

Vermont 2020

Comprehensive Economic Development Strategy



Prepared by the
Agency of Commerce and Community Development,
The Vermont CEDS Committee and the Garnet Consulting Group.

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Abbreviations Found in this Document

ACCD	Vermont Agency of Commerce and Community Development
ACT	American Council for Technology
AIV	Associated Industries of Vermont
ALB	Albany International Airport
BDL	Bradley International Airport
BEA	Bureau of Economic Analysis
BERC	Biomass Energy Resource Center
BI	Worldwide Business Intelligence
BOS	Boston Logan International Airport
BLS	Bureau of Labor Statistics
BTV	Burlington International Airport
BYOBiz	Build Your Own Business
CAGR	Compound Annual Growth Rate
CBP	County Business Patterns
CBR	Computer Business Review
CCV	Community College of Vermont
CEDF	Clean Energy Development Fund
CEDS	Comprehensive Economic Development Strategy
COPS	Hospitality Certificates of Proficiency
CSA	Community Supported Agriculture
DET	Vermont Department of Employment and Training
DFR	Vermont Department of Financial Regulation
DHCD	Department of Housing and Community Development
DO LL	Department of Labor
DRTC	Dartmouth Regional Technical Center
EA	Enterprise Architecture
EDA	U.S. Economic Development Administration
EDD	Economic Development District

Abbreviations Found in this Document - Continued

EHR	Electronic Health Records
EMSI	Economic Modeling Specialists International
EB-5	Visa program to attract foreign investors
ESRI	Supplier of GIS software
Ex-Im	United States Export-Import Bank
F2P	Farm to Plate
F.A.R.M.S.	Farm and Agricultural Resource Management Stewards
FedEx	Federal Express
FHWA	Federal Highway Administration
Garnet	Garnet Consulting Services, Inc.
GPI	Genuine Progress Indicator
GDP	Gross Domestic Product
GSP	Gross State Product
HIECE	Hospitality Industry and Education Centers of Excellence
IDC	International Data Corporation
IECE	Industry and Education Centers of Excellence
IEDC	International Economic Development Council
IT	Information Technology
LQ	Location Quotient
MEDICA	Large medical trade show in Germany
MWh/MW	Megawatt Hours/Megawatt
MHT	Manchester-Boston Airport
NAEP	National Assessment of Educational Progress
NAICS	North America Industry Classification System
NES	Nonemployer Statistics
NFP	Not for Profit
NGO	Non-governmental Organization
NGV	Natural Gas Vehicle
NIH	National Institute of Health
NIST MEP	National Institute of Science and Technology Manufacturing Extension Partnership
PEV	Plug-in Electric Vehicle
PM	Project Management

Abbreviations Found in this Document - Continued

PPM	Project Portfolio Management
PV	Photovoltaic
QCEW	Quarterly Census of Employment and Wages
R&D	Research and Development
RDC	Regional Development Corporation
REIS	Regional Information Systems
RIT	Rochester Institute of Technology
RPC/RPO	Regional Planning Commission/Regional Planning Organization
SBDC	Small Business Development Center
SBTT	Small Business Technology Transfer
SeVEDS	Southeastern Vermont Economic Development Strategies
SIB	Vermont State Infrastructure Bank
SLQ	Saint Lawrence & Atlantic Railroad (Quebec)
SOC	Standard Occupational Classification
STEM	Science, Technology, Engineering & Mathematics
SBIR	Small Business Innovation Research
SWAT	Special Weapons and Tactics
SWOT	Strengths, Weaknesses, Opportunities, Threats (Competitive Assessment)
TAACCCT	Trade Adjustment Assistance Community College and Career Training
TIF	Tax Increment Financing
TLP	Technology Loan Program
TMDL	Total Maximum Daily Load
UPS	United Parcel Service
US BEA	United States Bureau of Economic Analysis
USCIS	US Citizenship and Immigration Services
USDA	United States Department of Agriculture
USTAR	Utah Science Technology and Research Initiative
US GDP	United States Gross Domestic Product
UVM	University of Vermont
VAAA	Vermont Chamber's Aerospace and Aviation Association
VCAP	Vermont Capital Access Program
VCET	Vermont Center for Emerging Technologies
VDOL	Vermont Department of Labor

Abbreviations Found in this Document - Continued

VEDA	Vermont Economic Development Authority
VEGI	Vermont Employment Growth Incentive
VEIC	Vermont Energy Investment Corporation
VEPC	Vermont Economic Progress Council
VGTP	Vermont Global Trade Partnership
VHFA	Vermont Housing Finance Agency
VMEC	Vermont Manufacturing Extension Center
VSJF	Vermont Sustainable Jobs Fund
VTC	Vermont Technology Council
VTEPSCoR	State Committee for the Vermont Experimental Program to Stimulate Competitive Research
VTP	Vermont Training Program
VTSBDC	Vermont Small Business Development Center
vtTA	Vermont Technology Alliance
VTrans	Vermont Agency of Transportation
VWBC	Vermont Women's Business Center

EDA CEDS Requirements Checklist

Requirement	Where Compliance is Documented in this CEDS
1. The Strategy Committee must represent the main economic interests of the region.	The composition of the Vermont CEDS Committee is referenced in Chapter 1 – Introduction and Mission and discussed in Appendix A which covers the CEDS Process and Committee.
2. The Strategy Committee must include Private Sector Representatives (defined in 13 C.F.R. § 300.3, with respect to any for-profit enterprise, as any senior management official or executive holding a key decision making position, or that person's designee) as a majority of its membership.	The composition of the Vermont CEDS Committee is referenced in Chapter 1 – Introduction and Mission and discussed in detail in Appendix A which covers the CEDS Process and Committee.
3. The Planning Organization should ensure that the Strategy Committee also includes: <ul style="list-style-type: none"> • Public officials; • Community leaders; • Representatives of workforce development boards; • Representatives of institutions of higher education; • Minority and labor groups; and • Private individuals. 	The composition of the Vermont CEDS Committee is referenced in Chapter 1 – Introduction and Mission and discussed in Appendix A which covers the CEDS Process and Committee.
4. The CEDS must contain a background of the economic development situation of the region that paints a realistic picture of the current condition of the region. This background must include a discussion of the economy, population, geography, workforce development and use, transportation access, resources, environment, and other pertinent information.	<p>A summary is presented in Chapter 2 – An Overview of Vermont. Details on workforce, transportation, environment and resources are included in the related chapters and sectors of the same names.</p> <p>A more detailed analysis is presented in Appendix B – Economic Data Analysis.</p>
5. The CEDS must include an in-depth analysis of the economic development problems and opportunities that identifies strengths and weaknesses in the regional makeup of human and economic assets, and problems and opportunities posed by external and internal forces affecting the regional economy. This analysis must: <ul style="list-style-type: none"> • Incorporate relevant material from other government-sponsored or supported plans and demonstrate consistency with applicable State and 	<p>A summary is presented in Chapter 2 – An Overview of Vermont.</p> <p>A more detailed analysis is presented in Appendix C- SWOT Analysis/Competitive Assessment.</p> <p>Appendix E provides a list and analysis of other relevant documents that were reviewed during the preparation of this CEDS</p>

Requirement	Where Compliance is Documented in this CEDS
<p>local workforce investment strategies.</p> <ul style="list-style-type: none"> Identify past, present, and projected future economic development investments in the region. Identify and analyze economic clusters within the region. 	<p>Appendix G presents examples of major recent and projected investments. In addition, Chapter 4A on Finance and Capital outlines EB-5 investment</p> <p>Target Sectors, Chapter 6, provides data and Appendix D provides a detailed Sector and Cluster Analysis.</p>
<p>6. The CEDS must contain a section setting forth goals and objectives necessary to solve the economic problems, or capitalize on the resources, of the region.</p>	<p>Goals and Objectives are addressed in Chapter 3 – Goals and Chapter 4 – Action Areas.</p>
<p>7. The CEDS must include a section discussing the relationship between the community in general and the private sector in the development and implementation of the CEDS.</p>	<p>The composition of the CEDS committee, including the leadership of the private sector, is discussed in Appendix A. The private sector was significantly represented during all aspects of the CEDS process. The role of the private sector in implementation is also discussed in each Action Area, in particular Finance where private sector EB-5-funded infrastructure business projects are bringing \$300 million into the state.</p>
<p>8. The CEDS must contain a section which identifies regional projects, programs and activities designed to implement the Goals and Objectives of the CEDS. This section should identify and describe:</p>	<p>Chapter 4 – Action Areas and Chapter 7 – Vital and Other Projects provide this information.</p>
<p>A. Suggested Projects-</p> <ul style="list-style-type: none"> All suggested projects, programs and activities and the projected number of jobs to be created as a result. Lead organizations' responsibilities for execution of the projects. 	
<p>B. Vital Projects- A prioritization of vital projects, programs, and activities that address the region's greatest needs or that will best enhance the region's competitiveness, including sources of funding for past and potential future investments. These can be overarching "themes." Funding sources should not be limited to EDA programs.</p>	
<p>9. CEDS Plan of Action: The plan of action, as described in the CEDS, implements the goals and objectives of the CEDS in a manner that-</p>	<p>See Chapter 4 – Action Areas.</p>

Requirement	Where Compliance is Documented in this CEDS
<ul style="list-style-type: none"> • Promotes economic development and opportunity; • Fosters effective transportation access; • Enhances and protects the environment; • Maximizes effective development and use of the workforce consistent with any applicable State or local workforce investment strategy; • Promotes the use of technology in economic development, including access to high-speed telecommunications; • Balances resources through sound management of physical development; and • Obtains and utilizes adequate funds and other resources. 	
<p>10. The CEDS must contain a section that discusses the methodology for cooperating and integrating the CEDS with a State's economic development priorities.</p>	<p>As a state-level CEDS, this document sets forth the State's economic development priorities.</p>
<p>11. The CEDS must contain a section that lists the performance measures used to evaluate the Planning Organization's successful development and implementation of the CEDS, including but not limited to the:</p> <ul style="list-style-type: none"> • Number of jobs created after implementation of the CEDS; • Number and types of investments undertaken in the region; • Number of jobs retained in the region; • Amount of private sector investment in the region after implementation of the CEDS; and • Changes in the economic environment of the region. 	<p>Metrics for performance monitoring are set forth in Chapter 3 - Goals and Action area specific goals are presented in Chapter 4 – Action Areas.</p>
<p>12. The Planning Organization is responsible for making a new or revised CEDS available for review and comment by the public for a period of at least thirty (30) days prior to submission of the CEDS to EDA.</p>	<p>As described in Appendix A – CEDS Process, the document received a public review period of 30 days prior to the June 30 submission and comments were incorporated.</p>

EXECUTIVE SUMMARY

In the wake of 2011's Tropical Storm Irene, Vermont set out to not only repair its infrastructure but to create a stronger and more prosperous state; resilient to both natural and economic impacts. This Comprehensive Economic Development Strategy (CEDS) was born of that effort.

Directed by Governor Peter Shumlin, funded by the U.S. Economic Development Authority, and produced by the Agency of Commerce and Community Development in tandem with the CEDS Committee, this document sets a strategy that the state will build on and add to over the next five years.

Citizens from all regions and all walks of life were consulted and provided valuable input. Plans and data from groups around Vermont (including our four regional CEDS) were taken into account. The CEDS was also built based on input from state agencies and partners.

It proposes actions we can take to fulfill the mission: *Improve the economic well-being and quality of life of Vermonters while maintaining our natural resources and community values.* And it lays out specific goals and measurable targets for achieving that mission in four action areas:

- Access to finance and capital
- Workforce development and education
- Physical infrastructure
- Business environment

The CEDS establishes strategies that can move us toward accomplishing those goals. The document also identifies the 12 target business sectors that have a strong likelihood of growing our economy and enhancing the quality of life for Vermonters. It suggests projects and initiatives that can help each action area and sector grow. It anticipates future events and identifies tactics that will help us build resiliency.

Lastly, this CEDS sets out a unique, overarching goal: It proposes to not only grow jobs and wages and increase our Gross Domestic Product, but also to improve the Genuine Progress Indicator, (GPI)—a measure that takes into account economic, social and natural assets and impacts—by 5% over baseline over the next five years.

This measure of success reflects Vermont's holistic approach to economic development and the desire of all parties involved to not only grow our economy as gauged by traditional measures but to also take into account the value of our working landscape and natural resources, our culture of innovation and the Vermont brand.

I. INTRODUCTION AND MISSION

“In Vermont we lead differently, live differently and profit differently” – Joe Fusco, Vice-President Casella Waste Systems; Chair, Vermont CEDS Committee, June 3, 2013

On June 3, 2013 more than 175 Vermonters met in Rutland to discuss the future direction of the Vermont economy. They came from every corner of the state and represented Vermont’s wide variety of businesses, non-profits, educational institutions and government. They came out of a shared belief in Vermont’s traditions, values and innovative spirit, and out of a commitment to help our state become more resilient in the face of global uncertainties.

That gathering kicked off Vermont’s first statewide Comprehensive Economic Development Strategy. While many regional CEDS have been completed (including, most recently in Vermont, the Southeastern Vermont CEDS, the Chittenden County ECOS, the Two Rivers-Ottawaquechee regional effort for east-central Vermont and one for the northern tier of the state) few states have attempted a statewide plan.

Funded by the U.S. Economic Development Administration, the Vermont CEDS began, in part, as a tool for building economic resiliency in the wake of Tropical Storm Irene. Following that August 2011 storm, 500 miles of state roads were destroyed, 200 bridges were damaged and 1,000 homes were obliterated, a level of infrastructure damage that significantly disrupted the state's economy. Of the state’s 251 towns, 225 had infrastructure damage.

That event became a rallying call for Vermont to not only repair its physical foundations but to also rebuild its business and community infrastructure to withstand future upheavals, whether climatic or economic. In the past three years, with support from the state and federal governments, Vermont has made tremendous progress toward repairing the damages and has made its economy stronger than ever.

Since 2011, Vermont has already achieved several milestones:

- More than 11,000 net new jobs have been added.
- Vermont has become a national leader in solar energy, adding 1000 jobs in 2013, more solar jobs per capita than any other state.
- The EB-5 investment program has (since 2006) generated more than \$300 million in foreign direct investment with a portion of those funds going to projects that will help our ski resorts flourish as four-season destinations while adapting to climate change.
- Broadband coverage has been extended to 99% of the state.
- Vermont has been named the #1 state in the nation by Opportunity Nation’s “The Opportunity Index” for the third year in a row.

At the regional level, Burlington has been named by Techie.com as one of the top 10 emerging technology centers in the nation and second in the nation for innovation by Business Insider. The Northeast Kingdom, whose economy has historically lagged behind the rest of the state's, is creating new jobs and community assets thanks to an infusion of capital from Vermont's innovative EB-5 foreign direct investment program. Southeastern Vermont, faced with the decommissioning of the Vermont Yankee nuclear plant and associated job loss, has produced its own CEDS and is branding itself as a region.

Despite the progress, our state still faces numerous challenges:

- The national trend of growing income and wealth inequality is reflected to a degree in Vermont. Vermonters, especially younger people and those at the lower end of the educational and economic spectrum, have limited opportunities to build a livelihood that can sustain them and their families.
- Our infrastructure, built to sustain the small towns and factories of a century ago, is aging and, in places, vulnerable. New building and economic growth will depend on adequate water and sewer capacity, which is limited in many areas.
- Vermont's population, projected to grow by only 1% between 2013 and 2017, is aging more rapidly than the nation's. This creates challenges to our education system, tax structure, customer base, and workforce. It also raises questions about succession in the many small businesses that make up a large part of our economy.
- Vermont's small tax base means limited availability of funds for business incentives or infrastructure investment. We are also faced with aggressive and well-funded business recruiting from our neighboring states: New York, for instance, has recently instituted the Start-Up NY program that will allow eligible businesses to operate tax-free for ten years, while New Hampshire has no income or sales tax.
- The natural resources so crucial to our state's economy and brand such as food production, tourism, and recreation, are vulnerable to climate change, pollution and depletion. Vermont's forests, which helped mitigate the flooding caused during Irene, are located primarily (85%) on private land, too little of which is covered by forest management plans that can help sustain them as an economic and natural resource.
- With aggressive new clean water standards set for Lake Champlain and Long Island Sound, we must find ways to curb run-off and pollution within our watersheds while maintaining and growing land-based economic activity.
- Energy costs, while low in New England, remain high relative to the rest of the U.S.

To tackle these and other issues, and to explore new ways to grow our economy, the state of Vermont applied for and received federal funding for a statewide Comprehensive Economic Development Strategy (CEDS) from the U.S. Economic Development Administration.

The Agency of Commerce and Community Development team worked closely with a CEDS Committee of more than 30, half of whom hail from the private, for-profit business sector and

the rest representing regions, interest groups, not-for-profits, education, minority and labor groups. A group of consultants led by Garnet Consulting Group Inc. assisted with the process. This involved 10 months of public stakeholder meetings around the state as well as extensive meetings across government agencies. In all, more than 300 citizens and more than 12 state departments participated. A full report on the process and meeting notes are included in Appendix A: CEDS Process.

This CEDS, first and foremost, lays out a road map and an economic development action strategy for the next five years. As much as possible, this CEDS focused on actions that can be taken and goals that could be achieved without requiring new legislation or taxes.

Rather than a specific work plan, it is an iterative document that will be continually updated, revised and refined over the next five years. In the following chapters, we will identify:

Goals: Outcomes that can be achieved by 2020 through implementation of this CEDS.

Measurable targets: Metrics for success

Strategies: The approaches that will help us get there.

Initiatives: Ideas or actions that will move us toward the goals.

Projects: “Vital” projects are those that were identified by the CEDS Committee as primary projects that contribute to achieving this CEDS goals.

Projects will be described in greater detail Chapter 7 and Initiatives in the Appendix F document.

The Mission of Vermont's CEDS

Why create a CEDS? As defined by the U.S. Economic Development Administration, which funded the preparation of this CEDS:

A comprehensive economic development strategy (CEDS) is designed to bring together the public and private sectors in the creation of an economic roadmap to diversify and strengthen regional economies. The CEDS should analyze the regional economy and serve as a guide for establishing regional goals and objectives, developing and implementing a regional plan of action, and identifying investment priorities and funding sources. A CEDS integrates a region's human and physical capital planning in the service of economic development. Integrated economic development planning provides the flexibility to adapt to global economic conditions and fully utilize the region's unique advantages to maximize economic opportunity for its residents by attracting the private investment that creates jobs for the region's residents. A CEDS must be the result of a continuing economic development planning process developed with broad-based and diverse public and private sector participation, and must set forth the goals and objectives necessary to solve the economic development problems of the region and clearly define the metrics of success. Finally, a CEDS

provides a useful benchmark by which a regional economy can evaluate opportunities with other regions in the national economy.

More simply stated in the 2013 Southeastern Vermont CEDS, “A Comprehensive Economic Development Strategy (CEDS) is a region’s playbook for engaging in a collaborative, region-wide transformation of the economy in order to raise productivity, create wealth, and increase prosperity for residents.”

This statewide CEDS will take into account and build upon all of Vermont’s regional plans as well as numerous strategic plans from other agencies and organizations.

The mission of Vermont's statewide CEDS is to:

Improve the economic well-being and quality of life of Vermonters, while preserving our natural resources and community values.

How Do We Accomplish This?

Economic development is a complex process involving the interaction of multiple, interdependent systems, each with its own parameters and institutional frameworks. We cannot, for example, produce and retain a skilled workforce without addressing education, housing, health care, poverty and a host of other social and economic factors. Each of these factors in turn has its own "ecosystem" of governmental, non-profit, businesses and private agencies working towards a set of specific goals within that subject area. The challenge is to engage these players in a) finding the overlaps between their own primary aims and the related goals and strategies of the economic development system, and b) focusing collective resources more effectively to accomplish mutually beneficial results.

The CEDS process has identified the following key components of Vermont’s economic development system. When approached in a coordinated way, these strategies work together to achieve our mission:

- 1. Accessible Financing and Capital:** Create financial structures and programs that give Vermont enterprises access to capital and the means to grow.
- 2. A Skilled Workforce:** Ensure that all Vermont citizens have the skills they need to produce a robust livelihood and that Vermont businesses have the skilled talent they need to succeed.
- 3. Sound Infrastructure:** Provide or improve infrastructure that is critical to economic and community development in Vermont.
- 4. A Competitive Business Environment:** Create a hospitable environment for the establishment, cultivation and growth of businesses at all stages and for entrepreneurial innovation.

While the above strategies make sound policy sense for any region, the CEDS will also set forth strategies to address opportunities and issues unique to Vermont as a state:

- By building upon the abundant and unique assets of **our working landscape**, the innovative spirit of its associated businesses (such as food, farming, forestry and tourism), and the commitment of Vermonters to their communities, we will foster economic vitality, resiliency, and the sustainability of Vermont's landscape.
- To ensure that no Vermonter is left out of our state's prosperity, we will forge inter-agency partnerships to tackle the broader socio-economic issues that limit both economic development and **Vermonters' quality of life**, such as poverty; lack of affordable housing across a range of income brackets; health quality and health care access; and substance abuse prevention and remediation.
- Vermont's uniquely collaborative **entrepreneurial culture has been a major spur to innovation**, building scale and marketing in sectors such as advanced manufacturing, software and value-added agriculture. We will nurture and build upon the networks and hubs that produce innovative products, processes and services to benefit Vermonters and the Vermont economy.
- Lastly, we will support and strengthen the unique values and assets that contribute to the **Vermont brand** and continue to leverage it to grow our state.

The goals, strategies and initiatives provided in this CEDS are the results of many meetings with citizens around the state, with our CEDS Committee, industry and business groups, with towns and regions, with partner organizations and within state government. We would like to thank all who lent their time, energy and ideas to this process. Your work will make this a better state.

2. AN OVERVIEW OF VERMONT

Vermont is a place of apparent contrasts. We are a small rural state with more than 7,000 farms and yet our largest private sector employer is IBM, the iconic electronics manufacturer. We are known for our cheeses, craft beers and skiing, yet, increasingly, our cutting-edge technology companies (such as Dealer.com, BioTek, Logic Supply and NRG Systems) make INC. magazine's list of fastest-growing companies. Vermont has more than 100 general stores and, at the same time, is home to MyWebGrocer, an Internet-based grocery marketing company with over 300 employees.

Innovative businesses that build off Vermont's classic rural values (craftsmanship, hard work, ingenuity) define 21st century Vermont. That combination also frames the challenges and opportunities the state faces as it moves into the future. Because of "diseconomies" of scale and concentration, rural areas are typically less economically robust than more urbanized parts of the United States. However, Vermont has successfully cultivated and attracted individuals and businesses to build a vibrant and diverse economy.

In this section we look at the history of the Vermont economy, analyze our present situation, establish benchmarks, and identify key areas that can have the greatest impacts on our economic progress.

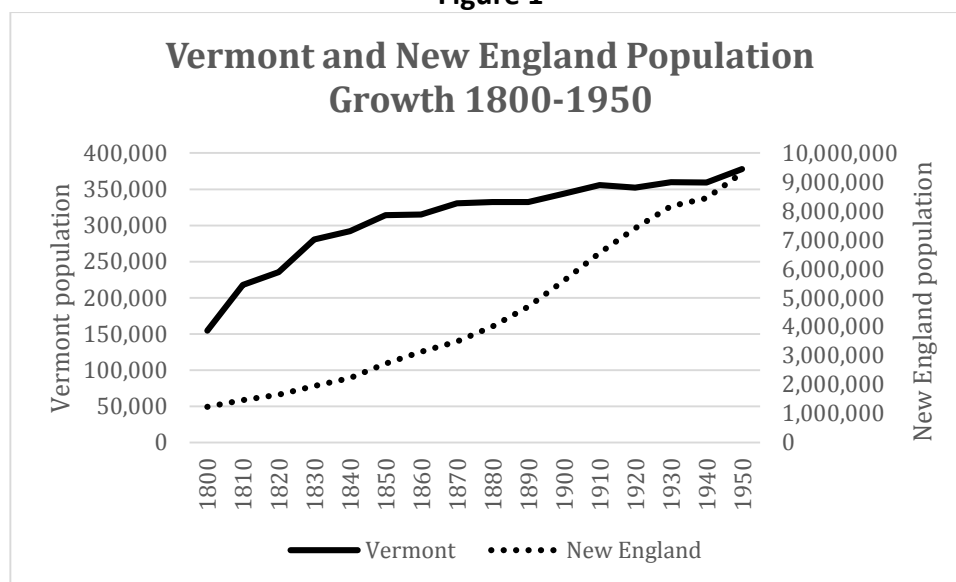
How We Got Here

Settled in the mid 18th century by migrants from the neighboring colonies of Massachusetts, New Hampshire and later New York, Vermont's thickly forested landscape challenged incoming farmers while providing rich resources for the charcoal and timber industries.

Forestry and agriculture continued to dominate the Vermont economy through most of the 19th century. The state's relative isolation and limited manufacturing base kept its economy lagging behind its New England neighbors. In the mid-19th century, Vermont began to establish innovative niche industries where it claimed regional and national leadership: precision machine works in the Connecticut River Valley centered in Springfield, industrial scales perfected by Thaddeus and Erastus Fairbanks in St. Johnsbury, and mutual insurance, with companies like National Life and Vermont Mutual setting the industry standards, in Montpelier.

Rail lines and expanding barge traffic on Lake Champlain began to move Vermont out of isolation. But the slow-growing, land-based occupations of farming and forestry remained the predominant source of employment in Vermont through the 19th century. Its population depleted by western migration in the wake of the Civil War, Vermont grew by only ten percent between 1850 and 1950 while the United States population expanded fivefold and New England tripled.

Figure 1



Source: US Census Bureau

But in this same period, Vermont was laying a foundation that would provide opportunities for growth in the second half of the 20th century. Education was the key for many individuals to move from unskilled farm work into higher-wage careers, and Vermont’s educational pioneers like Justin Morrill, creator of the Land Grant College movement, and philosopher/educator John Dewey, advanced the state of higher education on a national scale. Vermont had eight institutions of higher learning by the mid-19th century, all of which still flourish today. As more fully discussed below, the other factor that primed Vermont for rapid growth in the second half of the 20th century, paradoxically enough, was a settlement pattern that changed little from the early 1800s to the 1950s.

The 19th century development of Vermont resulted in hundreds of villages spaced between two and 10 miles apart. Each of these had schools and churches; many had general stores. The larger villages had town halls, libraries and eventually fire stations. A few dozen villages grew into regional trading centers and developed more recognizable “downtowns” with a concentration of commercial structures surrounded by dwellings.

In other parts of New England, towns grew faster during the first part of the 20th century and filled in much of the rural land between them. Mechanized transportation decreased the necessity for closely spaced villages, but slow growth in Vermont delayed sprawl and many of its historic villages and the downtowns continue to exist, some with a remarkable degree of vitality.

In the latter part of the 20th century, Vermont began to consider how to best maintain its villages and downtowns as centers of community, commerce and culture. Growing out of public discussions was Vermont's landmark land use and development law, Act 250. Its regulations,

combined with local and regional planning, have helped to maintain compact development and settlement patterns. This has preserved much of the character and community life of Vermont, but has also been perceived by some as a hindrance to certain types of economic development.

The Modern Economy

More rapid expansion began in the 1950s and 1960s as the interstate highway system shortened travel time to the major population centers of Boston and New York. City dwellers began to visit Vermont for vacations, and then settled in to live and start businesses, many of which have grown into major employment and income engines.

The most obvious example is Thomas Watson, Jr. of IBM, who came to ski in Stowe and then set up a manufacturing facility in Essex in 1956. At the time, the American Woolen Company in nearby Winooski had just closed, idling 800 people; the General Electric arms plant had reduced its Burlington workforce from 2,000 to 500, and the state's unemployment rate was close to 12 percent. At its height, IBM came to employ over 8,000 workers on the Essex campus, complete with its own wastewater treatment and other facilities. As of June 2014, with employment of close to 4,000, IBM remained the largest private employer in Vermont.

Others also found Vermont a conducive environment and set up modern manufacturing facilities in Vergennes (CF Benton, later Simmonds Precision and later still B.F. Goodrich, then United Technologies), Bennington and St. Albans (Energizer) and St. Johnsbury (EHV Industries, which merged into EHV Weidmann and now, WICOR). As businesses grew, so did disposable income, allowing more consumer-based businesses to flourish.

Vermont's natural beauty, pristine environment and rural nature have proved to be long-term economic assets as tourism and recreation have expanded as well. Commercial skiing in Vermont started in the 1930s as a mostly locals' sport and boomed after World War II as packed ski trains headed north from New York. During the late 1950s and 1960s, some of the larger areas expanded and have since become the destination resorts we know today: Stowe, Killington, Jay Peak, Stratton, Mount Snow and others, attracting visitors from all over the US and increasingly from around the world.

Tourism currently yields more than 5 percent of the state's GDP. Many people who visit or attend college in Vermont stay to establish businesses and not surprisingly, many of those are recreation-based. Starting in the 1960s, a new wave of "flatlanders" ventured north: idealistic and often socially conscious, they embraced the possibilities of the rural landscape and celebrated what they saw as the simpler, Vermont way of life. Some went on to found innovative, iconic businesses born from their lifestyles and passions, such as Ben & Jerry's, Burton, Seventh Generation, and Keurig Green Mountain.

Today, these businesses are among Vermont's largest. They are emblematic of both how the state has become an incubator for entrepreneurs and present challenges as homegrown businesses become multinational successes and/or are bought by out-of-state companies. Do they stay or do they leave?

Happily, many of the founders who exited Vermont's successful businesses are committed to living in Vermont and have gone on to start others here. Vermont's reputation as a greenhouse for entrepreneurs has gained national attention and helped spawn a new wave of rapidly growing companies, particularly in the digital and biotechnology areas.

Still, as these enterprises expand, they recognize a need to reach beyond our state and even national borders to attract needed talent, develop new supply chains and reach new markets. They may become more vulnerable to incentives offered by other states and countries and, especially if publicly traded, more compelled to maximize net revenues. Some, however, are adopting corporate forms such as the public benefit and "B corporations" that measure social and environmental benefits as well as profits. The venerable 200-year-old King Arthur Flour is the best-known Vermont example.

Regional, national and global economies continue to mature. While Vermont has benefited from locational advantages that have evolved over the past 250 years to foster a uniquely rural brand of economic progress, the state will need to be more systematic in building on its strengths and addressing its weaknesses to keep pace with the rapidly changing world economy.

That is the charge that the Vermont Agency of Commerce and Community Development (ACCD) accepted in taking on the development of this Comprehensive Economic Development Strategy.

Measuring Our Economy Today

Vermont is and always will be dependent on and linked tightly to the regional and national economies. Therefore, to assess the health of Vermont's economy and the policies we might undertake to improve it, we need to place it in the context of New England and the United States.

As of 2013, about 325,000 Vermonters were working in enterprises contributing to the State's economy, which is about 0.2% of the nation's workforce. In 2012, Vermont workers and businesses produced over \$27 billion in value as measured by the Gross Domestic Product. As with the workforce, the Vermont GDP represents about 0.2% of the U.S. economy. Even in New England, Vermont economic activity represents only about 3.4% of activity in the region.

Figure 2

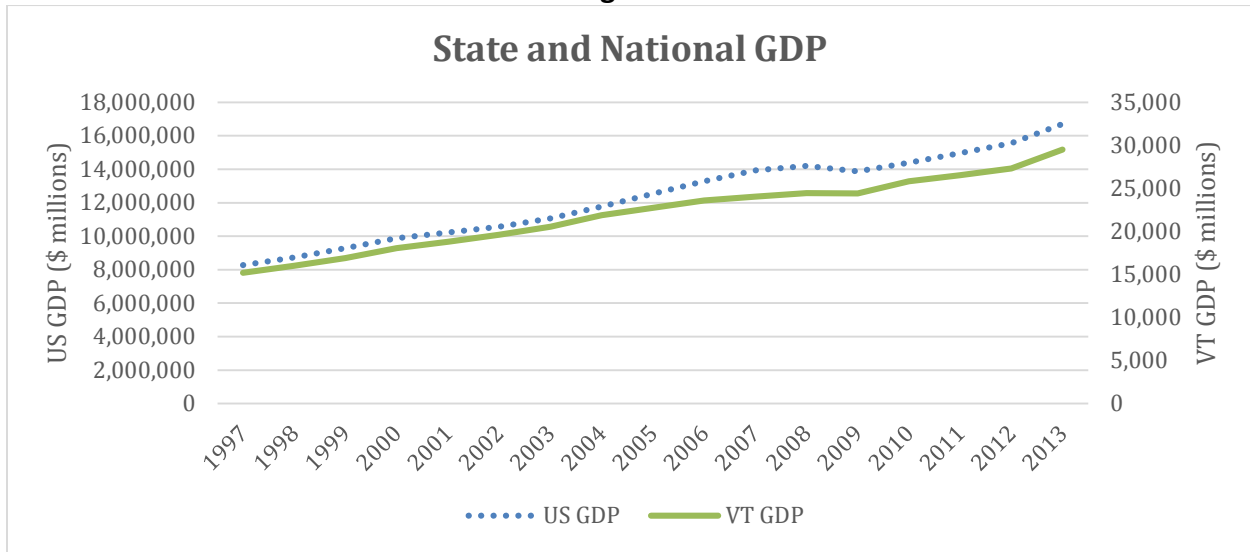
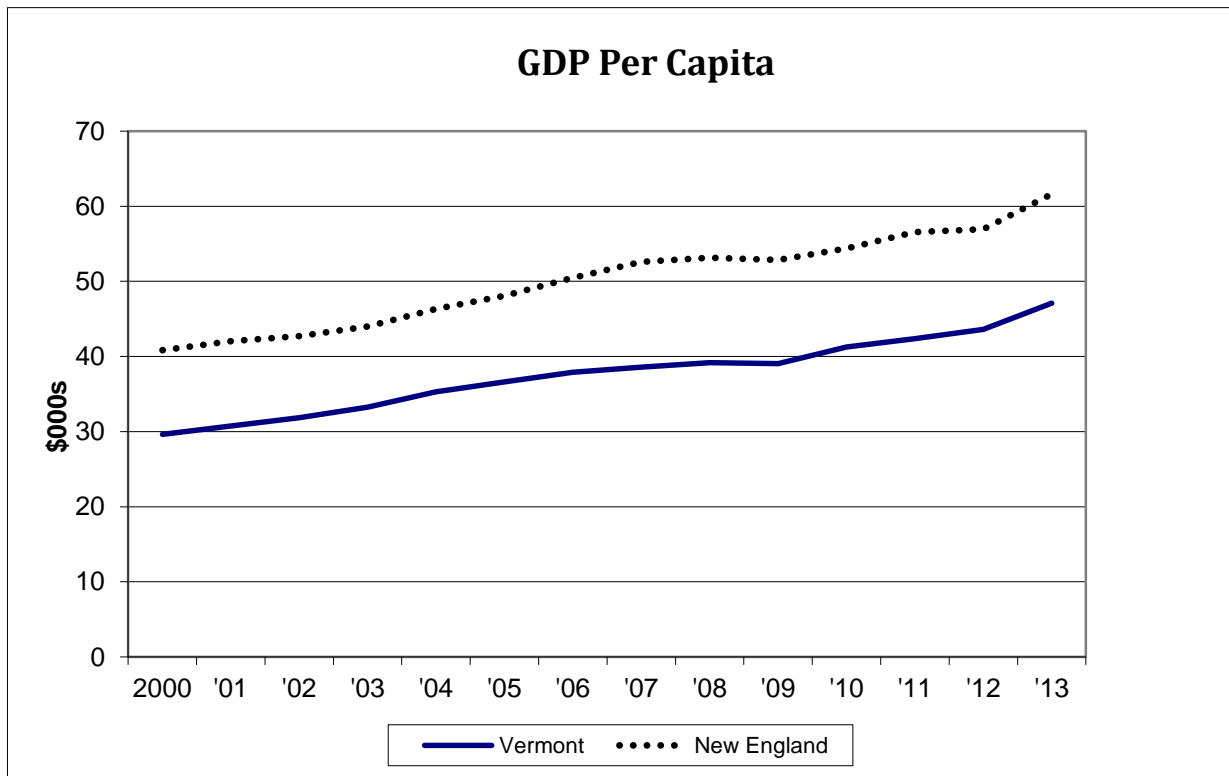


Figure 3

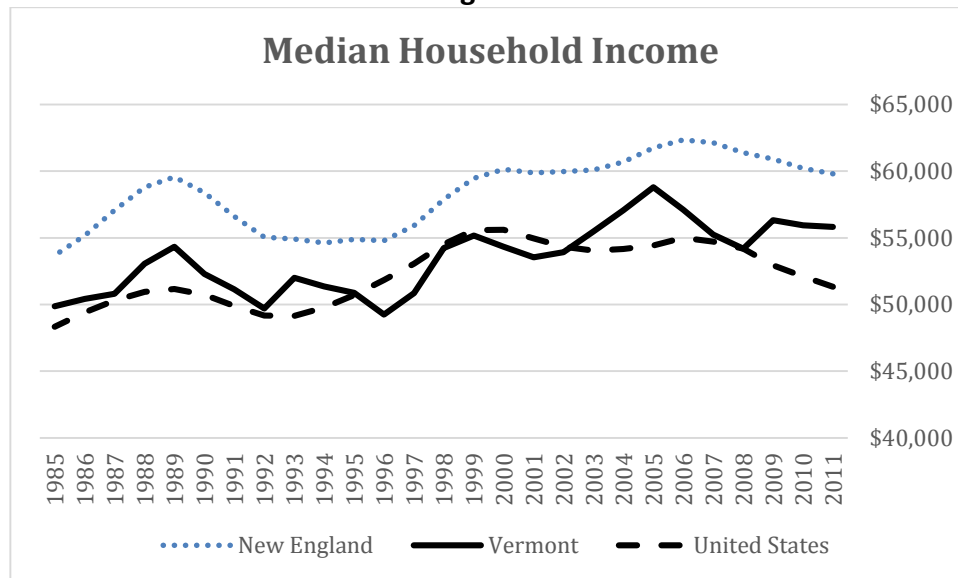


Source: Bureau of Economic Analysis

Another important measure of Vermont economic health is household income. In 2012, Vermont median household income was \$53,000, comparing favorably with the 2012 US median household income of \$51,000 but lower than the New England median. The rural

nature of Vermont's landscape and economy largely accounts for its lower household income relative to more urbanized areas of New England.

Figure 4



Note: The "New England" Median Income is an average of the six state medians, not the actual median for the region. Source: US Census Bureau, American Community Survey (3 year average, may differ from annual statistics)

From the graphs, three observations are apparent:

- Vermont's economy, like its population, is small. When comparing the Vermont Gross Domestic Product and the United States' GDP, we see that Vermont represents less than 0.2% of U.S. economic activity.
- The Vermont economy closely tracks the United States economy. The last fifty years of productivity and income data show that, in general, the Vermont economy expands and contracts with the national economy, but more slowly.
- Vermont economic activity is lower on a per capita basis than it is elsewhere in New England.

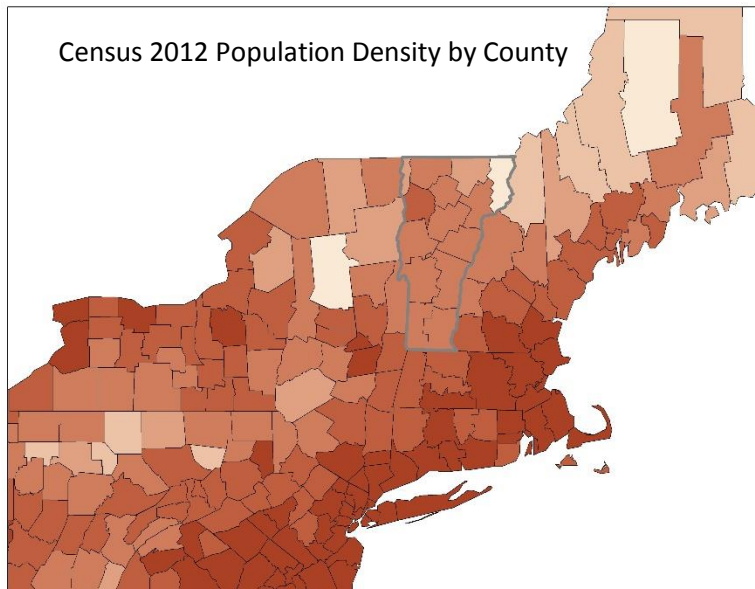
No single metric of productivity or income can give a true measure of progress in or value added to the economy. For example, there are thousands of people who stay home to take care of children, elders or others and who keep households running smoothly. The value of such essential effort is not captured in Vermont's \$27 billion Gross Domestic Product. Similarly, our production of goods and services can result in the depletion or degradation of natural resources, and a true measure of progress must account for the irreplaceable losses that result.

For that reason, Vermont now also measures its economic progress with a more comprehensive metric called the Genuine Progress Indicator (discussed more fully in Chapter 3), which accounts for both traditional measures of economic progress (such as GDP) as well as social changes and environmental degradation. Using that metric, the Vermont economy added about \$15.9 billion in value in 2012, the last year for which the full set of data is available.

Geographic Disparities: A Tale of Two Vermonts

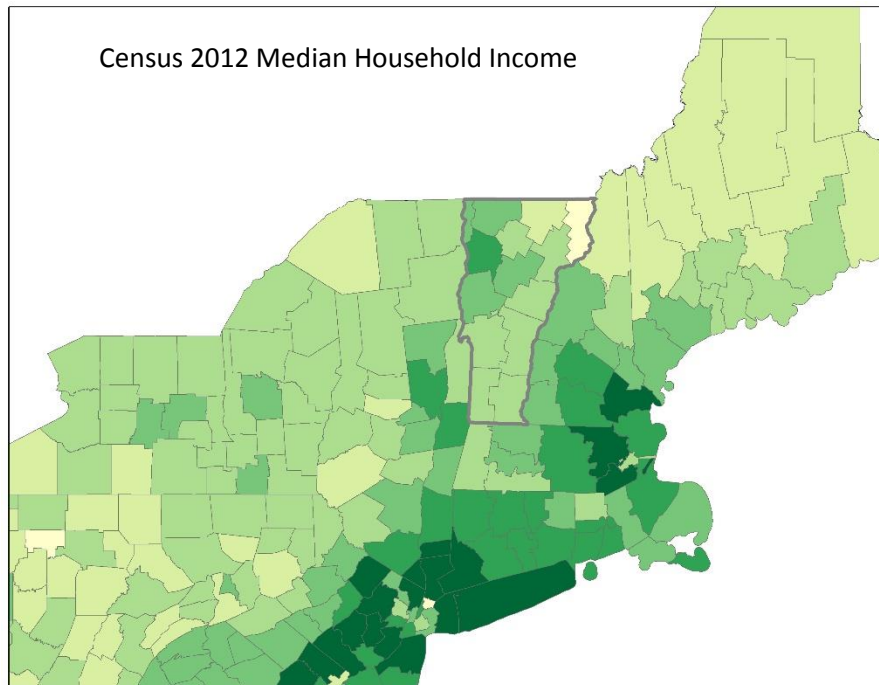
As is true for most states, economic activity is not uniformly distributed across Vermont. With more than one-quarter of Vermont’s citizens, Chittenden County is the most populous county and shows correspondingly greater economic activity. The maps that follow show population densities in New England and New York, correlating almost directly with economic activity in each county. Communities in the orbit of the Boston, New York and Albany metro areas all have greater economic activity than areas that lie in more rural areas. From this map, we can see Chittenden County as its own population center: household income and other metrics of economic activity are higher there than in Vermont as a whole, but not as high as in counties near the major New England cities.

There is an often repeated saying: Chittenden County is such a nice place to live—and so close to Vermont. This underlines the fact that there is growing disparity between the growth of Burlington and its surrounding areas and the more rural parts of Vermont and its smaller cities.



As with statewide measures of income and productivity, more regional detail is necessary to understand the drivers of economic activity in each area and the conditions that will promote its economic growth. In four parts of the state (Chittenden County, the Windham County area, Two Rivers Ottauqueechee and the rural northern tier), Regional Development Corporations and other partners have completed regional CEDS to provide the necessary local context for regional economic progress.

While historically rural areas such as the Northeast Kingdom are benefitting from the influx of foreign direct investment via EB-5 projects and related tourism dollars, many other rural areas throughout Vermont are still facing serious economic hardships. Economic development in the west-central and southern part of the state has not seen the growth of Chittenden County, and the I89 corridor. This CEDS is intended to provide a broad foundation for statewide change.



Sector Strengths

Beyond geographic disparities, different business sectors also have varying levels of dollar volume and growth. The next table shows the relative contribution of different sectors to productivity and employment. When considering broad sectors such as service industries,

Understanding the Location Quotient

In addition to showing which business sectors contribute the most to the economy, this Table 1 includes a national Location Quotient. This figure represents the proportion of economic activity (i.e., contribution to GDP) taking place in Vermont compared to the total of that sector's activity in the United States. A Location Quotient of 1.0 means that that sector's output in the state is the same proportion of that sector's output nationally. A Location Quotient of 2.0 means that Vermont has twice as much activity in that sector as would be expected for the sector's overall contribution to the national economy, while a Location Quotient of 0.5 means we have half the activity compared to the sector's overall contribution to the national economy.

manufacturing and health care, the proportions of employment and GDP contribution of the sectors in the Vermont economy are similar to the pattern in the United States as a whole. (In [Chapter 6: Target Sectors](#) we will look more closely at some of Vermont's most promising sectors and Appendix D "Cluster Analysis" provides a much more detailed look at Vermont's economy.)

However, as shown in the column in Table 1 titled "Location Quotient," some Vermont sectors

have a relatively higher share of activity (e.g. "Accommodation and Food Services") and some relatively low (mining and information). The following table is an overview of key sectors as of 2012:

Table 1 – Key Sectors of the Vermont Economy

Sector name	2012 GDP (\$ million)	Employees	Number of businesses	GDP Location Quotient
Agriculture, Forestry, Fishing and Hunting	325	(see note)	417	1.275
Mining, Quarrying, and Oil and Gas Extraction	52	800	65	.10
Utilities	774	1,800	48	1.451
Construction	1035	14,200	2848	1.056
Manufacturing	3150	31,800	1075	.962
Wholesale Trade	1263	9200	1451	.802
Retail Trade	2195	37,700	3253	1.319
Transportation and Warehousing	542	6,800	555	.659
Information	655	4,700	488	.541
Finance and Insurance	1480	9,000	972	.679
Real Estate and Rental and Leasing	3683	3,100	708	1.09
Professional, Scientific, and Technical Services	1775	14,000	2995	.849
Management of Companies and Enterprises and Administrative and Support and Waste Management and Remediation Services	793	10,100	100	.727
Educational Services (not including preK-12, public schools)	616	12,600	405	1.953
Health Care and Social Assistance	2827	48,100	1878	1.384
Arts, Entertainment, and Recreation	245	4,000	400	.912
Accommodation & Food Services	1335	29,500	1755	1.614
Other Services (except Government)	697	10,100	1982	1.055
Government (includes preK-12 public schools)	3803	55,000	N/A	1.1136
Note: Agriculture employment is measured using a different methodology.				

Source: Bureau of Economic Advisors, Vermont Department of Labor

Capital Flow

One important characteristic of a local economy is the balance of imports and exports. In some cases, such as the purchase of fossil fuels, the Vermont household exports capital (i.e., depletes income and assets) to buy items produced outside of the state (or even outside of the U.S.). On the flip side, Vermont's production of dairy, manufactured products or tourism services results in money flowing in from out of state, creating imported capital (increased income and assets) to Vermont businesses. In still other cases, such as the consumption of health care services, much of what we consume in Vermont is produced here in the state.

Each sector of Vermont's economy has a different pattern of capital flow into and out of the state. In setting economic development priorities, we seek to increase activity that results in revenues flowing into the state (capital importation) as well as activities that reduce the outflow of money (capital exports) necessary to purchase goods and services not locally available.

In addition to the consideration of capital flow into and out of Vermont, the state's role in international exports reflects the growing importance of global trade. Statistically, Vermont is often recognized as a key player in international exports and the dollar value of Vermont exports exceeds \$4 billion per year. However, that figure deserves closer scrutiny. IBM is the largest contributor to the dollar volume of exports in Vermont and its export of very high value semiconductors and circuit boards is very important and yet overwhelms the full story of export value for the state.

Many other sectors outside of semiconductors and circuit boards are participating in global trade. More than 1,000 businesses in Vermont provide international exports from sectors as wide ranging as aerospace, dairy, paper products and electronics. In 2013, the total value of these products (not including semiconductors and circuit boards) exceeded \$1.5 billion.

Poverty in Vermont

Poverty is not only a social issue and human hardship, but a flaw in the economy that affects us all. The social costs of poverty—public assistance outlays, the limited purchasing power of low-income households, and the reduced productivity of lower wage workers— are a drag on the broader economy.

Each of those factors can be quantified:

- Vermont's Joint Fiscal Office reports that Vermont spends more than \$1.4 billion each year on social welfare programs, or more than \$2,000 per capita (the second highest level of any state). While not all of this is directed to those below the federally established "Poverty Line," it is all in support of lower income households.
- Increasing household income for the lowest 20% of Vermont households to \$25,000 could infuse more than \$500 million in cash each year into the Vermont economy.

- Increasing the productivity of wage earners in the lowest income 20% of households to generate \$500 million in household income will result in an increase in GDP of a similar \$500 million (and because income inequality is the single largest drag on Vermont's GPI, GPI growth will be even greater.)

Improving conditions for households in poverty will improve the overall economy, statistically. But it is also important to better understand the impacts of poverty on each individual household: Almost half of all Vermont renters and nearly 40% of its homeowners pay more than 30% of their income for housing, severely limiting their income available for other needs such as nutritious food, health care and educational opportunities. Not being able to afford those basics puts many families in a continuing spiral that makes it harder for children to advance. When poverty becomes a multi-generational condition, the recovery to middle class becomes even more difficult.

Because poverty restricts the opportunities for low-income households in education, health and limits participation in social activities, those families face disproportionate stresses with respect to domestic violence, substance abuse and crime. Adding these stresses to those resulting from decreased job opportunities multiplies the problems for low income households and puts even greater burdens on the social networks that provide for basic safety and security.

The solutions to help break the cycle of poverty rely on understanding the causes of poverty. Improving education for those in poverty and developing first-generation college-bound students can help break the cycle and is a focus in this CEDS. However, the continuing support of social networks to provide mental health counseling, day care opportunities, and the myriad of other supports are also critical and no single strategy will be successful without considering each of the factors contributing to the problem.

For all of the economic reasons plus our social obligation, Vermont regularly takes action to increase economic opportunity for lower income households. The Governor has established a Poverty Council to address a full suite of policies to improve the condition of low-income households. This Comprehensive Economic Development Strategy is one element of that effort that will help the underemployed upgrade their job skills and help businesses expand in order to provide better paying opportunities.

Overall Strengths and Challenges for the Vermont Economy

The following is a summary of the strengths and challenges that project participants provided during the outreach sessions. More detailed information is provided in Appendix B: “Economic Data Analysis” and Appendix C: “Competitive Assessment.” A summary of the major findings from those two documents is as follows:

Strengths of the Vermont Economy

- Well-educated workforce (91.7% of Vermont adults have high school diplomas compared with 86%, nationally and 35.8% have bachelors or graduate degrees, compared to 29.1% nationally)
- Pre-K-graduate school education system that is recognized for high quality
- Low unemployment (4.3% in 2013, compared to 7.3% nationally)
- Strong indicators of public health (#1 ranking by Health.com)
- Small size making business entry relatively easy
- Small size making networking opportunities easy
- Small size making communications with state and local government more effective
- Vermont is within one day drive of the large markets of the Eastern U.S. and Canada
- Vermont brand is good for both selling goods and services and attracting workers
- Strong communities and a settlement pattern that sustains communities and small town community values
- High quality of life (low crime, access to cultural activities and the natural environment)
- Some business sectors have a concentration of activity that provides for future growth

Challenges for the Vermont Economy

- Small size makes it difficult to establish a concentration in many business sectors
- Small size makes it difficult to access capital from the larger Eastern US financial markets
- Mismatch between the skills of entry level workers and needs of expanding companies
- Small size and changing demographics results in a decline in the number of traditional working age adults
- Cases of chronic poverty keeping some Vermonters on the economic sidelines
- Tension between some business proponents and slow or no growth proponents
- Ongoing presence of a few very large employers may be tenuous
- Relatively high costs for consumer goods
- Because of scale of most manufacturers in the state, it is often difficult to purchase equipment that is scale appropriate.
- Aging infrastructure, in particular wastewater and stormwater infrastructure, are making it increasingly difficult to build or expand.
- Perception that Vermont is not a business-friendly state.

Key Action Areas

These big-picture snapshots of the Vermont economy are a starting point for considering strategies to improve the state's economic condition. Further analysis begins with a sharper focus on the key drivers of economic productivity. After reviewing data, the CEDS Committee identified four key action areas: Finance and Capital; Workforce and Education; Physical Infrastructure, and Business Environment. Why these four?

Finance and Capital: Businesses need capital to invest in the buildings in which they operate, and the technology and machinery that help them produce goods and services profitably. The assessed value of Vermont's commercial and industrial property is more than \$12 billion, with net business investment in assets increasing by more than \$1 billion each year. [Chapter 4A](#): Finance and Capital examines the current status of private sector capital and explores financing strategies to increase access to capital for Vermont enterprises.

Workforce and Education: While this overview of the Vermont economy sketched a broad picture of Vermont's labor, [Chapter 4B](#): Workforce and Education describes in more detail the skills Vermont workers bring to their employers, reviews the current status of the Vermont workforce and the strategies to improve workforce skills, and assesses the potential benefits to economic productivity from improving those skills.

Physical Infrastructure: Local, state and the federal governments must also invest in public infrastructure to support business activity and community life. They must maintain roads and public transit systems for goods, workers and visitors and, in many communities, publicly funded drinking water and wastewater service. Utilities such as electric generating and transmission facilities are infrastructure investments financed and operated privately but regulated as a public good and as critical elements of a support system for economic activity. [Chapter 4C](#): Physical Infrastructure focuses on public and publicly regulated infrastructure and assesses strategies to improve it in the service of a flourishing state economy.

Business Environment: Vermont has about 23,000 business employers, almost 80% of which have fewer than 10 employees, and these small businesses account for a high proportion of the state's economic and employment growth. Vermont also has 20,000 self-employed business proprietors. While Vermont's labor force represents only about 0.2% of employed workers in the U.S., we are home to almost 0.3% of the nation's businesses, representing a 50% higher rate of business ownership than in the U.S. as a whole. [Chapter 4D](#): Business Environment examines current conditions affecting entrepreneurship and business development and identifies strategies the state can pursue to improve those conditions.

Vermont Today - Benchmarks for the Future

This snapshot of Vermont's benchmark economic conditions will be one way we measure future progress. Appendix B: "Economic Data Analysis" provides more detail.

Table 2 – Statistical Benchmarks

Benchmark Category	Base Year	Data
Workforce and Education		
<input checked="" type="checkbox"/> Number of workers <ul style="list-style-type: none"> • Employed workers • Workers including self employed 	2012 2011	299,000 326,000
<input checked="" type="checkbox"/> Unemployment rate	Average 2013	4.3%
<input checked="" type="checkbox"/> Migration rates (of taxpayers)	2011	8,715 in; 9,543 out
<input checked="" type="checkbox"/> Educational attainment of workforce, Vermonters age 25 and older	2012	<ul style="list-style-type: none"> • 91.7% have HS diploma • 35.8% have Bachelor's degree • 13.9% have an advanced degree
<input checked="" type="checkbox"/> Number of attendees of Vermont colleges and universities	2011	45,318
<input checked="" type="checkbox"/> Average Wages	2013	\$41,000
Finance and Capital		
<input checked="" type="checkbox"/> Net capital investment	2012	\$620 million
<input checked="" type="checkbox"/> R & D expenditures	2012	\$138 million
<input checked="" type="checkbox"/> Venture capital	2013	\$26 million
Infrastructure		
<input checked="" type="checkbox"/> Grand list value for commercial/industrial/ utility	2013	\$12.6 billion
<input checked="" type="checkbox"/> Vermont vehicle miles travelled	2012	7.2 billion
<input checked="" type="checkbox"/> Number of community drinking water systems	2012	425
<input checked="" type="checkbox"/> Median house price (house on less than 6 acres)	2013	\$189,000
<input checked="" type="checkbox"/> Household ownership rate	2012	72%
<input checked="" type="checkbox"/> Monthly median rent 2 BR HUD Fair Market Rent	2013	\$674-\$1309
<input checked="" type="checkbox"/> Number of housing starts	2013	945 single unit starts permitted
Business Environment		
<input checked="" type="checkbox"/> Number of businesses by business size	2012	79% are businesses <10 employees
<input checked="" type="checkbox"/> Exports	2012	\$4.3 billion
<input checked="" type="checkbox"/> Patents	2013	551
<input checked="" type="checkbox"/> Business bankruptcies (2013)	2013	45
Other General Economic Measures		
<input checked="" type="checkbox"/> Tourism visits	2011	14 million
<input checked="" type="checkbox"/> Foreclosures	2013	1,577
<input checked="" type="checkbox"/> Poverty rate	2012	11.8%

3. GOALS

In 2009, the Commission on the Future of Economic Development completed a two-year process to provide guidance for state government in helping the state move forward. The principles established provide a foundation for the work of the 2013-2014 CEDS process.

- (1) Vermont's businesses, educators, nongovernmental organizations, and government form a collaborative partnership that results in a highly skilled multigenerational workforce to support and enhance business vitality and individual prosperity.
- (2) Vermont invests in its digital, physical, and human infrastructure as the foundation for all economic development.
- (3) Vermont state government takes advantage of its small scale to create nimble, efficient, and effective policies and regulations that support business growth and the economic prosperity of all Vermonters.
- (4) Vermont leverages its brand and scale to encourage a diverse economy that reflects and capitalizes on our rural character, entrepreneurial people, and reputation for environmental quality.

This CEDS has been an opportunity to not only address those four important tenets but also to build on those foundations, strengthen networks and collaboration, identify where investments are needed and to leverage our brand and our state's greatest strength, its people.

This Comprehensive Economic Development Strategy will build on the state's strengths while working to address the challenges. This document includes four sections that describe those strengths and challenges in more detail and lays out the strategies to meet intermediate, Action Area goals that will help the state meet its overall mission of improving the economic well-being of all Vermonters.

Action Area Goals and Measureable Targets

While the goals provide direction in developing and implementing strategies, measurable targets are designed to help the state track progress in meeting those goals.

Goal: Finance and Capital

*Vermont will enjoy continuous and robust increases in private capital investment to produce new employment and economic activity. **Target:** Stimulate a \$1 billion increase in investment in Vermont by 2020.*

Goal: Workforce and Education

*Existing and future employers find workers with required skills and the state's workers embrace lifelong learning to ensure access to careers with livable wages. **Target** - Improve worker productivity 5% over US baseline by 2020.*

Goal: Physical Infrastructure:

*Maintain critical infrastructure that allows for business operations and expansion and meet all goals for energy, transportation, telecom, housing, waste and stormwater, drinking water and public safety. **Target:** Vermont has the necessary transportation, utility, real estate, telecommunications, and other physical infrastructure to support thriving business operations throughout the state.*

Goal: Business Environment

*Ensure that Vermont's regulations, policies, programs, and assistance programs provide a competitive advantage for business recruitment, retention, expansion, creation, and operations. **Target:** Increase GDP 4% above the baseline growth by 2020.*

Overall Goal

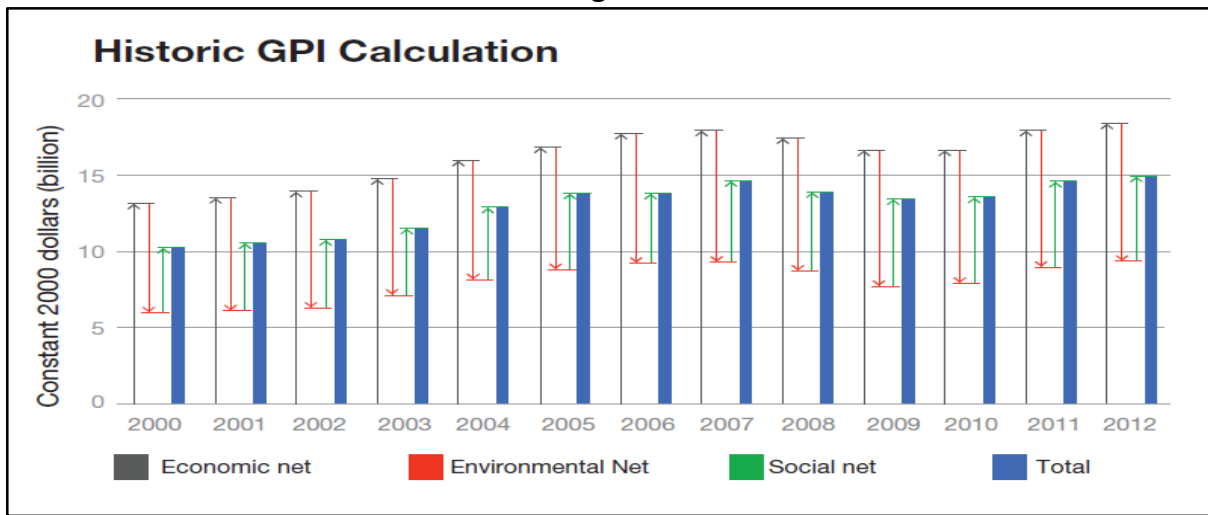
Accomplishing these goals will grow the Vermont economy. However, there is still the need to track the state's overall progress in *"improving the economic well-being of Vermonters while maintaining our quality of life, natural resources and community values."*

The most commonly used measure for economic activity is the Gross Domestic Product (GDP). However, this metric does not include many economic factors that reflect the economic well being of Vermonters or the value of natural resources and community values. For example, GDP does not measure:

- The value of unpaid labor
- The depletion of built and natural capital
- The economic drag of income inequality

The Genuine Progress Indicator (GPI) includes the same measures of consumption that form GDP. However, GPI adds 25 other factors to include economic impacts of resource depletion and changes in social capital. For this reason, Vermont will measure its economic progress with GPI. Using that metric, the Vermont economy added about \$15 billion in value in 2012, the last year the full set of data is available.

Figure 7



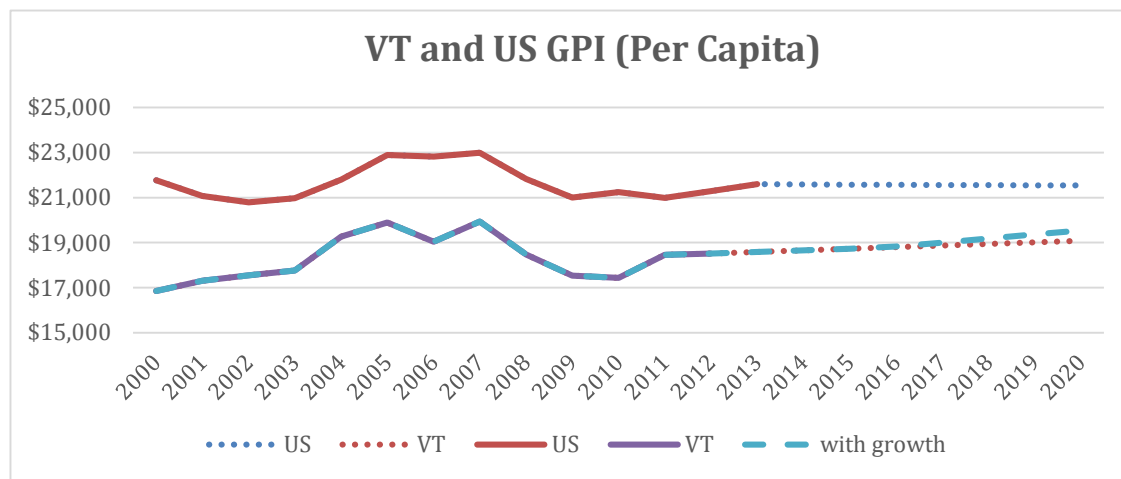
Source: Gund Institute at the University of Vermont. Note: The above figure is in constant dollars.

Using the measure of GPI, Vermont is now able to articulate its goal for economic progress:

The overarching goal for this Comprehensive Economic Development Strategy is to increase the Genuine Progress Indicator by 5% over the national baseline by 2020.

The Genuine Progress Indicator

For over a decade, the Gund Institute at the University of Vermont has been working with economists and state governments to establish a more comprehensive measure of economic growth. The Genuine Progress Indicator takes the core concept of GDP (measuring economic growth) and qualifies it by summing private consumption with a number of other variables ignored by GDP alone. GDP has been used as a measure of economic growth



for decades now, and is too often used as well as a measure of well being in general. The creator of GDP, Simon Kuznets, famously warned against this in a report to Congress: “The welfare of a nation can scarcely be inferred from a measurement of national income.” GDP takes into account all spending, including that on disaster relief, environmentally damaging practices, and socially damaging work; and represents it as positive. *GPI* takes into account variables including but not limited to negative environmental impact, negative social impact, positive non-market services (such as volunteer work), and positive social impact. By doing this GPI creates a more complete view of economic growth and includes other factors valued by Vermonters. In 2004, the first Genuine Progress Indicator (GPI) was published for Vermont. In 2012, Act 113, directed the Gund Institute for Ecological Economics to:

1. Build the database to produce annual GPI estimates;
2. Work with Vermont's Secretary of Administration to institute a data advisory group representing the broad public, private, and civil society interests included in GPI;
3. Develop and test the use of GPI in state public policy and budget analysis; and
4. Review and propose additional factors to enhance the standard GPI.

At present, more than 18 states have GPI accounts under consideration. The calculation of GPI is still under development and there is an understanding that not all of the factors currently included are the best reflection of progress. Just as with GDP, these calculations will continue to improve over time. However, it is clear that the general approach to include environmental, social and a more comprehensive review of economic activity provides an improvement over GDP for measuring economic progress and citizen well being.

4. ACTION AREAS

Introduction

As noted earlier in this CEDS, the CEDS Committee and other stakeholders repeatedly identified four key action areas that are critical for Vermont’s growth. These are:

- Access to Finance and Capital
- Workforce and Education
- Physical Infrastructure
- Business Environment

The following four subchapters dive into these areas and look at the strengths and challenges, strategies and “initiatives” that will help us reach the stated goal, and “projects” that are activities that could benefit from additional public sector funding.

The “initiatives” are ideas that are in varying forms of development and are further described in the Appendix F document “Initiative Details.” They will be continually evaluated, refined and updated as the CEDS is implemented over the next five years. Several are currently underway, others may be proposed as future fundable projects. In most cases, the initiatives require the participation of multiple state agencies and private sector partners.

The “projects” (see Chapter 7) were the subject of CEDS Committee evaluation and are very discrete activities to help strengthen economic activities in the state. In most cases, the projects are hosted by individual agencies, either in state government or regional partners.

In addition to these four action areas, the Committee also identified three important strengths that are “uniquely Vermont,” and actions to maintain them. These are addressed in Chapter 5: Uniquely Vermont.

- The strength and values of the Vermont brand
- Vermont’s working landscape
- Our culture of innovation

By addressing these areas and then implementing the Target Sector plan and the actions described for the 12 target sectors (see Chapter 6), the plan is that we will both cultivate the strengths identified here and make significant steps toward overcoming the challenges our state still faces, including improved business resiliency (see Chapter 8) in the face of future natural disasters, global economic changes, or other disruptive forces.

4A. ACTION AREA: FINANCE AND CAPITAL

A robust financing system ensures that businesses have access to and a choice of the right match of capital no matter their size, business sector or stage of development. State government is limited in providing access to capital for private sector businesses. However, a combination of appropriate regulations, incentive programs and technical assistance, can provide incremental support for financing activities and incent private sector funders to engage.

A successful financing system includes technical and business assistance to ensure that entrepreneurs have the advisory capacity and leadership skills they need to put outside capital to productive work.

Finance and Capital Goal

Vermont will enjoy continuous and robust increases in private capital investment to produce new employment and economic activity.

Measurable target: A \$1 billion increase in investment in Vermont by 2020.

To make progress toward this goal, Vermont will pursue the following strategies, among others. Each represents a point on the spectrum of a complete financing system:

- New investment tools within Vermont
- Energy Investment
- Direct Foreign Investment (through the EB-5 program)

Table 3 – Major Components of Increased Investment

Finance and Capital Program	Past Record of Investment	Future Target (by 2020)
New Investment Instruments	\$0	\$200 million
Renewable Energy and Energy Efficiency Investments	\$500 million between 2008 and 2013 for solar, wind and efficiency	\$500 million above the current baseline
Direct Foreign Investment through EB-5	\$300 million between 2006 and 2013	Additional \$300 million

Strengths in providing capital and finance support

Vermont has a wide array of entities and programs to provide support for business start-ups, retention, attraction, and expansion. These include but are not limited to the following:

State/Public Partnership Programs

- Vermont Economic Development Authority (Entrepreneurial Lending Fund and Technology Loan Program)
- Vermont Employment Growth Incentive (VEGI) has been named among the top incentive programs in the country by GoodJobsFirst.com and has a positive return on investment.
- Vermont Seed Capital Fund: early stage venture capital for technology companies
- Vermont Center for Emerging Technologies: Incubation facilities, services, and mentoring for technology start-ups in partnership with universities and colleges
- Angel Venture Investment Capital Gain Deferral
- Research and Development Tax Credit/Sustainable Technology R&D Tax Credit
- Vermont Small Business Offering Exemption
- Vermont Enterprise Fund, a \$4.5 million new fund for retaining or attracting businesses

Private Sector Vermont's private sector has contributed significantly to recent growth:

- Vermont businesses are increasing their net investment capital by approximately \$1 billion per year.
- Vermont manufacturers invest \$200 to \$400 million per year in capital purchases.
- Annual private research and development (R&D) investments amount to more than \$100 million in Vermont, slightly higher than the national per capita average
- Vermont banks have significant capital assets available for loans.
- A small number of hands-on venture firms such as Fresh Tracks Capital and North Country Angels provide both capital and mentoring
- There are a number of strong non-governmental organizations and community lenders that partner to provide substantial assistance to small businesses.

Energy Vermont has a range of programs to support initiatives in renewable energy:

- Clean Energy Development Fund
- Alternative Fuel and Advanced Vehicle R&D Tax Credit
- Commercial Energy Loan Program
- Thermal Energy Finance Program
- Energy Loan Guarantee Program
- Small Business Energy Loan Program
- Vermont Sustainable Jobs Fund: Vermont Bioenergy Initiative

Working Lands Vermont has a strong array of working lands programs to support developing farm- and forest-based enterprises and food systems.

- Working Lands Enterprise Initiative
- Vermont Agricultural Development Program
- Vermont Sustainable Jobs Fund: Farm to Plate Strategic Plan
- Vermont Sustainable Jobs Fund: Flexible Capital Fund
- Vermont Farm Viability Program
- Vermont Agricultural Credit Corporation

Financing and Incentives Challenges

- Vermont lags other states in developing grant programs for innovation, R&D and commercialization in its technology-intensive sectors that would support productive partnerships between tech-intensive industries and research institutions. Such programs in other states provide funding for businesses in early stages of development and facilitate readiness for capital and venture funding. They also help build capacity for industry-driven R&D at research institutions including colleges and universities.

Examples include the following:

- [Maine Technology Institute](#)
 - [Start-up NY](#)
 - [Ben Franklin Partnership](#) (PA)
 - [Utah Science Technology and Research Initiative \(USTAR\)](#)
 - [Ohio Third Frontier](#)
 - [Innovate Rhode Island Fund](#).
- Vermont needs appropriate support for its targeted business clusters.
 - Vermont's "angel" investor network is aging. Growing and diversifying the private investor base will be important to maintain vitality in financing start-up companies.
 - Vermont is remote from key financial centers such as New York City and entrepreneurial/technology hubs such as Boston

General strategy for meeting the Capital and Financing Goal

Establish and maintain a portfolio of funding and financing programs that can effectively and sustainably meet the needs of Vermont's businesses, regardless of their size, business sector or stage of development they are in.

Detailed strategy

- ***Strategy: Build a comprehensive system to provide access to financing and mentoring for promising early-stage companies, particularly those in the "new" economy that are knowledge- or service-based and lack tangible assets.***

Many promising sectors of the Vermont economy that need capital, especially in the early stages of development, find it difficult to attract investment. For those businesses, Vermont will enhance a financing and technical assistance system with the following attributes:

- Accessible for credit-worthy and investment-worthy businesses
- Transparent: investors/funders and entrepreneurs understand the breadth of creative options available to get a deal done
- Has advisory capacity: brings technical, business and leadership expertise
- Sustainable, values-based
- Targeted by industry/sector and structured to fit with industry needs
- Matching risks and rewards, providing win-win opportunities for investors and businesses
- Collaborative: funders work together and understand one another's investment criteria
- Locally based: money circulates locally, attracting local investors, lenders, and funders of all types (foundations, for-profit, non-profit, etc.)
- Highly networked: able to help entrepreneurs find the right match for their needs

- ***Strategy: Vermont's Public Service Department and Agency of Commerce and Community Development will partner with the Energy Action Network for follow up on energy financing strategies.***

Vermont has established an ambitious goal of meeting 90% of its energy needs with renewable sources by the year 2050. This will require expanded business and government capital resources to finance new, local electricity generation, new transmission and distribution infrastructure, and energy efficiency improvements in homes, businesses and vehicles.

The renewable energy and efficiency sector in Vermont has already successfully raised capital for a number of clean energy projects. Developers have constructed large-scale wind and solar projects using a variety of financing resources. The Energy Action Network has convened representatives of the clean energy sector with the financing community to explore additional financing options for new projects.

Over the next five years, Vermont plans to increase investment in new generation, transmission and distribution, and weatherization by \$500 million. The return on this investment will be in the form of reduced outlays for energy provided by out-of-state (and often offshore) sources.

Why Renewable Generation and Weatherization Pays

The installation of 30 MW of photovoltaic electricity generation capacity (representing many projects) will require a \$100 million investment. That investment will produce roughly 40,000 MWh of electricity with a current annual value of about \$8 million. Weatherization of 10,000 homes to produce a typical 30% reduction in heating fuel use requires an investment of about \$100 million. This will produce annual fuel savings of about \$800 per home, or a total of \$8 million annually. These investments also produce returns in the form of local economic stimulus: the renewables construction and weatherization work is largely carried out by Vermont contractors, and the dollars saved on fuel remain in the local economy rather than flowing outward to out-of-state companies.

- ***Strategy: Expand the use of EB-5 to attract foreign direct investment in a range of business expansion activities.***

Vermont government, in partnership with private sector partners, has established a financing system that links foreign sources of capital with businesses looking to expand in Vermont. Vermont was the first state to serve as a Regional Center for the coordination of EB-5 projects. Vermont's use of foreign direct investment has resulted in approximately \$300 million invested in the past five years, largely focused on tourism and recreational facilities, with resulting revenue growth in the Vermont tourism and recreation sectors. Future EB-5 investment is expected in manufacturing. Vermont has established a goal of raising an additional \$300 million in EB-5 qualifying investments in the next five years.

About Vermont's EB-5 Regional Center

The EB-5 program is a federal investment visa program run by the United States Citizenship and Immigration Services (USCIS) to incent investment and create American jobs by setting aside a pool of EB-5 visa green cards for qualified foreign investors who place capital into approved EB-5 projects. U.S. companies are able to use this investment for projects that meet the program's eligibility criteria, such as business expansions, development, or adding capacity. Highly respected and the first state-run center, the Vermont EB-5 program requires a minimum investment per investor of \$500,000 (opposed to \$1 million for standard EB-5 projects) and the creation of 10 direct and indirect jobs per investor.

Priority Initiatives

F1. Improve the Financial Markets in Vermont to ensure businesses of all sizes and stages have access to capital. Three steps are necessary to strengthen the linkage between businesses in need of capital and the sources of capital that are available. Phase One will lay a foundation through the development of a comprehensive database of funding entities and the recruitment of successful business owners who have experience in creative funding strategies. Phase Two builds the client base through workshops and a one-stop source for accessing sophisticated debt, equity, grant and other complex finance packaging assistance. Phase Three implements the system and includes marketing technical assistance programs, education tools for alternative ownership models and the development of an online assessment tool for service providers. This initiative will fill the gaps in Vermont's capital continuum to ensure businesses have access to capital no matter their size, business sector or stage of development. An additional objective is to provide entrepreneurs with the resources, advice and leadership skills they need to be prepared to take on outside capital.

F2. Link New Market Tax Credits with EB-5 investment projects. By combining the Federal EB-5 program with the New Market Tax Credits program we can maintain our competitive advantage for EB-5 and encourage investment in underserved areas.

F3. Establish a Local Vermont Investment Market to increase capital for start-ups and growing companies. Vermont will take advantage of new financing opportunities to provide small and unaccredited investors with expanded opportunities to invest in Vermont companies. In addition, such a marketplace may also support the exchange of ideas between larger investors and small companies that need access to expertise. A Vermont local investment initiative can build on the groundwork laid by groups like the Flexible Capital Fund (Vermont Sustainable Jobs Fund), the Vermont SEED Capital Fund (Vermont Center for Emerging Technologies), and Vermont-focused business pitch contests such as LaunchVT and Strolling of the Heifers. Reforms introduced through Congress' 2012 JOBS Act create opportunities for Vermont to upgrade its startup environment in ways that balance the implementation of capital appeals with the necessary fiscal oversight.

F4. Facilitate Employee Ownership Build on the good work done by the Vermont Employee Ownership Center to further advise on and encourage the continued in-state growth of businesses when sales, closure or other transitions are pending.

Other Initiatives

F5. Establish and Nurture an Innovation Ecosystem that through collaboration and alignment increases the scale and diversity of R&D and the overall Impact on the Vermont economy.

F6. Establish a Vermont Stock Exchange for Vermonters to Invest in Local Companies

F7. Establish Children's Savings Accounts that are Tax-deductible for Families and Relatives as a Source of Investment Funds

F8. Provide Financial and Credit Services Advice and Training to Reduce Worker Stress and Absenteeism due to Family Financial Crises

4B. ACTION AREA: WORKFORCE AND EDUCATION

With the second lowest unemployment rate in the nation, one of Vermont's primary challenges is ensuring that expanding businesses have the workforce they need. Because the population of entry-level workers is declining in Vermont (as it is in the rest of the United States) this CEDS focuses on improving the skills and productivity of its existing workers, rather than just increasing the number of jobs. This approach can benefit both the state's economy and its workers by increasing economic value and raising wages for workers who improve their skills.

Participants in the CEDS outreach meetings repeatedly spoke of the challenge many Vermont entrepreneurs face in finding enough workers with the right skills to help businesses thrive. The state's current investments of more than \$1.5 billion in public education and additional tens of millions of dollars for workforce training are only partially succeeding in filling the skills gap.

Workforce and Education Goal

Existing and future employers find workers with required skills and the state's workers embrace lifelong learning to ensure access to careers with livable wages.

Measurable targets for the Goal:

- **Vermont worker productivity (GDP per worker) is improved 5% by 2020.**
- **The Vermont average wage tracks the improvement in productivity gains.**

The result of accomplishing a 5% increase in worker productivity will be an additional \$1.1 billion in Gross Domestic Product (GDP) for the state and an estimated increase in Vermont salary and wages of \$550 million per year by 2020.

Table 4 – Vermont GDP and Wages Goal

Year	GDP per worker	Average Wage	Wage as percent of GDP
2000	\$56,900	\$28,900	51%
2012	\$83,700	\$41,000	49%
2014 (est.)	\$88,000	\$43,000	49%
2020 baseline	\$100,900	\$49,200	49%
2020 with goal	\$106,000	\$52,000	49%

Sources: Worker numbers and wages – Vermont Department of Labor, GDP – US BEA.

The following discussion of strengths and challenges separates the delivery of workforce education and training into two parts (although in reality, they are portions of the same life-

long education-employment continuum). "Workforce training" refers to activities geared to building workers' skills after they have left traditional pre-K-16 education.

Workforce and Education Strengths

- Vermont workers have a historic reputation for hard work, craftsmanship and reliability.
- In 2012, 35.8% of Vermont adults older than 25 had a bachelor's degree or higher compared with only 29.1% in the United States as a whole.
- In 2012, 91.4% of Vermont adults older than 25 had a high school diploma or higher, compared with only 86.4% in the U.S. as a whole.
- Vermont's unemployment rate is substantially lower than the nation's: in May of 2014, the Vermont rate was 3.3%, making it the second lowest in the United States.

Workforce Strengths

- To help keep college students in Vermont after graduation, especially those with technical education, the Vermont Technology Council has created a new website (<http://vermont.internships.com/join>) to help match state employers with college students seeking internships.
- The tech internship program, created in 2010, helped place more than 60 college students with Vermont technology companies. Internships make students aware of the great employment opportunities in Vermont, and provide employers the chance to recruit their future workforce.
- The Vermont Tech Jam, an annual career fair/tech expo showcasing the state's most innovative tech and bioscience companies, provides a unique matchmaking opportunity for tech-based employers and job seekers: more than 1,500 job seekers, students and tech professionals from Vermont and beyond came to the 2013 event, while 82 companies and organizations exhibited at the Jam.
- Vermont's STEM (Science, Technology, Engineering and Mathematics) incentive program, has provided cash incentive payments to new hires at Vermont companies in science-related and IT-related fields, has benefited more than 80 individuals to date.

Education Strengths

- There are 27 colleges and universities in Vermont, including one research university, five universities conferring master's degrees, an art school, a culinary school, a law school, and 14 undergraduate colleges conferring associate's and bachelor's degrees. The University of Vermont is the state's largest school and its flagship public university; the other five public institutions are organized as the Vermont State Colleges system. Four institutions chartered in other states also offer degree programs in Vermont.

- Vermont colleges are considered leaders in the nation in curricula that are increasingly relevant to growth businesses such as gaming and coding (Champlain), languages (Middlebury), security and cyber security (Norwich University), environmental law (Vermont Law School), food systems (UVM, Sterling, Vermont Tech), agriculture, nutrition and medical (UVM). In addition, Marlboro and Bennington Colleges are known for their strengths in creative fields, policy and liberal arts.
- There is a net positive migration of college-age people into Vermont: the number of students from elsewhere entering the state for higher education exceeds the number of graduating Vermont high school seniors leaving the state for that purpose.
- The U.S. Department of Education’s National Assessment of Educational Progress (NAEP) shows Vermont’s 4th and 8th graders are performing better than the national average in the three subject areas for which test data are available: mathematics, reading and science.

Workforce and Education Challenges

- Rapid increases in the cost of post-secondary education make it even harder for students from low-income families to pursue higher education. National statistics show that the participation in higher education is increasing steadily in higher income families while lower income family member participation is stagnant. This results in an expanding gap in education and income for high and low income households.
- The state’s population grew between 2000 and 2012 at a rate well below the national average; the trend is projected to continue since Vermont has a low birth rate and diminishing net in-migration.
- Vermont attracts few minority residents and most of the U.S. population growth is among ethnic minorities.
- Almost 50% of graduating high school senior boys do not pursue post-secondary education.
- As reported in many of the regional CEDS meetings, many employers in the state have difficulty recruiting individuals from outside the state due to
 - a narrow range of employment alternatives
 - a shortage of satisfactory employment opportunities for spouses
 - a shortage of available and affordable housing
 - a relatively high cost of living compared with wages
- The state has an older population than the national average, as measured by the median age.

- Many graduates of the state's colleges who would be assets to Vermont's economy move to other states to take advantage of job opportunities and, in some cases, to return to their home state or region.
- Several state agencies and private sector organizations administer workforce training programs without coordination, common standards or adequate measures of success.

Education challenges

- A key 2013 report on Vermont's technology economy finds that Vermont's K–12 education system provides inadequate opportunities for students to learn critical skills that are prerequisites for college level study and careers in computer science and hardware/software engineering.
- The Vermont Technology Alliance (VTTA), Vermont Technology Council (VTC), and Vermont Bioscience Alliance report technology companies need and have difficulty finding a continuous supply of educated employees.
- According to a report by the Snelling Center for Government on the workforce needs of environmental enterprises, the skills of graduates from Vermont high schools do not match the needs of these companies. There is a need to retool the curricula at many high schools to address the needs of Vermont's growing sector of "green" employers.
- Business leaders report that Vermont's high school graduates are poorly trained in science and math, unable to write and reason adequately for their assigned responsibilities, cannot work collaboratively to solve problems, and lack skills as curious and communicative problem solvers.
- The Vermont Technology Council reports a need to increase the number and diversity of student's pursuing STEM -related careers and advancing beyond K-12 to higher education.

Strategies for meeting the Workforce and Education goal

- ***Create and maintain a state-of-the-art system of linkages among all of Vermont's educational and training institutions and the state's businesses and workers.***

To meet the Workforce and Education goal, Vermont needs a comprehensive workforce education and training system. The 2014 Vermont Legislature agrees. Act 199 requires the Commissioner of Labor to develop "an integrated system of workforce education and training in Vermont." The three strategies that follow focus on traditional public education, career and technical education and workforce training. They address different populations but will work together to produce a fully integrated system.

➤ ***Increase the percentage of Vermont high school students who pursue higher education***

Many higher education experiences provide both a strong foundation for a range of career options and the social transition between home-based school and the entry into independent, adult life. While there is a growing sentiment that not all high school students benefit to the same extent from higher education and that its associated costs and debt burdens exceed resulting benefits, the general trend of greater college participation is driven by the reality that a college degree – associate's, bachelor's, or graduate - opens doors for opportunities which are closed to those without those credentials. As a sub-goal, Vermont should place an emphasis on expanding higher education opportunities for students from lower income backgrounds.

➤ ***Improve career technical education for high school students interested in careers as skilled tradespeople***

Career technical education will provide better career training and can open a wide array of work opportunities for some students, for instance, as skilled tradespeople, manufacturing workers or software developers. Redesigned “career and technical education” will also better address the demands of the business community for both entry level, current workers and older workers adaptable to changing employment needs.

➤ ***Improve the delivery of workforce training to Vermonters who have left the public education system***

In a rapidly evolving economy, employees require continual training to enhance workplace skills. The accelerating need for advanced workforce skills puts an increased demand on training programs. The increasing mobility of workers from job to job (carrying with them the skills developed through training and experience) builds a greater need for public investment in workforce training.

Vermont currently spends more than \$60 million a year to deliver training to everyone from high school students, to inmates, to veterans. There is also a wide range of training programs targeted at new and current employees. Better coordination of training activities, including those delivered by the private sector, will ensure that the content and delivery of training produces maximum benefit.

Implement a comprehensive workforce training system with:

- Assessment of skills needed by workers and employers
- Coordination of skills delivery with the needs of the business community
- An enhanced information and referral network for workforce training activities
- Delivery of high quality training experiences geared to individual learning styles
- Certification programs to ensure quality and communicate delivered skills
- Evaluation of training programs to ensure quality and continuous improvement

Strategies focusing on other important workforce sectors will be considered as Vermont's Comprehensive Economic Development Strategy moves beyond 2014. These additions will include:

- a focus on older workers, recognizing the potential to expand their participation in the workforce to make up for the shortage of new workforce entrants. We must also look at how we "*Optimize the Potential of Vermont's Older Workers,*" per the recommendations in the report of this same name produced by the Windham Foundation in 2008.
- Initiatives to attract more young workers to Vermont to reverse the decades-old trend of net numbers of young workers leaving the state.
- Strategies for training to strengthen the skills in the population of self-employed sole proprietors contributing to the state's economy and skill base.

Workforce and Education Priority Initiatives

W1. Workforce Needs Assessment. The Department of Labor and the Department of Economic Development in collaboration with Regional Development Corporations and other partners will develop and apply a survey of Vermont businesses to better understand the needs of employers with respect to specific skills that are currently lacking in the Vermont workforce. The mismatch between worker skills and employer requirements has been a major issue raised during the CEDS process. Compiling the anecdotal evidence into a systematic assessment will help us to strengthen the activities that are designed to help link workers and good jobs. The initiative will improve workforce training results and improve the ability of young workers (and those seeking career changes) to identify jobs or skill development that meet their career objectives.

W2. Coordination of Training Programs. The Department of Labor in consultation with other state agencies will begin to establish an integrated system of workforce education and training for Vermont. The system will include an inventory of the workforce training and education programs in place, benchmarks of success, and the long-term goals for future workforce training and education activities. This initiative will be informed by the ongoing results gathered from the Workforce Skills Needs Assessment as one mechanism to ensure the connection between employer needs and the delivery of services to Vermont workers.

W3. Develop New Programs of Study to Support Priority Career Pathways in Six Key Sectors. Vermont Agency of Education has identified 6 priority sector/cluster areas for workforce, economic development and education/training, including:

- Travel/Tourism and Business Systems (Culinary, Hospitality, Accounting, Management, Entrepreneurship)
- Manufacturing/Engineering (STEM)

- Green Building, Construction and Design
- Local Food Systems, Natural Resources (Sustainable Food and Value-added Systems, Forestry)
- Information Technology (Networking, Software Development, Website Design)
- Health/Medical

A Statewide Consortia will guide each of the priority sectors to develop career pathways. Consortia membership will include education, higher education, business/industry and state agencies. The charge to the cluster/sector Statewide consortia will be to ensure implementation of “Programs of Study” covering grades 9-14 (including non-college postsecondary opportunities), endorse a single Program of Study for each priority cluster/sector, recommend industry certifications and other outcomes required in each Program of Study, manage and update as needed the Programs of Study competencies and standards, monitor quality outcomes of Programs of Study. The current career and technical education system is under-utilized and could serve the workforce and economic development needs of the state in a more robust manner. Clearer focus on priority sectors and consistent quality outcomes would better serve the state as well as our youth and adults, business and industry.

W4. Build a Tech-Savvy Workforce in Vermont via the Statewide Digital Literacy Network. The statewide Digital Literacy Network will build on the foundation established by the Vermont Digital Economy Project and the Internet Intern Program (VT Council on Rural Development, Department of Libraries and CCV). It will expand the first steps that have been taken to establish a new collaborative task force with broad representation. In order to thrive and be competitive in the local, national and global marketplace, the Vermont workforce needs citizens who are skilled in computer and digital technologies, in the effective use of digital information resources, and are equipped to be flexible, life-long digital learners. This initiative will also allow citizens in the most rural parts of the state to have access to computers and high-speed electronic communications at little or no cost.

W5. Vermont Strong Scholars Program. As described in S. 220 of the 2014 Vermont Legislature, the Vermont Scholars Program will be “a postsecondary loan forgiveness and internship initiative designed to forgive a portion of Vermont Student Assistance Corporation loans for students employed in economic sectors identified as important to Vermont’s economy and to build internship opportunities for students to gain work experience with Vermont employers.” One outcome from this program will be a higher level of retention of graduating Vermont students helping to counter an outflow.

W6. Develop Vermont Libraries as Community Anchors for Learning, Economic Development and Engagement. The Vermont Department of Libraries will work with five to 10 “hub” public libraries to pilot a variety of innovative approaches to support

learning, economic development, and citizen engagement. Today's library offers both physical and virtual services and librarians are navigators of information resources including digital and electronic formats, connecting citizens with the tools and resources needed to enrich and enhance quality of life. Libraries can support the development of skills such as problem solving and critical thinking. And libraries are frequently located in the heart of a community center, contributing to the energy of downtowns and acting as true community anchors. Strong libraries help make strong communities and are a selling point for attracting new residents, tourists, businesses and economic growth.

W7. Establish Vermont Career Week to Raise Awareness of Industries, Opportunities and Career paths and the Skills Required. One week a year will be designated where businesses open their doors to schools and schools (k-16) will focus educational efforts around career opportunities. Encourage regional job fairs to be held at this time and a market to skilled out-of-state applicants in sectors where there is a dearth of in-state talent. Bennington currently has a career week in place that could serve as a blueprint. This initiative is designed to raise awareness of the opportunities here and help Vermonters build the skills needed for these and for future jobs.

W8. Make Vermont Home Campaign. ACCD and the Department of Labor will work with employers to highlight and communicate both in and out of state the exciting career opportunities and businesses that are here. Recruiting efforts will focus on those who have the skills needed and on those who have an affinity for Vermont including college alumni, tourists (skiers, etc.) and other visitors. A first step, "Great Jobs in Vermont" is underway: GreatJobsinVermont.com links to a Department of Tourism webpage that both highlights the lifestyle and jobs available here and then links to the Department of Labor job site and to a LinkedIn page supported by Vermont's business community. GreatjobsinVermont.com will be promoted via alumni communications and marketed via the Department of Tourism's outreach campaign.

W9. Assessment of College Role in Career Training. Proposals suggested during the stakeholder engagement process that are considered as part of this initiative include:

- Adult vocational academy, a proposal to help people become more qualified for higher-tech jobs, particularly for workers in industries that are in decline.
- A proposal to develop Community Technical Colleges, using the combined resources of the state colleges. It would provide industry-recognized certificate programs, especially in agriculture, forestry, hospitality and tourism, health care, manufacturing, information technology, transportation and STEM. The certificates would be recognized toward AA and BS degrees.
- The Great Post-Secondary Alliance: a proposal to bring together the adult technical education and Vermont post-secondary institutions to create portable, recognized training and education certification. Currently many students must

leave the state to study for associates' degrees. Make it possible for veterans to access this training, which they cannot do at technical centers.

W10. Keep College Grads in Vermont. Proposals that would be considered as part of this initiative include:

- Vermont Career Internship Program – a statewide effort to match high school, college students and recent grads with internship opportunities. The Department of Labor, per S. 220, will lead and help fund this.
- Destination Education, a proposal that encourages mid-sized companies to train employees in return for a contracted length of employment post training.
- Internship Credits: Work with Vermont's institutes of higher education and business to establish a credit program for internships.

Other Workforce and Education Initiatives

W11. Set up a Client-based Voucher System to encourage businesses to hire career change or entry-level employees as they acquire new skills through job-specific training

W12. A 12 month Dialogue between the Business Community and Educators to identify curriculum changes required to meet emerging workforce skills requirements

W13. Establish a Public-Private Partnership Foundation to Fund Breakthrough K-12 Education Projects for STEAM+L Skills Development

W14. Launch an Employers/education Co-op that delivers rapid response training

W15. Establish a Vermont Technology Corps to help youth develop soft skills and work readiness skills

W16. Innovation Institute

W17. Careers in Non-profits

W18. Teacher Externships

Workforce and Education Project

P14. Master's of Biotechnology degree program

4C ACTION AREA: Physical Infrastructure

Physical infrastructure includes the public and publicly regulated assets that enable businesses and communities to function productively. In this sector we look at the strengths and challenges of Vermont's infrastructure components and, where possible, include strategies and initiatives to address them. This CEDS will examine eight infrastructure components in the following subsections:

1. Energy Systems
2. Housing
3. Industrial sites
4. Public Safety
5. Telecommunications
6. Transportation
7. Water - Drinking Water
8. Water - Wastewater and Stormwater Management

Like the nation as a whole, Vermont faces the challenge of maintaining and upgrading its aging infrastructure. Vermont's citizens place value on the preservation of historic villages and buildings, open fields, forests, ridgelines, and rural byways. But we also demand the expansion of telecommunications, water treatment, and wastewater management systems. While preserving long-standing community assets is crucial to Vermont's unique character and its visual aesthetics, (which have their own quantifiable economic as well as social benefits), it also presents challenges for economic growth:

- Materials and products, tourism and business traffic must flow easily and efficiently within the state, to urban and business centers in neighboring states and Canadian provinces, and to international trade hubs such as Montreal, New York, and Boston.
- Residents, institutions and businesses need reliable, affordable supplies of energy and electricity.
- Access to reliable high-speed Internet and cellphone service have rapidly become baseline prerequisites for all citizens and businesses.
- With increasingly strict federal water quality standards for Lake Champlain and other watersheds, some future business growth will be contingent on adequate wastewater and storm water treatment.
- Vermont must maintain its leading rank in the nation as a "safe" state, a significant attraction for people considering where to raise a family and operate businesses.

- Along with ensuring a workable mix of facilities for business startups and expansions, Vermont must increase its supply of affordable homes and apartments and maintain vibrant communities to attract and retain entrepreneurs and workers.

Overall Physical Infrastructure Goal

Vermont has the necessary transportation, utility, real estate, telecommunications, and other physical infrastructure to support thriving business operations throughout the state.

General Infrastructure Strengths

- Many communities currently have unused infrastructure capacity available for additional economic activity.
- Vermont has a robust system of municipal and regional planning that helps coordinate infrastructure investments for maximum benefit and cost-effectiveness.
- Vermont has recently passed legislation to ease procedural restrictions and facilitate development in designated downtowns and village centers.

General Infrastructure Challenges

- The rural, low-density nature of Vermont works against economies of scale for financing and operating infrastructure.
- While consultation with municipal and regional planning bodies can facilitate infrastructure investments, many individual projects do not take advantage of that potential, and conflicts arise that slow infrastructure development.
- Many of Vermont's 251 towns and villages do not have the experience or capacity to create integrated infrastructure plans and navigate the often complicated permitting processes infrastructure build out often requires.

General Infrastructure Strategy

- ***Develop and implement cross-agency coordinated infrastructure plans that build upon all existing relevant state and regional plans to accomplish the following:***
 - ***Focus municipal infrastructure investments to support business development and affordable housing.***
 - ***Help towns plan so they have the infrastructure needed for economic development and housing growth, especially water and sewage treatment systems.***
 - ***Coordinate state agency activities to facilitate the implementation of infrastructure projects.***
 - ***Achieve statewide energy goal of 90% use of renewable energy by 2050.***

General Infrastructure Initiatives

11. SWAT Infrastructure Teams to Support Local Development of Water, Waste Water Transportation, Telecom and Energy Projects. Develop a pilot project for ten communities and offer support from four technical assistance teams made up of professionals to address the specific community need for water, wastewater, and storm water infrastructure as well as transportation, telecom and energy. The four teams will cover: engineering assessments and alternative systems analysis; financing and funding; project management; and public outreach. This project will also secure funding and work with partners to develop a grant process for municipalities to apply for one or more of the SWAT technical assistance teams. A key to the success of this initiative is the creation of a funding package that will allow municipalities to have access to the necessary expertise for project scoping, planning, construction and management.

12. Align Funding and Permitting to Implement Small Scale Water and Wastewater Solutions. Align funding, permitting and education to replicate the successes of other rural states in implementing small-scale water, storm water and wastewater solutions necessary for economic development. A number of states have invested in education and outreach, planning for permanent management of on-site systems, and used federal funds creatively to enable smaller, decentralized wastewater treatment options that are necessary for maintaining community vitality. New advances in green storm water infrastructure design and construction provide opportunities to at once beautify communities, save costs and protect the environment. Vermont can do the same. Tackling these issues is not easy, but is critical to Vermont's future. Overcoming these challenges will require additional resources and discussion to develop detailed recommendations.

13. Infrastructure Handbook, Outreach Strategy and Targeted Funding for Ongoing Technical Assistance. Lessons learned and the 'how tos' from the pilot project SWAT technical assistance teams (documented as part of the project requirements) will be compiled into an easy-to-use online manual including check lists, best practices, and sample financing plans and training available for communities state-wide. Increased education would provide communities with tools and outreach to help more communities create capital and asset management plans that identify, prioritize and fund the infrastructure needed. The cost of borrowing money is at an historic low and Vermont has the highest overall credit ratings of the New England states. The ability to issue bonds to support infrastructure is not a problem in most cities and towns. However, voters only support issues they understand and communities need help communicating the necessity and long-term benefits of infrastructure investments. The Infrastructure Handbook can help communities with capital planning.

Other General Infrastructure Initiatives

14. Develop Villages Collaboratively with state GIS and economic modeling support

15. Build capacity for the Revitalization of Downtowns requiring Brownfields Transformation

16. Develop a “Plug and Play” Approach to Kick Starting Complex Infrastructure or multi-party dependent business opportunities

17. Track New Development in Real-Time to help state and local agencies target successful permitting and support approaches

1. Energy Systems

Energy represents a significant cost of doing business in Vermont. Vermont commercial and industrial users spent \$800 million for energy in 2012. While Vermont does not have a concentration of heavy manufacturing (for which low-cost energy is a primary concern), agriculture, advanced manufacturing, and many information technologies do require reliable energy sources at competitive prices.

Vermont’s primary fuel for residential and small commercial space heating is #2 fuel oil, supplemented in residential settings by cordwood and a small but growing supply of wood pellet fuel.

Green Mountain Power provides electricity service to 70% of Vermont customers. Nineteen other municipal and cooperatively owned utilities provide service to a patchwork of service areas, mostly in small communities across the state.

Vermont Gas provides natural gas to approximately 50,000 Vermont customers. Natural gas is currently a low cost energy option. In areas not served by Vermont Gas, liquid petroleum fuels (propane and fuel oil) are used and require much higher costs for applied energy end uses.

Energy System Goal

The State of Vermont has established an ambitious goal of providing 90% of the energy needs by 2050 with renewable supplies.

Energy System Strengths

- Electricity prices in Vermont are lower than in other states in the northeast region.
- Natural gas is a low-cost alternative currently available in the northwestern part of the state. Vermont Gas transmission corridor expansion plans will provide additional natural gas to Addison County and, in a final phase of expansion, to the Rutland area.

- Vermont is a national leader in energy efficiency and also has a concentration of renewable energy businesses for wind, solar and hydro electricity generation.
- Vermont has installed solar capacity to power 6,500 homes.
- Vermont received a \$69 million grant from the US Department of Energy that has leveraged Vermont utility investments in developing Smart Grid infrastructure. The Smart Grid provides advantages for systems management with long-term goals of matching cost-effective customer use with lower cost off-peak production.
- A number of local hydro projects offer targeted local energy while Hydro-Quebec is a significant contributor to Vermont's energy needs.

Energy System Challenges

- Electric transmission and distribution costs per connected user are relatively high in Vermont, in part due to low customer density.
- While the current national market for electricity is favorable for customers, spikes in demand may increase in the future resulting in supply constraints and high costs.
- Most of Vermont relies on propane and fuel oil, with high prices and the possibility of future price spikes if supplies are constrained due to climate (extended cold weather), changes in source supplies or diminished refining capacity, or market manipulations.
- The State of Vermont has established an ambitious goal of providing 90% of the energy needs in 2050 with renewable supplies. There is an intermediate goal of meeting 75% of the state's electric needs from renewable sources by 2032.

Energy System Strategies

- ***To meet the energy goal, Vermont has a Comprehensive Energy Plan that is updated regularly. Currently, the Public Service Department is carrying out a Total Energy Study to better understand scenarios that will describe the impacts of future energy policies.***
- ***The nearly statewide deployment of Smart Grid will enable rate structures that incent the increased effective utilization of the existing electric infrastructure and reduce the need for additional infrastructure (and its associated costs). The Smart Grid will also enable greater integration of variable renewable generation.***
- ***The goal for renewable energy supplies provides an economic opportunity for the state and this is reflected in the choice of Renewable Energy, Efficiency and Electricity Innovation as one of the Target Economic Sectors for this CEDS.***

Energy System Initiatives

IE1. Expand mortgage-backed weatherization activities to reduce fossil fuel dependence.

Energy System Projects

P19. Demonstration of integrated solar, wind and biomass farm project with smart-grid

P25. – Wood pellet mill

2. Housing

Housing, the foundation of Vermonters' lives and their communities, is an equally critical element of the infrastructure that supports the state's economy.

Vermont enjoys both a high rate of home ownership and a stable single-family housing market compared to national patterns. Vermont weathered the Great Recession of 2008 with a less severe decline in productivity and employment than the nation as a whole, attributable in part to the fact that housing prices in Vermont declined by only 10% during the market collapse compared to the national decline of 15% and some regional declines exceeding 30%.

At the same time, there is a significant shortage of rental and owner-occupied housing affordable to workers at typical Vermont wage ranges. The state's rental vacancy rate is well below the national average and has been close to 1% for several years in the Burlington metro area. The housing stock is dominated by older homes, many with high energy and maintenance costs.

The quality, availability and affordability of housing have a direct impact on Vermont workers and their employers. A lack of housing options close to work affects employees by increasing commuting times and transportation costs. The challenge of commuting can lead to lower productivity and higher absenteeism. For employers, worker recruitment and business growth are more difficult when potential employees are unable to find a home they want and can afford.

- Vermont has a policy and funding commitment to affordable housing development at the State level via the Vermont Housing & Conservation Board, Vermont Housing Finance Agency, the Department of Housing and Community Development, and others. Priority is given to mixed income developments.

In addition to the benefits that households gain from improved housing availability, the construction sector, which suffered in the collapse of the national housing bubble, will be strengthened with greater investment in new housing construction and renovation.

Housing Goal

All Vermonters have access to a reasonable supply of housing units that meet their household needs at a cost no more than 30% of their household income, and housing availability for employees is not a barrier to business expansion.

Housing Strengths

- 71% of Vermont households own their own homes, compared to 64% nationally.
- The state has a network of experienced housing development/management nonprofits committed to affordable housing.
- Because Vermont has not overbuilt, it experienced lower rates of foreclosure and disinvestment in residential buildings during the recent recession.
- Public investment in housing is well stewarded and protected by permanent affordability restrictions.
- Housing development dollars and developments serve as one of the state's most significant revitalization tools for community centers and historic buildings.
- Vermont land use and planning policies and housing programs direct development to downtowns and village centers – where market trends show people want to live.
- The state's housing developers are very successful in bringing Low Income Housing and New Market Tax Credits to Vermont and leveraging private equity to create mixed use and mixed income developments in community centers. Every 25 modest single-family homes constructed in Vermont could add or support 61 jobs, \$2 million in wages/salaries and \$6.3 million in business income.
- High-quality innovative housing developers with a focus on energy efficiency and electricity innovation.
- Strong and innovative “green” building sector.

Housing Challenges

- Lack of adequate housing to meet the needs of current and prospective employees is one of the barriers to business expansion cited by employers. Based on New Hampshire research, there is a negative impact on employment from a lack of modestly priced housing; this may be in the range of 1,500-3,000 jobs per year.
- Vermont's housing stock is dominated by older, owner-occupied homes, many built before the era of high energy costs and therefore costly to heat; most Vermont housing relies on increasingly costly fuel oil.
- The rate of home construction in Vermont is among the lowest in the nation due in part to high costs and regulatory constraints. Housing developments, particularly affordable

housing, can face heavy permitting opposition, which adds costs and discourages private developers.

- Housing prices face upward pressure from high-income out-of-state residents seeking second homes, especially in parts of the state that host ski areas and other recreational complexes.
- Changing demographics and market trends will require shifts in the types of housing needed to address the circumstances of older residents and well as younger and single people who want to live in or be near to community centers.
- Rental units are in very limited supply in some parts of the state.
- Particularly in southern and east central Vermont, a high proportion of second homeowners drives up prices.
- Rental subsidies for lower-income households and HUD funds for housing development are shrinking while demand and need are increasing.
- Vermont's reliance on property tax for municipal and educational revenues contributes to the affordability problem.

Housing Strategies

- ***Conduct a Statewide Housing Needs Assessment to reflect current conditions, address regional differences and unmet needs and highlight the importance of an adequate housing supply to the state's success in economic development***

Housing Initiatives

In parallel with the development of a new housing needs assessment, there are three categories of initiatives to improve the housing situation in Vermont:

IH 1. New Home Construction

- Provide technical assistance and incentives to municipalities to create areas ready for housing development.
- Provide support and training to municipalities to identify and remove zoning barriers and enhance density.
- Support the creation of Neighborhood Development Areas (NDAs) to reduce development costs and uncertainties in areas designated for growth that are identified and supported locally.
- Provide grants (up to \$20,000) for planning, site identification, drafting regulations and design guidelines, infrastructure analysis.
- Award tiered incentive grants to municipalities when an NDA is created, units permitted and built. Allow grants to be used for any local capital need.
- Match housing developers to municipalities with areas ready for development.

- Promote the creation of accessory dwelling units as a means of increasing density, providing starter units and options for aging households that free up larger single-family homes.
- Target areas with excess water and wastewater capacity for additional housing development.
- Prioritize municipalities with infrastructure needs for the SWAT Technical Assistance Pilot Project to help reduce development costs.
- Work with builders and developers to encourage and facilitate more energy-efficiency and high-performance construction.

IH 2. Building Renovation

- Expand funding for the preservation, rehabilitation and creation of housing in areas where homes are not affordable at typical Vermont wages.
- Preserve existing publicly assisted, mixed-income housing in employment centers.
- Improve financing options for single and multi-family developers.
- Create revitalization and reinvestment incentives and tools for housing in blighted areas.
- Identify property tax barriers to investments and improvements in residential housing.
- Foster partnerships between publicly funded and private housing developers to create mixed income developments and neighborhoods.

IH 3. Shared Housing, Creating Rental Units, and Appropriate Housing For Elderly Populations

- Provide incentives for private owners to improve small multi-family rental properties.

3. Industrial Sites

Over the past several decades, regions around Vermont have successfully created business parks that have become home to many employers. Some of the parks were developed by Regional Development Corporations, others by the private sector or municipalities. In all cases, they serve as centers for employment and prosperity. There are also many viable industrial/commercial sites in community centers and in other areas outside of industrial parks. Springfield, for example, has many potential industrial properties in its downtown area. Metropolitan Burlington has substantial office space, both occupied and for lease.

Industrial Sites Strengths

- There is a strong supply of good build-to-suit contractors in Vermont
- Good industrially zoned parcels with full infrastructure are available, generally in very wide price ranges

- A strong commercial real estate community works well with State teams
- Assistance for the redevelopment of brownfields

Industrial Sites Challenges

- ACCD's Commercial Site Locator is incomplete
- The supply of available sites for larger companies is small
- There is a lack of larger buildings (50,000 square feet or more) in certain regions
- Some regions have very limited property availability
- Some property owners, particularly of brownfield sites, are reported to place too high a value on their property
- The cost to redevelop brownfields is often prohibitively high

Industrial Sites Strategy

- ***Identify future needs for business expansion and relocation by region and develop a plan to ensuring that sites are identified with the water, energy, fiber and other infrastructure needs for growing businesses in the next 20 years.***

Industrial Sites Initiatives

IS 1. Identify industrial growth areas in regions around the state and ensure they have the water treatment, energy, fiber and other needs to accommodate growing businesses. Encourage future industrial park planning in regions currently lacking sites and collaborate with state agencies on brownfield redevelopment.

IS 2. Improve Industrial Building Availability for small and emerging businesses

4. Public Safety

Vermont has the second lowest rate of violent crime of all states, less than one-half the national rate. Property crime is also lower than national averages, but while the national rate of property crimes has declined more than 10% over the past ten years, Vermont's rate has remained steady.

Police services are provided by a mix of state police, county sheriffs and, in the state's larger towns and cities, local police forces. Fire services are provided by volunteer fire departments in most Vermont towns, while the state maintains fire death rates lower than the national average. Ambulance services are often coordinated with other public safety activities. Many small towns use regional systems.

Public Safety Goal

Public safety goals are established to preserve the health and safety of Vermont residents. While these are not strictly economic development goals, the success of Vermont in providing an environment of high quality public safety is an important characteristic when individuals and businesses consider Vermont as a location to live and work.

Public Safety Strengths

- Low crime rates
- Low incidence of fatal fires

Public Safety Challenges

- The rural nature of the state makes it difficult to provide the same level of rapid response in small towns as is expected in more urban areas.
- Many areas of the state depend on a relatively small State Police force (210 officers) to provide local policing services.

5. Telecommunications

Access to high-speed internet is as important as well-maintained roads and energy reliability. For citizens, businesses and visitors alike, it is important to continue to invest in our broadband infrastructure. As of December 31, 2013, over 99% of Vermonters had access to high-speed internet and most of the remaining 1% had an identified solution for service. Providers such as FairPoint, Comcast, EC Fiber, VTel, Southern Vermont Cable, Duncan Cable, Verizon, AT&T and others helped the state reach this important milestone. A strong public-private partnership facilitated this build-out by making funding available and identifying each E-911 address that was to be served. By enacting legislation to improve the siting of telecommunications infrastructure, such as took place in H.297 during the 2014 legislative session, Vermont has also worked to encourage new cellular deployment around the state. While our cellular canopy has improved, large areas across the state still do not have reliable coverage.

Telecommunications Goal

- **By 2024, all Vermonters have access to 100 mbps speeds (symmetrical) .**

Telecommunication Strengths

- Nearly 100% of Vermonters have access to broadband service
- Coordinated effort among state government agencies and the private sector continues to advance telecommunication development throughout Vermont.
- The areas around Burlington and Springfield have access to very high speed broadband.
- Vermont benefits from many providers offering a diversity of services
- New USF funding (Connectivity Fund) will be helpful for additional provider support

Telecommunications Challenges

- Cell and telecommunications service is still inadequate in some parts of the state
- Gigabyte-speed broadband coverage will require significant additional investment
- Vermont's terrain and geography present technical challenges to coverage
- Vermont's small market does not attract large carrier investment
- Licensing of state sites for provider use

Telecommunications Strategies

- **Emphasize improvement of high-speed service to designated growth areas while implementing the 2014 Telecommunications Plan**

Telecommunications Initiative

ITC 1 Deliver reliable, high speed broadband access and cell coverage to key economic hubs and corridors throughout the state.

6. Transportation

Poised at the northern end of the East Coast economic corridor, no place in Vermont is ever more than a five-hour drive from New York, Boston, Albany or Montreal. These cities and surrounding areas contain a major portion of the country's population, businesses, and capital. Our proximity to such hubs enables one-day highway shipping to many U.S. and Canadian metropolitan areas as well as reasonable access to European or other international markets through New York or Boston metro airports, or northeastern seaports. Vermont's three major interstate highways run through much of the state, facilitating product movement, distribution access, and workforce commuting. Rail lines, though underdeveloped, crisscross the state and there are 16 airports, including Burlington's International Airport.

Highways are the state's most critical transportation asset, providing access and mobility to Vermonters, businesses and tourists. The highway network, coupled with the rail system allows shippers to export their products, employees to get to work, and visitors to access all four corners of the state. Approximately \$600 million in state and Federal Highway Administration funding is invested annually to maintain this system to enable development. Vermont's continued prosperity relies on this critical piece of infrastructure.

Transportation Strengths

- Facilities at Vermont's 16 airports range from multi-carrier passenger aviation, airfreight and a Foreign Trade Zone at the Burlington International Airport (BTV) to smaller private and municipal general aviation terminals and runways.
- A highway system with capacity to accommodate future growth.

- Primarily providing passenger service to major hubs such as Chicago, Philadelphia, and the New York and Washington, DC metro areas, Burlington International Airport is currently served by six airlines (Continental, Delta, Jet Blue, Porter, United and US Airways) with direct flights to 12 destinations. There are between 27 and 40 daily departures and arrivals, at least 40 per weekday. Current carrying capacity is approximately 2,500 seats per day.
- Both major commercial parcel carriers, UPS and Federal Express (FedEx), as well as Royal Air Freight, fly into BTV, providing service for much of northern Vermont, with BTV serving as a sub-regional hub for FedEx. Some cargo from FedEx's Memphis "super-hub" arrives by medium-range Boeing 757 aircraft, is distributed to smaller aircraft and flown to destinations such as Portland, ME and Syracuse, NY.
- Portions of Vermont are easily accessible to Bradley International Airport (BDL) in Connecticut via I-91; to Manchester-Boston Regional Airport (MHT) via I-89 and I-93; to Logan International Airport (BOS) via I-89/I-93; and to Albany International Airport (ALB) via US 7/New York Route 7.
- Rutland–Southern Vermont Regional Airport is served by Cape Air, which provides three round-trip flights to Boston a day.
- The Amtrak Vermonter passenger train service runs from St. Albans to NYC and on to DC with 10 stops in Vermont. The Ethan Allan Amtrak service runs from Rutland through Albany, NY and on to New York City's Penn Station.
- There are several rail freight lines operating in Vermont.
- Scenic byways throughout the state attract tourists and reinforce the image of Vermont.
- Ten public transit providers throughout the state provide alternatives to personal automobile transportation. Bus and train ridership has increased in recent years.
- The Vermont Agency of Transportation (VTTrans) GoVermont website provides real-time assistance to those seeking carpool and vanpool matching services as well as public transit schedules and bike route information.

Transportation Challenges

- Significant deferred maintenance on aging highways, bridges, and rail lines has resulted in structural deficiencies throughout the transportation system creating increasing wear and tear on vehicles as well as cost for companies.
- Other than I-89 between White River Junction and Burlington, Vermont lacks high-speed east-west highways.
- US Route 7, the major north-south artery on the west side of the state, is mostly two lanes (except for a short southern segment), which hinders freight movement.

- Current passenger carrying capacity at BTV has declined to approximately 2,500 seats per day from a high of about 3,400 seats per day in 2004-2006. This cutback included two very popular flights a day to Atlanta because the flight segments were judged too long by the airline (Delta).
- Not all Vermont airports meet standards for nighttime flying, which is critical for “just in time” delivery.
- Increasing cost of fossil fuels and decreasing reliance on alternative modes of transportation will increase shipping and distribution costs for businesses.
- Climate change and extreme weather have severe impacts on transportation services and reliability throughout the state. Tropical Storm Irene's impact on transportation infrastructure included damage to 500 miles of state highway and 200 bridges (many repaired within two months). New England Central Railroad reported over 65 stretches of track as badly damaged (but they were reopened within three weeks).
- High costs of gasoline and car ownership can limit employment for residents in rural parts of the state, especially for employees at low-income jobs.
- Lack of public transportation in the more rural parts of the state can limit workforce participation (only .8% of the population uses public transportation compared to the national average of 4.8%).

Transportation Strategies

- ***Maintain, rehabilitate and upgrade the state’s highway system and facilities.***
- ***Implement Vermont’s Statewide Transportation Improvement Program for 2014-2017, which addresses the many maintenance and highway improvement challenges with a focus on economic development.***
- ***Create faster, more reliable air, rail and roadway (including bus) connections between Vermont economic centers and major markets (Montreal, Albany, New York, Boston).***
- ***Build networked commuter access to major urban hubs and employment centers from outlying towns and residential communities.***
- ***Facilitate tourism and growth of second home markets by improving access to resort towns via air, rail and bus.***

Transportation Initiatives

- IT1. Redevelop Airports around High Value-added Products
- IT2. Redevelop Vacant Properties Connected to the Rail Network for Businesses Requiring Rail Access

Transportation Projects

P5. Burlington Railyard Enterprise Project

A network of multimodal transportation infrastructure improvements to support economic development in Burlington as well as improving the connectivity and access to the waterfront and to the railyard and the livability of the surrounding neighborhoods. (Note: This initiative is also referenced in *Ecos*, the Chittenden County CEDS.)

P6. Burlington Intercity Passenger Rail Service

Extend Ethan Allen Express Amtrak to Burlington from its current end point in Rutland.

P7. Western Corridor Intercity Passenger Rail Service

With New York, develop a passenger rail service that will connect Manchester, North Bennington, and Mechanicville, NY to Albany and New York City Amtrak services.

State Airport Projects

Improving the infrastructure for the state airports provides flexibility for shipping goods into and out of Vermont and expands the possibilities for private passenger service.

- P8. Rutland State Airport Infrastructure Improvements Add four commercially powered solar hazard beacons, a 120' x 130' jet hangar, airport rescue and firefighting building, and airport terminal to support commercial aircraft activity.
- P9. Newport State Airport Water & Sewer Project Extend water and sewer lines from Newport City to the airport. Needed to accommodate planned growth on airport property and the surrounding area.
- P 10. Hartness State Airport Infrastructure Improvements Add eight commercial-powered solar hazard beacons, a 120' x 130' jet hangar with apron, and sixty-five acres of tree clearing in airport approach surfaces. This airport, in one of the most economically challenged areas of Vermont, has previously competed with

Lebanon, N.H.'s which is cutting back its services. Improve road between airport and Springfield industrial park to facilitate freight use.

- P11. Stowe Morrisville Airport Extend runways and create destination for private planes accessing Stowe Mountain Resort and surrounding areas and a proposed new commercial service, that intends to build a flight simulator and flight school.

P12. Redevelop Vacant Properties Connected to the Rail Network

P. 31 Burlington Airport Infrastructure Improvements Build customs facility to facilitate movement of international passengers

7. Water – Drinking Water

In 2012, there were more than 1,300 public drinking water systems in Vermont, many for seasonal and transient use (hotels, restaurants, campgrounds, summer camps). Vermont has 425 Community Water Systems, i.e. drinking water systems that supply larger communities and associated businesses, serving about 72% of the residential population. Unlike most parts of the country, more than one-quarter of Vermonters are served by small systems (fewer than 3,300 connections). According to the US Census Bureau, only 9% of US citizens outside of Vermont are served by these small systems.

Drinking Water Goal

All Vermonters will have access to safe, clean drinking water that meets Federal and state standards to protect human health

Metric: All of Vermont's public water systems are in 100% compliance with Safe Drinking Water Act standards

Drinking Water Strengths

- In general, Vermont has adequate supplies of high quality drinking water from ground water and surface water sources. While Vermont may be subject to increasing episodes of drought as the result of climate change, the impacts of drought here will be far less than in other parts of the country that have inadequate local sources and lower overall rainfall (or snow).

Drinking Water Challenges

- As with so many issues, Vermont's low population density makes it difficult to support the costs of maintaining public drinking water systems.

- Continuing and escalating maintenance costs make the long-term viability of drinking water supplies problematic.
- The construction of new drinking water systems in areas that are currently underserved is also challenged by low population densities and the higher construction costs associated with new projects.
- There are parts of the state where small communities do not have a publicly supplied water system and each resident and business relies on a private, often less reliable water supply. In some cases, the lack of a public drinking water system inhibits new residential or business activity.

Drinking Water Initiatives

See General infrastructure initiatives I 1, I 2, and I 3 that address drinking water infrastructure needs

8. Water - Wastewater and Stormwater

Many communities around the state do not have the necessary wastewater or stormwater infrastructure to support development and redevelopment projects. The infrastructure is either aging or nonexistent. More than 200 historic village centers have no public wastewater treatment facilities. Without this critical infrastructure, development is difficult and costly. Such limitations can lead to locating new business activity outside of villages and town centers, consuming more land, harming natural resources, and eroding the character and centrality of villages and town centers.

Community surveys and stakeholder groups that were convened in 2012 and 2013 named “*funding for water and wastewater infrastructure*” as the top priority to strengthen Vermont communities and the state's economy. Indeed, without addressing the many issues surrounding water quality, runoff and availability, construction and growth in Vermont will be limited and our natural resources—so key to our brand and the industries such as tourism which rely on clean water and lakes—will be negatively affected.

Small villages seeking to build assets such as community centers, restaurants, and senior housing are often stymied by lack of adequate infrastructure, and development shifts elsewhere. New wastewater rules make redevelopment of these centers difficult, and there is growing concern that buildings in need of redevelopment may become vacant and blighted, lowering community property values. Communities are increasingly being required to take action to address polluted stormwater runoff but lack the resources to plan, design or finance the necessary improvements.

In addition, new regulations establishing Total Maximum Daily Loads (TMDLs) to prevent phosphorous and other pollutants in Lake Champlain and Long Island Sound will mean Vermont

will need to significantly improve its wastewater runoff. For Lake Champlain alone, the Agency of Natural Resources has estimated mitigation costs at \$30,000 per acre for stormwater management, \$3,000 per 1,000 feet to improve roadside ditches and \$50,000 per mile for levee removal. Runoff from dairy farms and other agriculture also play a significant role.

Inadequate, aging and failing wastewater and stormwater infrastructure is the principal barrier to reaching a host of state and local goals, from building more housing for all income levels, to revitalizing communities, to protecting the environment. For Vermont communities to thrive and grow, this issue must be addressed.

Wastewater and Stormwater Strengths

- Baseline data gathering in progress: as part of their FY 2015 contract, the Regional Planning Commissions will work with the Vermont Department of Housing and Community Development (DHCD) and others to develop and test a methodology for assessing regional public water and wastewater needs. The project will assess the capacity of existing systems in villages and downtowns to 1) retain existing businesses and residents, and 2) support the development of additional housing and businesses.
- The Agency of Commerce and Community Development has developed a publication that describes the options for municipalities pursuing wastewater system investments: *Wastewater Solutions for Vermont Communities, 2008*.

Keeping Our Waters Clean

The Clean Water Act of 1972 requires that all surface waters meet national standards for ecological and human health. States must develop strategies for reducing pollutant loads in water bodies that fail to meet those standards. The formula that describes the maximum level of pollutant allowed into an impaired water body is the Total Maximum Daily Load or TMDL. In 2013, the United States EPA gave Vermont and New York a proposed TMDL for Lake Champlain that requires substantial reductions in phosphorus loading. More recently the EPA has determined that the plans developed by the states bordering the lake are inadequate to produce the mandated load reduction.

The most important generator of pollutants in Lake Champlain (and most other water bodies in the U.S.) is non-point source pollution. Non-point pollution differs from point-source pollution in that there is no identifiable business or municipality discharging a pollutant into a water body (usually through an effluent pipe). Rather, the pollutant loads result from rain water or melt water carrying pollutants from roads, roofs, farmland or human-disturbed land. The management of non-point pollution is difficult because there is no particular enforcement focus for reducing the release of pollutants.

Controlling stormwater runoff from large watersheds involves activities affecting thousands of landowners, along with more aggressive highway and parking lot runoff management practices. This is expected to create new business opportunities for environmental management and remediation firms.

Wastewater Challenges

- Federal and state funding sources for infrastructure are inadequate, Tax Increment Financing (TIF) is limited to six municipalities statewide and municipalities are reluctant to bond for long-term improvements since citizens are concerned with high taxes.
- Some regulators are reluctant to approve, and some engineers and contractors are reluctant to build, alternative decentralized systems that can be more affordable options.
- Regulatory requirements for control of polluted stormwater runoff will require new designs and construction methods for roads, parking lots, and buildings.
- Many municipalities are administered mainly by part-time staff or volunteers who may not have the financial or technical knowledge, resources or capacity to plan, develop and implement complex infrastructure projects.

Wastewater and Stormwater Goal

Wastewater and stormwater treatment systems in all Vermont communities are in good repair and can support reasonable levels of residential and business expansion.

Wastewater and Stormwater Strategy

- ***Develop regional wastewater/stormwater plans to ensure that communities have the capacity to grow and can mitigate runoff to help the state meet new Total Maximum Daily Load (TMDL) standards for Lake Champlain and Long Island Sound.***
- ***Work with farms and agriculture to improve soil retention and reduce phosphorous runoff.***

Wastewater and Stormwater Initiatives

See General infrastructure initiatives I 1, I 2, and I 3 that address wastewater and stormwater infrastructure needs

Wastewater and Stormwater Projects

P29. Wetland restoration program to enhance wildlife habitat, flood resiliency and water quality

4D ACTION AREA: BUSINESS ENVIRONMENT

A strong state economy will depend on successfully implementing the initiatives in the four key action areas of Vermont's Comprehensive Economic Development Strategy. The importance of a skilled, motivated workforce, access to private sector capital, and reliable public and regulated infrastructure are discussed in earlier CEDS chapters. This chapter's topic is equally critical: the environment that allows businesses to flourish. A strong business environment encompasses technical assistance, networking opportunities, reasonable operating costs and a consistent, predictable regulatory climate.

Vermont's rural nature will always present businesses with challenges including high costs and limited access to large business networks. However, the state can continue to develop a business environment that fosters the birth and growth of Vermont-based businesses, facilitates the strategic relocation of companies that have an inherent and sound business reason to be based here, and encourages businesses to remain strong here, even after a transition in ownership.

One factor that differentiates Vermont from other states is the widely recognized high quality of life in Vermont. While not always directly associated with the business environment, high quality recreation, natural beauty, low crime and good public schools contribute to the success of Vermont businesses. These factors have attracted entrepreneurial, highly educated migrants whose businesses either benefit from the Vermont brand or can function effectively in an environment that suits the founder's lifestyle choices.

In addition, the Vermont brand and the state's reputation for quality and craftsmanship, trustworthiness and integrity bring value to the goods and services produced here. These qualities, as well as a nimble regulatory environment, have already helped establish certain sectors here (such as captive insurance and food), they are increasingly valuable and can be used to attract new and growing sectors such as cyber security and financial services.

Business Environment Goal:

Ensure that Vermont's regulations, policies, programs, and assistance programs provide a competitive advantage for business recruitment, retention, expansion, creation, and operations.

Measurable target for the goal:

Increase the GDP 4% from baseline growth by 2020.

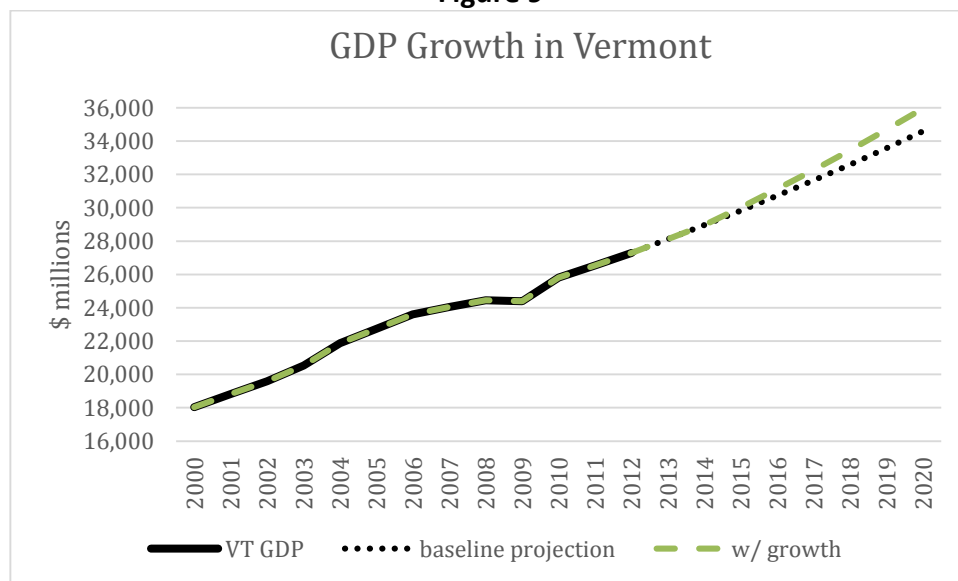
In 2012, Vermont had a Gross Domestic Product (GDP) of \$27.3 billion. Background growth including inflation will increase GDP to \$34.6 billion by 2020.

Implementation of Vermont’s Comprehensive Economic Development Strategy will increase the GDP by an additional 4% or \$1.3 billion to \$35.9 billion.

Table 5 - Vermont GDP Growth	
Year	Vermont GDP
2000	\$18.0 billion
2012	\$27.3 billion
2014 (est.)	\$29.0 billion
2020 (baseline)	\$34.6 billion
2020 goal	\$35.9 billion

To accomplish this goal, Vermont will target its economic development resources towards sectors that have relatively strong prospects for growth, an existing concentration of business activity in Vermont and, in some cases, characteristics that can help Vermont meet some of its non-economic goals.

Figure 9



Business Climate Strengths

- Access to government officials and responsiveness at the state and federal level was cited at every CEDS meeting as one of the top strengths of the Vermont business environment.

- Vermont ranks very well nationally on broader business climate indices that go beyond taxes and regulations, including the Corporation for Enterprise Development Assets & Opportunity Scorecard, where it ranks *best in the nation* for 2013, and the Beacon Hill Institute State Competitiveness Report, where it ranked 19th best in the nation in 2012 .
- Techie.com has named Burlington one of the top 10 emerging tech hubs in the U.S. and *Business Insider* ranks it as the second “most innovative” city in the nation. The Brookings Institution lists Burlington among the top five cities in the U.S. in patents per capita.
- The Vermont brand adds value, as much as 5 to 10% by some estimates, to the goods and services produced and marketed from the state..
- Vermont is an incubator state: almost 80% of the state's businesses have 10 or fewer employees. Small businesses are the source of most Vermont job growth.
- Vermont continues to excel as an entrepreneurial "ecosystem," now ranking second in the 2013 Kauffman Index of Entrepreneurial Activity.
- Vermont is one of the top three global leaders in the captive insurance field (behind Bermuda and Cayman Islands) and has a historically strong insurance sector.
- Vermont businesses are national leaders in several sectors: renewable energy and solar (most solar jobs per capita); food (including coffee, cheese, beer, flour, cider), and tourism (3rd highest number of skier visits).
- Vermont's electricity costs are low relative to those of its New England neighbors.
- There is a robust start-up community (primarily in the Chittenden County area) with business plan competitions (such as the \$70K prize for LaunchVT) and networking events.
- Vermont Center for Emerging Technologies has played a strong role in supporting start-ups with mentoring and capital.
- Manufacturing workforce is supported and well trained via Vermont Manufacturing Extension Center, Vermont Technical College, Community Colleges of Vermont and a variety of other educational programs and institutions.
- Vermont has been a leader in enacting legislation against patent trolling.

Business Services Strengths

- Vermont’s Regional Development Corporations and Small Business Development Centers (RDCs and SBCDs) are hubs for a well-integrated network of entrepreneurship assistance providers, including some specialized for technology, e-commerce, manufacturing, agribusiness, women's business, and support for low-income entrepreneurs.

- Vermont's Congressional delegation involves itself directly in supporting business development.
- Regional business support providers (RDCs, SBDC, Small Business Administration) are usually co-located for user convenience.
- Support organizations such as Vermont Technology Council, Peer-to-Peer Collaborative, the Vermont Sustainable Jobs Fund and Vermont Businesses for Social Responsibility contribute importantly to business and sector growth.
- Community Action Agencies offer statewide, targeted assistance programs for low-income/disadvantaged entrepreneurs starting primarily income-substitution businesses.
- A strong Procurement Technical Center provides assistance in state and federal contracting.
- Vermont's innovative health care reform plan and move to single-payer system may reduce costs for businesses.
- Vermont Manufacturing Extension Center has played a key role in assisting the manufacturing community.
- Vermont Chamber of Commerce and Lake Champlain Chamber of Commerce have both played roles in leading key sector growth in their membership areas.
- Vermont's Employment Growth Incentive has been named one of the top incentive programs in the country. It has not only helped many of Vermont's largest companies become established here and grow but has also shown a positive return on investment.
- Vermont Training Program has also helped train many employees for specific work needed at growing businesses. It too has shown a strong return on investment and, in 2013, saw its trainees receive, on average a 13% increase in wages.

Business Climate Challenges

- Vermont ranks poorly nationally on business climate indices that focus solely on direct costs of taxes and regulation, including the Tax Foundation State Business Tax Climate index where it ranks 45th in the nation in 2013, and the Small Business Entrepreneurship Council Small Business Survival Index where it ranks 48th in the nation for 2013.
- Some businesses and members of the economic development community perceive Vermont's Act 250 land use law to be overly restrictive to economic growth.
- Vermont lacks the density to create true clusters in some industries.
- Ownership of many privately held companies is aging and succession plans are often uncertain.
- Vermont lacks "deep pockets" to provide incentives for recruitment or retention.
- Vermont has high energy costs compared with other states outside of the northeast.
- Uncertainty around how changes in health care reform will impact business costs.

- There is a perception, often reinforced by legislative initiatives, that Vermont is not a business –friendly state.

Cost Challenges

- Vermont's high overall state and local tax burden, 10.10% according to the Tax Foundation, ranks the state 13th highest in the country. Nationally the burden is 9.9%.
- Vermont has relatively low electricity costs when compared to other northeastern states, but its limited access to natural gas requires many companies to rely on more expensive petroleum fuels (fuel oil and propane), and overall energy costs are high relative to other parts of the country.

Business Services Challenges

- Availability of business services and expertise is uneven across the state.
- Publicly funded entities that assist businesses or provide important infrastructure are seeing shrinking funding allocations.
- A plethora of economic development players (referred to by some as the “alphabet soup of agencies”) creates potential confusion of names, regions served and specific roles.

Strategies for Meeting the Business Environment Goal

- ***Facilitate start-ups and enhance their success rate. By working more closely with smaller companies and linking them with appropriate partners and resources, Vermont can help reduce failures and nurture companies with a capacity to grow.***
- ***Support networks for 12 targeted economic sectors (see Chapter 6). Create public-private partnerships to leverage sector growth based on existing sectoral strategic plans (such as the Farm to Plate program or Advanced Manufacturing Partnership), or develop new ones where necessary.***
- ***Reduce business costs by improving regulatory processes and helping businesses identify and implement cost reduction measures.***
- ***Develop recruitment and retention plans specific to individual target sectors.***
- ***Reduce hurdles to growth by examining pertinent systems, policies and legislation and recommending improvements.***
- ***Implement health care reform to help simplify administration and reduce costs***
- ***Foster an environment that sparks, encourages and grants businesses the freedom to innovate.***

Business Environment Initiatives

B1. Establish an Enhanced Economic Development Technical Assistance Delivery System for Optimum Business Resilience/Success. Create a one-stop shop and business registration

portal to help guide businesses to the technical assistance, financial resources and workforce training they may need at all stages. Implement IEDC Business, Retention and Expansion “Best Practices”. Establish regional “coaching teams” to assist businesses.

B2. Develop a Business Cost Reduction Program. Develop a comprehensive plan to make Vermont more competitive with other states by assessing and reducing costs including energy, taxes, utilities, workers comp, and healthcare.

B3. Implement a Statewide Entrepreneurial Accelerator Program. Develop and implement a coordinated plan to accelerate technical assistance, programs and resources to accelerate entrepreneurial growth. Set up network of incubators and accelerators linked to educational institutions in key towns around the state that can build on the strengths of the Burlington start-up community and replicate events and programs such as Peak Pitch, LaunchVT, the Vermont TechJam and Hackathon.

B4. Made in Vermont. Leverage the Vermont brand’s association with quality to better market products and services globally. Create a targeted marketing campaign to promote value of Vermont-made products and services with a distinct “Made in Vermont” seal.

B5. Sector Priority Plan Support and help network growth sectors. Create team approach to developing sector plans and growth strategies. Use Farm to Plate as a model and adapt where possible to other sectors (see Chapter 6: Target Economic Sectors).

B.6. Form a Vermont-wide Benchmarking Roundtable to replicate successful strategies from one region or business sector to another.

B7 Host Statewide Survey and Workshops on Ownership Transition to ensure that businesses can be successful on an ongoing basis.

B8 Create and Maintain an Innovation Index modeled after Maine’s Innovation Index, with dashboards to monitor Vermont’s progress and compare it to national trends.

Other Initiatives

B9. Simplify and Better Coordinate Permitting Processes to expedite and reduce the cost of developing projects in Vermont

Business Environment Projects

P13. Vermont Business Accelerator/Incubator/Maker Space Program

5. UNIQUELY VERMONT

Our Brand, Working Landscape, and Culture of Innovation

In every CEDS discussion around the state – from regional gatherings of citizens to cabinet-level meetings – three topics were repeated over and over: The strength of the Vermont brand, the unique character of our working landscape and the importance of maintaining a culture of innovation. These three themes will run throughout this document and influence many of the initiatives and are characterized below.

The Vermont Brand

In every region of the state, people refer to the importance of ‘that Vermont thing.’ That ‘thing’ can be better described as the Vermont brand: the sum of impressions and values conveyed by the word *Vermont* and all it is applied to.

In 1891, a promotion observed that Vermont is:

“A place of rural beauty, a place where farms produce wholesome food and where mountains, lakes and trails offer vigorous, refreshing outdoor recreation, a place where history is important and relationship to the land still means something. Vermont is a safe place away from the noise and crime of the cities.”

Those sentiments, resurrected by Tom Slayton in his editorial in *Vermont Life* in 2003, still ring true today. As Dan Dunlop, founder of Jennings, a North Carolina health-care marketing agency, wrote in 2010:

“For me, there is also this intangible aspect of life in Vermont where I always felt more connected with the natural world. There’s something healthy about being in a state that is so green. It makes you want to be active. Living between the mountains and Lake Champlain, it is hard to forget that you are in a truly beautiful place. I really do believe that for most of the people who live there, Vermont is as much a state of mind as it is a physical place. It always surprises me when I meet someone from Vermont who is contemplating moving to the southeast or mid-Atlantic region to escape the cold. I always think, ‘At what cost?’”

Vermont’s brand strengths are well documented and supported by a number of nationwide accolades. As of 2014, Vermont ranks in the top three states in the nation for quality of life and health and is first in the Opportunity Index (www.opportunityindex.org). A 2003 branding study by the O’Neal Strategy Group observed that the words “hard-working, friendly, respectful

of the environment” as the brand personality and “beautiful, peaceful, natural, genuine and year-round outdoor fun” as the brand’s attributes.

The consultants also noted, however, that the attributes and the outside perception of the brand did not encompass how well Vermont caters to families nor did it convey the skilled workforce. Those two items are key attributes that Vermont can leverage. In addition, its history of creating high-quality and authentic products was viewed as an asset that could be built upon as Vermont seeks to attract both new workers and new businesses and as we market current products.

A challenge brought up by CEDS participants: how to update the brand to reflect both the bucolic, rural image of historic Vermont and the vibrant, innovative culture that is part of our new economy, particularly in cities such as Burlington. How then, do we both retain tourists who come for relaxation and recreation and attract new, young residents who come here for jobs, to start businesses and raise families?

While many may suggest an ad campaign, we must remember that a brand is a cumulative sum of impressions and that new impressions and experiences with the product or services will far outweigh any media campaign.

Vermont’s Brand Strengths

- State government at various levels has focused on the Vermont brand and devoted resources to it on an ongoing basis. The Vermont brand lines up with the citizens’ view of themselves.
- The Vermont brand is unique and provides for a distinct sense of place.
- The Vermont brand is established with more recognition for it each year.
- Legislation creating the position of chief marketing officer with specific charges has encouraged the Vermont state agencies to work together more closely.
- The Vermont brand brings tourists and new residents and provides advantages to Vermont businesses.
- State government has continually reflected and reinforced the Vermont brand resulting in differentiating itself from other states.
- Vermont has both in-state and out-of-state recognition for its products.
- The Vermont logos are highly recognizable.
- The population of Vermont is small enough to have had nearly complete exposure to the Vermont brand.
- The homes, farms and historic sites in Vermont appear to be more intact than in other areas giving the impression of authenticity and being genuine.
- It appears that locals, visitors and purchasers of Vermont products will continue to have a sustained sense of continuity with the Vermont brand.

Vermont’s Brand Weaknesses

- There is an unrealistic expectation of a Vermont utopia by some citizens already living in the state or those who have recently moved there in the last few years.

- There is an unwarranted expectation that Vermont does not have issues that appear to conflict with the image of the Vermont brand.
- The overuse of bucolic images may convey the image of a backwater place lacking in economic opportunity; how do we ensure the images and words (beautiful, peaceful and natural) are not considered as synonymous with rural and backward?
- There is the possibility of a distortion of the brand by a commercialized definition of the special place if the people of Vermont do not remain authentic.
- There are concerns about the threats to agriculture and the subdivision and loss of arable and forested lands due to residential sprawl.
- A dairy economy, which is the cornerstone of agriculture in the state, is highly susceptible to national and global price fluctuations, and changes in markets and increasing costs of production. This can impact the brand.
- Vermont's forest products industry is cited as being at a dangerously critical point with the number of mills and other working forest enterprises at risk of closing. This can impact the brand.
- Despite an image that Vermont is one of the healthiest states, there is a complex array of social, medical and substance abuse, and wellness issues that are difficult to address uniformly in a rural state and the costs and availability of health care are major concerns
- There is an image of two Vermonts, one for Chittenden County and one for the rest of Vermont.
- There is a continuing tension between Vermonters' desire for a thriving economy with good jobs and modern amenities and their desire for the preservation of Vermont's traditional working landscape and small towns.
- Vermonters do not always understand, embrace or leverage the value of the brand.

Strategies

- ***Build on and update the Vermont Brand to attract a new generation of visitors, residents and businesses and add value to the goods and services produced here.***
- ***Leverage historic level of quality and craftsmanship and extend to new innovative products and services***
- ***Market products and businesses under the Vermont umbrella***
- ***Tell Vermont's business success stories globally***

Key Vermont Brand Initiatives (described elsewhere)

W8. Make Vermont Home Campaign

B4. Made in Vermont: A Program to Create Branding around Vermont Made Products and Seal that Denotes Quality.

Vermont's Working Landscape

Farms and forests define the physical nature of Vermont, and because Vermonters are closely tied to the land – both for its aesthetic beauty and contribution to our well being through recreation – the land is a basis for considering economic activities, as well. For many years, Vermont has been recognized for its responsible environmental policies to protect that land and its beauty: examples including no billboards, early adoption of a bottle bill and land use regulations that require well-planned development before open land and forests are converted to buildings, parking lots, and roads.

In the past ten years, there has been a tremendous focus on both the environmental and the economic benefits of the working landscape. Farms are the source of food, forests are the source of lumber, fuel and fiber and the overall landscape is the premier drawing card for visitors to the state. The realization has taken hold that possibly the best way to protect the landscape that we love is to ensure that it provides economic value. Altogether, the economic activity related to the land is captured under the term “working lands”, and Vermont is once again taking a leadership role in developing strategies for using the working lands as the basis for future economic activity.

The role of working lands to the state's economic development strategy is most apparent in the selection of the Target Economic Sectors (Chapter 6) that are the focus of initiatives and projects. Food Systems, Forest Products, and Tourism and Recreation are three of the sectors impacted by the Working Lands Investment Program established by the Vermont Legislature in 2009 and the innovative Farm to Plate Program.

Each of the Action Areas has had, and will continue to consider working lands with a set of economic activities to: raise capital, strengthen the workforce, establish appropriate infrastructure and ensure a healthy business environment to allow the businesses involved in the working landscape the best opportunity for future health.

Goals for Working Lands – The Vermont Farm to Plate (F2P) program has established a set of goals and provides regular updates to track progress.

Strategies

- ***Continue to leverage Farm-to-Plate program to build jobs and businesses in agriculture sector.***
- ***Apply sector Farm-to-Plate approach to forest products industry***
- ***Encourage private landowners of large areas to create sustainable, economically viable multi-use plans.***

The Farm to Plate Model

In 2009, the legislature identified three primary outcomes for the Farm to Plate Investment Program: increase economic development in Vermont's food and farm sector; increase jobs in the food and farm economy; and improve access to healthy local foods for all Vermonters. Since then, Vermont's food system has added at least 3,600 new jobs, 350 new farms and 199 new businesses. All over the country, Vermont is now being looked to as the leading example of how to transform our food system. And this systematic approach could be a model for other sectors .

A collaborative effort expanded on the initial goals to structure a Farm to Plate (F2P) Strategic Plan. Twenty-five additional goals capture the complexity of Vermont's food system. The Farm to Plate Strategic Plan analyzes the components of Vermont's food system and clarifies challenges to overcome—and opportunities to pursue. With the Farm to Plate Strategic Plan providing a common agenda, the F2P Network supports the work of existing programs, projects, and organizations; and seeks to advance new ideas and high impact, system level changes in a coordinated fashion. The Network is made up of over 300 organizations of all types and scales, all working together to implement the plan.

The Vermont Sustainable Jobs Fund (VSJF) serves as the backbone organization of the Farm to Plate Network, and manages the Vermont Food System Atlas - an inventory of Vermont's food system— and executes the editing and tracking of the Farm to Plate Strategic Plan. As a backbone organization, VSJF: guides vision and strategy; supports aligned activities and facilitates dialogue across the Network; establishes shared measurement practices; mobilizes funding; manages core Network communication needs; provides professional development and leadership training opportunities; builds public will and coordinates community outreach.

Vermont Farm to Plate is weaving together all components of Vermont's food system to strengthen the working landscape, build the resilience of farms and food enterprises, improve environmental quality, and increase local food access for all Vermonters.

Initiatives (also included in Food System and Forest Products sectors)

S-F1. Increase Availability of Traditional Skills to enable the working land sector to flourish

S-F2. Create Seasonal Work Combination Careers to fill labor shortages in agriculture, tourism, recreation and other key sectors and create equivalent to full-time work

S-F3 Invest in a Center for Science in Agriculture to help Vermont become a leader in fermented food and forestry products research and education

Sector Projects

P 15. Southern Vermont Cold Storage and Distribution Hub

P 16. Regional Food Processing for Food Access Programs

P 17. Vermont Livestock Slaughter and Process

P 18. Dairy Farm Infrastructure Development

P 19. Demonstration on-farm integrated solar, wind, and biomass project with smart-grid

P 20. Food Safety Program to Maintain Market Access and Ensure Integrity of Vermont Brand

P 21. Domestic Export

P 22. Farm and Forest Technical Assistance Continuum

P 23. Technical Assistance for Farms

P 24. Culinary Arts Training

P 25. Wood pellet mill

P 26. Forest-based Recreation Destination Hub

Vermont: A State of Innovation

For a state with a small and largely rural population, Vermont has an impressive history of innovation. In the 1820s the town of Windsor was the home of the modern machine shop. Today, Burlington ranks #2 on Business Insider's list of the 20 most innovative cities in the U.S..

Vermont can lay claim to any number of innovative firsts, from the University of Vermont, the first land grant college to Champlain College's leading gaming curricula and Norwich University's cyber security program; from Orvis's reels and fly rods to Burton's snowboards, from the construction of the first U.S. DC electric motor to Efficiency Vermont, the first state-wide energy efficiency program, from Ben & Jerry's novel approach to ice cream to the Keurig Green Mountain K-cup beverage system. Thanks in large part to the contribution of IBM, Vermont ranks seventh in the country in patents per capita. Recent legislation in Vermont to protect against patent trolling seeks to protect our innovative and creative inventions.

Events such as the Vermont Tech Jam, Hackathons and our burgeoning network of co-working spaces are designed to fuel creative entrepreneurship and business pitch contests such as

LaunchVT (with its \$70K reward of cash and in-kind services) and Peak Pitch, with its creative chairlift-pitch approach help recognize and reward good ideas.

Throughout the CEDS process, the need to foster innovation was a continual theme and since innovation runs across many aspects of the economy, it is included in every sector. Each of the four key Action Areas will require innovative approaches to help Vermont capitalize on its relative advantages. Similarly, maximizing the value of information to help businesses and support the information infrastructure is critical for advancing the state's economy. While innovation runs through all sectors and all goal areas and is inherent in many of the initiatives, it deserves its own dedicated goal, metrics and strategies:

Goal for Innovation – Vermont will continually nurture and promote a culture of innovation across business, education, government and non-profits.

Measurable objectives – Vermont will develop the Innovation Index, similar to Maine's, using indicators from other state efforts and, each year, improve the score on the metric.

Strategies

- *Expand throughout Vermont the work that the Vermont Center for Emerging Technologies has done in helping to incubate and nurture start-ups in the Burlington and Middlebury areas.*
- *Foster networks of incubator, co-working and maker spaces that are tied to urban hubs around the state with connections to educational institutions.*
- *Encourage collaboration among Vermont's varied institutions of higher education to foster R&D and commercialization and to spur entrepreneurship in key sectors.*
- *Create statewide programs similar to the multi-institution Food Systems curricula.*

Initiatives

S – AM1. Expand Collaborative R&D between Vermont's Research Institutions and Industry aligned to current strengths and emerging sectors

S- AM2. Establish Ongoing Networking Opportunities between education, small businesses and investors to promote the formation of new, collaborative enterprises

S – AM3. Develop an Entrepreneurial IT Sector that Creates Apps and Systems that Support or Increase the Efficiency of Emerging Industries, Sectors or Activities

Projects

P13. Vermont Business Accelerator/Incubator Program

P. 27 Build on Vermont TechJam and Hackathons

6. Target Economic Sectors

Introduction

An important aim for this CEDS, as for any strategic plan, is to focus deployment of the state's limited capital and human resources on certain economic sectors that can provide the greatest return on those investments in terms of benefits to businesses, workers, and the Vermont economy. The choice of these priority sectors for retention and expansion of companies already in the state, new business start-ups, and recruitment to Vermont is based on the following criteria:

- Potential for growth
- Existing concentration in Vermont
- Strong leadership
- Higher than average wages
- Meeting other policy goals*
- Building on Vermont strengths such as the Vermont brand and quality of life *

*(The target sectors that meet one of the last two criteria are marked with *.)*

The CEDS Committee reviewed sectoral data and identified the following as showing particular promise over the next five years. Within many of these general sectors are smaller, strong and well-networked “clusters,” such as Aviation or Composites in the Advanced Manufacturing sector, Captive Insurance in the Financial Services sector, and Dairy in the Food Systems sector.

- Advanced Manufacturing
- Arts and Culture*
- Biotechnology
- Education*
- Financial Services and Insurance (including Captive Insurance)
- Food Systems*
- Forest Products
- Green Businesses
- Health Care*
- Renewable Energy and Efficiency*
- Software Development and IT
- Tourism

A significant part of Vermont’s current economic activity is not included in these sectors. This is not a judgment on the value of those businesses to Vermont and in most cases the overall improvement of economic conditions in Vermont will provide the basis for growth in the non-

priority sectors. Rather, it is recognition that a constantly strengthening economy is highly diversified and the state has the opportunity to support that diversification. This does not mean the state will be investing in these areas – businesses will be doing that.

Action Plans

The State will work with a variety of partners to maximize the benefits to each of these sectors from the initiatives outlined in the four Action Areas: access to needed capital and financing, a strong and skilled labor pool, critical infrastructure, and a competitive business environment. In addition, where applicable the State will apply the successful model of network support used in the Farm to Plate program (described in Chapter 5: Uniquely Vermont: Our Working Landscape), which has generated more than 2200 new jobs.

The State and its partners will work with businesses and the appropriate sector associations to:

- Assess and improve the state's business environment for each sector,
- Identify both obstacles and opportunities for growth,
- Consider synergies that could produce efficiencies in the business supply chain,
- Set up networking events where appropriate
- Assist in raising awareness of the strength and values of the products and services of each key Vermont sector.

Advanced Manufacturing

Manufacturing is making a comeback in the United States and in Vermont. After decades of employment reductions and outsourcing to offshore manufacturing facilities, there is a slow growth in some domestic production and, in some instances, on-shoring (that is, the return of production by US companies from overseas). Three factors are driving this trend: production efficiencies that require less labor, dissatisfaction with the quality of offshore production, and a focus on reducing expensive transportation costs.

The term “*advanced manufacturing*” captures a wide range of product manufacturing but has the common element of integrating information technologies with manufacturing. Advanced manufacturing also lends itself to smaller scale production, providing advantages for nimble management practices and requiring a workforce with well-integrated skill sets including information technology, marketing savvy, customer relations and logistics.

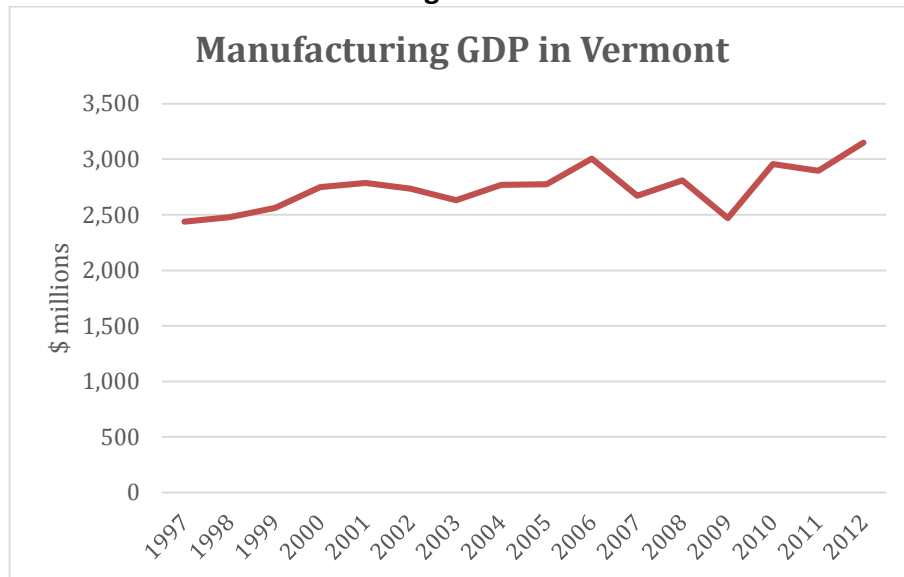
In 2013, the Advanced Manufacturing Partnership developed a set of recommendations for helping 21st century manufacturing activities thrive in Vermont, noted in the Advanced Manufacturing Report that this CEDS will carry forward for implementation.

Why a Priority?

Growing economic opportunities

As the Figure 10 shows, manufacturing revenues as a whole have shown only slight improvement over the past 15 years. Vermont continues to lose manufacturing facilities, but some types of manufacturing are growing and may grow further if they can integrate new technologies.

Figure 10



Source: US Bureau of Economic Analysis

Existing cluster of activity

For manufacturing as a whole, Vermont holds a Location Quotient close to 1.0: despite the state's small size, the concentration of manufacturing in the Vermont economy is equivalent to that of the United States as a whole. Vermont does hold an advantage in concentration for the following subsectors:

- Aviation
- Composites
- Computer and electronic products (including microchips)
- Electrical equipment, appliances and components
- Furniture and related products
- Medical equipment
- Nonmetallic mineral products
- Wood products

High quality jobs

Manufacturing offers jobs with higher wages and salaries than many other sectors in the Vermont economy. In 2013, the average manufacturing wage in Vermont was \$54,675 compared with the overall average wage of \$42,056.

Building on Vermont's Strengths

Traditional manufacturing is typically carried out in very large facilities, often requiring hundreds of new employees; Vermont and its workforce are not well scaled to meet such companies' needs. However, smaller, advanced manufacturing companies often start with a few employees and remain at a modest level, making this subsector a good fit for Vermont's labor and capital capacities.

Key Advanced Manufacturing Sector Initiatives

S-AM1. Expand Collaborative R&D between Vermont's research institutions and industry aligned to current strengths and emerging sectors

S-AM2. Establish Ongoing Networking Opportunities between colleges/universities small business and investors to promote the formation of new collaborative enterprises

S-AM3. Develop an Entrepreneurial IT Sector that creates apps and systems that support or increase the efficiency of emerging industries, sectors or activities

Advanced Manufacturing Sector Projects

P 12. Redevelop Vacant Properties Connected to the Rail Network for businesses requiring rail access

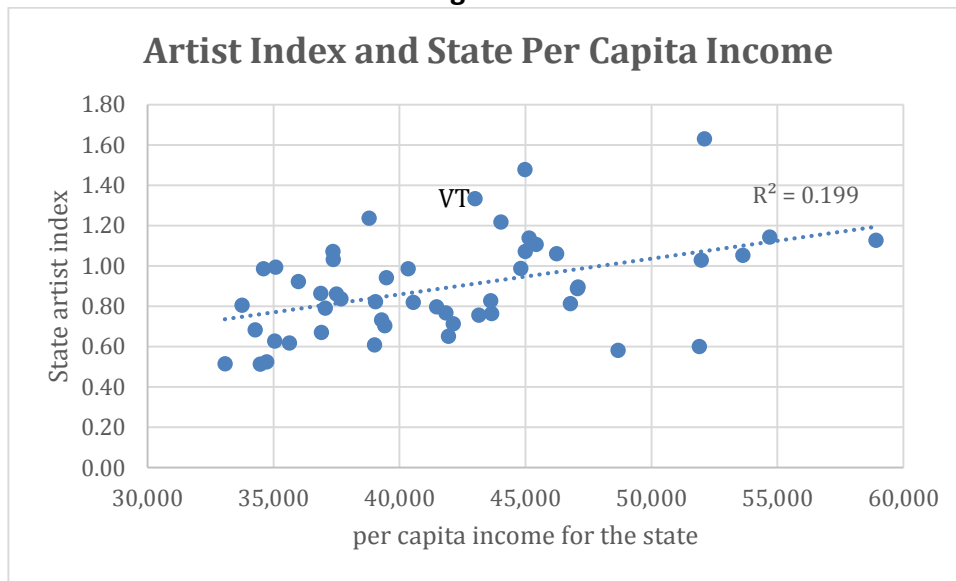
Arts and Culture

Arts and culture play two important roles in the Vermont economy. In the traditional economic sense, the sector produces jobs and revenue. Perhaps as importantly, art and culture help define community character and contribute to placemaking as a whole. The presence of a vital arts community correlates strongly with the overall strength of a region's economic activity. Figure 11 shows the relationship between the concentrations of artists in a state and state per capita GDP.

Artists contribute directly to Vermont's economy in significant ways, including the sale of art and the ticket sales for music and theatrical productions. Other key activities include the sale of arts goods and materials, recording production of music and film for mass distribution, and studio residencies and training programs.

A central dynamic in this aggregate picture of arts-based employment in Vermont is the number of professional, working artists who hold full-time employment in other sectors, for example as professionals, in education, agriculture, or as small business owners. Looking nationally, in 2013 2.1 million workers indicated “artist” as their primary occupation; an additional 271,000 workers held second jobs in artistic occupations. Most people who hold secondary occupations in the arts work indicate “professional” as their primary occupation.¹

Figure 11



Sources: Income, 2006-2010 (5-Year ACS); U.S. Census Bureau
 Artist Index, National Endowment for the Arts - <http://arts.gov/sites/default/files/105.pdf>

Why a Priority?

Growing economic opportunities

The vitality of the "creative economy" for artists, artisans, performers and cultural entrepreneurs depends on the discretionary income of local residents and visitors. As Vermont continues to recover slowly from the Great Recession, there are signs of growth in the sector.

Existing cluster of activity

Taken together, Vermont is home to around 2,286 arts-related businesses (nearly 5 percent of all businesses) that employ 7,357 residents (just about 2 percent of the workforce).²

Americans for the Arts has compiled statistics of employment across many parts of the arts community and has developed a “Local Arts Index.” As with the Location Quotient for industry sectors, each state has a measure of the relative concentration of artists and cultural workers.

¹ National Endowment for the Arts, 2013: <http://arts.gov/artistic-fields/research-analysis/data-profiles/issue-3> accessed June 2, 2014

² Americans for the Arts, 2014: <http://aftadc.brinkster.net/Vermont/Vermont.pdf> accessed June 2, 2014

Vermont's index is 1.33, meaning there are 33% more artists as a proportion of total Vermont employment than the nation as a whole.

High quality jobs

The wage structure for artists is as varied as their professional range. While many artists in Vermont have low annual earnings and their creative activities are secondary to full-time employment in other sectors, the Department of Labor identifies many artistic professions whose 2013 average wage is well above a livable threshold. Examples include:

Arts and Drama teachers (postsecondary) = \$79,730

Graphic designers = \$45,120

Museum curators = \$61,030

Meeting other Vermont policy goals

Public school students exposed to arts, music and theater education improve their overall academic performance. A thriving arts community in Vermont strengthens the capacity of public schools to provide arts and culture education.

Building on Vermont's Strengths

Vermont artists are ambassadors for Vermont. Visual artists from Norman Rockwell to Sabra Field, Woody Jackson to Stephen Huneck reinforce a powerful Vermont image of vibrant and healthy rural communities. Musicians from Ryan Miller (Guster) to Grace Potter and the Nocturnals, Trey Anastasio (Phish) to Neko Case (New Pornographers) keep Vermont's legacy of funk-folk fusion on the charts. While filmmakers Jay Craven and John O'Brien produce works that assert a strong independent regional narrative, others with Vermont roots - from Miranda July to Colin Trevorrow – produce works that speak to quirky, independent themes in keeping with Vermont's cultural traditions. Creative goods designed by globally recognized brands such as Burton, Zutano and Stave Puzzles keep Vermont known for quality, sustainability and health. Even our globally recognized food brands – from Ben and Jerry's to Keurig Green Mountain – trade on finely crafted brands that deftly combine Vermont's creative spirit and healthy living. Visitors recognize Vermont in part for the art that has grown deep roots in our landscape and people.

Key Arts and Culture Sector Initiatives

S-AC1.Capitalize on the Vermont Arts

Arts and Culture Sector Projects

P 13 Vermont Business Accelerator Program

Biotechnology

Within the larger health care sector, biotechnology for medical equipment and diagnostics has evolved as a vibrant growth sector for some Vermont businesses such as BioTek and Mylan. For the past few years, the Department of Economic Development's Foreign Trade office has fruitfully deployed federal grants to help a number of such companies connect with international customers at Germany's MEDICA, the largest medical trade show in the world.

Why a Priority?

Growing economic opportunities

Rising costs of health care present a challenge to the United States economy as a whole. Biotechnology is one small segment of the overall health care system, but one in which Vermont businesses are well positioned to capture future growth. From a report produced by Battelle/Bio that covered the period just after the depth of the recession:

During the 2001 to 2010 period, the bioscience industry grew by 6.4 percent, adding more than 96,000 jobs. By comparison, total employment for all private sector industries in the U.S. fell by 2.9 percent, losing more than 3 million jobs.

Existing cluster of activity

According to the Battelle/Bio report, Vermont growth in the biosciences sector is focused in the medical equipment and diagnostics subsector (location quotient = 1.4). Battelle reports that Vermont in 2010 had 212 businesses employing 1,957 workers in the NAICS coded industries representing all biosciences. While that figure represents less than 1% of the total Vermont labor force, it has strong growth potential.

High quality jobs

In Vermont, the average annual wage in the biosciences sector in 2010 was \$65,173 compared with the average annual wage for the state of \$39,425.

Key Biotechnology Sector Initiatives (similar to those for Advanced Manufacturing)

S-AM1. Expand Collaborative R&D between Vermont's research institutions and industry aligned to current strengths and emerging sectors

S-AM2. Establish Ongoing Networking Opportunities between colleges/universities small business and investors to promote the formation of new collaborative enterprises

S-AM3. Develop an Entrepreneurial IT Sector that creates apps and systems that support or increase the efficiency of emerging industries, sectors or activities

Biotechnology Sector Projects

P 14. Master's of Biotechnology Degree

Clean Energy, Efficiency and Electricity Innovation

Vermont households and businesses spend more than \$1.6 billion each year on electricity and fuel for lighting, powering equipment, heating and transportation. Most of these expenditures are for electricity and fuels from out of state sources. Responding to concerns about climate change, energy security, and future price uncertainties, Vermont has become a national leader in efforts to improve energy efficiency and invest in locally sourced renewable energy supplies and we are at the forefront of “electricity innovation”. A parallel trend in the rest of the United States and other countries is increasing attention to clean energy sources, providing opportunities for Vermont "clean energy" firms to expand their markets.

The Clean Energy sector includes companies that research, design, construct, and install wind, solar, and hydro electricity generation; use biomass as a thermal heat source; and/or provide energy efficiency services such as system controls, weatherization, and equipment upgrades.

Why a Priority?

Growing economic opportunities

Vermont has established a goal of supplying 90% of its energy needs through the use of renewable energy by the year 2050. This ambitious goal requires replacing fossil fuels with a combination of efficiency and renewable energy supplies. Vermont currently spends more than \$1 billion per year on fossil fuels, a figure that will only increase in the long term as supplies are depleting. As with other business activity, Vermont represents only the tip of the iceberg of US fossil fuel consumption, which exceeds \$400 billion annually. Economic pressure and climate change are resulting in an increased commitment to reducing future use.

Existing cluster of activity

Vermont is a national leader both in renewable energy generation and in energy efficiency. Vermont's ascendancy grew from early local initiatives. The Searsburg wind facility completed in 1997, was the first large wind installation in the northeast. Efficiency Vermont was the first state energy efficiency utility. In both cases, that early experience has helped Vermont's clean energy companies expand into out-of-state markets. Further evidence of Vermont's leadership in the Clean Energy sector comes from a recent study on the size of the Clean Energy workforce. Preliminary results show that Vermont has more solar jobs per capita than any state and twice as many clean energy jobs per capita as Massachusetts, itself a leader in efforts to reduce fossil fuel use. And while a significant amount of Vermont's electricity is generated by hydro projects in Quebec, there is an effort to develop local hydro projects in some towns.

Vermont is unique in having established a regulated third-party energy efficiency utility. Efficiency Vermont has worked with thousands of homeowners and businesses to reduce

electricity and fuel use, reducing electric demand growth and thereby the need for new investments in generation and transmission. More recently, Efficiency Vermont's services have now expanded to include weatherization of Vermont homes and businesses. As the result of its Vermont successes, Efficiency Vermont's parent company, the Vermont Energy Investment Corporation, is expanding into other states and internationally.

High quality jobs

The Clean Energy sector includes many job types such as engineering, marketing, communications and construction that offer higher-wage careers than sectors such as retail or hospitality. As the sector grows, it will create additional high-wage management positions.

Meeting other Vermont policy objectives

Vermont's Comprehensive Energy Plan has a goal of meeting 90% of our energy needs in 2050 with renewable sources. Implementing economic development strategies to support clean energy and efficiency enterprises will be a vital in meeting that goal.

Building on Vermont strengths

Consistent with our commitment to being "green" and supporting local businesses, is Vermont's emphasis on renewable energy generation and efficiency to help lower environmental impacts. As Vermont clean energy and efficiency businesses expand into national and international markets, their Vermont location may produce marketing advantages as the Vermont clean energy sector gains greater visibility.

Strategies to move the sector forward:

- Clean energy finance innovation (at large and small scale, including on-bill financing of energy-efficiency and distributed renewables.
- Continued support for net metering
- Biomass district heating
- Expanded thermal/efficiency/weatherization programs
- Continued growth in electric energy efficiency
- Expanded infrastructure for electric vehicles

Key Clean Energy, Efficiency and Electricity Innovation Sector Initiatives

All of the relevant Action Area initiatives in Advanced Manufacturing as well as, in particular, the following Infrastructure Energy Initiative:

IE1. Expand mortgage-backed weatherization to reduce fossil fuel dependence

Clean Energy, Efficiency and Electricity Innovation Sector Projects

P 19. Demonstration on-farm integrated solar, wind and biomass project with Smart Grid

P 25. Wood Pellet Mill

Education

Education is a critical underpinning of the Vermont economy for several reasons:

- A strong education will prepare Vermonters for jobs and higher-wage careers.
- A skilled, educated workforce is a competitive business advantage and critical to business growth
- Vermont has consistently excelled in delivering education to students at all levels from around the world, both on campuses and via online curricula.
- Education is a growing and valuable business sector that attracts our-of-state students and tuition revenues to Vermont

Maintaining a focus on the education sector, particularly postsecondary education, will help Vermont capitalize on its key assets of an educated citizenry and workforce and enable the state to continue attracting students to take advantage of the state's dynamic array of educational opportunities.

There are 27 colleges and universities in Vermont enrolling more than 45,000 students, of whom less than one-third are Vermonters; there is a net influx of first-year undergraduate students of about 1,500 each year. (To put this in context, Vermont is importing undergraduates at almost twice the rate per capita of Massachusetts, a recognized national leader in postsecondary education) The influx of graduate and professional students is even larger. In addition to the income these students and their families bring to Vermont's higher education institutions and host communities, the postsecondary population also supports local businesses and real estate values

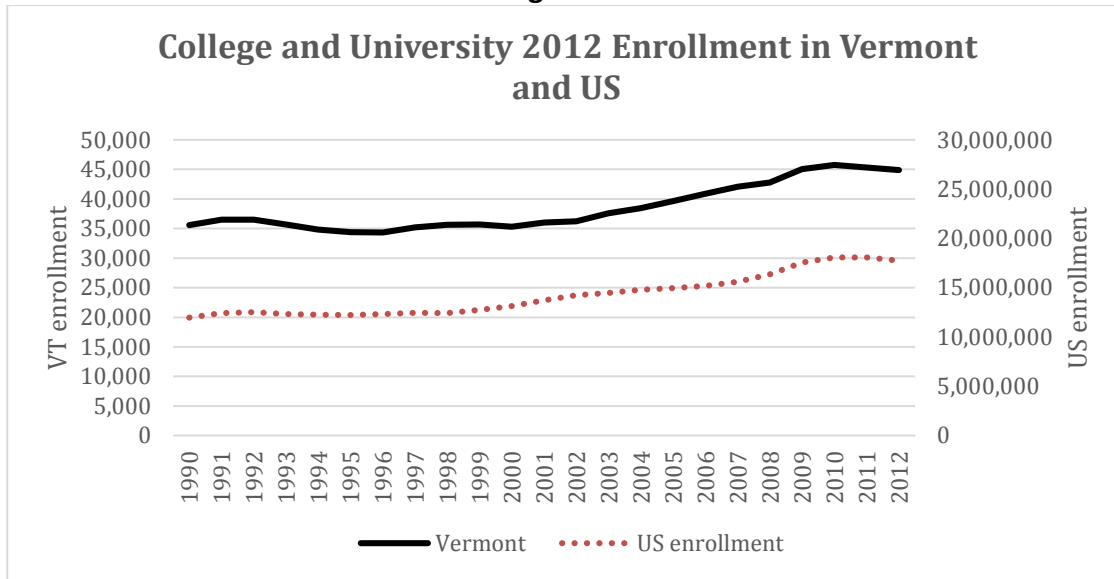
Why a Priority?

Growing economic opportunities

The reduction in traditional student-age populations across the country has not yet resulted in notable decreases in postsecondary enrollment in Vermont colleges. With appropriate strategic focus, Vermont can capitalize on demand from a growing proportion of post-college age Americans and global citizens who are pursuing higher education.

Because postsecondary students are mobile, a successful education strategy can result in an increase in market share for Vermont higher education institutions even as the national population of college age students continues to decline.

Figure 12



Source: National Center for Educational Statistics

Existing cluster of activity

While controversial, it is true that Vermont has a greater share of public school teachers than any other state in the country. Vermont has the lowest student to teacher ratio of any state. In addition, private school employment (largely in colleges and universities) accounted for almost 10,000 workers in 2012 in Vermont. When considering GDP, Vermont's private (mostly nonprofit) educational services sector has a Location Quotient of greater than 2.0 meaning that there is more than twice as much economic activity in Vermont's educational service sector as there is in the United States based on the size of the economy. Furthermore, unlike public school education, post secondary education results in the influx of dollars from out-of-state.

High quality jobs

Educators themselves are well educated, and their positions are relatively well paid. In 2013, those in the broadly defined private education sector had an average wage of \$41,301. Public school teachers, by definition are not private sector employees. Using different data collection methodologies from most used throughout this report, the average teacher salary in Vermont is \$58,463. (The average teacher's aid salary is \$18,715.)

Building on Vermont strengths

Vermont is consistently ranked among the top five states for the performance of its K-12 public education system. The state's high concentration of colleges and universities reinforces the importance and visibility of education in Vermont and is a currently an underused selling point for visitors, entrepreneurs and prospective residents.

Key Education Sector Initiatives (Same as Workforce Initiatives).

Environmental Consulting, Green Businesses and Building

Vermont is regularly characterized as a leading “green” state. In 2011, Greenopia reported that Vermont was the “greenest” of the states and 24/7 Wall St. also places Vermont at the top of its green rankings. Vermont has a strong reputation for programs and policies to reduce negative environmental impacts. As a result, entrepreneurs who value environmental quality look to Vermont for “green” opportunities, and in some cases relocate to the state.

The Vermont Environmental Consortium has been working for the past several years to identify and work with green businesses to build on the strengths of the cluster. Within the “green business” cluster, several subsectors can be added to the previously discussed area of renewable energy and efficiency: environmental consulting, green building; organics composting and recycling, and water quality management.

Why a Priority Sector?

Growing economic opportunities

Surface water quality concerns are on the increase in light of continuing economic expansion and visible evidence of water quality degradation, particularly in Lake Champlain and the Long Island Sound that receives water from the Connecticut River Basin. Vermont is subject to tightened water quality standards through the 2012 TMDL for Lake Champlain. The TMDL will require addressing stormwater runoff from Vermont farms, developed land and dirt roads, among other activities.

Vermont’s Act 148 requires among other provisions that, between 2015 and 2020, organics currently sent to landfills be isolated from the waste stream and processed to capture their value as soil amendments and for possible energy recovery. The Act creates a significant business opportunity for collection and processing companies who will help Vermont businesses and homeowners comply with the requirements.

Vermont has also been a leader in green building and as renewable supplies and energy costs become increasing pressures on new building, we have an opportunity grow this sector

Existing cluster of activity

In 2010, the Vermont Environmental Consortium completed a survey of 250 Vermont businesses and identified almost 20,000 employees in companies providing environmental services, including such national leaders as Casella Waste Management. Complementing and facilitating the state's concentration of green business activity, the University of Vermont has one of the largest environmental studies programs in the U.S., and the Vermont Law School is a national leader in environmental law.

High quality jobs

Green businesses offer a wide range of products and services and therefore cross many occupations and traditional business classifications. Employment patterns in the sector are most likely analogous to those in the NAICS Professional Services category which in Vermont has an average salary of \$56,468 compared with the overall average of \$42,056.

Building on Vermont strengths

Vermont has been a national leader in a number of fronts:

- Recycling: In 2012, the Legislature passed Act 148, Universal Recycling, to ensure that recycling and resource recovery are central to all solid waste management programs.
- Water quality management: Vermont is a leader in the watershed basin approach to water quality management and helped develop decentralized water treatment technologies in the 1990s. The integration of earlier Vermont strengths will be important in moving forward to meet federally mandated water quality goals.

Meeting other Vermont policy goals

Act 148 requires the recycling of organics (food waste) on a phased schedule between now and July of 2020. Businesses will be forming to collect, process, compost, or otherwise recover the value from food waste so that restaurants, food producers and households can comply with the law's requirements. Those businesses will benefit from start-up support. Improving water quality management will require additional business activity in each stage of the process: water quality monitoring, watershed management, implementation of wastewater and stormwater management technology, and programs to ensure full community participation.

The Vermont Agencies of Natural Resources, and Agriculture and Food Markets are working together to provide technical assistance to smaller dairy farms that impact water quality in the Lake Champlain basin. There are approximately 650 small dairy farms in the Champlain basin, each of which will go through an assessment procedure between now and 2020 and in most cases, each of those farms will need to implement new infrastructure provided by Vermont businesses to keep soil and nutrients from entering surface waters.

Key Green Businesses and Building Sector Initiatives

11: SWAT Technical Assistance Pilot Project

Environmental Consulting, Green Businesses and Building Sector Projects

P 23. Technical Assistance for Farms to assist in meeting water quality goals

P 28. Waste to Work: Job Creation and Capital Building Program

P 29. Wetland Restoration program to enhance wildlife habitat, flood resiliency and water quality

Financial Services and Insurance

As a domicile for captive insurance (self-funded insurance subsidiaries of non-insurance companies), Vermont is a national and global leader. Recently, Cassatt Insurance Group formed Vermont's 1,000th captive and Vermont is among the top three captive domiciles worldwide (with Bermuda and the Cayman Islands) and leads the U.S.

A few companies began testing the feasibility of the captive insurance model in the late 1970s. Aware of the business opportunity, the Vermont Legislature responded with laws that provided predictability and a fair regulatory environment. As the field grew, expertise for forming and managing captives became centered in Vermont and the state maintains its competitive advantage with responsive legislation, clear regulation and a knowledge base to keep new captives locating in the state. Vermont also has a strong traditional insurance sector, led by one of its largest employers, National Life, and supported by a subsector of accounting, legal and other sector-specific services.

In the broader spectrum of financial services, Vermont is a very small market, following the lead of New York and Boston financial centers. However, since many financial transactions can now be managed from remote locations with advanced telecommunications capacity, financial professionals can conduct business effectively from locations that suit their lifestyle desires. Vermont has already seen and will increasingly benefit from the migration of financial services practitioners to the state.

Future competitiveness in this sector will require the state to create additional financial management tools. Vermont will benefit from using the history of captive insurance management and applying its lessons to financial services companies to cultivate new equity and debt services. As the Finance and Capital section of the Vermont CEDS outlines, the state is poised to move forward on providing a spectrum of capital options for Vermont businesses, and the financial services sector may be poised to take advantage of a new, robust financial services toolbox.

Why a Priority?

Growing economic opportunities

The captive insurance market is still growing. Each year, new companies decide to use captives to address liability and other risks. The cluster of services in Vermont continues to provide a home for these new captives. In addition, in 2014 Governor Shumlin signed the Legacy Insurance Management Act to allow the formation of specialized Vermont-based insurance companies to acquire older policies and enable their clients to take them off their books.

Financial services are a critical part of the 21st century economy. While New York City will be the center of the financial services market for the foreseeable future, Vermont, in particular those areas with access to very high speed Internet services such as Burlington or Springfield,

can play an increasing role as a location for individuals and small firms seeking an alternative location for some of their operations.

Existing cluster of activity

Vermont is the national leader in captive insurance. In 2012, Vermont hosted captives writing \$26.7 billion in premiums, the most of any location, foreign or domestic. Vermont does not have a similar position in the financial services industry as a whole. However, new financing tools may provide the state an opportunity to build a future financial service niche market.

High quality jobs

The financial services sector enjoys an average annual salary of \$67,601 compared to the overall state average of \$42,056.

Key Financial Services and Insurance Sector Initiatives

S-FI1. Use Legacy Insurance Management Act passed in 2014 to build new market

Food Systems

Vermont was settled by colonists of European descent in the 18th century and, for its first 150 years, was largely an agricultural economy. The 20th century saw remarkable changes: 27% of Vermont workers worked on farms at the beginning of the century, but fewer than 2% did so at the century's end. Parallel with that decline, the proportion of Vermont-grown food consumed in state dropped significantly.

The amount of Vermont land in farming also dropped and the state's landscape changed from predominantly farmland to the current situation in which less than 11% of the land is cleared for agriculture and most of the rest is forested.

Despite the historic trend of loss of farmland and reductions in the agricultural workforce, agriculture provides significant and growing economic activity for the state. The dairy industry is the largest direct agricultural sector, and dairy receipts amount to more than \$1 billion each year. When food manufacturing and restaurant businesses are added, food-related receipts exceed \$3 billion per year.

Vermont's powerful localvore movement has been decades ahead of a national trend. In 2009, legislation crafted and driven by a consortium of Vermont businesses, nonprofits and local food advocates resulted in the Farm to Plate Investment Program. That initiative has resulted in an array of programs and funding resources to support farm-based enterprises, and the results are already apparent. The 2012 Census of Agriculture shows the number of farms in Vermont increasing, reversing a century of decline. The 2013 Farm to Plate Annual Report reveals that

Vermont's food system has added at least 2,200 new jobs since 2009, more than 500 jobs beyond the original forecast.

One important concept of Vermont's Working Lands Initiative is to strengthen the value chain between food production on the farm and the eventual consumer as it moves from "Farm to Plate," capturing more of the added value for the farmer as well as local partner-intermediaries. Vermont farmers who can participate in more value-added activities realize greater revenues from their production.

Local restaurants, responsible for more than \$500 million in Gross Domestic Product in Vermont, also benefit from closer connections to local farmers since many local residents and visitors willingly pay premiums to "eat local". In addition, Vermont's educational institutions such as the University of Vermont, Sterling College and others have been national leaders in agriculture and food systems development, and the New England Culinary Institute has helped foster culinary expertise while it devises creative new uses for seasonally available Vermont food products.

Vermonters and other Americans are placing increasing value on the quality, purity and origins of food. Vermont was recently rated as the strongest local food system in the nation. More Vermonters participate in Community Supported Agriculture (CSAs) than any other state and there are more farmers' markets per capita in Vermont than in any other state.

In addition, some of Vermont's largest businesses have helped to reinforce the sense of quality associated with Vermont's brand. These include Ben& Jerry's, Cabot, King Arthur Flour, Keurig Green Mountain, Commonwealth Dairy, Lake Champlain Chocolates, Freedom Foods, Vermont Creamery and many others. Their success is now being paralleled in the craft beer and spirits arena with the growth of Vermont Hard Cider, Magic Hat, Long Trail, Switchback and some of the world's top-rated microbrews such as those produced by The Alchemist, Lawson's and Hill Farmstead.

The shelves of local markets reveals a rapid expansion of locally grown and processed food products, from produce and specialty cheeses to beer and locally raised meats.

Why a Priority?

Growing Economic Opportunities

While the volume of the overall market for food in Vermont and in the United States merely tracks the rate of population growth, the market for Vermont food products has much greater growth potential for two reasons:

1. Because so much of the food in the current Vermont diet is imported from outside the state, a modest increase in local food consumption creates significant increases in demand for Vermont agricultural production.

2. The increase in national and even global demand for fresh, high quality food puts the Vermont brand front and center with its concentration of organic, minimally processed, and specialty food products produced on a small scale.

Existing Cluster of Activity

Agricultural crop and animal production has a Location Quotient of 1.27 for Vermont, meaning that Vermont has 27% more agricultural economic activity per capita (as measured by GDP) than other states. The concentration of agriculture in Vermont is all the more significant considering that the surrounding states have agricultural Location Quotients of less than .25.

Vermont also has a high concentration of food manufacturing activity. The larger end of the food production spectrum includes major regional and national players such as Agri-Mark, Commonwealth Dairy, and Ben and Jerry's in the dairy industry, and Vermont Hard Cider and Keurig Green Mountain Coffee in beverages. King Arthur Flour, a 200-year-old Vermont company, is the largest producer of bread flour in the country and continues to grow.

Smaller food producers, including creators of artisan cheeses and craft beers, are also showing remarkable levels of recent growth. Vermont brands are considered among the highest quality products in the world, with Cabot and Jasper Hill Cheeses, for example, winning top honors in American Cheese Society rankings, the Alchemist Brewery's Heady Topper rated the Best Beer in the World by *Beer Advocate*, and Hill Farmstead named the best craft brewery in the U.S. by the Brewers Association.

Building on Vermont Strengths

The Vermont farm, with its white farmhouse, red barn and green fields, is one of the state's most enduring images, and Vermont has always been known for its pure, high-quality maple syrup and dairy products. More broadly speaking, the rock-solid reputation of Vermont agricultural products for quality and integrity appears to be spilling over to Vermont-branded products and services as a whole.

In addition, the University of Vermont's (one of the original land grant colleges) strength in food systems and agriculture, coupled with the New England Culinary Institute's focus on food preparation and the new Institute for Applied Agriculture and Food Systems offered by Vermont Technical College create a learning environment that will continue to fuel this sector.

Key Food Systems Sector Initiatives

S-F1. Increase the Availability of Traditional Skills to enable the working landscape sector to flourish

S-F2. Create Seasonal Work Combination Careers to fill labor shortages in agriculture, tourism, recreation and other key sectors and create equivalent to full-time work

S-F3 Invest in a Center for Science in Agriculture to help Vermont become a leader in fermented food and forestry products research and education

Sector Projects

P 15. Southern Vermont Cold Storage and Distribution Hub

P 16. Regional Food Processing for Food Access Programs

P 17. Vermont Livestock Slaughter and Process

P 18. Dairy Farm Infrastructure Development

P 19. Demonstration on-farm integrated solar, wind, and biomass project with smart-grid

P 20. Food Safety Program to Maintain Market Access and ensure integrity of Vermont brand

P 21. Domestic Export

P 22. Farm and Forest Technical Assistance Continuum

P 23. Technical Assistance for Farms

P 24. Culinary Arts Training

Forest Products

Forest products in Vermont have gone through a deep economic cycle since 18th century European settlement, when Vermont was almost entirely forest land. The state's first economic activity was agriculture, which required land clearing and timber harvesting. As the market for timber grew, land clearance generated huge volumes of timber, some milled locally and some driven downriver for processing along the Connecticut River, or in mills and potash production sites along Lake Champlain.

As Vermont was deforested and more land opened to the west with even richer sources of wood, the Vermont forest products industry dwindled. Today, the decline of traditional commodity agriculture has resulted in a resurgence of forest land cover in Vermont, but market conditions for forest products have not led to an expansion in the forest-based economy.

By measures of GDP, receipts, or employment, forest products account for only a small percentage of the state's economic activity. However, Vermont's forests are an invaluable resource for water quality, floodwater retention, air quality, wildlife habitat, tourism and

recreation and, perhaps most importantly, the character of the state. Without forests, Vermont would not be Vermont.

Why a Priority?

Existing Cluster and Potential for Future Growth

As revealed in a 2013 report from the Vermont Department of Forests, Parks, and Recreation, the forest products industry (including, logging, furniture manufacture, paper manufacture, wood for energy and other forest products) employed more than 6,000 workers in 2011, 1 in 60 Vermont workers. Forest product activity is spread across the northern tier of states, including most of Vermont, in an area designated as the Northern Forest. While Vermont does not have a particular concentration of GDP in forest products at present, the availability of the resource and the potential to grow markets is a reason for including the sector as a priority for Vermont. The forest products sector includes a range of value-added activities:

- Timber harvesting
- Transporting raw timber to primary processors
- Wood for fuel
- Wood for pulp
- Wood for construction
- Wood for mass-produced and artisanal furniture

Meeting other Vermont policy goals

The economic beneficiaries of Vermont forest land include the recreation businesses that rely on the forested land. Forest-based recreation employed more than 10,000 workers in Vermont in 2011, 1 in 36 workers.

In addition to providing recreational opportunities, enhanced activity in Vermont's forest products industry will increase the value of working forest lands and deter conversion of forest to residential development. The risk of such conversion is high since 85% of the Vermont forest is on private land, and this fragmented ownership pattern threatens the value and attributes of the forest resource. Preservation of this distinctive Vermont economic resource is a land use goal for the state. Small parcel sales would disrupt the forest's environmental and aesthetic value. For this reason, the forest products and food sectors are considered together as critical to maintaining Vermont's productive working lands.

Building on Vermont strengths

While the current market for Vermont forest products is small, there are opportunities to build the market, especially for value-added products that benefit from sustainable harvesting techniques. Vermont's wood artisans have a well-earned reputation for fine craftsmanship and sustainability, both brand attributes this sector can build on.

Key Forest Products Sector Initiatives

(Also mentioned in the section on the Food Sector)

S-F1. Increase the Availability of Traditional Skills to enable the working landscape sector to flourish

S-F2. Create Seasonal Work Combination Careers to fill labor shortages in agriculture, tourism, recreation and other key sectors and create equivalent to full-time work

Forest Products Sector Projects

P 21. Domestic Export

P 22. Farm and Forest Technical Assistance Continuum

P 25. Wood pellet mill

P 26. Forest-based Recreation Destination Hubs

Health Care

The health care sector in Vermont is the state's single largest economic sector, accounting for about 20% of the state GDP and continuing to grow. In line with Governor Shumlin's vision for creating a single-payer system, Vermont is taking steps to restructure the way citizens pay for and receive health care services, including assuring access to those services for all Vermonters. Success in that effort is likely to increase demand for preventive health care services and shift it away from more reactive, higher cost health care services, such as emergency room care. Regardless of future shifts, the size of the sector alone requires attention to its economic development impacts.

As in other parts of the country, health care costs in Vermont represent almost 20% of household expenditures and therefore almost 20% of the Vermont economy. Innovations in health care technology offer new business opportunities, while the restructuring of health care finance requires similar levels of innovation.

Why a Priority?

Growing economic opportunities

Health care services in Vermont and across the country continue to expand due to increasing penetration of new technologies and an aging population that requires greater levels of service. The state and its health care partners need to identify and make plans to ensure a supply of the types of job skills and other resources that will be in greater demand over the coming years.

In addition, increasing global needs and demands for improved health care will continue to expand business opportunities in “exported” health care technologies and services.

Existing cluster of activity

Primary health care delivery is localized to meet the needs of community members, while specialties in the sector are often more regionalized. Vermont has access to two large, research-oriented tertiary medical facilities: Fletcher Allen in Burlington and Dartmouth-Hitchcock just across the New Hampshire border. Dartmouth-Hitchcock serves a significant Vermont population and is staffed with many Vermont-based health care professionals. Physicians will often refer patients with specialized needs to these larger centers and reserve the use of the state’s 13 regional hospitals for more routine care.

Vermont also has a significant number of private facilities with specialties ranging from elderly care to psychiatric and substance abuse treatment. As a result of Tropical Storm Irene, the state's outmoded and non-compliant public psychiatric hospital in Waterbury was closed, and its beds are being replaced by a smaller, state-of-the-art facility as well as several regional treatment centers such as the Brattleboro Retreat.

High quality jobs

The health care industry includes a wide range of occupations and salaries. At the high end, physicians routinely earn more than \$100,000 annually while some lower-end, lower-skilled service providers earn less than \$30,000 per year. The health care sector also includes many administrative and facility support occupations, similar in pay scale to their counterparts in other professional service businesses.

Building on Vermont strengths

Vermont is consistently named as one of the top three healthiest states in the nation and has some of the best health outcome statistics of any state. Maintaining a healthy population and a strong health care system will be important not only in maintaining our quality of life, but also in reducing costs for individuals and businesses.

Meeting other state goals

With an aging population health care will be an increasingly important part of Vermont’s economy and Vermonters’ well-being. By improving health care and reducing, where possible costs, Vermont will improve the quality of life of its population. In addition, Vermont is playing a lead role in nationwide health care reform by working toward a single-payer system by 2017.

Key Health Care Sector Initiatives

S-H1: Implement Health Care Reform program. Continue efforts to implement a single-payer system.

Software Development and Information Technology

The Software Development and Information Technology Sector includes industries involved in the design, development, support, and management of hardware, software, multimedia, and systems integration services. For this discussion, the sector does not include hardware, semiconductor, or electronic components manufacturing (these are included in the Advanced Manufacturing sector).

Industries within the IT Cluster are expected to see growth over the next 10 years as IT becomes more critical to every aspect of the global and Vermont economy. For example, increased automation of operations in the Forest Products sector will result in increased demand for IT skills to design, install, manage, and maintain the equipment and lands. The IT Cluster will only grow as an important cross-sector component of the Vermont economy.

Through the work of a 2012-2013 Legislative Committee on Enhancing Vermont's Software and Information Technology and a 2012 industry initiative led by the Vermont Technology Alliance, Vermont Technology Council, and Vermont Bioscience Alliance, Vermont has recently developed specific assessments and recommendations to support the growth of IT and high-technology businesses.

Aspects of the information technology sector, which is small relative to the overall state economy, make the sector a particularly good fit for Vermont: the independent nature of the industry, relative ease of start-up for new enterprises, high wages, and integration with other clusters and sectors.

Vermont's IT labor market strengths, based on the sector's current size and projected job growth, include Computer User Support Specialists, Software Developers (Applications), Network and Computer Systems Administrators, Software Developers (Systems Software), Telecommunications Line Installers and Repairers, and Computer Systems Analysts.

The Vermont Center for Emerging Technologies (VCET) provides support (start-up, incubation acceleration) specifically for the software and information technology industry. While the program at present is relatively small and concentrated in Chittenden County, it could be beneficially expanded with additional funding and services.

Champlain College is nationally known for its gaming curricula and studies focused on software development, field-leading programs which have helped to graduate a strong cadre of professionals who can apply the skills required by game development to multiple other applications and businesses. In addition, events such as the annual Tech Jam, HackVT and

StoryHack have promoted the sector and helped build networks within it. Norwich University's cyber-security program is also an international leader in a field destined for growth.

Why a Priority?

Growing Economic Opportunities

Nationally, the IT consulting industry was projected to grow by 1.2% to reach \$337.0 billion in 2013 due to global and national growth in IT Security, Software and Application Development, Enterprise Software, and Cloud Computing. Low barriers to entry and low capital requirements favor the growth of the sector in Vermont.

Existing Cluster of Activity

A growing cadre of software developers is emerging in Vermont, mostly in Chittenden County. To support this growth, Champlain College in Burlington is building a reputation in providing training and experience to students in coding.

In addition to a growing skill base, significant improvement in the availability and quality of broadband service throughout the state through ConnectVT creates more favorable conditions for startup and expanding IT businesses, contractors, and entrepreneurs.

Vermont's growing strength in this sector is shown in the recent success of its media, electronic, Internet, and e-commerce companies in accessing venture capital: \$19.3 million between 2005 and 2012. Another example is the 2013 acquisition of online software developer and Vermont startup Dealer.com for close to \$1 billion.

High Quality Jobs

Software and IT jobs provide higher than average wages, with postsecondary degrees (associate's and beyond) typically required. The fields that include the occupations within the sector are broad, and there are several example occupations showing higher average wages compared to the Vermont overall average.

Computer programmers – median wage	- \$64,830
Network and Computer system administrator	- \$73,730
Software system engineer	- \$97,060
Median Vermont wage	- \$42,056

Building on Vermont strengths

The continuing development of a robust information technology and software sector provides a good overall fit with Vermont in terms of supporting small independent businesses, entrepreneurs, contractors, and consultants. In addition, Vermont is a national leader in enacting legislation to prevent patent trolling.

Meeting other Vermont policy goals

IT intersects synergistically with other sectors including telehealth, health records, and business analysts.

Steps to Help Move the Sector Forward

This CEDS proposes adopting key recommendations of the 2012 initiative of the Vermont Technology Alliance, Vermont Technology Council, and Vermont Bioscience Alliance, including the following:

- Help local financial institutions recognize the benefits of investing in Vermont's knowledge-based businesses.
- Increase communication between Vermont's technology companies and its high schools and colleges. The state's new science, technology, engineering and math (STEM) initiative, which offers a financial incentive for recent graduates who accept STEM-related jobs at Vermont companies, is a step in the right direction. VTC and vtTA members want to see an increased focus, not just on science and math, but on graduating students who can write, reason, and work collaboratively to solve problems.

Software Development and Information Technology Sector Projects

(In addition to those previously mentioned)

P 30. Build on Vermont TechJam and Hackathon: Raise awareness of events in and out of state and create network of satellite events around the state to replicate success of Burlington events and recruit talent.

Tourism and Recreation

With its mountains, lakes, historic districts, villages and small cities, Vermont is a global tourist destination. The last benchmark study completed by the Vermont Department of Tourism and Recreation for 2011 estimated that visitors spend about \$1.7 billion annually in Vermont.

For the ten years prior to 2011, tourism activity in Vermont was relatively flat. While some growth occurred in the middle 2000s, that growth was erased during the Great Recession, and signs of a rebound were just beginning to show in the 2011 report. Anecdotal evidence suggests that the past two years have shown even greater resurgence in the sector.

The tourism and recreation sector includes some of Vermont's largest job categories. Vermont has a broad range of accommodations from national hotel chains to hundreds of small country inns and motels. Tourism also supports the restaurant industry. The Vermont Department of

Tourism and Marketing estimates that one-third of Vermont restaurant revenues come from out-of-state visitors. Specialty shopping is one of the draws for visitors who also generate a significant share of retail business in the state.

Recreation services in Vermont are varied, with the ski, snowboarding and snowmobile industries providing economic activity for much of rural Vermont during the winter months. Vermont ranks third in the country in skier days. Increasingly, Vermont's winter resorts are adopting four-season strategies, and in warmer weather draw millions of visitors per year for golf, fishing, hunting, water sports, hiking, and biking.

In total, tourism and recreation provide more than 26,000 jobs in Vermont, many of these in the more rural areas.

Tourism and recreation in the Vermont economy has mixed benefits and drawbacks. Many hospitality jobs pay low wages, and poorly managed tourist activity can lead to congestion in small towns. However, local businesses which rely on out-of-state visitors are a critical driver of economic activity in rural parts of the state that otherwise have limited economic opportunities.

Furthermore, there is significant anecdotal evidence that tourism can serve as a stepping stone for longer term, deeper economic growth. Perhaps the greatest example is the story of Thomas Watson, Jr. In 1957, Mr. Watson decided to locate a division of IBM in Essex Junction after enjoying several years at his winter home in Stowe. The rest is history: IBM has been the largest private sector employer in Vermont for several decades.

Beyond the anecdotes, Vermont's second home economy, which increases retail and recreational demand, is an additional spinoff from tourism. The total value of second homes in Vermont is greater than \$10 billion and second only in concentration per capita to Maine. In many cases, slopeside condominium construction stimulates local construction economies. Like Mr. Watson, second home owners often make the full transition and move their families and business activity to Vermont.

Why a Priority?

Growing economic opportunities

Vermont ski areas have been the focus of significant investment in the past 10 to 20 years. Most recently, Jay Peak has used foreign investment capital through the EB-5 program to upgrade its base facilities and to construct a golf course and the state's first indoor water park. Burke, Sugarbush, Stowe, and Mount Snow have also invested millions of dollars to improve the visitor experience. As a result of those investments, Vermont is capturing an increasing share of northeast skier days. As with any investment, the benefits will accrue many years after the construction is complete. Recent lodging revenue data also suggest that winter visitation is increasing.

Other tourist activities are largely dependent on overall economic conditions. Since the recovery from the Great Recession, American's leisure spending has increased and the Vermont tourism and recreation businesses are beneficiaries:

*As reported on TravelPulse.com regarding tourism travel at the national level:
Data released April 25 (2014) by the Commerce Department's Bureau of Economic Analysis (BEA) showing estimates of GDP growth by industry illustrate that travel posted the No. 2 growth rate of all U.S. industries in 2013, trailing only the agricultural sector. In the fourth quarter, overall real GDP growth slowed to an annual pace of 2.6 percent - off from a 4.1-percent pace set in the third quarter. Eleven of the 14 major industrial private sectors profiled in the BEA report slowed from the third quarter to the fourth. Travel growth, meanwhile, actually accelerated to a 4.2-percent rate in the fourth quarter, up from 3.1 percent in the third. Travel dramatically outpaced the rest of the economy for the year, growing more than three percent compared to 1.9 percent for all sectors.*

Existing cluster of activity

Vermont enjoys a Location Quotient for accommodations revenue of greater than 5, a striking statistic. That means Vermont has five times greater hotel and lodging revenues per capita than the United States as a whole. Tourism and recreation are like other economic activities: the greater the concentration, the easier it is for support industries to flourish. In particular, the addition of new tourism facilities and recreation opportunities increases the overall attractiveness of Vermont as a destination, leading to even greater growth in visits.

Building on Vermont's economic strengths

Vermont tourism and recreation is largely focused on outdoor activity. Winter visitation is almost entirely based on skiing (both Alpine and cross-country), snowboarding, and snowmobiling. In the summer, there is a mix of water-related activity, hiking, biking, and summer cultural events such as craft fairs, auto rallies, theater and music festivals. Surveys of Vermont visitors consistently show that the vital small towns and the rural nature of the state are important factors in their selection of Vermont as a vacation destination. Maintaining environmental quality and small-town vitality is clearly crucial for the continued success of Vermont tourism and recreation businesses.

Meeting other Vermont policy goals

Recreation, tourism and second home development provide important revenue streams to rural communities that encourage landowners to keep large forested areas intact. For this reason, tourism and recreation are a part of an overall state strategy for preserving the working lands of Vermont. Several recreation activities, such as hiking, hunting, dog sledding, and

wildlife observing, depend on intact forests, and these activities help provide a livelihood for those seeking to maintain traditional lifestyles.

Finally, the recreation aspect of Vermont's Tourism and Recreation sector is a welcome amenity for Vermont year-round residents seeking to enjoy winter sports, outdoor summer activities, and the shoulder seasons' relief of music and theater.

Challenges for the Tourism and Recreation Sector

Long-term climate change could have severe negative impacts on skiing, foliage-viewing season, maple syrup production and other agricultural activities that are key draws for visitors. In addition, the prevalence of low wage jobs in the sector not only concerns advocates seeking policies ensuring a living wage, but also leads to regular labor shortages. This is particularly apparent during the ski season when a number of ski areas have not been able to fill positions with local workers and have recruited foreign workers to fill the jobs.

Goal for the Tourism and Recreation Sector

Vermont has established a goal of increasing tourism visitor days 10% over the next five years. This will result in new job opportunities, greater tax revenues for the state, and a level of business revenues that will generate continuing investments to improve recreational opportunities for Vermonters as well.

Strategy to Meet the Goal

- **A growing, labor-intensive economic sector in a period of stagnant labor force growth is a challenge. However, continuing investment in recreation facilities will increase the quality of the tourism and recreation experience and the worker skill levels necessary to support tourism and recreation activity. Over time, Vermont tourism and recreation businesses will cultivate job training programs to move entry level workers into higher skill, higher wage jobs that will further increase the value of tourism and recreation experiences.**

Tourism and Recreation Sector Projects

P 24. Culinary Arts Training

P.23 Master Naturalist Program

P 26. Forest based Recreation Destination hubs

7. VITAL PROJECTS

This Chapter of the Vermont CEDS presents information on Projects that were submitted to and evaluated by the CEDS Committee and ACCD.

In this CEDS we make the distinction between Initiatives that are elements of Vermont's statewide economic development strategic plan and Projects as defined by EDA . Projects are discrete activities usually hosted by individual state agencies or economic development partners and the potential topic of grant applications to EDA or other funding sources. Both are referenced within their appropriate Action Areas in [Chapter 4](#).

Three major sources of Project suggestions were used:

1. Because this is a statewide CEDS, all state Cabinet agencies involved in Vermont's economic development efforts were contacted. Two groups of meetings were held with Cabinet officials or representatives to discuss the types of Projects or Initiatives being sought and evaluation criteria to be used (particularly those desired by EDA), and to encourage multi-agency discussions that might lead to collaborative inter-agency submissions.
2. Project and Initiative ideas were gathered from throughout the state through a series of regional workshops held in cooperation with Vermont's Regional Development Corporations and Regional Planning Commissions.
3. CEDS Committee members were encouraged to submit suggested Projects and Initiatives.

A Project Solicitation Letter and Scoring Sheet were distributed to show the types of information being sought. While the Scoring Sheet was not used in final evaluation due to wide variations in project outcomes, the information included therein was useful in fully informing the CEDS Committee regarding the potential impact.

In total, 30 potential projects were submitted. These were evaluated by the CEDS Committee who were asked to indicate which ones each member considered Vital, and which should be included on the Other Projects list.

Table 6 presents the results of that process.

Table 6– Projects

Project Name	Relates to Action Area or Target Sector	Project Location	Lead Organizer	Project Description	Jobs	Estimate of Total Cost	Non-EDA Funding Sources
P 1. Support for UVM STEM Research & Education Building Renovation and Construction	Workforce Education	Burlington	University of Vermont	To upgrade, modernize, and expand state-of-the-art STEM facilities for excellence in STEM teaching, research, entrepreneurship, and innovation at the University of Vermont	TBD	TBD	Ongoing capital campaign; public and private funds being actively leveraged
P 2. UVM STEM Education Delivery & Career Training	Workforce Education	Burlington & Statewide	University of Vermont	To leverage and continue critical advances in STEM education delivery and career training developed by the 2013 TAACCCT grant managed by UVM	TBD	TBD	Ongoing institutional recruitment and support of key faculty and staff; ongoing development of both public & private funding for STEM education
P 3. iTeach: Computer Science Teacher Education Program	Workforce Education	Burlington	University of Vermont	To increase the capacity for computer science learning and careers in VT and increase gender, race, geographic, and economic diversity in computer science fields	TBD	TBD	Ongoing institutional recruitment and support of key faculty and staff; ongoing development of both public & private funding for STEM education
P 4. VT Behavioral Healthcare Workforce Training	Workforce Education	Burlington	University of Vermont	Development of a comprehensive plan for VT to address health/mental health staffing shortages & advance competency-based training for health care/mental health care professionals	TBD	TBD	Ongoing institutional recruitment and support of key faculty and staff; ongoing development of both public & private funding for STEM education

Project Name	Relates to Action Area or Target Sector	Project Location	Lead Organizer	Project Description	Jobs	Estimate of Total Cost	Non-EDA Funding Sources
P 5. Burlington Railyard Enterprise Project	Infrastructure: Transportation.	Burlington, Chittenden County	VTrans	A network of multimodal transportation infrastructure improvements to support economic development of an emerging creative economy center in Burlington as well as improving the connectivity and access to the waterfront and to the railyard while improving the livability of the surrounding neighborhoods.	TBD	\$10-30 million	TBD
P 6. Burlington Intercity Passenger Rail Service	Infrastructure: Transportation	Rutland, Addison, Chittenden Counties	Vtrans	Extend the Ethan Allen Express Amtrak to Burlington from its current end point in Rutland.	TBD	TBD	TBD
P 7. Western Corridor Intercity Passenger Rail Service	Infrastructure: Transportation	Western Counties, Bennington to Chittenden	Vtrans	With the State of New York State, develop a passenger rail service that will connect Manchester, VT, North Bennington, VT, and Mechanicville, NY to the Albany, NY and New York City Amtrak services.	TBD	TBD	TBD
P 8. Rutland State Airport Infrastructure Improvement	Infrastructure: Transportation	Rutland area	Vtrans	Add four commercially powered solar hazard beacons, a 120' x 130' jet hangar, airport rescue and firefighting building, and airport terminal to support commercial aircraft activity.	TBD	TBD	TBD
P 9. Newport State Airport Water and Sewer Project	Infrastructure: Transportation	Orleans County area	Vtrans	Extend water and sewer lines from Newport City to the airport. Needed to accommodate planned growth on airport property and the surrounding area.	TBD	TBD	TBD

Project Name	Relates to Action Area or Target Sector	Project Location	Lead Organizer	Project Description	Jobs	Estimate of Total Cost	Non-EDA Funding Sources
P 10. Hartness State Airport Infrastructure Improvement	Infrastructure: Transportation	Windsor County Area	Vtrans	Add eight commercial-powered solar hazard beacons, a 120' x 130' jet hangar with apron, and sixty-five acres of tree clearing in airport approach surfaces. This airport, in one of the most economically challenged areas of Vermont, has previously competed with Lebanon, NH's which is cutting back its services. Improve road between airport and Springfield industrial park to facilitate freight use.	TBD	TBD	TBD
P 11. Stowe-Morrisville Airport	Infrastructure: Transportation	Lamoille County Area	Vtrans	Extend runways and create destination for private planes accessing Stowe Mountain Resort and surrounding areas and a proposed new commercial service, Stowe Aviation, which intends to build a flight simulator and flight school.	TBD	TBD	TBD
P 12. Redevelop Vacant Properties Connected to the Rail Network	Infrastructure: Transportation	Statewide	ACCD and Vtrans	Invest in properties and sites for redevelopment by manufacturers or distributors of products and produce suitable for rail shipment/delivery e.g. large fabricated plant and engineering equipment such as blades and towers for wind turbines, girders as well as timber products	TBD	TBD	TBD

Project Name	Relates to Action Area or Target Sector	Project Location	Lead Organizer	Project Description	Jobs	Estimate of Total Cost	Non-EDA Funding Sources
P 13. Vermont Business Incubator/Accelerator program	Business Environment; Innovation	Statewide	ACCD	<p>A program to seed shared work environments (“coworking” spaces) and startup “accelerators”. Three goals of the Vermont Accelerator Program are to:</p> <ul style="list-style-type: none"> • Lower the risks associated with locating a professional or business presence downtown and starting up a new business. • Provide a framework for the delivery of key services to startups, including networking, mentoring, promotion, workshops and training. • Create a network both among entrepreneurs within Vermont’s larger towns and between towns. 	TBD	\$250,000	UVM, Middlebury and other Vermont colleges
P 14. Master’s of Biotechnology degree program	Biotech	Chittenden	Vermont Biosciences Alliance	The tools of biotechnology require a set of skills that are not a part of any standard academic curriculum. These include not only the technical skills required when working with animals, plants and microorganisms, but the social interaction of biotechnology with ethics, economics, and public safety. Students who gain these skills are valuable for Vermont’s growing biotechnology businesses	20 per year	TBD	TBD
P 15. Southern Vermont Cold Storage and Distribution Hub	Food	Windham County	Food Connects and Harlow Farm	Create expanded cold storage and food aggregation point in southern Vermont, Connects local farmers with wholesale markets and distributors.	20 FTE	TBD	Harlow Farm
P 16. Regional Food Processing for Food Access Programs	Food	Windsor and Rutland Counties	Salvation Farms and Vermont Food Bank	Infrastructure to lightly process and distribute food to meet the food security needs of low income Vermonters.	20-25 FTE	\$300-500,000	

Project Name	Relates to Action Area or Target Sector	Project Location	Lead Organizer	Project Description	Jobs	Estimate of Total Cost	Non-EDA Funding Sources
P 17. Vermont Livestock Slaughter and Process	Food	Addison County	Addison County Regional Dev. Corp.	VLSPC has outgrown its current premises in the county, and has secured financing to move its operations to Middlebury. The project has the backing of VEDA, several prominent social impact investors, and the Development Director of the City and College of Middlebury. More than fifty growers depend upon this capability in the State's largest agricultural County, as do fifteen current employees.	10 FTE complete. The fit-up will employ as many as 35-40 When complete	\$4 million (\$200,000 request)	TBD
P 18. Dairy Farm Infrastructure Development	Food	Statewide	VHCB, VT AAFM, WLEB	Improve infrastructure in the 750+ small and medium dairy farms (< 200 cows). These infrastructure investments would result in an increase in the volume and quality of milk produced.	TBD	TBD	\$400,000 from Commonwealth Dairy
P 19. Demonstration on-farm integrated solar, wind and bio-mass project with Smart-grid	Food; Clean Energy	Statewide	Agency of Agriculture, Public Service Department	The application of new energy technologies on farms requires an up-front investment in order to build the experience of installation and operation, as well as build a track record for success.	TBD	TBD	TBD
P 20. Food Safety Program to Maintain Market Access and Ensure the Integrity of the Vermont Brand	Food; Forest	Statewide	Vermont Agency of Agriculture	Develop the regulatory framework for a food safety program. Achieve state-wide of the FSMA by 2017. Provide technical assistance, training and planning to support the implementation	TBD	TBD	TBD

Project Name	Relates to Action Area or Target Sector	Project Location	Lead Organizer	Project Description	Jobs	Estimate of Total Cost	Non-EDA Funding Sources
P 21. Domestic Export	Food; Forest	Statewide	Vermont Agency of Agriculture	Addresses the gap in services to assist agricultural and forest products businesses to supply the demand of regional and national markets through technical assistance and marketing meeting subsidies.	10 jobs created and 65 jobs maintained	\$200,000	\$50,000 from legislature appropriation
P 22. Farm and Forest Technical Assistance Continuum	Food; Forest		Vermont Housing Conservation Board	Strengthen the technical assistance network for both farmers and those in the forest products industry. A part of the assistance is directed to help growing businesses with access to finance.	Affecting > 1,000 jobs	\$300,000	\$100,000 from VHCB
P 23. Technical Assistance for Farms to assist in meeting water quality goals	Food; Green Business	Lake Champlain Basin	Agency of Agriculture and Agency of Natural Resources	Technical and small business training to help start up of entrepreneurial businesses provide on-farm needs and a sustainable support system for the agricultural community.		\$10 - \$40 million	\$4 million match from a range of sources
P 24. Culinary Arts training	Food; Tourism	Statewide	ACCD and Agency of Education	Expanding on a pilot in Rutland, this program provides training to current restaurant workers to take more responsibility at Front of House activities.	Assist up to 100 workers per year	TBD	NECI, local restaurants
P 25. Wood pellet mill	Forest; Energy	St. Johnsbury	NVDA	The construction of a wood pellet mill will allow for the increased use of local, lower grade timber and supply homeowners that are a part of a program to distribute pellet stoves for winter heat.	13 FTE direct. Additional FTE from loggers	\$4.5 million	80% debt, 20% owner equity

Project Name	Relates to Action Area or Target Sector	Project Location	Lead Organizer	Project Description	Jobs	Estimate of Total Cost	Non-EDA Funding Sources
P 26. Forest based Recreation Destination hubs	Forest; Tourism	Statewide, with potential target communities for pilot		Design a toolkit and facilitated program for communities (including non-profits, towns, town committees, Friends of Groups, etc.) to be able to create a forest-based recreation hub. This will culminate in a program that will award grants to communities for planning and marketing assistance.	TBD	TBD	TBD
P 27. Master Naturalist program development	Tourism;	Statewide	Vermont Fish & Wildlife	Establish a Master Naturalist program providing an opportunity to engage traditional user groups at a higher level, to increase understanding of the natural world, to encourage participation in conservation and recreation activities taking place statewide, and to develop a future generation of Vermonters who are more actively engaged in the natural world. With a strong instructional base, these Master Naturalists will help contribute to future conservation of and recreation activities within the state by serving as mentors and knowledge sources for both residents and visitors to Vermont.	TBD	TBD	TBD

Project Name	Relates to Action Area or Target Sector	Project Location	Lead Organizer	Project Description	Jobs	Estimate of Total Cost	Non-EDA Funding Sources
P 28. Waste to Work Job Creation and Capital Building Program	Green Business	Statewide with emphasis on population centers (Rutland, White River Junction and Springfield, Bennington)and the Northeast Kingdom.	Central Vermont Community Action Council Food Cycle Coalition	Fund compost site development, business planning, marketing and job development in support of Vermont's nation-leading organic waste recycling program.	100 full-time or FTE	\$1,800,000	US Dept. of Health & Human Services Office of Community Services
P 29. Wetland Restoration program to enhance wildlife habitat, flood resiliency, and water quality	Green Business	State wide	Vermont Fish & Wildlife	Work cooperatively with a wide range of partners (e.g., USFWS, EPA, NRCS, DEC, FPR, Ducks Unlimited, among others) as well as private landowners to identify and develop restoration plans for wetlands in strategic locations within various watersheds in Vermont. Funds would be used to restore a wetland restoration ecologist position in the Department as well as provide funds for the conservation of wetland habitats. This program would build resilience for Vermont's communities and working lands.	TBD	TBD	TBD

Project Name	Relates to Action Area or Target Sector	Project Location	Lead Organizer	Project Description	Jobs	Estimate of Total Cost	Non-EDA Funding Sources
P 30. Build on Vermont TechJam and Hackathon	Software and IT	Statewide	ACCD	The Vermont TechJam and Hackathon activities are successful in drawing entrepreneurs and making connections with financing resources. Expanding on this success by locating the activities throughout the state and broadening the participation will build on the brand of the two events and provide greater opportunity for the software and IT sectors.	TBD	\$100,000	TBD
P 31. Burlington Airport Infrastructure Improvement	Infrastructure – Transportation	Burlington	VTrans	Build Customs facility to facilitate the movement of international passengers	TBD	TBD	TBD

8. BUILDING RESILIENCE

Introduction

Tropical Storm Irene caused \$1 billion in damage to Vermont in 2011. The possibility that climate-related disasters will strike the state repeatedly in the future has triggered a series of discussions and projects aimed at building resilience into Vermont's infrastructure, economy, governance and business structures.

In its comprehensive report on Irene and its aftermath, *Vermont's Roadmap for Resilience*, the Institute for Sustainable Communities elaborates: "A resilient Vermont is focused on identifying and managing risks, proactively reducing our vulnerabilities and improving our response and recovery to ensure that we are continually building resilience to climate change and natural disasters. We understand that resilience is not a final destination, but a continuous process."

The last sentence hints at a broader context in which resilience is a set of principles that overlies environmental, biological, social, economic, and political systems. In their journal article "Assessing State Policy Linking Disaster Recovery, Smart Growth, and Resilience in Vermont Following Tropical Storm Irene," Gavin Smith and his colleagues note that:

"Narrow definitions of resilience imply quickly returning to a state of normalcy...rather than exploring options to return to a 'new normal' that may include improving upon pre-event conditions...For instance, improving social resilience may involve addressing pre-event conditions tied to equity and social justice, as those most vulnerable to the effects of disasters are often the poor, elderly, or those that speak English as a second language. Quickly returning to a precondition characterized as highly inequitable or vulnerable to future events is not indicative of resilience."

From this perspective, as Smith *et al.* observe, true recovery includes

- Decreased vulnerability to natural hazards
- Equitable decision-making processes
- A strengthened economy
- Good environmental stewardship

This CEDS focuses in particular on the third of those elements – a strengthened economy. Skiing, agriculture, maple and forest product production, tourism, and health are key sectors of our economy that could be weakened by climate change.

Ecotrust, a leading NGO working on sustainability issues, takes the framework several steps further in outlining six "Resilience Principles" to be used as overlay criteria for economic development strategy and initiatives:

1. Embrace complexity (Does it encourage flexibility and awareness of uncertainty?)
2. Plan for change (Does it reflect systems thinking and foresight? Does it consider multiple scales? Does it build adaptive capacities?)
3. Expand opportunities (Does it enrich human, social, cultural, economic, and ecological well-being? Does it build diverse and accessible forms of livelihood and local wealth?)
4. Develop diverse relationships (Does it forge trusted partnerships and rich feedback loops amongst a flexible network of people and resources?)
5. Design for learning (Does it facilitate continuous learning, adaptation, knowledge, sharing, and innovation?)
6. Build local and regional self-reliance (Does it empower communities?)

Within this range, what is a working concept of resilience that has value in the context of Vermont's statewide CEDS? One approach to answering this question is to identify key goal and strategy areas for economic development along with the corresponding set of economic resilience principles, and reframe the economic development goals and strategies in that light. Figure 13 represents a conceptual framework for this, with segments in the economic development pie chart color-coded with their corresponding area in economic resilience.

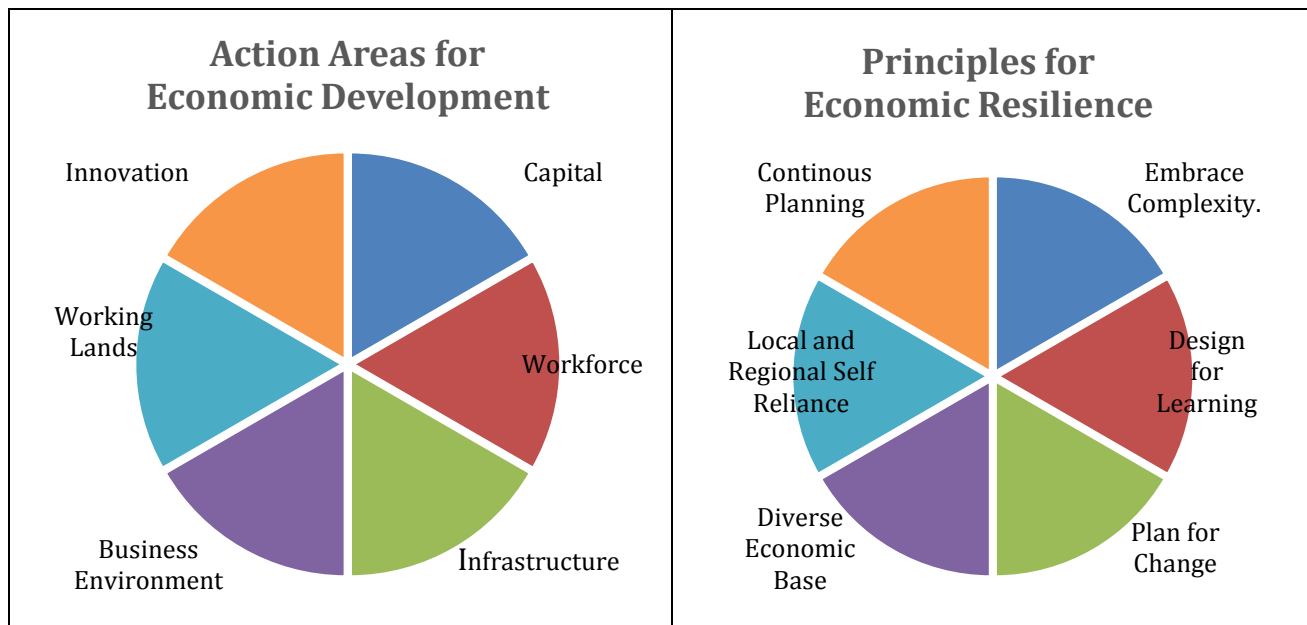


Figure 13: A Model for Resilient Economic Development

Table 7 demonstrates how the aims of economic development and economic resilience complement each other and provides examples of strategies and initiatives which will benefit Vermont's economic future

**Table 7: Examples of Strategies and Initiatives
To Link Economic Development and Economic Resilience**

ECONOMIC DEVELOPMENT: Action Areas and Economic Development Goals	ECONOMIC RESILIENCE: Principles for Resilience to overlay with Economic Development	STRATEGIES AND SAMPLE INITIATIVES:
<p>BUSINESS ENVIRONMENT <i>A competitive business environment for business recruitment, retention, expansion, creation and operations</i></p>	<p>DIVERSE ECONOMIC BASE Aim: Develop diverse relationships forging trusted partnerships and rich feedback loops amongst a flexible network of people and resources</p>	<p>Strategy: Enhance and facilitate startups working with small companies and linking them with appropriate partners and resources. Initiatives: B3 – Entrepreneurial Acceleration Program, B5 – Sector Priority Plan Support</p>
<p>PRODUCTIVE WORKING LANDS <i>Consumption of Vermont-produced food by Vermonters and regional consumers will measurably increase. (From the Farm to Plate Strategic Plan)</i></p>	<p>LOCAL, REGIONAL SELF-RELIANCE Aim: Build local and regional self-reliance using local regional assets.</p>	<p>Strategy: Increasing food production for local and regional markets (From Farm to Plate Strategic Plan) Initiative: SF1 – Increasing the availability of Traditional skills, and SF3 – A Center for Science in Agriculture to help Vermont become a leader in Fermented Food and Forestry</p>
<p>INFRASTRUCTURE: Water, waste, transportation <i>Vermont has the necessary transportation, utility, real estate, telecommunications and other physical infrastructure to support thriving business operations throughout the state.</i></p>	<p>PLAN FOR CHANGE Aim: Reflect systems thinking and foresight; consider multiple scales; and build adaptive capacities</p>	<p>Strategy: Develop and implement cross agency coordinated infrastructure plans that build upon all existing state and regional plans Initiative: I1: SWAT Infrastructure teams to Support Local Development of Water, Wastewater and Energy Projects</p>

ECONOMIC DEVELOPMENT: Action Areas and Economic Development Goals	ECONOMIC RESILIENCE: Principles for Resilience to overlay with Economic Development	STRATEGIES AND SAMPLE INITIATIVES:
INNOVATION, TECHNOLOGY FOR QUALITY AND COMPETITIVENESS <i>Vermont will improve the identification and initiation of innovative activities for workforce development, business environment, and finance.</i>	CONTINUOUS PLANNING FOR CHANGE, ADAPTABILITY Aim: Vermont is a haven for businesses leading the world in adapting to, mitigating and reversing the effects of climate change and other economic shocks.	Initiatives: F3: Establish a Local Vermont Investment Market, W4: Build a Tech- Savvy Workforce in Vermont via the Statewide Digital Literacy Network, and B6: Form a Vermont-wide Benchmarking Roundtable.
AFFORDABLE, FLEXIBLE CAPITAL <i>Vermont will enjoy continuous and robust increases in private sector capital investment to produce new employment and economic activity.</i>	EMBRACE COMPLEXITY Aim: Flexible capital encourages diversity and awareness of uncertainty.	Strategy: Build a comprehensive system to provide access to financing and mentoring for promising early-stage companies. Initiative: F1 Improve the Financial Markets in Vermont
WORKFORCE AND EDUCATION <i>Existing and future employers find workers with required skills and the state's workers embrace lifelong learning to ensure access to careers with livable wages.</i>	DESIGN FOR LEARNING Aim: Facilitate continuous learning, adaptation, knowledge sharing, and innovation	Strategy: Create and Maintain a state of the art system of linkages among all of Vermont's educational and training institutions and the state's businesses and workers. Initiative: W2: Coordination of Training Programs

Examples of Resiliency Projects in Vermont

Vermont has already been very active in resilience planning, including the *Vermont's Roadmap for Resilience* document prepared by the Institute for Sustainable Communities.

The state has also actively and successfully sought funding to support resilience planning and projects, due in great part to the active involvement of Vermont's Senate and Congressional delegation: U.S. Senators Patrick Leahy and Bernie Sanders, and Congressman Peter Welch. In addition to preparation of this CEDS, funded by a \$300,000 grant from the U.S. Economic Development Administration (EDA), other funded projects include the following:

- Vermont Economic Resilience Initiative: With funding from the EDA, the Vermont Economic Resilience Initiative (VERI) is helping the state analyze threats to Vermont's areas of economic activity, develop plans to reduce impacts and avoid future losses, and help our communities and businesses make the changes needed to bounce back quickly when disaster strikes.
- Vermont Economic Development Authority: EDA awarded a \$2 million grant to the Vermont Economic Development Authority (VEDA) to expand its disaster loan fund, and an additional \$500,000 grant to the State of Vermont to help regional planning commissions and communities plan for future disasters.
- Vermont Council on Rural Development: EDA awarded Vermont a \$1.8 million grant to help businesses, farms, towns and nonprofits use online resources to bolster disaster resilience in the wake of Irene and other disasters that struck Vermont in 2011. The Vermont Council on Rural Development (VCRD) applied for the grant out of a pool of disaster funding which the Vermont delegation fought to include in the federal budget last year. VCRD will use the funds to implement the Vermont Digital Economy Project – a \$2.2 million effort that will offer a suite of online tools, broadband infrastructure and counseling targeted at up to 25 yet-to-be identified Irene-affected or flood-hit communities.
- The Windham and Bennington Regional Commissions and their corresponding Regional Development Corporations were jointly awarded \$472,000 in EDA disaster recovery funds for the Southern Vermont Post-Irene Recovery Project. This EDA investment supports region-wide capacity building for disaster recovery. The project will establish two flood recovery offices that will expand capacity to assist affected businesses and encourage the development of innovative public/private approaches to economic restructuring, revitalization and resilience.
- Entergy Vermont Yankee: When Entergy announced it would be closing its Vermont Yankee nuclear plant, the state negotiated a settlement that will include \$10 million in grants to be awarded between 2014 and 2019 for projects to improve the economy and job creation in Windham County. The Southeastern Vermont VEDS addresses this.
- Vermont Telecommunications Authority: EDA awarded the Vermont Telecommunications Authority (VTA) a \$1.6 million grant to help deploy disaster- resilient cellular and broadband services to towns ravaged by Irene and other 2011 flooding.

Preparing for Other Shocks

The outreach efforts that underlie this Comprehensive Economic Development Strategy placed particular focus on resilience. To move beyond the largely flooding-related strategies analyzed through other resilience projects in Vermont in the wake of Tropical Storm Irene, the CEDS outreach efforts enumerated other types of shocks that threaten harm to the Vermont economy. These include:

- The loss of strategic employers
- Climate change and other weather events
 - Lack of snow
 - Drought
 - Summer heat
- Increasing health care costs
- Increasing energy costs
- Disruption in energy supplies
- Health pandemic

For each of these particular threats, specific strategies complement the general strategies that have been the result of work to address future flooding threats.

The Loss of a Strategic Employer

With more than 40,000 businesses that employ fewer than 50 workers, small businesses are the backbone of the Vermont economy and a focus of this CEDS. Assistance in financing, workforce development and sector support will provide small businesses a benefit that is not so easily delivered to larger businesses. However, a small number of large businesses have a critical impact on regional economies and in a very few cases, on the state as a whole.

The state's largest private sector employer, by a factor of nearly two, IBM has more than 4,000 highly skilled and, generally highly paid, engineers and technicians who create the most sophisticated microchips in the world. Thanks to them, Vermont currently ranks seventh in the nation in patents per capita (since IBM accounts for 70 percent of those). IBM also contributes 70 percent of all of Vermont's international exports, totaling more than \$2.8 billion as of 2012.

The impact of this one company is statewide as its employees hail from all 14 counties of the state and 192 of the state's 251 towns. The taxes paid by IBM and its employees provide a significant portion of Vermont's state and local government funding. Workers' charitable giving, through the company's employee contribution campaign alone, totals more than \$780,000.

In the past decade, IBM has halved its Vermont workforce from a high of more than 8,000 employees in 2001. Former employees have gone on to start some of Vermont's most successful new ventures, including IDX (sold to GE Healthcare in 2006), AsicNorth, ipCapital and Shelburne Vineyards.

This year, as the IBM parent company began to scale back and divest of its hardware operations, the future of the Vermont plant is in question.

No Vermont economic development strategy would be complete without considering the impact of “Big Blue” and its possible departure. Consistent with the CEDS consideration of other economic shocks, economic resilience also considers the response that is necessary for the loss of activity resulting from IBM’s potential departure.

The use of IBM’s highly skilled workforce and state-of-the-art physical plant for future economic activity must be framed as an opportunity for improved economic outcomes for the state. That consideration is true for the case where IBM stays in Vermont, or if it is to leave.

Vermont has economic incentive tools such as VEGI and the newly created Vermont Enterprise Fund to open discussions with companies looking to utilize the IBM resources. But, the scale of IBM may require additional tools and partnerships with local, regional and federal partners to fully capitalize on the potential.

The consideration of these strategies happens at a time when Vermont is facing a more certain and regionally significant closure in the southern part of the state. In 2013, Entergy’s Vermont Yankee Nuclear plant announced its plan to shut down with more than 600 workers in Windham County, many of them nuclear engineers receiving salaries in the six-figure range. Vermont has been able to successfully bridge any gap the loss of nuclear energy might have entailed with other energy sources but replacing the jobs and wages is an ongoing challenge.

Unlike IBM, the Vermont Yankee power plant has limited value for future redevelopment and no company will step up to use the site and replace the economic activity taking place in Vernon. The State has set up a program supported by \$10 million in funds negotiated with Vermont Yankee that will be disbursed in grants and loans over the next five years to rebuild jobs and opportunities in the county. As those funds are distributed, it will become more clear what additional programs are necessary to assure that southeastern Vermont develops the necessary resilient structures to move forward.

The experience that Vermont gains in addressing economic shocks will be important as new challenges will certainly arise. Big shocks represented by changes in Vermont’s large businesses will require the continuing partnerships that Vermont enjoys with its local, regional and federal partners.

Climate Change and Weather Impacts

Climate change is one of the factors that introduces accelerating stresses to the Vermont economy. There are several indicators showing changes in the climate of Vermont. In general, these show:

- Increased high precipitation events
- Changing annual schedules of biological activity (flowers blooming, trees leafing out)
- Changing dates of physical weather events (ice in lakes, first and last frost)
- Warmer winter average temperatures

Climate change is also predicted to have other effects although the current evidence is not yet as clear

- Reduced snow cover
- Increased snow storm impacts
- Increased wind events
- Greater frequency of drought
- Warmer summer temperatures

All of these changes have impacts on economic activities – some small, some large, some negative, some positive and all of them uncertain.

Increased damage from high precipitation – Storm damage

Storm damage has been the focus of past weather related events in Vermont. Any increase in flooding will result in a corresponding increase in the dollar damages that result. Tropical Storm Irene resulted in close to \$1 billion in damage. Other storms have had more local effects and also result in significant loss to properties.

Damage to Forest Products

The viability of different forest species will be affected by changing climate. The possibility of pest invasion and competition from warmer –wetter climate adapted species may affect the quality of the timber as the trees suffer from stress. The current value of forest products in Vermont is greater than \$200 million.

Damage to Recreation and Tourism

Different vacation patterns have differing relationships to weather. Warm temperature is great for lakeside vacations, but a disaster for the snow sports. Fall foliage is affected by weather and changing climate may alter the overall schedule and quality of Vermont's fall colors. Currently stressed maple trees may not be able to handle competition from warmer climate species and droughts may affect the survival of certain trees. During the otherwise slow tourist season of late September through October, fall foliage is the primary draw for the state and results in more than \$20 million in Rooms tax receipts alone each year.

Damage to Agriculture

Any change in climate effects crops. Some of the changes may be addressed by low-cost changes of agricultural practices, but others will require increased investments. These include the need to irrigate crops when there are drought conditions. Other costs arise with the northern expansion of pest range when warmer weather allows for the survival of species that have previously been excluded from Vermont.

Damage to health

Some disease vectors are restricted in their range due to the climate. These include mosquito-borne diseases such as West Nile Virus. As the climate warms, these diseases that are currently rare or non-existent in Vermont may thrive. In addition, air quality in the form of higher ozone formation results from warmer temperatures. Higher ozone levels lead to an increase in the frequency of respiratory disease.

Damage to the Vermont Brand

The iconic snow covered fields and mountains of Vermont may have less prevalence as cold weather seasons get shorter and snow melting is more frequent. Our current temperate summers that invite visitors from the south to escape their swelter may offer less of a temperature relief as temperatures rise.

Unknown impacts

Possibly the greatest impacts from changes in the Vermont climate are those that are currently unknown. Will there may be damage to our roads? Will longer summers require more air conditioning changing the peak electricity profiles of our electric distribution and transmission systems? Will people change their overall travel and work habits? And how will any of these changes affect Vermont?

In summary

The topic of climate change is controversial when specific predictions suggest specific policy choices. The only certainty is that the climate will change and a more thorough consideration of possible impacts on the Vermont economy while difficult to pinpoint and quantify, will at least not surprise us. If we can make economic decisions that prepare the state and its businesses for a range of outcomes, then we will have made some progress in the larger strategy to improve the state's economic resilience.

Vermont's small economy has some of the highest per capita use of fossil fuels of any state in the country. If Vermont can take the lead in efforts to reduce the emission of greenhouse gases, it will signal the state's acceptance of responsibility for climate change and may position Vermont for leadership on necessary initiatives to help all energy users change their practices.

Health Care Costs

Unlike the flooding events from climate change, other threats to the economy are evolving over a longer time period. Increasing health care costs are unquestionably a challenge for businesses in Vermont as they are throughout the U.S. Vermont is taking steps to develop an alternative funding system for health care that reduces the burdens on business owners and increases opportunities for employees by decoupling health care coverage from employment. These efforts are on a statewide scale; to learn more about them, readers should visit the Vermont Health Care Reform website: <http://hcr.vermont.gov>

Energy Costs and the Disruption of Energy Supplies

Vermont has experienced several severe petroleum price shocks in the past 40 years. Each rapid increase in the price of fuel oil, gasoline and propane requires adjustment of business practices, financial models, and technology.

To reduce the severity of impacts from energy price shocks on Vermont homeowners and businesses, Vermont has set a goal to reduce its consumption of non-renewable energy resources so that by the year 2050, 90% of Vermont's energy needs will be met by renewable fuels. This effort will have the additional benefit of mitigating negative effects of climate change. Progress reports on these efforts are available by visiting the website of Vermont's Public Service Department and its update of the state's Comprehensive Energy Plan: http://publicservice.vermont.gov/publications/energy_plan/2011_plan

Health Pandemics

Since the possibility of an avian flu pandemic arose in 2004, Vermont has been working to strengthen public health structures and policies for action that will help protect households, businesses, and government functions. Vermont has developed a series of responses designed to anticipate multiple public health shocks as follows:

- Flu - <http://healthvermont.gov/panflu/documents/0706PandemicFluPlan.pdf>
- Smallpox - http://healthvermont.gov/emerg/smallpox/smallpox_plan.aspx
- SARS - <http://healthvermont.gov/prevent/sars/sars.aspx>
- West Nile and Eastern Equine

- Encephalitis-
http://healthvermont.gov/prevent/arbovirus/surveillance/documents/arbovirus_surveillance_response_plan.pdfhttp://healthvermont.gov/prevent/arbovirus/surveillance/documents/arbovirus_surveillance_response_plan.pdf
- Anthrax -
<http://healthvermont.gov/emerg/anthrax.aspx><http://healthvermont.gov/emerg/anthrax.aspx>

Resources for Resilience

The devastation of Tropical Storm Irene in August 2011 resulted in a period of rapid, enforced learning about resilience against future disasters, whether economic, political or natural in nature. One of the major lessons learned was the irreplaceable value of Vermont's social capital. Story after story spoke to the heroism and generosity of friends and neighbors, many having suffered severe losses themselves, who devoted time, energy and funds to helping their fellow Vermonters recover.

Like any living, thriving organism, the community that is Vermont must adapt to large scale environmental change or be rendered dysfunctional and obsolete. Adaptation requires not only the capacity to recover and rebuild in the wake of now-unavoidable disasters and shocks, but to anticipate and weather them with minimal damage. Resilience planning in Vermont is about building stronger, healthier communities, households, local economies, and business enterprises whose own impact on the natural environment is increasingly constructive and positive rather than damaging and resource-depleting.

Since the storm and its aftermath, Vermont has developed an impressive array of resources and tools to help its communities, businesses and households plan for, work through and recover from catastrophic changes. There is no need to reinvent in this CEDS these highly sophisticated "wheels" that will carry Vermont forward into a sustainable and resilient future. Listed at the end of the chapter, with links to sources, are a number of useful and comprehensive Vermont documents. In addition, two external documents, one from Ecotrust and one from the National Association of Counties (NACo) are noted and proved useful in developing a conceptual framework for economic resilience in the context of the CEDS

Resiliency Resources:

- Institute for Sustainable Communities, *Vermont's Roadmap to Resilience: Preparing for Natural Disasters and the Effects of Climate Change in the Green Mountain State*, December 2013, at <http://resilientvt.files.wordpress.com/2013/12/vermonts-roadmap-to-resilience-web.pdf>
- Smith, Gavin, Dylan Sandler, and Mikey Goralnik, "Assessing State Policy Linking Disaster Recovery, Smart Growth, and Resilience in Vermont following Tropical Storm Irene," *Vermont Journal of Environmental Law*, November 2013, pp. 67-102.
<http://vjel.vermontlaw.edu/files/2013/11/Smith.pdf>

- Smith, Gavin, Dylan Sandler, and Mikey Goralnik, *Vermont State Agency Policy Options, Smart Growth Implementation Assistance Program: Disaster Recovery and Long-Term Resilience Planning in Vermont*, August 2013.
http://accd.vermont.gov/sites/accd/files/Documents/strongcommunities/cpr/VT-StateAgencyPolicyOptionsFINAL_web.pdf
- U.S. Economic Development Administration, *Vermont DR-4022, Economic Impact Assessment, Economic Recovery Support Function* at
http://vtstrong.vermont.gov/Portals/0/Documents/Vermont_Econ_Impact_Final%20-%2042312.pdf
- U.S. Environmental Protection Agency, *Disaster Recovery and Long-Term Resilience Planning in Vermont, Guidance Document for the State of Vermont*, November 2013,
http://accd.vermont.gov/sites/accd/files/Documents/strongcommunities/cpr/Vermont%20SGIA%20Guidance%20Document%20FINAL_web.pdf
- Vermont Agency of Commerce and Community Development, *The Downtown/ Village Economic Recovery Project: Building an Action-oriented Revitalization Plan for Seven Downtowns/Village Centers* at
http://accd.vermont.gov/sites/accd/files/Documents/strongcommunities/cpr/One%20Pager%20-%20Building%20an%20Action_v2_short.pdf
- Vermont Center for Geographic Information, "Mapping for Emergency Management," webinar summary at http://vcgi.vermont.gov/webinar_03_12_2013
- Vermont Department of Public Safety, Division of Emergency Management and Homeland Security, *State of Vermont Hazard Mitigation Plan*, November 2013.
http://vem.vermont.gov/sites/vem/files/VT_SHMP2013%20FINAL%20APPROVED%20ADOP TED%202013%20VT%20SHMP_scrubbed_cleanedMCB.pdf
- Vermont Irene Recovery Office, "Final Irene Recovery Report: Reflections on Weathering the Storm" at
<http://vtstrong.vermont.gov/Portals/0/Documents/2013-IRO-final-report.pdf>
- Vermont Natural Resources Council, *Resilient Communities Scorecard: A Tool for Assessing your Community*, February 2013. <http://vnrc.org/wp-content/uploads/2013/04/Whole-Scorecard-FINAL-full-color-REDUCED-SIZE.pdf>
- Vermont Small Business Development Center, *The VtSBDC Disaster Recovery Guide for Business*, August 2013 at
<http://www.vtsbdc.org/assets/files/VtSBDC%20cover%20and%20pages-client.pdf>

- Donella Meadows Institute, *Vermont's New Economy: A Look at the New Economy by the Numbers*, October 2013. <http://www.donellameadows.org/wp-content/userfiles/New-Economy-Booklet-web-download-1.pdf>
- Ecotrust, *Resilience and Transformation: A Regional Approach*, at <http://www.nxtbook.com/nxtbooks/ecotrust/resilience/#/0>
- NACO (National Association of Counties), *Strategies to Bolster Economic Resilience: County Leadership in Action*, at <http://www.naco.org/newsroom/pubs/Documents/Strategies%20to%20Bolster%20Economic%20Resilience.pdf>

9. CONCLUSION

This Comprehensive Economic Development Strategy has laid out the goals, challenges, and opportunities Vermont needs to improve the well-being of its citizens over the next five years.

This CEDS is just a starting point, not a work plan in itself but a strategic document that will become a foundation for work plans across state and local government, education, and businesses. Achieving the goals outlined here will take a coordinated effort of all interested parties. Our metrics for success will be the measurable targets listed throughout as well as the summary metrics listed in Table 2 – Statistical Benchmarks in Chapter 2, A Vermont Overview.

Our next steps will be to discuss the details of this plan around the state with interested and invested parties and ensure that appropriate teams are involved and working toward specific goals on projects and initiatives. It will be presented in detail as well at our October 28 Economic Development Summit along with an interim report on the progress to date.

This document will be updated annually every year for the next five years. Each year, we will assess progress, identify gaps, and modify plans as needed.

More initiatives will arise; more projects will be undertaken. It will be hard work.

But Vermonters are good at that.

Many thanks go out to Governor Shumlin and his Cabinet, the CEDS Committee, state employees from a variety of agencies and the hundreds of citizens who participated in the planning and creation of this document, and to the thousands more who will participate in its implementation.

APPENDICES

This Comprehensive Economic Development Strategy for the State of Vermont is the result of extensive background work and contributions by members of the CEDS Committee, the staff of the Agency of Commerce and Community Development, the consulting team, State Cabinet officials, Vermont's Regional Development Corporations and Planning Commissions, and many others.

This background work is presented in the following Appendices that are available online at http://accd.vermont.gov/business/strategic_planning

- A. CEDS Process and Committee, Review and Meeting Notes
- B. Economic Data Analysis
- C. Competitive Assessment
- D. Cluster Analysis
- E. Documents Reviewed
- F. Detailed Initiatives and Projects
- G. Examples of Recent Major Investments in Economic Development