov 04</td>
<td>Full Commission Reviews and Endorses Recommended Refinements to be Made during 6-Month Period for Preparing Initial Draft Plan</td>
</tr>
<tr>
<td><strong>Early 2005</strong></td>
<td><strong>Prepare Initial Draft of the 2006 Regional Plan</strong></td>
</tr>
<tr>
<td>Jan – June 05</td>
<td>PRUC Prepares Initial Draft Plan Based on Endorsed Refinements</td>
</tr>
<tr>
<td>April – June 05</td>
<td>Full Commission Reviews and Endorses Initial Draft Plan</td>
</tr>
<tr>
<td><strong>Late 2005</strong></td>
<td><strong>Prepare Intermediate Draft of the 2006 Regional Plan</strong></td>
</tr>
<tr>
<td>July – Aug 05</td>
<td>Staff and Commissioners Present Endorsed Initial Draft Plan to Municipalities and Others for Feedback</td>
</tr>
<tr>
<td>Aug – Oct 05</td>
<td>PRUC Receives/Reviews Feedback and Prepares Recommended Intermediate Draft Plan Based on Feedback</td>
</tr>
<tr>
<td>Oct – Nov 05</td>
<td>Full Commission Reviews and Endorses the Introduction and Planning Areas Chapters of the Intermediate Draft Plan</td>
</tr>
<tr>
<td>Nov 05 – Jan 06</td>
<td>Full Commission Reviews and Endorses Remaining Chapters of the Intermediate Draft Plan</td>
</tr>
<tr>
<td><strong>Early 2006</strong></td>
<td><strong>Prepare Public Hearing Draft of the 2006 Regional Plan</strong></td>
</tr>
<tr>
<td>Feb – March 06</td>
<td>Staff and Commissioners Present Intermediate Draft Plan to Municipalities and Others for Feedback</td>
</tr>
<tr>
<td>Feb – May 06</td>
<td>PRUC Reviews Feedback and Prepares Public Hearing Draft Plan Based on Feedback</td>
</tr>
<tr>
<td>April – May 06</td>
<td>Full Commission Reviews and Endorses Public Hearing Draft Plan</td>
</tr>
<tr>
<td><strong>Late 2006</strong></td>
<td><strong>2006 Regional Plan Adoption</strong></td>
</tr>
<tr>
<td>May 06</td>
<td>30-Day Warning for Required 1st Public Hearing</td>
</tr>
<tr>
<td>June 06</td>
<td>1st Public Hearing (Staff, PRUC, Commissioners)</td>
</tr>
<tr>
<td>July – Aug 06</td>
<td>30-Day Warning for Required 2nd Public Hearing</td>
</tr>
<tr>
<td>Aug 11, 06</td>
<td>2nd Public Hearing (Staff, PRUC, Commissioners) / PRUC Recommends Plan Adoption to Full Commission</td>
</tr>
<tr>
<td>Aug 28, 06</td>
<td>Plan Adopted by Affirmative Vote of Commissioners Representing Municipalities</td>
</tr>
<tr>
<td>Oct 2, 06</td>
<td>Towns Have 35 Days to Review Plan – If a Majority of Region’s Towns Object, the Plan is Vetoed; Otherwise, It Goes into Effect October 2, 2006</td>
</tr>
</tbody>
</table>

*As amended by the Commission in October 2005.

**PRUC = Plan Review and Update Committee, the CCRPC committee primarily responsible for developing the 2006 Plan.
Regional Plan. This request enabled the public to work from a set of concrete proposals and enabled the Commission to build on the foundation of the 2001 Plan, rather than starting from a blank slate. From September to November 2004, CCRPC’s Plan Review and Update Committee (PRUC) examined detailed suggestions relating to every section of the 2001 Plan that were received from communities, planning commissions, regional organizations, professional planners, and citizens. In October and November 2004, the Commission reviewed and endorsed PRUC’s recommendations for incorporating these suggested refinements.

In January 2005, PRUC began preparing the Initial Draft of the 2006 Plan. Starting with this stage and throughout the subsequent stages of the process, the Commission posted draft materials on CCRPC’s website and invited the public to submit comments via a dedicated email box or postal mail.

In June 2005, the Commission approved release of the Initial Draft. The Initial Draft framed the 2006 Plan’s basic themes and policies. That is, the Initial Draft purposely did not contain the full breadth and depth of material that were anticipated to be in the 2006 Plan. Rather, the Initial Draft was designed to obtain early feedback on the Plan’s most general features and to seek consensus on the Plan’s most fundamental recommendations. Subsequent drafts were used to refine and embellish these features and recommendations.

The Commission distributed copies of the Initial Draft to municipal legislative bodies and planning commissions, regional organizations, interest groups, and citizens; posted it on CCRPC’s website; and solicited input from organizations and individuals by means of letters and press releases. The Commission also posted copies of all written feedback on the Initial Draft on CCRPC’s website. At later stages of the process, feedback received on subsequent drafts was posted.

In the second half of 2005, PRUC and CCRPC reviewed public feedback on the Initial Draft and prepared the Intermediate Draft. CCRPC approved the release of the first three chapters of the Intermediate Draft in November 2005 and of the remaining chapters in January 2006. The Commission posted the Intermediate Draft on CCRPC’s website; distributed copies to the entities that received the Initial Draft as well as to libraries, community centers, and municipal buildings; and held public forums to obtain more feedback from members of the general public on February 21, 22, and 23, 2006.

PRUC and CCRPC prepared the Public Hearing Draft based on public feedback received on the Intermediate Draft. CCRPC retained the services of copy editors to help ensure that the Plan’s discussion of complex and detailed issues was accessible to nonexpert readers. Additional public input was obtained at three forums held in mid-June 2006 and at the first of two required public hearings held on June 22, 2006. At CCRPC’s June 26, 2006 meeting, the Commission considered possible revisions to the Public Hearing Draft. The Commission held its second public hearing on August 24, 2006 and considered adoption of the Plan at its August 28, 2006 meeting. Adoption requires that the Commissioners representing at least 12 (not less than 60 percent) of CCRPC’s 19 member municipalities vote in favor of the Plan.

The adopted Regional Plan was then submitted immediately to the legislative bodies of CCRPC’s 19 member municipalities. The Plan is considered duly adopted and takes effect 35 days after the date of adoption unless within 35 days of the date of adoption CCRPC receives certification vetoing the Plan from the legislative bodies of at least 10 (a majority) of CCRPC’s 19 member municipalities.
Maps / Geographic Information System (GIS)

All of the maps that appear in the 2006 Regional Plan were prepared using CCRPC’s Geographic Information System (GIS). GIS is a set of computer software and hardware tools used to store, manage, analyze, and display information in powerful ways:

- It links the measurements taken of variables to particular locations, thereby allowing us to determine and display with maps how various places are similar and how they are different.
- It provides for the simultaneous analysis of many different factors, making it easier to consider complex problems.
- Because it uses digital technology, large numbers of measured values may be processed quickly, enabling us economically to consider alternative approaches and scenarios. Digital technology also means that the virtual maps in the system can easily be customized to suit specific needs (for example, different scales, study areas, sets of variables, and stylistic and graphic features).

Of necessity, the paper maps that are included in the 2006 Regional Plan are limited illustrations of the underlying datasets that reside in CCRPC’s GIS. Any detailed analysis of mapped data contained within the Plan should be based on the GIS source files, rather than the paper map. Please contact CCRPC staff to obtain copies of the GIS files.

Differences Between the 2001 and 2006 Regional Plans

The 2006 Regional Plan seeks to update and build on the 2001 Regional Plan, based on awareness of changed conditions, improved analytical tools, and more recent deliberations. Major improvements made to the 2006 Regional Plan are summarized below.

Planning Areas

The regional plans for Chittenden County before 2001 designated the areas in the County that were regarded as being most suitable for future development as “Growth Centers.” The 2001 Regional Plan changed this practice by designating areas that were regarded as being most suitable for different types of development as “Planning Areas.”

The 2001 Plan used the Planning Areas concept primarily to depict land-use policies and largely refrained from using Planning Areas to target policies in other chapters of the Plan (such as Housing, Infrastructure, and Natural Resources). While the 2006 Regional Plan continues to use the Planning Areas concept to target various land-use policies to different places in the County, the Plan also uses Planning Areas to target policies made in its other chapters.

When the 2006 Regional Plan designates different places in the County as being in the same Planning Area, the Plan is recommending that these places should share the same general features and characteristics. The Plan is not recommending that development should be uniform throughout an entire Planning Area nor that all places with the same Planning Area designation should be developed in exactly the same way. In each Planning Area, municipalities are expected and encouraged to tailor the Regional Plan’s general policies to address local challenges and opportunities.
Policy Plan

There are different types of plans. The selection of a particular type of plan defines the kinds of plan contents, analytical methods, and participatory process necessary for the plan to be effective. The factors determining which type of plan should be prepared include

- The specific purposes that the plan is intended to achieve,
- The nature of the plan’s recommendations, and
- A realistic assessment of whether successful implementation of the plan depends on measures undertaken solely by the parties who prepare or adopt the plan or whether measures undertaken by additional parties are crucial to success.

CCRPC decided that the 2006 Regional Plan will be most useful to Chittenden County if it is a “Policy Plan” for the following reasons:

- The principal purpose of this type of plan is to identify key considerations that are intended to be used in many subsequent decision-making processes;
- The Regional Plan’s recommendations address the future well-being of Chittenden County (evolving states of affairs, not one-time outcomes or products), involve a wide range of subjects, and affect many people over an expansive territory; and
- State statutes establish that both CCRPC and the Regional Plan are advisory in character and the entities whose decisions and actions are needed to successfully implement the Regional Plan are large in number and have wide-ranging characteristics.

Consequently, CCRPC strove to have the 2006 Regional Plan use the analytical methods, participatory process, and contents that are appropriate to a Policy Plan.

This means that the character of the recommendations made by the 2006 Regional Plan are very different than those of the 2001 Regional Plan. The 2001 Plan made three types of recommendations: goals (broad objectives), policies (positions that help to achieve goals), and implementation strategies (courses of action to achieve policies). The 2006 Plan makes only one type of recommendation: policies. Each policy describes preferable general features of the County’s future, regardless of whether it could be described as a goal, strategy, or action.

Implementing the Regional Plan

A Policy Plan is implemented differently from many other types of plans. Successful implementation of a Policy Plan depends on respecting the plan’s purpose of providing general guidance:

- Preparers of a policy plan should recognize that the plan cannot be a blueprint that dictates all subsequent decisions. They should value the plan’s role as a starting point for implementers entrusted with making decisions that are complicated by detailed considerations that the plan cannot fully anticipate.
- Implementers of a policy plan should recognize that the plan provides a foundation for their more rigorous, detailed decision making. They should value the plan’s analysis of major issues and its regional consensus on key policy choices.

In the years following adoption of the Regional Plan, CCRPC will work with member municipalities, regional partner organizations, and others to

- Identify the most urgent and important issues affecting the future welfare of the County and
- Host strategic planning processes to build collaborative approaches to address these matters.
Collaboration

More than any other place in Vermont, Chittenden County stands to benefit from collaborative planning among CCRPC, municipalities, special-purpose regional boards, and the private sector. In a metropolitan area like ours, the economy, environment, and sense of community are the products of many individual actions and decisions. The choices we make as individuals have immediate and cumulative impacts on our neighbors and on our collective well being. Collaborative planning helps to coordinate those choices so that they support one another.

If collaborative planning is to be successful in promoting the appropriate development of the County, CCRPC Commissioners, municipal officials, members of regional boards, as well as business, nonprofit, and community leaders should understand, value, and respect each other’s special roles and responsibilities in this planning partnership:

- Regional planning works best when it establishes general policies addressing fundamental matters that affect the well being of many communities, rather than attempting to dictate decisions best made by local leaders, specialized boards, or private enterprise and individuals.
- Municipal planning works best when it establishes municipal policies that suit local needs and circumstances, while advancing outcomes that benefit the region.
- The boards of regional special-purpose organizations make highly complex decisions related to key aspects of the County’s well being. Their decisions both affect and are affected by community development policies.
- The business community, nonprofit organizations, and individuals have perspectives and opinions that are critical to the success of community and regional planning. Planning processes need to involve the public and the public needs to involve itself in planning processes.

It is not a question of choosing between allegiance to either local or regional goals. The future of the County depends on developing a set of shared goals that promote the well being of both the County and its communities. This approach is necessary because

- The State does not authorize CCRPC to implement the *Regional Plan* by using the powers delegated to municipalities to implement municipal plans. Instead, the *Regional Plan* is intended to be implemented primarily through the combined voluntary actions of member municipalities and others. CCRPC’s Commissioners share responsibility for ensuring that planning undertaken by the Commission both responds to the needs of individual member municipalities and promotes the County’s future well being.
- The State does not authorize municipalities to plan for and manage development outside their borders. Instead, municipalities within a region are authorized to establish a regional planning commission to collaborate on identifying, assessing, and addressing matters of common concern.
- Regional special-purpose organizations are empowered to carry out focused missions, rather than interpret the broad community development policies of the region and its communities. CCRPC and municipalities facilitate the effective and efficient fulfillment of the missions of regional special-purpose organizations when they respect the counsel of these organizations when crafting community development policies.

Planning often is described as being a process. Truly collaborative planning requires time to build the requisite trust among partners and the ongoing commitment to achieving shared goals. In crafting and implementing the *2006 Regional Plan*, CCRPC strives to promote collaborative planning by respecting the roles of its planning partners.
Act 250 and Section 248 / Substantial Regional Impact

Certain types of proposed developments are required to obtain a permit from one of Vermont’s nine District Environmental Commissions to establish that the proposed development will satisfy 10 criteria defined by Act 250. One of these 10 criteria is that the proposed development be “in conformance with any duly adopted local or regional plan or capital program.” In addition, certain proposed utility facilities are required to obtain a permit from Vermont’s Public Service Board to establish that the proposed facility will satisfy criteria defined by Section 248. One of the Section 248 criteria is that the proposed facility will “not unduly interfere with the orderly development of the region with due consideration having been given to the recommendations of the municipal and regional planning commissions.”

Both Act 250 and Section 248 require applicants for projects in Chittenden County to submit copies of their application to CCRPC. CCRPC has established a formal policy for its participation in the permit review procedures of Act 250 and Section 248. Under this policy, CCRPC’s Regulatory Review Committee considers whether each proposal is in conformance with the Regional Plan. This policy also provides that CCRPC staff will periodically check with municipal planning staff to identify proposals under development that may fail to be in conformance with the Regional Plan. This proactive, collaborative approach is an attempt to work out any concerns about Act 250 applications prior to their submission.

State laws also provide for the following

- In Act-250 and Section-248 proceedings in which the provisions of a regional plan or a municipal plan are relevant to the determination of any issue, the provisions of the regional plan must be given effect to the extent that they are not in conflict with the provisions of a duly adopted municipal plan. To the extent that such a conflict exists, the regional plan must be given effect if it is demonstrated that the project under consideration would have a substantial regional impact.

- A municipality may request the assistance of a regional planning commission in coordinating the way in which the municipality’s plan addresses projects of substantial regional impact with the way those projects are addressed by a neighboring municipality’s planning efforts. When so requested, the regional planning commission must convene an ad hoc working group to address the issue.

To carry out these responsibilities, Vermont laws also require that this Regional Plan define the criteria for determining when a proposed development will generate a “substantial regional impact” specifically with respect to Chittenden County. The Regional Plan’s definition of substantial regional impact “…must be given due consideration, where relevant, in state regulatory proceedings.”

Table 1-2 provides the statutorily required definition of substantial regional impact for Chittenden County. The table specifies the criteria to be used to identify both the impacts and the developments that will have impacts that are considered to be “substantial regional impacts.”

Vermont law (not the substantial regional impact criteria established by a regional plan) defines whether a proposed development:

- Must apply to obtain an Act 250 or Section 248 permit and
- Is or is not entitled to be issued the relevant permit.
A development —whether or not it has a substantial regional impact — must comply with Act-250 and Section-248 standards. A development that has a substantial regional impact is not automatically incompatible with the Regional Plan.

CCRPC’s formal policy on Act 250 and Section 248 establishes that the Commission does not use the criteria defining a substantial regional impact to determine whether a proposed development does or does not conform to the Regional Plan. The policy does provide that CCRPC’s Regulatory Review Committee may use the substantial regional impact criteria to help identify proposals whose conformity to the Regional Plan should be considered more closely.

It is highly unlikely that provisions of the 2006 Regional Plan and the plans of CCRPC’s member municipalities will be in conflict with one another:

- State statutes establish that regional plans and municipal plans are to be compatible with one another.\textsuperscript{1-13}
- A regional plan must be adopted by not less than a 60 percent vote of the commissioners representing municipalities and may be vetoed by a majority of the municipalities.\textsuperscript{1-14}
- The Regional Planning Commission helps to minimize any conflicts when it reviews municipal planning processes because this review requires that a municipal plan be compatible with the regional plan.\textsuperscript{1-15}
- In reviewing Act-250 cases where there was a question of whether the proposed development conformed to a plan, the Vermont Supreme Court established a general rule that plan provisions using “shall” are more likely to be interpreted as mandates or prohibitions, whereas provisions using “should” are less likely to be so interpreted.\textsuperscript{1-16} Because the 2006 Regional Plan is intended to be a Policy Plan that provides general guidance, CCRPC intentionally has not used “shall” in the Plan’s policy statements.
### Table 1-2
### SUBSTANTIAL REGIONAL IMPACT QUANTITATIVE THRESHOLDS*

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Criteria for When a Substantial Regional Impact Exists</th>
</tr>
</thead>
</table>
| **Airport Facility**                         | 1. Construction of a new:  
  • commercial airport,  
  • airport with paved runways,  
  • paved runway, or  
  • passenger terminal facility  
  2. Expansion of an existing paved runway or terminal facility by more than 25%                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| **Hospital or Extended Care Facility**       | Construction or expansion of a hospital or extended care facility that would create 50 or more beds. When development or a health care facility contains fewer than 50 beds, such development shall be considered office development.                                                                                                                                                                                                                                                                                                                                                                                                                       |
| **Electrical Generation or Transmission Infrastructure** | Any proposed generating facility/transmission or expansion requiring Public Service Board approval under 30 VSA Chapter 5, Sec 248.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| **Natural Gas, Propane, LP Gas, or Fuel Transmission Infrastructure** | The construction or extension of transmission lines requiring Public Service Board approval under 30 VSA Chapter 5, Sec 248.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| **Industrial Park**                          | Any proposed new industrial park outside of Metropolitan, Village, Transition, and Enterprise Planning Areas.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| **Industry, Office, Retail, Wholesale, or Service** | Any proposed building footprint exceeding:  
  1. 100,000 SF in a Metropolitan Planning Area  
  2. 75,000 SF in a Village Planning Area  
  3. 75,000 SF in a Transition Planning Area  
  4. 75,000 SF in an Enterprise Planning Area  
  5. 25,000 SF in a Rural Planning Area                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| **Earth Resource Extraction**                | Any proposed extraction operation that annually generates an average of 60 or more truckloads, or 120 or more truck trip ends per weekday.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| **Hotel or Motel Development**               | Any proposed lodging facility exceeding:  
  1. 150 or more rooms in a Metropolitan Planning Area  
  2. 50 or more rooms in a Village Planning Area  
  3. 100 or more rooms in a Transition Planning Area  
  4. 35 or more rooms in a Rural Planning Area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| **Water Transmission Infrastructure**        | The construction or extension of transmission lines over 2,500 FT in length and 12 inches or greater in diameter, outside Metropolitan, Village, Enterprise or Transition Planning Areas except on sites with private water transmission systems not involving sales to the public, or for hydraulic looping for reliability and/or redundancy reasons within an existing municipal service area or to allow the interconnection of Metropolitan and Village Planning Areas.                                                                                                                                                                                                                                                                                                                                 |
| **Sanitary Sewer Transmission Infrastructure** | The construction or extension of transmission lines over 2,500 FT in length and 25 inches in diameter, outside Metropolitan, Village, Enterprise or Transition Planning Areas except on sites with private sewer transmission systems not involving sales to the public.                                                                                                                                                                                                                                                                                                                                                                                      |

*(Continued)*
### Table 1-2
**SUBSTANTIAL REGIONAL IMPACT QUANTITATIVE THRESHOLDS**
(Continued)*

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Criteria for When a Substantial Regional Impact Exists</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Educational Facility</strong></td>
<td>The construction or expansion by 10% of total square footage of a regional (multi-municipal) educational facility.</td>
</tr>
</tbody>
</table>
| **Residential Development** |  • Any residential development in a Metropolitan Planning Area that proposes to construct over 200 dwelling units.  
                                   • Any residential development in a Transition Planning Area that proposes to construct over 100 dwelling units.  
                                   • Any residential development in a Village Planning Area that proposes to construct over 60 dwelling units.  
                                   • Any residential development in a Rural Planning Area that proposes to construct over 10 dwelling units. |
| **Solid Waste Management** | 1. Construction of a regional landfill, expansion of an existing landfill, or any building, land, facility, or land development associated and otherwise described as an integral component of a planned or existing regional landfill. A regional landfill is a landfill that serves more than one municipality.  
                                   2. Any development proposal that would result in increasing the volume of solid waste entering a regional landfill by three percent (3%) or more.  
                                   3. Any solid waste or recycling facility that handles or processes 5 percent or more of the County’s solid waste or recycling tonnage. |
| **Cultural Facility** | Civic or Convention Center: A facility or portion thereof designed to accommodate the following numbers of people in assembly:  
                                   1. 1,000 or more in assembly in a Metropolitan, Village, or Transition Planning Area  
                                   2. 250 in a Rural Planning Area  
                                   Cinema: A cinema with the following numbers of seats:  
                                   1. 1,000 or more in a Metropolitan, Village, or Transition Planning Area.  
                                   2. 250 or more in a Rural Planning Area  
                                   Theater: A live performance space providing the following number of seats:  
                                   1. 1,000 or more in a Metropolitan, Village, or Transition Planning Area.  
                                   2. 250 or more in a Rural Planning Area  
                                   Museum: A museum with a projected peak draw of 1,000 visitors or more per day, regardless of Planning Area location. |
| **Recreation Facility** | Outdoor: 50 acres for parks or inherently spacious outdoor recreational facilities, including ski areas, golf courses, and natural areas. 20 acres for other outdoor uses including but not limited to sports fields, tennis courts, and swimming pools.  
                                   Indoor: Any indoor recreational facility, including but not limited to sports arenas, stadiums, race tracks, amusement parks, and ice skating rinks, with total building floor space as follows:  
                                   1. 100,000 SF in a Metropolitan Planning Area  
                                   2. 75,000 SF in a Village Planning Area  
                                   3. 75,000 SF in a Transition Planning Area  
                                   4. 25,000 SF in a Rural Planning Area  
                                   5. 75,000 SF in an Enterprise Planning Area |
| **Transportation System Impacts** | 1. Any development proposal that reduces the level of service (LOS) one letter grade at intersections within the project’s impact area.  
                                   2. Any development proposal that requires the significant extension or expansion of a major regional route, state highway or component of the Metropolitan Transportation System defined by the Chittenden County Metropolitan Planning Organization’s Metropolitan Transportation Plan. |
As part of the public review of the Initial Draft of this Plan, several member municipalities expressed concerns related to the role of substantial regional impact in Act 250/Section 248 processes, the characteristics of an effective SRI definition, and the wisdom of proposed amendments to particular SRI criteria in Table 1-2. Limited time and staff resources prevented CCRPC from undertaking the type of focused planning process needed to prepare amendments to the SRI definition that would enjoy widespread municipal support. Consequently, Table 1-2 contains the SRI Quantitative Thresholds used in the 2001 Regional Plan except for the following changes (all highlighted in yellow in Table 1-2):

1) Categories expressed as plural have been changed to singular (e.g., “facilities” to “facility”) to clarify that a single proposed development of that type is governed by those criteria;
2) The term “Infrastructure” has been added to the names of four categories to clarify that it is a proposed change to the infrastructure system that is governed by those criteria;
3) “Propane, LP Gas, or Fuel” has been added to the category “Natural Gas” to clarify that all types of fuel transmission lines are governed by that criterion;
4) In the categories “Industry, Office, Retail, Wholesale and Service” and “Hotel/Motel Development” the word “or” was substituted for “and” to clarify that the proposed land use only needs to be of one of those types (not all types) to be governed by those criteria;
5) Because the 2006 Plan changes the name of one planning area, Table 1-2 substitutes the new planning area name for the old name (“Enterprise” for “Special Use”);
6) In the subcategories of “Civic or Convention Center,” “Cinema,” and “Theater” (all part of “Cultural Facility”) the word “or” was substituted for “and” in the list of planning areas to clarify that a proposed facility need not be located in all of the listed planning areas for the criteria to apply;
7) In the subcategories of “Cinema” and “Theater” (both part of “Cultural Facility”), the phrase “1,000 or more” is deleted from the introductory line so that the subsequent planning area thresholds are meaningful;
8) In the category of “Recreation Facility,” the phrase “or Rural” is deleted from the third threshold so that the fourth threshold is meaningful.

CCRPC will convene a task force of representatives designated by each member municipality to recommend a consensus SRI definition shortly after the 2006 Regional Plan adoption becomes final. The Commission then will use the formal regional plan amendment process to consider whether the SRI definition recommended by the task force should be incorporated into the 2006 Regional Plan.
Notes

1-1 This section relies on “A History of Chittenden County” by Coralie Magoon, which was included in each of CCRPCC’s regional plans until 1991 and on the “History” section of the 2001 Regional Plan.

1-2 In 1798, the Vermont Legislature would deny the “Seven Nations of Lower Canada Indians” compensation for all of the lands west of the Green Mountains north of Ticonderoga on the basis that their claim was nullified when their French allies ceded Canada to the English.

1-3 Buel’s Gore was first chartered in 1780 and Richmond was established in 1794 from parts of Bolton, Hunting- ton, Jericho, and Williston. South Burlington was established in 1865 when Burlington incorporated. Essex Junction was incorporated in 1892. Winooski was created from Colchester in 1922.

1-4 Franklin County was created from part of Chittenden County in 1792 and other areas were carved out of Chittenden until 1839. Since then, Chittenden County has existed at its present size of about 520 square miles.

1-5 Northwest Vermont is composed of Addison, Chittenden, Franklin, Grand Isle, Lamoille, and Washington Counties.

1-6 OMB’s standards provide that each metropolitan area must have at least one urbanized area of 50,000 or more inhabitants. An urbanized area is composed of one or more “central places” and the densely settled (generally at least 1,000 persons per square mile) “urban fringe” surrounding the central place.

1-7 A CCRPC policy that describes the process and standards for confirming municipal planning programs and approving municipal plans is posted on CCRPC’s website: www.ccrpcvt.org.

1-8 The 10 Act 250 criteria are set out in 10 VSA 6086.

1-9 Section 248 criteria are set out in 30 VSA 248.

1-10 24 VSA 4348 (h).

1-11 24 VSA 4345a (18).

1-12 24 VSA 4345a (17).

1-13 See 24 VSA 4345a (5), 4382 (a), and 4350 (b) (2). 24 4302 (f) (2) defines one plan being “compatible with” another plan when “…the plan in question, as implemented, will not significantly reduce the desired effect of the implementation of the other plan.” If the plan, as implemented, will significantly reduce the desired effect of the other plan, the plan may be considered compatible when it includes the additional contents required in 4302 (f) (2) (A) through (D).

1-14 24 VSA 4348 (f).

1-15 24 VSA 4350 (b) (2).

Introduction

Assuring a high quality of life for the people who live and work in Chittenden County requires careful planning. The Chittenden County Regional Planning Commission (CCRPC) is charged by the State of Vermont with preparing a regional plan at least every five years to protect the County’s resources and to guide its development. This chapter

- States the Vision for Chittenden County that guides this Plan,
- Provides background about the County and CCRPC,
- Describes why and how the 2006 Regional Plan was prepared, and
- Explains how the Plan will be implemented.

Vision Statement

Chittenden County should be a place

- Where a high quality of life is built on sustainable economic development, affordability, and environmental stewardship;

- That continues to be both Vermont’s economic engine – hosting the highest quality and widest variety of economic opportunities in Vermont – and one of Vermont’s most popular tourist destinations;

- That people are proud to call home because of its environmental diversity, natural beauty, human services, and cultural, social, and recreational amenities;

- Where households that prefer to live in Chittenden County are able to do so because there is a diversity of employment and housing opportunities for all income levels, ages, and special needs, built through consistent, efficient, and equitable review processes; and

- With conveniently located, appropriately scaled, vibrant, and enjoyable development centers surrounded by productive open landscapes. Development centers include established villages and downtowns, as well as new centers whose sizes, densities, land-use mixes, and locations are planned by municipalities and coordinated regionally to promote efficient land use. Open landscapes include areas that provide for thriving agriculture and silviculture, recreation, and habitat networks that sustain a diverse and healthy ecosystem.

Economic prosperity funds our needed community facilities and infrastructure, as well as the social, cultural, and conservation programs that contribute to our high quality of life. Our prosperity and quality of life will continue to result from thoughtful development that sustains healthy businesses and ecosystems, a vital economy that is consistent with stewardship of our natural resources, and a network of safe and healthy communities.

To articulate this vision more clearly, the 2006 Chittenden County Regional Plan provides broad policy direction, rather than detailed requirements, for planning development in locations that sustain Chittenden County’s economic prosperity, environmental integrity and quality of life. The County’s 19 municipalities continue to make the primary, site-specific decisions that determine how this vision is realized.
Chittenden County

Overview

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, waterbodies, small cities, suburban areas, and villages.

Founded in 1787, Chittenden County has about 150,000 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 outstanding quality of life.

Figure 1-1

LOCATION OF CHITTENDEN COUNTY, VERMONT
History

Algonquin and Mohawk Native Americans, who valued the region’s waterways for transportation and used the area for seasonal hunting, were struggling for control of the northern Lake Champlain area when Europeans began exploring and settling there in the 1600s. The Abanaki tribe inhabited the area during the European colonial period.

The French, based in what is now Canada, also valued the region for its strategic waterways. During the Seven Years War in the 1760s, the French and their Native American allies used the region as a staging area for attacks on English colonial settlements in the Connecticut River Valley.

English colonials also disputed who should control the Lake Champlain region. The colonial governors of both New Hampshire and New York issued land grants for the area. New Hampshire issued grants creating the townships of Charlotte and Hinesburg in 1762 and Bolton, Burlington, Colchester, Essex, Huntington, Jericho, Milton, St. George, Shelburne, Underhill, Westford, and Williston in 1763. A 1770 convention of settlers held in Bennington declared that the “Green Mountain Boys” would resist the enforcement of decisions by New York courts. New York retaliated by issuing the “Bloody Act,” providing for the summary execution of any apprehended Green Mountain Boy.

In 1772-73, Ira Allen and Remember Baker explored along the Winooski River and settled near the lower falls of the Winooski. At the same time, two men bearing New York grants settled on Shelburne Point. By the time of the outbreak of the American Revolution in 1776, about 40 families had settled in the area.

Conventions held in Windsor in January and June of 1777 declared Vermont to be a free and independent republic. At first, Vermont was divided into only two counties (Cumberland in the east and Bennington in the west). Rutland County was established in 1781, Addison County in 1785, and Chittenden County in 1787.

In 1783, families that had fled the area for safety during the American Revolution returned, along with many new settlers. When Vermont joined the United States in 1791, Chittenden County’s population had grown to almost 9,400 and by 1810 it was over 14,600. Over time, settlers cleared the forests for lumber and to create crop fields in the lowlands and pastures in the uplands.

From 1790 to 1814, 30 ships were built and launched in Burlington, including the world’s second commercial steamship, the “Vermont,” in 1808. The opening of the Erie Canal and the construction of the Champlain Canal in 1817 promoted closer commercial ties with New York and a decline in reliance on trade with Canada. In addition to the shipping of lumber, stone, and agricultural commodities, Lake Champlain’s commerce included tourism starting in the mid-1800s.

Railroad companies were started in 1843 to build lines along Lake Champlain and from Lake Champlain to the Connecticut River. Throughout the 1800s, the rail network in Vermont was expanded, so that by 1900, fewer than 100 towns in Vermont were without a rail depot.

The productive soils of the midwest United States lured potential settlers from Vermont in the 1800s. Consequently, Chittenden County’s population growth slowed after 1810, so that the County had just under 18,200 people in 1860 and 39,600 in 1900. Sheep farming shifted to dairy farming through the latter half of the 1800s.
The Industrial Revolution that transformed the nation in the 1800s also transformed the County. By 1909, Burlington alone had 82 manufacturers employing almost 2,400 workers. The County’s manufacturers produced woolen goods, brush and broom fibers, maple syrup, small tools and implements, printing, furniture, and electrical equipment. By 1929, manufacturing employed about 4,500 people in the County.

In November 1927, prolonged heavy rain combined with large-scale deforestation in northern Vermont resulted in catastrophic flooding of the Winooski River and its tributaries. The 1929 stock market crash and the Great Depression of the 1930s demonstrated the region’s economic ties to the nation, leaving many workers idle and stalling the region’s growth for a decade.

America’s entry into World War II increased demand for many of the region’s commodities and the County generally prospered during the 1940s. By 1950, two carriers provided regular commercial airline service at the Burlington airport, which had been constructed in 1930.

However, by the mid-1950s the region again was experiencing major unemployment, due in part to the continued shifting of textile jobs from New England to the South and the decline in defense production at the end of the Korean Conflict. The textile industry’s employment alone dropped from about 2,000 in 1951 to less than 200 in 1958, with the mills closing completely in 1965. Although the majority of the County’s land area was occupied by farms in the 1960s, farming and forestry employed less than six percent of the workforce.

New types of employers began to dominate the region’s economy in the 1960s. The University of Vermont, St. Michael’s College, Champlain College, and other institutions of higher education expanded enrollments. Mary Fletcher and Bishop DeGoesbriand Hospitals merged. IBM, which began production in the County in 1957, became the State’s largest private sector employer.

Chittenden County, historically more urbanized than other parts of Vermont, began to grow in the 1960s and 1970s in ways that accentuated its distinctiveness. In the mid-1960s, completion of I-89 provided for increased auto and truck access within the County, within the emerging multi-county Northwest Vermont region,15 and between the region and other parts of Vermont and the United States. During this period, the County enjoyed lower unemployment and higher wages than the rest of Vermont. Prosperity spawned new housing and nonresidential development, increasingly in the suburban communities around the County’s historic urban core. More non-native Vermonters chose to relocate here because of the region’s opportunities and amenities.

To better manage growth, the State enacted Act 200 and Act 250 and authorized municipalities to adopt a variety of land-use controls. New regional special-purpose entities also were established (CCRPC – 1966, the Champlain Water District – 1971, the Winooski Valley Park District – 1972, the Chittenden County Transit Authority – 1973, the Vermont Housing Finance Agency – 1974, the Vermont Industrial Development Authority – 1974, the Chittenden County Metropolitan Planning Organization – 1983, and the Chittenden Solid Waste District – 1987).

History’s basic lesson is that times change. Over the years, the people of Chittenden County have used the County’s natural resources in different ways, labored at different kinds of jobs, been guided by different social and political values, and developed different types of communities. The future promises to bring new opportunities and challenges. This Regional Plan, the plans of the County’s 19 municipalities, and the plans of the region’s organizations and businesses express our collective commitment to realizing a bright future for Chittenden County.
Regional Setting

Chittenden County is the heart of a multi-county metropolitan region. The conventional concept of a “metropolitan area” or “metropolitan region” is a core area containing substantial population, together with adjacent communities that have a high degree of social and economic integration with that core.

The U.S. Office of Management and Budget (OMB) defines Metropolitan Statistical Areas (MSAs) for the purposes of collecting, tabulating, and publishing federal data. As of 2003, OMB has designated 361 MSAs in the U.S., including the Burlington – South Burlington MSA Vermont’s only MSA.

The Burlington – South Burlington MSA increased in geographic size from 1990 to 2003 (see Figure 1-2). This is because the added areas had become more socially and economically integrated with the areas within the earlier designated MSA. The growing size and integration of the metropolitan region raise several interrelated concerns:

- Chittenden County’s communities are increasingly interdependent: Some problems that historically were regarded as local now increasingly have regional consequences. *Success in addressing these problems will require increased cooperation and collaboration among communities.*
- The State’s planning goal of maintaining Vermont’s historic settlement pattern of compact village and urban centers separated by rural countryside presents special challenges in the face of regional development pressure. *Concentrating development in the County’s core areas will be essential to minimizing development in rural areas.*
- Increasingly, people who work in Chittenden County are seeking housing outside of the County for reasons of lifestyle, availability, and/or affordability. *Chittenden County is exporting its housing demand to its neighboring counties.*

Following World War II, U.S. metropolitan areas became increasingly decentralized. Many economic, social, and technological changes contributed to this era of “suburbanization” such as:

- Increased household incomes and social mobility together with a high pace of social change;
- Decentralized systems of economic production and business organization;
- Growing use of automobiles and trucks and the affiliated system of interstate highways and improved roadways that increased the accessibility of outlying areas; and
- The communications revolution that has made digital information “spaceless” and turned areas distant from former information centers into more attractive locations.

Decades of suburbanization have transformed U.S. metropolitan regions so that they now have multiple development centers. These centers range in size and density and may serve either general or various specialized purposes. For example, downtown Burlington continues to serve as a general-purpose employment, commercial, financial, institutional, and cultural center for our region. However, the region also has many other existing and planned general-purpose and special-purpose centers: Winooski’s downtown, Williston’s Taft Corners, Milton’s Town Center, and Essex’s Forestdale Industrial Area.
Figure 1-2

BURLINGTON – SOUTH BURLINGTON METROPOLITAN STATISTICAL AREA, 1990 AND 2003

2003 Burlington-South Burlington, Vermont MSA
- Includes all of the municipalities in Chittenden, Franklin, and Grand Isle Counties

1990 Burlington, Vermont MSA
- Includes the municipalities of Burlington, Charlotte, Colchester, Essex, Georgia, Grand Isle, Hinesburg, Jericho, Milton, Richmond, St. George, Shelburne, South Burlington, South Hero, Williston, & Winooski
The Chittenden County Regional Planning Commission (CCRPC)

Overview of Vermont’s Regional Planning Commissions (RPCs)

Each of Vermont’s 11 RPCs was created by its member municipalities and approved by the Vermont Agency of Commerce and Community Development as addressing a coherent socio-economic region capable of providing a continuing planning program.

The State calls upon each RPC to fulfill the following duties:

- Promote the mutual cooperation of the RPC’s member municipalities and cooperate with neighboring states, regions, counties, and municipalities;
- Assist and advise municipalities in the preparation of plans, studies, and bylaws regarding the appropriate development and use of the region’s physical and human resources;
- Prepare a regional plan;
- Review proposed State capital expenditures for compatibility with the RPC's regional plan and assist municipalities in assessing compatibility with municipal plans;
- Appear before District Environmental Commissions to aid in Act-250 reviews of proposed developments and appear before the Public Service Board to aid in Section-248 reviews of proposed utilities; and
- Confirm municipal planning programs and approve municipal plans.\(^1\)\(^7\)

In order to fulfill these responsibilities, the State empowers each RPC to

- Prepare studies, plans, and recommendations on a broad set of issues;
- Retain staff and consultant assistance, enter upon land with the prior approval of the owner to make examinations and surveys, hold public hearings, and require municipalities and the State to provide information;
- Carry out, with the cooperation of member municipalities, programs for the appropriate development and use of the region’s physical and human resources; and
- Perform other acts or functions that the RPC deems to be necessary or appropriate.

History of CCRPC

In 1956, the Burlington City Planning Commission commissioned a “Regional Planning Report,” which proposed having Chittenden County’s communities share in the funding of the preparation of a regional plan. The Greater Burlington Industrial Corporation (GBIC) commissioned a 1958 study, *Planning for the Burlington Region, Chittenden County, Vermont*, which proposed the establishment of a regional planning commission. In the fall of 1965, GBIC, the Chamber of Commerce, and the University of Vermont Extension Service lobbied the municipalities of the County to create a regional planning commission.

On March 1, 1966, 15 municipalities voted to establish CCRPC and adopted CCRPC’s charter and bylaws on May 2, 1966. CCRPC amended its bylaws in 1972 to expand membership beyond one representative appointed by each of the County’s 18 municipalities to include five at-large Commissioners, each representing a special subject area (Agriculture, Business/Industry, Conservation/Environment, Socio-Economic/Housing, and Transportation). In 2001, Buel’s Gore (the County’s 19th municipality) officially joined CCRPC.
The Commission’s formal planning program began on July 1, 1968, funded by federal and state grants as well as locally appropriated contributions. CCRPC’s first planning efforts culminated in a series of working papers that

- Defined the overall objectives and approaches for the planning program;
- Inventoried basic information about the County (such as land use, demographics, the economy, transportation, community facilities, public utilities and open space/recreation);
- Studied key regional issues (housing, community development, and law enforcement); and
- Prepared model ordinances and other tools for use by member municipalities.


In 1983, after nine communities signed a memorandum of understanding, the Governor designated the Chittenden County Metropolitan Planning Organization (CCMPO) to undertake transportation planning under guidelines mandated by the federal government. CCMPO contracted with CCRPC for technical and administrative services. Nine non-CCMPO municipalities formed the Chittenden County Rural Planning Organization (CCRPO) in 1993. CCMPO established separate offices from CCRPC and hired its own staff in 1997 and merged with CCRPO in 1998. In 2002, CCMPO collocated with CCRPC in the offices both organizations share to this day.

The **2006 Regional Plan**

The Chittenden County Regional Planning Commission (CCRPC) has a statutory duty to prepare a regional plan at least every five years to protect the environment and to guide the future growth and development of land, public services, and public facilities in Chittenden County. The **2006 Chittenden County Regional Plan** captures the most recent vision for the future of Chittenden County and is the result of public hearings and work sessions; feedback from municipalities, regional organizations, and the public; and deliberation by the Commission’s volunteer members and professional staff.

**Why Plan?**

Community planning and regional planning enable people with different outlooks and awareness to learn about important and sometimes controversial matters, to agree on common objectives, and to collaborate on undertaking coordinated agendas of actions. Public planning should strive to engage people not only because our laws and democratic traditions require it, but also because public engagement makes planning better. Effective public planning promotes

- Greater understanding of key facts,
- Deeper and more widespread appreciation of divergent views,
- Increased consensus on important goals and objectives, and
- Improved collaboration in undertaking complicated sequences of interrelated actions.

Planning for an entire region is especially challenging. While we all agree that Chittenden County should be a “great place to live, work and play,” there are myriad visions of exactly how such a place should look and which actions we should undertake to achieve this goal. CCRPC is statutorily designated as the County’s only official forum for developing public consensus on the future of Chittenden County. The **2006 Regional Plan** is intended to articulate the current consensus for our County’s future.
The Purposes of a Regional Plan

Vermont statutes [24 VSA 4347] establish that a regional plan has the general purpose of … guiding and accomplishing a coordinated, efficient and economic development of the region which will, in accordance with the present and future needs and resources, best promote the health, safety, order, convenience, prosperity and welfare of the inhabitants as well as efficiency and economy in the process of development.

To accomplish this general purpose, the 2006 Chittenden County Regional Plan

- Aids decision making by
  - Informing people about past conditions, current circumstances, and likely future trends,
  - Describing how decisions interrelate, and
  - Identifying efforts that have been undertaken, currently are under way, or are planned for the future.

- Documents our collective decisions on broad policy issues, enabling individuals and communities to focus on how best to achieve shared objectives through local decisions.

- Facilitates the resolution of disputes by identifying in advance our agreed goals and schedule of planned activities.

This Regional Plan is written for many users:

- Residents – By reading and discussing the Plan, residents may participate in shaping our Region’s future.

- Businesses and property owners – The Plan provides individuals and business decision makers with information about demographic, economic, and land use trends that are expected to influence the region over time.

- Municipalities, special-purpose governments, and nonprofit organizations – Local officials can use this Plan as a guide when preparing plans and making decisions.

- State and federal government officials – Officials who make regulatory decisions (such as Act 250 and Section 248 reviews of proposed developments), public investment decisions (such as grant awards to communities), or decisions on policies affecting our region may use this Plan to learn about past, current, and anticipated conditions and our preferences for the future.

The Style of the 2006 Regional Plan

The Regional Plan is written to help different readers accomplish a variety of purposes. This necessarily means that individual readers may find the writing style or content of some Plan sections to be ill-suited or unnecessary for using the Plan. For example, the Plan includes

- Explanations of concepts so that nonprofessional readers may better appreciate discussions of more complex issues;

- Numerous headings and bullet points so that readers can skim over sections to more easily locate the specific material that interests them; and

- Clearly designated policies that are differentiated from the background material describing issues.
The Relationships Between the 2006 Regional Plan and Other Plans

Vermont statutes establish that each regional plan and the adopted plans of the municipalities in that region should be compatible with one another. The regional plans of adjoining regions also are to be compatible with another. Consequently, no plan “trumps” all other plans.

Each regional plan also must be consistent with goals established by the State to guide all municipal and regional planning. State regulatory proceedings must give each regional plan’s definition of “substantial regional impact” due consideration, where relevant.

Regional planning and municipal planning work best when they work in concert. Regional planning works best when it establishes general policies addressing fundamental matters that affect the well being of many communities. These determinations are made by municipal representatives on the regional planning commission and reflect current municipal plans as well as feedback offered by municipal officials during development of the regional plan. Municipal planning works best when it takes these general regional planning policies and refines and adapts them to suit local needs and circumstances. Municipalities (not regional planning commissions) are authorized by the State to use regulatory and nonregulatory tools to implement their municipal planning policies.

Statement of Compatibility and Consistency

Pursuant to 24 VSA 4302 (f), 4345a (5), 4348a (a), and 4348a (a)(8), CCRPC has

- Reviewed the approved plans of its member municipalities and of its adjoining regional planning commissions and concluded that this Regional Plan is compatible with those plans (that is, this Regional Plan, as implemented, will not significantly reduce the desired effect of the implementation of the other plans) and

- Reviewed the goals of 24 VSA 4302 and concluded that this Regional Plan is consistent with those goals (that is, implementation of this Regional Plan will result in substantial progress toward attainment of the goals established in 24 VSA 4302).

How the 2006 Regional Plan Was Prepared

Overall Process

In early 2004, CCRPC established the following objective:

- Prepare and adopt by August 28, 2006 a regional plan for Chittenden County that
  - Is consistent with the goals of Chapter 117 (24 VSA 4302), compatible with approved municipal plans and adjoining regional plans, and conforms with all other statutory requirements and
  - Establishes policies with sufficient clarity and specificity to facilitate their use in subsequent decision making and Plan implementation.

In April 2004, CCRPC decided to invest two and a half years in the preparation of the 2006 Regional Plan (see Table 1-1). The overall process provided for the preparation of three draft plans: (1) Initial Draft, (2) Intermediate Draft, and (3) Public Hearing Draft. Each draft was prepared expressly for the purpose of enabling the public to suggest improvements to be incorporated into the subsequent draft. Thus, each successive draft tested public acceptance of a wider range of more refined factual presentations and policy recommendations.

CCRPC initiated the plan development process in July 2004 by asking member municipalities, regional organizations, and the public to provide feedback on needed changes to the 2001
### Table 1-1
**TIMELINE FOR PREPARING THE 2006 REGIONAL PLAN***

<table>
<thead>
<tr>
<th>Timing</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 2004</td>
<td>Strategic Planning for the 2006 Regional Plan Update Project</td>
</tr>
<tr>
<td>April – May 04</td>
<td>PRUC** Prepares Recommended 2006 Regional Plan Timeline and Project Description</td>
</tr>
<tr>
<td>April – May 04</td>
<td>Full Commission Reviews and Endorses Recommended Timeline and Description / Distributed to Municipalities</td>
</tr>
<tr>
<td>April – June 04</td>
<td>PRUC Prepares Requests for Municipal, Public, and Regional Partner Feedback on Needed Refinements to 2001 Regional Plan Sections</td>
</tr>
<tr>
<td>May – June 04</td>
<td>Full Commission Reviews and Endorses Requests for Municipal, Public, and Regional Partner Feedback on Needed Refinements to 2001 Regional Plan Sections</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Late 2004</th>
<th>Identify Scope of the 2006 Regional Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>July – Sept 04</td>
<td>Staff and Commissioners Solicit Municipal, Public and Regional Partner Feedback on Needed Refinements to 2001 Regional Plan Sections</td>
</tr>
<tr>
<td>Aug – Oct 04</td>
<td>PRUC Receives/Reviews Feedback and Recommend Refinements to be Made during 6-Month Period (Jan.-June 05) for Preparing Initial Draft Plan</td>
</tr>
<tr>
<td>Oct – Nov 04</td>
<td>Full Commission Reviews and Endorses Recommended Refinements to be Made during 6-Month Period for Preparing Initial Draft Plan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Early 2005)</th>
<th>Prepare Initial Draft of the 2006 Regional Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan – June 05</td>
<td>PRUC Prepares Initial Draft Plan Based on Endorsed Refinements</td>
</tr>
<tr>
<td>April – June 05</td>
<td>Full Commission Reviews and Endorses Initial Draft Plan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Late 2005</th>
<th>Prepare Intermediate Draft of the 2006 Regional Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>July – Aug 05</td>
<td>Staff and Commissioners Present Endorsed Initial Draft Plan to Municipalities and Others for Feedback</td>
</tr>
<tr>
<td>Aug – Oct 05</td>
<td>PRUC Receives/Reviews Feedback and Prepares Recommended Intermediate Draft Plan Based on Feedback</td>
</tr>
<tr>
<td>Oct – Nov 05</td>
<td>Full Commission Reviews and Endorses the Introduction and Planning Areas Chapters of the Intermediate Draft Plan</td>
</tr>
<tr>
<td>Nov 05 – Jan 06</td>
<td>Full Commission Reviews and Endorses Remaining Chapters of the Intermediate Draft Plan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Early 2006</th>
<th>Prepare Public Hearing Draft of the 2006 Regional Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb – March 06</td>
<td>Staff and Commissioners Present Intermediate Draft Plan to Municipalities and Others for Feedback</td>
</tr>
<tr>
<td>Feb – May 06</td>
<td>PRUC Reviews Feedback and Prepares Public Hearing Draft Plan Based on Feedback</td>
</tr>
<tr>
<td>April – May 06</td>
<td>Full Commission Reviews and Endorses Public Hearing Draft Plan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Late 2006</th>
<th>2006 Regional Plan Adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 06</td>
<td>30-Day Warning for Required 1st Public Hearing</td>
</tr>
<tr>
<td>June 06</td>
<td>1st Public Hearing (Staff, PRUC, Commissioners)</td>
</tr>
<tr>
<td>July – Aug 06</td>
<td>30-Day Warning for Required 2nd Public Hearing</td>
</tr>
<tr>
<td>Aug 11, 06</td>
<td>2nd Public Hearing (Staff, PRUC, Commissioners) / PRUC Recommends Plan Adoption to Full Commission</td>
</tr>
<tr>
<td>Aug 28, 06</td>
<td>Plan Adopted by Affirmative Vote of Commissioners Representing Municipalities</td>
</tr>
<tr>
<td>Oct 2, 06</td>
<td>Towns Have 35 Days to Review Plan – If a Majority of Region’s Towns Object, the Plan is Vetoed; Otherwise, It Goes into Effect October 2, 2006</td>
</tr>
</tbody>
</table>

---

*As amended by the Commission in October 2005.

**PRUC = Plan Review and Update Committee, the CCRPC committee primarily responsible for developing the 2006 Plan.
Regional Plan. This request enabled the public to work from a set of concrete proposals and enabled the Commission to build on the foundation of the 2001 Plan, rather than starting from a blank slate. From September to November 2004, CCRPC’s Plan Review and Update Committee (PRUC) examined detailed suggestions relating to every section of the 2001 Plan that were received from communities, planning commissions, regional organizations, professional planners, and citizens. In October and November 2004, the Commission reviewed and endorsed PRUC’s recommendations for incorporating these suggested refinements.

In January 2005, PRUC began preparing the Initial Draft of the 2006 Plan. Starting with this stage and throughout the subsequent stages of the process, the Commission posted draft materials on CCRPC’s website and invited the public to submit comments via a dedicated email box or postal mail.

In June 2005, the Commission approved release of the Initial Draft. The Initial Draft framed the 2006 Plan’s basic themes and policies. That is, the Initial Draft purposely did not contain the full breadth and depth of material that were anticipated to be in the 2006 Plan. Rather, the Initial Draft was designed to obtain early feedback on the Plan’s most general features and to seek consensus on the Plan’s most fundamental recommendations. Subsequent drafts were used to refine and embellish these features and recommendations.

The Commission distributed copies of the Initial Draft to municipal legislative bodies and planning commissions, regional organizations, interest groups, and citizens; posted it on CCRPC’s website; and solicited input from organizations and individuals by means of letters and press releases. The Commission also posted copies of all written feedback on the Initial Draft on CCRPC’s website. At later stages of the process, feedback received on subsequent drafts was posted.

In the second half of 2005, PRUC and CCRPC reviewed public feedback on the Initial Draft and prepared the Intermediate Draft. CCRPC approved the release of the first three chapters of the Intermediate Draft in November 2005 and of the remaining chapters in January 2006. The Commission posted the Intermediate Draft on CCRPC’s website; distributed copies to the entities that received the Initial Draft as well as to libraries, community centers, and municipal buildings; and held public forums to obtain more feedback from members of the general public on February 21, 22, and 23, 2006.

PRUC and CCRPC prepared the Public Hearing Draft based on public feedback received on the Intermediate Draft. CCRPC retained the services of copy editors to help ensure that the Plan’s discussion of complex and detailed issues was accessible to nonexpert readers. Additional public input was obtained at three forums held in mid-June 2006 and at the first of two required public hearings held on June 22, 2006. At CCRPC’s June 26, 2006 meeting, the Commission considered possible revisions to the Public Hearing Draft. The Commission held its second public hearing on August 24, 2006 and considered adoption of the Plan at its August 28, 2006 meeting. Adoption requires that the Commissioners representing at least 12 (not less than 60 percent) of CCRPC’s 19 member municipalities vote in favor of the Plan.

The adopted Regional Plan was then submitted immediately to the legislative bodies of CCRPC’s 19 member municipalities. The Plan is considered duly adopted and takes effect 35 days after the date of adoption unless within 35 days of the date of adoption CCRPC receives certification vetoing the Plan from the legislative bodies of at least 10 (a majority) of CCRPC’s 19 member municipalities.
Maps / Geographic Information System (GIS)

All of the maps that appear in the 2006 Regional Plan were prepared using CCRPC’s Geographic Information System (GIS). GIS is a set of computer software and hardware tools used to store, manage, analyze, and display information in powerful ways:

- It links the measurements taken of variables to particular locations, thereby allowing us to determine and display with maps how various places are similar and how they are different.
- It provides for the simultaneous analysis of many different factors, making it easier to consider complex problems.
- Because it uses digital technology, large numbers of measured values may be processed quickly, enabling us economically to consider alternative approaches and scenarios. Digital technology also means that the virtual maps in the system can easily be customized to suit specific needs (for example, different scales, study areas, sets of variables, and stylistic and graphic features).

Of necessity, the paper maps that are included in the 2006 Regional Plan are limited illustrations of the underlying datasets that reside in CCRPC’s GIS. Any detailed analysis of mapped data contained within the Plan should be based on the GIS source files, rather than the paper map. Please contact CCRPC staff to obtain copies of the GIS files.

Differences Between the 2001 and 2006 Regional Plans

The 2006 Regional Plan seeks to update and build on the 2001 Regional Plan, based on awareness of changed conditions, improved analytical tools, and more recent deliberations. Major improvements made to the 2006 Regional Plan are summarized below.

Planning Areas

The regional plans for Chittenden County before 2001 designated the areas in the County that were regarded as being most suitable for future development as “Growth Centers.” The 2001 Regional Plan changed this practice by designating areas that were regarded as being most suitable for different types of development as “Planning Areas.”

The 2001 Plan used the Planning Areas concept primarily to depict land-use policies and largely refrained from using Planning Areas to target policies in other chapters of the Plan (such as Housing, Infrastructure, and Natural Resources). While the 2006 Regional Plan continues to use the Planning Areas concept to target various land-use policies to different places in the County, the Plan also uses Planning Areas to target policies made in its other chapters.

When the 2006 Regional Plan designates different places in the County as being in the same Planning Area, the Plan is recommending that these places should share the same general features and characteristics. The Plan is not recommending that development should be uniform throughout an entire Planning Area nor that all places with the same Planning Area designation should be developed in exactly the same way. In each Planning Area, municipalities are expected and encouraged to tailor the Regional Plan’s general policies to address local challenges and opportunities.
Policy Plan

There are different types of plans. The selection of a particular type of plan defines the kinds of plan contents, analytical methods, and participatory process necessary for the plan to be effective. The factors determining which type of plan should be prepared include

- The specific purposes that the plan is intended to achieve,
- The nature of the plan’s recommendations, and
- A realistic assessment of whether successful implementation of the plan depends on measures undertaken solely by the parties who prepare or adopt the plan or whether measures undertaken by additional parties are crucial to success.

CCRPC decided that the 2006 Regional Plan will be most useful to Chittenden County if it is a “Policy Plan” for the following reasons:

- The principal purpose of this type of plan is to identify key considerations that are intended to be used in many subsequent decision-making processes;
- The Regional Plan’s recommendations address the future well being of Chittenden County (evolving states of affairs, not one-time outcomes or products), involve a wide range of subjects, and affect many people over an expansive territory; and
- State statutes establish that both CCRPC and the Regional Plan are advisory in character and the entities whose decisions and actions are needed to successfully implement the Regional Plan are large in number and have wide-ranging characteristics.

Consequently, CCRPC strove to have the 2006 Regional Plan use the analytical methods, participatory process, and contents that are appropriate to a Policy Plan.

This means that the character of the recommendations made by the 2006 Regional Plan are very different than those of the 2001 Regional Plan. The 2001 Plan made three types of recommendations: goals (broad objectives), policies (positions that help to achieve goals), and implementation strategies (courses of action to achieve policies). The 2006 Plan makes only one type of recommendation: policies. Each policy describes preferable general features of the County’s future, regardless of whether it could be described as a goal, strategy, or action.

Implementing the Regional Plan

A Policy Plan is implemented differently from many other types of plans. Successful implementation of a Policy Plan depends on respecting the plan’s purpose of providing general guidance:

- Preparers of a policy plan should recognize that the plan cannot be a blueprint that dictates all subsequent decisions. They should value the plan’s role as a starting point for implementers entrusted with making decisions that are complicated by detailed considerations that the plan cannot fully anticipate.
- Implementers of a policy plan should recognize that the plan provides a foundation for their more rigorous, detailed decision making. They should value the plan’s analysis of major issues and its regional consensus on key policy choices.

In the years following adoption of the Regional Plan, CCRPC will work with member municipalities, regional partner organizations, and others to

- Identify the most urgent and important issues affecting the future welfare of the County and
- Host strategic planning processes to build collaborative approaches to address these matters.
Collaboration

More than any other place in Vermont, Chittenden County stands to benefit from collaborative planning among CCRPC, municipalities, special-purpose regional boards, and the private sector. In a metropolitan area like ours, the economy, environment, and sense of community are the products of many individual actions and decisions. The choices we make as individuals have immediate and cumulative impacts on our neighbors and on our collective well being. Collaborative planning helps to coordinate those choices so that they support one another.

If collaborative planning is to be successful in promoting the appropriate development of the County, CCRPC Commissioners, municipal officials, members of regional boards, as well as business, nonprofit, and community leaders should understand, value, and respect each other’s special roles and responsibilities in this planning partnership:

- Regional planning works best when it establishes general policies addressing fundamental matters that affect the well being of many communities, rather than attempting to dictate decisions best made by local leaders, specialized boards, or private enterprise and individuals.
- Municipal planning works best when it establishes municipal policies that suit local needs and circumstances, while advancing outcomes that benefit the region.
- The boards of regional special-purpose organizations make highly complex decisions related to key aspects of the County’s well being. Their decisions both affect and are affected by community development policies.
- The business community, nonprofit organizations, and individuals have perspectives and opinions that are critical to the success of community and regional planning. Planning processes need to involve the public and the public needs to involve itself in planning processes.

It is not a question of choosing between allegiance to either local or regional goals. The future of the County depends on developing a set of shared goals that promote the well being of both the County and its communities. This approach is necessary because

- The State does not authorize CCRPC to implement the Regional Plan by using the powers delegated to municipalities to implement municipal plans. Instead, the Regional Plan is intended to be implemented primarily through the combined voluntary actions of member municipalities and others. CCRPC’s Commissioners share responsibility for ensuring that planning undertaken by the Commission both responds to the needs of individual member municipalities and promotes the County’s future well being.
- The State does not authorize municipalities to plan for and manage development outside their borders. Instead, municipalities within a region are authorized to establish a regional planning commission to collaborate on identifying, assessing, and addressing matters of common concern.
- Regional special-purpose organizations are empowered to carry out focused missions, rather than interpret the broad community development policies of the region and its communities. CCRPC and municipalities facilitate the effective and efficient fulfillment of the missions of regional special-purpose organizations when they respect the counsel of these organizations when crafting community development policies.

Planning often is described as being a process. Truly collaborative planning requires time to build the requisite trust among partners and the ongoing commitment to achieving shared goals. In crafting and implementing the 2006 Regional Plan, CCRPC strives to promote collaborative planning by respecting the roles of its planning partners.
Act 250 and Section 248 / Substantial Regional Impact

Why the Regional Plan Defines Substantial Regional Impact

Vermont has established two procedures for reviewing the impacts of certain major development proposals:

- **Act 250** – Certain proposed developments are required to obtain a permit from one of Vermont’s nine District Environmental Commissions in order to establish that the proposed development will satisfy 10 criteria defined by Act 250. One of these 10 criteria is that the proposed development be “in conformance with any duly adopted local or regional plan or capital program.”

- **Section 248** – Certain proposed utility facilities are required to obtain a permit from Vermont’s Public Service Board to establish that the proposed facility will satisfy criteria defined by Section 248. One of the Section 248 criteria is that the proposed facility will “not unduly interfere with the orderly development of the region with due consideration having been given to the recommendations of the municipal and regional planning commissions.”

In Act-250 and Section-248 proceedings in which the provisions of a regional plan or a municipal plan are relevant to the determination of any issue, the regional plan’s provisions must be given effect to the extent that they are not in conflict with the provisions of a duly adopted municipal plan. To the extent that such a conflict exists, the regional plan must be given effect if it is demonstrated that the project under consideration would have a “substantial regional impact.” That is, the issue of whether a proposed development has a “substantial regional impact” is important only when there is a conflict between the regional plan and municipal plan.

It is highly unlikely that provisions of the 2006 Regional Plan and the plans of CCRPC’s member municipalities will be in conflict with one another because:

- The Land Use Panel of the Natural Resources Board that oversees the Act 250 process currently interprets “conflict” between a municipal plan and a regional plan in very narrow terms: “A conflict exists when one plan allows the project but the other does not.”

- To determine whether a municipal plan or a regional plan provides guidance as to whether a proposed development is in conformance with the plan, the Land Use Panel considers two questions: (1) Is the language in the plan mandatory or merely a guidance and (2) Are the plan’s provisions specific or ambiguous?

- To determine in Act-250 cases whether a plan provision is mandatory or merely a guidance, the Vermont Supreme Court established a general rule that plan provisions using “shall” are more likely to be interpreted as mandates or prohibitions, whereas provisions using “should” are less likely to be so interpreted. CCRPC deliberately chose to make the 2006 Regional Plan a “policy plan” that is intended to provide general advisory guidance and intentionally chose not to use “shall” in the Plan’s policy statements.

- State statutes establish that regional plans and municipal plans are to be compatible with one another.

- A regional plan must be adopted by not less than a 60 percent vote of the commissioners representing municipalities and initially may be vetoed by a majority of the municipalities.

- Confirmation of a municipality’s planning process by CCRPC requires that the municipality’s plan be compatible with the regional plan.

Vermont law requires that this Regional Plan define “substantial regional impact” as the term is to be used with respect to Chittenden County. The Regional Plan’s definition of substantial regional impact “…must be given due consideration, where relevant, in state regulatory proceedings.”
It is important to remember that Vermont law (not this Regional Plan’s substantial regional impact definition) determines whether or not a proposed development

- Must apply to obtain an Act 250 or Section 248 permit and
- Is entitled to be issued the relevant permit.

Both Act 250 and Section 248 require the permit applicant for a project that is proposed to be located in Chittenden County to submit a copy of the application to CCRPC. CCRPC is a party in any such application for an Act 250 permit\(^1\) and may apply to be a party in any such application for a Section 248 permit.

CCRPC has established a formal policy for its participation in the permit review procedures of Act 250 and Section 248. Under this policy,

- CCRPC’s Regulatory Review Committee considers whether an applicant’s proposal is in conformance with the Regional Plan.
- The substantial regional impact definition is used to help identify proposals whose conformance with the Regional Plan should be considered more carefully.
- The substantial regional impact definition is not used to determine whether a proposed development is in conformance with the Regional Plan.
- CCRPC staff are to periodically check with municipal planning staff to identify emerging development proposals to assess their conformance with the Regional Plan. This proactive, collaborative approach attempts to work out any concerns about Act 250 and Section 248 applications prior to their submission.

The following section constitutes the required definition of “substantial regional impact,” as this term is to be used with respect to Chittenden County.

**Definition of Substantial Regional Impact**

A proposed development has a substantial regional impact if a policy of this Regional Plan that is relevant to the determination of an issue in an Act 250 or Section 248 proceeding\(^2\) makes recommendations that are more specific about one or more characteristics, features, standards, or conditions relating to the proposed development than the recommendations of the municipal plan.

---

**Notes**

1. This section relies on “A History of Chittenden County” by Coralie Magoon, which was included in each of CCRPC’s regional plans until 1991 and on the “History” section of the 2001 Regional Plan.
2. In 1798, the Vermont Legislature would deny the “Seven Nations of Lower Canada Indians” compensation for all of the lands west of the Green Mountains north of Ticonderoga on the basis that their claim was nullified when their French allies ceded Canada to the English.
3. Buel’s Gore was first chartered in 1780 and Richmond was established in 1794 from parts of Bolton, Huntington, Jericho, and Williston. South Burlington was established in 1865 when Burlington incorporated. Essex Junction was incorporated in 1892. Winooski was created from Colchester in 1922.
4. Franklin County was created from part of Chittenden County in 1792 and other areas were carved out of Chittenden until 1839. Since then, Chittenden County has existed at its present size of about 520 square miles.
5. Northwest Vermont is composed of Addison, Chittenden, Franklin, Grand Isle, Lamoille, and Washington Counties.
6. OMB’s standards provide that each metropolitan area must have at least one urbanized area of 50,000 or more
inhabitants. An urbanized area is composed of one or more “central places” and the densely settled (generally at least 1,000 persons per square mile) “urban fringe” surrounding the central place.

A CCRPC policy that describes the process and standards for confirming municipal planning programs and approving municipal plans is posted on CCRPC’s website: www.ccrpcvt.org.

During the preparation of the 2006 Regional Plan in 2005-2006, CCRPC received many comments regarding the role that the definition of Substantial Regional Impact (SRI) plays in Act 250 / Section 248 processes, the characteristics of an effective SRI definition, and proposed revisions to the SRI definition used in the 2001 Regional Plan. During the 2006 Regional Plan-development process, limited time and staff resources prevented CCRPC from undertaking the type of focused review needed to prepare amendments to the SRI definition that would enjoy widespread support. Consequently, the 2008 Regional Plan adopted by CCRPC in August 2006 continued to employ the SRI definition from the 2001 Regional Plan, except for eight technical corrections.

In late 2006, CCRPC requested each of CCRPC’s 19 member municipalities to designate a representative to an SRI Task Force that would recommend needed revisions to the Regional Plan’s SRI definition. The SRI Task Force dedicated over a year to reviewing the relevant State statutes and the 2006 Regional Plan’s SRI definition, deliberating on the characteristics that an SRI definition should have, considering the definitions used by other regional planning commissions, and attempting several approaches for improving the existing SRI definition.

In April 2008, the Task Force agreed on an approach for defining SRI that properly balanced administrative simplicity and certainty. The Task Force recommended that this revised Regional Plan section be substituted for the section adopted by CCRPC in August 2006 because

- The old SRI definition consists principally of numerical standards that each relate to a specific type of proposed development or impact. Consequently, the 2006 approach has the following shortcomings:
  - Numerical Standards – Although numerical standards are precise and certain, it often is very difficult to establish consensus that a specific threshold truly distinguishes “regional” from “local;”
  - Specific Types – Because it is unlikely that a list of specific types of proposed types of impacts or developments will be comprehensive, this approach may result in gaps in coverage; and
  - Proposed Developments – The existing approach tends to focus on the size of a proposed development (rather than on the actual impacts that are likely to result) and tends to assume that bigger developments are more likely to have regionally significant impacts (it tends to overlook the possibility of many small developments having a combined / cumulative impact that is of regional significance); and.
- The new SRI definition establishes a single simple rule that is in keeping with the rules that are used to consider issues related to SRI in Act 250 reviews.

CCRPC reviewed the Task Force’s recommended revision at the Commission’s May 19, 2008 meeting and approved using the statutory regional plan amendment process to consider whether the Task Force’s recommendations should be adopted as part of the 2006 Regional Plan. On June 19, 2008 and July 24, 2008, CCRPC held the public hearings required by that process and on October 27, 2008 CCRPC voted to adopt the SRI definition recommended by the SRI Task Force.

The Act 250 criteria are set out in 10 V.S.A. 6068.

The Section 248 criteria are set out in 30 V.S.A 248. 10 VSA 6605 (c) also mandates that the Secretary of the Agency of Natural Resources may not issue a new Solid Waste Management Facility Certification unless the facility is included in an implementation plan that has been adopted pursuant to 24 V.S.A. § 2202a for the area in which the facility is located, is consistent with the state plan, and is “in conformance with any municipal or regional plan adopted in accordance with 24 V.S.A. chapter 117.”

24 V.S.A 4348 (h). This 4348 (h) rule applies specifically to proceedings under Act 250, Section 248, and solid waste management facility certification. Since January 2007, there were over 100 Act 250 permit applications, less than 10 Section 248 permit applications and no applications for Solid Waste Management Facility Certification in Chittenden County.


Land Use Panel, Natural Resources Board; “Section 32. Criterion 10 (Local Plan and Regional Plan).” Act 250 Training Manual at III. C. “How is a Town Plan or Regional Plan Interpreted?,” citing Re: Times and Seasons, LLC and Hubert K. Benoit, #3W0839-2-EB, Findings of Fact Conclusions of Law, and Order at 58 (November 4, 2005) and other decisions.


See 24 V.S.A 4345a (5), 24 V.S.A 4382 (a), and 24 V.S.A 4350 (b) (2). 24 V.S.A 4350 (f) (2) defines one plan being “compatible with” another plan when “…the plan in question, as implemented, will not significantly reduce the desired effect of the implementation of the other plan.”  If the plan, as implemented, will significantly reduce the desired effect of the other plan, the plan may be considered compatible when it includes the additional contents required in 24 V.S.A 4302 (f) (2) (A) through (D).

24 V.S.A 4348 (f).
1-17 24 V.S.A 4350 (b) (2).
1-18 24 V.S.A 4345a (17).
1-19 State of Vermont, Natural Resources Board, Land Use Panel, Act 250 Rules (Effective October 3, 2007), Section 14 (A) states that “Party Status in Act 250 proceedings is established pursuant to 10 V.S.A. Section 6085 (c). 10 VSA 6085 (c) (1) states that “In proceedings before the district commissions, the following persons shall be entitled to party status: …(C) The municipality in which the project site is located, and the municipal and regional planning commissions for that municipality;…”
1-20 This definition also applies to applications for Solid Waste Management Facility Certification under 10 VSA 6605 (c).
Planning Areas

One of Chittenden County’s major assets is the diversity of its communities, each with its own special character. The Regional Plan uses the concept of Planning Areas to identify the locations of certain general types of places so that the Plan can use targeted general policies to promote the desired future basic character of these places. Municipal planning refines the Plan’s general policies and establishes the specific character of each place based on consideration of local factors and the municipality’s own definition of community identity. This chapter

- Explains the Planning Areas concept,
- Describes how the boundaries of the five types of Planning Areas were defined, and
- Summarizes the general character of each Planning Area and the policies that relate to it that are set forth in the Plan’s later chapters.

Overview of Planning Areas

General Description and Purposes

The Planning Areas concept is a tool that the Regional Plan uses to identify those areas of the County where certain Regional Plan policies are to apply. Each Planning Area indicates where certain Regional Plan’s policies apply, whereas the Plan’s text describes what these policies are.

Designating a variety of Planning Areas enables the Regional Plan to target specific policies to particular types of places in the County. Each of the five Planning Areas designated by the Regional Plan has its own special character:

- **Metropolitan Planning Areas** are intended to be regional or subregional centers for jobs, housing, and community facilities and have an urbanized character.
- **Transition Planning Areas** are intended to be near Metropolitan, Village or Enterprise Planning Areas where future development is especially encouraged to use limited land resources and infrastructure efficiently and to protect natural resources.
- **Enterprise Planning Areas** are intended to be employment centers.
- **Village Planning Areas** are intended to be local centers for jobs, housing, and community facilities and have the character of a Vermont village.
- **Rural Planning Areas** are intended to be places that preserve Vermont’s traditional rural character.

The Regional Plan uses Planning Areas to designate the general areas where general planning policies are most appropriate. When the Regional Plan specifies that a particular type or form of development is appropriate in a particular Planning Area, it does not mean that this development is appropriate everywhere in that Planning Area. A municipality should tailor each of the Regional Plan’s general policies to suit local circumstances when the municipality decides in its plan and zoning bylaws whether a particular development is appropriate to a subarea of a Planning Area.
Relationship of Planning Areas and Growth Centers

A Vermont municipality may apply for State designation of four types of areas collectively referred to as “growth centers:” (1) “Downtown Development District,” (2) “Village Center,” (3) “New Town Center Development District,” and (4) “Growth Center.” Areas that receive designation are eligible for a variety of State incentives.2-1

On May 24, 2006, the Governor signed into law Act 183 (Senate Bill 142) that revised the definition of “growth center” and established a new process for growth center designation:

- A municipality may apply for growth center designation concurrently with an application for downtown designation [24 VSA 2793], village center designation [24 VSA 2793a], or new town center designation [24 VSA 2793b].2-2
- A municipality that applies for designation of any of the four types of growth centers is required to have a planning process confirmed by the municipality’s regional planning commission and a municipal plan approved by the municipality’s regional planning commission pursuant to 24 VSA 4350.2-3
- When requested by a municipality, the municipality’s regional planning commission is required to provide technical assistance in support of the application.2-4
- By October 2006, the Land Use Panel of the Natural Resources Board and the Department of Housing and Community Affairs are to establish a body to (1) provide municipalities with a preapplication review process, (2) ensure consistency in growth center designation and related planning, (3) provide the State Board with staff support and expertise in land use, community planning, and natural resource protection, and (4) coordinate State agency review.2-5
- The municipality’s decision to apply for growth center designation must be made by vote of the municipal legislative body, subject to the process established by 24 VSA 1972 (adoption of an ordinance or rule) and 24 VSA 1973 (permissive referendum).2-6
- The State board that considers approval of an application for growth center designation includes as a voting member a representative from the membership organization of the State’s 11 regional planning commissions.2-7

As noted above, for an area to be considered for designation as any of the four types of growth centers, the municipal applicant must have a planning process that has been confirmed by the municipality’s regional planning commission and a municipal plan that has been approved by the municipality’s regional planning commission. These actions require the regional planning commission to determine that the municipality’s plan conforms to the regional plan. Consequently, it is helpful to municipalities seeking growth center designation for the regional plan to identify areas that are appropriate for such designation.

The 2006 Chittenden County Regional Plan uses the Planning Areas concept to designate the general areas of the County that are most appropriate for growth center designation. Specifically, the Regional Plan recommends that any area within a Metropolitan Planning Area, Transition Planning Area, Enterprise Planning Area, or Village Planning Area is generally appropriate for consideration of being designated as a growth center. This does not mean that all places within these Planning Areas meet all of the statutory criteria for growth center designation. Rather, it means that from a regional planning perspective it is appropriate for a municipality to apply for growth center designation for an area that is within any of these four Planning Areas.
Establishing Planning Areas

All of the Regional Plan’s policies relate to the County’s future and explicitly state the way something should be (rather than simply describing what it is now or what it is expected to be in the future). The Regional Plan uses the Planning Areas concept to identify the specific places in the County where particular Regional Plan policies apply. The Planning Areas identify those places that should share similar general features and characteristics in the future.

Municipal zoning regulations provided the starting point for establishing the Planning Areas. Zoning districts define places that are intended to develop in similar ways in the future. However, there are challenges to using municipal zoning to establish the Regional Plan’s Planning Areas.

- Municipal zoning is not uniform. Communities may differ in
  - The types or degrees of regulation used to accomplish the same objective;
  - The purposes or objectives that are to be achieved by same type or degree of regulation;
  - How precisely they define zoning district boundaries; and
  - How they enforce the same regulation.

- Municipal zoning is by definition local. Zoning policies in one community are seldom identical with those in neighboring communities.

Consequently, CCRPC sometimes diverged from municipal zoning when it established the Regional Plan’s Planning Areas so that the Planning Areas would identify the desired general future character of places in the County in a way that achieves both local and regional planning objectives:

- **Metropolitan Planning Areas** – Areas where local zoning authorizes future residential, commercial, industrial, and institutional development to occur on the greatest scale and at the greatest densities in the County.

- **Transition Planning Areas** – Areas near a Metropolitan Planning Area, Village Planning Area, or Enterprise Planning Area where local zoning authorizes future development to occur on greater scales and at greater densities than is typical in the Rural Planning Areas and where CCRPC encourages future development efficiently to use limited land resources and infrastructure and to minimize adverse impacts on natural resources.

- **Enterprise Planning Areas** – Areas where local zoning authorizes a future concentration of employment uses.

- **Village Planning Areas** – Areas where local zoning authorizes a variety of future residential and nonresidential development at densities and scales in keeping with the character of a Vermont village.

- **Rural Planning Areas** – Areas where local zoning promotes the preservation of Vermont’s traditional rural character.
Planning Area Descriptions

The five Planning Areas are depicted on Map 2-1 (located at the back of the Plan). Table 2-1 provides an overview of some characteristics of these Planning Areas.

Table 2-1
OVERVIEW OF PLANNING AREA CHARACTERISTICS*

<table>
<thead>
<tr>
<th>Major Characteristics</th>
<th>Planning Areas</th>
<th>County Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metro</td>
<td>Transition</td>
</tr>
<tr>
<td>Land Area</td>
<td>17,964 5.2%</td>
<td>18,379 5.3%</td>
</tr>
<tr>
<td>% of County Total</td>
<td>5.2%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Developed Area</td>
<td>14,849 82.7%</td>
<td>13,141 71.6%</td>
</tr>
<tr>
<td>Acres</td>
<td>14,849 82.7%</td>
<td>13,141 71.6%</td>
</tr>
<tr>
<td>% of Planning Area</td>
<td>82.7%</td>
<td>71.6%</td>
</tr>
<tr>
<td>% of County Total</td>
<td>8.2%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Undeveloped Area</td>
<td>3,051 17.0%</td>
<td>5,203 28.4%</td>
</tr>
<tr>
<td>Acres</td>
<td>3,051 17.0%</td>
<td>5,203 28.4%</td>
</tr>
<tr>
<td>% of Planning Area</td>
<td>17.0%</td>
<td>28.4%</td>
</tr>
<tr>
<td>% of County Total</td>
<td>1.9%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Housing # of Units</td>
<td>33,373 51.0%</td>
<td>13,389 20.5%</td>
</tr>
<tr>
<td>% of County Total</td>
<td>51.0%</td>
<td>20.5%</td>
</tr>
<tr>
<td>Employment # of Jobs</td>
<td>64,272 68.9%</td>
<td>4,681 5.0%</td>
</tr>
<tr>
<td>% of County Total</td>
<td>68.9%</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

* Developed Area and Undeveloped Area are for 2003, Housing is for 2004-2005, and Employment is for 2000. The method used to estimate the areas that are Developed and Undeveloped yields results that do not exactly total the Land Area. Consequently, the percentages of each Planning Area that are Developed and Undeveloped were calculated based on the total of these two categories for that Planning Area.

SOURCE: CCRRPC Geographic Information System.

Metropolitan Planning Area

Metropolitan Planning Areas contain the County’s highest-density and largest-scale developments and have an urbanized character. Employment, commercial, institutional, recreational, educational, and cultural facilities serve regional and local needs. These land uses are locally planned and managed to coexist successfully with neighborhoods and natural areas. Places within Metropolitan Planning Areas typically are served by facilities and services that offer a variety of transportation options, including nonmotorized modes.

The Regional Plan designates seven Metropolitan Planning Areas in the County (see Map 2-1). The largest of these is within Burlington, Colchester, South Burlington, and Winooski. The remaining areas are located in Essex Junction, Essex Town, Williston, and Milton.

Many of the other chapters of the Regional Plan present policies that relate specifically to the Metropolitan Planning Areas. Those policies recommend that Metropolitan Planning Areas:

- Provide for land uses that serve the business, commercial, cultural, educational, employment, industrial, institutional, and recreational needs of the County and the multi-county region as well as land uses that serve the needs of local residents and employers;
- Contain the County’s largest buildings and highest residential and nonresidential densities and be regarded as a suitable location by employers and households having a wide range of needs;
Have a high priority for public sewer and water infrastructure and for transportation investments (including nonmotorized modes) to support future development;

Encourage appropriate infill development in suitable areas;

Minimize adverse impacts on natural resources and ensure ecosystem health; and

Be developed in accordance with local plans and bylaws that designate the best locations for land uses, manage development to ensure that land uses and activities are compatible, and promote the prosperity and well being of the County.

The planning area concept is a tool for articulating the Regional Plan’s general policies (see page 2.1). The Regional Plan does not recommend that all parts of every Metropolitan Planning Area serve identical economic and land-use functions (see page 1.5). A municipality should tailor the Regional Plan’s general policies to support the special character and function of each place designated as Metropolitan Planning Area in light of local economic development objectives, community development policies, and resource protection goals. It is appropriate for places within a Metropolitan Planning Area in a single community to be different. It also is appropriate for places within Metropolitan Planning Areas in different communities to be different.

**Transition Planning Area**

The Transition Planning Areas are places near the Metropolitan Planning Areas, Village Planning Areas, or Enterprise Planning Areas that are designated by local plans and bylaws for future development. Many parts of the Transition Planning Area already have been developed, often in suburban styles of development. Future development and redevelopment in this Planning Area should use land resources and infrastructure investments efficiently, while minimizing adverse impacts on natural resources and protecting strategic open space.

The Regional Plan designates 20 Transition Planning Areas in the County (see Map 2-1), located in Colchester, Essex Junction, Essex Town, Milton, Shelburne, South Burlington, and Williston.

Many of the other chapters of the Regional Plan present policies that relate specifically to the Transition Planning Areas. Those policies recommend that Transition Planning Areas:

- Be developed in accordance with local plans and bylaws that designate the best locations for land uses, make the most efficient use of land resources and public infrastructure, promote development patterns that maximize accessibility between residential and nonresidential land uses, and manage development to ensure that land uses and activities are compatible;
- Encourage appropriate infill development in suitable areas;
- Have a high priority for public sewer and water infrastructure and for transportation investments (including nonmotorized modes) to support future development; and
- Balance compact development with open space in order to minimize adverse impacts on natural resources, ensure ecosystem health, and retain the capacity to absorb future growth.

The planning area concept is a tool for articulating the Regional Plan’s general policies (see page 2.1). Local considerations will affect the development of the specific areas designated by this Plan as Transition Planning Area. A municipality should tailor the Regional Plan’s general policies to support development that is appropriate, given local policies and site considerations. It is appropriate for places within a Transition Planning Area in a single community to be different and for places within Transition Planning Areas in different communities to be different.
Enterprise Planning Area

Enterprise Planning Areas provide places for a single major employer or a concentration of employers that are likely to attract workers from the County and multicounty region. Development in these Planning Areas is to be locally planned and managed to minimize adverse impacts on surrounding planning areas. The Regional Plan designates 16 Enterprise Planning Areas in the County (see Map 2-1) located in Burlington, Colchester, Essex Town, Hinesburg, Milton, and Williston.

Many of the other chapters of the Regional Plan present policies that relate specifically to the Enterprise Planning Areas. Those policies recommend that Enterprise Planning Areas

- Be developed in accordance with local plans and bylaws to provide for the needs of existing and future employers, using design standards that incorporate alternatives to automotive transportation, ensure the compatibility of nearby land uses, and minimize adverse impacts on natural resources and ecosystem health;
- Provide employment opportunities that promote the Regional Plan's economic development policies; and
- Have a high priority for public sewer and water infrastructure and for transportation investments (including the transportation of goods) to support future development.

The planning area concept is a tool for articulating the Regional Plan's general policies (see page 2.1). The Plan does not recommend that every part of all Enterprise Planning Areas contains identical land uses. A municipality should tailor the Plan's policies to support the community's special economic development needs, community development policies, and resource protection goals. It is appropriate for places within an Enterprise Planning Area in a single community to be different and for places within Enterprise Planning Areas in different communities to be different.

Village Planning Area

A Village Planning Area is a compact area of mixed-use activities that maintains the character of a Vermont village. This type of Planning Area is intended to serve its local surroundings as a municipal center where people can live, work, shop and recreate. The Regional Plan designates 20 Village Planning Areas in the County (see Map 2-1). Some municipalities have more than one Village Planning Area and some municipalities have none.

Many of the other chapters of the Regional Plan present policies that relate specifically to the Village Planning Areas. Those policies recommend that Village Planning Areas

- Provide for the commercial, cultural, educational, employment, industrial (when compatible), institutional, and recreational needs of local residents and employers;
- Have a high priority for public sewer and water infrastructure and for transportation investments (including nonmotorized modes) to support future development; and
- Be developed in accordance with local plans and bylaws to allow for higher-density, mixed-uses, employing design standards that incorporate alternatives to automotive transportation, ensure the compatibility of nearby land uses and minimize adverse impacts on natural resources and ecosystem health.

The planning area concept is a tool for articulating the Regional Plan's general policies (see page 2.1). The Plan does not recommend that every village be identical. A municipality should tailor the Plan's policies to support its own community development goals. It is appropriate for places
within a Village Planning Area in a single community to be different and for places within Village Planning Areas in different communities to be different.

**Rural Planning Area**

Most of Chittenden County is rural: farmsteads, pastures, crop fields, woodlands, meadows, and wetlands. The rural landscape so prevalent in the County’s southern, eastern, and northern areas defines Chittenden County’s character and is a cherished feature of our quality of life.

The Rural Planning Area provides for places that are primarily working lands and natural areas so that these places may retain the character of Vermont’s traditional rural landscape. The *Regional Plan* designates almost 85 percent of the County as Rural Planning Area (see Map 2-1). The single largest Rural Planning Area encompasses parts of 16 municipalities. The three municipalities that are not in this largest Rural Planning Area have other Rural Planning Areas within their boundaries. Nine municipalities are designated entirely as either Rural or Village Planning Areas.

Many of the other chapters of the *Regional Plan* present policies that relate specifically to the Rural Planning Areas. Those policies recommend that Rural Planning Areas

- Promote the use of land for recreation, conservation, agriculture, silviculture, and other resource-extraction industries through private activities, public land management, and the designation of natural areas.
- Be developed in accordance with local plans and bylaws and cooperative efforts among government agencies, nonprofit organizations, and landowners to retain the character of Vermont’s traditional rural landscape and ensure ecosystem health.
- Encourage residential development to be small-scale and to cluster on small lots so as to aggregate areas of open space.
- Not provide the same level of services as the other Planning Areas, instead providing most local services for Rural Planning Area residents and agricultural businesses in nearby Village Planning Areas, while other needs will be met by uses in the Metropolitan Planning Areas or Enterprise Planning Areas.
- Have a lower priority for public sewer and water infrastructure investments and programs.

The planning area concept is a tool for articulating the *Regional Plan*’s general policies (see page 2.1). Rural character combines various mixes of natural and working landscapes. Municipalities should tailor the *Regional Plan*’s policies to support the community’s own resource protection and community development policies in light of local site considerations. It is appropriate for places within a Rural Planning Area in a single community to be different and for places within Rural Planning Areas in different communities to be different.

**Notes**

2-1 See generally 24 VSA 2790 to 2797.
2-2 24 VSA 2793c (h).
2-3 24 VSA 2793 (b) (3); 24 VSA 2793a (a); 24 VSA 2793b (b) (1); 24 VSA 2793c (d) (5) (A).
2-4 24 VSA 2793c (a).
2-5 24 VSA 2793c (b).
2-6 24 VSA 2793c (c).
2-7 24 VSA 2792 (f).
Land Use

Chittenden County has a rich diversity of natural landscapes (forests and water bodies), rural areas (farms, dispersed residences, and villages), and urbanized areas (small cities and suburban areas). This diversity is one of the County’s most valuable assets, enabling a household or employer to choose among possible locations to access the mix of land uses that best suits its needs. The Regional Plan promotes the collocation of appropriate uses, while striving to maintain the distinct identities of individual communities. This chapter

- Describes the major features and characteristics of Chittenden County’s land-use pattern (the types of land uses, the general density of land uses, and the County’s historic resources);
- Considers the possible future land use pattern of the County, particularly with respect to agricultural land uses; and
- Recommends general land use policies for the County and each of five Planning Areas.

Existing Land Use

Land Use Types

Making an inventory of Chittenden County’s land uses is a challenging task. In 2006, the approximately 345,000 acres of land in the County were divided into almost 45,000 separate parcels and the number of parcels grows each year. In some cases, a single parcel is devoted to more than one land use. It also is important to remember (especially in the more rural areas of the County where there are many large parcels) that each parcel is classified as being in a single land use category even though portions of the parcel may not be devoted to that designated use.

The designation of a single land use for a particular parcel entails making a judgment about which land use is most important to identify. This judgment is not always based on the land use that utilizes the majority of the parcel’s land area. In other words, “land use” is not the same as “land cover.” “Land cover” describes the different features that are on the surface of the land (such as a dwelling, yard areas, and a driveway), whereas “land use” describes the category that best sums up this cluster of features and activities (such as residential).

There also are different land use classification systems. CCRPC’s Geographic Information System employs the Land Based Classification Standards (LBCS) established by the American Planning Association. For the Regional Plan, CCRPC used major LBCS categories of land use “activity” to identify land use. Activity refers to the actual use of land, which sometimes appears to be at odds with the observable land cover.

Four major land use categories most typify “development” (see Map 3-1 and Figure 3-1):

- **Residential** (about 34 percent of the County’s land area) – Includes public and private housing of all types. These land uses are distributed throughout the County.
- **Retail, Service, or Trade** (about one percent of the County’s land area) – Includes retail stores, business and government offices, hotels and motels, restaurants and food establishments, and business and personal services. These land uses are concentrated in the Metropolitan and
Village Planning Areas.

- **Industrial, Business, or Waste-Related** (about two percent of the County’s land area) – Includes manufacturing facilities for all types of products including high-tech and value-added, as well as wholesale trade, warehouses, storage facilities, construction contractors, and solid waste facilities. These land uses are concentrated in the Metropolitan and Enterprise Planning Areas.

- **Institutional and Infrastructure** (about nine percent of the County’s land area) – Includes public safety facilities, schools, colleges, libraries, theaters, museums, health care facilities, places of worship, cemeteries, military bases, utilities (such as water supply, sewage treatment, and power), airports, railroads, roads, highways, parking lots, and ferry terminals. These land uses are concentrated in the Metropolitan, Enterprise, and Village Planning Areas.

The three major land use categories that least typify “development” and most typify “open space” (although some parcels in these categories do have some “development”) are located predominantly in the Rural Planning Area (see Map 3-1 and Figure 3-1):

- **Leisure** (about 10 percent of the County’s land area) – Includes areas devoted to all types of active or passive recreation.

- **Natural Resource-Related** (about 26 percent of the County’s land area) – Includes all types of farming, maple sugaring, logging, mines, quarries, and sand and gravel pits.

- **No Human Activity or Unclassified** (about 18 percent of the County’s land area) – Includes all areas that have no observable human activity or an activity that cannot be classified into one of the other categories.
Development Densities

The County’s varied land use also is evident in the portions of the County that are developed and undeveloped (see Map 3-2 and Figure 3-2). Parcels of land on which there is some development total about 178,000 acres (53 percent of the County’s total land area) and parcels on which there is no development total about 159,000 acres (47 percent of the County’s land area).

Most (89 percent) of the acreage of the residential parcels in the County is developed as low-density residential (one dwelling unit or less per acre), while about 11 percent is medium-density (between one and eight dwelling units per acre) and less than one percent is high-density (greater than eight dwelling units per acre). Most (72 percent) of the acreage of the nonresidential parcels in the County is low density (one employee per acre or less), whereas about 24 percent is medium density (between one and 20 employees per acre) and about four percent is high density (20 employees or more per acre).

Historic and Archeological Sites and Districts

The History section in the Introduction of this Regional Plan summarizes how people’s actions over the past 300 years have resulted in the County we experience today. Their actions have left us with a rich legacy of archeological and historical sites. We add to this legacy by recognizing the places that in recent history have played a special role in shaping our future. These aesthetic, educational, and historical resources are important not only because they help define the region’s identity and contribute to our quality of life, but also because they may perform important present-day functions and promote tourism.
Some historic resources are recognized and well interpreted, while others are less visible or even kept secret for their protection (particularly archeological resources such as burial sites). Resources can be significant to local, Vermont, or the national history.

Historic resources are officially designated using criteria that distinguish them from things that are merely old. The criteria used in the National Historic Preservation Act of 1966 (mirrored in State and local designation criteria) are that a resource

- May exist in the form of
  - An object (even if it is in a museum, not where it was found or originally used),
  - A structure (such as a bridge or a building foundation),
  - A building (even if it is now devoted to a new use),
  - A site (such as the scene of an historic event), or
  - A district (a set of structures, buildings, or sites that share a coherent theme, such as a village or a network of trails);
- Has the quality of significance in American history, architecture, archeology, engineering, or culture;
- Possesses integrity of location, design, setting, materials, workmanship, feeling, and association; and
- Is associated with, embodies, or is likely to yield (or has yielded)
  - Events that have made a significant contribution to the broad patterns of our history,
  - The lives of persons significant in our past,
  - The distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic values, or represent a significant resource whose components may lack individual distinction, or
  - Information important in our history or prehistory.

Threats to archeological and historical resources include

- Complete destruction (whether intentional, by neglect, or by abandonment) and total replacement by a different land use or structure;
- Deterioration that jeopardizes a resource’s character or integrity;
- Alteration (even if well meaning) that is not sensitive to its heritage; and
- Destruction, deterioration, or alteration of the setting near a resource that diminishes the context for appreciating it.

The complexity of the threats to these resources explains the need for multifaceted approaches for resource protection:

- **Public Ownership** – The mission of some government agencies (such as the Vermont Division of Historic Preservation) is to properly manage and interpret historic resources owned by that government. Governments also are required by Vermont and federal laws to manage the resources they own in ways that preserve their heritage values.

- **Public Actions** – State and federal laws (such as Section 106 of the National Historic Preservation Act) require governments to avoid significantly compromising historic resources when they carry out actions, use their property (even nonhistoric), provide public funds to others, and issue permits or licenses to others.

- **Public and Private Subsidies** – Governments and private preservation organizations provide funding and technical assistance for the acquisition, preservation, restoration, and reconstruction of historic resources and tax incentives for preservation activities (such as Vermont’s Scenic Byways Program).
Private Ownership/Preservation – Some private owners have a commitment to heritage values (such as an owner who creates a conservation easement to preserve a property’s historic character).

Public Regulation of Private Property – Governments regulate how a private party may use an historic resource (such as by imposing restrictions on demolition) or a nonhistoric property that is near an historic resource to preserve the character of setting (such as Criteria 8 of Act 250). Other laws (such as Vermont’s Historic Preservation Act) require certain proposed developments to identify archeological resources during project planning and to mitigate impacts on these resources.

Official Designation – Listing of a resource on a national, State, or local register of historic places (such as 24 VSA 4414[F], which enables municipalities to designate historic districts, areas, and landmarks under zoning) confers status that may promote private preservation efforts and triggers eligibility for special incentives and protections.

There are over 4,400 designated historic sites in Chittenden County (over 2,500 in Burlington alone) and over 80 designated historic districts (see Map 3-3). Map 3-3 does not display archeological sites that have not been designated as historic sites in order to protect these from looting. Vermont’s Division of Historic Preservation has prepared guidelines for communities to identify and protect historic and archeological resources.

Future Land Use

Regional Build-out Analysis

In 2003, CCRPC prepared a “Regional Build-out Analysis” (RBA). The RBA illustrates the potential state of the County’s development if the County were entirely built-out according to 2002 municipal zoning restrictions and certain physical constraints on development.

The RBA shows which development outcomes would result if communities did not change their existing regulations as the County developed over time. The study is not a prediction that this development will certainly (or even probably) occur. It most certainly is not a prediction that this development will occur by a particular future year. It illustrates only what could happen if the County develops in conformity with our communities’ existing regulations. The RBA also provides a framework for assessing how the County’s development outcomes would be affected if local development regulations were changed.

Map 3-4 and Table 3-1 illustrate the general development outcomes portrayed by the RBA. At ultimate build-out (assuming there are no changes to municipal zoning and if the RBA’s other assumptions hold true), the County would have about 47,100 more dwelling units (about 75 percent more) and about 157,000,000 additional square feet of commercial building area (about 390 percent more). In addition, the County’s overall development pattern would be quite different than what it currently is and has been historically, namely a pattern of development concentrated in urban and village centers that are surrounded by rural countryside.

The RBA means that, in the aggregate, the 2002 zoning for all municipalities in the County provided much greater opportunity for future commercial development than for future residential development. This is not unusual. Communities, particularly those with limited commercial development, often seek to ensure that there is an abundance of suitably zoned locations to provide for the wide range of needs that prospective businesses may have. As commercial development occurs over time, a community often adjusts its zoning.
Table 3-1
2003 REGIONAL BUILD-OUT ANALYSIS RESULTS

<table>
<thead>
<tr>
<th>Major Characteristics</th>
<th>Planning Area</th>
<th>County Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metro</td>
<td>Transition</td>
</tr>
<tr>
<td>Residential</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Dwelling Units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual 2003</td>
<td>33,373</td>
<td>13,389</td>
</tr>
<tr>
<td>At Build Out</td>
<td>48,429</td>
<td>22,752</td>
</tr>
<tr>
<td>% of County Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual 2003</td>
<td>51%</td>
<td>20%</td>
</tr>
<tr>
<td>At Build Out</td>
<td>44%</td>
<td>21%</td>
</tr>
<tr>
<td>Non-Residential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,000s of Sq. Ft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual 2003</td>
<td>26,974</td>
<td>2,106</td>
</tr>
<tr>
<td>At Build Out</td>
<td>108,818</td>
<td>14,530</td>
</tr>
<tr>
<td>% of County Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual 2003</td>
<td>67%</td>
<td>5%</td>
</tr>
<tr>
<td>At Build Out</td>
<td>55%</td>
<td>7%</td>
</tr>
</tbody>
</table>


Some communities also may feel pressured to overzone for commercial uses because of concerns about fiscal impacts on local government. Nonresidential properties are believed to generate greater net local revenues than do residential properties. However, a community that pays too much attention to the impacts of prospective land uses on local government costs and revenues is said to engage in “fiscal zoning.” Some states (but so far not Vermont) regard “fiscal zoning” as a form of illegal exclusionary zoning, because the community excludes legitimate land uses for reasons not used to exclude other land uses (especially existing ones) that have similar fiscal impacts.

Agricultural Preservation

This section focuses on the issues and policies related to the land-use activities of farming. The Economic Development chapter discusses the issues and policies related to the business of farming. The Natural Resources chapter considers the issues and policies related to the natural resources necessary to farming.

According to the U.S. Census of Agriculture, farming in Chittenden County experienced the following land-use changes from 1982 to 2002:

- The total amount of land in farms decreased by 37,693 acres (from 114,372 to 76,679 acres, a 33-percent rate of decline);
- The proportion of all land in the County that is in farms decreased by 10.9 percent (from 33.1 percent to 22.2 percent, a 33-percent rate of decline);
- The average farm size decreased by 64 acres (from 226 to 162 acres, a 28.3-percent rate of decline). This decrease in average farm size resulted from both a decline in the number of larger farms (i.e., at least 50 acres) and an increase in the number of smaller farms (i.e., less than 50 acres) (see Table 3-2);
- The amount of farmland devoted to crops or pasture declined by 28,271 acres (from 62,883 to 34,612 acres, a 45-percent rate of decline that exceeds the rate of decline in the amount of total land in farms) (see Table 3-3); and
- Farm production shifted from dairy and livestock to other farm products (see Table 3-4).

In 2003, the proportion of total land in farming varied among the County’s municipalities, from over 45 percent to under two percent (see Table 3-5).
Table 3-2
NUMBER OF FARMS OF DIFFERENT SIZES IN CHITTENDEN COUNTY, 1982 AND 2002

<table>
<thead>
<tr>
<th>Farm Size (Acres)</th>
<th>1982</th>
<th>2002</th>
<th>1982 to 2002 Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>1,000 or More</td>
<td>9</td>
<td>2</td>
<td>-7</td>
</tr>
<tr>
<td>500 to 999</td>
<td>44</td>
<td>26</td>
<td>-18</td>
</tr>
<tr>
<td>180 to 499</td>
<td>177</td>
<td>94</td>
<td>-83</td>
</tr>
<tr>
<td>50 to 179</td>
<td>162</td>
<td>153</td>
<td>-9</td>
</tr>
<tr>
<td>10 to 49</td>
<td>85</td>
<td>143</td>
<td>58</td>
</tr>
<tr>
<td>Under 10</td>
<td>28</td>
<td>47</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>505</td>
<td>465</td>
<td>-40</td>
</tr>
</tbody>
</table>


Table 3-3
ACRES DEVOTED TO DIFFERENT USES ON CHITTENDEN COUNTY FARMS, 1982 AND 2002

<table>
<thead>
<tr>
<th>Use</th>
<th>1982</th>
<th>2002</th>
<th>1982 to 2002 Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Percent</td>
<td>Acres</td>
</tr>
<tr>
<td>Crops and Pasture</td>
<td>62,883</td>
<td>28,271</td>
<td>-45.0%</td>
</tr>
<tr>
<td>Forest</td>
<td>35,816</td>
<td>31,208</td>
<td>-12.9%</td>
</tr>
<tr>
<td>Other</td>
<td>15,673</td>
<td>10,859</td>
<td>-30.7%</td>
</tr>
<tr>
<td>Total</td>
<td>114,372</td>
<td>76,679</td>
<td>-33.0%</td>
</tr>
</tbody>
</table>


Table 3-4
VALUE OF FARM PRODUCTS IN CHITTENDEN COUNTY, 1982 AND 2002

<table>
<thead>
<tr>
<th>Farm Product</th>
<th>1982</th>
<th>2002</th>
<th>1982 to 2002 Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$1,000s</td>
<td>%</td>
<td>$1,000s</td>
</tr>
<tr>
<td>Dairy</td>
<td>$19,709</td>
<td>78.3%</td>
<td>$15,439</td>
</tr>
<tr>
<td>Cattle, Calves</td>
<td>$2,644</td>
<td>10.5%</td>
<td>$1,719</td>
</tr>
<tr>
<td>Hay, Silage, Field Seeds</td>
<td>$732</td>
<td>2.9%</td>
<td>$1,742</td>
</tr>
<tr>
<td>Fruit, Nuts, Berries</td>
<td>$147</td>
<td>0.6%</td>
<td>$685</td>
</tr>
<tr>
<td>Vegetables, Sweet Corn, Melons</td>
<td>$363</td>
<td>1.4%</td>
<td>$1,730</td>
</tr>
<tr>
<td>Nursery, Greenhouse Crops</td>
<td>$404</td>
<td>1.6%</td>
<td>$5,971</td>
</tr>
<tr>
<td>All Other</td>
<td>$1,159</td>
<td>4.6%</td>
<td>$823</td>
</tr>
<tr>
<td>Total</td>
<td>$25,158</td>
<td>100.0%</td>
<td>$28,109</td>
</tr>
</tbody>
</table>

The reasons for preserving agriculture become more numerous and compelling as one moves from a national or state perspective to a regional or local perspective:

- **Food Production** – The ability of the nation to feed itself (or other parts of the world) is tied to larger issues of how well global markets distribute the food that is produced and whether gains from improved technologies of production and distribution can keep pace with population growth. However, at a state, regional or local level, the quality of agricultural commodities (such as freshness or variety) can be enhanced by local production.

- **Economic Base** – Regardless of agriculture’s contribution to the national or state economy (and whether that share is growing or declining), agriculture can play a significant role in a regional or local economy, especially when its indirect economic benefits are considered.

- **Cultural and Scenic Identity** – Farming represents an important facet of the County’s heritage, directly contributing to our quality of life and indirectly promoting tourism.

- **Managing Growth** – Preserving agriculture is one way in which a region or locale can manage growth (including poorly planned development that leads to irreversible environmental degradation, loss of open space, and land-use conflicts whose impacts are focused locally and regionally).

Participants at a 2005 listening forum held by CCRPC identified natural resource, business, and land-use concerns as important to the success of farming in the County (see Figure 3-3). Any single measure to preserve agriculture may accomplish some of these objectives and not others. Preserving agriculture requires a combination of policies and actions that address the:

- Natural resources necessary to farming (soils, water quality, and air quality),
- Business of farming (and businesses related to farming), and
- Land-use activities related to farming (which sometimes are regarded as being incompatible with other nearby land uses).
Figure 3-3
SUMMARY OF 2005 CCRPC AGRICULTURAL FUTURES FORUM –
REPORTED SUCCESS FACTORS AND OBSTACLES TO FARMING IN CHITTENDEN COUNTY
(Not Prioritized)

<table>
<thead>
<tr>
<th>Success Factors</th>
<th>Obstacles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supportive Neighbors and Public</td>
<td>Conflicts with Non-Farming Neighbors</td>
</tr>
<tr>
<td>Good Farming Organizations, Resources, and Networks</td>
<td>Lack of Public Awareness of Farming Needs</td>
</tr>
<tr>
<td>Market Access (Proximity to Customers and Internet)</td>
<td>Limited Market Access</td>
</tr>
<tr>
<td>Access to Land with Productive Soils</td>
<td>Loss of Access to Lands with Productive Soils</td>
</tr>
<tr>
<td>Property Tax Relief (e.g., Current Use Program)</td>
<td>Escalating Taxes (Assessed Property Values)</td>
</tr>
<tr>
<td>Good Employees</td>
<td>Tight Labor Market and High Labor Costs</td>
</tr>
<tr>
<td>Proximity of Suppliers and Support Services</td>
<td>Zoning Restrictions on Farm Support Services</td>
</tr>
<tr>
<td>Good Farm Management</td>
<td>Time and Cost of Permitting</td>
</tr>
<tr>
<td>Good Transportation System</td>
<td>Busy Roadways / Traffic / Congestion</td>
</tr>
<tr>
<td></td>
<td>High Traffic Speeds / High Speed Limits</td>
</tr>
<tr>
<td></td>
<td>Low Bridge Weight and Width Limits</td>
</tr>
<tr>
<td></td>
<td>High Start-Up Costs to New Farmers</td>
</tr>
</tbody>
</table>

Excessive attention to measures that address only one or two of these concerns, rather than coordinated programs addressing all three concerns, achieve only partial successes. For example, such an approach may result in:

- Conserved areas with soils suitable for farming that are perpetually fallow because they cannot be farmed profitably or dedicated to alternative uses or
- The replacement of working family farms by hobby farms or corporate agribusinesses.

Vermont municipalities are specifically authorized to establish two special types of zoning districts that are particularly appropriate for preserving agricultural land uses:

- Agricultural or rural residential districts, permitting all types of agricultural uses and prohibiting all other land development except low-density residential development (see 24 VSA 4414 [1] [B] [i]) and
- Forest districts, permitting commercial forestry and related uses and prohibiting all other land development (see 24 VSA 4414 [1] [B] [iii]).

Vermont statutes preclude municipal zoning from regulating certain aspects of farming. However, these laws do not prevent local zoning from excessively restricting farm-support businesses (such as veterinarians or farm implement sales and service businesses). Nor do these laws prevent zoning practices that can contribute to the loss of farmland. The consequences of zoning policies and practices need to be evaluated periodically to ensure that they have not resulted in unintended consequences. For example,

- Local zoning that authorizes nonagricultural land uses in farm areas can increase land values. Such increases can price out potential purchasers who would continue to devote the land to farming (such as conservation organizations and young people trying to start a farm) and make it more likely that farmlands will be converted to more profitable land uses.
- Large minimum lot sizes (such as 10 or 20 acres) for non-farm land uses in rural areas limit land values there. Limited land values give farmers less collateral for obtaining loans. A farmer with insufficient collateral to borrow money for needed farm investments (such as equipment, seed, or livestock) may be forced to sell a portion of the farm to obtain the funds. The large minimum lot size and lower land values may force the farmer to sell more farm land to obtain the needed funds. Although this newly created lot is much more land than a
household needs for a home, it is most likely too small to be farmed profitably. Over time, the accumulation of such piecemeal subdivisions reduces the amount of land being farmed, contributes to the fragmentation of farm communities, and introduces land-use conflicts.

In addition to zoning, Vermont communities have three tools that are especially appropriate for the preservation of agricultural land uses:

- **Conservation Commissions** – Since 1977, Vermont’s municipalities have been authorized to establish local commissions to recommend that the legislative body of the municipality acquire different interests in land for purposes including agricultural preservation (see 24 VSA 4501 – 4506). Almost all municipalities in Chittenden County have established conservation commissions.

- **Land Trusts** – Municipalities are authorized to acquire different interests in land for conservation purposes, including agricultural preservation (see 10 VSA 6301 – 6309).

- **Transferable Development Rights** – Municipalities are authorized to institute a program that restricts development in some portions of the community and requires those seeking to develop other portions of the community to acquire “transferable development rights” held by the owners of the restricted lands and others (see 24 VSA 4423).

---

**Land Use Policies**

**General Policies**

1. Development in Chittenden County should be concentrated within the Metropolitan Planning Areas, Transition Planning Areas, Enterprise Planning Areas, and Village Planning Areas and development not directly supporting rural activities should be discouraged in the County’s Rural Planning Areas.

2. Municipal plans and bylaws should determine the appropriate locations for different types, densities, and scales of development and for open space areas within each Planning Area.

3. Developments in areas designated by municipal plans and bylaws for development should efficiently use sewer, water, transportation and other infrastructure.

4. Municipal plans and bylaws should manage development to ensure that potentially incompatible land uses can locate near one another while minimizing land use conflicts.

5. Municipal plans and bylaws should promote infill development and redevelopment within previously developed areas.

6. The County’s archeological and historic resources should be preserved, restored, and reconstructed, in accordance with municipal plans and State policies.

7. Development in all of the County’s Planning Areas should establish a land-use network that supports agricultural, silvicultural and conservation land uses located principally in Rural Planning Areas and whenever practical in other areas.
Metropolitan Planning Area Policies

1. Development in a Metropolitan Planning Area should include the County’s widest variety of land use types.

2. Development with the highest density of residents in the County should be located in a Metropolitan Planning Area.

3. Development with the highest density of employees in the County should be located in a Metropolitan Planning Area or an Enterprise Planning Area.

4. Buildings of the largest size and scale in the County (except barns) should be located in a Metropolitan Planning Area or an Enterprise Planning Area.

5. Developments serving the needs of residents and/or employers of the entire County, multicounty region, or larger territory should be located in a Metropolitan Planning Area.

6. Developments serving the general needs of residents and employers within a Metropolitan Planning Area should be located in a Metropolitan Planning Area.

7. Metropolitan Planning Areas should provide for an overall development pattern of interconnected, mixed-use development consistent with principles of transit oriented design in order to provide for the widest variety of transportation mode choices including public transportation and pedestrian/bicycle facilities, rather than isolated enclaves of single-use development.

Transition Planning Area Policies

1. Development in a Transition Planning Area should include a wide variety of land use types, densities, and scales, so that appropriate portions of a Transition Planning Area are capable of becoming another type of planning Area.

2. Development in a Transition Planning Area should create areas of high-density, urban scale development, while preserving strategic natural areas, connections between natural areas, and lands for open space and future growth.

3. Transition Planning Areas should provide for an overall development pattern of interconnected, mixed-use development consistent with principles of transit oriented design in order to provide for the widest variety of transportation mode choices including public transportation and pedestrian/bicycle facilities, rather than isolated enclaves of single-use development.

(Continued)
Enterprise Planning Area Policies

1. Development in an Enterprise Planning Area should provide for the land uses, densities, and scales determined by local plans and bylaws that enable these areas to function as employment centers.

2. Developments with the highest densities of employees in the County should be located in an Enterprise Planning Area or a Metropolitan Planning Area.

3. Development in an Enterprise Planning Area should support the strategies of the 2004 Long-Term Strategic Economic Development Plan.

4. Development in an Enterprise Planning Area should be managed to ensure that nearby areas and natural resources are adequately protected from adverse impacts by employing measures such as buffer areas.

Village Planning Area Policies

1. Development in a Village Planning Area should include a mixture of land uses at densities and scales that are appropriate to a Vermont village (see page 2.5).

2. Development in a Village Planning Area should primarily serve the needs of local residents and employers as well as those in smaller nearby towns.

3. The density of development in a Village Planning Area should be distinctly higher than surrounding Rural Planning Areas.

4. Village Planning Areas should contain interconnected, mixed-use development consistent with principles of transit oriented design, rather than isolated enclaves of single-use development.

Rural Planning Area Policies

1. Development in the Rural Planning Area should include a mixture of land uses at densities and scales that are appropriate to Vermont’s traditional rural landscape (primarily agriculture, silviculture, resource-extraction industries, businesses that support such uses and other small-scale businesses that are consistent with the predominantly rural character of these areas, as well as conserved open space, and low overall residential density).

2. Residential developments in the Rural Planning Area should employ cluster development to aggregate areas of conserved open space, while sustaining the low overall density required to preserve rural character.
Resources

The following resources provide further information on the major topics of this chapter.

Land Use Planning


CCRPC. *Transit-Oriented Design for Chittenden County.* CCRPC. 2002. Posted at [www.ccrpcvt.org/vertical/Sites/%7BB8DFDB70-7812-4FAE-9861-8A26C79323B6%7D/uploads/%7B0A6C54B5-7F0D-4224-893F-3F829C50BA22%7D.PDF](http://www.ccrpcvt.org/vertical/Sites/%7BB8DFDB70-7812-4FAE-9861-8A26C79323B6%7D/uploads/%7B0A6C54B5-7F0D-4224-893F-3F829C50BA22%7D.PDF).


Vermont Department of Housing and Community Affairs: [www.dhca.state.vt.us/](http://www.dhca.state.vt.us/) and [www.dhca.state.vt.us/Planning/index.htm](http://www.dhca.state.vt.us/Planning/index.htm).


Vermont Planning Information Center provides an extensive list of additional resources by topic: [www.vpic.info/resources/](http://www.vpic.info/resources/).

Historic Preservation


Vermont Division for Historic Preservation: [www.historicvermont.org/info/home.html](http://www.historicvermont.org/info/home.html).

Agricultural Preservation

American Farmland Trust: [www.farmland.org/default.asp](http://www.farmland.org/default.asp).


Farmland Information Center: [www.farmlandinfo.org/](http://www.farmlandinfo.org/).

Notes

3.1 CCRPC first adopted the LCBS system in 2000. In November 2002, CCRPC undertook a major update of the land-use inventory when one intern and one regular staff member devoted six months to identifying the land uses on each of the County's 47,636 parcels. This information was shared with municipal planners, who verified and corrected the data.

3.2 Although the concept of land-use density (or intensity) is straightforward (the quantity of a particular type of land use per unit of land area), land-use density is not always so easily measured. For residential land uses, the Regional Plan employs the standard measure of the number of dwelling units per acre of lot size even though the “intensity” of the land-use impacts of different types of dwelling units on the land may vary. For nonresidential land uses, the Regional Plan employs the measure of employees per acre. A more conventional measure of nonresidential land-use density is the square feet of nonresidential building floor area per acre of lot size. However, some nonresidential land uses are not conducted in buildings (for example, farming). In addition, CCRPC has more reliable point-specific data on the number of employees of nonresidential land uses than on building floor area.
3.3 CCRPC’s RBA employed methods described in a lengthy separate report posted on www.ccrpcvt.org.

3.4 The Census of Agriculture that collects data from farm operators every five years is different from the more widely known Census of Population and Housing that collects data every 10 years from people on socioeconomic and housing issues. The Bureau of the Census in the U.S. Department of Commerce conducted the Census of Agriculture until 1997, when responsibility shifted to the U.S. Department of Agriculture.

3.5 The results of this forum were documented in *Agriculture and Chittenden County Communities: A Listening Forum for Farmers and Local Decisionmakers, Topic: What is Needed for Agriculture to be Successful in Chittenden County?* Posted at www.ccrpcvt.org. A future forum is planned to discuss potential local and regional policies and tools to support agriculture.

3.6 *VSA 4413 (d) prohibits municipal bylaws from regulating “…accepted agricultural and silvicultural practices, including the construction of farm structures…” A person must still notify a municipality of the intent to build a farm structure and must abide by setbacks approved by the Secretary of Agriculture, Food, and Markets, but no municipal permit for a farm structure is required. Agricultural and silvicultural practices are as defined by the Secretary of Agriculture, Food, and Markets under 10 VSA 1021 (f) and 1259 (f) or by the Commissioner of Forests, Parks and Recreation under 6 VSA 4810. A “farm structure” is defined as “a building, enclosure, or fence for housing livestock, raising horticultural or agronomic plants, or carrying out other practices associated with accepted agricultural or farming practices, including a silo as farming is defined in 10 VSA 6001 (22), but excludes a dwelling for human habitation.”*
Natural Resources

In Chittenden County and Vermont, we value the exceptional quality of our natural environment and seek to protect it. This chapter discusses our three major natural resources (air, water, and land). The section on Land Resources includes subsections on earth resources, agricultural soils, forest resources, and natural areas. Each of these sections and subsections presents background information and recommends policies related to that resource.

Air Quality

Background

Clean air is a major feature of the quality of life that we aspire to have and a major aspect of the identity that we project to the rest of the world. Unlike water resources and land resources, few people assert a private property interest over their use of the air. When a private party pollutes the air, it is widely recognized as diminishing our collective right to this shared resource.

Various sources contribute to air pollution. The combined impacts of thousands of motor vehicles operating on the region’s roads make them a major source of many types of air pollution. Although fewer in number and located at fixed sites, industries and businesses that produce certain products or use certain compounds also are potential major sources. Homes also are potential sources of air pollution through the combined impacts of using products such as wood-burning stoves, lawnmowers, and solvents.

The U.S. Clean Air Act establishes a national framework for controlling air pollution. This law authorizes the U.S. Environmental Protection Agency (EPA) to set standards for air pollutants, establish regulations to control pollution-emission sources, and enforce air pollution regulations. States have a major role in implementing many provisions of the Clean Air Act through state laws that may be more stringent (but cannot be less stringent) than the federal requirements.

In Vermont, the Agency of Natural Resources (ANR) implements many of the provisions of the Clean Air Act. ANR conducts air quality monitoring at various locations in Vermont, including Burlington and Underhill. ANR also regulates and requires permits from businesses that emit air pollutants and attempts to reduce pollution from motor vehicles through its regulations on cleaner fuels, vapor-control devices on fuel pumps, and low-emission vehicles program.

Municipal governments also may pass ordinances that help protect air quality. For example, Burlington, Colchester, South Burlington and Winooski prohibit open burning and Burlington also prohibits motor vehicle idling.

Air Quality Standards

The EPA sets National Ambient Air Quality Standards (NAAQS) for ozone, sulfur dioxide, carbon monoxide, nitrogen dioxide, particulate matter (PM), and lead. Over the last decade, the air in Chittenden County has been well within most of the NAAQS standards, but has come closest to violating the standards for ozone and 2.5 particulate matter (see Figure 4-1).
Figure 4-1
AIR QUALITY (NAAQS COMPLIANCE) TRENDS IN CHITTENDEN COUNTY

Underhill, VT Ozone Trend
Ambient Standard = 0.08 ppm

Burlington, VT Sulfur Dioxide Trend
Ambient Standard = 0.14 ppm

Burlington, VT Carbon Monoxide Trend
Ambient Standard = 9.0 ppm

Burlington, VT Nitrogen Dioxide Trend
Ambient Standard = 0.05 ppm

Burlington, VT 2nd Maximum PM 10 Trend
Ambient Standard, 2nd Max = 150 ug/m3

Burlington, VT PM 10 and PM 2.5 Trend
Ambient Standard, PM 10 Wt. Mean = 50
Ambient Standard, PM 2.5 Wt. Mean = 15
Failure to comply with NAAQS standards imposes heavy direct and indirect costs:

- Impaired human health, shortened life expectancy, and increased need for medical services;
- Reduced ecosystem health (such as reduced agricultural and silvicultural productivity, damage to wildlife and vegetation, and reduced habitat quality);
- Reduced economic returns and government revenues as a result of the loss of tourism based on Vermont’s pristine environment; and
- EPA designation as “nonattainment areas” of places where air pollution levels persistently exceed the NAAQS (as well as nearby areas that contribute to pollution levels in such places). EPA has established a range of nonattainment categories for ozone and carbon monoxide. The severity of the category affects the remedial measures required and the deadlines for achieving attainment. In general, nonattainment designation increases State and local government expenditures (such as for heightened transportation planning by CCMPO and VTrans); mandates reordering the priorities of State, regional, and local transportation and land-use policies; and imposes special costs on households and employers (such as motor vehicle emissions testing).

Most of the NAAQS pollutants, including ozone, are generated by motor vehicles in Chittenden County and by out-of-state sources. We can work to ensure that the County continues to enjoy clean air by urging the federal government to continue to (1) regulate the manufacturing of motor vehicles to control emissions and (2) enforce the NAAQS so as to minimize the generation of pollutants in other states. Reduced energy consumption also will help, achieved by conservation, improvements in energy and transportation system efficiency, mixed-use development patterns, reductions in motor vehicle use, and decreased reliance on upwind polluting power sources.

The EPA also has identified 188 hazardous air contaminants, sometimes known as air toxics, but has not established ambient air quality standards for them. In Vermont, ANR has established health-based standards for hazardous air contaminants and recently proposed to make many of these standards more stringent. Monitoring in Chittenden County indicates that four of these pollutants routinely exceed the State’s standards (benzene, 1,3-butadiene, carbon tetrachloride, and formaldehyde). Three of these pollutants (not carbon tetrachloride) are generated primarily by local emissions, particularly from motor vehicles and fuel combustion.

**Acid Deposition (Acid Rain)**

Fossil-fuel combustion releases sulfur dioxide and nitrogen oxides (both NAAQS pollutants). These substances combine with ozone in the atmosphere to become sulfuric acid and nitric acid. These acids may travel a long distance before falling to earth as acid rain or other precipitation. When these acids accumulate faster than they can be flushed from local environments, soils and waterbodies become increasingly more acidic.

Native trees and other plants that have evolved in soils of a particular acidity are harmed when acid rain raises the acidity of soils. Destruction of this vegetation disrupts the food chain and disfigures habitat conditions. When waterbodies become even slightly more acidic, many aquatic invertebrates, amphibians, and fish are harmed. This reduces the food supply for other aquatic animals, birds, and mammals. Algae, mosses and fungal mats thrive in acidic lakes, as do certain species of insects and fish that are more tolerant of acidic environments.

Small lakes at higher elevations tend to be more affected by acid rain. None of Vermont’s 37 lakes listed as highly acidic are in Chittenden County. Although much of the acid rain in Vermont is caused by out-of-state emission sources, increased energy efficiency and conservation and reduced motor vehicle use in Northwest Vermont can help to reduce acid rain.
Mercury Deposition

Mercury is released into the atmosphere by natural sources (such as volcanic activity), but the greatest sources of mercury emissions are metal mining and smelting, municipal-waste incineration, sewage and medical-waste incineration, coal-fired power plants, and fossil-fuel combustion. Mercury also can be released during disposal of a wide range of consumer, medical and industrial products (such as fluorescent lamps, thermometers, and electrical switches).

Like sulfuric acid and nitric acid, mercury released to the atmosphere can be transported long distances before returning to earth in rain or dry deposition. In aquatic environments, mercury can be converted to methylmercury, which is much more readily absorbed by organisms.

Once absorbed, mercury has a tendency to collect in the tissues of living organisms. Mercury levels become increasingly concentrated in each successive stage of the food chain, as mercury-contaminated plants and animals are eaten by other animals. Mercury is toxic to humans and can affect growth, reproduction, neurological development, and learning ability.

Mercury emissions to the atmosphere are reduced by energy conservation, reduced reliance on fossil fuels, use of nonmercury products, and the proper disposal of products containing mercury.

Climate Change

“Climate change” refers to changes in the average weather of a region or of the entire Earth. Although there are long-term natural climate cycles (such as the Ice Ages), the Earth's temperature is rising more rapidly in modern times than at any time in the past.4-3

Climate is influenced by natural factors and by human factors (such as “greenhouse-gas” emissions). Although the precise impact of these factors is debated, the current scientific consensus is that human activities resulting in increased emissions of greenhouse gases are the major factor driving the temperature increases observed over the last 50 years.4-4

“Greenhouse gases” (such as carbon dioxide) are transparent to solar radiation but opaque to radiation that has a “long” wavelength. Sunlight passes through these gases in the Earth’s upper atmosphere, strikes the Earth’s surface, and is radiated back into the atmosphere as heat. Because heat radiation has a long wavelength, greenhouse gases in the upper atmosphere reflect some of it back toward the Earth (rather than allowing it to drain off into outer space), similar to the glass in a greenhouse. When the upper atmosphere has higher concentrations of greenhouse gases, more heat is reflected back to the Earth, increasing the surface temperatures that reflect climate change.

Debate exists over predictions of future climate change resulting from increased surface temperatures due to the global warming induced by the greenhouse effect. The EPA reports that by 2100 the global average

- Surface temperature could increase 1.6 to 6.3 degrees Fahrenheit,
- Precipitation and the frequency of intense rainfall will increase, and
- Sea level will rise by six to 38 inches.4-5

Projections of regional climate change are less reliable than global projections. The EPA reports that by 2100 Vermont temperatures could increase by four to five degrees Fahrenheit and precipitation could increase by 10 to 30 percent.4-6 These changes would make Vermont's climate more like the current climate of New Jersey:
Vermont’s hardwood forests (including sugar maples) would be replaced by species such as oak and hickory that are better adapted to warmer, wetter conditions;

- Warmer summers could dry up some wetlands and increase the need for agricultural irrigation;
- Fall foliage season would be shorter and less colorful and ski season would be shorter; and
- The increased intensity of precipitation events would test stormwater-management systems.

The three most important greenhouse gases (carbon dioxide, methane and nitrous oxide) are generated by both natural sources and human activities. Transportation is the single largest source of greenhouse-gas emissions in Vermont and fossil-fuel combustion sources combine to produce 78 percent of these greenhouse-gas emissions (see Table 4-1).

In 2000, the City of Burlington adopted a Climate Action Plan calling for a 10-percent reduction in greenhouse-gas emissions by 2010. The Alliance for Climate Action (ACA) was formed to pursue this strategy in Burlington and throughout the State. The ACA’s “10% Challenge” program encourages businesses and households to pledge to reduce greenhouse-gas emissions, provides information and emission-calculation tools, and promotes activities to reduce vehicle travel and to conserve energy. Along with many other organizations and businesses, Burlington, Charlotte, Underhill and Williston have agreed to participate in the “10% Challenge.”

In 2001, Vermont signed the New England Governors/Eastern Canadian Premiers Climate Change Action Plan, which establishes goals for reducing greenhouse-gas emissions relative to 1990 emissions. Governor Douglas’ Executive Order #14-03 established the Climate Neutral Working Group to coordinate State government efforts to reduce greenhouse gas-emissions.

### Table 4-1

<table>
<thead>
<tr>
<th>Greenhouse Gas</th>
<th>Source</th>
<th>Typea</th>
<th>Global Warming Potentialb</th>
<th>Metric Tons of Carbon Equivalentsc</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fossil Fuel Combustion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>CO₂</td>
<td>1</td>
<td>351,079</td>
<td>18.5%</td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>CO₂</td>
<td>1</td>
<td>131,266</td>
<td>6.9%</td>
<td></td>
</tr>
<tr>
<td>Industrial</td>
<td>CO₂</td>
<td>1</td>
<td>130,768</td>
<td>6.9%</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>CO₂</td>
<td>1</td>
<td>816,854</td>
<td>44.9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CH₄</td>
<td>21</td>
<td>3,835</td>
<td>(included above)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NO₂</td>
<td>310</td>
<td>32,045</td>
<td>(included above)</td>
<td></td>
</tr>
<tr>
<td>Electric Utility</td>
<td>CO₂</td>
<td>1</td>
<td>15,750</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td>Biomass Combustion</td>
<td>CO₂</td>
<td>1</td>
<td>187,582</td>
<td>9.9%</td>
<td></td>
</tr>
<tr>
<td>Domestic Livestock &amp; Managed Wildlife</td>
<td>CH₄</td>
<td>21</td>
<td>167,883</td>
<td>3.9%</td>
<td></td>
</tr>
<tr>
<td>Animal Manure</td>
<td>CH₄</td>
<td>21</td>
<td>2,824</td>
<td>0.15%</td>
<td></td>
</tr>
<tr>
<td>Nitrogen Fertilizer Usage</td>
<td>NO₂</td>
<td>310</td>
<td>920</td>
<td>0.05%</td>
<td></td>
</tr>
<tr>
<td>Land Use Changes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Forest Growth</td>
<td>CO₂</td>
<td>1</td>
<td>-19,457</td>
<td>-1.0%</td>
<td></td>
</tr>
<tr>
<td>Wetland Drainage</td>
<td>CO₂</td>
<td>1</td>
<td>-1</td>
<td>-0.00009%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CH₄</td>
<td>21</td>
<td>-19</td>
<td>(included above)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>1,895,597</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>

a CO₂ = Carbon Dioxide; CH₄ = Methane; NO₂ = Nitrous Oxide;
b Global Warming Potential is a measure of how much a greenhouse gas is estimated to contribute to global warming, relative to a comparable mass of carbon dioxide. (The GWP of carbon dioxide is 1.)
c Negative values result from vegetation sequestering carbon from the atmosphere.

**Air Quality Policies**

1. Proposed development and community development policies should minimize emissions of NAAQS pollutants, State-identified air pollutants, and greenhouse gases.

2. Each municipality, employer, and household should be encouraged to voluntarily undertake reasonable measures to reduce the emission of air pollutants and greenhouse gases beyond compliance with air quality standards.

3. The regional and local land development patterns should reduce reliance on motor vehicles by supporting the use of transit oriented development (TOD) and transportation options, such as transit, ride-sharing, and non-motorized travel (bicycle and pedestrian) in order to reduce the number and duration of motor vehicle trips.

4. Existing and future development should be encouraged to reduce energy use and to use renewable energy sources that have demonstrated air quality benefits.

**Water Quality**

**Background**

The County’s water resources have three major components:

1. **Surface Waters** (lakes, ponds, reservoirs, rivers, and streams) and their corresponding watersheds (the areas of land that drain into the surface water bodies in the County; see Map 4-1).

2. **Ground Water** – The system of underground water that percolates from the surface to form aquifers. In some places, ground water naturally returns to the surface-water system via springs or direct flows into ponds, lakes, streams, or rivers.

3. **Wetlands** – Areas of land that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas (see Map 4-2).

The County’s water resources provide us with many important benefits:

- **Potable Water Supply** – Lake Champlain is the drinking water source for more than 108,000 Chittenden County residents and thousands of other water users. Aquifers supply water in the County’s rural areas. Households and businesses also depend on adequate supplies of clean water for other purposes (such as irrigation, washing and manufacturing processes).

- **Habitat** – The County’s surface waters and wetlands provide diverse habitats for aquatic and land-based wildlife that form a naturally interconnected regional habitat network.

- **Recreation** – Water-based recreational activities (such as swimming, boating and fishing) on Lake Champlain, the County’s smaller lakes and ponds, and our streams and rivers add a special dimension to our unique quality of life.

- **Scenic Quality** – The still waters of ponds and lakes and the moving waters of streams and rivers contribute scenic values to our quality of life.
Tourism – These previous benefits are enjoyed not only by residents but also by visitors who help fuel the County’s economy.

By jeopardizing these benefits, water resource degradation threatens our health, environment, economic well being, and overall quality of life. Map 4-3 depicts the 24 surface waters that are designated by the State as “Impaired Waterways” (that fail to conform to State water quality standards).4-7 Table 4-2 identifies the impaired waterways in the County (at least 50 named waterways in the County are not impaired).

Water Quality Concerns

The quality of our water resources is affected by pollutants (such as acid rain) that originate outside of Chittenden County. However, many water-quality concerns result from the actions that we take when developing and using land and water in Chittenden County. Water resources also cross political and property boundaries. Consequently, protecting or enhancing the County’s water resources requires the cooperation of government, landowners, employers, and residents.

As is evident from Table 4-2, a waterway may be impaired in various ways. In Chittenden County, two causes of impairment are of greatest concern:

- **Phosphorus** – A nutrient essential to plant life, when excess phosphorus from household and agricultural fertilizers and soils or other sources enters a natural water body, it can stimulate the excessive growth of algae and other aquatic plants. Such growth depletes the levels of dissolved oxygen in the water, which harms aquatic animal life and impairs water’s recreational and aesthetic value. Phosphorus levels in some areas of Lake Champlain are sufficiently critical to cause Vermont and New York jointly to establish a “Total Maximum Daily Load” (TMDL) study to manage the reduction of this pollutant.

- **Stormwater** – Runoff of precipitation and snowmelt in developed areas (especially over impervious/paved surfaces) flushes a combination of pollutants from the land (including suspended soil particles, toxic chemicals, nutrients such as phosphorus, and pathogens). It also concentrates the volume of water and increases water velocities.

Water pollution is categorized into two general types, based on its source:

- **Point Source** – Pollution that enters waterways from a fixed point. An example would be a pipe carrying waste from a specific factory.

- **Nonpoint Source** – Pollution (including excess sediment) that enters waterways from a wide geographic area rather than from a specific location. An example would be stormwater runoff from many buildings, parking lots, roads, and fields, even when that runoff is collected by a drainage system and enters a waterway via a specific pipe or channel.

Chittenden County’s water quality is managed in many ways by a variety of public and private entities. Federal and State water quality regulations and programs address both point source and nonpoint-source pollution:

- **Point Source** – Regulations typically affect specific individual properties (for example, particular factories or municipal wastewater treatment facilities).

- **Nonpoint Source** – Programs are more complex, encompass regulatory and voluntary approaches, and affect land uses differently. Agricultural nonpoint-source pollution typically is addressed through cost-share and technical support from State and federal agencies. 4-8 Nonpoint-source pollution from urban stormwater is more heavily regulated, in some cases through the federal National Pollutant Discharge Elimination System (NPDES) Phase II program or through evolving State programs, such as the stormwater-impaired waters permit system.
<table>
<thead>
<tr>
<th>ID No.</th>
<th>Name</th>
<th>Impairments</th>
<th>Length (Miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>Lake Champlain Basin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Bartlett Brook</td>
<td>Stormwater</td>
<td>3.9</td>
</tr>
<tr>
<td>2</td>
<td>Burlington Bay</td>
<td>Mercury, PCBs</td>
<td>6.0</td>
</tr>
<tr>
<td>3</td>
<td>Direct Drainages to Inner Mallets Bay</td>
<td></td>
<td>18.0</td>
</tr>
<tr>
<td>4</td>
<td>Englesby Brook</td>
<td>Stormwater, E.Coli</td>
<td>1.4</td>
</tr>
<tr>
<td>5</td>
<td>Indian Brook</td>
<td>Stormwater</td>
<td>17.1</td>
</tr>
<tr>
<td>6</td>
<td>LaPlatte River</td>
<td>Fecal Coliform, Mercury</td>
<td>19.6</td>
</tr>
<tr>
<td>7</td>
<td>Mallets Bay</td>
<td>Mercury, PCBs</td>
<td>15.0</td>
</tr>
<tr>
<td>8</td>
<td>Mud Hollow Brook</td>
<td>Fecal Coliform</td>
<td>6.7</td>
</tr>
<tr>
<td>9</td>
<td>Munroe Brook</td>
<td>Stormwater</td>
<td>17.1</td>
</tr>
<tr>
<td>10</td>
<td>Potash Brook</td>
<td>Stormwater, E.Coli</td>
<td>8.2</td>
</tr>
<tr>
<td>11</td>
<td>Shelburne Bay</td>
<td>Mercury, PCBs</td>
<td>9.0</td>
</tr>
<tr>
<td>12</td>
<td>Stone Bridge</td>
<td>Undefined</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>Winooski River Watershed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Allen Brook</td>
<td>Stormwater, E.Coli</td>
<td>12.6</td>
</tr>
<tr>
<td>14</td>
<td>Centennial Brook</td>
<td>Stormwater</td>
<td>4.7</td>
</tr>
<tr>
<td>15</td>
<td>Morehouse Brook</td>
<td>Stormwater</td>
<td>0.6</td>
</tr>
<tr>
<td>16</td>
<td>Muddy Brook</td>
<td>Toxics, Nutrients, Temperature</td>
<td>10.7</td>
</tr>
<tr>
<td>17</td>
<td>Shelburne Pond</td>
<td>Low Dissolved Oxygen, Phosphorus</td>
<td>6.3</td>
</tr>
<tr>
<td>18</td>
<td>Sunderland Brook</td>
<td>Stormwater</td>
<td>6.7</td>
</tr>
<tr>
<td>19</td>
<td>Unnamed Tributary to Joiner Brook</td>
<td>Sediment</td>
<td>1.8</td>
</tr>
<tr>
<td>20</td>
<td>Unnamed Tributary to Muddy Brook</td>
<td>Toxics, (TCE)</td>
<td>3.6</td>
</tr>
<tr>
<td>21</td>
<td>Winooski River</td>
<td>Mercury, E.Coli</td>
<td>40.7</td>
</tr>
<tr>
<td></td>
<td>Lamoille River Watershed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Arrowhead Mtn. Lake</td>
<td>Mercury</td>
<td>5.7</td>
</tr>
<tr>
<td>23</td>
<td>Lamoille River</td>
<td>Mercury, Low Dissolved Oxygen</td>
<td>13.3</td>
</tr>
<tr>
<td>24</td>
<td>Stevensville Brook</td>
<td>Acid</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>Otter Creek Watershed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Lewis Creek</td>
<td>E.Coli</td>
<td>11.0</td>
</tr>
<tr>
<td>26</td>
<td>Pond Brook</td>
<td>E.Coli</td>
<td>0.5</td>
</tr>
</tbody>
</table>

a The 26 waterbodies listed in this table are on Part A of the State’s 303d List of impaired waterways. These are waterbodies that are known to have one or more impairments and are scheduled to have a TMDL study developed. There also are waterbodies in Chittenden County that are on other Parts of the 303d List:

- Part B - Impaired, No TMDL Required because Attainment Expected in a Reasonable Time: Muddy Brook and Unnamed Tributary of Winooski River;
- Part C - Stressed and in Need of Further Assessment to Confirm If Impaired: Huntington River, Tributary #8 of Sunderland Brook, Unnamed tributary to Sunderland Brook, and Winooski River; at mouth;
- Part D - Completed TMDLs: None;
- Part E - Altered by Exotic Species: Arrowhead Mountain Lake, Burlington Bay, Lake Iroquois, Mallets Bay, and Shelburne Bay;
- Part F - Altered by Flow Regulation (e.g., Dams): Arrowhead Mountain Lake, Joiner Brook, Lower Lamoille River, and Lower Winooski below Essex #18 dam;
- Part G - Altered by Channel Alterations (e.g., Dredging and Improper Culvert Placement): None.

b See Map 4-3 for locations.

c Lengths are only the portions of waterways within Chittenden County. Impaired length is either entire waterway or the portion of waterway upstream of the impaired reach defined by river mile points.

d The Vermont Dept. of Environmental Conservation regards all segments of these three waterbodies as being impaired, even though only some segments of them are listed on the 303d List of impaired waterways.

Vermont has endeavored to preserve and enhance the quality of surface waters by preparing watershed plans for the State's major watersheds. In Chittenden County, a plan has been prepared for the Lamoille River watershed and one is being prepared for the Northern Lake Champlain Basin. These watershed plans take a more holistic approach to resource protection by assessing the feasibility of undertaking land-use and development practices that better protect water resources. Watershed planning may be employed not only to protect a waterbody from degradation, but also to restore the quality of urban streams. For example, plans for Englesby Brook identify features contributing to degradation and propose actions to fix them.

Local communities employ various measures aimed at protecting water resources. Zoning regulations (such as stream buffers and resource-protection districts), septic regulations, and subdivision regulations all strive to manage land development in ways that contribute to protecting water resources. Local resource-management policies (such as riparian buffers) and public works protocols (such those related to the frequency of storm-drain cleaning) are sometimes undertaken under the purview of federal regulations (such as the Phase II Stormwater Program).

The Champlain Water District (CWD) implements a Watershed Management Program for Source Protection that

- Regularly assesses the water quality of Shelburne Bay of Lake Champlain (the source for the potable water CWD provides to 12 water systems in the County);
- Builds partnerships to improve the Lake's water quality and limit degradation of CWD's source water (such as the Bartlett Bay Stormwater Treatment System, a partnership of 12 public and private sector entities that uses a state-of-the-art wetlands treatment system to remove 80 percent or more of the stormwater pollutant load of runoff from U.S. Route 7 and nearby properties); and
- Educates people about the Lake's role in providing drinking water (through CWD programs aimed at community leaders, the public, and school children and support for the initiatives of the Regional Stormwater Education Program).

Wetlands

Not all types of wetlands have standing water all of the time. Some wetlands are flooded only in the spring and early summer and dry up during the summer. Others may never have standing water but have saturated soil conditions for a portion of the growing season. Consequently, the Wetlands Office (WO) in Vermont Department of Environmental Conservation's (DEC's) Water Quality Division uses evidence of three factors in the official designation of a wetland:

- **Hydrology** – The timing and extent of flooding or soil saturation and is the most important factor for wetland designation. Rainfall, soil permeability, position in the landscape, surrounding land use, and type of vegetation all influence the hydrology of a wetland. Hydrology is sometimes the most difficult factor to determine in the field because water levels in wetlands are often highly variable in the course of an average year. Direct evidence of wetland hydrology includes actual observation of soil saturation or surface water, long-term observation of water levels in monitoring wells, records of past floods, and detection of flooding on aerial photographs. Indirect evidence includes water marks and silt deposits on trees, shallow rooting of trees or shrubs, buttressing, silt-stained leaves on the ground surface, and flood debris.
- **Soils** – When soil is continuously saturated for at least one week during the growing season, soil micro-organisms may rapidly use up the oxygen. When soil is continually saturated throughout the growing season, the lack of oxygen may severely slow the rate of decay of plant matter. Such soils in Vermont are considered wetland soils. When saturation is of shorter
duration or if water flow through the wetland is greater, there may be little or no accumulation of organic matter. Consequently, soils that are gleyed or mottled within 18 inches of the surface also are wetland soils. The U.S. Department of Agriculture’s Natural Resource Conservation Service (NRCS) has prepared soil surveys for most of Vermont’s counties and is in the process of mapping the remaining counties. These surveys are used as guides in identifying the larger areas of wetland soil.

- **Vegetation** – The presence of specific plant species that have adapted to growing in the low-oxygen conditions associated with prolonged soil saturation or inundation also is used to designate wetlands. DEC maintains lists of the specific species used.

The WO uses these criteria to establish which areas should be included on the National Wetland Inventory. The WO estimates that the State has about 244,000 acres of identified wetlands (4.1 percent of Vermont’s land area), that it has an additional 80,000 acres of wetlands that have yet to be identified, and that the State has lost more than one-third of its original wetlands. Historically, many wetlands in Vermont were drained for farming, but DEC reports that in recent years residential, commercial and industrial development have been the primary causes of wetland loss.

About 17,500 acres of wetlands have been identified in Chittenden County (five percent of the County’s land area; see Map 4-2). Our wetlands should be protected because they serve many valuable functions as natural linkages between land areas, surface waters, and the ground water network:

- Preserve water quality by filtering water before it enters surface waters and groundwater;
- Provide seasonal and year-round flood water storage and erosion control;
- Serve as seasonal and year-round habitat for fish and wildlife (including many threatened and endangered species); and
- Contribute other benefits to our quality of life (such as aesthetics, recreation, and education).

The primary federal program protecting wetlands is Section 404 of the *Clean Water Act*. Administered by the U.S. Army Corps of Engineers, Section 404 regulates the placement of fill or dredged material into “waters of the U.S.,” which include all wetlands in Vermont. Federal permits require review by the State under Section 401 of the *Clean Water Act* to ensure that State water quality standards are not violated.

Based on Vermont’s 1986 Act Relating to the Regulation of Wetlands, the Water Resources Board in 1990 adopted rules that identify 10 significant functions of three classes of wetlands. The State’s Wetlands Rules consider only Class One and Class Two wetlands to be sufficiently significant to merit protection. DEC’s Wetlands Office administers the Rules. The Rules list activities that are allowed within Class One and Class Two wetlands and their adjacent buffer zones (100 feet for Class One and 50 feet for Class Two). All activities not specifically listed are considered to be “conditional uses.” A person proposing a conditional use in a protected wetland is required to obtain a Conditional Use Determination (CUD) from the Wetlands Office. The Office may issue a CUD only when it determines that the activity will not adversely impact the protected functions of the wetland.

Vermont’s Act 250 (24 VSA 6086 [1] [G]) also works to manage land development in or near wetlands. The Wetlands Office provides advisory recommendations to the District Environmental Commissions for the approximately 200 Act 250 permit applications annually that involve potential wetland impacts.
Section 404 (b) (1) of the U.S. *Clean Water Act* and Section 8.5 of the *Vermont Wetland Rules* provide for “wetlands mitigation.” This series of steps (avoidance, minimization, restoration, enhancement and compensation) must be addressed sequentially to offset adverse impacts on wetlands from development. The compensation of wetlands is considered only when avoidance, minimization, restoration, and enhancement are not practicable alternatives, and when there will be no net loss of wetland functions, values, or acreage.

Vermont municipal zoning regulations may regulate shorelands to preserve and protect wetlands (24 VSA 4414 [1] [D]). The Chapter 117 reforms enacted in 2003 repealed 24 VSA 4409 [c] [2] [a]), which previously had required municipal zoning administrators to notify DEC’s Wetlands Office of proposed land development activities within wetlands prior to the issuance of a local zoning permit. The Wetlands Office had 30 days to provide comments to the zoning administrator as to whether local approval of the project might violate State and federal wetland regulations.

### Water Quality Policies

1. The quality of our surface waters, ground water resources, and wetlands should be protected and enhanced.

2. Each municipality, employer, and household should strive to use water resources efficiently, to adopt water conservation policies and measures to be used in times of limited water supply, and voluntarily undertake reasonable measures to reduce water pollution beyond compliance with water-quality standards, including currently unregulated pollutants.

3. Land development should incorporate practices that minimize non-point source water pollution from stormwater runoff (such as practices to manage the volume of stormwater runoff and to reduce soil erosion, septic failures, and the transmission of toxic substances).

4. Stormwater runoff from transportation infrastructure should be properly managed to minimize adverse water quality impacts.

5. Lower density development should employ innovative approaches to reduce adverse stormwater impacts, such as nonstructural management practices and low-impact development practices.

6. Public and private organizations should partner in efforts to educate the public and municipalities on water quality concerns, such as the Regional Stormwater Education Program (RSEP).

7. Public and private organizations should partner with the State in preparing a watershed plan and river corridor plans for each of the County’s watersheds.

8. Public and private organizations should consider partnering to form multijurisdictional stormwater programs and/or utilities to effectively, efficiently, and fairly undertake measures to improve water quality and impaired waterways.

9. Agricultural enterprises should employ best management practices to manage animal wastes and reduce the runoff of pollutants from agricultural lands and farmsteads.
Land-Resource Quality

Earth Resources

Background

Chittenden County contains two major zones of bedrock geology (see Map 4-4):

- Sedimentary Zone – Rocks formed by the deposit of sediment, located predominantly in the lowlands between Lake Champlain and the uplands on the eastern side of the County and

- Metamorphosed Zone – Rocks formed by metamorphic processes located predominantly in the uplands on the eastern side of the County.

No major geologic threats (such as major fault lines, seismic disturbances, areas prone to sinkholes or subsidence) or opportunities (such as major deposits of valuable minerals) exist in the County.

The only earth resources in Chittenden County that currently are commercially viable are sand and gravel. 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 need for these aggregates is greater in Chittenden County than in other areas of Vermont. Chittenden County is rich in sand deposits with over two billion cubic yards available. Almost another two billion cubic yards of sand is unavailable because of inaccessibility, conflicting land use, environmental sensitivity, or poor quality. Gravel is less abundant with about 430 million cubic yards available and less than 140 million cubic yards unavailable.

Map 4-5 depicts the County’s topographic relief. The County contains lowlands that are around 100 feet above sea level near Lake Champlain and in the floodplains of major rivers; rolling hills between 100 and 1,000 feet above sea level in much of the County; and highlands in the eastern part of the County that rise to some of the State’s highest peaks in the Western Green Mountains.

Earth Resources Policies

1. Aggregate resources should be available to support future development and construction in Chittenden County.

2. Municipal plans and bylaws, in conjunction with State regulations, should ensure that earth resource extraction does not adversely impact surface water and ground water resources and minimizes adverse effects on the environment and on adjoining land uses by requiring that erosion and runoff be minimized during operations and that restoration occurs after operations cease.

Agricultural Soils

Background

Agricultural soils are soils with certain characteristics that make them especially productive for specified types of farm production. These soils constitute a limited natural resource, even when they are not devoted to agricultural land uses or are not currently used profitably by farm enterprises. In Vermont, agricultural soils are designated as being in one of two general categories:
Prime Agricultural Soils – Soils that satisfy specific sets of criteria applying to different types of farm production as established by the U.S. Department of Agriculture and

Statewide Agricultural Soils – Soils that do not meet the criteria for Prime Soils but do meet similar standards established by the State of Vermont. Statewide Soils are further divided into subcategories of “Class I” and “Class II” soils.

Agricultural soils typically are located in the lowlands of Chittenden County (see Map 4-6). Prime Soils are located most often in the floodplains of County’s major streams and rivers. Statewide Soils are most widespread in the central and southern areas portions of the western County.

State and local efforts to preserve agricultural soils tend to rely on strategies such as fostering planned unit development, purchasing conservation easements, and requiring “mitigation.” Mitigation requires a developer of agricultural soils to pay into a fund that is used to acquire the conservation easements for (or to purchase outright) other agricultural soils to ensure that they are not developed. The preservation of agricultural soils resources involves not only targeted resource-protection policies but also policies related to promoting agricultural land uses (see pages 3.6 – 3.9) and agricultural and farm businesses (see pages 6.9 – 6.10).

**Agricultural Soils Policies**

1. The designation of specific soil types as those which merit preservation for their agricultural productivity should be based on scientific assessments of their productivity in order to clearly define which soils will require mitigation measures if developed and which soils will be eligible for preservation using mitigation funds.

2. Where local plans and bylaws so provide, agricultural soils in Metropolitan, Transitional, Enterprise, or Village Planning Areas should be preserved as part of urban greenspaces.

3. Where local plans and bylaws so provide, agricultural soils in Metropolitan, Transition, Enterprise, or Village Planning Areas should be developed for nonagricultural land uses only if mitigation funds or lands are provided in conformance with State and local rules governing mitigation programs.

4. Any mitigation funds or lands provided to offset the development of agricultural soils in Chittenden County should be used to preserve agricultural soils in areas dedicated by local plans and bylaws for the preservation of farm activities in Chittenden County.

5. Agricultural soils in Rural Planning Areas should be retained by limiting the development of non-agricultural land uses on these soils.

6. Programs to preserve agricultural soils should strive to compensate landowners for the loss of the rights to use and develop these areas for non-agricultural activities by employing tools such as purchase of development rights, transferable development rights, and preferential property tax assessment.

**Forest Resources**

**Background**

Chittenden County’s urban and rural forests contribute significantly to the region’s environmental, social, and economic health because trees and forests
Make our neighborhoods and communities safer, healthier, and more pleasant by
- Reducing stormwater runoff and flood hazards,
- Modulating the local temperature effects of the sun and wind,
- Providing privacy for land uses and screening of undesirable land uses,
- Separating incompatible land uses, and
- Buffering the adverse impacts of development from other uses and natural resources;

Preserve natural resources by
- Serving as wildlife habitats,
- Sustaining the quality of our water resources, and
- Improving local air quality;

Provide valuable, locally available, and renewable economic resources, including
- Lumber for construction, manufacturing, and crafting,
- Other forest products (such as maple syrup and Christmas trees), and
- Fuel for homes, businesses, and electric power generation; and

Are characteristic features of Vermont’s rural landscape that provide to residents and visitors
- Scenic benefits and
- Special recreational amenities.

In the 1800s, settlers in Vermont converted forests into farm pastures and fields. As a consequence, by the late 1920s, less than one-third of Vermont was forested. Now over two-thirds of the State are forested. Because trees grow slowly, such gains necessarily are the product of decades of changed land-use practices.

In 2001, CCRPC prepared a study of the County’s forests. That study documented the portions of the County with various types of forest cover (see Map 4-7), based on the most recent land-cover analysis of the entire County then available (prepared in 1993). In 1993, approximately one-third of the County was in “core forest” (forest that is at least 100 meters from a zone of human disturbance; see Map 4-8). However, this represented a decrease of more than 32,600 acres (22 percent) since 1978 (see Table 4-3).

Land development associated with the County’s likely future population and economic growth could, if improperly managed, increase the loss and fragmentation of forests in the County. Forest fragmentation occurs when a large expanse of forest is divided into smaller areas of forest separated by non-forest land uses. A single contiguous forest provides more benefits (such as habitat, increased buffering of natural and human impacts, and efficient logging) than does an equivalent land area divided among many smaller fragmented forests. A forest that is divided into multiple parcels held by different owners (who may have different – even competing – objectives and uneven capacities for managing forest resources) is more vulnerable to fragmentation.

To prevent or minimize the loss and fragmentation of forests in the County, private landowners and public officials need to treat trees and forests as valued resources that should be sustained through stewardship. Educational materials on forest conservation, management, and stewardship are available from the Forestry Division of the Vermont Department of Forests, Parks and Recreation, the University of Vermont, and other organizations (see the Resources section at the end of this chapter).

Vermont has enacted statutes and the Forest Division has adopted regulations to prevent and control forest fires, regulate timber harvesting, control tree pests, and promote forest products (see 10 VSA Chapter 83). State law also authorizes municipalities to designate and purchase “municipal forests” (10 VSA 2651 – 2655) and to establish forest zoning districts that permit commercial forestry and related uses and prohibit all other land development (24 VSA 4414 [1] [B] [ii]).
Table 4-3
1978 TO 1993 CHANGE IN CORE FORESTS*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolton</td>
<td>23,232</td>
<td>20,911</td>
<td>-2,321</td>
<td>-10%</td>
<td></td>
</tr>
<tr>
<td>Buel's Gore</td>
<td>2,556</td>
<td>2,516</td>
<td>-40</td>
<td>-2%</td>
<td></td>
</tr>
<tr>
<td>Burlington</td>
<td>159</td>
<td>9</td>
<td>-150</td>
<td>-95%</td>
<td></td>
</tr>
<tr>
<td>Charlotte</td>
<td>1,939</td>
<td>886</td>
<td>-1,053</td>
<td>-54%</td>
<td></td>
</tr>
<tr>
<td>Colchester</td>
<td>6,482</td>
<td>2,194</td>
<td>-4,288</td>
<td>-66%</td>
<td></td>
</tr>
<tr>
<td>Essex**</td>
<td>10,556</td>
<td>4,717</td>
<td>-5,839</td>
<td>-55%</td>
<td></td>
</tr>
<tr>
<td>Hinesburg</td>
<td>8,614</td>
<td>7,043</td>
<td>-1,571</td>
<td>-18%</td>
<td></td>
</tr>
<tr>
<td>Huntington</td>
<td>16,209</td>
<td>15,990</td>
<td>-219</td>
<td>-1%</td>
<td></td>
</tr>
<tr>
<td>Jericho</td>
<td>12,275</td>
<td>8,497</td>
<td>-3,778</td>
<td>-31%</td>
<td></td>
</tr>
<tr>
<td>Milton</td>
<td>11,139</td>
<td>6,354</td>
<td>-4,785</td>
<td>-43%</td>
<td></td>
</tr>
<tr>
<td>Richmond</td>
<td>10,069</td>
<td>8,975</td>
<td>-1,094</td>
<td>-11%</td>
<td></td>
</tr>
<tr>
<td>Shelburne</td>
<td>839</td>
<td>266</td>
<td>-574</td>
<td>-68%</td>
<td></td>
</tr>
<tr>
<td>South Burlington</td>
<td>399</td>
<td>83</td>
<td>-315</td>
<td>-79%</td>
<td></td>
</tr>
<tr>
<td>St. George</td>
<td>759</td>
<td>579</td>
<td>-180</td>
<td>-24%</td>
<td></td>
</tr>
<tr>
<td>Underhill</td>
<td>25,544</td>
<td>19,580</td>
<td>-5,964</td>
<td>-23%</td>
<td></td>
</tr>
<tr>
<td>Westford</td>
<td>13,260</td>
<td>9,822</td>
<td>-3,438</td>
<td>-26%</td>
<td></td>
</tr>
<tr>
<td>Williston</td>
<td>4,565</td>
<td>2,888</td>
<td>-1,677</td>
<td>-37%</td>
<td></td>
</tr>
<tr>
<td>Winooski</td>
<td>24</td>
<td>1</td>
<td>-23</td>
<td>-96%</td>
<td></td>
</tr>
<tr>
<td>County Total</td>
<td>148,619</td>
<td>111,312</td>
<td>-32,666</td>
<td>-22%</td>
<td></td>
</tr>
</tbody>
</table>

* Forest that is at least 100 meters from a human disturbance.
** Includes Essex Junction.


Forest Resources Policies

1. Municipal plans and bylaws should recognize trees as valued resources and as important parts of both the built environment and the natural environment.

2. Municipal plans and bylaws should encourage developers and property owners to plant, replant, and retain native species of trees as part of the urban landscape, rural roadsides, and in buffer strips for scenic, water quality, and habitat diversity enhancement.

3. Municipal plans and bylaws should include measures to protect and enhance significant forested areas and especially to prevent the further fragmentation of such areas by development.

4. Municipal plans and bylaws should include measures to connect core forest areas with forested areas or with other land uses that perform natural areas open-space functions.

5. Development should be limited in core forests and avoided in forested areas that contain rare, threatened, or endangered forest community types.
Natural Areas

Background

Open space that is devoted to natural areas is integral to Chittenden County’s character. Natural areas sustain the health of the environment, contribute to our appreciation of nature, buffer development, mitigate stormwater, support recreation, and attract tourists.

In 2002-2004, CCRPC developed a measure of the suitability of places in Chittenden County to perform natural-areas open-space functions. This measure combines into a single score the consideration of many factors related to an area’s increased suitability to perform natural-areas open-space functions:

- Exemplary natural communities,
- Unfragmented landscape,
- Refuge and habitat for rare and threatened species,
- Lands with restoration potential,
- Significant habitats for terrestrial wildlife,
- Contribution to overall and representative biotic and physical diversity,
- Water quality and aquatic habitats, and
- Stable rivers and subsurface water systems.

By combining these factors into a single summary measure, the Natural Areas (NA) Measure saves decision makers the time and cost of collecting, processing, and analyzing all of this information. The NA Measure is intended to serve as a starting point for further consideration, not as a policy judgment about which areas should be designated, preserved, or used as open space. These decisions are to be made by municipalities and open space organizations, based not only on the factors summarized by the NA Measure but also on locally determined considerations (such as budgeted resources, policies, and priorities).

The NA Measure (see Map 4-9) depicts large areas in the eastern section of the County that are “most suited” for natural-areas open-space functions. Other areas that are “most suited” for these functions exist throughout the County. Much of the County has large areas that are “more suited” with connecting areas that are “suited” for these functions. Creating connections between large and significant habitat areas allows animals and plants to move seasonally (and more frequently), thereby strengthening many natural-areas functions.

In 2002-2003, CCRPC developed an inventory of areas in the County that are locally designated for open space. The inventory identified those open-space resources in each municipality that serve as “Natural Areas.” Countywide, 868 parcels totaling almost 42,000 acres of Natural Areas were inventoried (almost half of the nearly 86,000 acres of open space in the County).

Multiple public and private entities have acquired lands in fee simple absolute or conservation easements to limit development of specific properties in Chittenden County:

- The State of Vermont owns almost 25,000 acres of open space, most of which is in natural areas.
- The U.S. government owns about 11,000 acres of open space that is mostly in natural areas.
- The Vermont Land Trust has conserved over 9,000 acres of land in the County since the early 1980s. More than half of this land has been under conservation since 1995, which is indicative of the generally increasing trend toward conservation in Chittenden County.
Local land trusts and watershed organizations are part of a conservation partnership network to assist in local, regional, watershed, and statewide conservation initiatives.

- The Winooski Valley Park District has acquired and manages over 1,700 acres for passive recreation and conservation within its seven member towns. The system of public natural areas has over 24 miles of trails and 13 miles of shoreline and is used as “outdoor classrooms” by local schools.

- Most of the County's municipalities have established conservation commissions to recommend conservation initiatives to their local legislative bodies. Voters in nine municipalities (Bolton, Charlotte, Hinesburg, Huntington, Jericho, Richmond, Shelburne, South Burlington, Westford, and Williston) have established open-space funds that collectively total more than $826,000 annually. Several other communities are considering creating similar open-space funds.

Map 4-10 inventories the properties conserved by public and private entities for all purposes (for example, natural areas, agricultural preservation, or scenic preservation).

Effective and efficient wildlife protection addresses concerns at the most appropriate level:

- Species (such as programs prohibiting harmful actions to a particular species),
- Habitat (such as programs to restore wetlands),
- Landscape (such as efforts to maintain and restore connectivity of riparian areas in a particular watershed), and
- National and international (such as restoration of lost habitat along migration routes).

Municipalities authorized to manage local land use and development are particularly well suited to implement actions that affect the quality of habitat. Because the habitat and natural areas boundaries seldom coincide with municipal boundaries, regional coordination can help make municipal actions more effective and efficient.

Natural-area open-space functions are often complex and subtle. For example, for an area to be effective as wildlife habitat, it needs to have features that support many interrelated species with different needs at different life-cycle stages and during different seasons. The value of open space for wildlife habitat often diminishes when areas become fragmented into smaller disconnected pieces. Continuous corridors of open space are necessary to support some wildlife species.

A single contiguous natural area is more effective as wildlife habitat than an equivalent land area divided among many smaller fragmented natural areas. In addition, wildlife that is forced to travel between fragmented natural areas is more vulnerable to harm from people (such as being struck by motor vehicles) and more likely to harm people or property (such as by feeding from gardens or trash).

The Vermont Fish and Wildlife Department has prepared guides for community programs to protect wildlife and to protect and restore wildlife habitat (see Resources).
Natural Areas Policies

1. Municipalities, regional entities, and the State should preserve and protect existing designated open-space areas providing natural areas functions and be guided by open-space plans and strategies.

2. Planning for natural areas conservation should consider the factors assessed by the Natural Areas Measure developed in the CCRPC’s Chittenden County Open Space Plan.

3. Public and private open space stewards should cooperatively and periodically inventory and evaluate their existing conservation priorities and management practices to assess the need for actions to enhance the natural area system in the County.

4. Public and private open-space stewards should work cooperatively to promote greater connectivity between conserved lands to establish and enhance an interconnected, natural area system in the County.

Resources

The following resources provide further information on the major topics of this chapter.

Air Quality


Air Pollution Control Division of the Vermont Department of Environmental Conservation. www.anr.state.vt.us/air/.


Water Quality

Center for Watershed Protection. www.cwp.org/index.html

Chittenden County Regional Stormwater Education Program (RSEP). www.smartwaterways.org/.


Lake Champlain Committee. www.lakechamplaincommittee.org/lcc/.


The Shelburne Bay Watershed. www.shelburnebay.org/.

The University of Vermont. Water Resources. www.uvm.edu/%7Euvnext/environment/?Page=water.html#UVM_publications.


Water Quality Division of the Vermont Department of Environmental Conservation.

Wetlands Section of the Vermont Department of Environmental Conservation.


Earth Resources


Forest Resources


Forest Division, Vermont Department of Forests, Parks, and Recreation. www.vtfpr.org/htm/forestry.cfm.


Natural Areas


Notes

Particulate matter is a mixture of solid particles and liquid droplets. The NAAQS has separate standards for two sizes of particulate matter: 10 millionths of a meter or smaller and 2.5 millionths of a meter or smaller.

Monitoring for lead is not conducted. EPA's 2004 summary of New England air quality stated, "During 2004, Vermont did not conduct ambient air lead monitoring. Historical ambient air concentrations of lead in Vermont have been extremely low and ambient monitoring for this pollutant has not been warranted."

According to the Intergovernmental Panel on Climate Change, global surface air temperatures increased between 1900 and 2000 by 0.7-1.4°F (cited in Pew Center on Global Climate Change. 2003. Understanding the Causes of Global Climate Change, www.pewclimate.org/global-warming-basics/fact_sheets.cfm, accessed 20 March 2006). Over the same period, the average temperature in Burlington has increased 0.4°F, and precipitation has increased by as much as five percent in many parts of Vermont (U.S. EPA. September 1998. Climate Change and Vermont, EPA 236-F-98-007aa.).


Vermont annually prepares the “305b Report,” which is a summary of the impaired waterways, as part of its *Clean Water Act* responsibilities. See [www.vtwaterquality.org/planning/docs/305b/pl_305b04-toc.pdf](www.vtwaterquality.org/planning/docs/305b/pl_305b04-toc.pdf).

In Vermont, all farms must comply with Accepted Agricultural Practices and large farms must comply with additional regulations under the Large Farm Operation permit system. In 2005, the Vermont Agency of Agriculture proposed rules for Medium Farm Operations that may become effective by the time the 2006 Regional Plan is adopted. See [www.vermontagriculture.com/AgriculturalWaterQuality/MFO/MFO.htm](www.vermontagriculture.com/AgriculturalWaterQuality/MFO/MFO.htm).


See [www.anr.state.vt.us/dec/waterq/wetlands/htm/wl_function.htm](www.anr.state.vt.us/dec/waterq/wetlands/htm/wl_function.htm).


Phase II of CCRPC’s Open Space Plan developed this and other measures of open-space function by working with technical advisory groups composed of experts in each area and by employing methods described in a separate report posted on [www.ccrpcvt.org](www.ccrpcvt.org).

The Vermont Fish and Wildlife Department has prepared guides for municipalities and others to prepare plans to protect natural areas (listed in Resources).

Phase I of CCRPC’s Open Space Plan developed this inventory in close cooperation with municipalities and by employing methods described in a separate report posted on [www.ccrpcvt.org](www.ccrpcvt.org).

Phase I defined “Natural Areas” as “Unique or irreplaceable features of the natural landscape, including, but not limited to, areas supportive of wildlife habitat, unusual plant species, geologic features, and wetlands.” See also Table 2 of the Phase I report posted on [www.ccrpcvt.org](www.ccrpcvt.org).

The *Regional Plan* identifies “fragmentation” as an important issue for different types of resources and land uses. It is important to remember that “fragmentation” has a special meaning for each type of resource. For example, fragmentation of a forest results principally from the physical separation of forested areas by non-forested areas. The fragmentation of habitat may result from merely transforming a single feature of the landscape (such as erecting a fence). The fragmentation of an agricultural area may occur when farmers no longer are able to access dispersed fields (such as when existing road bridges cannot support the weight of new larger farm equipment).
Demographics

Awareness of the characteristics of Chittenden County’s residents improves planning for their needs. This chapter presents information about selected characteristics of the County’s residents and describes how these characteristics affect social and economic conditions in order to provide context for the matters the Plan considers in other chapters. This chapter

- Summarizes eight significant characteristics and trends of the County’s population,
- Portrays important recent trends,
- Describes key current conditions, and
- Provides forecasts of the size of the County’s future population.

Overview

The eight most significant recent trends and current characteristics of the County’s residents are

- **Slowing Growth** – The County’s population is growing, but at a lower rate than in recent decades. This trend affects the growth in demand for goods and services (such as housing), including public facilities and services (such as schools, roads, and public-safety services). This slowing growth is reflected in the forecast of the County’s future population.

- **Diminished Metropolitan Share** – The County’s share of the total population of the Northwest Vermont Region is declining. While the County continues to be the Region’s employment and commercial center, more households are living in nearby counties.

- **Smaller Households** – Average household sizes are decreasing, because of increased numbers of single-person households and decreasing average family size. This means a greater number of housing units are needed to house the same number of people.

- **Aging Population** – The number of elderly and their proportion of the County’s total population is increasing, while the proportion of the County’s total population who are 18 years old or younger is declining. This affects the demand for certain types of goods and services (such as housing) and for certain types of public facilities and services (such as schools and special transportation services).

- **Increase in Non-Native Vermonters** – The number of people who were not born in Vermont and their proportion of the County’s total population is increasing. This may affect the demand for various types of goods and services, including public facilities and services.

- **Increased Racial and Ethnic Diversity** – The proportion of the County’s population that is White, Non-Hispanic has decreased in recent decades but remains greater than that in the U.S. This may affect the demand for different types of goods and services, including public facilities and services.

- **People with Disabilities** – More than one in 10 people in the County have one or more disabilities, although their proportion of the County’s total population is smaller than in Vermont or the U.S. as a whole. People with disabilities benefit from special social services, accessibility features in buildings that provide for public access, and special housing features.

- **High Educational Levels** – The County’s population has a higher level of educational attainment (especially college graduates) than the populations of Vermont or the U.S., an important economic development asset.
Recent Trends

Population Growth

From 1960 to 2000, the County’s population increased by over 72,000 people (see Figure 5-1), a 97-percent increase representing an average annual growth rate of 1.71 percent. However, for each successive decade during this period the increases in the number of people and the corresponding rate of growth were smaller than in the previous decade (see Table 5-1).

<table>
<thead>
<tr>
<th>Period</th>
<th>Population Growth (People)</th>
<th>10-Year Rate of Growth</th>
<th>Average Annual Rate of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-1970</td>
<td>24,706</td>
<td>33.2 %</td>
<td>2.91 %</td>
</tr>
<tr>
<td>1970-1980</td>
<td>16,403</td>
<td>16.5 %</td>
<td>1.54 %</td>
</tr>
<tr>
<td>1980-1990</td>
<td>16,227</td>
<td>14.0 %</td>
<td>1.32 %</td>
</tr>
<tr>
<td>1990-2000</td>
<td>14,810</td>
<td>11.2 %</td>
<td>1.07 %</td>
</tr>
</tbody>
</table>

SOURCE: U.S. Bureau of the Census, Characteristics of the Population, 1960: Table 7; 1970: Table 16; 1980: Table 1; 1990: Table 1; 2000: STF 3.

In the 1960s, Chittenden County’s population growth far outpaced growth in Northwest Vermont, Vermont, and the U.S. (see Figure 5-2). Since then, the County’s population growth rate has been closer to that of Northwest Vermont (suggesting that more people working in Chittenden County are living outside of the County). In the 1970s and 1980s, the County’s growth rate (and Northwest Vermont’s) still exceeded the growth rates of Vermont and the nation. In the 1990s, growth rates for the County and Northwest Vermont still exceeded Vermont’s growth rate but were lower than the Nation’s growth rate. These trends resulted in Chittenden County’s and Northwest Vermont’s increased shares of the State’s total population (see Figure 5-3) and the County’s increased population density from 138.1 people per square mile in 1960 to 271.9 people per square mile in 2000.

From 1960 to 2000, Chittenden County’s communities grew at different rates (see Map 5-1). In general, the suburban-ring communities experienced high growth rates during this period, while the historic urban-core communities experienced low growth rates. These outcomes are due to

- Differences in the numbers of new housing added during this period largely because of the availability of undeveloped land in the suburban communities, coupled with people’s preferences for automobile-oriented, suburban lifestyles and
- Fewer people residing in each housing unit because of declines in family size and increases in the number of single-person households.

Household Size

As the County’s population grew in size, its characteristics also changed in important ways. One of the most significant changes was that the County’s average household size declined by about one person per household (a 30-percent reduction) from 1960–2000 (see Figure 5-4). However, most of this decline occurred from 1960 to 1980 and the 1990–2000 change was a decline of only 0.09 people per household (a 3.5-percent decline). These declines are the result of

- Families having fewer children (the main decline was in 1960 to 1980; see Figure 5-5) and
- Increases in the number of single-person households, often elderly widows/widowers, recently divorced people, and young adults entering the job market (see Figure 5-6).

Smaller households mean that more dwellings are needed to house the same number of people.
Figure 5-1
POPULATION IN CHITTENDEN COUNTY, 1960 – 2000

Figure 5-2
AVERAGE ANNUAL RATES OF POPULATION GROWTH IN CHITTENDEN COUNTY, NORTHWEST VERMONT, VERMONT, AND UNITED STATES, 1960 – 2000

Figure 5-3
SHARES OF VERMONT’S POPULATION IN CHITTENDEN COUNTY AND NORTHWEST VERMONT, 1960 – 2000
Figure 5-4
AVERAGE HOUSEHOLD SIZE IN CHITTENDEN COUNTY AND VERMONT, 1960 – 2000

Figure 5-5
AVERAGE FAMILY SIZE IN CHITTENDEN COUNTY AND VERMONT, 1960 – 2000

Figure 5-6
PERCENTAGES OF TOTAL HOUSEHOLDS THAT ARE SINGLE PERSON HOUSEHOLDS IN CHITTENDEN COUNTY AND VERMONT, 1960 – 2000

Aging of the Population and Other Characteristics

Another major demographic change often is described as the “aging” of the population. From 1960 to 2000, the average age of Chittenden County’s residents increased by almost 10 years (see Figure 5-7). This trend resulted principally from:

- Increases in the portion of the total population who are 65 years old or older (see Figure 5-8), resulting from increased life expectancy which in turn results from economic prosperity, social welfare programs, and advances in medical care and
- Decreases in the portion of the total population who are under 18 years old (see Figure 5-9).

Changes in the age composition of the population alter the need for particular public services such as education and health care.

In recent decades, the portions of Chittenden County’s and Vermont’s total population that are native Vermonters – i.e., born in Vermont – have decreased (see Figure 5-10). The County and State also have become more racially diverse during this period, although they remain much less so than the United States (see Figure 5-11).52

Figure 5-7
MEDIAN AGE IN CHITTENDEN COUNTY & VERMONT, 1960 – 2000

Figure 5-8
PERCENTAGES OF RESIDENTS AGED 65+ IN CHITTENDEN COUNTY & VERMONT, 1960 – 2000
Figure 5-9
PERCENTAGES OF RESIDENTS AGED UNDER 18 IN CHITTENDEN COUNTY & VERMONT, 1960 – 2000

Figure 5-10
PERCENTAGES OF RESIDENTS WHO WERE BORN IN VERMONT IN CHITTENDEN COUNTY & VERMONT, 1960 – 2000

Figure 5-11
PERCENTAGES OF RESIDENTS WHO ARE WHITE NON-HISPANIC IN CHITTENDEN COUNTY & VERMONT, 1960 – 2000


Current Conditions

Population Density

Population density in the County varies, with the greatest densities in and around the historic urban core (see Map 5-2 and Table 5-2).

Table 5-2
MUNICIPAL POPULATION SIZE AND DENSITY, 2000

<table>
<thead>
<tr>
<th>Area</th>
<th>Population</th>
<th>Population Density (People per Square Mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolton</td>
<td>971</td>
<td>22.86</td>
</tr>
<tr>
<td>Buel's Gore</td>
<td>12</td>
<td>2.38</td>
</tr>
<tr>
<td>Burlington</td>
<td>38,889</td>
<td>3,770.56</td>
</tr>
<tr>
<td>Charlotte</td>
<td>3,569</td>
<td>86.05</td>
</tr>
<tr>
<td>Colchester</td>
<td>16,986</td>
<td>460.52</td>
</tr>
<tr>
<td>Essex Junction</td>
<td>8,591</td>
<td>1,804.06</td>
</tr>
<tr>
<td>Essex Town</td>
<td>18,626</td>
<td>477.48</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>4,340</td>
<td>109.01</td>
</tr>
<tr>
<td>Huntington</td>
<td>1,861</td>
<td>48.79</td>
</tr>
<tr>
<td>Jericho</td>
<td>5,015</td>
<td>141.69</td>
</tr>
<tr>
<td>Milton</td>
<td>9,479</td>
<td>184.19</td>
</tr>
<tr>
<td>Richmond</td>
<td>4,090</td>
<td>128.44</td>
</tr>
<tr>
<td>St. George</td>
<td>698</td>
<td>194.46</td>
</tr>
<tr>
<td>Shelburne</td>
<td>6,944</td>
<td>285.65</td>
</tr>
<tr>
<td>South Burlington</td>
<td>15,814</td>
<td>894.01</td>
</tr>
<tr>
<td>Underhill</td>
<td>2,980</td>
<td>58.03</td>
</tr>
<tr>
<td>Westford</td>
<td>2,086</td>
<td>53.13</td>
</tr>
<tr>
<td>Williston</td>
<td>7,650</td>
<td>252.15</td>
</tr>
<tr>
<td>Winooski</td>
<td>6,561</td>
<td>4,586.14</td>
</tr>
<tr>
<td>County Total</td>
<td>146,571</td>
<td>271.91</td>
</tr>
</tbody>
</table>


Age and Gender Cohorts

A population pyramid is a special chart that illustrates the sizes of different age cohorts with males on one side of the chart and females on the other. Its name stems from its classic pattern of being widest at the base (depicting a large number of infants and children) and steadily tapering to the top as death reduces the number of people in each successively older cohort. In modern times, factors such as medical advances, changes in family size, and migration have accounted for departures from the classic pyramid form in many regions.

Chittenden County’s population pyramid for 2000 (see Figure 5-12) illustrates several special demographic characteristics that have important social and economic implications:

- The five age cohorts under age 25 are increasingly smaller in successively younger cohorts, suggesting future declines in school enrollment and in young people entering the workforce.
- The bulge in the five middle-aged cohorts (over 34 and under 60) illustrates the large size of the “baby boom” cohorts that are fast approaching retirement age. This pattern could signal the need in the coming decades for the County’s employers to replace large numbers of experienced workers at a time when employers nationwide are experiencing a similar trend.
Figure 5-12
POPULATION PYRAMID FOR CHITTENDEN COUNTY, 2000

MALES 71,243
FEMALES 75,328

1,031 80 & Over 2,616
1,024 75 to 79 1,546
1,386 70 to 74 1,955
1,971 65 to 69 2,193
2,273 60 to 64 2,358
3,325 55 to 59 3,415
4,509 50 to 54 4,758
5,540 45 to 49 5,817
6,265 40 to 44 6,668
6,401 35 to 39 6,470
5,386 30 to 34 5,489
5,245 25 to 29 5,010
6,656 20 to 24 6,750
5,756 15 to 19 6,073
5,148 10 to 14 5,188
5,156 5 to 9 4,695
4,171 Under 5 4,327

CHITTENDEN COUNTY RESIDENTS

The already sizable number of people aged 65 or more can be expected to live longer and soon be joined in retirement by the large numbers of “baby boomers.” Whether these people choose to remain in the County during retirement will greatly affect the demands for housing and a wide range of community services.

Diversity

As previously mentioned, Chittenden County’s population has not been as racially diverse as the population of United States (see Figure 5-11). In 2000, about 95 percent of the County’s residents identified themselves as being White, whereas every other major racial category is represented by less than two percent of the population (see Figure 5-13).\(^5\)\(^4\) The cultural backgrounds of the County’s residents also are relatively homogenous, as evidenced by the large proportions of European ancestries reported (see Figure 5-14).

Although smaller proportions of Chittenden County’s population have disabilities than in Vermont or the United States as a whole, more than one in 10 people in the County have one or more disabilities (see Table 5-3). People with disabilities benefit from special social services, accessibility features in buildings that provide public access, and special housing features.

Chittenden County’s population has a higher level of educational attainment (especially college graduates) than the populations of Vermont or the United States as a whole (see Table 5-4). This is an important asset and consideration for economic development.

Household Characteristics

In 2000, about one person in 20 in Chittenden County resided in a group quarters (institutionalized and noninstitutionalized, one person in five lived in a nonfamily household, and three out of four people were in a family household (see Figure 5-15).
Figure 5-14
ANCESTRIES OF CHITTENDEN COUNTY RESIDENTS, 2000

Table 5-3
DISABILITY STATUS IN CHITTENDEN COUNTY, VERMONT, AND UNITED STATES, 2000

<table>
<thead>
<tr>
<th>Percent of Civilian Noninstitutionalized Population 5 Years and Over with the Specified Disability</th>
<th>Chittenden County</th>
<th>Vermont</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Disability (Having one or more of the four specific types of disability)</td>
<td>13.4%</td>
<td>17.1%</td>
<td>14.9%</td>
</tr>
<tr>
<td>Sensory (Blindness, deafness, or a severe vision or hearing impairment)</td>
<td>3.7%</td>
<td>3.8%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Physical (A substantial limitation in the ability to perform basic physical activities, such as walking, climbing stairs, reaching, lifting, or carrying)</td>
<td>5.4%</td>
<td>7.7%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Mental (Difficulty learning, remembering, or concentrating)</td>
<td>4.2%</td>
<td>5.1%</td>
<td>7.7%</td>
</tr>
<tr>
<td>Self-Care (Difficulty dressing, bathing, or getting around inside the home)</td>
<td>1.5%</td>
<td>2.1%</td>
<td>8.1%</td>
</tr>
</tbody>
</table>


Table 5-4
EDUCATIONAL ATTAINMENT IN CHITTENDEN COUNTY, VERMONT, AND UNITED STATES, 2000

<table>
<thead>
<tr>
<th>Percent of Persons 25 Years &amp; Over with</th>
<th>Chittenden County</th>
<th>Vermont</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School Degree or Higher</td>
<td>90.6%</td>
<td>86.4%</td>
<td>84.1%</td>
</tr>
<tr>
<td>Bachelor's Degree or Higher</td>
<td>41.2%</td>
<td>29.4%</td>
<td>25.6%</td>
</tr>
</tbody>
</table>

Figure 5-15
PEOPLE IN GROUP QUARTERS, HOUSEHOLDS, AND FAMILIES IN CHITTENDEN COUNTY, 2000
(Number of People / Percentage of Total Population = 146,571)

IN GROUP QUARTERS*
(7,431 / 5.1%)

INSTITUTIONALIZED* (920 / 0.6%)
NON-INSTITUTIONALIZED* (6,511 / 4.4%)

*Group Quarters include residences where Institutionalized people are under supervised care or custody (e.g., prisons) and where Non-Institutionalized people are not under supervised care or custody (e.g., dormitories).

IN HOUSEHOLDS (139,140 / 94.9%)

SINGLE PERSON HOUSEHOLDS
(14,715 / 10.0%)

NON-FAMILY HOUSEHOLDS
(29,681 / 20.3%)

Males (6,277 / 4.3%)
Females (8,438 / 5.8%)
ALL OTHER NON-FAMILY HOUSEHOLDS
(14,966 / 10.2%)

FAMILY HOUSEHOLDS
(109,459 / 74.7%)

HOUSEHOLDERS**
(35,439 / 24.2%)

Males (26,347 / 18.0%)
Females (9,092 / 6.2%)

SPOUSES OF HOUSEHOLDERS**
(29,147 / 19.9%)

CHILDREN
(39,331 / 26.8%)

OTHER RELATIVES
(3,017 / 2.1%)
NONRELATIVES
(2,525 / 1.7%)

**“Householder” is the head of a household designated by that household.

Forecasts

Background

Plans often make two kinds of statements about the future:

- **Predictions** – Descriptions of probable future conditions and
- **Guidance** – Descriptions of future courses of action or outcomes that we strive to achieve, often stated as recommended policies.

This Plan’s population predictions describe the future levels of population that are likely to occur, rather than the future levels of population that are likely to occur if we are successful in achieving the Plan's guiding policies.

Several factors make estimating the size of Chittenden County’s future population challenging.

- **It is Challenging to Make Reliable Predictions Concerning People** – People are able to act on the basis of individual preferences and capacities (especially in a free society that strives to expand their options and ability to exercise individual choice) and each person’s preferences and capacities change over time.

- **We Must Guess at the Relevance of Using Information about Current and Past Conditions to Describe Future Conditions** – Because the present and the past consist of actual experiences, information about actual experience may be used to describe current or past conditions. Because the future does not yet exist, we must hypothesize how the future will resemble past and present experiences. The current fast pace of social, economic, and technological change erodes the relevance of information about the past and present to describe the future. Social and economic globalization is expanding the sphere of actors and events that can alter our future.

- **It is Easier to Make Reliable Short-Range Predictions than Long-Range Ones** – Because people tend to repeat behavior from one day to the next, there is inertia to social experience so that the near-term future is more likely to resemble the present and recent past than is the long-term future.

- **It is Easier to Make General Predictions that are More Reliable over a Longer-Range about Large Communities, than to Make Equivalent Predictions for Smaller Communities** – Larger, more complex communities are less influenced by individual actors or events such as the success of a particular employer. Major change occurs in larger communities as the result of major events or the steady, cumulative effect of many minor events over the long term. In smaller communities, smaller events can trigger major change in the short term and the cumulative effects of minor events can more rapidly result in major change.

Analysts have used two general approaches to managing the uncertainty of predicting the future size of populations: projection methods and forecasting methods. Each of these methods is described separately in an appendix at the end of this chapter in order to provide a foundation for understanding the predictions of Chittenden County’s population that are made here.

Countywide Population Forecast

In recent years, four sets of predictions for the County's future population have been prepared:

- **EPR** – In 2000 and 2001, Economic and Policy Resources, Inc. (EPR), a Williston-based consulting firm, prepared population and employment forecasts for Chittenden County and subareas of the County for every five years from 2000 to 2035, using a two-stage process:
1. A regional input-output model (REMI Policy Insight) was used to forecast the future economy of the six-county Northwest Vermont region (including employment and population).

2. Two forms of regression were used to identify the most statistically reliable trend lines for the shares of the region’s employment and population in Chittenden County (i.e., Small Area Population Projection) and in subareas of Chittenden County (i.e., Ordinary Least Squares regression). These trend lines were then used to make projections of the County and subarea shares of the forecasted regional total over the same period.

The EPR forecasts were officially adopted by CCRPC in 2001 and have been used to prepare the 2025 Metropolitan Transportation Plan, the Long-Term Strategic Economic Development Plan, and (with some revision) the “2010 Housing Targets” that were endorsed by CCRPC.

- **Woods & Poole**[^5-6] – Woods & Poole, a consulting firm based in Washington, D.C., annually prepares updated race-, age-, and gender-specific population forecasts and economic forecasts (including employment) for all U.S. counties for every five-year period to 2030. Their process:
  1. Uses a model of the U.S. economy to prepare economic forecasts for each of 172 Economic Areas (EAs) defined by the U.S. Department of Commerce’s Bureau of Economic Analysis. The EA used for Chittenden County includes nine counties in northern Vermont and three counties in northeast New York.
  2. Predicts population and population characteristics for the EA and counties using a cohort component method that forecasts migration rates based on forecasted employment.

Woods & Poole report that the overall error of their 27,819 county-level 10-year forecasts made since 1984 averages 14.3 percent for employment and 9.7 percent for population.

- **Louis Berger**[^5-7] – VTrans retained the Louis Berger Group to prepare an Environmental Impact Statement (EIS) for the proposed segments A and B of the Circumferential Highway. To assess the likely impacts of the alternatives being considered, in 2006 Louis Berger prepared a set of population and employment forecasts for the County and subareas of the County. Berger employed a cohort-component model with refinements using U.S. Census Bureau estimates for recent population and net migration rates for certain age cohorts based on a Berger employment forecast.

- **MISER**[^5-8] – Vermont’s Department of Aging and Independent Living retained the Massachusetts Institute for Social and Economic Research (MISER), affiliated with the University of Massachusetts, to prepare population forecasts for Vermont’s counties from 2005 to 2020. Prepared in 2003, the MISER forecasts use a cohort component method, statewide average death and migration rates, and local fertility rates (statewide fertility rates were used for about one-third of the communities that tended to have small numbers of people).

These four sets of predictions of the County’s future population and employment are presented in Table 5-5. A comparison of these four sets of population predictions is facilitated by examining their corresponding rates of population change (see Table 5-6):

- EPR’s forecasted rates of population change are much higher than those of the other forecasts because of EPR’s much higher predicted rates of employment change (especially for 2000–2005). EPR’s forecasted rates of population change are closer to those the County had in the 1970s and 1980s than to those of the 1990s (see Table 5-1, which shows the County’s trend of a declining average rate of population growth in each successive decade since 1960.

- The Woods & Poole forecasted rate of 2000–2005 population change partly results from their use of a slightly higher 2000 population than the other forecasts. After 2005, they forecast a slight increase in the rate of population growth in each successive five-year period. This is despite their forecast of a steady decline in the rate of employment growth in each successive five-year period after 2005. Their forecasted rates of population change are lower than the County experienced from 1960 to 2000 (see Table 5-1).
Table 5-5
PREDICTED POPULATION & EMPLOYMENT GROWTH IN CHITTENDEN COUNTY

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPR</td>
<td>146,571</td>
<td>158,194</td>
<td>168,833</td>
<td>181,134</td>
<td>196,161</td>
<td>212,884</td>
<td>230,798</td>
<td>249,257</td>
<td></td>
</tr>
<tr>
<td>Woods &amp; Poole</td>
<td>146,972</td>
<td>151,550</td>
<td>158,145</td>
<td>165,161</td>
<td>172,484</td>
<td>180,183</td>
<td>189,627</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Louis Berger</td>
<td>146,571</td>
<td>150,239</td>
<td>156,530</td>
<td>163,168</td>
<td>171,114</td>
<td>180,037</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Miser</td>
<td>146,571</td>
<td>152,846</td>
<td>157,471</td>
<td>161,491</td>
<td>165,813</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPR</td>
<td>124,203</td>
<td>139,205</td>
<td>151,112</td>
<td>163,466</td>
<td>176,676</td>
<td>190,583</td>
<td>206,027</td>
<td>222,629</td>
<td></td>
</tr>
<tr>
<td>Woods &amp; Poole</td>
<td>119,559</td>
<td>125,691</td>
<td>133,672</td>
<td>141,658</td>
<td>149,640</td>
<td>157,621</td>
<td>165,594</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Louis Berger</td>
<td>124,203</td>
<td>129,791</td>
<td>137,465</td>
<td>145,116</td>
<td>153,809</td>
<td>163,000</td>
<td>172,718</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Miser</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

*The level for 2000 used by each forecast. aJune 2001 EPR report, Table 2. cSeptember 2000 EPR report, Table 5.


Table 5-6
PREDICTED AVERAGE ANNUAL RATES OF CHANGE (%)*
IN POPULATION & EMPLOYMENT IN CHITTENDEN COUNTY

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td></td>
<td>1.54%</td>
<td>1.31%</td>
<td>1.42%</td>
<td>1.61%</td>
<td>1.65%</td>
<td>1.63%</td>
<td>1.55%</td>
</tr>
<tr>
<td>EPR</td>
<td>0.62%</td>
<td>0.85%</td>
<td>0.87%</td>
<td>0.87%</td>
<td>0.88%</td>
<td>0.91%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Woods &amp; Poole</td>
<td>0.50%</td>
<td>0.82%</td>
<td>0.83%</td>
<td>0.96%</td>
<td>1.02%</td>
<td>1.04%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Louis Berger</td>
<td>0.84%</td>
<td>0.60%</td>
<td>0.51%</td>
<td>0.53%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Miser</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td>2.31%</td>
<td>1.66%</td>
<td>1.58%</td>
<td>1.56%</td>
<td>1.53%</td>
<td>1.57%</td>
<td>1.56%</td>
</tr>
<tr>
<td>EPR</td>
<td>1.01%</td>
<td>1.24%</td>
<td>1.17%</td>
<td>1.10%</td>
<td>1.05%</td>
<td>0.99%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Woods &amp; Poole</td>
<td>0.88%</td>
<td>1.16%</td>
<td>1.09%</td>
<td>1.17%</td>
<td>1.17%</td>
<td>1.17%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Louis Berger</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Miser</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* The Average Annual Rate of Change equals the annual rate of percentage change that must occur over all of the years in that 5-year period to achieve the change in the absolute value of the level of population or employment from the beginning year of the 5-year period to the end year of that 5-year period, as depicted in Table 5-5.

- The Berger population forecast for 2005 benefits from a U.S. Census Bureau estimate of the 2005 population. Following 2005, Berger forecasts a relatively stable rate of population change through 2015, then forecasts slightly increased rates in each subsequent five-year period.

- The rate of change associated with the Miser population forecasts decrease in each successive five-year period until 2015, then increase only slightly in 2015 to 2020. In general, its forecasted rates of population change are lower than those of the other forecasts and much lower than the rates the County experienced from 1960 to 2000.
EPR’s short-term population forecasts should be set aside because they are based on an employment forecast that did not envision the short-term downturns in the national economy (following September 11, 2001) and regional economy (following IBM’s layoffs after 2001). EPR’s long-term population forecasts also represent relatively high rates of population growth given the County’s 45-year trend of declining rates of population growth. Moreover, these population forecasts appear to be based on employment forecasts that, in hindsight, are too high.5-9

The variation among the Woods & Poole, Berger, and Miser population forecasts is always less than four percent of the Woods & Poole forecasts (see Table 5-7). That is, despite using different reasonable methods and assumptions, these three forecasts yield essentially the same population counts. Because these three forecasts did use methods and assumptions that are reasonable, it is reasonable to conclude that the County’s future population will approximate the levels they estimate. The average of these three forecasts yields a joint approximation (see Table 5-8). However, because all three forecasts used the cohort component method, they all are susceptible to underestimating the effect that migration has on the County’s population. Unlike many other parts of Vermont, migration in Chittenden County in recent decades has yielded net population increases.

### Table 5-7
**COMPARISON OF WOODS & POOLE, BERGER, AND MISER POPULATION FORECASTS FOR CHITTENDEN COUNTY**
(Percentages of the Woods & Poole Forecasts)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Woods &amp; Poole</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Louis Berger</td>
<td>99.7%</td>
<td>99.1%</td>
<td>99.0%</td>
<td>98.8%</td>
<td>99.2%</td>
<td>99.9%</td>
<td>100.6%</td>
</tr>
<tr>
<td>MISER</td>
<td>99.7%</td>
<td>100.1%</td>
<td>99.6%</td>
<td>97.8%</td>
<td>96.1%</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

### Table 5-8
**FORECASTED POPULATION OF CHITTENDEN COUNTY***

<table>
<thead>
<tr>
<th>Forecast Year</th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>151,500</td>
<td>157,400</td>
<td>163,000</td>
<td>170,000</td>
<td>180,000</td>
<td>190,000</td>
</tr>
</tbody>
</table>

* The forecasted population is the average of the Woods & Poole, Berger, and Miser forecasts (see Table 5-5) made for that forecast year, rounded to the nearest 100 in 2005 and 2010, the nearest 1,000 in 2015 and 2020, and the nearest 10,000 in 2025 and 2030.

The reliability of forecasts tends to diminish the further into the future they are made.5-10 The forecasts of the County’s future population in Table 5-8 use rounding to convey more realistically the diminishing precision associated with the diminishing reliability of forecasts. The maximum possible error resulting from rounding would be less than

- 0.05 percent for the 2005 and 2010 forecasts (which are rounded to the nearest 100),
- 0.5 percent for the 2015 and 2020 forecasts (which are rounded to the nearest 1,000), and
- Three percent for the 2025 and 2030 forecasts (which are rounded to the nearest 10,000).
Table 5-9 shows the average annual rates of population change associated with the forecasted populations for the County. The average annual rates of population growth

- From 2000 to 2020 are lower than those the County experienced from 1990 to 2000 (continuing the long-term trend of declining rates of growth) and
- From 2020 to 2030 are approximately the same as those the County experienced from 1990 to 2000.

Although these forecasted rates of population growth are lower than those forecasted by EPR in 2001, they continue to represent expanded need for jobs, housing, and public services.

Earlier drafts of the 2006 Regional Plan had proposed including population forecasts for the 19 municipalities in the County. Some municipalities expressed concerns that such forecasts might conflict with those in municipal plans. Regardless, the model to be used to prepare these forecasts could not be put in operation before the deadlines for approving the Regional Plan. CCRPC will be working with the Chittenden County Metropolitan Planning Organization in the summer and fall of 2006 to prepare municipal population and employment forecasts to be used to prepare the 2030 Metropolitan Transportation Plan.

Appendix – Population Projection and Forecasting Methods

Projection Methods

Projection methods predict the estimated levels of future population by creating a mathematical formula that describes the pattern of past population change and then applying the formula – “projecting it” – to describe the pattern of future population change. These methods assume that the factors that affect population levels in the future will have the same net effects as the factors that affected population change during the chosen past period. Analysts are most confident making this assumption when they believe that the future will closely resemble a past that has had a consistent pattern of change. The two key issues in the use of projection methods are (1) the choice of the period of past change and (2) the selection of the type of mathematical formula that best describes the pattern of change during the chosen past period.

In choosing the appropriate period of past change, analysts strive to choose the period for which they judge that population change most closely resembles the future period the projection addresses. This decision needs to be based on careful consideration of the expected future,
rather than on simplistic, mechanical rules. For example, it is a mistake to choose a period of past change

- Merely because it spans a duration of time equivalent to the span of the forecast or
- That includes major events that had a dramatic effect on population change and are unlikely to be repeated in the future (such as the opening or closing of a major employer).

The selection of a formula to describe the pattern of change over the chosen past period is based on the formula’s capacity to accurately represent the set of population counts over the chosen period. The formula may be graphically represented as a line that summarizes a set of points representing the population counts (see Figure 5-16). Because the formula line is intended to be only a summary of the entire set of population counts, the line need not intersect each point and population change during a part of the period may be different in character or magnitude from the overall trend portrayed by the line.

Figure 5-16 also illustrates how different mathematical formulas may be used to describe population growth, decline, or no change. Change may be either “linear” (occurring at a uniform rate) or “nonlinear” (occurring at a variable rate). A nonlinear formula can portray a rate of population change that becomes greater over time, becomes smaller over time, or shifts from increasing to increasing or vice versa.

The principal advantage of using projection methods is that we can use statistical theory to assess how well a mathematical formula describes the set of population counts. The more a “large” number of population counts follow the pattern described by a formula, the more confidence we can have that this formula correctly portrays the past trend. However, it is not always possible to use statistics properly to assess the reliability of a projection.5-11

Figure 5-16
EXAMPLES OF DIFFERENT TYPES OF POPULATION PROJECTION METHODS
The statistical reliability of a projection formula to describe past population counts is not the same as the likelihood that the predicted population counts will actually result (i.e., it does not state the “accuracy” or “reliability” of the prediction). The probability that future projections will hold true is determined not only by the formula but also by how well the future mirrors the chosen past period, a factor that cannot be assessed with certainty until we have actually experienced the future.

A major drawback of projection methods is that they do not give us much guidance for determining when they need to be revised. In the years after a projection is made, it may be suspected that population change differs from the projection trend. The projection typically is not helpful in resolving debate over whether the recent change represents an acceptable fluctuation within the trend or is evidence that the past trend no longer holds true. When one or more major events occurs after the projection is made, the projection typically is not helpful in resolving debate over whether these events warrant revising the projection. This is true even when these events are of a character or magnitude that was not experienced in the past period on which the projection is based.

The cohort component method is a special type of projection method that disaggregates change in total population into four components:

\[
\text{Births} - \text{Deaths} + \text{In-Migration} - \text{Out-Migration}
\]

or

\[
\text{“Natural Increase”} + \text{“Net Migration”}
\]

In its most elaborate form, this method develops a separate projection for each of these four components of population change for each age cohort (such as those shown in Figure 5-12). This method’s use of disaggregation isolates any error in projecting the rates to a particular component and cohort. However, it also entails making many more separate projections. As with all projection methods, the reliability of cohort component predictions ultimately depends on whether future population change follows past trends. Because birth rates and death rates typically are less volatile than migration rates, this method is especially well suited to predicting the populations of areas that experience little in-migration or out-migration.

**Forecasting Methods**

Forecasting methods predict the estimated levels of future population using (1) a mathematical formula that describes how one or more factors are related to the level of population and (2) estimates of the future levels of these factors. These methods assume that population in the future will continue to be affected by the formula’s factors in the ways postulated by the formula. Consequently, the key issues in the use of forecasting methods are the reliability of the formula and reliability of the estimates of the future levels of the chosen factors.

We are most confident in assuming the reliability of a forecasting formula when it describes a set of relationships that social science research has demonstrated to be very stable over time or to change in very predictable ways. Ideally, this research has demonstrated the statistical reliability of the relationship either over a broad range of areas or for areas that are very similar to the area of the forecast.

Forecasting formulas typically use factors that are either

- **Causes** – Factors that are thought to cause or influence population change and have been demonstrated through research to correlate with population change in consistent ways or
- **Indicators** – Factors that logically are associated with population size and have been demonstrated through research to vary with population change in consistent ways.
Unlike the formulas used in projections, forecasting formulas employ factors that explain why the population is predicted to reach the forecasted level. If we become skeptical about whether these relationships will continue to hold in the future, we are forewarned that the population forecast is less reliable. If we know that these relationships have changed (or that the predicted values of the formula’s factors have changed), we know how to modify the forecast to reflect this change.

Forecasting formulas may involve many factors that influence population change in complicated ways or may involve few factors that influence population in very direct ways. There are tradeoffs in attempting to gain greater predictive reliability by using more complex formulas:

- Complex formulas require more data and the necessary data may be required to have special qualities (such data may not exist for the area of the forecast).
- In many cases, the reliability of a formula is only as strong as its weakest link. Because a complex formula has more links, it may be more vulnerable to error. Depending on the formula’s structure, the lack of reliability in one of its components may even be compounded by other components.
- Complex formulas are not as likely to be intuitively understood by policy makers or the public, nor as easily explained to them. This diminishes the advantage that forecasting has over projection (namely, it helps us to understand why forecasted populations are predicted to result).

When assessing the reliability of predicted future levels of a factor used by a forecasting formula one should consider whether

- The entity that prepared the estimates has the requisite objectivity, capacities, and resources;
- The methodology used is explicit and sound;
- Past estimates have a track record of the reliability; and
- The estimate represents an official policy decision (i.e., either the estimate itself is official or a set of official policies establishes the future value).

Sometimes the predicted future levels of a factor used in a forecasting formula are prepared using a projection method. This blending of projection and forecasting methods is not inherently problematic, but it does underscore the need independently to assess the reliability of each part of the overall method used.

One type of forecasting method compares the population of the area of the forecast with the population of another (usually larger) area. This approach then uses a predicted population for the other (larger) area and the trend in the ratio of the populations of the two areas to calculate the predicted population of the area of the forecast. It is important to remember that in almost all cases, the population size of the larger area is merely an indicator – not a cause – of the population size of the area to be forecasted. This usually implies that the trend in the ratio is less reliable.

**Resources**

The following resources provide further information on the major topics of this chapter.


August 28, 2006

____. *County and City Databooks*.  http://fisher.lib.virginia.edu/collections/stats/ccdb/.
____. *Vermont Community Data Bank*.  http://crs.uvm.edu/databank/.

Notes

5-1 As described in the previous bullet point, because the historic urban-core communities were more built-out in 1960 than their suburban neighbors, the core communities had relatively low rates of housing growth from 1960 to 2000. The limited rate of growth in housing was offset by declining household size, which applied across the community’s entire supply of housing. Because the higher rate of housing-growth in the suburban communities more than offset declining household size, those communities experienced greater rates of population growth.

5-2 The U.S. Census Bureau employs a specific set of categories for describing the racial characteristics of the population. For the first time in 2000, the Census enabled people to describe themselves as belonging to more than one racial category. Because the Census Bureau regards Hispanic/Latino as a category of ethnicity (not race), a Hispanic/Latino person is included as being a member of one of the Census’ racial categories.

5-3 The Decennial U.S. Census compiled comprehensive demographic information for Chittenden County. The most recent Decennial Census compiles data for the year 2000. Although that may seem to be many years ago, most of the information from the 2000 Decennial Census was not reported until after the preparation of the 2001 Regional Plan. Consequently, the 2000 Census is the most recent reliable source for data on most demographic conditions in the County.

5-4 See footnote 5-2.

5-5 Economic and Policy Resources, Inc., *Economic and Demographic Forecast – Northwest Vermont and Chittenden County 2000 to 2035 and Beyond*, September 2000 and June 2001. The June 2001 report revised the population forecasts made in the September 2000 report based on the results of the 2000 Census (the revised 2000 base year population was reduced by less than one percent).

5-6 Woods & Poole Economics, Inc. Washington, D.C. Copyright 2005. Woods & Poole does not guarantee the accuracy of this data. The use of this data and the conclusions drawn from it are solely the responsibility of CCRPC.


5-9 For example, the economic forecasting model used by EPR may have relied on forecasts of large national growth in the semiconductor manufacturing industry that, while continuing to hold true as an average for all such producers in the nation, are less likely to be experienced by the County’s major semiconductor producer for reasons specific to the County firm not captured by EPR’s model.

5-10 For example, Woods & Poole report that the overall error of their 27,819 county-level 10-year population forecasts made since 1984 averages 9.7 percent.

5-11 For example, the most reliable source of population counts, the U.S. Census, is taken only once a decade. In most cases, a period of past population change that has been selected because it is judged to represent the likely future will not span many decades. To achieve the minimum number of data points required by statistics to assess the reliability of a formula, some analysts mistakenly concoct imaginary data for years between the Censuses by interpolating successive pairs of Census counts. However, this practice cheats the basic assumptions of the statistical theory.

5-12 In addition, if the source of the postprojection population levels is different from what was used to prepare the projection, the “new trend” may be due to differences in the ways the two sets of data were gathered, rather than reflecting a real change in the population.
Economic Development

Chittenden County is the heart of the Northwestern Vermont economic region. Whereas the County has roughly one-fourth of Vermont’s population, it has about one-third of the State’s jobs. This chapter provides background information, describes economic development initiatives, and recommends policies to promote the County’s economic well being.

Background

Defining “Economic Development”

The term “economic development” means different things to different people. This suggests considering exactly what the term means for the purposes of this Regional Plan.

The “economy” refers to the production, distribution, and consumption of goods and services. When we consider the economy, we focus on what, how, and why we do these activities. When we undertake an activity for economic gain – whether it is working at a job, lending money, investing in a business venture, or leasing property – we would like to be fairly compensated for that activity. So the economy is largely a way of looking at some of the activities that people do and the compensation – wages, profits, interest, and rents – provided for doing those activities.

“Development” means more than the quantitative growth of something; it also encompasses its qualitative improvement. It isn’t simply about “more,” it’s also about “better.” Assessing growth is relatively easy because the only challenge to assessing whether you have more of something is accurately counting it. Assessing development is more challenging because it is likely that people bring different values to bear on the question of whether a change represents improvement.

Putting these ideas together, “economic development” is a term we use to consider how we can improve the system of rewards provided to people when they undertake activities for economic gain. These improvements can address immediate concerns such as workplace conditions or more far-reaching concerns such as the use and development of land. The potential benefits and costs of undertaking and neglecting economic development are depicted by the “Circle of Prosperity” (see Figure 6-1).

![Figure 6-1: The Circle of Prosperity](image)
Existing Conditions and Employment Forecast

Economists classify the components and features of an economy to better understand its special needs and issues. One fundamental approach is to assess how many establishments and employees make “goods” (tangible things) and how many produce “services” (intangibles).

Goods-producing employers in the County represent about one-sixth of all employers and employ about one-fourth of all employees. The goods-producing economic sector in the County with the greatest number of employees is manufacturing, which has almost one-fifth of the County’s employment (see Table 6-1).

Over the past 50 years, Chittenden County has mirrored the national economy’s transition in becoming a “post-industrial” service economy: About five-sixths of the County’s employers and three-fourths of its jobs are in Service sectors. Among the County’s Service sectors, retail trade has the greatest employment (see Table 6-1). This transition has not been painless: From 1998 to 2003 alone, the County had a net loss of over 400 manufacturing jobs. While some of the service-producing jobs that have been created earn high wages (such as physicians or software engineers), the 1st-quarter 2003 per-employee payroll for workers in all service sectors in Chittenden County was about 45 percent lower than for manufacturing workers overall.

Another way of analyzing the economy is to identify which goods and services produced in the County are “exported” outside the County and which are consumed locally. Any enterprise can, in effect, export the goods or services it produces. For example, IBM exports the microchips it manufactures worldwide, Home Depot sells some of its goods to non-County residents, and UVM educates students from outside Vermont who pay tuition.

Exported goods and services are important to the health of the County’s economy because they “import” into the County the dollars that were used to purchase them. These imported dollars increase County income, going to local residents, business owners, and property owners as wages, profits, and rents. When regional income increases, people have more money to spend locally. When exported goods or services decline, regional income decreases and people have less money to spend locally.

When people spend money to purchase goods and services locally (rather than using it to import goods or services from outside the County), they keep that money circulating in the regional economy. Locally produced goods and services often address fundamental needs of residents and employers. For example, households typically buy food locally and pay taxes for local public schools to educate their children, while employers buy some materials from local providers and pay taxes for police and fire-protection services.

Figure 6-2 illustrates the importance of these components of the County economy. The imported dollars used to purchase exported goods or services raise total County income. When people and employers spend County income for locally produced goods and services, they keep those dollars in the County economy. The “multiplier effect” describes how many times (on average) each dollar that comes into the County economy is used to purchase locally produced goods or services before it leaves the County economy to purchase imported goods or services. The more we produce goods and services that are exported outside the County and the more we retain County income by consuming locally produced goods and services, the more dollars we have available to generate the benefits depicted in the Circle of Prosperity (see Figure 6-1).

Over 70 percent of non-farm employers in Chittenden County are very small employers (with fewer than 10 employees) and almost 95 percent are small employers (with fewer than 50 employees) (see Table 6-2). Although there are relatively few medium employers (with 50-500
Table 6-1
EMPLOYMENT AND ESTABLISHMENTS IN MAJOR ECONOMIC SECTORSa
IN CHITTENDEN COUNTY AND UNITED STATES, 2004

<table>
<thead>
<tr>
<th>Economic Sectorb</th>
<th>Chittenden County</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Establishments</td>
<td>Employees</td>
</tr>
<tr>
<td></td>
<td>(1,000s)</td>
<td>%</td>
</tr>
<tr>
<td>Totald</td>
<td>5.461</td>
<td>100.0</td>
</tr>
<tr>
<td>Goods Producing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>0.809</td>
<td>14.8</td>
</tr>
<tr>
<td>Construction</td>
<td>0.218</td>
<td>4.0</td>
</tr>
<tr>
<td>Forestry, Fishing, Hunting, &amp; Agricultural Support</td>
<td>0.011</td>
<td>0.2</td>
</tr>
<tr>
<td>Mining</td>
<td>0.004</td>
<td>0.1</td>
</tr>
<tr>
<td>Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retail trade</td>
<td>4.629</td>
<td>84.8</td>
</tr>
<tr>
<td>Health Care &amp; Social Assistance</td>
<td>0.894</td>
<td>16.4</td>
</tr>
<tr>
<td>Accommodation &amp; Food Services</td>
<td>0.520</td>
<td>9.5</td>
</tr>
<tr>
<td>Professional, Scientific &amp; Technical Services</td>
<td>0.682</td>
<td>12.5</td>
</tr>
<tr>
<td>Finance &amp; Insurance</td>
<td>0.332</td>
<td>6.1</td>
</tr>
<tr>
<td>Wholesale trade Information</td>
<td>0.291</td>
<td>5.3</td>
</tr>
<tr>
<td>Educational Services</td>
<td>0.155</td>
<td>2.8</td>
</tr>
<tr>
<td>Other Services (Not Public Administration)</td>
<td>0.084</td>
<td>1.5</td>
</tr>
<tr>
<td>Administration, Support, Waste Management, &amp; Remediation Services</td>
<td>0.492</td>
<td>9.0</td>
</tr>
<tr>
<td>Transportation &amp; Warehousing</td>
<td>0.249</td>
<td>4.6</td>
</tr>
<tr>
<td>Arts, Entertainment &amp; Recreation</td>
<td>0.118</td>
<td>2.2</td>
</tr>
<tr>
<td>Management of Companies &amp; Enterprises</td>
<td>0.119</td>
<td>2.2</td>
</tr>
<tr>
<td>Real Estate, Rental &amp; Leasing</td>
<td>0.034</td>
<td>0.6</td>
</tr>
<tr>
<td>Utilities</td>
<td>0.244</td>
<td>4.5</td>
</tr>
<tr>
<td>Management of Companies &amp; Enterprises</td>
<td>0.005</td>
<td>0.1</td>
</tr>
</tbody>
</table>

a Non-farm establishments and employment; Individual sectors within the “goods producing” and “services” categories are listed in order of the amount of Chittenden County employment.
b Each sector whose percentage of total employment for Chittenden County exceeds the percentage of total employment for the U.S. is highlighted in yellow.
c Percent of “Total” (including “unclassified establishments”).
d Includes “unclassified establishments.”
e Size category reported (not actual count), so midpoint of range is used to calculate “goods producing” and “services” totals and percentages.

Figure 6-2
THE MULTIPLIER EFFECT

Exporting Goods & Services
Brings $$$ into the County

Local Consumption of
Locally Produced Goods & Services
Keeps $$$ in the County

Importing Goods & Services
Sends $$$ Out of the County

Table 6-2
ESTABLISHMENTS BY SIZE
IN CHITTENDEN COUNTY AND UNITED STATES, 2004

<table>
<thead>
<tr>
<th>Number of Employees in Establishment</th>
<th>Chittenden County</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (1,000s)</td>
<td>Percenta</td>
</tr>
<tr>
<td>1-4</td>
<td>2.813</td>
<td>51.5%</td>
</tr>
<tr>
<td>5-9</td>
<td>1.068</td>
<td>19.6%</td>
</tr>
<tr>
<td>10-19</td>
<td>0.814</td>
<td>14.9%</td>
</tr>
<tr>
<td>20-49</td>
<td>0.491</td>
<td>9.0%</td>
</tr>
<tr>
<td>50-99</td>
<td>0.151</td>
<td>2.8%</td>
</tr>
<tr>
<td>100-249</td>
<td>0.095</td>
<td>1.7%</td>
</tr>
<tr>
<td>250-499</td>
<td>0.019</td>
<td>0.3%</td>
</tr>
<tr>
<td>500-999</td>
<td>0.007</td>
<td>0.1%</td>
</tr>
<tr>
<td>1,000+</td>
<td>0.003</td>
<td>0.1%</td>
</tr>
<tr>
<td>Total</td>
<td>5.461</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

a Percent of column total.


employees) and large employers (with 250 or more employees), they represent large shares of total employment. The County’s five largest employers (IBM, Fletcher Allen Health Care, the University of Vermont, Chittenden Corporation, and IDX) combine to employ about 15,200 people (almost one-fifth of the County’s total employment). Map 6-1 depicts the locations of the County’s largest employers (those with 250 or more employees) and areas in the County with large concentrations of employees (250 or more). Most of these centers of employment are in a Metropolitan, Enterprise, or Village Planning Area.
In 2003-2004, private-sector and public-sector organizations interested in the County’s economic future prepared a *Long-Term Strategic Economic Development Plan*. The Strategic Economic Development Plan used a forecast of 2015 employment broken down by economic sector that had been prepared for CCRPC as part of the *2001 Regional Plan*. Although this forecast was prepared prior to the slowdowns of the national and regional economies that began in 2001, it represents the most recent effort to identify the County’s future employment. A key feature of this forecast is that the already large services sector is projected to grow at a higher rate from 2000 to 2015 than the County’s economy as a whole (51.5 percent versus 36.1 percent) and represent about half of the jobs added in this period (see Table 6-3).

### Table 6-3

**2015 Employment Projections by Major Economic Sector**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>Total Nonfarm Employment</td>
<td>119,829</td>
<td>163,061</td>
<td>43,232</td>
</tr>
<tr>
<td></td>
<td>36.1%</td>
<td>36.1%</td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>42,282</td>
<td>64,058</td>
<td>21,776</td>
</tr>
<tr>
<td></td>
<td>51.5%</td>
<td>36.1%</td>
<td>15.4%</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>19,194</td>
<td>24,775</td>
<td>5,581</td>
</tr>
<tr>
<td></td>
<td>29.1%</td>
<td>24.6%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>17,520</td>
<td>22,145</td>
<td>4,625</td>
</tr>
<tr>
<td></td>
<td>26.4%</td>
<td>24.6%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Government</td>
<td>14,535</td>
<td>15,644</td>
<td>1,109</td>
</tr>
<tr>
<td></td>
<td>7.6%</td>
<td>7.6%</td>
<td>0</td>
</tr>
<tr>
<td>Mining / Construction</td>
<td>7,483</td>
<td>12,109</td>
<td>4,626</td>
</tr>
<tr>
<td></td>
<td>61.8%</td>
<td>24.6%</td>
<td>37.2%</td>
</tr>
<tr>
<td>Finance, Insurance, Real Estate</td>
<td>8,074</td>
<td>10,379</td>
<td>2,305</td>
</tr>
<tr>
<td></td>
<td>28.5%</td>
<td>24.6%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Transportation &amp; Public Utilities</td>
<td>5,035</td>
<td>6,352</td>
<td>1,317</td>
</tr>
<tr>
<td></td>
<td>26.2%</td>
<td>24.6%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>4,518</td>
<td>5,880</td>
<td>1,362</td>
</tr>
<tr>
<td></td>
<td>30.1%</td>
<td>24.6%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Agricultural Services, Forestry &amp; Fishing</td>
<td>1,188</td>
<td>1,719</td>
<td>531</td>
</tr>
<tr>
<td></td>
<td>44.7%</td>
<td>24.6%</td>
<td>20.1%</td>
</tr>
</tbody>
</table>

* Sectors are listed in order of forecasted 2015 employment. The major economic sectors in this table are based on the Standard Industrial Classification Code (SIC). The United States government now reports economic information by sector based on the North American Industrial Classification System (NAICS). NAICS was used in Table 6-1.

**Source:** *Long-Term Strategic Economic Development Plan – Greater Chittenden County Region, June 2004, Page 25 (citing Economic & Policy Resources, Inc., Economic and Demographic Forecast, 2001).*

## Developing the County’s Economy

In each of Vermont’s 11 regions, the State looks to three regional partner organizations that are based in that region to coordinate economic development planning. In Chittenden County, the following organizations perform these roles:

- **Regional Planning Commission (RPC)** – The Chittenden County Regional Planning Commission (CCRPC; see pages 1.6-1.8 for additional details).
- **Regional Development Corporation (RDC)** – Established in 1954 as a nonprofit RDC, GBIC’s mission is to attract, retain, and expand environmentally sensitive high-paying jobs in the Champlain Valley and to initiate and support advocacy, education, and collaborative programs in promoting its vision.
- **Regional Marketing Organization (RMO)** – The Lake Champlain Regional Chamber of Commerce (LCRCC). LCRCC’s mission is to promote and support the healthy environment that makes the Lake Champlain region and Vermont ideal places to live, work and do business. More than 4,000 business men and women participate in the Chamber’s programs and over 80 percent of its membership represents businesses with fewer than 30 employees.

In 2003-2004, CCRPC, GBIC, and LCRCC worked with municipalities and other interested parties to prepare the *Long-Term Strategic Economic Development Plan* discussed in the previous
section. One of the major tasks accomplished by that plan was to identify “key industries” in the County’s economy (see Figure 6-3). These key industries

- Are basic industries (those that tend to “export” their goods and services),
- Pay overall higher wages to employees, and
- Have experienced employment and wage growth.

Identifying these Key Industries highlights how the regional economy is transforming and gives a focus to policies and programs designed to develop the regional economy.6-4

Based on interviews with employers in these Key Industries (and other employers), the Strategic Economic Development Plan also identified the following “Key Attributes of Successful Regional Employers” that help to focus economic development policy making:

- Produce “dollar-importing” high-value goods and/or services.
- Achieve superior levels of labor productivity through specialized applications and/or knowledge.
- Maintain a continuous program of improvement in their productive capacity and efficiency through capital investment (e.g., they invest and reinvest to renew themselves).
- Maximize the region’s intellectual capital resources through collaboration that combines the strengths of industry, higher education, government, and civic organizations.
- Are attracted to the region’s natural resource endowments to gain competitive advantage.

The Strategic Economic Development Plan also prepared a list of factors and conditions that represent economic development assets and challenges (see Figure 6-4). These guide decision makers in how best to allocate limited resources enhance and publicize the County’s strengths and to address its weaknesses.

Feedback on drafts of this 2006 Regional Plan suggested that future analyses of the County’s economic development assets and challenges also should assess the County’s proximity to Canada,6-5 the importance of diversifying the economy to offset the vulnerability of the relatively small number of major employers,6-6 the impact of high housing costs and the limited supply of affordable housing,6-7 and the value of taking advantage of Vermont’s image when marketing products and services.6-8 The remainder of this section discusses other specific issues important to the County’s future economic vitality.

**Adequate Supplies of Land for Future Employers**

The Land Use chapter discussed CCRPC’s 2003 Regional Build-Out Analysis (see pages 3.5 – 3.6). That study found that if the County were entirely built-out according to 2002 municipal zoning and certain physical constraints on development, it would have about 157 million additional square feet of commercial building area (about 390 percent more than in 2002). This analysis suggests that there is an adequate supply of land for future employers. However, if the County were built-out in this way, much of the resulting commercial development would lie outside of the County’s urban and village areas.

In actuality, there is a limited supply of undeveloped land within existing or proposed sewer service areas in those Planning Areas appropriate for most employers: only about 691 acres in Enterprise Planning Areas, 2,879 acres in Metropolitan Planning Areas, and 480 acres in Village Planning Areas. Consequently, local land-use decisions affecting how this one percent of the total land area of the County is used will have major impacts on the County’s future economic development.
### KEY INDUSTRIES AND ILLUSTRATIVE EMPLOYERS*
IDENTIFIED IN THE LONG-TERM STRATEGIC ECONOMIC DEVELOPMENT PLAN

<table>
<thead>
<tr>
<th>1. High Value-Added Professional, Scientific &amp; Technical Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Financial Services</strong>: Dwight Asset Management, Inc., KPMG, Gallagher Flynn Captive Insurance: AIG, Marsh, Aon</td>
</tr>
<tr>
<td>2. Specialized Medical Treatment Services</td>
</tr>
<tr>
<td>Fletcher Allen Health Care Associated satellite providers (Doctors’ offices, non-campus treatment centers, etc.)</td>
</tr>
<tr>
<td>3. Niche Consumer Goods Manufacturing</td>
</tr>
<tr>
<td>Toys: VT Teddy Bear, Fat Cat Inc., Earth Toy</td>
</tr>
<tr>
<td>Recreation Equipment: Rossignol, Burton Snowboards</td>
</tr>
<tr>
<td>Printing: Lane Press, Offset House, Villanti &amp; Sons Printers</td>
</tr>
<tr>
<td>4. Connector and Insulated Wire Manufacturing</td>
</tr>
<tr>
<td>Huber &amp; Suhner, Champlain Cable</td>
</tr>
<tr>
<td>5. Instrumentation for Homeland Security/Defense Manufacturing</td>
</tr>
<tr>
<td><strong>Medical</strong>: Bio-Tek, Yankee Medical</td>
</tr>
<tr>
<td><strong>Specialty</strong>: NRG Systems</td>
</tr>
<tr>
<td><strong>Homeland Security-Defense</strong>: General Dynamics, Ascension Technologies, Triosyn, Polhemus</td>
</tr>
<tr>
<td>6. Specialty Plastics Manufacturing</td>
</tr>
<tr>
<td>Engineered Monofilaments, AstenJohnson, Shelburne Plastics</td>
</tr>
<tr>
<td>7. Specialty Commercial/Industrial Machinery Manufacturing</td>
</tr>
<tr>
<td>KBA North America, Hazelett, Blodgett, Husky</td>
</tr>
<tr>
<td>8. Engineered Electronics &amp; Electronic Components Manufacturing</td>
</tr>
<tr>
<td>IBM, Microstrain</td>
</tr>
<tr>
<td>9. Specialty Metal Fabricated Products Manufacturing</td>
</tr>
<tr>
<td>New England Air Systems, Tri-Angle Metal Fabrications, Preci-Manufacturing</td>
</tr>
<tr>
<td>10. Educational Services</td>
</tr>
<tr>
<td>UVM, St. Michael’s College, Champlain College, New England Culinary Institute</td>
</tr>
<tr>
<td>11. Primary Medical-Biotechnology and Other Research</td>
</tr>
<tr>
<td>UVM Medical School, Small technology companies &amp; proprietorships</td>
</tr>
<tr>
<td>12. Travel &amp; Tourism/Creative Arts</td>
</tr>
<tr>
<td>Shelburne Museum, Shelburne Farms, Lake Champlain Maritime Museum, Lake Champlain Transportation, ECHO, Bolton Valley Resort, Champlain Valley Exposition, Fleming Museum, Firehouse Center for the Visual Arts, Regional Hotels, Motels, the Vermont City Marathon, Flynn Theater</td>
</tr>
</tbody>
</table>

*Listed Employers are examples for each Key Industry (the list is not intended to be comprehensive).  

**SOURCE:** Long-Term Strategic Economic Development Plan – Greater Chittenden County Region, June 2004, Pages 16-17.
### CHITTENDEN COUNTY’S ECONOMIC DEVELOPMENT STRENGTHS AND WEAKNESSES IDENTIFIED IN THE LONG-TERM STRATEGIC ECONOMIC DEVELOPMENT PLAN

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>An available workforce with a solid work ethic.</td>
<td>Limited work force availability in higher skilled occupations.</td>
</tr>
<tr>
<td>Access to good quality K-12 educational resources</td>
<td>Lack of space in current tech programs.</td>
</tr>
<tr>
<td>&amp; high quality higher education resources.</td>
<td>Difficulty for the regional work force in moving from lower tech, blue-collar occupations to jobs with higher skills requirements.</td>
</tr>
<tr>
<td>Generally available &amp; affordable telecommunications.</td>
<td>Significant parts of the work force lack basic communication &amp; interpersonal skills in some key sectors of the regional economy.</td>
</tr>
<tr>
<td>Generally good environmental quality &amp; good access to recreational resources.</td>
<td>The region has a limited supply of equity &amp; venture capital resources—almost nonexistent for some types of early-stage equity capital—and particularly for technology.</td>
</tr>
<tr>
<td>Generally available &amp; for the most part affordably priced industrial &amp; commercial space-sites—particularly in the near-term horizon with some exceptions.</td>
<td>A perceived, &amp; in most cases, a real problem with predictability, &amp; ease of obtaining state approvals/permits &amp; local approval/permits. Although much of this is beyond the immediate scope &amp; influence of the region, the region needs to work cooperatively with municipalities within the Chittenden County region &amp; with state agencies to address these concerns.</td>
</tr>
<tr>
<td>Good access to quality health care.</td>
<td>Although perhaps the deepest in the state when compared to other regions in Vermont, the region has relatively limited resources for technology related companies dependent upon higher educational resources relative to other states.</td>
</tr>
<tr>
<td>An overall excellent quality of life.</td>
<td>The region lacks a large inventory of potentially developable commercial-industrial sites that could be used to meet the region’s long-term commercial and industrial development needs.</td>
</tr>
<tr>
<td>Generally good access to major market area.</td>
<td>The region has high relative electrical energy costs for regional businesses—and particularly for manufacturers who are competing in a global market place.</td>
</tr>
<tr>
<td>Good access to debt capital sources that are competitively priced.</td>
<td>Parts of the region have limited wastewater treatment discharge capacity into the Winooski River—without moving to a higher level of treatment technology with its attendant higher costs.</td>
</tr>
<tr>
<td>Pockets of willing &amp; active local governments pursuing economic development.</td>
<td></td>
</tr>
<tr>
<td>The region has a strong travel &amp; tourism asset base &amp; a vibrant creative arts community that make distinctive, positive contributions to quality of life.</td>
<td></td>
</tr>
<tr>
<td>The region has always had a “welcoming attitude towards foreign nationals &amp; those visiting for extended periods, offering opportunities for augmentation of the regional work force &amp; as a source of potential regional entrepreneurs.</td>
<td></td>
</tr>
</tbody>
</table>

**SOURCE:** *Long-Term Strategic Economic Development Plan – Greater Chittenden County Region, June 2004, Pages 11-12.*
Farming and Forestry

Farming and forestry contribute to the County’s employment, income, and cultural legacy. Effective agricultural preservation depends on addressing the land use of farming (see pages 3.6 – 3.9), the natural resources important to farming (see pages 4.1 – 4.10 and 4.12 – 4.13), and the business of farming (the focus of this section).

From 1982 to 2002, farm enterprises in Chittenden County experienced
- A six-percent decline in total number and declines in the Individual Family and Partnership types of farm enterprises (see Table 6-4),
- A 33-percent decline in total land area in farms (from 114,372 to 76,679 acres),
- A 22-percent decline in the number of farm operators who described farming as their principal business and a 14-percent increase in those who described themselves as being part-time,
- An increase of only $9,600 in the average value of agricultural products per farm, and
- Declines 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 (see Table 6-5).

In addition, the value of “other farm related income” (farm income from products made on the farm such as cheese or for services provided on the farm such as farm equipment repair)

<table>
<thead>
<tr>
<th>Table 6-4</th>
<th>TYPES OF FARM ENTERPRISES IN CHITTENDEN COUNTY, 1982 AND 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Farm Enterprise</strong></td>
<td><strong>1982</strong></td>
</tr>
<tr>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>Individual Family</td>
<td>433</td>
</tr>
<tr>
<td>Partnership</td>
<td>51</td>
</tr>
<tr>
<td>Family-Held Corporation</td>
<td>13</td>
</tr>
<tr>
<td>Non-Family Corporation</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>505</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Table 6-5</th>
<th>VALUE OF FARM PRODUCTS ($1,000) IN CHITTENDEN COUNTY, 1982 AND 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Farm Products</strong></td>
<td><strong>1982</strong></td>
</tr>
<tr>
<td></td>
<td>$1,000</td>
</tr>
<tr>
<td>Dairy</td>
<td>$19,709</td>
</tr>
<tr>
<td>Cattle &amp; Calves</td>
<td>$2,644</td>
</tr>
<tr>
<td>Hay, Silage, Field Seeds</td>
<td>$732</td>
</tr>
<tr>
<td>Fruits, Nuts, Berries</td>
<td>$147</td>
</tr>
<tr>
<td>Vegetables, SW, Corn, Melons</td>
<td>$363</td>
</tr>
<tr>
<td>Nursery &amp; Greenhouse Crops</td>
<td>$404</td>
</tr>
<tr>
<td>All Other</td>
<td>$1,159</td>
</tr>
<tr>
<td>Total</td>
<td>$25,158</td>
</tr>
</tbody>
</table>

increased from $438,000 in 1987 to $1,573,000 in 2002. Direct sales to consumers increased from 2.1 percent of the total value of farm products in 1992 to 4.3 percent in 2002.

Farm production expenses depend on how much production and which types of production occur in the County. From 1987 to 2002, average farm production expenses in the County increased 26 percent (not adjusted for inflation), compared with 32 percent for Vermont. Subtracting production expenses from the market value of products sold yields the net cash return on sales. The net cash return on sales per acre for farms in Chittenden County increased from $30.19 in 1987 to $89.12 in 2002 (compared with Vermont’s increase from $59.25 to $81.68).

From 1982 to 2002, total farm payroll (the cost of both hired farm laborers and contract farm labor) in the County increased by 123 percent (from $2,307,000 to $5,155,000). The average property taxes per acre for farms in the County increased 153 percent from 1987 to 2002 (from $10.17 to $25.72).

In summary, 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.

The federal and State governments have established numerous programs to promote farm businesses (such as targeted income-tax and property-tax policies, management and technical assistance programs, and regulations on the marketing of farm products). Municipal decision makers can promote the success of farm businesses in the County primarily by considering the impacts of land-use policies and decisions on the business of farming (see pages 3.6 – 3.9).

Although forestry is a relatively small part of Chittenden County’s economy, it supports other economic activity in the County (see Table 6-6) and plays a vital part in the State’s economy.6-9

Table 6-6
FORESTRY AND THE FOREST-RELATED ECONOMY, CHITTENDEN COUNTY, 2003

<table>
<thead>
<tr>
<th></th>
<th>Establishments</th>
<th>Employees</th>
<th>Annual Payroll ($1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forestry and Logging</td>
<td>4</td>
<td>11</td>
<td>$582</td>
</tr>
<tr>
<td>Wood Products Manufacturing</td>
<td>11</td>
<td>103</td>
<td>$3,821</td>
</tr>
</tbody>
</table>


Tourism and Visitation

The Vermont Department of Tourism and Marketing (VDTM) estimated that travel and tourism contributed $1.462 billion to the State’s economy and $182 million in government revenues in 2003. Shopping, lodging, and food/beverages each garnered about one-fourth of tourist spending. Tourism supported more than 7,700 proprietors, 20,000 direct jobs, and 8,700 indirect jobs in the tourism industry statewide.6-10

VDTM surveyed tourists in the State in 2003, asking them to identify their principal reason for visiting Vermont. Sightseeing, shopping, and winter sports/outdoor recreation each motivated about 30 percent of the visits, while history and the arts generated about 10 percent.6-11 Chittenden County’s natural, commercial, recreational, historic, and cultural assets support all of these tourist objectives. The Burlington International Airport serves as an important gateway for travelers and the County has the State’s greatest concentration of accommodations and dining businesses.6-12
In 2002, the municipalities in Chittenden County along Lake Champlain (Charlotte, Shelburne, South Burlington, Burlington, Winooski, Colchester and Milton) and the municipality where the Amtrak rail station is located (Essex Junction) formed the Chittenden County Corridor of the Lake Champlain Byway to improve visitor awareness of this area’s special assets. Through a Federal National Scenic Byways grant, CCRPC is helping this group to

- Develop and install 32 interpretive exhibit panels and several trailblazer road signs,
- Design and produce a brochure and map highlighting the cultural, environmental, historical, and recreational resources of the Corridor, and
- Develop a Lake Champlain Byway website in partnership with other Vermont and New York counties along Lake Champlain.

The Lake Champlain Regional Chamber of Commerce (LCRCC) is the designated Regional Marketing Organization (RMO) for Chittenden County. One of LCRCC’s RMO responsibilities is to promote tourism and visitation in the County. The Long-Term Strategic Economic Development Plan identified Travel & Tourism/Creative Arts as one of the County’s 12 Key Industries (see Figure 6-3) and as one of the major strengths of the County’s economy (see Figure 6-4).

**Other Parts of the County’s Economic Foundation**

The Long-Term Strategic Economic Development Plan (LTSEDP) and Comprehensive Economic Development Strategy (CEDS) also propose strategies and actions to promote

- **Higher Education** – The LTSEDP and CEDS identify institutions providing higher education services as a specific Key Industry, as contributing to the success of other Key Industries (such as UVM’s Center for Emerging Technologies and the UVM Medical School’s involvement in the Key Industry of Primary Medical-Biotechnology), and as providing key workforce training opportunities. The 2003 County Business Patterns reports that six higher ed institutions in the County employed over 1,400 people with an annual payroll in excess of $26 million.

- **Health Care** – The LTSEDP and CEDS also identify institutions in the County that provide health-care services both as a Key Industry and an asset that contributes to the success of other economic sectors. The success of health-care providers in containing the growth of health-care costs for the workers of other enterprises in the County is important to the regional economy’s competitiveness. The 2003 County Business Patterns reports that 515 health-care establishments in the County employed over 11,800 people with an annual payroll exceeding $383 million.

- **Telecommunications** – For most businesses, availability of wireless telecommunications and high-speed Internet service is essential. Successful production of information-based goods and services and the ability of employers to communicate with affiliates, suppliers, and customers increasingly depend on connecting businesses in our region to the high-speed global telecommunications network.

- **The Creative Economy** – Museums, performing arts, visual arts, and design businesses improve the quality of life of residents, promote tourism and visitation, and in some cases perform specialized services that contribute to the success of other employers.

- **Major Employers** – Employers that employ a relatively large number of workers and pay relatively high wages serve as cornerstones of the regional economy.

- **Burlington International Airport** – The success of the airport and other providers of key transportation services (such as the ferries on Lake Champlain) is critically important to sustaining the linkages between our region’s economy and the global economy.
Regulatory Issues

The LTSED and CEDS propose strategies and actions to address concerns related to the impacts of federal, State, and local regulations on business and land development. It is often challenging to decide whether a government regulation should be revised on the grounds that the benefits it provides do not justify the hardships it imposes. This is because

- A regulation often has direct and indirect benefits and burdens;
- Benefits and burdens often are difficult to measure and compare;
- People who are affected by regulations may vary in their need for benefits and their capacity to endure burdens; and
- Some or all of the relevant facts and values may change over time.

Brownfields

A brownfield is a site that is believed (correctly or incorrectly) to contain pollution that limits reuse of the site. The pollution that is believed to exist may have been created long ago. A program to address brownfields identifies whether a site is polluted, the nature and extent of the pollution, and the measures (and their costs) needed to remove the pollution, reduce its effects, or protect against its impacts.

In 1997, the City of Burlington initiated efforts to assess and ameliorate brownfield properties in the City so that they might be dedicated to productive reuse. The U.S. Environmental Protection Agency has twice designated the Burlington brownfields program as a National Showcase Community finalist.

CCRPC has been awarded a federal grant to initiate an assessment program that would work with property owners on the voluntary identification of properties in Chittenden County that may be contaminated by petroleum products.

Economic Development Policies

1. The comparative job growth and wage growth rate of change in the County should exceed the State average.
2. The rate of job growth in the County’s Key Industries (see Figure 6-1) should exceed their respective national rates of growth, while maintaining their relative wage rate standings.
3. The County should have a coordinated workforce education and training program for technical occupations.
4. The County should implement and update the U. S. Economic Development Administration-approved Comprehensive Economic Development Strategy (CEDS).
5. The Regional Partner organizations should develop close working relationships with their counterparts to further job retention/creation in Northwest Vermont.
6. The County’s supply of affordable housing should be increased to prevent housing costs from slowing the growth of the regional economy.

(Continued)
7. A higher proportion of the State resources that are raised in the County should be invested to improve the County’s economic competitiveness.

8. The County’s economy should be diversified, so that there is not over-reliance on a particular economic sector or employer.

9. The State, in conjunction with GBIC/LCRCC, CCRPC, and member municipalities, should encourage most employers to locate in the Metropolitan, Transition, Enterprise, and Village Planning Areas and should encourage large employers to locate in the Metropolitan, Transition, and Enterprise Planning Areas.

10. The State, GBIC/LCRCC, CCRPC, and member municipalities should work cooperatively to ensure there is universal broadband telecommunications access in Chittenden County.

11. The State, in conjunction with GBIC/LCRCC, CCRPC, and member municipalities, should encourage employers that support agricultural enterprises to locate in Village Planning Areas if they are compatible with the character of a Vermont village or to locate in the Rural Planning Area if they are compatible with the character of Vermont’s rural landscape.

12. The State and municipalities should support infrastructure investment to foster economic development in areas planned for development.

13. The special needs for capital, employment training, management assistance and technical assistance of the County’s small employers should be adequately provided for.

14. The County’s legacy of natural resources and enviable quality of life should be maintained and these economic development assets should be touted in materials to promote travel and tourism to the County.

Resources

The following resources provide further information on the major topics of this chapter.

Creative Economy


Economic Development


GBIC. www.vermont.org_gbic.

Farming and Forestry
UVM Extension. www.uvm.edu/extension.

Tourism and Visitation
Vermont Department of Tourism and Marketing. www.vermontpartners.org/.
www.vermontvacation.com/.

Notes
6-1 The “Circle of Prosperity” was introduced to Vermont in 1997 by the Vermont Business Roundtable and has been refined in the Long-Term Strategic Economic Development Plan and the Comprehensive Economic Development Strategy.
6-3 The Plan is posted on www.crrpvcvt.org.
6-4 Other economic sectors are important to the County economy for other reasons. For example, agriculture provides multiple benefits that supplement the Plan’s criteria for key sectors.
6-5 The 2004 Long-Term Strategic Economic Development Plan does discuss the general importance of boosting international trade on page 34 and building and sustaining partnerships between the County’s economic development partners and similar organizations in southern Quebec on page 71.
6-6 The Chittenden County Comprehensive Economic Development Strategy (CEDS) states on page 25, “the county should be very concerned about the fact that the regional economy remains concentrated in too few sectors and in too few employers within those sectors” and includes specific projects under strategy B2 (on pages 65–67): “Promote strategic business expansion and recruitment to diversify the regional job base.”
6-8 See, for example, the O’Neal Strategy Group, “The Vermont Brand” (2003 Report to the Vermont Marketing and Promotion Team) posted at www.uvm.edu/~snrvtdc/publications/branding.pdf; and Vermont Department of Tourism and Marketing, “How to Use the Vermont Brand,” www.vermontpartners.org/htm/research_vtbrand.asp.
6-9 See www.uvm.edu/extension/publications/nrem/nrs1.htm.


6-12 In 2003 Chittenden County had over 50 businesses that employed almost 1,400 workers in providing accommodations for travelers (hotels, motels, bed-and-breakfasts, RV parks and campgrounds) and almost 350 food-service and drinking places that employed over 5,700 workers. U.S. Dept. of Commerce, *2003 County Business Patterns*. Chittenden County.

6-13 The *Long-Term Strategic Economic Development Plan* prepared a 61-page program of Strategies, Actions, and Tasks to build the Region’s economic competitiveness. The LTSEDP’s recommendations differ in scope and character from the 2006 Regional Plan’s policies. However, the LTSEDP also recommends that six outcome-oriented measures be used to gauge progress associated with successful implementation. The first five of those measures are reworded and included as the first five General Policies that follow.
Housing is important because it

- Answers the basic human need for shelter of people and their personal property,
- Helps to define the character of neighborhoods and communities,
- Is the largest expense borne by most households, and
- For most homeowners, constitutes a large portion of household wealth.

Residential location is important because it

- Influences a household’s access to a particular mix of employment, commercial, social, recreational, and other opportunities,
- Defines a household’s eligibility for local government services (especially education),
- Helps to define people’s sense of community, and
- Affects the types and levels of impacts on our environment.

This chapter of the Regional Plan first examines the current conditions affecting the demand for and supply of housing, identifies 2010 housing targets, discusses several specific housing issues, and recommends housing policies for Chittenden County.

Existing Conditions

Chittenden County has almost one-fourth of Vermont’s population and households and one-fifth of Vermont’s elderly residents and people with a disability (see Table 7-1). More than half of the County’s households are family households and over one-fourth are single-person households.

The County also contains a large share of Vermont’s housing supply (see Table 7-2). In 2000, more than one-fifth of Vermont’s year-round housing units and over one-fourth of its occupied, year-round rental units were in Chittenden County. The vacancy rate of the County’s year-round housing was less than two percent, less than half the vacancy rate of the State as a whole. Owner-occupied housing represents two-thirds of Chittenden County’s occupied housing units and renter-occupied housing represents one-third.

Detached single-unit housing makes up over half of Chittenden County’s housing (see Table 7-3 and Table 7-4). Except for mobile homes, the County has greater shares of other housing types than does Vermont as a whole. Most of the County’s existing housing is located in the Metropolitan and Transition Planning Areas (see Table 7-5). The County’s housing stock also tends to be newer than that of the State as a whole (see Table 7-6).

<table>
<thead>
<tr>
<th>Table 7-1</th>
<th>POPULATION &amp; HOUSEHOLDS, 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chittenden County</td>
</tr>
<tr>
<td>Population</td>
<td>146,571</td>
</tr>
<tr>
<td>Persons 65+ Years Old</td>
<td>13,780</td>
</tr>
<tr>
<td>Noninstitutionalized Persons with a Disability</td>
<td>18,331</td>
</tr>
<tr>
<td>Households</td>
<td>56,452</td>
</tr>
<tr>
<td>Family Households</td>
<td>35,168</td>
</tr>
<tr>
<td>Single-Person Households</td>
<td>14,732</td>
</tr>
</tbody>
</table>

Table 7-2
HOUSING SUPPLY, 2000

<table>
<thead>
<tr>
<th>Housing Supply, 2000</th>
<th>Chittenden County</th>
<th>Vermont</th>
<th>Chittenden County as a % of Vermont</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year-Round Housing Units*</td>
<td>57,573</td>
<td>251,322</td>
<td>22.9 %</td>
</tr>
<tr>
<td>Occupied Units</td>
<td>56,452</td>
<td>240,634</td>
<td>23.5 %</td>
</tr>
<tr>
<td>Owner-Occupied Units</td>
<td>37,292</td>
<td>169,784</td>
<td>22.0 %</td>
</tr>
<tr>
<td>Renter-Occupied Units</td>
<td>19,160</td>
<td>70,850</td>
<td>27.0 %</td>
</tr>
<tr>
<td>Vacancy Rate**</td>
<td>1.9%</td>
<td>4.3%</td>
<td></td>
</tr>
</tbody>
</table>

* Does not include seasonal, recreational or occasional use units (Chittenden County = 1,291; VT = 43,060).
** Vacancy Rate = (Year Round – Occupied) / Year Round X 100

Table 7-3
HOUSING TYPES, 2000*

<table>
<thead>
<tr>
<th>Housing Type (Units in Structure)</th>
<th>Chittenden County</th>
<th>Vermont</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Unit Detached</td>
<td>32,847</td>
<td>193,229</td>
<td>65.6%</td>
</tr>
<tr>
<td>Single Unit Attached</td>
<td>4,005</td>
<td>10,080</td>
<td>3.4%</td>
</tr>
<tr>
<td>Mobile Home</td>
<td>2,644</td>
<td>22,631</td>
<td>7.7%</td>
</tr>
<tr>
<td>2 Units</td>
<td>4,968</td>
<td>21,180</td>
<td>7.2%</td>
</tr>
<tr>
<td>3-4 Units</td>
<td>5,242</td>
<td>18,775</td>
<td>6.4%</td>
</tr>
<tr>
<td>5-9 Units</td>
<td>4,663</td>
<td>15,155</td>
<td>5.1%</td>
</tr>
<tr>
<td>10-19 Units</td>
<td>1,506</td>
<td>4,553</td>
<td>1.5%</td>
</tr>
<tr>
<td>20+ Units</td>
<td>2,980</td>
<td>8,105</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

* Includes seasonal, recreational or occasional use units (Chittenden County = 1,291; VT = 43,060).

Table 7-4
HOUSING TYPES BY MUNICIPALITY, 2000
(Number of Dwelling Units in Structure)

<table>
<thead>
<tr>
<th>Area</th>
<th>1 Dwelling Unit*</th>
<th>2-4 Dwelling Units</th>
<th>5+ Dwelling Units</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%***</td>
<td>Number</td>
<td>%***</td>
</tr>
<tr>
<td>Bolton</td>
<td>336</td>
<td>91.3%</td>
<td>18</td>
<td>4.9%</td>
</tr>
<tr>
<td>Buel's Gore</td>
<td>6</td>
<td>100.0%</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Burlington</td>
<td>6,264</td>
<td>39.4%</td>
<td>5,085</td>
<td>32.0%</td>
</tr>
<tr>
<td>Charlotte</td>
<td>1,194</td>
<td>93.4%</td>
<td>84</td>
<td>6.6%</td>
</tr>
<tr>
<td>Colchester</td>
<td>4,580</td>
<td>74.5%</td>
<td>925</td>
<td>15.1%</td>
</tr>
<tr>
<td>Essex Town**</td>
<td>5,237</td>
<td>74.7%</td>
<td>857</td>
<td>12.2%</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>1,432</td>
<td>89.6%</td>
<td>119</td>
<td>7.4%</td>
</tr>
<tr>
<td>Huntington</td>
<td>660</td>
<td>95.1%</td>
<td>29</td>
<td>4.2%</td>
</tr>
<tr>
<td>Jericho</td>
<td>1,625</td>
<td>92.8%</td>
<td>95</td>
<td>5.4%</td>
</tr>
<tr>
<td>Milton</td>
<td>3,081</td>
<td>92.2%</td>
<td>218</td>
<td>6.5%</td>
</tr>
<tr>
<td>Richmond</td>
<td>1,257</td>
<td>83.6%</td>
<td>163</td>
<td>10.8%</td>
</tr>
<tr>
<td>St. George</td>
<td>259</td>
<td>99.2%</td>
<td>2</td>
<td>0.8%</td>
</tr>
<tr>
<td>Shelburne</td>
<td>2,191</td>
<td>83.2%</td>
<td>219</td>
<td>8.3%</td>
</tr>
<tr>
<td>South Burlington</td>
<td>4,282</td>
<td>67.6%</td>
<td>613</td>
<td>9.7%</td>
</tr>
<tr>
<td>Underhill</td>
<td>1,002</td>
<td>95.0%</td>
<td>46</td>
<td>4.4%</td>
</tr>
<tr>
<td>Westford</td>
<td>686</td>
<td>94.6%</td>
<td>36</td>
<td>5.0%</td>
</tr>
<tr>
<td>Williston</td>
<td>2,500</td>
<td>85.6%</td>
<td>262</td>
<td>9.0%</td>
</tr>
<tr>
<td>Winooski</td>
<td>1,016</td>
<td>34.5%</td>
<td>1,160</td>
<td>39.4%</td>
</tr>
<tr>
<td>County Total</td>
<td>37,608</td>
<td>66.6%</td>
<td>9,931</td>
<td>17.6%</td>
</tr>
</tbody>
</table>

* Includes attached, detached, mobile homes, RVs, & boats.
** Includes Essex Junction.
***% = Percent of Municipal total (Except the percents in the County Total row are percent of the County total).
Table 7-5
HOUSING INVENTORY IN PLANNING AREAS, 2004

<table>
<thead>
<tr>
<th>Planning Area</th>
<th>Single Family</th>
<th>All Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>% of Total</td>
</tr>
<tr>
<td></td>
<td>Housing Units in Planning Area</td>
<td>% of Total Housing Units</td>
</tr>
<tr>
<td>Metropolitan</td>
<td>10,642</td>
<td>31.9%</td>
</tr>
<tr>
<td>Transition</td>
<td>9,499</td>
<td>70.9%</td>
</tr>
<tr>
<td>Enterprise</td>
<td>114</td>
<td>92.7%</td>
</tr>
<tr>
<td>Village</td>
<td>3,822</td>
<td>75.4%</td>
</tr>
<tr>
<td>Rural</td>
<td>12,256</td>
<td>91.1%</td>
</tr>
<tr>
<td>Total</td>
<td>36,333</td>
<td>55.5%</td>
</tr>
</tbody>
</table>


Table 7-6
AGE OF HOUSING STOCK, 2000*

<table>
<thead>
<tr>
<th>Year Structure Built</th>
<th>Chittenden County</th>
<th>Vermont</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>1999 to March 2000</td>
<td>1,252</td>
<td>2.1%</td>
</tr>
<tr>
<td>1995 to 1998</td>
<td>3,340</td>
<td>5.7%</td>
</tr>
<tr>
<td>1990 to 1994</td>
<td>4,866</td>
<td>8.3%</td>
</tr>
<tr>
<td>1980 to 1989</td>
<td>10,706</td>
<td>18.2%</td>
</tr>
<tr>
<td>1970 to 1979</td>
<td>11,032</td>
<td>18.7%</td>
</tr>
<tr>
<td>1960 to 1969</td>
<td>7,128</td>
<td>12.1%</td>
</tr>
<tr>
<td>1940 to 1959</td>
<td>8,185</td>
<td>13.9%</td>
</tr>
<tr>
<td>1939 or Earlier</td>
<td>12,355</td>
<td>21.0%</td>
</tr>
</tbody>
</table>

* Includes seasonal, recreational or occasional use units (Chittenden County = 1,291; VT = 43,060).

Chittenden County’s share of the State’s housing supply is increasing. From 1990 to 2000, the County’s total housing units increased at a higher rate than Vermont, representing over one-fourth of the State’s total housing growth (see Table 7-7). The number of occupied units increased more than the number of total units, evidence of a tightening housing market.

Despite the growth in housing supply, Chittenden County experienced even greater growth in the factors affecting the demand for housing (see Table 7-8):

- Almost one-third of Vermont’s 1990-2000 population growth and over one-fourth of the State’s growth in households occurred in Chittenden County.
- Employment growth in the County represented more than 40 percent of the State’s growth. Chittenden County’s function as an employment center dramatically affects the County’s housing market. In 2000, there were 85 jobs in the County for every 100 residents. This is extraordinarily high when compared with the 1999 U.S. average of only 41 jobs for every 100 residents. The 2000 Census reported that fully 21 percent of the County’s workforce resided outside of the County, while only seven percent of its residents worked outside of the County.
- The County’s growth in per capita income was over one-fifth larger than the State’s growth; and
- The aging of the County’s population (see Tables 5-7 and 5-8) increases the demand for senior housing. In the future, greater numbers of seniors from Vermont and elsewhere may move to the County because of its medical and social services and low crime.
Table 7-7
1990-2000 GROWTH IN HOUSING SUPPLY

<table>
<thead>
<tr>
<th></th>
<th>Chittenden County</th>
<th>Vermont</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>Total Housing Units</td>
<td>6,769</td>
<td>13.0%</td>
</tr>
<tr>
<td>Occupied Housing Units</td>
<td>8,013</td>
<td>14.2%</td>
</tr>
</tbody>
</table>

SOURCE: U.S. Bureau of the Census, Census 2000, Table DP-1; Census 1990, Report CH 1-47, Table 1.

Table 7-8
1990-2000 GROWTH IN FACTORS AFFECTING HOUSING DEMAND

<table>
<thead>
<tr>
<th></th>
<th>Chittenden County</th>
<th>Vermont</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>Population</td>
<td>14,810</td>
<td>11.2%</td>
</tr>
<tr>
<td>Households</td>
<td>7,977</td>
<td>16.5%</td>
</tr>
<tr>
<td>Employment*</td>
<td>10,295</td>
<td>14.8%</td>
</tr>
<tr>
<td>Per Capita Income*</td>
<td>$7,899</td>
<td>37.6%</td>
</tr>
</tbody>
</table>

SOURCE: U.S. Bureau of the Census, Census 2000, Table DP-1; Census 1990, Report CP 1-47, Table 1; County and City Data Book: 2000, Table B.

The gap between the supply and demand for housing in Chittenden County translates into limited housing choices and rapidly increasing housing costs. Owner-occupied housing costs are increasingly higher in Chittenden County than in Vermont as a whole (see Table 7-9) and rental housing costs are higher in the County than in many nearby counties (see Table 7-10).

Income growth for the County’s households has not kept pace with these higher housing costs.\(^7\)\(^4\) In the 1990s, increased numbers of the County’s households (both homeowners and renters) devoted more than 30 percent of their household income to housing (see Table 7-11).\(^7\)\(^2\)

The County’s housing shortage does not affect all households equally. Households lacking high incomes can afford only a limited portion of the region’s housing supply and hence have fewer housing choices in terms of location, type, size, and quality. Households that need housing with special characteristics or features (such as large households and those with seniors, people with disabilities, renters, first-time homebuyers, and single-persons) have greater difficulty in finding suitable housing. Many households are forced to seek housing in other counties, resulting in longer commutes and increased growth and housing costs in rural areas.

The housing shortage generates immediate and long-term threats to our quality of life:

- **Less Disposable Income** – High housing costs reduce a household’s ability to buy other goods and services;
- **Threat to Prosperity** – High housing costs discourage existing employers from expanding and new employers from locating here;
- **Reduced Time for Family and Friends** – The longer workday resulting from extended commutes erodes our free time; and
- **Impaired Environmental Quality** – The shortage of housing convenient to job centers necessitates the building of housing in rural locations. Such housing (1) requires longer commutes (increasing congestion and degrading air quality) and (2) promotes a pattern of growth counter to this Plan’s land-use policies.\(^7\)\(^3\)
Table 7-9
1998-2004 MEDIAN HOME PRICES*

<table>
<thead>
<tr>
<th>Year</th>
<th>Chittenden County</th>
<th>Vermont</th>
<th>Chittenden County as a % of Vermont</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>$215,000</td>
<td>$160,000</td>
<td>134.4 %</td>
</tr>
<tr>
<td>2001</td>
<td>$161,460</td>
<td>$129,000</td>
<td>125.2 %</td>
</tr>
<tr>
<td>2000</td>
<td>$145,000</td>
<td>$117,000</td>
<td>123.9 %</td>
</tr>
<tr>
<td>1999</td>
<td>$132,000</td>
<td>$110,000</td>
<td>120.0 %</td>
</tr>
<tr>
<td>1998</td>
<td>$129,000</td>
<td>$109,900</td>
<td>117.4 %</td>
</tr>
</tbody>
</table>

* Sales prices are based on VHFA analysis of 2001 Property Transfer Tax Data of primary residences including single-family homes, condominiums, and mobile homes with land. Transfers under $10,000 were deleted based on a random sample of contacts with town clerks indicating that transfers were primarily not arm’s length transactions. Transfers also were not included if the sale price was less than 60% of the list value, indicating that the transaction was not arm’s length or that the property was in need of considerable rehabilitation.


Table 7-10
MEDIAN RENTAL HOUSING COSTS, 2005*

<table>
<thead>
<tr>
<th>Rental Unit Size</th>
<th>Chittenden, Franklin, &amp; Grand Isle Counties</th>
<th>Addison County</th>
<th>Lamoille County</th>
<th>Washington County</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bedroom</td>
<td>$670</td>
<td>$599</td>
<td>$569</td>
<td>$544</td>
</tr>
<tr>
<td>2 Bedroom</td>
<td>$848</td>
<td>$711</td>
<td>$678</td>
<td>$710</td>
</tr>
<tr>
<td>3 Bedroom</td>
<td>$1,111</td>
<td>$943</td>
<td>$928</td>
<td>$955</td>
</tr>
<tr>
<td>4 Bedroom</td>
<td>$1,337</td>
<td>$1,249</td>
<td>$1,189</td>
<td>$1,025</td>
</tr>
</tbody>
</table>

* Median Rental Housing Prices are based on HUD’s 2005 median rents.

SOURCE: VHFA, Fact Sheets for Chittenden County, Franklin County, Grand Isle County, Addison County, Lamoille County, & Washington County 2005.

Table 7-11
HOUSING COST BURDEN, 1989 & 1999*

<table>
<thead>
<tr>
<th></th>
<th>Chittenden County</th>
<th>Vermont</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>Owners Who Pay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.0 to 34.9% of Income</td>
<td>1989</td>
<td>7.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.0+% of Income</td>
<td>1989</td>
<td>7.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renters Who Pay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.0 to 34.9% of Income</td>
<td>1989</td>
<td>8.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.0+% of Income</td>
<td>1989</td>
<td>8.8%</td>
</tr>
</tbody>
</table>

*Selected monthly housing ownership costs (or gross rent) as a percentage of household income.

SOURCE: U.S. Bureau of the Census, Census 2000 Table DP-4; Census 1990 C9OSTF3A.
In 2002, the Chittenden County Housing Task Force (a panel of housing experts and local business and government leaders convened by CCRPC) concluded that we need to reduce the County’s housing shortage by building more housing.7-4 The Task Force identified three major factors that contribute to the County’s shortfalls in housing production, which repeatedly had been identified in previous studies of housing in Chittenden County, Northwest Vermont, and Vermont:

- For more housing to be built and built more affordably, land-use regulations need to permit a wide range of housing types and increased housing densities.
- Housing requires suitable infrastructure (e.g., roads/transit, sanitary sewers/septic systems, water supply systems/wells, storm water facilities, and utilities).
- Local and State permitting decisions need to be timely and fair.

Drawing from Vermont-based housing studies, the Task Force identified initiatives that may be undertaken by State, regional, and local governments to promote housing production (see Table 7-12). Housing developers also may take actions to increase the supply of housing and to curb housing costs:

- Improve coordination with municipalities especially before submitting applications;
- Increase the use of development options that take advantage of design flexibility and density bonuses in local regulations (such as clustering and planned unit development);
- Construct smaller dwelling units at greater densities;
- Construct more multifamily dwellings; and
- Create more mixed-income developments by collaborating with affordable housing partners to access subsidies and integrate affordable housing into market-rate developments.

The State authorizes CCRPC to plan for anticipated growth in the County so that development occurs in locations that are suited to best preserve and utilize Vermont’s resources. CCRPC’s planning for the County is advisory: The Commission is not authorized to enact land-use regulations nor does it allocate funds for the construction of key infrastructure. The State authorizes the County’s 19 municipalities to manage development through regulation and infrastructure investments. However, no single municipality acting alone can successfully address the County’s housing shortages. To succeed, CCRPC and the County’s 19 communities will need to partner with one other (as well as with the State, the private sector, and housing organizations) to coordinate our response to this common problem.

**Housing Needs Forecast**

The need for housing units is determined by the demands of households. In recent years, the number of households in the County has been growing at a higher rate than its population (see Table 7-8). The average size of households also has decreased (see Figure 5-4), effectively requiring more housing units to house the same number of people.

People form different sizes and types of households at different stages in their lives. In the future, even if the County contained the same total number of people, those people would likely form different numbers of different types of households from those that exist now. These households would demand different amounts of different types of housing units.
### Table 7-12
**INITIATIVES TO PROMOTE GREATER HOUSING PRODUCTION IDENTIFIED BY THE 2002 CHITTENDEN COUNTY HOUSING TASK FORCE**

<table>
<thead>
<tr>
<th>Issue Addressed</th>
<th>INITIATIVES IMPLEMENTED PRIMARILY</th>
<th>By the State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Permit Process</td>
<td>Workforce Housing Coalition / Housing Endorsement Criteria Development Review Boards</td>
<td>Unified Local/Regional/State Reviews Legislative Reform of Chapter 117**</td>
</tr>
<tr>
<td></td>
<td>Fast-Track Review</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fee Waivers</td>
<td></td>
</tr>
<tr>
<td>Local Zoning</td>
<td>Local Rezoning to Permit Affordable Housing Types, Increased Densities, &amp; Compact Settlement Patterns Use Impact Fees Instead of Development Timing Regulations Stronger Regional Plan Policies</td>
<td>Legislative Reform of Chapter 117**</td>
</tr>
<tr>
<td>Act 250 Process</td>
<td>Use Regional Planning Commission’s Act 250 Party Status to Support Worthy Projects Workforce Housing Coalition/ Housing Endorsement Criteria</td>
<td>Legislative Reform of Act 250**</td>
</tr>
<tr>
<td>Housing Supply Distribution</td>
<td>Regional Workforce Housing Allocation Higher Ed Institutions Provide More On-Campus Housing for Students</td>
<td>Live-Near-Work Subsidies</td>
</tr>
<tr>
<td>Infrastructure Costs</td>
<td>Use Regional Planning Commission as an Info Clearinghouse on Alternative Septic Technologies Use Impact Fees Instead of Excessive Design Requirements</td>
<td>Legislative Reform to Provide for Minimum &amp; Maximum Infrastructure Design Standards Downtown Program Reforms**</td>
</tr>
</tbody>
</table>

* Most of these actions can be tailored to address these issues as they specifically relate to the provision of affordable housing to low- and moderate-income households, the disabled, the elderly, or other segments of the housing market.

** In 2004, the Legislature enacted comprehensive revisions of Chapter 117 and revised certain procedures and appeals processes of Act 250. The Legislature made further revisions to Act 250 as part of the Growth Centers Bill (Senate Bill 142) in 2006.


A household’s demand for housing is influenced by a host of factors:

- **Access to Jobs** – Most households strive to live within a reasonable commuting range of the workplaces of the household’s workers. Consequently, the region’s employment locations and transportation facilities and services influence the regional housing market. The U.S. Census reported that in 2000, 19,856 people who worked in Chittenden County resided outside of the County (21 percent of the County’s workforce) and 5,572 people who resided in the County worked outside of it (seven percent of the County’s labor force).

- **Access to commercial and institutional uses, social networks, and community services (principally schools).**

- **The supply of different housing types** (the options available and their costs, including factors affecting new home construction such as the characteristics and cost of developable land).

Each household evaluates these factors based on the personal preferences of its members. The commuting data reported above indicate that roughly 20,000 people who work in Chittenden County reside outside of the County. While some of these households may prefer this arrangement, many households may feel their choice was dictated by the County’s high housing costs.
Vermont's laws authorizing municipalities and regional planning commissions to undertake planning promote regional collaboration in addressing housing needs:

- All municipal plans must contain a housing element that includes a recommended program for addressing certain housing needs as identified by the regional planning commission. [24 VSA 4382 (a) (10) & 4382 (c)]
- All regional plans must contain a housing element that identifies the need for housing for all economic groups in the region and in the region’s communities. Regional planning commissions also are to give “due consideration” to municipal planning studies when identifying housing needs. [24 VSA 4348a]

To avoid having each municipality and CCRPC work at cross purposes to meet these statutory obligations, in 2003 CCRPC asked each of the County’s 19 municipalities to designate a representative to a Housing Targets Task Force. CCRPC charged this Task Force with developing principled, realistic, and fair approaches to identify future housing needs for the County and each of the 19 municipalities in the County. The Task Force met almost monthly from May 2003 to October 2004 before issuing its recommendations, which CCRPC endorsed in November 2004.

As part of fulfilling its charge, the Housing Targets Task Force estimated the Countywide housing need in 2010. To do this, the Task Force first carefully considered two studies prepared by Economic & Policy Resources, Inc. (EPR) in 2000 and 2001. Both of EPR's 2010 housing need forecasts are based on ambitious employment-growth forecasts (26,900 more jobs in 2010 than in 2000). The Task Force concluded that changes in the regional economy since 2000 (for example, the national economic slowdown and local IBM layoffs) suggest the need to reconsider EPR's employment forecasts (especially when applying EPR's long-range forecasts to a near-term forecast year such as 2010). The Task Force concluded that the employment growth rate generated from an analysis performed by Dr. Michael Munson (formerly Town Planner in Williston) is more credible than the rate used by EPR in 2000, before growth in the local and national economies slowed.

Consequently, the Task Force decided to discount EPR's average forecasted 2010 housing need by the difference between EPR's forecasted employment growth rate and the Munson model's employment growth rate. This yielded a forecasted Countywide housing need of 9,983 more housing units in 2010 than in 2000. The Task Force concluded that this Countywide target of about 10,000 more housing units in 2010 than in 2000 (about 17.7 percent more housing versus EPR's forecast of about 23.7 percent more housing) is reasonable, especially compared with recent 10-year increases in total housing units in Northwest Vermont and Chittenden County.

The Task Force then decided that each municipality should have three housing targets:

1. **Total Housing** – Includes the number of housing units in targets #2 and #3,
2. **Moderate Income Housing** – Housing units that may be afforded by households earning 80 percent to 120 percent of the Burlington MSA’s median household income, and
3. **Affordable Housing** – Housing units that may be afforded by households earning less than 80 percent of the Burlington MSA’s median household income.

Each target is the suggested increase in a community’s housing units from 2000 to 2010. These housing units are expected to be permanent housing (not temporary shelter) occupied year-round (not seasonally) by residents (not by people who have short-term needs for shelter such as motels or who are required to be housed in special facilities such as jails).
To ensure that the municipal targets for total housing are principled, the Housing Targets Task Force used an eight-factor formula to allocate a portion of the Countywide 2010 target for total housing to each community.\(^7\)\(^-\)\(^11\) To ensure that the municipal targets for total housing are reasonable and fair, the Task Force established a rule that no community’s target for total housing should exceed 125 percent of that community’s 10-year average housing growth from 1980 to 2000.\(^7\)\(^-\)\(^12\) The Task Force also established that the targets for moderate income housing and affordable housing would each be 10 percent of the municipality’s target for total housing.

Table 7-13 identifies the recommended housing targets for each of the County’s 19 municipalities.\(^7\)\(^-\)\(^13\) These targets are NOT QUOTAS that require a community to meet a minimum number of housing units. These targets are NOT CELILINGS that prohibit a community from exceeding a number of units. Each municipality’s housing targets ARE GOALS to be used as starting points to guide the community’s consideration of housing needs when it develops the State-mandated housing section of its municipal plan. In that section, the municipality identifies

1. Whether or not the community expects to achieve each of its 2010 housing targets;
2. For each housing target that is not expected to be achieved, the factors that likely cause this; and
3. A program of local actions designed to address each of the identified housing factors that the community agrees should be addressed and that the community is capable of addressing.

![Table 7-13](attachment:Table713.jpg)

Table 7-13
RECOMMENDED MUNICIPAL 2000-2010 HOUSING TARGETS

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Total Housing (Includes Moderate &amp; Affordable Housing)</th>
<th>Moderate Income Housing (= 10% of Total Housing)</th>
<th>Affordable Housing (= 10% of Total Housing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolton</td>
<td>28</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Buel’s Gore</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Burlington</td>
<td>1,560</td>
<td>156</td>
<td>156</td>
</tr>
<tr>
<td>Charlotte</td>
<td>195</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Colchester</td>
<td>1,277</td>
<td>128</td>
<td>128</td>
</tr>
<tr>
<td>Essex</td>
<td>666</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>Essex Jct.</td>
<td>504</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>299</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Huntington</td>
<td>199</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Jericho</td>
<td>308</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>Milton</td>
<td>633</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>Richmond</td>
<td>280</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>St. George</td>
<td>18</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Shelburne</td>
<td>531</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>South Burlington</td>
<td>1,444</td>
<td>144</td>
<td>144</td>
</tr>
<tr>
<td>Underhill</td>
<td>205</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Westford</td>
<td>178</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Williston</td>
<td>1,093</td>
<td>109</td>
<td>109</td>
</tr>
<tr>
<td>Winooski</td>
<td>144</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9,563</strong></td>
<td><strong>956</strong></td>
<td><strong>956</strong></td>
</tr>
</tbody>
</table>

Special Housing Concerns

Affordable Housing

By definition, half of the County’s households earn the median household income or less. They consist of families, workers, consumers, taxpayers, and voters who contribute to the County’s well being and who deserve decent and affordable housing. Households with lower incomes are more likely to devote greater portions of their income to housing. Chittenden County’s households that have lower household income are more likely to have housing cost burden (i.e., to devote more than 30 percent of household income to housing; see Table 7-11).

Because households with lower incomes are less likely to be able to afford to own a home,7-14 the supply of affordable rental housing is particularly important. About one-third of the County’s year-round housing is rental housing, a five-percent greater share than in Vermont as a whole (see Table 7-2). The County’s householders who rent are far more likely to have housing cost burden than the householders who own their homes. In 1999, one-third of renter households paid 35 percent or more of their household income for housing, while only one-seventh of homeowner households did so (see Table 7-11. In addition, households cannot always find rental housing that meets their needs (for example, families with more than two children cannot always find units with an adequate number of bedrooms).

Mobile homes can be an affordable type of housing. Mobile homes represent almost five percent of the County’s year-round housing. However, the percentage of each municipality’s total housing represented by mobile homes ranges from less than one percent to almost 50 percent (see Table 7-14).

Table 7-14
MOBILE HOMES BY MUNICIPALITY, 2000

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Mobile Homes</th>
<th>Number</th>
<th>Percent*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolton</td>
<td>68</td>
<td>16.5%</td>
<td></td>
</tr>
<tr>
<td>Buel’s Gore</td>
<td>1</td>
<td>16.7%</td>
<td></td>
</tr>
<tr>
<td>Burlington</td>
<td>125</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td>Charlotte</td>
<td>28</td>
<td>1.9%</td>
<td></td>
</tr>
<tr>
<td>Colchester</td>
<td>595</td>
<td>8.8%</td>
<td></td>
</tr>
<tr>
<td>Essex Junction</td>
<td>30</td>
<td>0.9%</td>
<td></td>
</tr>
<tr>
<td>Essex Town</td>
<td>67</td>
<td>0.9%</td>
<td></td>
</tr>
<tr>
<td>Hinesburg</td>
<td>241</td>
<td>14.2%</td>
<td></td>
</tr>
<tr>
<td>Huntington</td>
<td>121</td>
<td>16.2%</td>
<td></td>
</tr>
<tr>
<td>Jericho</td>
<td>54</td>
<td>3.0%</td>
<td></td>
</tr>
<tr>
<td>Milton</td>
<td>529</td>
<td>15.1%</td>
<td></td>
</tr>
<tr>
<td>Richmond</td>
<td>180</td>
<td>11.8%</td>
<td></td>
</tr>
<tr>
<td>St. George</td>
<td>133</td>
<td>48.7%</td>
<td></td>
</tr>
<tr>
<td>Shelburne</td>
<td>134</td>
<td>4.9%</td>
<td></td>
</tr>
<tr>
<td>South Burlington</td>
<td>30</td>
<td>0.5%</td>
<td></td>
</tr>
<tr>
<td>Underhill</td>
<td>25</td>
<td>2.3%</td>
<td></td>
</tr>
<tr>
<td>Westford</td>
<td>96</td>
<td>12.8%</td>
<td></td>
</tr>
<tr>
<td>Williston</td>
<td>203</td>
<td>6.7%</td>
<td></td>
</tr>
<tr>
<td>Winooski</td>
<td>15</td>
<td>0.5%</td>
<td></td>
</tr>
<tr>
<td>County Total</td>
<td>2,644</td>
<td>4.5%</td>
<td></td>
</tr>
</tbody>
</table>

*% = Percent of total year-round housing units in the municipality.

Vermont law requires municipal zoning to regulate individual mobile homes the same as conventional housing [24 VSA 4412 (B)] and prohibits municipal bylaws from excluding mobile home parks [24 VSA 4412 (C)]. Because many mobile-home parks in Vermont were established decades ago, they did not always employ design standards considered important today. Community opposition to the establishment of new parks often exists. In 2005, the Vermont Department of Housing and Community Affairs held hearings across the State concerning mobile-home park issues and will release a “guidance document” for communities on mobile-home parks in 2006.

In the near future, CCRPC plans to estimate the size of the County’s stock of privately owned and publicly subsidized affordable housing. In general, it is likely that the communities with the largest quantities of affordable housing are those with the largest quantities of older housing and denser forms of housing (such as Burlington and Winooski) and those with high numbers of mobile homes (see Table 7-14).

Increasing a community’s supply of affordable housing often begins with programs to sustain its existing supply. Home maintenance and code enforcement programs help prevent affordable units from deteriorating to the point of requiring demolition. Units that have been vacant or abandoned benefit from grant and loan programs to owners that foster major rehabilitation. Historic preservation programs can promote the adaptive reuse of large former single-family residences and nonresidential buildings into affordable multiunit buildings.

Fifty years ago in many areas of the U.S., site-development and construction efficiencies argued for producing large-scale, multiunit affordable-housing developments, often owned and managed by public-housing authorities. More recently, as a matter of sound housing and community-development policy, there has been greater interest in blending affordable housing with market-rate housing in existing mixed-income neighborhoods and in new mixed-income developments. Public housing vouchers provided to low- and moderate-income renter households expand their housing choices among units that participate in the voucher program. The City of Burlington also has adopted “inclusionary housing,” which requires a new housing development exceeding a certain number of housing units to provide a minimum proportion of affordable units.7-15

**Homelessness**

In almost all cases, homelessness is not a lifestyle choice: Homeless people cannot afford housing. This is primarily because there is not enough affordable housing and in some cases because people face challenges that limit them from earning sufficient income to afford housing. In short, effective responses to homelessness incorporate both a community’s housing and its safety net of human services.7-16

Because it is important to provide a mix of services in a sequence determined by the circumstances of each homeless person or family, actions to aid the homeless are planned and coordinated through a “continuum of care.” The continuum is essentially an agreement among a team of specialized service providers to ensure that there are no gaps in service delivery.

An important component of the continuum of care is having adequate supplies of transitional housing. This form of housing is designed and operated to provide affordable temporary living space in conjunction with housing-counseling and other services that enable the homeless to make the transition from temporary shelters into permanent housing.
Housing for Moderate Income Households

High housing costs also hurt households with moderate incomes. High housing costs prevent many moderate income households from homeownership and can compel them to own or rent housing that is of lower quality or in more remote locations. Housing shortages can lead higher income households to bid up the cost of housing that otherwise would be affordable to moderate income households. The process of “gentrification” can also drive up prices in particular neighborhoods, making them unaffordable to low- and moderate-income households.

Even when moderate income households are able to purchase a home, high housing costs may mean they have less disposable income to pay for routine home maintenance or to invest in home improvements (let alone to pay for other important household expenses). This can result in general neighborhood decline that dissuades owners from maintaining or improving other properties in the neighborhood.

Housing for Seniors and People with Special Needs

In 2000, almost 13,800 people in Chittenden County were aged 65 or older, representing almost one-tenth of the County’s population. Since 1970, people in this age cohort (“seniors”) have grown as a share of the County’s total population (see Table 5-8) and their number is expected to continue to grow in the future.

Households headed by seniors most often are one-person or two-person households. When seniors continue to live in conventional housing, it is described as independent living. Seniors may receive housekeeping services, personal-care services, or medical-care services in their independent residences. Seniors also can participate in “home-share” programs where they share their housing with one or more people who provide services instead of paying rent.

Specially designed and operated congregate forms of housing for seniors offer assisted living or skilled nursing-care services (some facilities also have sections that specialize in residents with Alzheimer’s disease). Developments that combine all these types of housing (often referred to as “life care” or “adult care”) enable seniors to transition from one level of care to another within the same facility.

In 2000, almost 20,000 people with disabilities lived in Chittenden County (see Table 5-3). Like seniors, people with disabilities may live in independent-living or in congregate forms of housing where they receive housekeeping, personal-care, or medical-care services. “Residential-care homes” are small-scale forms of congregate housing that were once referred to as “group homes.”

“Accessible housing” describes any type of housing that contains special features (ramps, handrails, and special plumbing and electrical fixtures) that benefit people (seniors and non-seniors) who have disabilities that limit their mobility. People with mobility limitations (including seniors) benefit from housing that is served by transit and by paratransit services.

The Americans with Disabilities Act and Fair Housing Act (see next section) establish certain protections for people with disabilities. In general, these laws prohibit discrimination on the basis of a person’s disability when the person is seeking to buy or rent housing (including actions by realtors, rental agents, and lenders).

These laws also impose special responsibilities on governments considering the approval of permits for housing proposed for the use of people with disabilities. Governments may not refuse to make a “reasonable accommodation” to a standard or condition established by an official policy or regulation when such accommodation may be necessary for a person with a disability to use or enjoy a dwelling.
Housing Discrimination

Fair-housing laws are intended to enable people to make choices about housing without other people or the government discriminating against them. These laws address discrimination in how housing is sold, rented, appraised, financed, and advertised. They protect everyone:

- People of all races and religions,
- People with disabilities,
- The elderly,
- Families with children, and
- All homeowners and residents who are protected from being victimized by destructive practices such as steering potential residents to only certain communities, neighborhoods, or developments.

As part of Vermont’s 2005 – 2010 HUD Consolidated Plan for Housing and Community Development Programs, the State retained consultants who prepared an “Analysis of Impediments to Fair Housing Choice.” This report examines how public and private conditions affect fair-housing choice in the State. An “impediment” to fair-housing choice is any action, omission, or decision that restricts, or has the effect of restricting, the availability of housing choice on the basis of factors prohibited by Vermont’s Fair Housing Act. To continue to receive federal Housing and Urban Development funds, Vermont must specifically certify that it will affirmatively advance fair housing. To accomplish this, it must demonstrate progress in undertaking remedial actions that address the impediments identified in the “Analysis of Impediments” (see Figure 7-1).

Figure 7-1
IDENTIFIED IMPEDIMENTS TO FAIR HOUSING CHOICE

1. Lack of Affordable Housing
2. Rental Housing Units in Poor Condition
3. Lack of Accessible Housing
4. Zoning Ordinances that Require Large Lots
5. Zoning Ordinances that Do Not Allow for High Density Residential Uses, Including Multi-Family and Mobile Home Uses
6. Lack of Awareness of Fair Housing Laws and Rights Granted under the Law
7. Need to Strengthen Fair Housing Requirements for Municipal Grantees of HUD Community Development Block Grant Funds
8. Discrimination in Rental and Sales Markets
9. Lack of Public Transportation Options

Municipalities carry out four broad categories of activities that affect housing. Each category can trigger municipal fair housing responsibilities.

1. **Regulatory Activities** – When a municipality enacts and administers regulations (e.g., zoning or building/housing codes) that affect existing or potential residential properties;

2. **Provision of Services** – When a municipality provides routine services in residential areas or to residents;

3. **Provision of Subsidies** – When a municipality offers financial incentives (e.g., grants, loans, or loan guaranties) or special services (e.g., special infrastructure projects or housing rehabilitation services) to residential property owners or to residents; and

4. **Proprietary Activities** – When a municipality buys or sells real property, particularly if the property was used or will be used as a residence.

Municipalities have fair-housing responsibilities regardless of whether the federal or State government has funded the activity that is the basis for the complaint. A fair housing violation does not require a discriminatory intent: A violation may be found even when only a discriminatory impact or burden results. In many cases, a violation is found simply because municipal officials carried out regular activities in a routine way and failed to recognize their special fair housing responsibilities (see Figure 7-2).

Fair-housing laws impose special obligations that supersede a municipality's regular bylaws and routine administrative practices. A municipality faces significant costs if a fair-housing complaint is filed against it and if it is found to have violated the *Fair Housing Act* (see Figure 7-3). The fact that fair-housing laws may add to the cost and time of undertaking municipal actions does not diminish a municipality's fair-housing obligations. Municipal officials who are considering a new ordinance, expenditure, or action or are reviewing an existing one can avert allegations of failing to meet these obligations by asking, "What are the fair housing implications of undertaking this action or of undertaking no action?"

In addition, a municipality that receives HUD funds (including grants of HUD funds awarded by the State) must certify that it affirmatively furthers fair housing. HUD has identified the following actions that a local government can take to demonstrate that it has complied with this certification:

- Enactment and enforcement of an ordinance providing for fair housing consistent with federal fair housing law;
- Support of the administration of state fair housing laws;
- Participation in voluntary partnerships developed with public and private organizations to promote the goal of fair housing choice;
- Contracting with private organizations, including fair housing organizations, to address fair housing impediments;
- Activities that assist in remediating findings or determinations of unlawful segregation or other discrimination involving assisted housing within a recipient's jurisdiction and other actions in response to fair housing impediments; and
- Conducting neighborhood meetings or similar mechanisms for educating and sharing information with residents aimed at overcoming opposition to acceptance into the area of persons in the categories covered under the *Act*. 

---

*7.14 / 2006 Chittenden County Regional Plan*
Examples of Regulatory Activities Found to be Violations

- Excluding multifamily housing in residential zoning districts with predominantly white residents while permitting multifamily housing only in residential zoning districts with predominantly minority residents.
- Delays in issuing building permits for residences in a housing development that was generally known to have greater minority ownership than the community-at-large.
- Requiring the approval of neighboring property owners or residents as a condition for issuing a conditional use permit for a group home.
- Enforcement of building code regulations disproportionately in developments with predominantly minority residents.
- Failing to make "reasonable accommodations" for residences for people with disabilities (as required by the 1988 Amendments to the Act), as in the following examples:
  - A city's refusal to allow zoning rear yard setback requirements to be met in the side yard of a residence proposed for mentally ill or recovering substance abusers;
  - Denial of a special use permit for the conversion of an office building to a residence for persons with AIDS. The city argued that this use most closely fit the zoning ordinance's definition of a "hospice," not permitted in commercial zoning districts.
  - Attempting to regulate a group home for HIV positive residents as a "chronic nursing home," not permitted in the residential zoning district where the group home was proposed.

Examples of Service Provision Activities Found to be Violations

- Termination of police protection to minority residents following acts of racial violence.
- Selection of a school site near the center of an area with predominantly minority residents, instead of at the edge of such area which would promote integrated enrollment.

Examples of Subsidy Activities Found to be Violations

- "Steering" minority applicants for Section Eight housing vouchers to buildings with predominantly minority residents.
- Use of federal Community Development Block Grant funds by a community for water and sewer projects only in areas with predominantly white residents, where areas with predominantly minority residents had a greater need for such projects.
- Providing misinformation and selectively disposing of applications for a residential rehabilitation and energy conservation program.

Examples of Proprietary Activities Found to be Violations

- Acquisition and demolition of the only housing occupied predominantly by minority residents as part of a downtown revitalization project where there was no provision of replacement housing.
- Failure to comply with fair housing regulations in advertising and selling a residence to the highest bidder.
- Systematic disinvestment in and non-maintenance of existing public housing.
- Prohibition of "mentally infirm" residents, unwed mothers, and residents dependent on guide dogs from public housing.
Figure 7-3
POTENTIAL MUNICIPAL COSTS TO DEFEND A FAIR-HOUSING COMPLAINT AND IF A FAIR-HOUSING VIOLATION IS FOUND

When a municipality must defend against a complaint based on the Fair Housing Act, its costs may include:
- Its own attorney's fees,
- One-half of the court costs,
- The costs of diverting municipal officials from their regular duties to assist in preparing a defense, and
- The loss of community prestige through adverse publicity.

When a municipality is found to have violated the Fair Housing Act, additional costs may include:
- Nominal or compensatory damages to the complainant (including those for pain and suffering, mental anguish and emotional distress, and humiliation),
- Punitive damages to the complainant (which may be imposed for intentional and willful violations),
- Civil penalties:
  - Up to $10,000 if it is the violator's first violation,
  - Up to $25,000 if the violator has had a previous violation in the past five years, or up to $50,000 if the violator has had two or more violations in the past seven years; and
  - Up to $50,000 if a “pattern and practice” is shown or up to $100,000 if the violator has been previously found to have engaged in a “pattern and practice”),
- The complainant's attorney's fees and share of court costs,
- The loss of eligibility for federal funding of municipal projects and programs,
- Court-supervised or HUD-supervised oversight of municipal services, and
- Court-ordered or HUD-ordered municipal expenditures for projects and programs to accomplish specific objectives (including record keeping and reporting of municipal activities).

Housing Policies

1. All types of households should have adequate opportunities for decent, affordable housing throughout Chittenden County.

2. The County’s middle-income, working age households should experience no worse than the Statewide average change in the percentage of households that pay more than 30 percent of household income on housing costs.

3. The majority of new housing should be constructed in the Metropolitan and Village Planning Areas and in locally designated growth centers within Transition Planning Areas.

4. Municipal plans should assess the community's ability to meet the 2010 Housing Targets, identify any local barriers to housing production that prevent attainment of the Targets, and develop programs of local actions to address those barriers.

5. Municipalities and the State of Vermont should evaluate development regulations and review procedures to reduce duplication in permitting, lack of coordination in local and State reviews, and unnecessary requirements that are barriers to housing production, while protecting the environment, historic structures, settlement patterns, and the overall quality of life.

6. Municipalities should review and revise community plans, capital programs, and regulations to assess where residential development can be accommodated at increased densities in appropriate areas.

(Continued)
7. Municipalities should encourage housing at the maximum densities allowed by local plans and regulations.

8. Higher educational institutions in Chittenden County should provide much greater on-campus housing for students.

9. Chittenden County’s for-profit, non-profit, and public sector housing stakeholders should work collaboratively to address the County’s housing needs.

Resources

The following resources provide further information on the major topics of this chapter.

Housing


Housing Division of the Vermont Department of Housing and Community Affairs.  www.dhca.state.vt.us/Housing/index.htm.


Vermont Housing Finance Authority.  www.vhfa.org/.


Affordable Housing


Housing Vermont.  www.hvt.org/.


National Housing Institute.  www.nhi.org/.


Housing for Seniors and People with Special Needs


Cathedral Square Corporation.  www.cathedralsquare.org/.


Homelessness


Committee on Temporary Shelter. www.cotsonline.org/.


Housing Discrimination


Notes

7-1 The “Housing Wage” in Chittenden County is higher than for Vermont. The Housing Wage is the hourly wage rate needed by a household working 40 hours per week and devoting 30 percent of income to pay the official Fair Market Rent and utilities as set by HUD. For 2005, the Housing Wage for Chittenden County and Vermont were

<table>
<thead>
<tr>
<th></th>
<th>2005 Housing Wage</th>
<th>As a % of Vermont</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chittenden County</td>
<td>$15.92</td>
<td>114.5 %</td>
</tr>
<tr>
<td>Vermont</td>
<td>$13.90</td>
<td>100.0 %</td>
</tr>
</tbody>
</table>


7-2 The 30-percent of household income affordability criterion is the official guideline used by the federal Department of Housing and Urban Development and by the Vermont Housing Finance Agency. When a household that owns a home sells it, the household is able to capture any increase in the home’s value. A household can use these funds to reduce the portion of a new home’s cost that is mortgaged, thereby reducing the household’s monthly housing costs for that new home.

7-3 The dispersion of housing to more remote locations also creates new demands on transportation and other forms of infrastructure. CCRPC and the Chittenden County Metropolitan Planning Organization expect to focus on assessments of the likely impacts of a dispersed pattern of regional growth in the coming years.

7-4 The Task Force’s report, “Unlocking Housing Opportunities – Strategies for Increasing the Supply of Housing in Chittenden County” is posted at www.ccrpcvt.org.

7-5 The Housing Targets Task Force recommendations are posted at www.ccrpcvt.org. As part of the State’s 2005 – 2010 HUD Consolidated Plan for Housing and Community Development Programs, it retained consultants who prepared a housing needs assessment for Chittenden County (see www.dhca.state vt.us/Housing/ConPlan/Volume%20I/Chittenden%20County%20Housing%20Needs%20Assessment.pdf). Without providing details of the methodology used, that study estimated that there would be 4,938 more households in 2010 than there were in 2000 (see Table 13) and a need for 3,291 new owner housing units by 2010 (see Table 4). In 2005, the State also published *The Vermont Housing Needs*
Assessment Guide, which revised a 2003 Massachusetts publication that provides guidance to local officials in the preparation of a housing needs assessment (see www.housingdata.org/assessment/assessment_guide.pdf).

7.6 In “Housing in Northwestern Vermont” (prepared in August 2000), EPR forecasted a need for 31,472 additional total housing units for the six-county Northwestern Vermont region in 2010. If Chittenden County’s portion of this forecasted regional total need were the same as the County’s 2000 portion of the region’s total housing units (43.1 percent), then the County’s 2010 need would be 13,564 units.

In “Economic and Demographic Forecasts for Chittenden County” (prepared in September 2000), EPR forecasted a 2000–2010 increase in “housing-unit demand” of 12,654 for Chittenden County. In June 2001, EPR adjusted its population forecasts based on the 2000 Census results. If the housing-unit demand forecast is reduced by the same rate as the adjusted population forecast, it would be 12,591 units. If this housing unit demand of 12,591 units is adjusted to reflect a five-percent vacancy rate (making it more comparable with the previous EPR study), it would represent a Countywide 2010 housing need of 13,221 units.

7.7 The Munson analysis recognized that the 1978-to-2002 change in the total jobs in Chittenden County (using annual employment data provided by the Vermont Department of Employment and Training) is a remarkably stable, linear trend ($R^2 = 0.975$).

7.8 $13,564 + 13,221 = 26,785 \rightarrow 26,785 / 2 = 13,393 \rightarrow$ Or about 13,400 units.

### Recent 10-Year Housing Increases

<table>
<thead>
<tr>
<th>Time Period</th>
<th>6-County Northwest Vermont Region</th>
<th>Chittenden County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>1990-2000</td>
<td>13,981</td>
<td>11.4%</td>
</tr>
<tr>
<td>1980-1990</td>
<td>31,450</td>
<td>34.5%</td>
</tr>
</tbody>
</table>


7.9 Median household income is a statistic that is officially established by the federal Department of Housing and Urban Development (HUD) and is widely used by HUD and others in the administration of housing programs. Median household income is used to estimate typical household income, but is not the same as the mean or average income. HUD establishes median household income for a given area annually. In 2006, the median income for the Burlington – South Burlington Metropolitan Statistical Area is $70,500 (so that 80% of median household income is $56,400 and 120% of median household income is $84,600). “Affordable” means that a household does not devote more than 30 percent of its household income to housing costs. This would mean that Moderate Income Housing imposes a cost of no more than $2,115 per month in 2005 and Affordable Housing imposes a cost of no more than $1,410 per month.

### Recent Factors in the Allocation Formula

- Recent Population
- Recent Population Growth
- Recent Employment
- Recent Employment Growth
- Recent Year-Round Housing
- Undeveloped Developable Land Zoned for Development
- Residential Redevelopment Capacity
- Regional Development Suitability

The Task Force decided that certain other possible factors (such as sewage treatment capacity) are more relevant as explanations for why a community may not be able to meet its targets.

The formula treats each factor equally. The first stage of the formula calculates the potential proportion of the County’s Target for Total Housing (10,000 housing units). The municipality’s potential proportion of the County’s Target for Total Housing is the average of the summation of the municipal proportions of the County total for each of the eight factors:

$$\left[ \frac{(Municipality’s \ Recent \ Population \ / \ County’s \ Recent \ Population) + \ (Municipality’s \ Recent \ Population \ Growth \ / \ County’s \ Recent \ Population \ Growth) + \ (Municipality’s \ Recent \ Employment \ / \ County’s \ Recent \ Employment \ + \ (Municipality’s \ Recent \ Employment \ Growth \ / \ County’s \ Recent \ Employment \ Growth) + \ (Municipality’s \ Recent \ Year-Round \ Housing \ / \ County’s \ Recent \ Year-Round \ Housing) + \ (Municipality’s \ Undeveloped \ Developable \ Land \ Zoned \ for \ Development \ / \ County’s \ Undeveloped \ Developable \ Land \ Zoned \ for \ Development) + \ (Municipality’s \ Residential \ Redevelopment \ Capacity \ / \ County’s \ Residential \ Redevelopment \ Capacity) + \ (Municipality’s \ Regional \ Development \ Suitability \ / \ County’s \ Regional \ Development \ Suitability)}{8} \right]$$

Municipality’s Potential Proportion of County’s Total Housing Target $\times$ 10,000 Housing Units $=$ Municipality’s Calculated Target for Total Housing

The Municipality’s Calculated Target for Total Housing cannot exceed 125 percent of that municipality’s average 10-year growth in total housing from 1980 to 2000.

Municipality’s Moderate Income Housing Target $= 0.10 \times$ Municipality’s Target for Total Housing

Municipality’s Affordable Housing Target $= 0.10 \times$ Municipality’s Target for Total Housing

These formulas are discussed in detail on pages 8–16 of the Housing Targets Task Force report.
The use of this not-to-exceed rule reduces the total housing target for all of the County’s communities to 9,563.

Communities also are encouraged to consider the need to include goals related to people with special housing needs in the community’s State-mandated programs of local actions to address housing needs.

For example, households with greater incomes typically already own housing. Housing shortages increase the value of that housing, providing them with more equity to use to purchase new housing.

See the resources listed at the end of this chapter for more information on measures that may be undertaken to promote affordable housing.


For more information on residential-care homes, see www.dad.state.vt.us/ltcinfo/RCH2.htm.

For more information on the Americans with Disabilities Act requirements, see www.usdoj.gov/crt/ada/.

For more information on the “reasonable-accommodations” requirements of the Fair Housing Act, see www.hud.gov/offices/fheo/library/huddojstatement.pdf.

The federal Fair Housing Act and its 1988 Amendments authorize individuals to file complaints alleging housing discrimination on the basis of their race, color, national origin, religion, gender, handicap, or familial status and require the Department of Housing and Urban Development (HUD) to administer its programs and activities "...in a manner affirmatively to further the policies of this subchapter." Individuals alleging housing discrimination also may allege related acts of discrimination that are governed by other federal laws (such as §1982 of Title 42 of the U.S. Code or Title VI of the Civil Rights Act of 1964).

Vermont (9 VCS 4503) prohibits any person from engaging in “unfair housing practices” (such as the refusal to sell or rent and many other actions involved in the advertisement, financing, and brokering of a dwelling) because of a person’s race, sex, sexual orientation, age, marital status, religious creed, color, national origin, handicap, intent to occupy a unit with one or more minor children, or status as a person is a recipient of public assistance. The Human Rights Commission has jurisdiction over investigating and enforcing complaints of §4503 violations. The Commission follows a complaint review procedure (detailed in 9 VCS 4554) that is similar to the procedure used by HUD for investigating complaints of federal Fair Housing Act violations.

Infrastructure

“Infrastructure” is a system of facilities used in conjunction with natural systems to provide us with basic services. Adequate amounts of appropriate infrastructure are essential to sustain the County’s economic prosperity, standard of living, and the health of its ecosystems. This chapter first provides an overview of infrastructure and then background information and policies for six types of infrastructure systems: water supply, wastewater treatment, flood and stormwater control, solid waste management, transportation, and telecommunications.

Overview

The Regional Plan uses the term “infrastructure” to describe a system of facilities used in conjunction with natural systems that provides us with basic services, such as

- Water supply (such as groundwater and wells, surface water and intakes, filtration plants, storage, transmission, and distribution facilities);
- Wastewater treatment (such as sewage collection lines, pumping stations, and treatment facilities, as well as septic systems and affiliated soils);
- Flood and stormwater control (such as swales, culverts, detention, retention, and treatment facilities, as well as forests, wetlands, and floodplains);
- Solid waste management (such as drop-off collection stations, transfer stations, and disposal facilities);
- Transportation and rights-of-way (such as sidewalks, highways, bridges, and railroads);
- Telecommunication facilities (such as landlines for telephones, cable television, and high-speed digital communications, switching stations, satellite dishes, and wireless communications towers);
- Community facilities (such as government buildings, schools, and places of assembly; these facilities are discussed in Chapter 9);
- Recreation facilities (such as ballfields, playgrounds, gyms, multiuse paths/trails, and scenic and natural areas; these facilities are discussed in Chapter 9);
- Energy facilities (such as gas lines, electric lines, hydroelectric dams, and wind turbines; these facilities are discussed in Chapter 10); and
- Public safety facilities (such as police stations, fire stations, and emergency shelters; these facilities are discussed in Chapter 11).

We expect infrastructure systems to effectively provide for the public’s health, safety, and welfare by consistently functioning dependably, safely, and cost effectively. We should not wonder each time we turn on a tap whether water will come out, or worry each time we approach a bridge that it may collapse when we cross it, or consider whether we can afford to maintain it. Adequate amounts of appropriate infrastructure are essential to sustain the County’s economic prosperity, standard of living, and the health of its ecosystems.

For an infrastructure system to meet the objectives of providing dependable, safe, and inexpensive service, three parts of the system must function properly:
- **Capital Facilities** – The large-scale structural and physical systems (such as pipes, wires, buildings, and associated natural resources);

- **Maintenance Services** – The preventative actions that need to be performed to keep the capital facilities working and to extend their useful life (such as routine inspection and repair); and

- **Operating Services** – The actions that need to be performed to make the capital facilities work properly (such as periodic adjustments in the amounts of energy and resources used to make the facilities operate at appropriate levels).

The total cost of an infrastructure system includes the costs of its capital facilities, maintenance services, and operating services. Capital facilities are expected to provide services for a long time (especially when they are maintained and operated correctly). When infrastructure relies on natural resources, it is critically important that this resource use be sustainable over the long term.

The costs of constructing or replacing capital facilities typically are high and occur in a lump sum before the capital facilities provide services. Consequently, we often pay these costs by borrowing money, which is repaid in installments over time with revenues gathered from those who use or benefit from the services provided by those capital facilities.

While maintenance and operating costs may be great over the life of a capital facility, these costs are necessary; when managed properly, they save money by preventing the premature replacement of expensive capital facilities. The costs of maintenance and operating services are paid from current revenues, rather than with borrowed money.

Many infrastructure systems may be made more dependable, safe, and/or cost-efficient by increasing the size or efficiency of the system. Infrastructure systems that serve as networks (e.g., telecommunications or transportation) are more valuable when the network is expanded to serve more people or a larger territory. To achieve these economies of scale or performance improvements, some infrastructure systems are expanded so that they cross municipal boundaries. These expansions may be accomplished in different ways:

- A regional public entity may provide services to local-government customers (e.g., Champlain Water District, Winooski Valley Park District, or Chittenden Solid Waste District).

- A for-profit or a nonprofit private enterprise may be authorized as a utility to provide these services – or one key part of the infrastructure system – in a prescribed area (e.g., VELCO, Vermont Gas Systems, and telecommunications providers).

- A local government may enter into a contract to acquire services from another local government (e.g., wastewater services) or to share facilities (e.g., library networks).

- Different entities may simply interconnect their facilities with little initial or ongoing oversight (e.g., the interconnected system of private, municipal, state, and federal thoroughfares).

Because infrastructure systems are costly and expected to last a long time, it is important to plan for:

- Infrastructure expansions/upgrades in advance of the need for the services they will provide as established by regional and local plans and

- A regional development pattern that takes full advantage of the investments already made in existing infrastructure so that it is used effectively and efficiently before we make new infrastructure investments.

Because infrastructure systems often are expansive and can pose potential threats to natural resources and public health, it is especially important that the planning, construction, maintenance, and operations of infrastructure systems incorporate appropriate safeguards.
Because land development requires appropriate infrastructure, infrastructure planning is often tantamount to designating the areas that are appropriate for land development. Planning for expansion of infrastructure systems should recognize potential impacts – both positive and negative – on land-development patterns. For example, the Town of Milton currently operates approximately 12 miles of wastewater collection mains, pump stations, and a treatment facility that serves approximately 600 connections. In 2004, voters approved an upgrade of the Town’s treatment facilities. Milton undertook this $7.6 million project in conjunction with careful planning of changes affecting its town center and overall community development.

**Water Supply**

**Background**

Chittenden County’s households and businesses require adequate supplies of clean water for drinking, washing, irrigating plants, watering animals, manufacturing, and fighting fires. 8.1

Public-water systems 8.2 in the County provide water to about 135,000 people and to thousands of employers (see Map 8-1):

- The Champlain Water District (CWD) is a municipally-chartered, consolidated water district and the County’s largest water supplier, with 18,400 residential connections and 2,600 non-residential connections in 12 water systems (Colchester Town, Colchester Fire District #1, Colchester Fire District #3, Village of Essex Junction, Essex Town, Village of Jericho, Mallets Bay Water Company, Milton, Shelburne, South Burlington, Williston, and Winooski).

- The Burlington Department of Public Works (BDPW) has about 10,000 connections within the City of Burlington and Colchester Fire District #2.

- Smaller public-water systems in Jericho, Underhill, Richmond, and Hinesburg each serve about 300 connections.

Each public water supply system provides its customers with an annual water quality report. CWD and BDPW both use Lake Champlain as a water source. The other public water systems and private households and employers that are not served by public systems rely on wells that tap into groundwater supplies (see Map 8-1). State and local regulations exist to protect these groundwater and surface-water sources. Local land-use plans and bylaws also can consider the impacts that proposed developments will have on the quantity and quality of water supplies. Source-protection and water-conservation measures help to preserve the County’s abundant water supplies and to prevent increases in the cost of providing water.

**Water-Supply Policies**

1. Water sources should be managed to ensure that there are adequate supplies of clean water to provide for future domestic and non-domestic water needs in Chittenden County.

2. Areas within Metropolitan, Transition, Enterprise, and Village Planning Areas should be adequately served by public water supply infrastructure.

3. People and enterprises in Chittenden County should be encouraged by education programs and other measures to conserve their use of water and to manage their households and enterprises in ways that protect water quality.
Wastewater Treatment

Background

Treating domestic, commercial, and industrial wastewater preserves public health and the quality of the natural environment. Failing to treat wastewater adequately can have serious, immediate and long-lasting adverse impacts on our surface-water and groundwater systems; these problems are costly to correct. As detailed in the Water Quality section of the Natural Resources chapter of this Plan, these water resources are vitally important to the welfare of the County.

There are two general types of wastewater treatment systems in Chittenden County:

- **Public Wastewater Treatment Systems** – Wastewater is collected from multiple households and enterprises (typically via underground pipes), then treated and disposed at a common facility, in accordance with State and federal regulations and

- **On-Site Septic Systems** – One or more households/enterprises develops its own system to treat/dispose of wastewater on its own property in accordance with State and municipal regulations.

There are 12 public wastewater-treatment facilities in Chittenden County, serving Burlington, Colchester Town, Colchester Fire District #1, Essex Town, Village of Essex Junction, Hinesburg, Milton, Richmond, Shelburne South Burlington, Williston, and Winooski (see Map 8-2). In 2000, these facilities collectively served an area of almost 27,600 acres (eight percent of the County’s land area) and were approved to serve almost 39,000 acres (11 percent of the County’s land area; see Table 8-1). In 2000, these facilities treated over 12 million gallons of wastewater per day, had permitted capacity to treat over 17.8 million gallons per day, and had uncommitted reserve capacity for treating 3.7 million gallons per day (see Table 8-2). Nonetheless, CCRPC’s 2002 sewage-treatment capacity study found that the development of certain areas in the County would more than exhaust the remaining allocated treatment capacity for those areas (see Table 8-3).

Infrastructure is a set of tools to accomplish community-development objectives that people decide are important priorities. The State mandates that the construction and expansion of infrastructure reinforce development that maintains the State’s historic settlement pattern of compact village and urban centers separated by rural countryside [see 24 VSA 4302 (c) (1) (C)].

Expansion of the aggregate wastewater-treatment capacity in the County would make possible more and denser development in and near the County’s urbanized core, rather than forcing development to occur in the more rural parts of the County that can only support septic systems. In past decades, when development in the County introduced new challenges, the County’s leaders considered and created a regional water-supply provider (the Champlain Water District) and a regional solid-waste management organization (the Chittenden Solid Waste District). Similarly, the County should consider alternative regional organizational models that could provide wastewater-treatment services to areas that are locally designated for future concentrated development.

Locations outside of sewer-service areas and some developments within sewer-service areas use on-site septic systems to treat wastewater. The design of these systems depends on the capacity of the soils on which the system is constructed to serve as a filter through which water may percolate. Only about one-third of the soils in Chittenden County that have been classified for their general suitability are labeled as “well-suited” or moderately suited” for on-site septic systems (see Map 8-3 and Table 8-4).
Table 8-1
SERVICE AREAS OF WASTEWATER TREATMENT FACILITIES, 2000

<table>
<thead>
<tr>
<th>Wastewater Treatment Facility</th>
<th>2000 Service Area (Acres)*</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing</td>
<td>Approved</td>
<td>Proposed</td>
<td>Total</td>
</tr>
<tr>
<td>Airport Parkway</td>
<td>5,788</td>
<td>4,859</td>
<td>0</td>
<td>10,647</td>
</tr>
<tr>
<td>Bartlett's Bay</td>
<td>1,566</td>
<td>0</td>
<td>0</td>
<td>1,566</td>
</tr>
<tr>
<td>Burlington Main</td>
<td>3,024</td>
<td>0</td>
<td>0</td>
<td>3,024</td>
</tr>
<tr>
<td>Burlington North</td>
<td>1,973</td>
<td>0</td>
<td>0</td>
<td>1,973</td>
</tr>
<tr>
<td>Burlington River</td>
<td>662</td>
<td>0</td>
<td>0</td>
<td>662</td>
</tr>
<tr>
<td>Essex Junction</td>
<td>6,830</td>
<td>5,544</td>
<td>0</td>
<td>12,374</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>765</td>
<td>0</td>
<td>0</td>
<td>765</td>
</tr>
<tr>
<td>Milton</td>
<td>1,612</td>
<td>733</td>
<td>948</td>
<td>3,293</td>
</tr>
<tr>
<td>Richmond</td>
<td>471</td>
<td>0</td>
<td>266</td>
<td>737</td>
</tr>
<tr>
<td>Shelburne #1</td>
<td>1,255</td>
<td>0</td>
<td>0</td>
<td>1,255</td>
</tr>
<tr>
<td>Shelburne #2</td>
<td>2,894</td>
<td>0</td>
<td>0</td>
<td>2,894</td>
</tr>
<tr>
<td>Winooski</td>
<td>759</td>
<td>0</td>
<td>0</td>
<td>759</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>27,599</td>
<td>11,136</td>
<td>1,214</td>
<td>39,231</td>
</tr>
</tbody>
</table>

* Acreages presented here include rights-of-way land area and open lands without services within the served areas.


Table 8-2
SERVICE CAPACITIES OF WASTEWATER TREATMENT FACILITIES, 2000

<table>
<thead>
<tr>
<th>Wastewater Treatment Facility</th>
<th>Average Daily Discharge (GPD*)</th>
<th>2000 Capacities (GPD*)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Permitted</td>
<td>Unconnected Committed</td>
</tr>
<tr>
<td>Airport Parkway</td>
<td>1,462,417</td>
<td>2,300,000</td>
</tr>
<tr>
<td>Bartlett's Bay</td>
<td>619,000</td>
<td>1,250,000</td>
</tr>
<tr>
<td>Burlington Main</td>
<td>4,672,700</td>
<td>5,300,000</td>
</tr>
<tr>
<td>Burlington North</td>
<td>1,170,333</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Burlington River</td>
<td>813,383</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Essex Junction</td>
<td>1,724,000</td>
<td>3,100,000</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>179,225</td>
<td>250,000</td>
</tr>
<tr>
<td>Milton</td>
<td>154,043</td>
<td>275,000</td>
</tr>
<tr>
<td>Richmond</td>
<td>113,500</td>
<td>222,000</td>
</tr>
<tr>
<td>Shelburne #1</td>
<td>330,417</td>
<td>310,000</td>
</tr>
<tr>
<td>Shelburne #2</td>
<td>295,500</td>
<td>450,000</td>
</tr>
<tr>
<td>Winooski</td>
<td>791,583</td>
<td>1,400,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12,326,101</td>
<td>17,857,000</td>
</tr>
</tbody>
</table>

* GPD = Gallons Per Day.

## Table 8-3
**2000 Reserve Capacity Versus 2010 and 2030 Forecasted Service Demands of Wastewater Treatment Facilities**

<table>
<thead>
<tr>
<th>Wastewater Treatment Facility</th>
<th>Municipality Served</th>
<th>2000 Uncommitted Reserve Capacity (GPD)*</th>
<th>2010 Forecasted Additional Demand (GPD)*</th>
<th>2020 Forecasted Additional Demand (GPD)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airport Parkway</td>
<td>South Burlington</td>
<td>433,716</td>
<td>225,619</td>
<td>423,180</td>
</tr>
<tr>
<td></td>
<td>Colchester Town¹</td>
<td>200,763</td>
<td>169,157</td>
<td>336,108</td>
</tr>
<tr>
<td></td>
<td>Colchester FD#1</td>
<td>56,035</td>
<td>56,462</td>
<td>87,072</td>
</tr>
<tr>
<td>Bartlett's Bay</td>
<td>South Burlington</td>
<td>492,665</td>
<td>61,314</td>
<td>121,595</td>
</tr>
<tr>
<td>Burlington Main</td>
<td>Burlington</td>
<td>358,171</td>
<td>247,145</td>
<td>499,747</td>
</tr>
<tr>
<td></td>
<td>South Burlington</td>
<td>336,720</td>
<td>241,931</td>
<td>489,353</td>
</tr>
<tr>
<td></td>
<td>21,451</td>
<td>5,214</td>
<td>10,394</td>
<td></td>
</tr>
<tr>
<td>Burlington North</td>
<td>Burlington</td>
<td>711,924</td>
<td>56,465</td>
<td>115,713</td>
</tr>
<tr>
<td>Burlington River</td>
<td>Burlington</td>
<td>118,165</td>
<td>60,018</td>
<td>121,554</td>
</tr>
<tr>
<td>Essex Junction</td>
<td>Williston</td>
<td>1,056,728</td>
<td>330,751</td>
<td>669,804</td>
</tr>
<tr>
<td></td>
<td>Essex Town</td>
<td>150,817</td>
<td>162,909</td>
<td>334,762</td>
</tr>
<tr>
<td></td>
<td>Essex Junction</td>
<td>486,796</td>
<td>136,073</td>
<td>271,328</td>
</tr>
<tr>
<td></td>
<td>419,115</td>
<td>31,769</td>
<td>63,714</td>
<td></td>
</tr>
<tr>
<td>Hinesburg</td>
<td>Hinesburg</td>
<td>27,081</td>
<td>11,135</td>
<td>23,396</td>
</tr>
<tr>
<td>Milton</td>
<td>Milton</td>
<td>11,552</td>
<td>44,997</td>
<td>93,140</td>
</tr>
<tr>
<td>Richmond</td>
<td>Richmond</td>
<td>108,140</td>
<td>18,517</td>
<td>33,180</td>
</tr>
<tr>
<td>Shelburne FD#1</td>
<td>Shelburne</td>
<td>39,845</td>
<td>22,885</td>
<td>42,090</td>
</tr>
<tr>
<td>Shelburne FD#2</td>
<td>Shelburne</td>
<td>104,748</td>
<td>33,954</td>
<td>62,395</td>
</tr>
<tr>
<td>Winooski</td>
<td>Winooski</td>
<td>334,436</td>
<td>24,870</td>
<td>178,908</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>3,717,481</td>
<td>1,137,670</td>
<td>2,384,701</td>
</tr>
</tbody>
</table>

* GPD = Gallons Per Day. Demand in bright yellow table cells exceeds Uncommitted Reserve Capacity.


## Table 8-4
**Suitability of Soils for On-Site Septic Systems**

<table>
<thead>
<tr>
<th>Suitability Category</th>
<th>Acres</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-Suited</td>
<td>33,932</td>
<td>9.9 %</td>
</tr>
<tr>
<td>Moderately Suited</td>
<td>75,092</td>
<td>21.9 %</td>
</tr>
<tr>
<td>Marginally Suited</td>
<td>91,958</td>
<td>26.8 %</td>
</tr>
<tr>
<td>Not Suited</td>
<td>120,568</td>
<td>35.1 %</td>
</tr>
<tr>
<td>Not Rated</td>
<td>21,787</td>
<td>6.3 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>343,338</td>
<td>100.0 %</td>
</tr>
</tbody>
</table>

In 2002, Vermont amended the laws governing the regulation of on-site septic systems. These laws no longer always allow development on a parcel that exceeds 10 acres in area, regardless of the suitability of its soils for a septic system. To offset the elimination of this exception, the State revised the rules related to the construction of septic systems on “marginally suited” soils and instituted rules that would allow property owners to propose innovative approaches for on-site wastewater treatment. These regulatory changes tended to offset one another in communities that do not have a relatively high proportion of marginally suited soils (most, but not all, municipalities in the County), so that roughly the same extent of development could occur. Some municipalities also have local septic-system regulations.

### Wastewater Treatment Policies

1. Public and on-site wastewater treatment systems should protect water quality and public health.

2. Areas designated for development within Metropolitan Planning Areas, Transition Planning Areas, Enterprise Planning Areas, and Village Planning Areas should be prioritized for service by public wastewater infrastructure.

3. Wastewater service areas should be prioritized to protect public health, to preserve and enhance water quality, and to serve high density, mixed-use development in order to maximize public investments in existing wastewater infrastructure.

4. The public should be aware of waterless and other innovative septic systems for use by clustered development in areas with soils that are less suitable for conventional septic systems.

5. The State should provide expanded resources to support the creation and expansion of wastewater treatment capacity.

6. Public sector and private sector leaders in Chittenden County should consider a regional model for providing wastewater treatment services to areas that are locally designated for future concentrated development.

### Flood and Stormwater Control

#### Background

When precipitation falls to the earth and accumulates more rapidly than it can be absorbed into the ground, it flows across the earth’s surface and becomes part of the surface-water system (streams, rivers, ponds, and lakes). Stormwater runoff occurs when the intensity and duration of rainfall and snowmelt exceed the earth’s capacity to absorb water. That is, runoff results from a combination of the amount of precipitation and the character of groundcover. Because there is little we can do to alter the frequency of storms, we attempt to control stormwater by managing the character of groundcover and by intercepting and controlling runoff.

Natural landscapes that contain many layers of vegetation (such as a canopy of trees, an understory of bushes, and a groundcover of grasses, herbs, and detritus) intercept precipitation before it strikes the ground, thereby reducing its erosive force and delaying its accumulation on the ground surface. Impervious and hardened surfaces (such as rooftops, streets, and parking lots) intercept precipitation directly and cause it to flow across the ground surface immediately and rapidly, thereby increasing its erosive force and accumulating on the ground surface. Stormwater control is necessary to manage the impact of the rapidly accumulated precipitation, thereby protecting water quality and public health.
lots) tend to prevent water from percolating into the ground. Steep slopes and hardened surfaces with less friction increase the velocity of the runoff so that it accumulates into greater volumes faster. Increased stormwater volume and velocity enable runoff to scour larger particles and to transport them downstream. Vegetative groundcover and reduced slopes slow runoff, diminishing its ability to transport materials.

Stormwater can create two general types of problems:

- **Water Quantity** – Flooding can injure people, property, and the environment when
  - Moving floodwater creates hazards and stream-channel and streambank erosion;
  - Stormwater forms pools that inundates development and natural areas; and
  - Higher peak flows damage aquatic habitat and aquatic life.

- **Water Quality** – Water pollution results when stormwater flowing across the earth’s surface dissolves chemicals and carries undissolved particles and other suspended material into surface waters. Increased volumes of runoff tend to transport more dissolved and suspended material. Stormwater as a transport mechanism is a concern when
  - Transports materials include toxic substances and biological pathogens and
  - Nontoxic sediments and nutrients are deposited downstream that may cover or disrupt downstream natural habitats.

Urban stormwater is a major contributor to water quality impairments in the County and delivers significant quantities of sediment, phosphorus, and toxic chemicals to Lake Champlain. Additional information about water quality is provided on pages 4.6–4.11.

Land development is not the only cause of flooding and water pollution. Nonetheless, development (especially in the absence of effective stormwater management) clearly has the potential to aggravate these concerns. If not properly managed,

- Increased impervious land coverage will add to the amount of untreated stormwater runoff and the velocity of discharges to waterbodies;
- Reduced areas of vegetation and pervious surfaces will reduce opportunities to slow runoff and filter pollutants before stormwater is discharged into water bodies;
- Locating development in flood prone areas will increase property damage and injury to people and redirect and heighten flooding; and
- Activities in developed areas will increase the amounts of certain pollutants being deposited onto ground surfaces, where they are vulnerable to being transported by stormwater into surface-water bodies.

Stormwater management protects people, property, and the environment by designing developments that drain runoff from certain areas, by managing the accumulation of stormwater in surface-water bodies, and by isolating development from flood-prone areas. Many public and private efforts to manage stormwater and protect water quality exist, creating the need for coordination and planning. The federal, State, and municipal regulations and programs addressing flooding and stormwater management are summarized below.

**National Flood Insurance Program (NFIP)**

First created in 1968 and most recently amended in 1994, this federal program offers flood insurance to the owners of properties located in communities that have adopted floodplain-management regulations limiting development in flood-prone areas. NFIP is administered by the Federal Emergency Management Agency (FEMA), which prepared maps of flood-prone areas to support the insurance program and regulations. In some cases, the designation of these
areas could be improved by employing alternative approaches or by considering updated information on watershed characteristics.

The Flood Mitigation Assistance Program (FMA) was created in 1994 to provide funding to assist states and communities participating in the NFIP in implementing measures to reduce or eliminate claims under NFIP. FMA provides planning grants to states and communities to prepare Flood Mitigation Plans (FMPs). States and communities with approved FMPs may apply for FMA project grants to undertake actions such as acquiring, relocating, or changing the elevation of NFIP-insured structures. Applicants for planning grants and project grants are encouraged to focus on “repetitive loss properties” (structures with four or more losses each with a claim of at least $1,000 within a 10-year period).8-3

**Clean Water Act (CWA)**

First enacted in 1972, the *CWA* directs the U.S. Environmental Protection Agency (EPA) to promulgate regulations and to carry out programs to improve the water quality of the nation’s waterways. The *CWA* requires states to publish a list of waterways identified as “water-quality impaired” (that do not meet water-quality standards). Chittenden County currently has nine waterways on this “303(d) list” principally as a result of stormwater runoff (see Table 4-2 and Map 4-3).

The *CWA* also requires Vermont to develop by 2013 a Total Maximum Daily Load (TMDL) study for each waterway on the 303(d) list. Each TMDL study would establish the existing pollutant levels in the waterway, compare these levels with Vermont standards, and develop an allocation to new and existing dischargers so that the impairment is corrected.

The expense and detailed regulation required by TMDL protocols can be avoided if water-quality problems are remedied so that water bodies are removed from the 303(d) list prior to the 2013 deadline for undertaking TMDL studies. The State is in the process of preparing plans for Vermont’s 17 major watersheds to identify strategies that would help prevent these waters from being on the 303(d) list. A watershed plan has been prepared for the Lamoille River and one is being prepared for the upper Lake Champlain basin.8-4 In 2002, Vermont and New York issued a jointly prepared TMDL for phosphorus pollution of Lake Champlain.8-5

**Vermont Stormwater Discharge Permits**

Vermont began requiring certain land developments to obtain stormwater-discharge permits in the mid-1970s. These permits are intended both to curtail flooding and protect water quality. These efforts initially were administered by the Wastewater Management Division of the Department of Environmental Conservation (DEC), but now DEC’s Water Quality Division administers this program. In 2002, VANR promulgated a major revision to the Stormwater Management Rule/Manual that establishes the standards that must be met by a developer in order to obtain a stormwater permit.8-6

**Vermont’s Stormwater-Impaired Watersheds**

In 2001–2002, the Vermont Water Resources Board (WRB) issued its ruling in the *Lowes* case. The decision addressed the issuance of State stormwater permits in the watershed of a waterway on the 303(d) list of impaired waters. The *Lowes* decision said that if the State had not prepared a TMDL allocation for the waterway, the State could not issue or reissue a stormwater permit to a development that would result in new or additional discharges of measurable and detectable levels of a pollutant contributing to the impairment. The heart of this decision was WRB’s
reversal of its previous position that a stormwater management facility installed in conformance with the State’s *Stormwater Manual* was presumed to meet Vermont water-quality standards.

As a result of the *Lowes* decision, VANR began issuing “Watershed Improvement Permits” (WIPs) in 2002 for stormwater discharges in the stormwater-impaired waters of the State. In 2003, a WRB decision overturned the WIPs for certain stormwater impaired waters in Chittenden County. The WRB then opened a fact-finding docket to investigate (1) the technical feasibility of designing cleanup plans for stormwater-impaired waters and (2) the degree of certainty that WIPs or other cleanup plans would result in impaired waters being cleaned up as a result of stormwater management measures taken by stormwater permittees.

In 2004, the State enacted H. 785 implementing many of the WRB docket’s recommendations. H. 785 requires the Vermont DEC to prepare before October 2007 a TMDL study or a Water Quality Remediation Plan (WQRP) for each of the 17 stormwater-impaired watersheds in the State. After a TMDL or WQRP is prepared, all existing and new dischargers of stormwater must apply for coverage under a watershed-specific general permit.\(^8\,\!^7\)

### Phase II NPDES

To implement the *Clean Water Act*, EPA developed regulations under the National Pollutant Discharge Elimination System (NPDES) that specifically address the water-quality impacts of stormwater runoff. These regulations apply to land developments and “municipal separate storm sewer systems” (MS4s). MS4s essentially include all systems designed or used by a public entity for collecting or conveying stormwater (except when combined with sanitary sewers). EPA first imposed these stormwater regulations on large land developments and large MS4s under Phase I of the NPDES program in 1990.

In 1999, EPA began the process of extending NPDES stormwater requirements to smaller land developments and many of the nation’s smaller communities under the Phase II program. In particular, all MS4s not already governed by Phase I and located in an “urbanized area” (i.e., an area in one or more municipalities with a combined population of at least 50,000 and a population density of at least 1,000 people per square mile) must comply with Phase II. A community does not need to have an impaired waterway for it to be required to participate in Phase II.

MS4s in Chittenden County include nine municipalities and three other public entities:

<table>
<thead>
<tr>
<th>Burlington</th>
<th>Essex Junction</th>
<th>South Burlington</th>
<th>Burlington International Airport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colchester</td>
<td>Milton</td>
<td>Williston</td>
<td>The University of Vermont</td>
</tr>
<tr>
<td>Essex</td>
<td>Shelburne</td>
<td>Winooski</td>
<td>VTrans</td>
</tr>
</tbody>
</table>

Each of these 12 MS4s must submit to DEC’s Water Quality Division a Notice of Intent (NOI) for coverage under a “Phase II General Permit” issued by VANR. Each MS4 must describe in its NOI a program that is designed to reduce the discharge of pollutants to the “maximum extent practicable,” protect water quality, and satisfy the appropriate water-quality requirements of the *Clean Water Act*. To accomplish these objectives, the NOI must indicate a five-year program of “best management practices” and “measurable goals” that the community has selected to satisfy each of six “minimum control measures”:

- Public education and outreach
- Public participation and involvement
- Illicit discharge detection and elimination
- Construction site runoff control
- Post-construction site runoff control
- Pollution prevention and good housekeeping

All 12 of the County’s MS4s jointly undertake the public education and outreach minimum control measure by collaborating on the Regional Stormwater Education Program (RSEP).\(^8\,\!^8\)
**Municipal Regulations**

In the early 1970s, Chittenden County municipalities also began to recognize the problems of stormwater runoff. Several of the County’s municipalities require the creation of undisturbed and vegetated riparian buffer zones. In 1984, South Burlington adopted a watershed-based ordinance regulating stormwater for the Bartlett Brook watershed.

For decades, our approach to stormwater management focused on reducing the flooding caused by major storms by promulgating regulations that require private land developments to build stormwater-management structures (e.g., swales, road ditches, catchbasins, storm-drain pipes, dry basins, and detention/retention ponds). This approach treated stormwater as a “problem,” focused on managing the quantity of stormwater and its rate of discharge, and sought to solve the problem by building special-purpose structures.

However, now federal and State mandates as well as our own recognition of the deteriorating condition of many water bodies call on us to adapt our approach to stormwater management so that we

- Treat stormwater as a component of our system of water resources (not as a problem) and
- Address both the quality and quantity of stormwater.

Conventional stormwater management structures simply are not designed to achieve these more complex resource management goals. To do so, stormwater management likely will need to use a greater number of more flexible tools. To successfully employ a larger variety of tools to achieve a broader range of objectives, we may need to evolve new types of stormwater-management organizations (such as South Burlington’s stormwater utility).

Two factors argue for examining the potential of intergovernmental approaches to stormwater management in Chittenden County:

- Watersheds do not respect municipal boundaries. As a consequence of the *Lowes* decision, the watersheds of impaired waterways have become the subjects of general permits. This could result in municipalities having to undertake heightened stormwater-management actions. If these waters continue to be impaired, federal regulations will require the development of TMDLs that likely will demand even greater stormwater management efforts. The waterways that currently are not impaired need to be well managed to provide for future planned growth that does not result in water-quality degradation.

- The geographic proximity of the municipalities in Chittenden County that have impaired waterways and/or are required to participate in the Phase II program provides an opportunity to engage in joint cost-saving activities that take advantage of economies of scale (such as the Regional Stormwater Education Program). Even those communities not currently mandated by federal and State law to participate in these programs stand to benefit by taking part.

In past decades, when development in the County introduced new challenges, the County’s leaders considered and created a regional water-supply provider (the Champlain Water District) and a regional solid-waste management organization (the Chittenden Solid Waste District). Similarly, the County should consider regional organizational models (such as a regional stormwater utility) that could provide effective and cost-efficient stormwater management services in areas that share common challenges (such as a stormwater-impaired watershed that will be governed by a general permit under a particular TMDL or Water Quality Remediation Plan).
Flood and Stormwater Control Policies

1. All development, including transportation and other infrastructure, should use best stormwater-management practices to minimize flooding, erosion, and pollution.

2. Municipalities should consider watershed-based approaches to stormwater management, employing stormwater-management and flood-control regulations and practices that maintain the natural functions of watersheds to mitigate impacts of land development on water quality and quantity.

3. Public-sector and private-sector leaders in Chittenden County should consider a regional model (such as a regional stormwater utility) that could provide effective and cost-efficient stormwater-management services.

Solid-Waste Infrastructure

Background

Established in 1987 and operating under the authority of Vermont’s solid-waste statutes (Act 78), the Chittenden Solid Waste District (CSWD) plans, develops and operates facilities and programs for solid-waste source reduction, recycling, collection, transfer and disposal. All Chittenden County municipalities are CSWD members except Buel’s Gore.

CSWD has adopted a Solid Waste Management Plan (as required by Act 78), which discusses the District’s previous, current, and proposed activities.8-11 CSWD also has adopted a Solid Waste Management Ordinance that governs important operational issues for the District’s facilities and services, such as requiring recycling and standardizing recycling procedures.8-12

Map 8-4 depicts the locations of solid waste management facilities in Chittenden County. CSWD’s facilities include eight drop-off/recycling-centers, a wood-and-yard-waste depot and compost center, a materials-recovery facility (for large volumes of recyclables), an environmental depot (for household hazardous-waste and certain business wastes), and two solid waste transfer stations. CSWD also has identified the need for and is the process of developing a landfill site.

CSWD does not operate solid-waste collection services (these are provided by private haulers licensed by the District, by some municipalities, or by citizens at drop-off centers). CSWD operates the Rover (a truck that schedules household hazardous-waste pickup at District facilities) and also manages a biosolids-management program that recycles wastes from municipal sewage-treatment facilities. Disposal of certain types of wastes (such as medical wastes, contaminated soils, and dead animals) is handled by private companies. CSWD undertakes many educational programs on solid-waste issues and best solid-waste management practices for households and employers.
Solid Waste Infrastructure Policies

1. Solid-waste management facilities and services in Chittenden County should be planned, developed, and operated to be effective, efficient and environmentally responsible in accordance with the Chittenden Solid Waste Management District’s Solid Waste Management Plan.

2. Users of the solid-waste system should pay for the cost of the solid-waste system and fee structures should provide incentives for generating less waste, recycling, composting of yard waste, and other desirable solid-waste management practices.

Transportation and Infrastructure Rights-of-Way

Background

Transportation

We design, build, and operate our transportation infrastructure to weave together people and land uses into communities, to interconnect our communities into a region, and to link our region to the larger nation and world. Transportation infrastructure enables people to travel and to transport goods via many modes (such as pedestrian, equestrian, bikes, cars, trucks, buses, trains, planes, pipelines, or watercraft).

Different kinds of facilities may be provided for a single transportation mode. For example, people can walk on a yard, a trail through the woods, a sidewalk along a roadway, or a paved pedestrian path connecting two land uses. In some cases, we design each facility to be part of a hierarchical system to improve performance. For example, driveways connect to local roads that are connected to collector roads that are connected to arterial roads that are connected to expressways that are connected to other expressways. Map 8-5 depicts the existing major transportation infrastructure in the County.

Having a transportation system that has multiple modes and facilities enables people and enterprises to make transportation choices that suit their particular needs and preferences. Our highly mobile society values having land-use and transportation choices. Land uses with greater accessibility have greater value and we strive to make highly valued land uses more accessible.

The development choices we make have transportation consequences and vice versa. The issue is not whether land development should always be regarded as “the cause” of transportation or vice versa. However, it is always prudent to consider the interaction between land development and transportation (the “land-use/transportation nexus”) when making development or transportation choices. We expect new land development to support regional transportation goals and we expect new transportation investments to support regional land-development goals.

The character and scale of transportation infrastructure can generate significant land-use and environmental impacts. These impacts need to be evaluated when planning and operating transportation facilities and services. When federal transportation funds are to be used to construct a proposed transportation facility that could have a significant environmental impact, an Environmental Impact Statement (EIS) is prepared. An EIS assesses whether the benefits of
a proposed project justify the social and environmental costs it imposes, in comparison with alternative ways of achieving those benefits.  

Transportation infrastructure often has far-reaching effects, a long service life, and a high cost. Consequently, it is important to carefully plan transportation facilities and services. Often it is possible to achieve the same transportation benefits using different facilities or services (or combinations of facilities and services) related to one or more modes. Hence, the evaluation of the costs and benefits of transportation options is a key feature of transportation planning.

The federal government prefers that a portion of the transportation funds it provides to the states be devoted to the special transportation needs of metropolitan areas. To help ensure this, the federal government requires that any federal transportation funds granted to a state that are spent in a metropolitan area must conform to the transportation plans prepared by the Metropolitan Planning Organization (MPO) of that area.

In keeping with these federal requirements, the State of Vermont, 18 municipalities in Chittenden County (not Buel's Gore), and transportation providers in the County have formed the Chittenden County Metropolitan Planning Organization (CCMPO). CCMPO prepares

- **Metropolitan Transportation Plan (MTP)** – A long-range transportation plan that is updated at least every five years to establish goals and objectives, analyses of trends, and an inventory of proposed projects for meeting the County’s transportation needs for the next 20 years;
- **Transportation Improvement Program (TIP)** – A short-range (four-year) list of priority transportation projects and activities that is updated at least every two years; and
- **Unified Planning Work Program (UPWP)** – The annual description of the transportation planning activities of CCMPO and its member agencies (and others undertaking transportation activities in the County) that budgets the CCMPO planning funds from all sources.

Recognizing that planning in Chittenden County should heed the “land use/transportation nexus,” CCRPC and CCMPO have representatives on each other’s boards and work closely together under the terms of a 2000 Memorandum of Understanding (MOU). Specifically, this MOU provides

> The CCMPO’s MTP shall be developed in consultation with the CCRPC and incorporate land use and demographic assumptions endorsed by the CCRPC. Once the MTP has been appropriately reviewed by the CCRPC and endorsed by the member municipalities and duly adopted by the CCMPO Board of Directors, the MTP shall be integrated into and become part of the CCRPC Regional Plan.

The *2006 Regional Plan* incorporates the findings, conclusions, and recommendations of the most recent *MTP adopted by CCMPO*.

Figure 8-1 identifies the vision and goals of the *2025 MTP* and Map 8-6 depicts the major transportation infrastructure improvements recommended by the *2025 MTP*. Some of the analyses of the *2025 MTP* were based on the land-use policies of the *2001 Regional Plan*. Consequently, CCRPC looks forward to working with CCMPO to prepare an updated MTP based on the land-use policies of the *2006 Regional Plan*.

**Infrastructure Rights-of-Way**

A right-of-way is a property right that authorizes a person (including a public entity) to enter onto or cross another person’s property. Private utilities and the public acquire rights-of-way so they can construct, maintain, and operate infrastructure on a portion of a parcel without acquiring the entire property.
Rights-of-way may be acquired in different ways, such as by purchase, grant (grants made to public entities often are referred to as “dedications”), condemnation, or prescription. When a municipality designates future infrastructure rights-of-way on its Official Map (24 VSA 4421), it precludes the issuance of a zoning permit for any land development located within the designated area, provided the municipality institutes proceedings to acquire the land or an interest in it within 120 days of the denial of the permit.

Planning for future infrastructure rights-of-way has several benefits:

- Consolidating compatible infrastructure within shared rights-of-way
  - Preserves greater areas of land for open space or for development,
  - Provides for shared access roads for infrastructure maintenance,
  - Can isolate visual intrusions and make visual screening more viable, and
  - Set aside a designated zone for future expansions.

- Planning and designating rights-of-way can streamline the development process and the development review process by helping to prevent the need to relocate infrastructure.

- Planned rights-of-way that uniformly separate incompatible infrastructure help prevent costly service interruptions caused by excavation or maintenance.
Transportation and Infrastructure Rights-of-Way Policies

1. Chittenden County’s transportation facilities and services should be planned, developed, and operated in conformance with CCMPO’s 2025 Metropolitan Transportation Plan and Transportation Improvements Program, as they may be updated and revised.

2. Transportation and infrastructure rights-of-way in Chittenden County should be planned and developed in close coordination with land-use planning in the County to promote the land-use goals and objectives of adopted municipal and regional plans.

Telecommunications

Background

Although many people regard telecommunications as a new type of infrastructure, “telecom” infrastructure has existed since the mid-1800s with the advent of the telegraph. Each new form of telecommunications (such as the telephone, radio, television, mainframe computer networks, microwave transmission, laser and fiber-optic transmission, cable TV, satellite dishes, the Internet, personal computers, fax machines, cell phones/personal communication devices, satellite radio, and broadband Internet access) has created new economic- and community-development issues. Government telecom regulations have evolved as they attempted to keep pace with these new industries and issues.

Telecom services provide important benefits to Chittenden County’s residents, visitors, businesses, organizations, and governments:

- Telecom services such as cellular telephones provide residents and visitors with more effective personal communications;
- Telecom services such as high-speed digital communications are critically important economic-development assets in the global information-based economy; they help Chittenden County’s employers to overcome the County’s remoteness from major national and international markets; and
- Telecom services such as E911 enable local governments to respond more quickly and effectively to personal and community emergencies.

The industries that produce these infrastructure systems and those that provide telecom services are among the most significant growth sectors of our economy. Telecom providers (the companies that provide telecom services) competing with one another to provide functionally equivalent services may rely on different types of telecom infrastructure. Digital technologies increasingly enable providers to bundle multiple telecom services (such as bundling cable TV with broadband Internet access).

There are two basic types of telecom infrastructure:

- Landlines – Systems that depend on wires or fiber-optic cable for transmitting telecom signals and
- Wireless – Systems that depend on broadcast signals via antenna or satellites for transmitting telecom signals.
Because landlines and wireless infrastructure can have adverse aesthetic and environmental impacts and should be able to interconnect, it is important for municipalities to plan and manage the expansion of telecom facilities in the County.

Municipal authority to regulate telecom infrastructure and telecom providers is limited by both federal and State law. One of the purposes of the federal Telecommunications Act of 1996 was to remove barriers to the expansion of telecom services. Because one of the telecom industry’s perceived barriers is overregulation by state and local governments, the 1996 Telecom Act established five major limits on state and local regulations of wireless telecom facilities (see Figure 8-2). Numerous lawsuits have sought clarification of the precise scope of these limits. Vermont uses Section 248 proceedings to evaluate certain types of telecom infrastructure and Act 250 to evaluate others.

Nevertheless, municipalities may impose restrictions within these limits to better manage telecom infrastructure. For example, a community can promote the collocation of wireless antennas onto existing towers or structures (rather than permitting the construction of multiple towers) or require tower designs that blend visually into the natural landscape. Municipalities also may promote the development of telecom infrastructure and manage the provision of telecom services through the exercise of nonregulatory powers (such as making municipal property available as a location for telecom infrastructure at low or no cost).

**Figure 8-2**  
Federal Telecom Act of 1996 –  
Five Major Limits on State and Local Regulations

1. **No Prohibition of Wireless** – Requirements may not prohibit or have the effect of prohibiting the provision of wireless telecom services.

2. **No Consideration of Signal Impacts** – If a wireless telecom facility meets the technical emissions standards set by the Federal Communications Commission, it is presumed to be safe and no local denial or restriction on a request or application to place or construct a wireless telecom facility can be based on grounds that its radio frequency emissions would be harmful to the environment or to the health of residents.

3. **No Discrimination Among Competing Wireless Providers** – Requirements may not unreasonably discriminate among wireless telecom providers that compete against one another.

4. **Actions Within a Reasonable Time** – A government must act within a reasonable period of time on a request or permit application to place or construct a wireless telecom facility.

5. **Denials Must Be in Writing and Be Based on Evidence in a Written Record** – A denial of a request or permit application to place or construct a wireless telecom facility must be in writing and must be based on evidence in a written record before the body making the denial.

Telecommunications Policies

1. All areas in Chittenden County should be served by high-speed Internet access (at least 500 kilobits per second).

2. Telecom infrastructure (including access roads and support buildings) should be balanced with maintaining Chittenden County’s scenic and environmental qualities and economic vitality.

3. Whenever feasible, wireless telecom antennas should collocate on towers or suitable structures, landlines should collocate in shared conduit or on shared poles, and newly constructed facilities should be designed to accommodate collocation of reasonably anticipated additional future facilities.

4. The owners of proposed telecom facilities should be required to post reasonable and adequate funds to pay for the dismantling of such infrastructure if it becomes unused after it is built.

5. Unused telecom facilities should be dismantled within a reasonable amount of time after their use has ended.

6. Where economically feasible, landlines should be located in underground conduit, rather than on above ground poles.

Resources

The following resources provide further information on the major topics of this chapter.

Water Supply

Wastewater Treatment


Flood and Stormwater Control
Chittenden County Regional Stormwater Education Program (RSEP). www.smartwaterways.org/.


Solid Waste Management
Chittenden Solid Waste District. www.cswd.net/.
Transportation and Rights-of-Way


Chittenden County Metropolitan Planning Organization. www.ccmpo.org/.


Vermont Agency of Transportation. www.aot.state.vt.us/.

Telecommunications


Notes

8-1 In areas not serviced by fire hydrants, farm ponds and dry hydrants are important parts of a community’s firefighting infrastructure.

8-2 “Public” water system describes a system that serves multiple users, regardless whether the system is owned or operated by a government, so that it might also be described as a “centralized,” “community” or “shared” system.

8-3 For more information on the National Flood Insurance Program and Flood Mitigation Program, see www.fema.gov/business/nfip/.

8-4 For more information on the State’s watershed and basin plans, see www.anr.state.vt.us/dec/waterq/planning.htm.


8-6 For more information on the State’s Stormwater Discharge Permits, see www.anr.state.vt.us/dec/waterq/stormwater/htm/sw_permits.htm.

8-7 For more information on the State’s plans for stormwater-impaired watersheds, see www.anr.state.vt.us/dec/waterq/stormwater/htm/sw_impaired.htm.

8-8 For more information on RSEP, see www.smartwaterways.org/.

8-9 For more information on South Burlington’s stormwater utility, see www.south-burlington.com/stormwater/.

8-10 For a very concise overview of stormwater utilities, see www.nrdc.org/water/pollution/storm/chap4.asp.

8-11 CSWD’s *Solid Waste Management Plan* is posted at www.cswd.net/about_us/swmp.shtml.

8-12 CSWD’s *Solid Waste Management Ordinance* is posted at www.cswd.net/about_us/swmo.shtml.

8-13 For more information on Environmental Impact Statements, see www.epa.gov/compliance/nepa/.
Community Facilities

Community facilities provide a range of important services that contribute to our quality of life, as well as building and reinforcing neighborhood, community, and regional identity. This chapter discusses three major types of community facilities (places of assembly and community service centers, child-care facilities, and recreation facilities). Each of these sections presents background information and recommends policies related to that type of community facility.

Introduction

Because community facilities are types of infrastructure, they have the characteristics and features of infrastructure that are described in the Introduction to Chapter 8. As infrastructure, a community facility consists of three components: capital facilities, maintenance services, and operating services. Operating services are particularly significant for most community facilities in determining the nature of the actual services they provide (for example, a school building provides a place for students to learn, but teachers do the educating).

Chapter 8 addresses the types of infrastructure that provide services to the sites of households and employers (water supply, wastewater treatment, flood and stormwater controls, solid waste management, transportation, and telecommunications). The community facilities addressed in this chapter typically provide services to households and employers at centralized locations (that is, users must go to the site of the service provider to be served). They include

- **Places of Assembly and Community Service Centers** – such as municipal buildings, community centers, public commons, and other gathering places for community and social relationship,
- **Child-Care Facilities** – including licensed, school-based, and home-based providers, and
- **Recreation Facilities** – for both active and passive recreation.

Because a community facility often serves a specific geographic area, a particular facility may be a cornerstone of community identity (for example, a school or park). In addition, community facilities often provide services to many people simultaneously, building a sense of belonging to or sharing in a common community such as participating in town meeting, a worship service, or a recreation league.

Increasing a community facility's accessibility to the people it is intended to serve typically makes it more effective. For most community facilities (such as a theater or social hall), this means that its location should make it easy for people to come to the facility. In the case of a service center (such as a fire station), this means that its location should provide for effective and efficient service delivery. Because the capital facility component of a community facility is expected to have a long service life, it is important to consider the needs of future clients of the facility when planning its location and design.

Planning the location and design of a community facility also should take into account any impacts that can positively or adversely impact nearby land uses. For example, the traffic generated by a facility that draws the public to it (such as a post office) may be valued by nearby commercial land uses. In some cases, managing the operations at a community facility is
sufficient to address concerns of adverse effects (for example, limiting the hours of operation). Potential adverse environmental impacts also must be considered. For example, rain should not be allowed to erode a road salt pile at a highway maintenance garage, causing it to leach into the groundwater or surface waters.

Many community facilities are owned and operated by public entities. However, facilities may be publicly owned but operated by a private concessionaire or may be privately owned and operated. Regardless of whether a facility is public or private, public access to or use of the facility may be restricted; for example, user fees or membership may be required.

Places of Assembly and Community Service Centers

Background

A place of assembly is a community facility where people gather to engage in an activity such as a place of worship or community center (see Map 9-1). A service center is a community facility where people go to obtain a particular service, such as a school or library, or is the base of operations from which a particular service is provided such as a post office (see Map 9-2). Public Safety Service Centers – such as police stations, fire stations, and hospitals – are discussed in Chapter 9. Of course, a particular facility may serve both as a place of assembly and a community service center.

Some places of assembly and community service centers are intended to serve local needs (such as a municipal building, elementary school, or local library), whereas other facilities are intended to serve the needs of the region or even greater areas (such as a federal or State office, college, or museum).

Places of Assembly and Community Service Center Policies

1. A place of assembly or community service center should be located in a State or locally designated growth center (such as a historic downtown) unless this would violate siting considerations central to the purpose of the facility, no suitable site exists, or each suitable site is prohibitively costly.

2. A place of assembly or community service center that serves the needs of the County or a greater area should be located where it is accessible from residential or mixed-use areas in a Metropolitan Planning Area or Transition Planning Area unless considerations central to the purpose of the facility require it to be located elsewhere.

3. A place of assembly or community service center that serves local needs should be located, where it is accessible from residential or mixed-use areas in the Metropolitan Planning Area, Transition Planning Area, or Village Planning Area of the community it is intended to serve unless considerations central to the purpose of the facility require it to be located elsewhere.

4. A place of assembly or community service center should be planned, developed, and operated to promote positive community impacts and to minimize adverse impacts on nearby land uses and the environment.
Child Care

Background

Quality child-care services provide important benefits to a community and the region.

- **Contribute to Early Childhood Development** –
  - Prepare children for schooling, resulting in
    - Improved educational performance and
    - More economically productive careers.
  - Enhance children’s social skills, resulting in
    - Greater personal and community civility and
    - Reduced crime.

- **Enable Parents of Young Children to be Workers** –
  - Make it possible for many parents to work and
  - Reduce employers’ recruiting and training costs for new employees resulting from
    turnovers due to parents’ inability to obtain adequate child-care services.

- **Enhance the Productivity of Working Parents** –
  - When parents are confident their children are well-cared, parents are less-distracted and
    more-productive workers.
  - When employers provide or subsidize child-care services as an employee benefit, parents
    are more loyal and committed employees and have less work absenteeism.

- **Expand Local and Regional Economies** – When child-care providers hire local workers and
  buy goods and services from local businesses, economic development is enhanced through
  the “multiplier effect” (see Figure 6-2 and page 6.2), expanded local and State government
  revenues, and the “circle of prosperity” (see Figure 6-1 and page 6.1).

In 2003, the Vermont Legislature recognized the strategic importance of child-care services to
building communities and regions when it amended Chapter 117 to include as one of the specific
purposes to be furthered by municipal and regional planning:

> To ensure the availability of safe and affordable child care and to integrate child care issues into the
  planning process, including child care financing, infrastructure, business assistance for child care
  providers, and child care workforce development. [24 VSA 4302 (c) (13)]

In 2000, while there was variation among municipalities in the County, in most communities
about two-thirds of children under six and more than three-fourths of children 6 to 17 were in
households in which all parents were in the labor force (see Table 9-1). The State’s regulations
of child-care providers focus on providers who care for children under the age of 13. For this
reason, it is important to estimate the need for and supply of such child-care services. In 2000,
almost 17,000 children under 13 years old in the County were in households where all parents
were in the labor force (see Table 9-2). Consequently, this number likely represents the
maximum demand for child-care services. Some of these households may schedule parental
work responsibilities or use informal child care (extended family or friends) so that they do not
require formal child-care providers. However, some households in which one or more parents
are not in the labor force also may make use of the limited supply of child-care providers.
### Table 9-1

**CHILDREN UNDER 18 YEARS OLD WITH ALL PARENTS IN THE LABOR FORCE, 2000**

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Number</th>
<th>Children Aged Under 6</th>
<th>Children Aged 6-17</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total Number</td>
<td>With All Parents in the Labor Force</td>
</tr>
<tr>
<td>Bolton</td>
<td>99</td>
<td>79</td>
<td>79.8%</td>
</tr>
<tr>
<td>Burlington</td>
<td>1,885</td>
<td>1,231</td>
<td>65.3%</td>
</tr>
<tr>
<td>Charlotte</td>
<td>273</td>
<td>184</td>
<td>67.4%</td>
</tr>
<tr>
<td>Colchester</td>
<td>1,230</td>
<td>780</td>
<td>63.4%</td>
</tr>
<tr>
<td>Essex Townc</td>
<td>1,389</td>
<td>877</td>
<td>63.1%</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>378</td>
<td>250</td>
<td>66.1%</td>
</tr>
<tr>
<td>Burlington</td>
<td>1,885</td>
<td>1,231</td>
<td>65.3%</td>
</tr>
<tr>
<td>Charlotte</td>
<td>273</td>
<td>184</td>
<td>67.4%</td>
</tr>
<tr>
<td>Colchester</td>
<td>1,230</td>
<td>780</td>
<td>63.4%</td>
</tr>
<tr>
<td>Essex Townc</td>
<td>1,389</td>
<td>877</td>
<td>63.1%</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>378</td>
<td>250</td>
<td>66.1%</td>
</tr>
<tr>
<td>Huntington</td>
<td>146</td>
<td>95</td>
<td>65.0%</td>
</tr>
<tr>
<td>Jericho</td>
<td>448</td>
<td>343</td>
<td>75.5%</td>
</tr>
<tr>
<td>Milton</td>
<td>838</td>
<td>495</td>
<td>59.1%</td>
</tr>
<tr>
<td>Richmond</td>
<td>344</td>
<td>230</td>
<td>66.9%</td>
</tr>
<tr>
<td>St. George</td>
<td>49</td>
<td>45</td>
<td>91.8%</td>
</tr>
<tr>
<td>Shelburne</td>
<td>587</td>
<td>268</td>
<td>45.7%</td>
</tr>
<tr>
<td>South Burlington</td>
<td>981</td>
<td>661</td>
<td>67.4%</td>
</tr>
<tr>
<td>Underhill</td>
<td>214</td>
<td>143</td>
<td>66.8%</td>
</tr>
<tr>
<td>Westford</td>
<td>169</td>
<td>110</td>
<td>65.1%</td>
</tr>
<tr>
<td>Williston</td>
<td>653</td>
<td>446</td>
<td>68.3%</td>
</tr>
<tr>
<td>Winooski</td>
<td>458</td>
<td>310</td>
<td>67.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10,141</strong></td>
<td><strong>6,547</strong></td>
<td>64.6%</td>
</tr>
</tbody>
</table>

---

*aBoth parents in labor force in two-parent households and one parent in labor force in single-parent households.
*bDoes not include Buel's Gore.  cIncludes Essex Junction.


### Table 9-2

**ESTIMATED CHILDREN UNDER 13 YEARS OLD WITH ALL PARENTS IN THE LABOR FORCE, 2000**

<table>
<thead>
<tr>
<th>Area</th>
<th>Children Under 6 with All Parents in the Labor Force</th>
<th>Total Number</th>
<th>% With All Parents in the Labor Force</th>
<th>Estimated Number</th>
<th>Estimated Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolton</td>
<td>79</td>
<td>111</td>
<td>79.3</td>
<td>88</td>
<td>167</td>
</tr>
<tr>
<td>Burlington</td>
<td>1,231</td>
<td>2,681</td>
<td>71.8</td>
<td>1,925</td>
<td>3,156</td>
</tr>
<tr>
<td>Charlotte</td>
<td>184</td>
<td>445</td>
<td>67.3</td>
<td>299</td>
<td>483</td>
</tr>
<tr>
<td>Colchester</td>
<td>780</td>
<td>1,503</td>
<td>75.4</td>
<td>1,133</td>
<td>1,913</td>
</tr>
<tr>
<td>Essex Townc</td>
<td>877</td>
<td>2,095</td>
<td>74.8</td>
<td>1,567</td>
<td>2,444</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>250</td>
<td>547</td>
<td>71.8</td>
<td>393</td>
<td>643</td>
</tr>
<tr>
<td>Huntington</td>
<td>95</td>
<td>210</td>
<td>70.0</td>
<td>147</td>
<td>242</td>
</tr>
<tr>
<td>Jericho</td>
<td>343</td>
<td>588</td>
<td>78.1</td>
<td>459</td>
<td>802</td>
</tr>
<tr>
<td>Milton</td>
<td>495</td>
<td>1,148</td>
<td>66.2</td>
<td>760</td>
<td>1,255</td>
</tr>
<tr>
<td>Richmond</td>
<td>230</td>
<td>511</td>
<td>77.3</td>
<td>395</td>
<td>625</td>
</tr>
<tr>
<td>St. George</td>
<td>45</td>
<td>84</td>
<td>82.5</td>
<td>69</td>
<td>114</td>
</tr>
<tr>
<td>Shelburne</td>
<td>268</td>
<td>754</td>
<td>67.9</td>
<td>512</td>
<td>780</td>
</tr>
<tr>
<td>South Burlington</td>
<td>661</td>
<td>1,390</td>
<td>77.1</td>
<td>1,072</td>
<td>1,733</td>
</tr>
<tr>
<td>Underhill</td>
<td>143</td>
<td>361</td>
<td>77.3</td>
<td>279</td>
<td>422</td>
</tr>
<tr>
<td>Westford</td>
<td>110</td>
<td>285</td>
<td>76.4</td>
<td>218</td>
<td>328</td>
</tr>
<tr>
<td>Williston</td>
<td>446</td>
<td>861</td>
<td>80.2</td>
<td>691</td>
<td>1,137</td>
</tr>
<tr>
<td>Winooski</td>
<td>310</td>
<td>573</td>
<td>71.3</td>
<td>409</td>
<td>719</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6,547</strong></td>
<td><strong>10,416</strong></td>
<td></td>
<td><strong>16,963</strong></td>
<td></td>
</tr>
</tbody>
</table>

---

*aBoth parents in labor force in two-parent households and one parent in labor force in single-parent households.
*bDoes not include Buel’s Gore.  cAverage % calculated for children aged 0-17 from Table 9-1.  dIncludes Essex Jct.

Child-care providers are regulated by the State of Vermont as follows:

- **Home-Based Care** – Those who care for children from more than two families in their home must be registered by the State and follow regulations for registered providers;
- **Child-Care Center** – Those who care for children in a children in a child-care center that is not a home must be licensed by the State and follow regulations for licensed providers; and
- **School-Aged Children** – Those who care for school-age children only in a school or center must be licensed by the State and follow regulations for school-age providers.

In 2005, there were 406 formal child-care programs in Chittenden County – 155 center-based, 228 home-based, and 23 school-based. As of January 2005, these programs had a combined capacity of almost 5,600 “slots” for children under 6 years old and about 1,900 slots for children aged six to 12 (see Table 9-3 and Map 9-3). Because slots are based on days of operation, this unit of measure does not easily translate into the number of children served. For example, a five-day slot (Monday to Friday) may be filled by one child attending all five days or by two children attending on alternate days (M/W/F and T/TH). Table 9-4 compares the year 2000 estimated maximum demand for child-care services and the year 2005 estimated supply of child-care slots. Because the estimated demand exceeds the estimated supply of child-care slots, it is likely that shortages exist when additional factors such as location, cost, time of day, and quality of services are considered.

### Table 9-3
**CAPACITY OF CHILD-CARE PROGRAMS IN CHITTENDEN COUNTY, 2005**

<table>
<thead>
<tr>
<th>Type of Program</th>
<th>Age Group Served</th>
<th>0-5 Years Old</th>
<th>3-5 Years Old</th>
<th>6-12 Years Old</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Slots*</td>
<td>Occupied Slots</td>
<td>Vacancy Rateb</td>
<td>Total Slots*</td>
</tr>
<tr>
<td>Full Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Center Based</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Based</td>
<td>3,506</td>
<td>3,204</td>
<td>8.6%</td>
<td>721</td>
</tr>
<tr>
<td>Part Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Center Based</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Based</td>
<td>1,320</td>
<td>1,069</td>
<td>19.0%</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before / After School</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Center Based / School</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based Home Based</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,397</td>
<td>1,313</td>
<td>6.0%</td>
<td>520</td>
</tr>
<tr>
<td>Totals</td>
<td>4,826</td>
<td>4,273</td>
<td>11.5%</td>
<td>736</td>
</tr>
</tbody>
</table>

* A slot may be filled by more than one child.  
b Vacancy Rate is the percentage of Unoccupied Slots / Total Slots.  

**SOURCE:** Child Care Resource Center.

### Table 9-4
**ESTIMATED NEED AND SUPPLY OF CHILD-CARE SERVICES IN CHITTENDEN COUNTY**

<table>
<thead>
<tr>
<th>Age Group Served</th>
<th>2000 Estimated Need*</th>
<th>2005 Supply (Total Slots)b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 6 Years Old</td>
<td>6,547</td>
<td>5,562</td>
</tr>
<tr>
<td>6-12 Years Old</td>
<td>10,416</td>
<td>1,917</td>
</tr>
</tbody>
</table>

*See Table 9-2.  
 b A slot may be filled by more than one child; See Table 9-3
According to the Child Care Resource (CCR), a nonprofit organization based in Williston, families struggle with lack of openings and the cost of child care. CCR concludes that the shortage of affordable quality services is most acute for children aged up to three years, because 60 percent of the requests CCR receives for assistance in locating child-care services relate to this age group (which includes only about one-fifth of the children aged 12 and under).

CCR also cautions that reported vacancy rates (see Table 9-3) may suggest the availability of slots for children. However, vacancies are explained in part by factors such as the lower quality, remote location, and high cost of some facilities. That is, reported vacancy rates document only the additional services that the existing providers could supply; they do not accurately represent community needs.

The locations of residential areas and employment centers in the County influence where child-care services would be most convenient for the households using them. The many workers who live outside the County and work at jobs inside the County also likely increase the demand for and influence the location of convenient child-care services.

The cost of child care can be a deterrent for families seeking safe and convenient services (see Table 9-5). The Vermont Agency of Human Services has established the Child Care Subsidy Program, which bases eligibility for state subsidies on gross monthly income and family size. For example, a family with three members and a gross monthly income of $1,157 is eligible for a 100-percent child-care subsidy. While this subsidy begins to address affordability issues for low-income families, middle-class families are not eligible for financial assistance. A family earning the median income in Chittenden County can expect to spend between 10 and 20 percent of its gross yearly income on child care.

In general, the State’s regulations of child-care providers require that providers meet basic standards for children’s health and safety. Some programs choose to achieve a higher standard of service recognized by accreditation by a national program. National accreditation exists for registered child care providers, licensed programs, and school-age programs. In addition, the State of Vermont recently introduced a rating system that goes beyond the basic standards set by the State’s regulations.

<table>
<thead>
<tr>
<th>Table 9-5</th>
<th>WEEKLY CHILD-CARE SERVICES COSTS, 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age Group</strong></td>
<td><strong>Full Day Care</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Center Based</strong></td>
</tr>
<tr>
<td>Under 3 Years Old</td>
<td>$166</td>
</tr>
<tr>
<td>3 to 5 Years Old</td>
<td>$140</td>
</tr>
<tr>
<td>6 to 12 Years Old</td>
<td></td>
</tr>
</tbody>
</table>

a Both parents in labor force in two-parent households and one parent in labor force in single-parent households.

b Does not include Buel’s Gore. c Includes Essex Junction.

Child-Care Policies

1. Municipal plans should formally assess the future local need for and supply of child-care services, assess whether local barriers exist for the provision of needed services, and develop action programs to reduce local barriers.

2. Municipalities periodically should review land-use and development regulations to identify needed amendments to authorize quality child-care services in appropriate locations convenient to households, including as home occupations.

3. Employers, schools, and community organizations should collaborate to ensure that affordable, quality child-care services are available to meet the different needs of households.

Recreation

Background

Chittenden County’s abundant water resources, varied terrain, extensive natural areas, and scenic rural areas provide a rich foundation for recreation in all seasons. These natural resources are supplemented by facilities supporting a wide variety of indoor and outdoor recreation activities (see Map 9-4 and Map 9-5). An extensive system of shared-use paths, on-road bike lanes, and off-road trails interconnect the County’s recreational facilities and areas (see Map 8-5).

Recreation programs make using these facilities and areas more rewarding to people with various recreational interests. These opportunities for indoor and outdoor, active and passive recreation add immeasurably to the quality of life of County residents and are a defining feature of the tourism and visitation sector of the County’s economy.

In 2003, CCRPC updated the inventory of the County’s open-space resources, including outdoor recreation areas. Table 9-6 reports the number of tracts and the acres of land in the 2003 open-space inventory that were devoted to each of 19 uses that the Vermont Department of Forests, Parks and Recreation employs statewide to categorize outdoor recreation areas. People with disabilities, seniors, and their friends and families benefit when recreational facilities are accessible and recreational programs and activities include ones that focus on their special needs.

In 2002–2004, CCRPC studied the suitability of all lands in Chittenden County to perform each of 11 categories of outdoor recreation (see Table 9-7). CCRPC staff worked closely with a technical advisory group composed of outdoor recreation experts to identify and measure the physical features and characteristics that support each group of outdoor recreation activities that share common resource requirements.
Table 9-6
USES OF CHITTENDEN COUNTY OUTDOOR RECREATION AREAS AND FACILITIES

<table>
<thead>
<tr>
<th>Use</th>
<th>Tracts</th>
<th>Acres</th>
<th>% of Total Acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publicly Owned Fish, Wildlife, Forest Management</td>
<td>57</td>
<td>24,634</td>
<td>55.3%</td>
</tr>
<tr>
<td>Natural or Scenic Area</td>
<td>435</td>
<td>6,662</td>
<td>15.0%</td>
</tr>
<tr>
<td>Skiing</td>
<td>4</td>
<td>6,258</td>
<td>14.1%</td>
</tr>
<tr>
<td>Trail Activities (incl. Horseback, stables)</td>
<td>25</td>
<td>1,906</td>
<td>4.3%</td>
</tr>
<tr>
<td>Golf</td>
<td>27</td>
<td>1,826</td>
<td>4.1%</td>
</tr>
<tr>
<td>Park</td>
<td>213</td>
<td>1,748</td>
<td>3.9%</td>
</tr>
<tr>
<td>Beach/Swimming</td>
<td>27</td>
<td>389</td>
<td>0.9%</td>
</tr>
<tr>
<td>Court and Field Games</td>
<td>39</td>
<td>220</td>
<td>0.5%</td>
</tr>
<tr>
<td>Recreation Resorts</td>
<td>4</td>
<td>212</td>
<td>0.5%</td>
</tr>
<tr>
<td>Camping, or Camp Area, (e.g., Scouts)</td>
<td>5</td>
<td>202</td>
<td>0.5%</td>
</tr>
<tr>
<td>Archery and Target Shooting</td>
<td>4</td>
<td>133</td>
<td>0.3%</td>
</tr>
<tr>
<td>Boat Marinas and Launch Areas, Boat Rentals</td>
<td>21</td>
<td>123</td>
<td>0.3%</td>
</tr>
<tr>
<td>Recreation Route (Bikeways, Recreation Paths)</td>
<td>31</td>
<td>60</td>
<td>0.1%</td>
</tr>
<tr>
<td>Fishing Access</td>
<td>7</td>
<td>58</td>
<td>0.1%</td>
</tr>
<tr>
<td>Hunting or Shooting Preserve</td>
<td>1</td>
<td>51</td>
<td>0.1%</td>
</tr>
<tr>
<td>Picnicking and Playgrounds</td>
<td>9</td>
<td>41</td>
<td>0.1%</td>
</tr>
<tr>
<td>Curling, Sledding, Outdoor Skating</td>
<td>1</td>
<td>11</td>
<td>0.0%</td>
</tr>
<tr>
<td>Amusement Areas</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Race Track or Motor Courts</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>910</td>
<td>44,534</td>
<td>100.0%</td>
</tr>
</tbody>
</table>


Table 9-7
OUTDOOR RECREATION MEASURES
DEVELOPED FOR PHASE II OF THE CCRPC OPEN SPACE PLAN

<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Examples of Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airports</td>
<td>Motorized Flying, Non-Motorized, Soaring, Skydiving</td>
</tr>
<tr>
<td>Alpine Sports</td>
<td>Alpine Skiing, Snow Boarding</td>
</tr>
<tr>
<td>Interaction with the Natural World</td>
<td>Rock Climbing, Tracking, Bird Watching</td>
</tr>
<tr>
<td>Large Area Specialized Activities</td>
<td>Golf, Fairgrounds, Gun/Archery Clubs</td>
</tr>
<tr>
<td>Large Water Area Activities</td>
<td>Motor Boating, Water Skiing, Sailing, on Large Lakes &amp; Rivers</td>
</tr>
<tr>
<td>Lineal, Trail-Based Activities</td>
<td>Hiking, Cycling, Horseback Riding, And Nordic Skiing</td>
</tr>
<tr>
<td>Motorized Snow Sports</td>
<td>Snowmobiling, Snow Mobile Racing</td>
</tr>
<tr>
<td>Playground / Field / Park Activities</td>
<td>Organized Field Sports, Skateboarding, Kite Flying</td>
</tr>
<tr>
<td>Recreation Path Activities</td>
<td>Walking, Jogging, Roller Skating</td>
</tr>
<tr>
<td>Small Water Area Activities</td>
<td>Swimming, Canoeing, Fishing on Ponds &amp; Streams</td>
</tr>
<tr>
<td>Woods / Forest Activities</td>
<td>Hunting, Trapping, Sugaring</td>
</tr>
</tbody>
</table>


Recreation Policies

1. Chittenden County residents and visitors should be served by facilities and programs that are planned and designed to provide opportunities for recreational activities that are in demand by people of all ages and physical abilities, accessible, and affordable.

2. When appropriate, recreation facilities and areas in Chittenden County should be connected by a network of pedestrian/bicycle paths and be within walking distance of residential areas and employment centers.
Resources

The following resources provide further information on the major topics of this chapter.

Child Care

Child Care Resource.  www.childcareresource.org/.


Recreation

Local Motion.  www.localmotionvt.org/.

Vermont Department of Forests, Parks, and Recreation.  www.vtfpr.org/.

Notes

9-1The U.S. Department of Commerce estimates that in 2002, about two-thirds of children under five years old whose mothers were employed and about one-sixth of children five to 14 years old whose mothers were employed were in regular child care not involving care by relatives. Julia Overturf Johnston, “Who’s Minding the Kids? Child Care Arrangements: Winter 2002”; U.S. Dept. of Commerce, Economics and Statistics Administration (P70-101; Survey of Income and Program Participation — SIPP); October, 2005; Tables 2 and 4.

9-2The U.S. Department of Commerce estimates that in 2002, about one-fourth of children under five years old whose mothers were not employed and about one-tenth of children five to 14 years old whose mothers were not employed were in regular child care not involving care by relatives. Julia Overturf Johnston, “Who’s Minding the Kids? Child Care Arrangements: Winter 2002”; U.S. Dept. of Commerce, Economics and Statistics Administration (P70-101; Survey of Income and Program Participation — SIPP); October, 2005; Tables 2 and 4.

9-3 Child Care Resource Center, “Child Care in Chittenden County,” 2005.

9-4 Vermont Agency of Human Services: Child Development Division.  Child Care Benefits: Income Eligibility.  www.brightfutures.dcf.state.vt.us/vtcc/process.do?1Mmr3gjumkz13-SgYEjWekr5%3dxgwJ3YEa.aU7zaju.xnn.xGOOh-O6-Ou%2bOD%256U60%256USG.qPggwEkoU3peYY.wjRszYgwUVm3wijR_mszrZsszer_uYUsmsgUWVjUv3mWgwkmnpwUVm3wjr_YY_ujiRuz1rgk13S500SqdD56h6_q.

9-5 See www.starsstepahead.org/.

9-6 For example, Partners In Adventure works with local organizations to provide youth aged 12-21 who have disabilities with non-disabled peers for a summer camp experience (see www.partnersinadventure.org/). Vermont Adaptive Ski and Sports provides access to and instruction in sports and recreational activities to individuals with disabilities (see www.vermontadaptive.org/). The Vermont Center for Independent Living provides a list of other organizations that offer recreational and social programs for people with disabilities (see www.vcil.org/links/recreationlinks.html).

9-7 Maps of these 11 measures are posted on CCRPC’s website: www.ccrpcvt.org.
Energy

Diverse, reliable, affordable, and environmentally responsible energy supplies are essential. The choices we make about which technologies to use and which energy sources they require affect our economic independence as well as the global and County environment. This chapter presents background information on energy consumption by transportation, residential, industrial, and commercial users and then on the production of electricity and renewable energy and finally recommends energy policies.

Overview

Energy planning and policies should be based on a solid foundation of information. Although information about the energy produced for sale to consumers is available, reliable information is lacking for entire categories of energy use (such as the energy generated by individual consumers for their own use or the energy saved by consumers who adopt energy conservation measures or who convert from one energy source to another).

In addition, most energy information that is available applies to Vermont, but not specifically to Chittenden County. Although the County has about one-fourth of the State’s population and about one-third of the State’s employment, the County’s economy and land-development pattern – as well as the lifestyles of many County residents – are qualitatively different from those of much of the rest of Vermont. As a result, it is likely that the County’s consumption and production of energy differ from Vermont’s as a whole. Consequently, we must use Vermont-wide data to estimate the facts that shape the County’s energy policy.

Vermont currently is highly dependent on certain nonrenewable energy sources (petroleum, nuclear electricity, natural gas, and coal), as opposed to renewable energy sources (hydroelectric, “wood and waste,” wind, photovoltaic, solar thermal, and geothermal energy (see Figure 10.1)). Nonrenewable energy sources can have major drawbacks, such as rising costs and production and consumption methods that can have adverse impacts on human health, wildlife habitats, and the global climate. We can avoid or minimize these drawbacks by using energy more efficiently, by increasing our use of renewable energy sources, and by establishing a more energy-efficient land-development pattern.

Vermont’s total energy consumption increased by more than 30 percent from 1980 to 2001 (see Table 10-1). Consumption of nonrenewable energy sources increased at a higher rate than total energy consumption, mostly because of increased consumption of petroleum. Consumption of natural gas (often regarded as the cleanest burning fossil fuel) doubled, while consumption of coal (relatively insignificant even in 1980) decreased by 80 percent during this period. Nuclear electricity consumption increased at a slightly greater rate than total energy consumption.

Consumption of renewable energy sources increased by about one-fifth from 1980 to 2001. Among renewable energy sources, the greatest increase – in terms both of absolute numbers and the rate of increase – was in the category of “other” (i.e., wind, photovoltaic, solar thermal, geothermal, biodiesel, and net imports of electricity). The use of wood declined during this period, whereas the use of hydroelectric energy remained nearly the same. The shift from positive to negative values of the “net interstate flow of electricity” in Table 10-1 indicates that Vermont went from being an importer of electricity produced out of state to being an
Figure 10-1
VERMONT ENERGY SOURCES, 2001
(Trillions of British Thermal Units [BTUs], Rounded to the Nearest 100s of Billions)

Table 10-1
1980–2001 CHANGE IN ENERGY SOURCES FOR VERMONT
(Trillions of British Thermal Units [BTUs], Rounded to the Nearest 100s of Billions)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>Nonrenewable Sources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petroleum</td>
<td>61.6</td>
<td>49.3%</td>
<td>88.9</td>
</tr>
<tr>
<td>Nuclear Electric</td>
<td>32.5</td>
<td>26.0%</td>
<td>43.6</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>4.0</td>
<td>3.2%</td>
<td>8.0</td>
</tr>
<tr>
<td>Coal</td>
<td>0.5</td>
<td>0.4%</td>
<td>0.1</td>
</tr>
<tr>
<td>Total</td>
<td>98.6</td>
<td>79.1%</td>
<td>140.6</td>
</tr>
<tr>
<td>Renewable Sources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydroelectric</td>
<td>8.4</td>
<td>6.7%</td>
<td>9.0</td>
</tr>
<tr>
<td>Wood</td>
<td>13.3</td>
<td>10.7%</td>
<td>8.7</td>
</tr>
<tr>
<td>Other*</td>
<td>0.6</td>
<td>0.5%</td>
<td>9.2</td>
</tr>
<tr>
<td>Total</td>
<td>22.3</td>
<td>17.9%</td>
<td>26.9</td>
</tr>
<tr>
<td>Net Interstate Flow Of Electricity</td>
<td>3.8</td>
<td>3.0%</td>
<td>-3.8</td>
</tr>
<tr>
<td>Total</td>
<td>124.7</td>
<td>100.0%</td>
<td>163.6</td>
</tr>
</tbody>
</table>

*Other is wind, photovoltaic, solar thermal, geothermal, and net imports of electricity.

SOURCE: Energy Information Administration, “State Energy Data 2001: Consumption – Vermont, Table 7.”
exporter during this period (most likely attributable to greater reliance on the Vermont Yankee generating plant).

Vermont's total energy need is a function of the number of energy users (people and enterprises) and the amount of energy that each user consumes. Energy conservation is considered as part of the Act 250 review of certain proposed developments in Vermont [10 VSA 6086 (a) (9) (F)]. Chittenden County and Vermont have demonstrated leadership in energy conservation and renewable energy (as demonstrated by CCRPC's publication in 1996 of *Outdoor Lighting Manual for Vermont Municipalities* and Efficiency Vermont's programs and provision of energy information). We need to remain vigilant for new opportunities to take advantage of emerging technologies and practices.

One of the key ways to reduce our energy use in Chittenden County is to promote higher-density, mixed-use development and to focus development in Metropolitan, Transition, Enterprise, and Village Planning Areas. These actions would generate dual savings by reducing

- The energy we use for transportation by promoting increased pedestrian/bicycle travel and availability of transit and by reducing trip distances and vehicle-miles traveled and
- The quantities of costly and often inefficient infrastructure needed to provide energy to households and employers by consolidating transmission and distribution systems and by promoting the use of distributed generation and co-generation systems.

**Energy Consumption**

**Overview**

Of the four major energy-consumption sectors, transportation used the most energy in Vermont in 2001 (see Figure 10-2). Moreover, the 1980–2001 increase in the amount of energy used by transportation in the State was greater than the increases in the other three categories combined (see Table 10-2).

Vermont's residential energy-consumption sector used the next greatest quantity of energy in 2001 (see Figure 10-2). From 1980 to 2001, the residential sector's energy use increased by an amount that was only about one-third that of transportation (6.4 trillion BTUs versus 18 trillion BTUs) and its rate of increase was only about half that of transportation (24.7 percent versus 53.1 percent).

In 2001, Vermont's industrial energy consumption sector used slightly more than half the quantity of the energy used by the residential sector (see Figure 10-2). The industrial sector's use of energy actually declined from 1980 to 2001 (see Table 10-2). Vermont's commercial energy consumption sector used about the same amount of energy in 2001 as did the industrial sector, but the rate of increase in the Commercial sector's use of energy from 1980 to 2001 was the greatest among the four energy-consumption sectors.

Because of the lack of County-specific data, this Plan does not forecast the future demand for different types of energy by the different consumption sectors.

**Transportation**

In 2001, transportation in Vermont consumed 51.9 trillion BTUs of petroleum and consumed less than 0.05 trillion BTUs of any other energy source. This was an increase of 18 trillion BTUs (53.1 percent) of petroleum energy use from the 33.9 trillion BTUs used in 1980.
Figure 10-2
TOTAL ENERGY CONSUMPTION
BY VERMONT’S FOUR MAJOR ENERGY CONSUMPTION SECTORS, 2001
(Trillions of British Thermal Units [BTUs], Rounded to the Nearest 100s of Billions)

Table 10-2
1980–2001 CHANGE IN TOTAL ENERGY CONSUMPTION
BY VERMONT’S FOUR MAJOR ENERGY CONSUMPTION SECTORS
(Trillions of British Thermal Units [BTUs], Rounded to the Nearest 100s of Billions)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>Transportation</td>
<td>33.9</td>
<td>36.7%</td>
<td>51.9</td>
</tr>
<tr>
<td>Residential</td>
<td>25.9</td>
<td>28.1%</td>
<td>32.3</td>
</tr>
<tr>
<td>Industrial</td>
<td>22.5</td>
<td>24.4%</td>
<td>18.8</td>
</tr>
<tr>
<td>Commercial</td>
<td>10.0</td>
<td>10.9%</td>
<td>17.4</td>
</tr>
<tr>
<td>Total</td>
<td>92.3</td>
<td>100.0%</td>
<td>120.4</td>
</tr>
</tbody>
</table>


More than 80 percent of the petroleum energy used by Vermont’s transportation sector in 2001 was devoted to motor gasoline, while less than 20 percent of the sector’s energy use was distillate fuel (diesel) and two percent was aviation gasoline and jet fuel. Motor gasoline is used overwhelmingly by automobiles and trucks, although some is used to operate motorcycles, farm equipment, snowmobiles, all-terrain vehicles, lawn mowers, and other small-engine equipment.

Using more fuel-efficient vehicles, alternative-fueled vehicles, such as biodiesel and compressed natural gas, and hybrid vehicles diminish reliance on petroleum fuels, as do initiatives to manage transportation demand. Regional and community land-use patterns that concentrate people,
jobs and services in smaller geographic areas and employ transit-friendly site design (as described in CCRPC’s *Transit Oriented Design Guidelines*, posted on www.ccrpcvt.org) can facilitate greater use of transit and nonmotorized transportation (such as walking and biking). Transportation systems that are more efficient (such as transit, rail, and those that reduce congestion) also save energy. These changes may not only generate energy savings but also improve environmental quality and the health of individuals.

**Residential**

Figure 10-3 shows Vermont’s residential energy sources and Table 10-3 shows the total and per-capita change in Vermont’s residential energy sources between 1980 and 2001. From 1980 to 2001, total energy consumption by Vermont’s residential sector increased by almost one-fourth. Most of this increase apparently resulted from population growth, as the estimated growth in per capita energy use during this period was only about four percent.

- **Petroleum** – In 2001, almost two-thirds of the energy used by Vermont’s residential energy consumption sector came from petroleum. Most of this energy is used to heat homes and domestic water. Proper building design and orientation (such as active and passive solar design), energy-efficient windows and doors, addition of insulation to homes and hot water tanks, and use of alternative energy sources can help reduce residential use of petroleum. The total amount of petroleum energy used by the residential sector increased by almost 40 percent from 1980 to 2001. Because the per capita use of petroleum increased by only about 16 percent, most of the growth in petroleum energy consumption appears to have resulted from increased population.

- **Electricity** – Over one-fifth of Vermont’s residential energy use in 2001 was electricity. Home heating and cooling and domestic water heating are the major residential uses of electricity. Although the total amount of electricity used by the residential sector increased from 1980 to 2001, the per capita amount actually declined. This finding indicates that the Residential sector is employing more energy-efficient technologies, converting to other energy sources, or both.

- **Natural Gas** – In 2001, about 10 percent of Vermont’s residential energy use was from the use of natural gas. From 1980 to 2001, Vermonters increased their use of natural gas by more than 100 percent; both the total amount and the per capita amount of natural gas increased during this period.

- **Wood and Coal** – Residential use of wood and coal as fuels declined dramatically from 1980 to 2001, so that these sources combine to represent less than five percent of residential energy use in 2001.

**Industrial**

Figure 10-4 shows Vermont’s industrial energy sources and Table 10-4 shows change in Vermont’s industrial energy sources.

- **Petroleum** – In 2001, almost 40 percent of Vermont’s industrial energy consumption consisted of petroleum, the lowest percentage dependence on petroleum among the State’s four major energy-consumption sectors. However, the industrial sector increased its use of petroleum energy sources from 1980 to 2001 by almost 18 percent.

- **Electricity** – Vermont’s industrial sector used electricity to provide slightly more than 30 percent of its energy needs in 2001 and increased the quantity of electricity used by 14 percent from 1980 to 2001. Unlike the State’s residential and commercial sectors, the industrial sector uses electricity not only for heating, cooling, and lighting but also to run machinery.
Figure 10-3
VERMONT’S RESIDENTIAL ENERGY SOURCES, 2001
(Trillions of British Thermal Units [BTUs], Rounded to the Nearest 100s of Billions)

![Pie chart showing energy sources]

Table 10-3
1980–2001 CHANGE IN VERMONT’S RESIDENTIAL ENERGY SOURCES

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Per Capita</td>
<td>Total</td>
</tr>
<tr>
<td>Petroleum</td>
<td>15.3</td>
<td>29.9</td>
<td>21.3</td>
</tr>
<tr>
<td>Electric</td>
<td>6.1</td>
<td>11.9</td>
<td>6.9</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>1.3</td>
<td>2.5</td>
<td>2.8</td>
</tr>
<tr>
<td>Wood</td>
<td>3.2</td>
<td>6.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Coal</td>
<td>0.1</td>
<td>0.2</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25.9</td>
<td>50.6</td>
<td>32.3</td>
</tr>
</tbody>
</table>

*aIn trillions of British Thermal Units (BTUs), rounded to the nearest hundreds of billions of BTUs.
*bBased on 1980 population of 511,456 and a 2001 population of 612,964; in millions of BTUs.
*cCannot be calculated.

Figure 10-4
VERMONT’S INDUSTRIAL ENERGY SOURCES, 2001
(Trillions of British Thermal Units [BTUs], Rounded to the Nearest 100s of Billions)

Table 10-4
1980–2001 CHANGE IN VERMONT’S INDUSTRIAL ENERGY SOURCES
(Trillions of British Thermal Units [BTUs], Rounded to the Nearest 100s of Billions)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>Petroleum</td>
<td>6.3</td>
<td>15.9%</td>
<td>7.4</td>
</tr>
<tr>
<td>Electricity</td>
<td>5.0</td>
<td>22.2%</td>
<td>5.7</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>1.6</td>
<td>7.1%</td>
<td>2.6</td>
</tr>
<tr>
<td>Wood</td>
<td>9.5</td>
<td>42.2%</td>
<td>3.2</td>
</tr>
<tr>
<td>Coal</td>
<td>&lt; 0.05</td>
<td>*</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>22.5</td>
<td>100.0%</td>
<td>18.8</td>
</tr>
</tbody>
</table>

*Cannot be calculated.


- **Natural Gas** – Although the industrial sector’s use of natural gas represented only about 14 percent of its total energy use in 2001, the sector increased its use of natural gas by more than 60 percent from 1980 to 2001.

- **Wood** – The industrial sector reduced its use of from 1980 to 2001. However, this energy source still represented 17 percent of the sector’s energy use in 2001, the largest share among the State’s four major energy-consumption sectors.

- **Coal** – The industrial sector all but eliminated its use of coal as an energy source from 1980 to 2000.
Commercial

Figure 10-5 shows Vermont’s commercial energy sources and Table 10-5 shows change in Vermont’s commercial energy sources.

- **Petroleum** – In 2001, almost 45 percent of the energy used by Vermont’s commercial energy consumption sector was petroleum. As in the residential consumption of petroleum, most of this energy is used to heat buildings and water. Consequently, proper building orientation, insulation, and other energy-efficiency measures can help to reduce commercial use of petroleum, as can using other energy sources. The 1980–2001 rate of increase in the use of petroleum by commercial users was the lowest among the major energy sources except for coal and was about half the rate of increase in the commercial sector’s total use of energy. This finding suggests that Vermont’s businesses were substituting other sources of energy for petroleum during this period.

- **Electricity** – Electricity provided Vermont’s commercial sector with almost 40 percent of its total energy consumption in 2001. The commercial sector more than doubled its use of electricity from 1980 to 2001. This rate of increase was greater than the rate of increase in total energy, suggesting that it is the result of both growth in the commercial sector and increased use of electricity by commercial users. In addition to heating and cooling commercial buildings, electricity is used to provide indoor and outdoor lighting.

- **Natural Gas** – Natural gas provided less than 15 percent of the commercial sector’s energy needs in 2001. However, this energy source experienced the greatest rate of growth from 1980 to 2001, almost three times the rate of growth in the commercial sector’s total energy use.

- **Wood** – In 2001, the commercial sector used twice as much energy produced from wood than it did in 1980, but this represented only about one percent of its energy use.

- **Coal** – The sector’s use of coal was two percent of the total in 1980 and decreased to significantly less than one percent in 2001.

Energy Production / Supply

Overview

As described above, petroleum and natural gas provided almost 60 percent of the State’s total energy needs in 2001. Vermont has no crude oil or natural gas reserves, wells, refineries, or major oil pipelines. Most of the State depends on rail and truck delivery of gasoline, diesel, and heating fuels from distant locations that often are subject to political instability or natural disasters. There were 975 gasoline stations in Vermont in 2004 (0.6 percent of the total for the U.S.). Chittenden County is served by a natural gas pipeline and service extends to many of the urbanized parts of the County (see Map 10-1). Vermont does not have significant potential for production of coal or geothermal energy (other than ground-sourced heating and cooling).

Energy sources that are produced in Vermont include electricity, wood, wind, photovoltaic energy, and solar thermal energy (see Figure 10-6). These sources provided only about one-third of the State’s energy consumption in 2001 (see Table 10-1). This section describes the production of these energy sources (focusing on electricity).
Figure 10-5

VERMONT'S COMMERCIAL ENERGY SOURCES, 2001
(Trillions of British Thermal Units [BTUs], Rounded to the Nearest 100s of Billions)

Table 10-5

1980–2001 CHANGE IN VERMONT'S COMMERCIAL ENERGY SOURCES
(Trillions of British Thermal Units [BTUs], Rounded to the Nearest 100s of Billions)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>Petroleum</td>
<td>5.7</td>
<td>57.0%</td>
<td>7.8</td>
</tr>
<tr>
<td>Electricity</td>
<td>3.1</td>
<td>31.0%</td>
<td>6.8</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>0.8</td>
<td>8.0%</td>
<td>2.5</td>
</tr>
<tr>
<td>Wood</td>
<td>0.1</td>
<td>1.0%</td>
<td>0.2</td>
</tr>
<tr>
<td>Coal</td>
<td>0.2</td>
<td>2.0%</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>10.0</td>
<td>100.0%</td>
<td>17.4</td>
</tr>
</tbody>
</table>

*Cannot be calculated.

Electricity

The production of electricity in Vermont in 2001 for sale to others (i.e., not including production by a household or enterprise for its own use) used a number of energy sources (see Figure 10-7):

- **Nuclear Energy** (more than 75 percent of the electricity) – Vermont Yankee (a 125-acre site in Vernon, Windham County) went on-line in 1973 and its current license expires in 2012.
- **Hydropower** (about 15 percent) – Existing hydro facilities, such as the Peterson Dam, offer a renewable method of providing for a significant portion of the State’s need for electricity. In addition, about 30 percent of Vermont’s total consumption of electricity is generated by hydropower facilities in Canada.
- **Wood** (about seven percent) including Burlington’s McNeil generating plant .
- **Petroleum and Natural Gas** (about one percent).
- **Wind** (less than one percent).

Over the 21-year period from 1980 to 2001, the total amount of energy devoted to producing electricity in Vermont increased by about 15.5 trillion BTUs (37 percent; see Table 10-6). Nuclear energy was responsible for over 70 percent of this increased production, but wood was the energy source that experienced the largest rate of increase (almost 700 percent). In 2001, approximately 43.2 trillion BTUs were used in the generation, transmission and distribution of electricity to Vermont’s consumers (more than 200 percent of the electricity actually consumed). This was an increase of 10.6 trillion BTUs (32.5 percent) since 1980.

Because twice as much electric power is used to deliver the amount of electricity we see on our electric bills, saving one kilowatt/hour in a home really saves three kilowatt/hours of power.
Figure 10-7
ENERGY SOURCES FOR VERMONT’S ELECTRIC POWER GENERATION, 2001
(Trillions of British Thermal Units [BTUs], Rounded to the Nearest 100s of Billions)

Table 10-6
1980–2001 CHANGE IN ENERGY SOURCES
FOR VERMONT’S ELECTRIC POWER GENERATION
(Trillions of British Thermal Units [BTUs], Rounded to the Nearest 100s of Billions)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>Nuclear Electric</td>
<td>32.5</td>
<td>78.3%</td>
<td>43.6</td>
</tr>
<tr>
<td>Hydroelectric</td>
<td>7.7</td>
<td>18.6%</td>
<td>8.8</td>
</tr>
<tr>
<td>Wood</td>
<td>0.5</td>
<td>1.2%</td>
<td>3.9</td>
</tr>
<tr>
<td>Petroleum</td>
<td>0.4</td>
<td>1.0%</td>
<td>0.5</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>0.2</td>
<td>0.5%</td>
<td>0.1</td>
</tr>
<tr>
<td>Wind</td>
<td>0.0</td>
<td>*</td>
<td>0.1</td>
</tr>
<tr>
<td>Coal</td>
<td>0.2</td>
<td>0.5%</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>41.5</td>
<td>100.0%</td>
<td>57.0</td>
</tr>
</tbody>
</table>

*Cannot be calculated.


Electricity use may be reduced by employing strategies including cogeneration (i.e., using energy that is the byproduct of another process, such as the heat generated by machinery), distributed energy (i.e., energy production at or near end-users), conservation of electricity used, improved efficiency, and substitution of alternative energy sources (such as solar and wind power).

Four different utilities provide electric power to consumers in Chittenden County (see Map 10-2). Information about the electricity generated by households and enterprises in the County and
State for their own use is not systematically gathered. At present, this lack of reliable data precludes forecasting the future growth of cogeneration and distributed energy production in the County.

Renewable Energy

Wood is an abundant native energy resource in Vermont (approximately 70 percent of the State is forested). However, we lack reliable information about the use of wood for energy in the County.

Areas in Chittenden County near Lake Champlain and in the highlands on the eastern side of the County are, in general, suitable for wind energy applications (see Figure 10-8). According to the U.S. Department of Energy, areas with winds of at least seven meters per second (M/S) are suitable for advanced wind turbine technology under development today and areas with winds less than 5.6 M/S are unsuitable for wind energy development.10-9 Wind power can enhance Vermont’s energy self-reliance, is relatively quiet, and has minimal impacts on air and water quality, which mostly relate to site design and development. However, the most viable sites often are also the most visible, raising concerns about aesthetics and scenic views. There is no reliable information on the use of wind energy in the County.

Currently, Vermont’s low quantity of sunshine generally tends not to make large-scale solar electric power cost-effective. However, particular households and enterprises may find solar cells more economical than connection to the grid, or they may elect to pursue this option to reduce the demand for utility-generated electric power. Again, reliable information on the use of solar energy in the County is lacking.

Small-scale generation of electric power (regardless of the means) is facilitated by “net metering,” in which excess energy produced by a consumer is automatically sold to that consumer’s electric utility company. Vermont’s net metering rules establish that a utility customer may obtain a net meter after obtaining a certificate of public good from the Vermont Public Service Board, provided production meets the size limits of 15 kilowatts for residential systems and 150 kilowatts for farm systems.10-10

Methane recovery from cattle waste10-11 and landfills10-12 also is a renewable energy source.
Figure 10-8
WIND RESOURCE POTENTIAL IN CHITTENDEN COUNTY

Wind resource class | MPH | M/S
--- | --- | ---
Class 1 | 0 - 11.4 | 0 - 5.1
Class 2 | 11.5 - 13.2 | 5.2 - 5.9
Class 3 | 13.3 - 14.5 | 6.0 - 6.5
Class 4 | 14.6 - 15.7 | 6.6 - 7.0
Class 5 | 15.8 - 16.6 | 7.1 - 7.4
Class 6 | 16.7 - 18.3 | 7.5 - 8.2
Class 7 | 18.4 - 24.6 | 8.3 - 11.0

Courtesy of Vermont Environmental Research Associates, Inc.
www.northeastwind.com
Energy Policies

1. Chittenden County’s households and employers should have access to diverse, reliable, affordable, and environmentally responsible energy supplies.

2. Energy production, transmission, and distribution infrastructure in Chittenden County should be efficient, reliable, cost-effective, and environmentally responsible.

3. A larger share of the Region’s energy needs should be supplied by a combination of responsible new generation in the Region, maintenance of renewable power sources (such as hydroelectric power), improved transmission, and gains made through increased efficiency and conservation.

4. Households and employers should, on a continual basis, be informed and encouraged to adopt energy-conservation and efficiency measures, as well as to use renewable energy sources.

5. Development should be concentrated in mixed-use, higher density development in the Metropolitan, Transition, Enterprise, and Village Planning Areas to conserve energy.

6. Land development in areas that are currently or may in the future be served by transit should employ principles of transit-oriented design.

7. Residential and nonresidential buildings and structures should employ site design, building orientation and design, building materials, utility systems, and production systems that promote energy efficiency and distributed generation.

8. Chittenden County’s transportation system should use diverse sources of power, maximize energy efficiency and energy conservation, reinforce energy-efficient land-use patterns, improve the efficiency of transporting goods (especially rail), and feature a variety of travel modes (such as transit, walking, and bicycling) that reduce reliance on single occupant vehicles.

9. Municipal land-use regulations should encourage the use of small-scale renewable energy sources as accessory uses to residential and nonresidential principal uses and should encourage larger-scale renewable energy sources as principal uses.

10. Municipal land-use regulations should encourage the development of alternative-fuel refueling stations.

Resources

The following resources provide further information on the major topics of this chapter.


Notes

10.1 The Energy Information Administration reports data on the use of wood as an energy source in the category of "wood and waste." In the remainder of this chapter, including in all tables and figures, this category is described as "wood."

10.2 Wind, photovoltaic, solar thermal, and geothermal energy are part of "Other" sources in the tables and figures of this chapter.

10.3 Communities nationwide have used the Manual to reduce energy and preserve the night sky. House Bill 28 calls on the State to update the Manual’s recommended standards.


10.7 For more information on Burlington’s McNeil generating plant, see www.burlingtonelectric.com/SpecialTopics/Mcneil.htm.

10.8 Energy Information Administration, “State Energy Data 2001: Consumption – Vermont,” Tables 8, 9, and 10. One approach to inventorying energy use includes the amount of electric power used to generate, transmit and distribute electricity in the total amount of electricity consumed by each major category of user (transportation, residential, industrial, and commercial). The Regional Plan does NOT use this approach and the quantities of electric power needed to generate, transmit, and distribute the electricity used by Vermont’s consumers are NOT included in Figures 8-3, 8-4, or 8-5 or Tables 8-3, 8-4, or 8-5. Instead, the Regional Plan treats the electric power used to generate, transmit, and distribute electricity to consumers as an energy-supply consideration.


10.10 For more information on Vermont’s net metering rules, see publicservice.vermont.gov/energy-efficiency/ee_netmetering.html.

10.11 For more information on methane recovery from manure piles, see www.cvps.com/cowpower/index.shtml.

10.12 For more information on methane recovery from landfills, see www.epa.gov/lmop/.
Public Safety

The events of September 11, 2001 and Hurricane Katrina in 2005 have helped to redefine our nation’s perceptions and practices related to public safety. These disasters have prompted national, state, and local leaders to

- Reaffirm that it is better to avoid or reduce disaster than merely deal with its consequences;
- Reassess our collective ability to curb disasters previously regarded as unimaginable; and
- Reinvest in emergency preparedness.

CCRPC recently completed the Chittenden County, Vermont Multi-Jurisdictional All-Hazards Mitigation Plan (MJAHMP), which identifies ways in which the providers of public safety services in Chittenden County can better protect people and property. Highlighting the major findings of the MJAHMP, this chapter first summarizes the current capacities of public safety providers in the County and reviews the risks posed by different types of hazards in the County, before recommending public-safety policies.

Public Safety Services and Facilities

There are three major types of public safety services:

- **Law Enforcement** – Personnel who prevent and investigate crimes, apprehend criminal suspects, gather evidence for criminal prosecutions, and maintain public order;
- **Fire Protection** – Personnel who prevent and fight fires and perform specialized rescue and recovery services; and
- **Emergency Medical Service (EMS)** – Personnel who render medical aid and transport victims.

In Chittenden County, a variety of municipal, joint-municipal, State, federal, volunteer, and other private entities provide these three types of public safety services (see Table 11-1); they operate from bases that tend to be located in the more densely settled parts of the County (see Map 11-1). Providers collectively have equipment to respond to emergencies in a wide range of settings and circumstances (see Table 11-2 and Table 11-3) and are trained to respond to a wide variety of special emergencies (see Table 11-4 and Table 11-5). Collaboration between providers results in more effective and cost-efficient services, without jeopardizing the independence of these separate entities to respond to public safety events within their individual jurisdictions.

Chittenden County has two Public Safety Answering Points (PSAPs) that receive “E-911” calls: (1) Shelburne PSAP (located in the Shelburne Police Department) handles calls originating in the towns of Charlotte, Hinesburg, Richmond and Shelburne and (2) Vermont State Police Dispatch Center (located in Williston) handles calls originating in all other towns.

Public safety agencies have multichannel radio systems that permit interagency communications and typically direct communications capability between neighboring towns and counterpart agencies. Dedicated interagency radio frequencies exist for each of the services (law enforcement, fire protection, and EMS), but formal plans are not yet in place for providing back-up capabilities in the event of the failure of a major radio system or dispatch center. The State has
### Table 11-1

**PUBLIC-SAFETY PERSONNEL IN CHITTENDEN COUNTY, 2005**

<table>
<thead>
<tr>
<th>Responder*</th>
<th>Police</th>
<th>Fire</th>
<th>Emergency Medical Service Levels**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Volunteer</td>
<td>Career</td>
</tr>
<tr>
<td>Air National Guard</td>
<td>0</td>
<td>0</td>
<td>46</td>
</tr>
<tr>
<td>Bolton Fire Dept.</td>
<td>0</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>Burlington Fire Dept.</td>
<td>0</td>
<td>0</td>
<td>79</td>
</tr>
<tr>
<td>Burlington Police Dept.</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Charlotte Fire Dept.</td>
<td>0</td>
<td>26</td>
<td>0</td>
</tr>
<tr>
<td>Charlotte Rescue</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Chittenden County Sheriff</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Coast Guard</td>
<td>0</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>Colchester Fire Company</td>
<td>0</td>
<td>55</td>
<td>0</td>
</tr>
<tr>
<td>Colchester Rescue</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Colchester Tech. Rescue</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Colchester Police Dept.</td>
<td>29</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Malletts Bay Fire Dept. (Colchester)</td>
<td>0</td>
<td>35</td>
<td>0</td>
</tr>
<tr>
<td>St. Michael’s College Fire Dept. (Colchester)</td>
<td>0</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>Essex Fire Dept.</td>
<td>0</td>
<td>45</td>
<td>0</td>
</tr>
<tr>
<td>Essex Police Dept.</td>
<td>24</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Essex Rescue</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Essex Junction Fire Dept.</td>
<td>0</td>
<td>38</td>
<td>0</td>
</tr>
<tr>
<td>Hinesburg Fire Dept.</td>
<td>0</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>Hinesburg Police Dept.</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Huntington Fire Dept</td>
<td>0</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>IBM</td>
<td>0</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>Milton Fire Dept.</td>
<td>0</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>Milton Police Dept.</td>
<td>16</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Milton Rescue</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Richmond Fire Dept.</td>
<td>0</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>Richmond Police Dept.</td>
<td>9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Richmond Rescue</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Shelburne Fire Dept.</td>
<td>0</td>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td>Shelburne Police Dept.</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Shelburne Rescue</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>South Burlington Fire Dept.</td>
<td>0</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>South Burlington Police Dept.</td>
<td>36</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>State Hazmat</td>
<td>0</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Underhill-Jericho Fire Dept.</td>
<td>0</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>University of Vermont Police</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vermont State Police</td>
<td>24</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Westford Fire Dept.</td>
<td>0</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Williston Fire Dept.</td>
<td>0</td>
<td>41</td>
<td>3</td>
</tr>
<tr>
<td>Williston Police Dept.</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Williston Rescue</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Winooski Fire Dept.</td>
<td>0</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Winooski Police Dept.</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>352</td>
<td>533</td>
<td>151</td>
</tr>
</tbody>
</table>

---

*In addition, Fletcher Allen Coordinated Transport (FACT) provides three ambulances during the day and one at night to transport patients between hospitals and clinics inside and outside of the region. FACT has 14 RNs, 15 EMT-Is, and 12 other EMT staff. FACT is an Incident Medical Assistance Team (not a traditional EMS unit) and does not respond to E-911 calls but it is a member of District #3 EMS and would assist in a multiple casualty incident.

**EMS Service Levels:** ECA = Emergency Care Attendant; EMT-B = Basic Services; EMT-I = Intermediate Services.

**Source:** CCRPC, Chittenden County, Vermont Multi-Jurisdictional All-Hazards Mitigation Plan, 2005.
## Table 11-2
FIRE-FIGHTING APPARATUS IN CHITTENDEN COUNTY, 2005

<table>
<thead>
<tr>
<th>Responder</th>
<th>Engine</th>
<th>Tanker</th>
<th>Ladder</th>
<th>Responder</th>
<th>Engine</th>
<th>Tanker</th>
<th>Ladder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air National Guard</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>Huntington Fire Dept.</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Bolton Fire Dept.</td>
<td>1</td>
<td>*2</td>
<td>0</td>
<td>IBM</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Burlington Fire Dept.</td>
<td>6</td>
<td>0</td>
<td>2</td>
<td>Milton Fire Dept.</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Charlotte Fire Dept.</td>
<td>2</td>
<td>*2</td>
<td>0</td>
<td>Richmond Fire Dept.</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Colchester Fire Company</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>Shelburne Fire Dept.</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Mailett Bay Fire Dept.</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>S. Burlington Fire Dept.</td>
<td>4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>(Colchester)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Michaels Fire Dept.</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>Underh.-Jericho Fire Dept.</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>(Colchester)</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td></td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Essex Fire Dept.</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>Westford Fire Dept.</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Essex Jct. Fire Dept.</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>Williston Fire Dept.</td>
<td>4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Hinesburg Fire Dept.</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>Winooski Fire Dept.</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>44</td>
<td>19</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Includes Engine-Tanker.


## Table 11-3
SPECIAL PUBLIC-SAFETY RESPONSE MODES IN CHITTENDEN COUNTY, 2005

<table>
<thead>
<tr>
<th>Responder</th>
<th>ATV</th>
<th>Bike Patrol</th>
<th>Boat</th>
<th>Cruisers</th>
<th>Dive</th>
<th>Snowmobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burlington Police Dept.</td>
<td></td>
<td>8</td>
<td>5</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coast Guard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charlotte Fire Company</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charlotte Rescue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chittenden County Sheriff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colchester Tech. Rescue</td>
<td>2</td>
<td>X</td>
<td>16</td>
<td>X</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Colchester Police Dept.</td>
<td></td>
<td>1</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essex Fire Dept.</td>
<td>X</td>
<td>1</td>
<td>1</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essex Junction Fire Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essex Police Dept.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hinesburg Police Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milton Fire Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milton Police Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shelburne Fire Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shelburne Police Dept.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>South Burlington Police Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underhill-Jericho Fire Dept.</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vermont State Police</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Williston Fire Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winooski Police Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* = Provides Service.

Table 11-4
SPECIAL PUBLIC-SAFETY SERVICE CAPABILITIES IN CHITTENDEN COUNTY, 2005

<table>
<thead>
<tr>
<th>Responder</th>
<th>Confined Space</th>
<th>Crowd Control</th>
<th>Hostage Negotiation</th>
<th>Ice Flat</th>
<th>Swift Water</th>
<th>Tactical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air National Guard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burlington Fire Dept.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burlington Police Dept.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charlotte Fire Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charlotte Rescue</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coast Guard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colchester Fire Company</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colchester Tech. Rescue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colchester Police Dept.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malletts Bay Fire Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Colchester)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essex Police Dept.</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essex Junction Fire Dept.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IBM</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milton Fire Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shelburne Fire Dept.</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shelburne Police Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Burlington Fire Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Burlington Police Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underhill-Jericho Fire Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of Vermont Police</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vermont State Police</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winooski Police Dept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

X = Provides Service.


Table 11-5
HAZARDOUS-MATERIALS CAPABILITIES IN CHITTENDEN COUNTY, 2005

<table>
<thead>
<tr>
<th>Responder</th>
<th>Hazardous Materials Training*</th>
<th>Haz-Mat Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Awareness</td>
<td>Operations</td>
</tr>
<tr>
<td>Air National Guard</td>
<td>43</td>
<td>42</td>
</tr>
<tr>
<td>Bolton Fire Dept.</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Burlington Fire Dept.</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Burlington Police Dept.</td>
<td>26</td>
<td>8</td>
</tr>
<tr>
<td>Charlotte Fire Dept.</td>
<td>36</td>
<td>2</td>
</tr>
<tr>
<td>Charlotte Rescue</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Coast Guard</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>Colchester Fire Company</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>Malletts Bay Fire Dept.</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>(Colchester)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Michaels College Fire Dept.</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>(Colchester)</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Essex Fire Dept.</td>
<td>38</td>
<td>30</td>
</tr>
<tr>
<td>Essex Junction Fire Dept.</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Hinesburg Fire Dept.</td>
<td>36</td>
<td>31</td>
</tr>
<tr>
<td>IBM</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Milton Fire Dept.</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Milton Police Dept.</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Richmond Fire Dept.</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>South Burlington Fire Dept.</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>State Hazmat</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Underhill-Jericho Fire Dept.</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Williston Fire Dept.</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Winooski Fire Dept.</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>394</td>
<td>363</td>
</tr>
</tbody>
</table>

* Number of trained personnel or X = Provides Service.

agreements with amateur shortwave-radio operators to provide communications in the event of a catastrophic event (Radio Amateur Civil Emergency Service – RACES).

The following formal written mutual-aid plans are either in place (see Table 11-6) or under development:

- The law enforcement agencies in the County have adopted a mutual-aid agreement.
- Federal Aviation Administration regulations require the Burlington International Airport to maintain a disaster plan, signed by all agencies that respond to the airport.
- The District Emergency Medical Services Council has developed a Mass-Causality-Incident (MCI) Plan that requires all participants to sign an agreement.
- Of the 16 fire departments in the County, only eight have formed a mutual-aid organization and there are no formal written operating plans governing response of the participating agencies. Numerous unwritten agreements between fire departments exist and govern response to incidents. Most mutual aid is requested at the time of the incident based on the perceived need.
- A statewide all-services mutual-aid agreement, which will govern police, fire, emergency rescue, public works, and other local government departments in the event of an emergency, also is currently under development.

However, the existence of formal plans does not guarantee that they will be implemented or followed.

**Table 11-6**

<table>
<thead>
<tr>
<th>Participating Agencies</th>
<th>Chittenden Cnty Police Agencies Mutual Aid Agreement</th>
<th>Burlington International Airport Emergency Phase Response Plan</th>
<th>Vermont EMS District 3 Response Plans</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>District 3</th>
<th>Interstate 89 &amp; Interstate 189</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>Jan. 1, 2005</td>
<td>Dec. 15, 2005</td>
</tr>
<tr>
<td>End Date</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

Hazard Mitigation

Background

Hazard mitigation is an approach to planning for public safety that is intended to facilitate sustained efforts to reduce or eliminate long-term risk posed to people and property by the effects of reasonably predictable hazards. Hazard mitigation planning

- Analyzes the likelihood that hazards caused by natural, societal, and technological forces will result in harm to people and property,
- Inventories and assesses resources available to address significant threats, and
- Coordinates measures to reduce the risk of harm.

A hazard has two components: (1) the force causing the event and (2) the person or property being damaged. As a first step in hazard mitigation, it is helpful to classify hazards into three types based on the types of forces that cause hazard events:

- **Natural Hazards** – Such as fires, floods, or ice storms;
- **Societal Hazards** – Such as crime, riots, or acts of terrorism; and
- **Technological Hazards** – Such as chemical spills, power failures, or airplane crashes.

Clearly, one type of hazard can trigger another type, such as the 1998 ice storm, which caused widespread power failures. Hazards cannot be eliminated, but it is possible to identify what hazards exist, where they are likely to be most severe, and which actions may be taken to reduce their severity. Armed with this knowledge, hazard mitigation reduces hazard severity by

- **Altering the Hazard** – Reducing the occurrence of an event-causing force,
- **Averting the Hazard** – Redirecting damaging effects away from people and property,
- **Adapting to the Hazard** – Preparing structures and people better withstand impacts, and
- **Avoiding the Hazard** – Limiting development in disaster-prone area.

The MJAHMP’s discussions of natural hazards, societal hazards, and technological hazards are summarized in the sections that follow.

Natural Hazards

Major Fire – Urban and Wildland

Table 11-7 inventories the types of fire-protection service responses in Chittenden County in 2003. Fire is the deadliest form of disaster in the State. Of the 831 structural fires in Vermont in 2000, 12 fires resulted in 22 civilian deaths (20 of which occurred in residential fires) and $20 million in property loss. Although smoke detectors have been required in rental housing for more than 20 years and in single-family dwellings for more than 10 years, only one building involved in the fatal fires in 2000 had working smoke alarms. In some remote locations, emergency access to water is a factor in controlling fires.

Fires that destroy buildings in town centers are less common in Vermont but do occur. In the past 15 years, downtown business areas in Randolph, St. Johnsbury, Montpelier, and Enosburg experienced major fires. The fire risk is heightened in areas with older commercial buildings lacking sprinkler systems. Multistructure fires are most likely in areas of denser development and in small-lot mobile-home parks.
### Table 11-7
**TYPES OF FIRE DEPARTMENT RESPONSES IN CHITTENDEN COUNTY, 2003***

<table>
<thead>
<tr>
<th>Fire Department</th>
<th>False Alarm</th>
<th>Hazardous Condition</th>
<th>Structural Fire</th>
<th>Service – Good Intent</th>
<th>Sub-Total</th>
<th>Total Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolton</td>
<td>16</td>
<td>20</td>
<td>9</td>
<td>15</td>
<td>60</td>
<td>78</td>
</tr>
<tr>
<td>Burlington</td>
<td>671</td>
<td>124</td>
<td>165</td>
<td>431</td>
<td>1391</td>
<td>1526</td>
</tr>
<tr>
<td>Charlotte</td>
<td>21</td>
<td>34</td>
<td>12</td>
<td>7</td>
<td>74</td>
<td>80</td>
</tr>
<tr>
<td>Colchester</td>
<td>125</td>
<td>67</td>
<td>14</td>
<td>106</td>
<td>312</td>
<td>409</td>
</tr>
<tr>
<td>Essex</td>
<td>66</td>
<td>82</td>
<td>17</td>
<td>73</td>
<td>238</td>
<td>294</td>
</tr>
<tr>
<td>Essex Junction</td>
<td>27</td>
<td>25</td>
<td>16</td>
<td>24</td>
<td>92</td>
<td>104</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>14</td>
<td>45</td>
<td>15</td>
<td>12</td>
<td>86</td>
<td>109</td>
</tr>
<tr>
<td>Huntington</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>IBM</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Malletts Bay</td>
<td>44</td>
<td>34</td>
<td>23</td>
<td>23</td>
<td>124</td>
<td>349</td>
</tr>
<tr>
<td>Milton</td>
<td>14</td>
<td>27</td>
<td>14</td>
<td>5</td>
<td>60</td>
<td>96</td>
</tr>
<tr>
<td>Richmond</td>
<td>13</td>
<td>19</td>
<td>15</td>
<td>36</td>
<td>83</td>
<td>95</td>
</tr>
<tr>
<td>Shelburne</td>
<td>1</td>
<td>23</td>
<td>2</td>
<td>3</td>
<td>29</td>
<td>34</td>
</tr>
<tr>
<td>South Burlington</td>
<td>279</td>
<td>168</td>
<td>86</td>
<td>181</td>
<td>714</td>
<td>802</td>
</tr>
<tr>
<td>Underhill-Jericho</td>
<td>24</td>
<td>52</td>
<td>25</td>
<td>27</td>
<td>128</td>
<td>152</td>
</tr>
<tr>
<td>Westford</td>
<td>6</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>Williston</td>
<td>104</td>
<td>41</td>
<td>5</td>
<td>80</td>
<td>230</td>
<td>263</td>
</tr>
<tr>
<td>Winooski</td>
<td>34</td>
<td>53</td>
<td>35</td>
<td>116</td>
<td>238</td>
<td>257</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>4,041</strong></td>
<td><strong>2,259</strong></td>
<td><strong>1,198</strong></td>
<td><strong>2,865</strong></td>
<td><strong>10,363</strong></td>
<td><strong>12,680</strong></td>
</tr>
</tbody>
</table>

* Data for Richmond are for 2001 and for Williston are 2002.

**SOURCE:** CCRPC, Chittenden County, Vermont Multi-Jurisdictional All-Hazards Mitigation Plan, 2005, Table 10.

The primary form of wildland fire in Chittenden County is a brush/grass fire accidentally started by persons burning trash, leaves, or brush. Nearly all of these reported events burn one acre or less and most (83 percent) of the events occur in the months of March, April, or May. Wildfires are of greatest concern during late summer and early fall when fields and forests are most likely to contain dry fuel and when people are vacationing in these areas. The County has not experienced a major forest fire in recent years.\(^{11-4}\)

**Flood / Ice Jam**

Chittenden County experienced 29 flood events for from 1950 through 2003 in eight different calendar months with an estimated cumulative property damage of $13,545,000 and two deaths (both in the January 1996 flood). Flooding also causes stream-bank erosion, stream course alteration, and siltation of downstream aquatic habitats. Damage can result from localized flashflooding or from larger, more prolonged inundations that have a more gradual onset. Although midwinter or spring thaws with ice jams cause some flooding, summer rainstorms cause most flooding in Vermont.

A “100-year flood” – the national standard for floodplain management – is the water level of a surface water body that has a 1-in-100 (or one percent) chance of occurring in any given year. The 100-year floodplain is the area that has a one-in-100 (or one percent) chance of being inundated in any given year. These 100-year floodplain areas are delineated on municipal Flood Insurance Rate Maps (FIRMs) issued by the Federal Emergency Management Administration (FEMA). In some cases, these maps need to be updated to reflect changes in watershed development.

In Chittenden County, all municipalities except St. George and Essex Junction are enrolled in the National Flood Insurance Program (NFIP) – also administered by FEMA – which
compensates insured private property owners who are the victims of floods. The County has only six multiple-loss NFIP properties – NFIP-insured properties that have made at least two insurance claims of more than $1,000 each during a 10-year period.

Municipal water-supply sources and distribution systems and wastewater collection and treatment systems, as well as public and private hydroelectric facilities are frequently subjected to flooding. The most frequent roadway flooding in the County occurs along highways located in the lower valleys of the Lamoille and Winooski rivers. Land development, loss of woodlands, and expansion of impervious groundcover tend to cause more frequent and more severe floods. New development within floodplains places people and investment squarely in the path of the risk of harm.

Ice jams can exacerbate and drastically increase localized flood elevations. Community snow removal and disposal into streams and rivers can contribute to ice jams.\textsuperscript{11,5}

**Severe Winter Storm**

The National Weather Service defines three separate types of winter storms:

- **Severe Winter Storm** – A storm that deposits four or more inches of snow during a 12-hour period or six or more inches of snow during a 24-hour period.
- **Blizzard** – A snowstorm with sustained winds of 40 miles per hour or more, heavy falling or blowing snow, and temperatures of 10 degrees Fahrenheit or colder.
- **Ice Storm** – Rain that freezes on impact. When the ice coating reaches 0.25 inch or more in thickness, it is heavy enough to damage trees, overhead wires, and similar objects.

Chittenden County experiences severe winter storms and blizzards from frontal events, lake-effect and lake-enhanced snows, and mountain-induced events. Heavy wet snows in early fall and late spring, ice storms, and high winds cause electric-power failures. The January 1998 ice storm and the heavy snowfall in November 2005 caused power outages for several days, paralyzed transportation networks, and devastated vegetation in the Champlain Valley and Green Mountains.

**Erosion / Landslide**

Some erosion is natural and is necessary for the proper functioning of a waterway. However, severe erosion and landslides may damage infrastructure, agricultural soils, structures, natural landscapes, and aquatic habitats. Alterations of landscapes – such as increasing impervious surface or replacing natural vegetation with crops – increase runoff volumes and stream flow velocities and typically accelerate erosion, contributing to the risk for landslides. Transportation infrastructure and agricultural land are the human investments most frequently endangered by fluvial erosion hazards. Residential, commercial and other private properties also are at risk.

The Vermont Agency of Transportation maintains a list of “scour-critical” stream-crossing structures endangered by streambed scour. Of the 176 inventoried structures in Chittenden County, 44 are considered scour-critical. Many other bridges and culverts are endangered by outflanking, debris jams, or channel adjustment processes not associated with the structures themselves. Catastrophic bank failure can occur under certain geologic conditions, threatening or destroying buildings and infrastructure. A significant percentage of landslides are located within riparian corridors and are frequently associated with fluvial processes.
Earthquake

Within Chittenden County, earthquakes have not caused significant damage or loss of life. If an earthquake were to occur on one of the three fault lines closest to the County and had a magnitude commensurate with a once-in-500-year likelihood of occurrence, a computer simulation model developed by FEMA estimates that there would be 60 to 118 persons injured (with seven to 14 of these injuries requiring hospitalization and zero to three fatalities) and $76 million to $116 million in total property damage. Buildings made of wood or nonreinforced masonry and manufactured housing would be most likely to suffer damage. Transportation repair costs would be mostly for bridges and airport facilities. Utility system repairs would be primarily for wastewater facilities, gas lines, and electrical-power facilities. Estimates of generated debris or fire starts were low in all three scenarios.

Other Natural Hazards

Table 11-8 summarizes the other types of natural hazards discussed in the *MJAHMP*.

<table>
<thead>
<tr>
<th>Natural Hazard</th>
<th>Number of Recent Events</th>
<th>Major Events</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Winds*</td>
<td>113b</td>
<td>14 Events</td>
<td>$50,000 to $130,000</td>
</tr>
<tr>
<td>Hurricane Force Winds #</td>
<td>2d</td>
<td>1996 Event</td>
<td>$220,000</td>
</tr>
<tr>
<td>Hurricane</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tornado</td>
<td>5 d</td>
<td>1983</td>
<td>$2,500,000</td>
</tr>
<tr>
<td>Lightning</td>
<td>11e</td>
<td>1</td>
<td>$500,000</td>
</tr>
<tr>
<td>Hail</td>
<td>34d</td>
<td>1968 Event</td>
<td>No recorded damage</td>
</tr>
<tr>
<td>Drought</td>
<td>5</td>
<td>1988 Event</td>
<td></td>
</tr>
</tbody>
</table>

*a* Below Hurricane Force (less than 74 miles per hour).

# 1960 to 2003.

At least 74 miles per hour.

# 1950 to 2003.

# 1988 to 2003.


Societal Hazards

Crime

Table 11-9 shows crime rates for Vermont, Chittenden County, and individual communities in the County. In most cases, the crime-prevention measures undertaken by police and private individuals are designed to reduce a criminal’s ability to succeed in committing a crime against a specific potential victim, not to reduce a person’s propensity to commit crimes. Consequently, communities should strive both to protect potential victims and address the underlying causes of criminal behavior.
Table 11-9

<table>
<thead>
<tr>
<th>Area</th>
<th>Type I Crimes</th>
<th>Type II Crimes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crimes</td>
<td>Crime Rate</td>
</tr>
<tr>
<td>Vermont</td>
<td>17,143</td>
<td>27.89</td>
</tr>
<tr>
<td>Chittenden County</td>
<td>5,660</td>
<td>38.17</td>
</tr>
<tr>
<td>Bolton</td>
<td>39</td>
<td>39.92</td>
</tr>
<tr>
<td>Buels Gore</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Burlington</td>
<td>2,423</td>
<td>62.31</td>
</tr>
<tr>
<td>Charlotte</td>
<td>39</td>
<td>10.70</td>
</tr>
<tr>
<td>Colchester</td>
<td>512</td>
<td>26.69</td>
</tr>
<tr>
<td>Essex</td>
<td>491</td>
<td>26.03</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>124</td>
<td>27.92</td>
</tr>
<tr>
<td>Huntington</td>
<td>11</td>
<td>5.80</td>
</tr>
<tr>
<td>Jericho</td>
<td>57</td>
<td>11.20</td>
</tr>
<tr>
<td>Milton</td>
<td>335</td>
<td>35.08</td>
</tr>
<tr>
<td>Richmond</td>
<td>65</td>
<td>15.70</td>
</tr>
<tr>
<td>St. George</td>
<td>11</td>
<td>15.56</td>
</tr>
<tr>
<td>Shelburne</td>
<td>139</td>
<td>19.67</td>
</tr>
<tr>
<td>South Burlington</td>
<td>668</td>
<td>41.51</td>
</tr>
<tr>
<td>Underhill</td>
<td>23</td>
<td>7.64</td>
</tr>
<tr>
<td>Westford</td>
<td>53</td>
<td>25.00</td>
</tr>
<tr>
<td>Williston</td>
<td>316</td>
<td>39.76</td>
</tr>
<tr>
<td>Winooski</td>
<td>355</td>
<td>53.93</td>
</tr>
</tbody>
</table>

a Type I Crimes = Criminal Homicide, Forcible Rape, Robbery, Aggravated Assault, Burglary-Larceny-Theft (except motor vehicle theft), Motor Vehicle Theft, and Arson.
b Type II Crimes = Forgery & Counterfeiting, Fraud, Embezzlement, Stolen Property (buying, receiving, possessing), Vandalism, Sex Offenses (except forcible rape, prostitution, & commercialized vice), Drug Offenses, Family/Children (offenses against), State or Local Liquor Law Violations (except drunkenness and driving under the influence), Disorderly Conduct, Simple Assault, Weapons (carrying, possessing, etc.), Prostitution & Commercialized Vice, Gambling, Vagrancy, Driving Under the Influence, and All Other Offenses.
c Crime Rate = Number of Crimes per 1,000 Residents. d Includes Essex Junction.


Other Societal Hazards

Table 11-10 summarizes the other types of societal hazards discussed in the MJAHMP.

Table 11-10

<table>
<thead>
<tr>
<th>Societal Hazard</th>
<th>Recent Events</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Disturbance</td>
<td>None</td>
<td>Systematic records are not kept; Burlington &amp; University of Vermont officials have reported incidents of unruly crowds at local bars &amp; clubs.</td>
</tr>
<tr>
<td>Terrorism</td>
<td>None</td>
<td>The Vermont Homeland Security Unit of the Department of Public Safety has identified the most likely targets of terrorism in Chittenden County. The Vermont Emergency Management Department (VEM) reports as of 2000 that no known or suspected terrorists (potential threat elements) were operating in Vermont.</td>
</tr>
<tr>
<td>Epidemics</td>
<td>None</td>
<td>Diseases such as HIV/AIDS, cholera, malaria, and resistant tuberculosis are major disasters in some parts of the world, but not at epideic levels in Vermont.</td>
</tr>
<tr>
<td>Mass Casualty Event</td>
<td>None</td>
<td>Fletcher Allen Health Care, the region’s major hospital, currently has the capacity to treat approximately 50 emergency patients. The VT Dept. of Health is responsible for implementing statewide plans for epidemics (bioterrorism or natural events) and is undertaking a program to coordinate hospitals in the event of a mass casualty event.</td>
</tr>
</tbody>
</table>

Technological Hazards

Transportation Incident

The most common form of transportation hazard event is automotive accident. Table 11-11 identifies the “High Accident Locations” in Chittenden County designated by the Vermont Agency of Transportation.

The presence of the Burlington International Airport and Vermont Air National Guard in the City of South Burlington increases the potential for a crash of a general aviation, commercial passenger, cargo, or military aircraft. Accurately assessing the likelihood and potential casualties and damages from such incidents is difficult, beyond the limited resources of the MJAHMP. Multiple parties are acting to mitigate such hazards: The City of Burlington manages the airport, the Burlington Police Department patrol the air terminal, the Federal Transportation Security Administration screens passengers and cargo and handles perimeter security, the South Burlington Fire Department responds to fires, and the Air National Guard respond to all air crashes.

Other potential transportation incidents include the crash of a rail freight or passenger train, the grounding or sinking of a commercial passenger/car ferry or excursion/cruise vessel in Lake Champlain and a mass-casualty auto/truck/bus traffic accident. Two rail lines operate in the County (New England Central Railroad and Vermont Railroad). In recent years, New England Central has transported principally lumber, paper and steel.11-6

Hazardous Materials

The federal Emergency Planning and Community Right-to-Know Act (EPCRA) establishes guidelines for federal, State and local governments and industry to use in conducting emergency planning and providing communities with information on hazardous chemicals. Vermont has designated Chittenden County as an emergency-planning district and established a Local Emergency Planning Committee to coordinate hazardous-materials emergency planning for the County, in consultation with municipal emergency service providers, the Department of Emergency Management, and the managers of all hazardous-materials facilities in the County.

The State has identified more than 1,000 distinct sites where hazardous materials are produced or stored in the County. Approximately 200 of these sites are known to store “Extremely Hazardous Substances,” primarily toxic chemicals used for commercial and industrial purposes.11-7 About half of the hazardous materials releases that have occurred in the County in recent years involved spills of flammable or combustible liquids, typically fuels (see Table 11-12).

Pollution Event

Table 11-13 identifies the amounts of EPA-designated toxic substances reported to have been released in Chittenden County from 1987 to 2003.11-8 The U.S. Coast Guard Station in Burlington maintains data on its responses to fuel spills in Lake Champlain. Chittenden County’s only incident in recent years was a 2003 marine-fuel spill of approximately 10 gallons at the Shelburne Shipyard.

Although most algae blooms are harmless, blue-green algae sometimes produces neurotoxins that can be dangerous if ingested in large enough quantities. In 1999, two dogs died after ingesting toxic blue-green algae from Lake Champlain. Blue-green algae can form when warm water temperatures and calm winds limit vertical mixing of the lake water. During the August 2001 heat wave, officials from the Vermont Department of Health posted a blue-green algae advisory for the Lake.
## Table 11-11
HIGH ACCIDENT LOCATIONS IN CHITTENDEN COUNTY, 1998-2002

<table>
<thead>
<tr>
<th>Community / High Accident Intersection or Location</th>
<th>Segment</th>
<th>Severity Index*</th>
<th>Community / High Accident Intersection or Location</th>
<th>Segment</th>
<th>Severity Index*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Burlington</strong></td>
<td></td>
<td></td>
<td><strong>Essex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 7</td>
<td>2.940 - 3.240</td>
<td>$77,150</td>
<td>VT 15</td>
<td></td>
<td>1.355 - 1.655</td>
</tr>
<tr>
<td>US 7/North St</td>
<td>2.710 - 2.730</td>
<td>$60,113</td>
<td>Susie Wilson Rd</td>
<td></td>
<td>0.100 - 0.400</td>
</tr>
<tr>
<td>VT 127</td>
<td>2.000 - 1.300</td>
<td>$58,911</td>
<td>VT 2A</td>
<td></td>
<td>0.478 - 0.778</td>
</tr>
<tr>
<td>Colches.Ave/Barrrett St</td>
<td>0.990 - 1.000</td>
<td>$50,089</td>
<td>VT 2A</td>
<td></td>
<td>0.478 - 0.778</td>
</tr>
<tr>
<td>North Union St</td>
<td>0.000 - 0.300</td>
<td>$46,360</td>
<td>VT 2A</td>
<td></td>
<td>0.478 - 0.778</td>
</tr>
<tr>
<td>US 7</td>
<td>0.140 - 0.440</td>
<td>$45,797</td>
<td>VT 116</td>
<td></td>
<td>4.306 - 4.606</td>
</tr>
<tr>
<td>Alt US 7/North St</td>
<td>1.620 - 1.640</td>
<td>$42,727</td>
<td>FAS 0210</td>
<td></td>
<td>2.200 - 2.500</td>
</tr>
<tr>
<td>US 7/Pearl St</td>
<td>0.000 - 0.400</td>
<td>$41,277</td>
<td>VT 116</td>
<td></td>
<td>4.706 - 5.006</td>
</tr>
<tr>
<td>North St</td>
<td>0.000 - 0.300</td>
<td>$40,205</td>
<td>VT 116</td>
<td></td>
<td>5.206 - 5.506</td>
</tr>
<tr>
<td>Battery St</td>
<td>0.100 - 0.400</td>
<td>$40,783</td>
<td>VT 116</td>
<td></td>
<td>4.706 - 5.006</td>
</tr>
<tr>
<td>Pearl St</td>
<td>0.000 - 0.300</td>
<td>$40,205</td>
<td>VT 116</td>
<td></td>
<td>5.206 - 5.506</td>
</tr>
<tr>
<td>East Ave</td>
<td>0.000 - 0.300</td>
<td>$39,380</td>
<td>VT 116/FAS 0210</td>
<td></td>
<td>5.410 - 5.510</td>
</tr>
<tr>
<td>North Ave</td>
<td>2.000 - 3.100</td>
<td>$37,619</td>
<td>FAS 0208</td>
<td></td>
<td>0.160 - 0.460</td>
</tr>
<tr>
<td>North Ave</td>
<td>0.200 - 0.500</td>
<td>$36,619</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colchester Ave</td>
<td>0.100 - 0.400</td>
<td>$35,678</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 7/1-189</td>
<td>0.160 - 0.180</td>
<td>$35,116</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 2</td>
<td>0.540 - 0.840</td>
<td>$34,658</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N.th St/N. Champln St</td>
<td>0.220 - 0.240</td>
<td>$34,768</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main St</td>
<td>0.000 - 0.300</td>
<td>$30,575</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North St</td>
<td>0.300 - 0.600</td>
<td>$30,317</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 7</td>
<td>2.540 - 2.840</td>
<td>$30,036</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VT 127</td>
<td>3.200 - 3.500</td>
<td>$29,775</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VT 7</td>
<td>1.940 - 2.240</td>
<td>$28,850</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternate US 7</td>
<td>0.800 - 1.100</td>
<td>$27,968</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Ave</td>
<td>1.600 - 2.100</td>
<td>$27,009</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearl St</td>
<td>0.400 - 0.700</td>
<td>$24,508</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternate US 7</td>
<td>1.200 - 1.400</td>
<td>$23,414</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 7</td>
<td>1.140 - 1.440</td>
<td>$21,263</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altem US 7</td>
<td>1.500 - 1.800</td>
<td>$21,277</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altem US 7/Main St</td>
<td>0.990 - 1.010</td>
<td>$21,074</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Champlin St</td>
<td>0.100 - 0.400</td>
<td>$20,082</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patchen St</td>
<td>0.000 - 0.300</td>
<td>$19,740</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 2</td>
<td>0.689 - 0.158</td>
<td>$18,801</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 7</td>
<td>4.800 - 1.174</td>
<td>$17,625</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Paul St</td>
<td>0.300 - 0.600</td>
<td>$17,400</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I 189</td>
<td>0.000 - 0.240</td>
<td>$16,154</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main St</td>
<td>0.300 - 0.600</td>
<td>$15,750</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charlotte</td>
<td>3.340 - 3.540</td>
<td>$33,617</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Colchester</strong></td>
<td>3.282 - 3.582</td>
<td>$33,617</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mallets Bay Ave</td>
<td>1.200 - 1.500</td>
<td>$252,033</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 2</td>
<td>0.285 - 0.585</td>
<td>$99,847</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VT 15</td>
<td>0.316 - 0.616</td>
<td>$37,798</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Porter Point Rd</td>
<td>0.000 - 0.300</td>
<td>$33,355</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VT 127</td>
<td>3.200 - 3.500</td>
<td>$32,336</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 7</td>
<td>1.319 - 2.185</td>
<td>$31,269</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 7/VT 127/Sever Rd</td>
<td>1.910 - 2.070</td>
<td>$31,221</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 7/VT 2A</td>
<td>3.590 - 3.670</td>
<td>$30,753</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 7</td>
<td>3.377 - 3.677</td>
<td>$30,598</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VT 127</td>
<td>2.600 - 2.500</td>
<td>$27,619</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VT 2A/E.Rd/Mill Pd Rd</td>
<td>1.460 - 1.480</td>
<td>$25,313</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VT 127/Porter Point Rd</td>
<td>0.890 - 0.910</td>
<td>$24,931</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VT 2A</td>
<td>1.378 - 1.678</td>
<td>$24,859</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 7/VT 127 Bay Rd</td>
<td>3.400 - 3.480</td>
<td>$24,804</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 7</td>
<td>2.200 - 2.500</td>
<td>$21,450</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Rd</td>
<td>1.740 - 2.030</td>
<td>$19,529</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 2/I-89</td>
<td>1.800 - 2.100</td>
<td>$19,744</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Severity Index = Average accident cost using National Safety Council 2000 cost estimates of Fatality = $1,000,000, Injury = $36,500, and Property = $6,400.

### Table 11-12
**RECORDED HAZMAT RELEASES IN CHITTENDEN COUNTY, 6/2000-9/2003**

<table>
<thead>
<tr>
<th>Class of Hazardous Material</th>
<th>Number of Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1 – Explosives</td>
<td>3</td>
</tr>
<tr>
<td>Class 2 – Gases</td>
<td>19</td>
</tr>
<tr>
<td>Class 3 – Flammable liquids and combustible liquids</td>
<td>96</td>
</tr>
<tr>
<td>Class 4 – Flammable solids; spontaneously combustible materials; dangerous when wet materials</td>
<td>0</td>
</tr>
<tr>
<td>Class 5 – Oxidizers and organic peroxides</td>
<td>0</td>
</tr>
<tr>
<td>Class 6 – Toxic materials and infectious substances</td>
<td>5</td>
</tr>
<tr>
<td>Class 7 – Radioactive materials</td>
<td>0</td>
</tr>
<tr>
<td>Class 8 – Corrosive materials</td>
<td>2</td>
</tr>
<tr>
<td>Class 9 – Miscellaneous dangerous goods</td>
<td>1</td>
</tr>
<tr>
<td>Unclassified</td>
<td>80</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>206</strong></td>
</tr>
</tbody>
</table>

**Source:** CCRPC, Chittenden County, Vermont Multi-Jurisdictional All-Hazards Mitigation Plan, 2005, Table 11.

### Table 11-13
**TOXIC RELEASES IN CHITTENDEN COUNTY, 1987-2003**

<table>
<thead>
<tr>
<th>Year &amp; Location of Toxic Releases</th>
<th>Toxic Releases (Pounds)</th>
<th>Year &amp; Location of Toxic Releases</th>
<th>Toxic Releases (Pounds)</th>
<th>Year &amp; Location of Toxic Releases</th>
<th>Toxic Releases (Pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burlington</td>
<td>31,500</td>
<td>Burlington</td>
<td>85,022</td>
<td>Burlington</td>
<td>17,709</td>
</tr>
<tr>
<td>Colchester</td>
<td>138,000</td>
<td>Colchester</td>
<td>46,516</td>
<td>Colchester</td>
<td>40,969</td>
</tr>
<tr>
<td>Essex Junction</td>
<td>187,235</td>
<td>Essex Junction</td>
<td>53,975</td>
<td>Essex Junction</td>
<td>184,074</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>450</td>
<td>Hinesburg</td>
<td>4</td>
<td>Shelburne</td>
<td>5</td>
</tr>
<tr>
<td>Shelburne</td>
<td>15,750</td>
<td>Shelburne</td>
<td>8,765</td>
<td>Shelburne</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total 1987</strong></td>
<td><strong>298,609</strong></td>
<td><strong>Total 1992</strong></td>
<td><strong>148,395</strong></td>
<td><strong>Total 1998</strong></td>
<td><strong>180,474</strong></td>
</tr>
<tr>
<td>1988</td>
<td></td>
<td>1993</td>
<td></td>
<td>1999</td>
<td></td>
</tr>
<tr>
<td>Burlington</td>
<td>27,000</td>
<td>Burlington</td>
<td>46,081</td>
<td>Burlington</td>
<td>7,210</td>
</tr>
<tr>
<td>Colchester</td>
<td>159,747</td>
<td>Colchester</td>
<td>44,696</td>
<td>Colchester</td>
<td>21,296</td>
</tr>
<tr>
<td>Essex Junction</td>
<td>91,529</td>
<td>Essex Junction</td>
<td>14,928</td>
<td>Essex Junction</td>
<td>202,296</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>750</td>
<td>Shelburne</td>
<td>12,255</td>
<td>Shelburne</td>
<td>5</td>
</tr>
<tr>
<td>Shelburne</td>
<td>15,250</td>
<td><strong>Total 1993</strong></td>
<td><strong>255,366</strong></td>
<td><strong>Total 1999</strong></td>
<td><strong>230,883</strong></td>
</tr>
<tr>
<td><strong>Total 1988</strong></td>
<td><strong>234,567</strong></td>
<td><strong>Total 1999</strong></td>
<td><strong>255,366</strong></td>
<td><strong>Total 2000</strong></td>
<td><strong>289,531</strong></td>
</tr>
<tr>
<td>Burlington</td>
<td>58,094</td>
<td>Burlington</td>
<td>28,691</td>
<td>Colchester</td>
<td>29,547</td>
</tr>
<tr>
<td>Colchester</td>
<td>12,997</td>
<td>Colchester</td>
<td>45,654</td>
<td>Essex Junction</td>
<td>203,834</td>
</tr>
<tr>
<td>Essex Junction</td>
<td>125,244</td>
<td>Essex Junction</td>
<td>10,180</td>
<td>Essex Junction</td>
<td>28,807</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>500</td>
<td>Shelburne</td>
<td>5</td>
<td>Essex Junction</td>
<td>106,846</td>
</tr>
<tr>
<td>Shelburne</td>
<td>19,760</td>
<td><strong>Total 1994</strong></td>
<td><strong>208,738</strong></td>
<td><strong>Total 2001</strong></td>
<td><strong>203,834</strong></td>
</tr>
<tr>
<td><strong>Total 1989</strong></td>
<td><strong>268,099</strong></td>
<td><strong>Total 2001</strong></td>
<td><strong>208,738</strong></td>
<td><strong>Total 2002</strong></td>
<td><strong>208,738</strong></td>
</tr>
<tr>
<td>1990</td>
<td></td>
<td>1995</td>
<td></td>
<td>2002</td>
<td></td>
</tr>
<tr>
<td>Burlington</td>
<td>45,069</td>
<td>Burlington</td>
<td>27,396</td>
<td>Colchester</td>
<td>148,395</td>
</tr>
<tr>
<td>Colchester</td>
<td>5,306</td>
<td>Colchester</td>
<td>28,739</td>
<td>Essex Junction</td>
<td>136,539</td>
</tr>
<tr>
<td>Essex Junction</td>
<td>107,188</td>
<td>Essex Junction</td>
<td>103,937</td>
<td>South Burlington</td>
<td>4</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>500</td>
<td>Shelburne</td>
<td>5</td>
<td><strong>Total 2002</strong></td>
<td><strong>148,395</strong></td>
</tr>
<tr>
<td>Shelburne</td>
<td>14,005</td>
<td><strong>Total 1995</strong></td>
<td><strong>203,477</strong></td>
<td><strong>Total 2003</strong></td>
<td><strong>203,477</strong></td>
</tr>
<tr>
<td><strong>Total 1990</strong></td>
<td><strong>220,432</strong></td>
<td><strong>Total 2003</strong></td>
<td><strong>203,477</strong></td>
<td><strong>Total 2003</strong></td>
<td><strong>203,477</strong></td>
</tr>
<tr>
<td>Burlington</td>
<td>152,703</td>
<td>Burlington</td>
<td>24,958</td>
<td>Colchester</td>
<td>247,949</td>
</tr>
<tr>
<td>Colchester</td>
<td>17,057</td>
<td>Colchester</td>
<td>14,779</td>
<td>Essex Junction</td>
<td>152,350</td>
</tr>
<tr>
<td>Essex Junction</td>
<td>71,083</td>
<td>Essex Junction</td>
<td>131,836</td>
<td>South Burlington</td>
<td>2</td>
</tr>
<tr>
<td>Hinesburg</td>
<td>4</td>
<td>Shelburne</td>
<td>10</td>
<td><strong>Total 2003</strong></td>
<td><strong>249,309</strong></td>
</tr>
<tr>
<td>Shelburne</td>
<td>11,005</td>
<td><strong>Total 1996</strong></td>
<td><strong>236,634</strong></td>
<td><strong>Total 2003</strong></td>
<td><strong>249,309</strong></td>
</tr>
<tr>
<td><strong>Total 1991</strong></td>
<td><strong>250,877</strong></td>
<td><strong>Total 1996</strong></td>
<td><strong>236,634</strong></td>
<td><strong>Total 2003</strong></td>
<td><strong>249,309</strong></td>
</tr>
</tbody>
</table>

**Source:** EPA Toxic Release Inventory, 2005 (see http://epa.gov/tri/tridata/tri03/index.htm), as reported by OMB Watch, www.rtknet.org/, 2005.

---

Choo Hefu,
Other Technological Hazards

Table 11-14 summarizes the other types of technological hazards discussed in the MJAHMP.

<table>
<thead>
<tr>
<th>Societal Hazard</th>
<th>Events</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of Electrical Service</td>
<td>2005, 2003, 1998</td>
<td>Service outages are reported to be a common problem in the eastern portions of Chittenden County due to the greater frequency of high winds, heavy snow and lightning strikes, although most outages last under two hours.</td>
</tr>
<tr>
<td>Loss of Sanitary Sewer Service</td>
<td>Rare</td>
<td>On-site septic system failures may be more frequent, but the impacts are more localized.</td>
</tr>
<tr>
<td>Contamination or Loss of Water Service</td>
<td>Rare</td>
<td>The Champlain Water District (CWD), a municipally chartered, consolidated water district, supplies water to 18,400 residential connections and 2,600 non-residential connections among 12 municipal water systems in Colchester Town, Colchester Fire District #1, Colchester Fire District #3, Essex Town, Essex Junction, Jericho, the Mallets Bay Water Company, Milton, South Burlington, Shelburne, Williston, and Winooski. The Burlington Department of Public Works (BDPW) serves more than 40,000 people with about 10,000 connections within the City of Burlington and Colchester Fire District #2. Lake Champlain is the source for both the CWD and the BDPW water systems. Additional municipal water systems provide water service in Jericho, Underhill, Richmond, and Hinesburg, each serving about 300 connections.</td>
</tr>
<tr>
<td>Loss of Gas Service</td>
<td>Rare</td>
<td>Vermont Gas Company provides service to approximately 25,000 residential and commercial customers in Chittenden County. Gas supplies from Canada are brought south through Franklin County. Service areas presently include almost all of Burlington, Essex Junction, South Burlington, and Winooski and significant portions of Colchester, Essex, Milton, Shelburne, and Williston.</td>
</tr>
<tr>
<td>Loss of Telecommunications Service</td>
<td>Reported to be common in the Eastern Portions of the County</td>
<td></td>
</tr>
<tr>
<td>Failure of High Hazard Dams</td>
<td>Rare</td>
<td>Of the 41 dams in the County with impoundments greater than 500,000 cubic feet (11.48 acre-feet), the only dam that has been assigned a “high” hazard rating by the Vermont Dam Safety Program is Essex No. 19 on the Winoosi River, which impounds 6,000 acre-feet. The “high” hazard rating does not mean that there is a significant danger of failure.</td>
</tr>
</tbody>
</table>


Public Safety Policies

1. Public safety services in each of Chittenden County’s communities should have the capacity to address the types and magnitudes of the community’s predictable hazards, as defined in the community’s own Local All-Hazard Mitigation Plan.

2. Public safety services in Chittenden County should build and maintain the collective capacities to address the types and magnitudes of predictable hazards in the County, as defined in the Chittenden County, Vermont Multi-Jurisdictional All-Hazards Mitigation Plan.

3. Chittenden County’s residents, employers, and property owners should be aware of the relative frequency and severity of disaster events, the linkages among disaster events, and the measures that they can take privately and communities can take collectively to alter, avert, or avoid hazards and to adapt to hazards.
4. Because of the range of levels and types of public safety services and service providers in different parts of Chittenden County, the County’s residents, employers, and property owners should be aware of the public safety services available in various locations so they can seek locations that best suit their own security needs.

5. Municipal land-use planning and regulation in Chittenden County should appropriately consider predictable hazards, as defined in the municipality’s Local All-Hazard Mitigation Plan.

6. The location, design, development, and operation of public and private infrastructure in Chittenden County should appropriately consider predictable hazards, as defined in Local All-Hazard Mitigation Plans and in the Chittenden County, Vermont Multi-Jurisdictional All-Hazards Mitigation Plan.

7. Chittenden County’s status as the State’s largest concentration of people and employment should be considered in hazard mitigation planning.

Resources

The following resources provide further information on the major topics of this chapter.

Centers for Disease Control. www.cdc.gov/.

Chittenden County Local Emergency Planning Council #1. www.ccrpcvt.org/index.asp?Type=B_BASIC&SEC={4C69302F-C45E-48B1-88D4-57F96680F2E0}.


Vermont Department of Public Safety. www.dps.state.vt.us/.

Notes

11-1 The MJAHMP is posted at www.ccrpcvt.org. CCRPC prepared the MJAHMP with the support of State and federal funding, using protocols established by Vermont Emergency Management (VEM), under the oversight of the Local Emergency Management Planning Committee (LEPC, a group of local emergency services providers formed by federal mandate in 1988 to plan for hazardous materials issues) and following public review and comment. The MJAHMP is supplemented by 18 local hazard mitigation plans that perform more detailed hazard mitigation planning for each of the municipalities in the County (Essex and Essex Junction are governed by a single local plan). Preparation of the MJAHMP satisfies part of the federal requirements for governments and private parties to receive future federal pre- and postdisaster relief funds. The MJAHMP includes detailed discussions of risk assessment, vulnerability assessment, and mitigation strategies. Given the size of Chittenden County and the limited resources set aside to prepare the MJAHMP, the MJAHMP does not provide all of the information found in some hazard mitigation plans, such as potential-loss analyses of hypothetical incidents.

11-2 Calls for service that are not radio dispatched by the State Police are then transferred to a dispatch center (Burlington, Colchester, Contact Communications, Essex, St. Michaels College, South Burlington, UVM, Williston, or Winooski. Wireless phone calls originating within the County may be received at a “PSAP” outside the County.

11-3 Adapting to the hazard includes evacuating people and property during hazard events. The MJAHMP does not include evacuation planning. Some emergency service providers have prepared local evacuation plans for specific types of events. There is a need for coordinated evacuation planning by the Vermont Department of Public Safety.
The U.S. Forest Service’s Wildland Fire Assessment System is posted at www.fs.fed.us/land/wfas/wfas23.html.

The US Army Corps of Engineers/Cold Regions Research and Engineering Laboratory has an ice-jam database posted at www.crrel.usace.army.mil/ierd/ijdb/.


The Toxics Release Inventory (TRI) is a database of detailed information on nearly 650 chemicals and chemical categories that are managed by over 23,000 industrial and federal facilities nationwide. Under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), expanded by the Pollution Prevention Act of 1990, EPA makes this information available to the public through the tabulation of reports submitted by these facilities.
This glossary explains special terms and acronyms used in this Regional Plan and in Vermont planning practice. It is intended to be an educational resource for readers of the Regional Plan, not merely a list of defined terms to support statutory interpretation of the Plan.

Entries that state a Vermont statutory definition are preceded by a statutory citation (for example, “24 VSA 4303:” for section 4303 of title 24 of Vermont Statutes Annotated). In addition, some entries refer to a Vermont statute (for example, “See 24 VSA 4303”) to learn more about basic rules applicable to that term. Terms related primarily to zoning administration are denoted by (Z) and terms related primarily to subdivision administration are denoted by (S).

100-YEAR FLOOD – A flood that has a predicted one percent chance of occurring or being exceeded in a given year (on average, it can be expected to occur once in 100 years). 24 VSA 4303 (8) establishes the 100-year Flood as the Base Flood for the purposes of regulations adopted pursuant to Chapter 117.

ACCD – Agency of Commerce and Community Development.

ACCESS MANAGEMENT PLAN – 24 VSA 4432 (1): A municipal plan to manage traffic and access onto public roads from adjacent property that complies with 19 VSA 1111.

ACCESSORY BUILDING OR STRUCTURE (Z) – A building or structure that is subordinate to and is used for purposes that customarily are incidental to those of the principal building or principal structure located on the same lot (for example, a freestanding garage, garden shed, or fence).

ACCESSORY DWELLING UNIT (Z) – 24 VSA 4412 (1) (E): A dwelling unit that is located within or appurtenant to an owner-occupied single-family dwelling (an efficiency or one-bedroom apartment that is clearly subordinate to a single family dwelling and complies with the standards and conditions established by 24 VSA 4412 (1) (E) and (F)).

ACCESSORY USE (Z) – A land use that is subordinate to and customarily incidental to a principal use located on the same lot (for example, off-street parking for a store).

ACT 78 – The law establishing Vermont’s solid waste management program. See 10 VSA Chapter 159.


ACT 250 – The environmental review process conducted by Vermont’s District Environmental Commissions to determine whether certain types of proposed developments will cause undue adverse impact on a site and its vicinity on the basis of 10 criteria. See 10 VSA 6001 - 6108.

ACTIVE RECREATION – Recreational activities in which people actively participate in doing (such as skiing, hunting or leisure walking).

ADMINISTRATIVE OFFICER – A person officially designated by a municipality to administer and enforce a bylaw. See 24 VSA 4448.

ADMINISTRATIVE PROCEDURES ACT – The laws governing how State agencies adopt rules and regulations and render decisions in administrative proceedings. See 3 VSA Chapter 25.

ADVERSE IMPACT – Inadequate, unsafe, or unhealthy conditions that result from a Land Development.

ADVISORY COMMISSION/COMMITTEE – 24 VSA 4433: A body established by a municipality to assist the Legislative Body or Planning Commission to prepare, adopt, and implement a municipal plan. An advisory commission authorized by 24 VSA 4433 or by Chapter 118 (Conservation Commissions) may advise Appropriate Municipal Panels, applicants, and Interested Parties in accordance with the procedures established under 24 VSA 4464.

AESTHETICS – Consideration for the appearance of the natural or built environment.

AFFORDABLE HOUSING – 24 VSA 4303 (1): Housing that is owned by its inhabitants or rented by its inhabitants, whose gross annual household income does not exceed 80 percent of the county median income (or of the MSA median income if the munic-
AFFORDABLE HOUSING DEVELOPMENT to ARTERIAL STREET

Affordability is located in an MSA, as defined by the U.S. Department of Housing and Urban Development, and the total annual cost of the housing is not more than 30 percent of the household’s gross annual income. The “total annual cost of housing” includes:

a) For housing owned by its inhabitants: principal, interest, taxes and insurance and
b) For housing rented by its inhabitants, rent, utilities, and condominium association fees.

AFFORDABLE HOUSING DEVELOPMENT – 24 VSA 4303 (2): A housing development of which at least 20 percent of the units (or a minimum of five units) are affordable housing units that are subject to covenants or restrictions that preserve their affordability for a minimum of 15 years or longer, as provided in municipal bylaws.

AGENCY OF COMMERCE AND COMMUNITY DEVELOPMENT (ACCD) – The State agency that contains the departments of Economic Development, Tourism and Marketing, and Housing and Community Affairs. See www.dca.state.vt.us.

AGENCY OF NATURAL RESOURCES (ANR) – The Vermont state government agency that contains the departments of Environmental Conservation, Fish and Wildlife Resources, and Forests, Parks, and Recreation. See 3 VSA 2802 and www.anr.state.vt.us.

AGRICULTURAL RUNOFF – Stormwater that has flowed over property used for agriculture.

AGRICULTURAL SOILS – See Primary Agricultural Soils and Forestry and Secondary Soils.

AGRICULTURE – For the purposes of Vermont’s “Current Use Program” of assessing agricultural property for property taxation, 32 VSA 3752 (1) defines “agricultural land” as any land, exclusive of any house site, in active use to grow hay or cultivated crops, pasture livestock or to cultivate trees bearing edible fruit or produce an annual maple product, and which is 25 acres or more in size except as provided below. There shall be a presumption that the land is used for agricultural purposes if it

a) is owned by a farmer and is part of the overall farm unit;

b) is used by a farmer as part of his farming operation under written lease for at least three years;

c) has produced an annual gross income from the sale of farm crops in 1 of 2, or 3 of the 5, calendar years preceding of at least:

i) $2,000 for parcels of up to 25 acres; and

ii) $75 per acre for each acre over 25, with the total income required not to exceed $5,000.

iii) Exceptions to these income requirements may be made in cases of orchard lands planted to fruit producing trees, bushes or vines which are not yet of bearing age.

AIR RIGHTS – The right to separately own or use a specific volume of space located in the air above the surface of land.

ALLEY (S) – A public or private vehicular access affording only secondary means of access to abutting property.

AMORTIZATION (Z) – The process of diminishing a total sum of money by payments over a period of time sometimes used to depreciate (extinguish) the value of a nonconforming structure so that a zoning prohibition of the nonconformity avoids being a Taking.

ANNEXATION – The inclusion of land that currently is not a part of a government’s jurisdictional territory into that government’s jurisdictional territory. See 24 VSA 1316 and 1461.

ANR – The Vermont Agency of Natural Resources.

APPEAL (Z) – The process used by an authorized party to contest a zoning decision. A zoning decision made by an Administrative Officer may be appealed to a Zoning Board of Adjustment (ZBA) or to a Development Review Board (DRB); see 24 VSA 4465, 4468, and 4470. A zoning decision made by the ZBA, DRB, or Planning Commission may be appealed to the Environmental Court, unless the decision was made on the record (in which case an appeal is pursuant to Rule 74 and 75 of the Rules of Civil Procedure; see 24 VSA 4471.

APPROPRIATE MUNICIPAL PANEL – 24 VSA 4303 (3): A Planning Commission performing development review, a Board of Adjustment, a Development Review Board, or a Legislative Body performing development review. See 24 VSA 4460.

ARCHAEOLOGICAL RESOURCES – Land, water, or construction that shows evidence of artifacts or significant design elements of human activity, usually from a time period of which only vestiges remain.

ARCHITECTURAL CONTROLS – Regulations and procedures requiring development to conform to design standards intended to increase the likelihood that the structure will be in keeping with the general appearance, historical character, and/or architectural style of the structures in a surrounding area.

ARITHMETIC MEAN – See Mean.

ARTERIAL STREET (S) – A street designed primarily
to carry medium to heavy volumes of traffic at moderately high speeds that generally limits access to abutting properties.

**BASE FLOOD** – A flood with a predicted frequency and elevation that serves as the basis for making policy decisions regarding floodplain use and development.

**BEST MANAGEMENT PRACTICES** – The methods, measures, designs, performance standards, maintenance procedures, and other management practices intended to prevent or reduce adverse impacts.

**BLOCK (S)** – Property bounded on one side by a street and on the other three sides by a street, railroad right-of-way, public park, waterway, or any combination thereof.

**BLOCK FACE (S)** – The portion of a block that abuts a single street.

**BMP** – Best Management Practices.

**BOARD OF ADJUSTMENT (Z)** – See Zoning Board of Adjustment.

**BROWNFIELD** – A redevelopment site believed to contain pollution from a previous land use that limits the reuse of the site.

**BUFFER (BUFFER AREA, BUFFER STRIP, BUFFER ZONE, LANDSCAPE BUFFER) (Z)** – A special area of a lot set aside for the purpose of reducing the Adverse Impacts that a land use on a lot has on nearby land uses. A buffer may be in addition to required Setback distances and may be required to contain a Screen or landscaping.

**BUILDING (Z)** – A structure with a roof supported by columns or walls used to shelter persons or property.

**BUILDING AREA (Z)** – The total area of a Lot covered by a building measured on a horizontal plane at the building’s mean grade level. It may exclude building appurtenances (such as steps, projecting windows, and uncovered porches).

**BUILDING CODE** – Police Power regulations that govern the design, construction and/or maintenance of a building or structure. Uniform building codes prepared by national panels of experts govern specific issues (such as structural design, electrical systems, plumbing systems, sanitation systems, heating, cooling and ventilation systems, fire prevention, and the occupancy of buildings).

**BUILDING COVERAGE (Z)** – The maximum decimal percentage permitted by a zoning bylaw for a Land Use calculated by dividing the total Building Area of all Principal Buildings and Accessory Buildings (and sometimes the areas of all other impervious surfaces) on a Lot by the total area of the lot upon which the land use is located.

**BUILDING ENVELOPE (Z)** – The net volume of cubic space that is available for the construction of a building or structure, when Setbacks, Building Height, and Bulk Regulations are met.

**BUILDING HEIGHT (Z)** – The maximum height (measured in feet or building stories) that a building or structure may be; often measured from the average grade at the base of the building to the peak of the roof (or sometimes to the eaves).

**BUILDING LINE (FRONT LINE) (Z)** – The minimum distance that a building or structure may be located from the front of a property, often measured from the Street Line.

**BUILDING PERMIT** – Official permission for the construction, repair, alteration or addition to a structure issued prior to construction when the applicant has demonstrated compliance with all applicable bylaws.

**BUILD-OUT ANALYSIS** – A study that examines an area’s capacity for development based on explicit assumptions about the area and the nature of development that is authorized.

**BUILT ENVIRONMENT** – The physical features of Land Development (such as Buildings, Streets, and Structures). See Natural Area.

**BULK REGULATIONS (Z)** – The maximum volume that a building or structure may have. The prescribed Floor-Area-Ratio (FAR), combined with the maximum Building Height, act as Bulk Regulations.

**BYLAWS** – 24 VSA 4303 (4): Municipal regulations applicable to land development adopted under the authority of Chapter 117 (including Zoning, Subdivision Regulations, shoreland and flood hazard bylaws, Official Map, and a Capital Budget and Program).

**CAPABILITY AND DEVELOPMENT PLAN** – 10 VSA 6001 (2): A plan prepared pursuant to 10 VSA 6042. Section 6042 provides for the Natural Resources Board to prepare a plan to guide and accomplish a coordinated, efficient and economic development of the State.

**CAPACITY STUDY** – 24 VSA 4303 (5): An inventory of available natural and human-made resources based on detailed data collection that identifies the capacities and limits of those resources to absorb Land Development.

**CAPITAL BUDGET** – 24 VSA 4430 (a): A list and description of the capital projects to be undertaken.
during the coming fiscal year, their estimated cost, and the proposed method of financing.

**CAPITAL PROGRAM** – 24 VSA 4430 (a): A plan of capital projects proposed to be undertaken during each of the following five years, their estimated cost, and the proposed method of financing.

**CAPITAL PROJECT** – 24 VSA 4430 (a): Includes (1) Any physical betterment or improvement (including furnishings, machinery, apparatus or equipment for that physical betterment or improvement when first constructed or acquired), (2) any preliminary studies and surveys relating to any physical betterment, or improvement, (3) land or rights in land, and (4) any combination thereof.

**CARRYING CAPACITY** – The capability of a resource to sustain a level of use without having its qualitative features degraded in any significant way.

**CCMPO** – Chittenden County Metropolitan Planning Organization.

**CCRPC** – Chittenden County Regional Planning Commission.

**CCTA** – Chittenden County Transportation Authority.

**CDBG** – Community Development Block Grant.

**CEDS** – Comprehensive Economic Development Strategy.

**CERTIFICATE OF OCCUPANCY** – See Occupancy Permit.

**CHAMPLAIN WATER DISTRICT (CWD)** – The district that provides potable water to 12 water systems in Chittenden County. See www.cwd-h2o.org.

**CHAPTER 117** – The Vermont Municipal and Regional Planning and Development Act. See 24 VSA 4301 - 4483.

**CHITTENDEN COUNTY METROPOLITAN PLANNING ORGANIZATION (CCMPO)** – The designated Metropolitan Planning Organization for Chittenden County. See www.ccmpo.org.

**CHITTENDEN COUNTY REGIONAL PLANNING COMMISSION (CCRPC)** – The designated Regional Planning Commission for Chittenden County that officially adopts this Regional Plan. See www.ccrpcvt.org.

**CHITTENDEN COUNTY TRANSPORTATION AUTHORITY (CCTA)** – CCTA operates the region’s transit bus system. See www.cctaride.org/ main.php.

**CHITTENDEN SOLID WASTE DISTRICT (CSWD)** – The entity that manages the solid waste generated in 18 municipalities in Chittenden County. See www.cswd.net.

**CIRC** – Circumferential Highway.

**CIRCUMFERENTIAL HIGHWAY** – A proposed limited access highway between State Route 127 in Colchester and Interstate Route 89 in Williston.

**CLOSURE (S)** – The degree of accuracy of a Metes and Bounds survey used to identify the location of a particular property.

**CLUSTER DEVELOPMENT (Z)** – Land Development that concentrates Land Uses on lots that sometimes have been reduced in size below the minimum size required by Zoning, to allow the remaining land on a site to be used for recreation, common open space, or the preservation of environmentally sensitive features.

**CODE ENFORCEMENT** – Government efforts to bring properties into compliance with building codes and other bylaws.

**COGENERATION** – The use of excess energy produced in one process or site for another process or site.

**COLLECTOR STREET (S)** – A Street designed to carry a moderate volume of traffic between local streets & arterial streets at moderate speeds that may limit vehicular access to abutting properties.

**COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)** – A federal program administered by the Department of Housing and Community Affairs that subsidizes a wide range of community development and economic development activities.

**COMMUNITY FACILITY** – A public or private facility used by groups of people (such as a park, school, library, church, or social hall).

**COMMUNITY LAND TRUST** – A nonprofit organization which develops affordable housing, commercial space, and parks while promoting homeownership, historic preservation, local control, and neighborhood revitalization.

**COMPATIBILITY** – The characteristic when multiple land uses may be located next to or near one another without causing significant adverse impacts on one another.

**COMPATIBLE WITH** – 24 VSA 4302 (f) (2): One plan is compatible with another plan when the plan’s implementation will not significantly reduce the desired effect of the implementation of the other plan. If a significant reduction would result, the plan may still be compatible if it includes elements described in section 4302 ((f) (2).

**COMPREHENSIVE ECONOMIC DEVELOPMENT STRATEGY** – A special plan that documents an
area’s economic conditions and needs and proposes strategies and actions that is a condition of eligibility for participation in certain EDA programs. The CEDS for Chittenden County is posted at www.gbicvtceds.org.

**COMPREHENSIVE PLAN** – An officially adopted plan that describes, analyzes, and makes policies about a wide range of topics (such as community facilities, economy, housing, land use, population, and transportation) to guide the development of an entire area (municipality, region, or state). See 24 VSA 4382 (municipalities) and 4348a (RPCs). See Special Plan.

**CONDEMNATION** – The process by which someone takes ownership of private property by using the power of Eminent Domain.

**CONDITIONAL USE (Z)** – A land use that may be authorized only after the Appropriate Municipal Panel finds that conditions specified in the zoning bylaw have been met following a Public Hearing warned by Public Notice.

**CONDOMINIUM** – Real estate with portions designated for separate ownership and the remainder designated for common ownership by the owners of the separately owned portions.

**CONFORMANCE WITH THE PLAN** – 24 VSA 4303 (6): When a bylaw or bylaw amendment is in accord with the municipal plan in effect at the time of adoption and includes all the following:

a) Makes progress toward attaining, or at least does not interfere with, the goals and policies contained in the municipal plan.

b) Provides for proposed future land uses, densities, and intensities of development contained in the municipal plan.

c) Carries out, as applicable, any specific proposals for community facilities, or other proposed actions contained in the municipal plan.

**CONSERVATION COMMISSION** – A municipal body that may prepare studies and inventories of, recommend municipal acquisition of, and manage property for conservation. See 24 VSA 4501 to 4506.

**CONSERVATION EASEMENT** – An easement that prohibits an owner from developing, altering, or using a specific property in ways that do not conserve the property as open space or preserve its historic or scenic character.

**CONSISTENT WITH THE GOALS** – 24 VSA 4302 (f) (1): Substantial progress toward attainment of the goals established by 24 VSA 4302 or (if the planning body determines that a particular goal is not relevant or attainable) the requirements defined in 24 VSA 4302 (f) (1) are met.

**CONSUMER PRICE INDEX** – A statistic prepared by the U.S. Department of Commerce used to assess variation in the value of money over time and in different parts of the U.S.

**CONTRACT ZONING (Z)** – An illegal modification of zoning regulations expressly made to suit a particular property owner, rather than to benefit the public welfare.

**CORE FOREST** – Those portions of forested area that are at least a certain minimum distance from a zone of human disturbance.

**CORRIDOR** – An area (often designated) closely associated with a linear feature (such as a river, highway, utility, or zone of wildlife movement).

**COST-BENEFIT ANALYSIS** – An evaluation of the disadvantages (costs) and advantages (benefits) of a proposed project, policy, action, or decision that often attempts to quantify the disadvantages and advantages into a single unit of measure, such as dollars.

**CPI** – Consumer Price Index.

**CSWD** – Chittenden Solid Waste District.

**CUL-DE-SAC (S)** – A Local Street that is terminated at one end by a vehicular turnaround and that intersects another street at the other end.

**CWD** – Champlain Water District.

**DEC** – May mean either the District Environmental Commission or the Department of Environmental Conservation.

**DEDICATION (S)** – The transfer of ownership of property in a land development from a private owner to a government. The government is not compelled to accept an offer of dedication and may place conditions on its acceptance.

**DENSITY (Z)** – The number of dwelling units or units of nonresidential use that are authorized or planned for a unit of land area.

**DEPARTMENT OF ENVIRONMENTAL CONSERVATION (DEC)** – The Vermont ANR department that administers most of ANR’s regulatory programs plus several voluntary pollution and waste reduction programs (including: air quality, environmental assistance, public facilities engineering, geology, environmental permits, solid waste, hazardous waste, surface water quality, watershed planning, stormwater management, and drinking water supply). See www.anr.state.vt.us/dec/dec.htm.
DEPARTMENT OF FISH AND WILDLIFE RESOURCES (FWD) – The Vermont ANR department that manages Vermont's fisheries and wildlife resources, enforces the state's hunting and fishing laws, and studies and inventories nongame wildlife species and natural communities. www.vtfishandwildlife.com.

DEPARTMENT OF FORESTS, PARKS AND RECREATION (FPR) – The Vermont ANR department that operates the State Parks system, manages State forests and natural areas, and provides assistance in the areas of forestry, recreation, and conservation education. See www.vtfpr.org.

DEPARTMENT OF HOUSING AND COMMUNITY AFFAIRS (DHCA) – The Vermont agency that provides planning technical assistance and oversees housing and community development programs. See 3 VSA 2472 and www.dhca.state.vt.us.

DESIGN REVIEW COMMISSION – An advisory commission established pursuant to 24 VSA 4433 (4).

DESIGN STANDARD – A minimum or maximum standard prescribed by a bylaw that governs a physical characteristic of a Land Development, Building, or Structure (such as its size or shape).

DEVELOPMENT – See Land Development. For the purposes of Act 250, “development” is defined by 10 VSA 6001 (3).

DEVELOPMENT AGREEMENT (IMPROVEMENTS AGREEMENT) (S, Z) – A contract between a developer and a government that requires the developer to undertake certain actions (such as construct or install improvements) listed in the agreement according to certain specifications and conditions.

DEVELOPMENT EXACTION – See Exaction.

DEVELOPMENT REVIEW BOARD – A board that a municipality may create to consolidate the functions of a Zoning Board of Adjustment and the subdivision review functions of a Planning Commission. See 24 VSA 4460.

DEVELOPMENT RIGHT – The legal right to develop a property.

DHCA – Department of Housing and Community Affairs.

DISTRICT – See Zoning District.

DISTRICT ENVIRONMENTAL COMMISSION – One of the nine commissions in Vermont that review applications for Act 250 permits. See 10 VSA 6001.

DOWNTOWN DEVELOPMENT DISTRICT – 24 VSA 2791 (4): A district delineated by a municipality and designated by Vermont’s Downtown Development Board under 24 VSA 2793.

DOWNTOWN PLAN – 24 VSA 4431 (2): A municipal plan for the development and revitalization of a downtown, village, or new town center, consistent with the purposes of 24 VSA 2790.

DOWNZONING (Z) – A change in the zoning classification of land that provides for less intensive development (either by changing the types of land uses permitted or by reducing the permitted density of development). Many property owners object when their property is down-zoned, because they believe downzoning reduces their property's value.

DRB – Development Review Board.

DRIVEWAY (S) – A privately owned, constructed, and maintained vehicular access from a public or private street to off-street parking or off-street loading spaces.

DU – Dwelling Unit.

DUE PROCESS (DUE PROCESS OF LAW) – A constitutional right that guarantees a person that his or her life, liberty, or property cannot be denied or taken by a government, unless the government follows due process of law. The right takes two forms: Procedural Due Process and Substantive Due Process.

DWELLING UNIT (Z) – One or more rooms, intended to be occupied by a household as separate living quarters containing cooking, sleeping, and sanitary facilities.

EASEMENT – A less-than-fee property right that can be positive or negative. A positive easement authorizes a second party to use the property in a specific, limited way (such as a right-of-way that authorizes the second party to cross the property). A negative easement prohibits a property owner from using the property fully (such as a scenic easement that prevents an owner from building a structure on the property that would block the public's view of a distant mountain). An appurtenant easement benefits a neighboring property; an easement that is not appurtenant is in gross.

ECONOMIC DEVELOPMENT – Policies, actions, and/or projects intended to improve the qualitative characteristics or to expand the quantitative size of the economy.

ECONOMIC DEVELOPMENT ADMINISTRATION – The federal office responsible for the provision of federal economic development assistance to economically depressed areas, especially to areas of high unemployment. See www.eda.gov.
EDA – Economic Development Administration.

EIS – Environmental Impact Statement.


EMINENT DOMAIN – The power of a government (or a person delegated such authority by a government) to require an owner to sell private property to the entity exercising the power if the entity pays the owner Just Compensation.

ENCROACHMENT – When a land use is located too close to another land use, resulting in one or more Adverse Impacts.

ENTERPRISE PLANNING AREA – A location designated by this Regional Plan that is recommended to be a center for employment.

ENDANGERED SPECIES – 10 VSA 5401 ((6): A species listed on the state endangered species list (see 10 VSA 5402) or determined to be an "endangered species" under the federal Endangered Species Act. The term generally refers to species whose continued existence as a viable component of the state's wild fauna or flora is in jeopardy.

ENVIRONMENTAL COURT – The court authorized to hear appeals of local land use decisions, ANR regulatory decisions, and District Environmental Commission decisions of Act 250 permit applications. See 4 VSA 1001 to 1004.

ENVIRONMENTAL IMPACT STATEMENT (EIS) – A formal assessment to document the types and degrees of impacts that a proposed development, action, or policy will have on the natural or built environment and to make a formal determination that the proposal has or does not have any significant, adverse environmental impacts.

EPA – Environmental Protection Agency.

EXACTION – The dedication of property, payment of money in lieu of dedication, or other contribution that a government requires a developer to make as a condition for some government action (such as approval of a development permit).

EXCLUSIONARY ZONING (Z) – A legal doctrine that prohibits government from using Zoning to exclude specific types of people (such as racial minorities, poor people, or handicapped people) or certain types of lawful Land Uses (such as churches, group homes, or mobile homes) that can take 3 forms: (1) explicit (expressly prohibiting a land use in a zoning ordinance), (2) implicit (failing to include a land use in a list of permitted land uses), and (3) effective (using unreasonable design standards to discourage development of a land use).

EXPRESSWAY (S) – A Street designed primarily to carry heavy volumes of traffic at high speeds, that generally contains multiple lanes of traffic in each direction, restricts traffic moving in one direction from crossing lanes of traffic moving in other directions at the same grade, and does not provide direct access to abutting properties.

FAMILY CHILD CARE HOME OR FACILITY – 24 VSA 4412 (5): A home or facility where the owner or operator is licensed or registered by the State for child care. Municipal zoning must consider a Family Child Care Home or Facility that serves 1) six or fewer children as a permitted single-family residential use of property, 2) no more than six full-time children and four part-time children (as defined by 33 VSA (4902(3)(A)) as a permitted use of property that may require Site Plan Approval, and 3) more than six full-time and four part-time children as being subject to all applicable zoning bylaws.

FAR – Floor-Area-Ratio.

FEE SIMPLE (FEE SIMPLE ABSOLUTE) – The legal term for ownership of the bundle of property rights (such as rights of use, development, possession, transfer, & mineral rights) for a particular property.

FEE SIMPLE ABSOLUTE – See Fee Simple.

FHWA – Federal Highway Administration of the US Department of Transportation.

FINAL PLAN – See Final Plat.

FINAL PLAT (FINAL PLAN) (S) – A plat prepared in accordance with bylaw standards that depicts the exact design of a proposed subdivision that is submitted to obtain formal municipal approval for the proposal. Such approval typically authorizes the plat to be recorded.

FINDING – A factual determination made by an Appropriate Municipal Panel that is based on evidence and testimony received at a Public Hearing that serves as the basis for its decision.

FLAG LOT – A Lot that (1) at the Street Line is narrower than the required minimum Lot Width but is wide enough to provide for a Driveway and (2) at the rear of the Lot is wide enough to comply with the required minimum Lot Width.

FLOATING ZONE (FLOATING DISTRICT) – A Zoning District for which there are regulations in the text of the Bylaw, but which is mapped (either automatically or by application) on the Zoning Map only.
when specific conditions for the establishment of the district are met in a particular area.

**FLOOD FRINGE** – The portion of a Floodplain that is outside the Floodway.

**FLOOD HAZARD AREA** – 24 VSA 4303 (8): The land subject to flooding from the Base Flood. See Flood.

**FLOODPLAIN** – The area of land that is inundated by a flood.

**FLOODPROOFING** – 24 VSA 4303 (8) (A): Any combination of structural and nonstructural additions, changes, or adjustments to properties and structures that substantially reduce or eliminate flood damage to any combination of real estate, improved real property, water or sanitary facilities, structures, and the contents of structures.

**FLOODWAY** – 24 VSA 4303 (8) (B): The channel of a river or other watercourse and the adjacent land area that must be reserved in order to discharge the base flood without accumulatively increasing the water surface elevation more than one foot. New development often is prohibited in the floodway.

**FLOOR AREA (GROSS FLOOR AREA)** – The total area of all of a building's floors, as measured to the outside surfaces of exterior walls (or from the centerline of party walls separating buildings or dwelling units), but may exclude cellars, crawl spaces, garages, carports, attics without floors, open porches, and balconies.

**FLOOR-AREA-RATIO (FAR)** – A measurement used to determine the building volume permitted on a particular lot that equals the floor area of all the buildings on a lot divided by the total land area of the lot. For example, an FAR of 3.0 applied to a 20,000 square foot lot would permit a building with up to 60,000 square feet of floor area. The owner also could construct a building with up four 15,000 square foot floors, five 12,000 square foot floors, six 10,000 square foot floors, and so on. The community's building height regulations would limit how tall the building could be.

**FORECAST** – A prediction that is based on (1) a mathematical formula that describes the relationship between the measure to be predicted and one or more other factors and (2) predictions of the future values of those other factors.

**FORESTRY AND SECONDARY SOILS** – 10 VSA 6001 (8): Soils that are not “Primary Agricultural Soils” but have reasonable potential for commercial forestry or commercial agriculture, and have not yet been developed. In order to qualify as forest or secondary agricultural soils the land containing such soils shall be characterized by location, natural conditions and ownership patterns capable of supporting or contributing to present or potential commercial forestry or commercial agriculture. If a tract of land includes other than forest or secondary agricultural soils only the forest or secondary agricultural soils shall be affected by criteria relating specifically to such soils.

**FRAGILE AREA** – An area of land or water which has unusual or significant flora, fauna, geological or similar features of scientific, ecological or educational interest.

**FRAGMENTATION** – Dividing areas used by wildlife habitat with land uses or development into areas that are too small or lack all of the needed features to continue to serve as habitat for specific species.

**FRONT LINE** – See Building Line.

**GBIC** – Greater Burlington Industrial Corporation.

**GENTRIFICATION** – The term used to describe the process when residential and nonresidential land uses that cater to affluent households displace existing residential and nonresidential uses that address the needs of less affluent households.

**GEOGRAPHIC INFORMATION SYSTEM (GIS)** – A computerized system that identifies the spatial location of data, allowing for spatial variation of one or more measures to be analyzed and displayed as maps.

**GIS** – Geographic Information System.

**GOODS** – Products that are tangible. See Services.

**GREATER BURLINGTON INDUSTRIAL CORPORATION (GBIC)** – The non-profit Regional Development Corporation that has the mission of attracting, retaining, and expanding environmentally sensitive, high-paying jobs in the Champlain Valley and initiating and supporting advocacy, education, and collaborative programs in promoting its vision. See www.vermont.org/gbic/index.html.

**GROUNDWATER** – Water that flows or collects below the land surface, sometimes seasonally and sometimes permanently.

**GRADE** – The elevation of the ground or paving (often specified either before or after excavation). It also may mean the degree of slope of terrain.

**GRANNY FLAT** – An Accessory Dwelling Unit occupied by a family member of the principal dwelling.

**GREENWAY** – A designated area planned to perform one or more Open Space Functions.
GROSS FLOOR AREA – See Floor Area.

GROUP HOME – A dwelling inhabited by up to a specified number of persons who are not a family, but typically who have a special characteristic that makes them eligible for living in the group home.

GROWTH CENTER – 24 VSA 2791 (12): An area or land that contains substantially the characteristics specified in subdivision (B) and

(A) is located in one or a combination of the following:

(1) A designated downtown, village center, or new town center;

(2) An area of land that is in or adjacent to a designated downtown, village center, or new town center, with clearly defined boundaries that have been approved by one or more municipalities in their municipal plans to accommodate a majority of growth anticipated by the municipality or municipalities over a 20-year period. Adjacent areas shall include those lands which are contiguous to the designated downtown, village center, or new town center. In situations where contiguity is precluded by natural or physical constraints to growth center development, adjacent areas may include lands lying close to and not widely separated from the majority of the lands within the designated growth center. Noncontiguous land included as part of a growth center must exhibit strong land use, economic, infrastructure, and transportation relationships to the designated downtown, village center, or new town center; be planned to function as a single, integrated growth center; and be essential to accommodate a majority of growth anticipated by the municipality or municipalities over a 20-year period.

(B) A growth center contains substantially the following characteristics:

(1) It incorporates a mix of uses that typically include or have the potential to include the following: retail, office, services, and other commercial, civic, recreational, Industrial, and residential uses, including affordable housing and new residential neighborhoods, within a densely developed, compact area;

(2) It incorporates existing or planned public spaces that promote social interaction, such as public parks, civic buildings (e.g., post office, municipal offices), community gardens, and other formal and informal places to gather.

(3) It is organized around one or more central places or focal points, such as prominent buildings of civic, cultural, or spiritual significance or a village green, common, or square.

(4) It promotes densities of land development that are significantly greater than existing and allowable densities in parts of the municipality that are outside a designated downtown, village center, growth center, or new town center, or, in the case of municipalities characterized predominately by areas of existing dense urban settlement, it encourages in-fill development and redevelopment of historically developed land.

(5) It is supported by existing or planned investments in infrastructure and encompasses a circulation system that is conducive to pedestrian and other nonvehicular traffic and that incorporates, accommodates, and supports the use of public transit systems.

(6) It results in compact concentrated areas of land development that are served by existing or planned infrastructure and are separated by rural countryside or working landscape.

(7) It is planned in accordance with the planning and development goals under section 4302 of this title, and to conform to smart growth principles.

(8) It is planned to reinforce the purposes of 10 VSA chapter 151.

GROWTH MANAGEMENT – Practices used to control the amount, type, intensity, location, and timing of development (including conventional land use controls such as Zoning and Subdivision Regulations). The term also is used to refer specifically to more innovative types of regulations (such as a ceiling on the number of building permits issued annually) and practices (such as staging the extension of Infrastructure). The term also is used to describe a community’s use of these practices to forestall, lessen, or prevent predicted growth (rather than accommodating or providing for it).

HABITAT – The physical and biological environment that a community of a plant or animal species requires to remain viable.

HAZARD AREA – 24 VSA 4303 (8) (C): Land subject to landslides, soil erosion, earthquakes, water supply contamination, or other natural or human-made hazards as identified within a local
Hazardous Waste to Infrastructure

mitigation plan in conformance with and approved pursuant to the provisions of 44 C.F.R. 201.6.

Hazardous Waste – 10 VSA 6602 (4): Any waste or combination of wastes that the ANR Secretary has determined may (1) cause or contribute to an increase in serious irreversible or incapacitating reversible illness, (2) cause or contribute to adverse acute or chronic effects on the health of persons or other living organisms, or (3) have an unusually destructive effect on water quality if discharged to the State’s ground or surface waters.

Hearing – See Public Hearing.

Highest and Best Use (Highest Use) – The type and intensity of lawful land use for a particular property that provides the maximum profit to the owner.

Highest Use – See Highest and Best Use.

Highway Commercial – Land Uses that rely on relatively high traffic volumes as a source of patrons (rather than, for example, relying on a nearby residential area for customers). It also refers to an area (such as a zoning district) intended to provide for highway commercial land uses, typically extending in a relatively narrow strip along the sides of a highway.

Historic Preservation – 22 VSA 701 (5): The research, protection, restoration and rehabilitation of buildings, structures, objects, districts, areas, and sites significant in the history, architecture, archaeology or culture of this state, its communities or the nation.

Historic Preservation Commission – An Advisory Commission established pursuant to 24 VSA 4433 (3) to assist in a municipality’s historic preservation efforts.

Historic Property or Resource – 22 VSA 701 (6): Any building, structure, object, district, area or site that is significant in the history, architecture, archaeology or culture of this State, its communities or the nation.

Home Occupation (Z) – An activity carried out for commercial gain by a resident conducted as an Accessory Use in the resident’s dwelling unit.

Household – One or more people who occupy a single Dwelling Unit.

Housing Commission – An Advisory Commission established pursuant to 24 VSA 4433 (5).

Housing Unit – See Dwelling Unit.

HUD – U.S. Department of Housing and Urban Development.

Impact – A consequence of an effect generated by a Land Use. An impact is most often considered to be significant when it is experienced off of the Lot of the Land Use that generated the effect. See Adverse Impact and Impacts Analysis.

Impact Fee – 24 VSA 5201 (3): A fee levied as a condition of issuance of a zoning or subdivision permit which will be used to cover any portion of the costs of an existing or planned capital project that will benefit or is attributable to the users of the development or to compensate the municipality for any expenses it incurs as a result of construction. The fee may be levied for recoupment of costs for previously expended capital outlay for a capital project that will benefit the users of the development. See 24 VSA 5200 to 5206.

Impacts Analysis (Impact Study) – The description and evaluation of the significance of one or more particular types of Impacts. Examples include environmental impact studies (EISs), fiscal impact analyses, and traffic impact studies. The term also refers to a formal method of assessing the impacts that flow from the effects caused by the activities associated with different types of Land Uses in order to determine the most appropriate strategies for balancing the costs and benefits of Land Development.

Impervious Surface – 10 VSA 1264 (6) A man-made surface including paved and unpaved roads, parking areas, roofs, driveways, and walkways, from which precipitation runs off rather than infiltrates.

Improved Land – A building site that already contains Improvements (such as streets, water supply systems, and sewage disposal systems), so that a developer of the site can focus development efforts on constructing Buildings.

Improvements – The public Infrastructure and private utilities that are provided in a Land Development to make it an attractive site for a particular Land Use.

Improvements Agreement – See Development Agreement.

Incentive Zoning (Z) – An option provided to developers to be relieved of a specific Design Standard (typically within proscribed limits), in exchange for providing an amenity or development feature specified by the Bylaw.

Infill Development – New development or redevelopment (often at greater intensity) on a site that is surrounded by pre-existing development.

Infrastructure – Facilities (such as streets and
utilities) that are necessary for the use and development of land. The term sometimes refers only to public facilities.

**INTERESTED PERSON (PARTY)** – 24 VSA 4465 (b) provides a lengthy detailed definition of this term for the purposes of Chapter 117. The term includes certain property owners, municipalities, groups of voters or real property owners, state agencies, and ACCD as being eligible to appeal municipal land development review decisions.

**INTERIM BYLAWS** – A Bylaw adopted under 24 VSA 4415 that is in effect for a fixed time while the municipality is considering a new or amended Comprehensive Plan or Bylaw.


**LAND DEVELOPMENT** – 24 VSA 4303 (10): The division of a parcel into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlargement of any building or structure, or of any mining, excavation or landfill, and any change in the use of any building or structure, or land, or extension of use of land.

**LAND EVALUATION AND SITE ASSESSMENT (LESA)** – The process set out in 6 VSA 8 for the identification of agricultural lands.

**LANDFILL** – A disposal site where refuse and earth (or other suitable cover material) are deposited and compacted in alternative layers of specified depth in accordance with an approved plan.

**LANDSCAPE BUFFER** – See Buffer.

**LAND TRUST** – A nonprofit organization dedicated to preserving land with high conservation values through land acquisition and protective conservation easements. Properties are chosen based on their natural, scenic, or historic character or to preserve current uses such as farming or silviculture.

**LAND USE (USE)** – How land is occupied or utilized. An activity, operation, or enterprise that is carried out in a building, structure or lot.

**LAND USE PANEL** – The NRB panel that oversees the activities of the District Environmental Commissions, provides administrative support and enforcement of Act 250 permits, and conducts rulemaking related to the Act 250 program.

**LAND-USE PLAN** – An Element of a Comprehensive Plan that designates policies regarding the future use of land. The plan may be an ultimate plan (depicting the land uses that are contemplated once all of the community’s land is developed) or it may govern a fixed period of time (such as a five-year plan).

**LCRCC** – Lake Champlain Regional Chamber of Commerce.

**LEAPFROG DEVELOPMENT** – A development pattern/process in which development occurs at a great distance from areas of Urban Development, such that there is not a smooth transition from more intensively developed areas to less intensively developed (or undeveloped) areas. Typically, it is discouraged because it requires infrastructure to be provided in less efficient ways.

**LEGISLATIVE BODY** – 24 VSA 4303 (9): The select-board in the case of a town, the trustees in the case of an incorporated village, and the mayor, alderpersons, and city council members in the case of a city, and the supervisor in the case of an unorganized town or gore.

**LESA** – Land Evaluation and Site Assessment.

**LESS-THAN-FEE PROPERTY RIGHT** – A property right that is less than full ownership of a property (such as a Conservation Easement or Right-of-Way). See Fee Simple.

**LOCAL STREET (S)** – A street designed primarily to carry a low volume of traffic at relatively low speeds that provides direct access to abutting properties, gathers traffic from driveways, and provides routes to collector streets.

**LOOP STREET (U-STREET) (S)** – A local street that curves to intersect the same street at each of the loop street’s ends and that intersects no other street (except possibly a cul-de-sac).

**LOT (S, Z)** – A parcel of land intended to serve as a unit of ownership, transfer, rent, use, improvement, or development. 10 VSA 6001 (11): Any undivided interest in land, whether freehold or leasehold, including but not limited to interests created by trusts, partnerships, corporations, cotenancies and contracts.

**LOT AREA (Z)** – The horizontal area contained within a lot’s Lot Lines (typically excluding that portion contained within street right-of-ways).
LOT COVERAGE (Z) – The total area of a Lot that is covered by Impervious Surfaces.

LOT DEPTH (S, Z) – The horizontal distance between the front Lot Line and the rear Lot Line of a Lot. Some communities measure lot depth using the mean average distance; others use the shortest distance.

LOT LINE (S, Z) – The boundary line of a lot.

LOT WIDTH (S, Z) – The horizontal distance between side Lot Lines. Some communities measure lot width at the Building Line; others at the Street Line.

MAINTENANCE AGREEMENT (S) – An agreement between a developer and a government that requires a developer who has constructed or installed Improvements to be Dedicated to the government to make any repairs or reconstructions and to maintain the improvements for a specified time from the date of acceptance of dedication.

MAJOR SUBDIVISION – A Subdivision that does not qualify as a Minor Subdivision.

MANDATORY DEDICATION – The Dedication of property that is required to be made by a developer to a government as a condition for some government action (such as approval of a development permit). See Exaction and Impact Fee.


MEAN (ARITHMETIC MEAN) – A statistic used to describe the typical (“average”) value for a group of values that is calculated by dividing the sum of the observed values by the number of observed values. See Median and Mode.

MEDIAN – A statistic used to describe the typical (“average”) value for a group of values that is the middle value when the values are arranged from highest to lowest value. See Mean and Mode.

METES AND BOUNDS – A system that identifies a particular parcel of land by describing a series of metes (measurements) and bounds (directions) from defined reference points. The reference points may be such varied things as a tree or corner fencepost, but governments increasingly require a reference point to be more permanent. See Monument.

METROPOLITAN PLANNING AREA – A location designated by this Regional Plan that is recommended to be a regional or sub-regional center for jobs, housing and community facilities that have an urbanized character.

METROPOLITAN PLANNING ORGANIZATION (MPO) – A regional transportation planning entity, created under federal transportation planning regulations. CCMPO is the MPO for Chittenden County.

METROPOLITAN STATISTICAL AREA – An area defined by the US Census Bureau containing at least one Urbanized Area and includes those surrounding areas that are economically integrated with the Urbanized Area (determined mainly by commuting patterns). The Burlington/South Burlington MSA is Vermont’s only MSA.

MINOR SUBDIVISION – A Subdivision that a community’s Subdivision Regulation permits to be reviewed using an expedited procedure and/or reduced plan requirements.

MIXED INCOME HOUSING – 10 VSA 6001 (27): A housing project in which at least 15 percent of the total housing units are affordable housing units.

MIXED USE – Development of land, a building, or a structure with a variety of complementary and integrated land uses. 10 VSA 6001 (28): Construction of both mixed income housing and construction of space for any combination of retail, office, services, artisan, and recreational and community facilities, provided at least 40 percent of the gross floor area of the buildings involved is mixed income housing. Mixed Use does not include industrial use.

MJAHMP – The Chittenden County, Vermont Multi-Jurisdictional All-Hazards Mitigation Plan.

MODE – A statistic used to describe the typical (“average”) value for a group of values that is the value that occurs most frequently in the group. See Mean, Median, and Multimodal.

MODE OF TRANSPORTATION (TRAVEL) – A method of transportation (such as auto or train).

MONUMENT – A marker placed into the ground by a land surveyor to identify a reference point on which a surveying measurement is based (such as the intersection of two boundary lines).

MORATORIUM – A temporary cessation of the issuance of development permits, pending the community’s completion of a new or amended plan or bylaw, so that property owners do not apply for permit approvals under the existing regulations.

MPO – Metropolitan Planning Organization.

MSA – Metropolitan Statistical Area.

MULTIFAMILY RESIDENCE (MULTIFAMILY DWELLING) – A building containing more than one Dwelling Unit. Some communities separately regulate as a duplex a building containing two dwelling units.
MULTIMODAL – Relating to more than one Mode of Transportation. It also may mean a distribution of values that has more than one Mode.

MULTIPLE FAMILY DWELLING – See Multifamily Residence.

MUNICIPALITY – 24 VSA 4303 (12): A town, a city, an incorporated village, or an unorganized town or gore.

MUNICIPAL LAND USE PERMIT – 24 VSA 4303 (11): Any of the following whenever issued:
(A) A zoning, subdivision, site plan, or building permit or approval, any of which relate to "land development" as defined in 24 VSA 4303 (10), that has received final approval from the applicable board, commission, or officer of the municipality.
(B) A wastewater system permit issued under any municipal ordinance adopted pursuant to chapter 102 of Title 24.
(C) Final official minutes of a meeting that relate to a permit or approval described in (A) or (B) that serve as the sole evidence of that permit or approval.
(D) A certificate of occupancy, certificate of compliance, or similar certificate that relates to the permits or approvals described in (A) or (B), if the bylaws so require.
(E) An amendment of any of the documents listed in (A) through (D).

NAAQS – National Ambient Air Quality Standards.

NARC – National Association of Regional Councils.

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) – The standards established by the U.S. Clean Air Act that establish the maximum concentrations of specific pollutants. Failure to comply with these standards places a region (and State) in “non-attainment status” that results in special administrative burdens and jeopardizes future federal funds to the State and region.

NATURAL AREA – An area of land or water that is not dominated by man-made features and that may have unusual or significant flora, fauna, geological, or similar features of scientific, ecological, or educational interest.

NATURAL RESOURCES BOARD (NRB) – The Vermont board created in 2005 that succeeds the Environmental Board and Water Resources Board. The NRB is a nine-member board, divided into two five-person panels (the Land Use Panel and the Water Resources Panel). See www.nrb.state.vt.us.

NRC – U.S. Nuclear Regulatory Commission.

NECESSARY WILDLIFE HABITAT – 10 VSA 6001 (12): Concentrated habitat which is identifiable and is demonstrated as being decisive to the survival of a species of wildlife at any period in its life including breeding and migratory periods.

NEIGHBORHOOD – An area that shares a common function and/or character. It may refer specifically to (1) an area whose residents regard it to be a separate community or (2) a collection of residential, commercial, and institutional land uses that form a basic unit of community planning.

NEW TOWN CENTER – 24 VSA 2791 (11): The area planned for or developing as a community’s central business district, composed of compact, pedestrian-friendly, multistory, and mixed use development that is characteristic of a traditional downtown, supported by planned or existing urban infrastructure, including curbed streets with sidewalks and on-street parking, stormwater treatment, sanitary sewers and public water supply.

NONCONFORMING LOT OR PARCEL (Z) – 24 VSA 4303 (13): A lot or parcel that does not conform to the present bylaws covering dimensional requirements but were in conformance with all applicable laws, ordinances, and regulations prior to the enactment of the present bylaws, including a lot or parcel improperly authorized as a result of error by the Administrative Officer.

NONCONFORMING STRUCTURE (Z) – 24 VSA 4303 (14): A structure or part of a structure that does not conform to the present bylaws but was in conformance with all applicable laws, ordinances, and regulations prior to the enactment of the present bylaws, including a structure improperly authorized as a result of error by the Administrative Officer.

NONCONFORMING USE (Z) – 24 VSA 4303 (15): A use of land that does not conform to the present bylaws but did conform to all applicable laws, ordinances, and regulations prior to the enactment of the present bylaws, including a use improperly authorized as a result of error by the Administrative Officer.

NONCONFORMITY (Z) – 24 VSA 4303 (16): A nonconforming use, structure, lot, or parcel.

NORTHWEST VERMONT – The region encompassing Addison, Chittenden, Franklin, Grand Isle, Lamoille, and Washington counties.

NRB – Natural Resources Board.

NUISANCE – See Private Nuisance and Public Nuisance.
OCCUPANCY PERMIT (CERTIFICATE OF OCCU-
PANCY) (Z) – A permit, typically issued at
the completion of construction but preceding the use
or change in use of a property, documenting
compliance with all of a community's land use
regulations and building codes and authorizing the
owner to use the property for the purposes specified
in the permit.

OFFICIAL MAP – A map officially adopted by a
municipality that depicts the location of existing
and planned public streets, lands, and structures.
See 24 VSA 4421.

OFFICIAL ZONING MAP (Z) – See Zoning Map.

OFF-STREET PARKING (Z) – The portion of a lot,
building, or structure that is used (or is required to
be used) solely for vehicular parking (typically also
including access lanes).

OFF-STREET LOADING (Z) – The portion of a lot,
building, or structure that is used (or is required to
be used) solely for the loading or unloading of
trucks, buses, taxis, etc.

OPEN SPACE – An area of land that is valued for
natural processes and wildlife, for agricultural and
sylvan production, for active and passive recrea-
tion, and/or for providing other public benefits

OPEN SPACE FUNCTION – The functions intended
to be provided by Open Space such as supporting
1) Natural Areas, 2) Working Landscapes, and
3) recreation.

OPEN SPACE PLAN – 24 VSA 4432 (3): A munici-
pal plan to guide public and private conservation
strategies.

ORTHOPHOTO – An aerial photograph that elimi-
nates the distortion produced on the edges of
normal aerial photographs caused by the curvature
of the earth’s surface.

OVERLAY ZONE (OVERLAY DISTRICT) (Z) – A Zoning
District (with boundaries that may or may not coin-
cide with those of regular zoning districts) used to
impose regulations that supplement those of the
regular zoning districts.

PARCEL – An area of land containing one or more
lots under common ownership or control.

PASSIVE RECREATION
PASSIVE RECREATION – Recreational activities in
which people participate principally as spectators
(such as watching a baseball game).

PAYMENT IN LIEU OF DEDICATION (IN LIEU PAY-
MENT) – The payment of cash made by a devel-
oper that is required as a substitute for the
dedication of property. See Exaction.

PEDESTRIAN SCALE – An urban development
pattern where walking is a safe, convenient and
interesting mode of travel that is at least as
attractive as any other mode to all destinations
within the area that may have the following
illustrative features:
• land uses that cater to pedestrian customers
  and clients,
• continuous, smooth and wide walking surfaces
  that provide visibility from streets and buildings,
• safety for pedestrians with few points where high-
speed automobile traffic and pedestrians mix,
• design features (such as storefronts, doorways,
trees, bollards, awnings, outdoor seating, signs,
and lighting) designed to serve those on foot, and
• well-integrated into the public transit system.

PERFORMANCE GUARANTEE (S, Z) – Financial
security (such as a letter of credit, performance
bond, escrow agreement, or other surety agreement)
or collateral, acceptable to a government as security
for a developer’s promises to the government in a
development agreement or maintenance agreement.

PERFORMANCE STANDARD (S, Z) – A regulation
that permits an individual Land Use, Structure,
Building, or Land Development to be constructed
or used, so long as activity in it does not exceed
maximum levels of specific Impacts on adjoining
properties (such as noise, vibration; odors, air
pollution; dust, dirt; glare, heat, radiation; solid
waste, stormwater, traffic, and/or visual impacts).
Performance standards provide for greater
flexibility in the design and use of property than do
Design Standards, but they also require ongoing
monitoring long after a development is con-
structed. In addition, because remedies to correct
problems identified by the failure to comply with a
performance standard must be retrofitted, they may
be more expensive than initial designs that prevent
problems by complying with design standards.

PERMITTED USE (PERMITTED BY RIGHT USE) (Z)
– A Land Use that does not require a special
action by an Appropriate Municipal Panel before
a Zoning Permit is issued.

PERSON – 24 VSA 4303 (17): An individual, corpora-
tion, partnership, association, and any other incorpo-
rated or unincorporated organization or group.

PHASED DEVELOPMENT – Required timing or other
limitation on a particular development under the
authority of a Bylaw to avoid or mitigate any undue
Adverse Impact on existing or planned community
facilities or services. See 24 VSA 4422.

PHYSICAL TAKING – See Taking.
PLACE OF ASSEMBLY – A term used by this Plan to describe a Community Facility where people gather to engage in an activity together.


PLANNING COMMISSION – The official body that prepares a Comprehensive Plan. This Plan uses the term to mean the Chittenden County Regional Planning Commission. See 24 VSA 4341 to 4346. A municipal planning commission is authorized also to prepare bylaws and studies for adoption by the Legislative Body and to perform other functions. See 24 VSA 4321 to 4328, 4384, 4460, and 4463.

PLANNED RESIDENTIAL DEVELOPMENT (PRD) – A type of Planned Unit Development that provides for a mixture of housing types or densities and typically involves Cluster Development

PLANNED UNIT DEVELOPMENT (PUD) – 24 VSA 4303 (19): One or more lots, tracts, or parcels of land to be developed as a single entity, the plan for which may propose any authorized combination of density or intensity transfers or increases, as well as the mixing of land uses. The plan, as authorized, may deviate from bylaw requirements that are otherwise applicable to the area in which it is located with respect to lot size, bulk, or type of dwelling or building, use, density, intensity, lot coverage, parking, required common open space, or other standards. See 24 VSA 4417.

PLANNING AREA – An area designated by this Plan where particular Policies recommended by this Plan are applicable.

PLAT (PLAN) (S, Z) – A drawing (or set of drawings) depicting details of a proposed development submitted by a developer to determine if the proposed Land Development will comply with the requirements of a Bylaw. The bylaw typically requires the plat to have a certain format and to show certain information.

POLICE POWER – The power of government to regulate the activities of private citizens (including the use of property) for the purpose of protecting the public health, safety, welfare, and morals.

POLICY – Any goal, objective, strategy, or action that is recommended in a Comprehensive Plan or a Special Plan as a guide for subsequent decision making.

POLICY PLAN – A special type of Comprehensive Plan or Special Plan that has the basic purpose of identifying Policies to be used as general guidance for making a wide range of more specific decisions and actions.

POPULATION PYRAMID – A special type of graph that illustrates the proportions of an area’s population who are in different age cohorts for both men and women.

PRD – Planned Residential Development.

PRELIMINARY PLAN – See Preliminary Plat.

PRELIMINARY PLAT (PRELIMINARY PLAN) (S) – A Plat that depicts the design of a proposed Subdivision and is submitted for the purpose of obtaining an initial approval of the general features and characteristics of the proposal. Such approval authorizes the developer to submit a Final Plat.

PRIMARY AGRICULTURAL SOILS – 10 VSA 6001 (15): Soils that have a potential for growing food and forage crops, are sufficiently well drained to allow sowing and harvesting with mechanized equipment, are well supplied with plant nutrients or highly responsive to the use of fertilizer, and have few limitations for cultivation or limitations which may be easily overcome. In order to qualify as primary agricultural soils, the average slope of the land containing such soils does not exceed 15%, and such land is of a size capable of supporting or contributing to an economic agricultural operation. If a tract of land includes other than primary agricultural soils, only the primary agricultural soils shall be affected by criteria relating specifically to such soils. The NRB’s Land Use Panel has adopted Rule 80 to preserve primary agricultural soils.

PRINCIPAL BUILDING (Z) – The Building in which the Principal Use on a Lot is conducted. See Accessory Building or Structure.

PRINCIPAL USE (Z) – The single dominant or main Land Use on a Lot. See Accessory Use.

PRIVATE NUISANCE – A thing or activity that interferes with the ability of an owner to use or enjoy his or her property. See Public Nuisance.

PROCEDURAL DUE PROCESS – This form of the constitutional right of Due Process requires government to use procedures that are fundamentally fair when it administers laws that take or deny a person’s life, liberty, or property (usually that the procedures must have features such as notice, opportunity for the person to be heard, and clearly established and impartial decision making rules).

PROJECTION – A prediction based on applying a mathematical formula that describes the pattern of past change in the predicted measure so that it also describes future change.
PSAP – Public Safety Answering Point.

PSB – Public Service Board.

PUBLIC SERVICE BOARD – The regulatory agency responsible for reviewing proposed utilities and their rights-of-way (the Section 248 process). See 30 VSA 3 and www.state.vt.us/psb.

PUBLIC HEARING – A formal procedure conducted to elicit testimony and evidence so that a governmental body may make factual findings used to determine if a proposed development satisfies conditions or standards specified by a bylaw.

PUBLIC NOTICE – Notice to the general public and/or to specific persons informing them of a public hearing or a public meeting that meets statutory requirements for form and timeliness. 24 VSA (21): The form of notice prescribed by sections 24 VSA 4444, 4449, or 4464, as the context requires.

PUBLIC NUISANCE – Something that endangers the health or safety of the public or is offensive to the senses of an ordinary person.

PUBLIC SAFETY ANSWERING POINT (PSAP) – A facility that receives emergency calls (such as “E-911”) and dispatches public safety services.

PUD – Planned Unit Development.

PURCHASE OF DEVELOPMENT RIGHTS – The acquisition of development rights by a municipality to carry out the purposes of Chapter 117. See 24 VSA 4431.

RAW LAND – A building site that is not developed with Improvements (such as streets, water supply systems, and sewage disposal systems). See Improved Land.

REAL ESTATE – See Real Property.

REAL PROPERTY (REAL ESTATE) – Land, buildings, and structures (and the legal rights to them).

RECORD (S) – The act of including a deed, plat, or other legal instrument in the official system of records dealing with Real Property ownership.

REDEVELOPMENT – The conversion, reuse, and or reconstruction of Buildings, Structures, Neighborhoods, and communities.

REGION – An area that may or may not be officially designated in which a certain set of natural, social, and/or economic interrelationships exist.

REGIONAL PLAN – This Comprehensive Plan for Chittenden County adopted by CCRPC that conforms to the purposes and requirements of 24 VSA 4345a (5), 4347, and 4348.

REGIONAL PLANNING COMMISSION (RPC) – A commission created by the process required by 24 VSA 4341 that is authorized to prepare and implement a Regional Plan and carry out other duties and powers set forth in 24 VSA 4345 to 4346. CCRPC is the RPC for Chittenden County.

REGULATORY FLOODPLAIN – See Floodplain.

REGULATORY TAKING – See Taking.

RENEWABLE ENERGY RESOURCES – 24 VSA 4303 (24): Energy available for collection or conversion from direct sunlight, wind, running water, organically derived fuels, including wood and agricultural sources, waste heat, and geothermal sources.

RESTRICTIVE COVENANT – A provision in a deed, title, or other legal document establishing the ownership of real property that establishes a rule, condition, restriction, or prohibition on the use or transfer of the property. Because covenants are imposed by private parties (not the government), they can be more restrictive than governmental land-use regulations.

RIGHT-OF-WAY – An Easement that permits its owner (e.g., a government, utility company, railroad, or by a person) to physically cross property owned by another person and prevents use or development that interferes with the right to cross. Right-of-ways may authorize improvements as streets, utility lines, walk-ways, and bikeways.

RIGHT-OF-WAY LINE (S, Z) – The boundary line of a Right-of-Way.

RIPARIAN – Of, pertaining to, or situated on, the edge of the bank of a river or other body of water.

RPC – Regional Planning Commission.

RUNOFF – See Stormwater.

RURAL GROWTH AREAS – 10 VSA 6601 (16): Lands which are not natural resources referred to in 10 VSA 6086(a)(1)(A) through (F), 6086(a)(8)(A), and 6086(a)(9)(B), (C), (D), (E) and (K) (the natural resources criteria for approving an Act 250 permit).

RURAL PLANNING AREA – An area designated by this Plan where development is recommended to be of a type, scale, and density in keeping with Vermont’s traditional rural landscape.

RURAL TOWN – 24 VSA 4304 (25): A town having, as at the date of the most recent U.S. census, a population of less than 2,500 persons, as evidenced by that census, or a town having 2,500 or more but less than 5,000 persons that has voted by Australian ballot to be considered a rural town.
SCALE – The size and proportion of a Building, Structure, or Land Development in comparison with nearby development.

SCENIC EASEMENT – A Conservation Easement used to limit development on a property in order to protect views of the property itself or to protect views of distant scenery.

SCENIC RESOURCES – Visually pleasing landscapes (such as mountains, farms, ridge lines and shorelines) and the locations providing vistas of those landscapes.

SCORP – State Comprehensive Outdoor Recreation Plan.

SCREEN (Z) – A fence, berm, or vegetation, often of a specified height, that visually obscures one area from another.

SCS – Soil Conservation Service.

SECONDARY IMPACT – An indirect consequence of an action.

SECTION 248 – The Vermont Law (30 VSA 248) governing how the Public Service Board may approve a proposed utility facility.

SEPTIC SYSTEM – A tank and a leaching field in which sewage is purified by bacterial action.

SERVICE CENTER – A term used by this Plan to describe a Community Facility to which people go to obtain a particular public service (such as a community center) or that serves as the base of operations from which a particular public service is provided (such as a fire station).

SERVICES – Products that are intangible. See Goods.

SETBACK (Z) – The required distance that a building, structure, or land use must be from a lot line.

SHALE – This term is used to denote the imposition of a mandate or duty.

SHORELAND – 10 VSA 1422 (8): Land between the normal mean water mark of a lake, pond or impoundment exceeding 20 acres and a line not less than 500 feet nor more than 1,000 feet from such mean water mark. See 24 VSA 4424.

SHOULD – 24 VSA 4303 (26): This term is used to denote that an activity is encouraged but not mandated.

SITE PLAN (Z) – A Plat that depicts the general layout of a proposed Land Development.

SITE PLAN REVIEW – The process by which a government reviews the Site Plan for a proposed development to ensure that the development will conform to applicable regulations. See 24 VSA 4416.

SKETCH PLAN – See Sketch Plat.

SKETCH PLAT (SKETCH PLAN) (S) – A plat (typically prepared according to less formal standards than a Preliminary Plat or Final Plat) that depicts the general features and characteristics of a proposed subdivision and is submitted so that the Appropriate Municipal Panel may (1) provide informal comments in order to improve the likelihood that a subsequent preliminary plat or final plat will be acceptable and (2) classify the proposed subdivision as a Major Subdivision or Minor Subdivision.

SMART GROWTH – 24 VSA 2791 (13): Growth that:
(A) Maintains the historic development pattern of compact village and urban centers separated by rural countryside.
(B) Develops compact mixed-use centers at a scale appropriate for the community and the region.
(C) Enables choice in modes of transportation.
(D) Protects the state’s important environmental, natural and historic features, including natural areas, water quality, scenic resources, and historic sites and districts.
(E) Serves to strengthen agricultural and forest industries and minimizes conflicts of development with these industries.
(F) Balances growth with the availability of economic and efficient public utilities and services.
(G) Supports a diversity of viable businesses in downtowns and villages.
(H) Provides for housing that meets the needs of a diversity of social and income groups in each community.
(I) Reflects a settlement pattern that, at full build-out, is not characterized by:
   (i) scattered development located outside of compact urban and village centers that is excessively land consumptive;
   (ii) development that limits transportation options, especially for pedestrians;
   (iii) the fragmentation of farm and forest land;
   (iv) development that is not serviced by municipal infrastructure or that requires the extension of municipal infrastructure across undeveloped lands in a manner that would extend service to lands located outside compact village and urban centers;
(v) linear development along well-traveled roads and highways that lacks depth, as measured from the highway.

SOLID WASTE – 10 VSA 6602 (2): Any discarded garbage, refuse, septage, sludge from a waste treatment plant, water supply plant, or pollution control facility and other discarded material including solid, liquid, semi-solid, or contained gaseous materials resulting from industrial, commercial, mining, or agricultural operations and from community activities (but does not include animal manure and absorbent bedding used for soil enrichment or solid or dissolved materials in industrial discharges which are point sources subject to permits under the Water Pollution Control Act (10 VSA Chapter 47)).

SOLAR ACCESS – The ability to receive direct sunlight between specific times of the day.

SPECIAL NEEDS POPULATIONS – Those persons requiring specific housing modifications or arrangements including people with physical or mental disabilities, the homeless, those adjusting to society after being incarcerated, and sometimes the elderly.

SPECIAL PLAN – A plan that describes, analyzes, and makes Policies about one or more specific topics (such as community facilities, economy, housing, land use, population, and transportation) or for a designated subarea (such as a Corridor). A Special Plan may or may not be officially adopted as an amendment of a Comprehensive Plan. See 24 VSA 4403 (5) (municipalities) and 24 VSA 4345(6), (11), and (13) (RPCs).

SPECIAL SERVICE DISTRICT (SSD) – A contiguous, designated area that receives a special type and/or level of one or more public services or infrastructure that is paid for by a special tax levy on properties located in the area.

SPILLOVER EFFECT (EXTERNALLY) – A consequence of an action that is unintended or not of primary concern to the action takers.

SPOT ZONING (Z) – A change in Zoning that usually applies to a relatively small number of properties. A more specific meaning is a zoning change that is unlawful because it is intended to benefit a particular property owner (not the public welfare).

SRI – Substantial Regional Impact.

SSD – See Special Service District.

STEWARDSHIP – A planning and management approach to land and natural resources that considers long-term sustainability, environmental impacts, and public benefits of actions as well as public and private dollar costs.

STORMWATER (RUNOFF) – 10 VSA 1264 (14): Precipitation and snowmelt that does not infiltrate into the soil, including material dissolved or suspended in it, but does not include discharges from undisturbed natural terrain or wastes from combined sewer overflows.

STORMWATER DETENTION (RETENTION) – Natural and man-made measures designed to slow or prevent the release of stormwater from a site so it may be released at a controlled rate or percolate into the ground to reduce the risk of flooding and to improve water quality.

STORMWATER RETENTION – See Stormwater Detention.

STREET – A public or private Right-of-Way intended primarily for vehicular use, typically required to be built to specific standards. See Arterial Street, Collector Street, Local Street, Alley, and Driveway.

STREET LINE – The boundary line of a Street that may extend beyond the paved portion of the street. See Right-of-Way Line.

STRUCTURE – 24 VSA 4303 (27): An assembly of materials for occupancy or use, including a building, mobile home or trailer, sign, wall, or fence.

SUBDIVISION – The division or redivision of a lot, tract, or parcel of land into two or more lots for the purpose (whether immediate or future) of lease, transfer of ownership, development, or improvement. For the purposes of Act 250, subdivision is defined by 10 VSA 6001 (19).

SUBDIVISION REGULATION – A municipal bylaw that may (1) regulate the procedures and requirements for the submission and processing of plats, and (2) establish standards for the design and layout of streets, curbs, gutters, street lights, fire hydrants, shade trees, water sewage and drainage facilities, public utilities and other necessary public improvements. See 24 VSA 4418 and 4463.

SUBSTANTIAL REGIONAL IMPACT (SRI) – An Impact of Land Development that triggers the requirements of 24 VSA 4345a (16), (17), and 4348 (h). An SRI is not automatically in conflict with a regional plan. An SRI is not always an Adverse Impact. 24 VSA 4345a (17) requires each RPC to define SRI as the term is to be used with respect to its region in its Regional Plan. This Regional Plan discusses and defines SRI for Chittenden County at pages 1-14 to 1-18.
SUBSTANTIVE DUE PROCESS – This form of the constitutional right of Due Process requires that a government’s laws or actions that take or deny a person’s life, liberty, or property must (1) be based on one or more legitimate governmental purposes, (2) employ means to achieve those purposes that are related to achieving that purpose, and (3) employ means that are reasonable. See Taking.

SURFACE WATERBODIES – Waterbodies where water collects on or flows across the earth’s surface (such as ponds, lakes, reservoirs, rivers, and streams). See Ground Water, Watershed, and Wetland.

TAKING – A court decision that the government has appropriated private property. A Physical Taking occurs if the government physically enters onto or uses private property, even if the government did not intend to do so (such as when a government dam floods private property located upstream from the dam). A Regulatory Taking occurs when a government regulation (such as a bylaw) cannot be upheld as a valid exercise of the Police Power and can be sustained only as an exercise of Eminent Domain. When a court declares that a taking has occurred, the government may be required to pay “just compensation” to the owner for value of the property taken.

TAX INCREMENT FINANCING (TIF) – The designation of a district that benefits from Improvements financed by increased property tax revenues that result from new development in the district after its designation. See 24 VSA 1891 to 1897.


TECHNICAL DEFICIENCY – 24 VSA 4303 (28): A defect in a proposed plan or bylaw, or an amendment or repeal thereof, correction of which does not involve substantive change to the proposal, including corrections to grammar, spelling, and punctuation, as well as the numbering of sections.

TELECOMMUNICATIONS FACILITY – 24 VSA 4303 (29): A tower or other support structure, including antennae, that will extend 20 or more feet vertically, and related equipment, and base structures to be used primarily for communication or broadcast purposes to transmit or receive communication or broadcast signals.

THREATENED SPECIES – 10 VSA 5401 (7): A species listed on the State threatened species list (see 24 VSA 5402) or determined to be a "threatened species" under the federal Endangered Species Act.

TIF – Tax Increment Financing.

TOD – Transit Oriented Development / Design.

TRACT – A parcel of land that may lack precise boundaries or may lie on both sides of a street or water body.

TRAFFIC GENERATION – The number of trips that originate from a particular Land Use within a stated period of time.


TRANSFER OF DEVELOPMENT RIGHTS (TDR; TRANSFERABLE DEVELOPMENT RIGHTS) – A Bylaw that allows for development rights to be transferred from one or more designated sending areas to one or more designated receiving areas. See 24 VSA 4423.

TRANSITION PLANNING AREA – A location designated by this Regional Plan where future development is especially encouraged to use limited land resources and infrastructure and to protect natural resources.

TRANSIT ORIENTED DEVELOPMENT / DESIGN (TOD) – Development that employs land-use, site design, and architectural principles that make it more conducive for transit (e.g., intersection designs to facilitate bus turning movements, bus pullout lanes, transit kiosks and shelters) and non-motorized travel (higher density, mixed uses within walking distances of each other, bike lanes, sidewalks, and streetscape features such as benches) and may include design features that are intended to restrict auto use (such as reduced off-street parking areas).

UA – Urbanized Area.

UNIFIED DEVELOPMENT BYLAWS – The integration of two or more Bylaws authorized by Chapter 117 into a single bylaw to consolidate the development review and permit process. See 24 VSA 4419.

URBAN DESIGN – The intentional design of structures, neighborhoods, and entire cities to improve their function and to make them more beautiful.

URBAN DEVELOPMENT – Land Development that has the Land Uses, Improvements, Scales, and Densities that are typical of cities.

URBAN MUNICIPALITY – 24 VSA 4303 (31): A city, incorporated village, or any town that is not a Rural Town.

URBAN RENEWAL – A federal program during the 1950’s, 1960’s, and 1970’s that attempted to promote the Redevelopment of urban areas by acquiring many private properties in an area (sometimes
using Eminent Domain), demolishing buildings, and consolidating the lots into larger parcels.

**URBAN SPRAWL** – See Sprawl.

**URBANIZED AREA** – An area defined by the U.S. Census Bureau that has at least 50,000 residents and a population density of at least 1,000 people per square mile.

**USD** – U.S. Department of Agriculture.

**USDOT** – U.S. Department of Transportation.

**USE** – See Land Use.

**VAPDA** – Vermont Association of Planning and Development Agencies.

**VARIANCE (Z)** – Permission granted by a ZBA or DRB to use or alter a structure in a way that does not comply with the strict application of a zoning requirement, but which does conform with the requirements of 24 VSA 4469.

**VCGI** – Vermont Center for Geographic Information.

**VERMONT ASSOCIATION OF PLANNING AND DEVELOPMENT AGENCIES (VAPDA)** – An association of Vermont’s 11 RPCs. See www.access-vermont.com/vapda/.

**VERMONT CENTER FOR GEOGRAPHIC INFORMATION (VCGI)** – The non-profit public corporation established in 1994 to (1) develop and implement a comprehensive strategy for the Vermont Geographic Information System (VGIS); (2) ensure that data gathered by Vermont agencies is in a form that is compatible with, useful to, and shared with VGIS, (3) develop and host interactive map applications to increase the public’s access to information; (4) perform outreach and training to current and potential GIS users; (5) Develop data standards, guidelines, and procedures; and (6) develop and assist in the development of essential statewide databases. See 10 VSA Chapter 8 and www.vcgi.org.

**VERMONT HOUSING FINANCE AGENCY (VHFA)** – The State agency that provides loans to housing developers, allocates federal and State Housing Tax Credits to facilitate housing development, and provides housing subsidies to qualifying households. See www.vhfa.org.

**VERMONT LEAGUE OF CITIES AND TOWNS** – The lobbying arm of Vermont’s municipalities. See www.vlct.org.

**VESTED RIGHT** – A right vests when it becomes a right that a government cannot lawfully deny. For example, a developer may obtain a vested right after an application for a development permit is approved, so that the community cannot enforce any subsequent changes to its bylaws to compel the developer to modify the proposed development or to prevent its construction.

**VHFA** – Vermont Housing Finance Authority.

**VILLAGE CENTER** – 24 VSA 2791 (10): A traditional center of the community, typically comprised of a cohesive core of residential, civic, religious, and commercial buildings, arranged along a main street and intersecting streets. Industrial uses may be found within or immediately adjacent to these centers.

**VILLAGE PLANNING AREA** – An area designated by this Plan that are recommended to be local centers for jobs, housing, and community facilities with the character of a Vermont village.

**VISION (VISION STATEMENT)** – An element of a Comprehensive Plan that strives to summarize what the desired future conditions for an area or the desired future outcomes of a process should be.

**VISION STATEMENT** – See Vision.

**VLCT** – Vermont League of Cities and Towns.

**VSA** – Vermont Statues Annotated.

**WATER POLLUTION** – The addition of pollutants to water in concentrations or in sufficient quantities to result in measurable degradation of water quality.

**WATER RESOURCES PANEL** – The NRB Panel that oversees the development of water resources management and wetlands protection policies for Vermont through (1) the adoption of State water quality standards and rules regulating, for example, the use of public waters, lake levels, and development impacts on significant wetlands and their protective buffer zones and (2) rulemaking authority to designate and protect significant wetlands and to designate outstanding resource waters.

**WATERSHED** – An area of land that drains water, sediment, and dissolved material to a common outlet at some point along a stream channel.

**WELLHEAD PROTECTION AREA** – An area designated by the Vermont Department of Health to protect the quality of public water supplies.

**WETLAND** – 24 VSA 4303 (32): An area of the state that is inundated by surface or groundwater with a frequency sufficient to support vegetation or aquatic life that depend on saturated or seasonally saturated soil conditions for growth and reproduction. Such areas include marshes, swamps, sloughs, potholes, fens, river and lake overflows, mud flats, bogs, and ponds, but exclude such...
areas as grow food or crops in connection with farming activities.

WINOOSKI VALLEY PARK DISTRICT (WVPD) – The district that works to make the public waters of the Winooski River accessible for recreational activity by establishing a system of public parks along the Winooski River. See 24 VSA 4861 and www.wvpd.org.

WIRELESS TELECOMMUNICATIONS SERVICES – Communications services that do not rely on wire connections between sender and receiver.

WORKING LANDSCAPES – Activities for gain that are based on natural resources (such as agriculture, silviculture, and mining).

WVPD – Winooski Valley Park District.

YARD (Z) – An area of land (whose size is determined by a required Setback distance) that may not be occupied by a Principal Building (or in some communities, also not by certain Principal Uses, Accessory Structures, or Accessory Uses).

ZBA (Z) – Zoning Board of Adjustment.

ZONE (Z) – See Zoning District.

ZONING (Z) – Police Power regulations that govern the use and development of land, buildings, and structures. Zoning regulations are different than other types of regulations because zoning regulations may vary in different areas of the community (called Zoning Districts). In Vermont, a municipality establishes zoning by enacting a Bylaw that may permit, prohibit, restrict, regulate, and determine land development, including (1) specific uses of land, water courses and other bodies of water, (2) dimensions, location, erection, construction, repair, maintenance, alternation, razing, removal and use of structures, (3) areas and dimensions of land and bodies of water to be occupied by uses and structures, as well as areas, courts, yards and other open spaces and distances to be left unoccupied by uses and structures, and (4) the timing or sequence of growth, density of population, and intensity of use. See 24 VSA 4411 to 4414.

ZONING BOARD OF ADJUSTMENT (ZBA) (Z) – The municipal body authorized to officially interpret a community’s zoning regulations when it hears (1) Appeals, (2) Conditional Use applications and (3) requests for Variances.

ZONING DISTRICT (DISTRICT, ZONE) (Z) – A portion of a community officially designated on the Zoning Map within which certain Zoning regulations apply.

ZONING MAP (OFFICIAL ZONING MAP) – The map officially adopted as part of a Zoning Bylaw that identifies Zoning District boundaries.

ZONING REGULATIONS – See Zoning.
Map 3-1
Existing Land-Use Types
August 2006

2006 Chittenden County Regional Plan

Legend
- Residential
- Shopping, Services, or Trade
- Industrial
- Institutional or Infrastructure
- Leisure
- Natural Resource-Related
- No Human Activity (or Unclassified)

Sources:
Major Roads and Railroad - VTrans
Town Boundary and Water Body - VCGI
2003 APA Landbase Classification System - CCRPC

Disclaimer:
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by registered surveyors. This map is not sufficient for delineation of features on the ground. It may indicate the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.
Map 3-2
Existing Development Densities
August 2006

2006 Chittenden County Regional Plan

Legend

Undeveloped or Unclassified Land
Non-Residential (Employees per Acres)
High (Greater than 20)
Moderate (1 - 20)
Low (Less than 1)

Residential (Dwelling Units per Acres)
High (Greater than 8)
Moderate (1 - 8)
Low (Less than 1)

Water Body

Sources:
Major Roads and Railroad - VTrans
Town Boundary and Water Body - VCGI
2003 APA Landbased Classification System-CCRPC

Disclaimer:
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for delineation of features on the ground. This map identifies the presence of features, and may indicate relationships between features, but is not a supplement for surveyed information or engineering studies.

1:165,000

April 25, 2006
Map 3-3
Historic Sites and Districts
August 2006

Legend
Historic Site
Historic District

2006 Chittenden County Regional Plan
Historic sites/districts - updated by CCRPC 2005 from State Database
Major Roads (2005) and Railroad (2003) - VTrans
Town Boundary (2004) and Water Body (2005) - VCGI

Disclaimer:
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.
Map 4-5
Surface Relief
August 2006

2006 Chittenden County Regional Plan

Legend
Elevation (Feet)

High : 4381

Low : 95

Sources:
Major Roads and Railroad - VTrans
County Boundary and Water Body - VCGI
USGS National Elevation Dataset 2001

Disclaimer:
The accuracy of information presented is determined by its sources.
The Chittenden County Regional Planning Commission is not responsible for these.
Questions of on-ground locations can be resolved by site inspections and/or
surveys by registered surveyors. This map is not sufficient for
delineation of features on the ground. This map identifies the presence
of features, and may indicate relationships between features, but is
not a replacement for surveyed information or engineering studies.

May 27, 2005
Map 4-6
Agricultural Soils
August 2006

2006 Chittenden County Regional Plan
Sources:
Major Roads and Railroad - VTrans
Town Boundary and Water Body - VCGI
Soils - NRCS

Disclaimer:
Areas with mapped agricultural soils may be developed.
The accuracy of information presented is determined by its sources.
Errors and omissions may exist. The Chittenden County Regional
Planning Commission is not responsible for these. Questions of on-
the-ground location can be resolved by site inspections and/or
surveys by registered surveyor. This map is not sufficient for
delineation of features on-the-ground. This map identifies the presence
of features, and may indicate relationships between features, but is
not a replacement for surveyed information or engineering studies.
Map 4-7
Forest Cover
August 2006

2006 Chittenden County Regional Plan

Legend
- Non-forest
- Coniferous Dominant Forest
- Deciduous Dominant Forest
- Mixed Forest

Sources:
- Forest Cover - 1993 Landsat TM - UVM Spatial Analysis Lab
- Roads and Railroads - VTrans
- Town Boundary and Water Body - VCGI

Disclaimer:
The accuracy of information presented is determined by its sources. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for delineation of features on the ground. This map identifies the presence of features and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.
Map 4-9
Suitability for Natural Areas
August 2006

2006 Chittenden County Regional Plan

Legend
- Not Suited
- Suited
- More Suited
- Most Suited

Sources:
- Major Roads and Railroad - VTrans
- Town Boundary and Water Body - VCGI
- Open Space Inventory-2004

Disclaimer:
The accuracy of information presented is determined by its sources.
Sources and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-
the-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for
delineation of features on the ground. This map identifies the presence of features, and may indicate relationships between features, but is
not a replacement for surveyed information or engineering studies.

December 12, 2005
1960 to 2000 Population Change
- 400% or more
- 300 - 399%
- 200 - 299%
- 100 - 199%
- 0 - 99%
- Less than 0%
- No Residents in 1960

Legend

Sources:
Town Boundary (2004) and Water Body (2005) - VCGI.

Disclaimer:
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.

Map 5-1
Population Growth
August 2006

2006 Chittenden County Regional Plan

December 13, 2005
Map 5-2
Population Density
August 2006

2006 Chittenden County Regional Plan
Sources:
- Population and Census Block Groups: U.S. Census Bureau, Census 2000

Disclaimer:
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.

Legend
- 2,000 people per square mile or more
- 1,000 - 1,999 people per square mile
- 500 - 999 people per square mile
- 200 - 499 people per square mile
- 100 - 199 people per square mile
- Under 100 people per square mile

June 26, 2006
Map 8-1
Public Water Supply Systems
August 2006

2006 Chittenden County Regional Plan
Sources:
Water Supply Sources and Protection Areas - ANR data
Water Supply - CCRPC - NEEDS TO BE UPDATED

Disclaimer:
The accuracy of information presented is determined by its source.
Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these.
Questions of on-the-ground location can be resolved by site inspections and/or surveys by registered surveyors.
This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.

Legend
Public Water Supply Service Area:
- Champlain Water District
- Burlington Dept. of Public Works
- Other
Public Water Supply Source
- Champlain Water District
- Other
Ground Water Source Protection Area
Surface Water Source Protection Area
Public Water Treatment Plant
- Champlain Water District
- Other

1:165,000
June 26, 2006
2 Miles
Map 8-2
Public Wastewater Treatment Systems
August 2006

2006 Chittenden County Regional Plan

Legend
- Wastewater Treatment Facility
Sewer Service Area (to be updated)
  Existing/Approved
  Proposed

Sources:
Sewer Service Area - CCRPC- NEEDS TO BE UPDATED

Disclaimer:
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for delineation of features on-ground. This map does not the presence of features and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.

1:165,000

December 22, 2005
NOTE: Ratings are based on Vermont Environmental Protection Rules, August 16, 2002, based on 20% maximum slope for lots created on or after June 14, 2002. This does not replace onsite investigation. Soil surveys are mapped based on field observations to a 3-acre minimum mapping unit with delineations skipping the dominant soil (some soil surveys have many soil polygons smaller than 3 acres). Inclusions of other soils, too small to be delineated, may be present within a mapped soil unit.
Legend

Chittenden Solid Waste District Facilities
△ Vermont Solid Waste Management Facility Certification
♀ Certification and Designated Scale
♀ Certification, Designated Scale, and Licensed Processor

Other Solid Waste Facilities
△ Vermont Solid Waste Management Facility Certification
♂ CSWD Licensed
♀ Certification and CSWD Licensed
♀ Closed Landfill - Requires Monitoring & Maintenance

Sources:
Solid Waste Facilities - CCRPC, 2005

Disclaimer:
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.

2006 Chittenden County Regional Plan

Map 8-4
Solid Waste Management Facilities
August 2006

1:165,000
0 0.5 1 2 Miles

June 1, 2005
gisserver/regionalplan2006/solidwastemanagmentfacilities.mxd
Map 9-1
Places of Assembly
August 2006

Legend
- Club
- Senior Center
- Community Center
- Fairgrounds
- Theater
- Museum

2006 Chittenden County Regional Plan
Sources:
Major Roads and Railroad - VTrans
Town Boundary and Water Body - VCGI
Community Facilities-CCRPC

Disclaimer:
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for delineation of features on-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.
Map 9-3
Child Care Facilities
August 2006

2006 Chittenden County Regional Plan

Disclaimer:
The accuracy of information presented is determined by its sources. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-ground location can be resolved by site inspections and/or surveys by registered surveyor. This map is not sufficient for determination of features on the ground. This map shows the presence of features, and may indicate relationship between features, but is not a replacement for surveyed information or engineering studies.
Map 10-2
Electric Power Service Areas
August 2006

2006 Chittenden County Regional Plan

Legend
- Burlington Electric Dept.
- Central Vermont Public Service Corp.
- Green Mountain Power Corp.
- Vermont Electric Co-op

Sources:
- Major Roads and Railroad - VTrans
- Town Boundary and Water Body - VCGI
- Electric Power Service Area - CVPS

Disclaimer:
The accuracy of information presented is determined by its sources. Gross and intentional errors exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of siting or planning may necessitate surveys by licensed surveyor. This map is not intended for delineation of features on the ground. This map should not be used for site specific planning.

1:165,000

0 0.5 1 2 Miles

December, 2005
Map 11-1
Emergency Service Providers
August 2006

2006 Chittenden County Regional Plan
Sources:
Major Roads and Railroad - VTrans
Town Boundary and Water Body - VCGI

Disclaimer:
The accuracy of information presented is determined by its sources.
The map is intended for informational purposes only. The Chittenden County Regional Planning Commission is not responsible for
errors or omissions. Questions of on-the-ground location can be resolved by site inspections and surveys by registered surveyors. This
map is not a replacement for detailed field surveys. This map identifies the presence of features, and may indicate relationships between
features, but is not complete or detailed enough for engineering studies or site inspections.