CHITTENDEN COUNTY RPC
Communities Planning Together

Chittenden County Regional Planning Commission
March 15, 2017
Agenda Item 8: Action Item

Final draft 2050 Population, Household, and Employment Forecast

Issues:

Vermont Statute requires that all plans shall be based upon surveys of existing conditions and probable future trends, and shall be made in light of present and future growth and requirements (24 VSA §4302(d)). Therefore, the CCRPC has historically prepared future demographic forecasts for the Regional Plan and MTP. As we prepare for the 2018 update of the ECOS Plan, we need to yet again set the County's population, housing, and employment forecasts. More specifically, forecasts are needed as inputs to the Energy model (LEAP) and the Travel Demand Model which will inform the energy element of the ECOS Plan and the MTP.

In previous iterations of approving forecasts, the CCMPO/CCRPC have agreed that forecasts should **describe the future as we expect it to be, not as we want it to be**. Essentially, forecasts are a necessary planning tool which help us to understand the impacts of increased population and enable us to make informed decisions based on a potential growth scenario. Also, it is important to keep in mind that future growth predictions are continually updated and revised along with the Regional Plan.

The consultants, RSG and EPR have revised the forecast per comments heard from municipalities, the PAC, the TAC, and LRPC. The comments received to date will be available here by Friday March 9, 2017. The attached memo describes the revisions, and includes the new forecasts.

PAC Recommendation: Recommend that the Board approve the 2050 Population, Household, and Employment forecast with further clarification needed on whether the 2040-2050 growth in persons in households is consistent with decreasing family size and birth rate and an aging population. See the attached email from the consultants for their responses.

LRPC Recommendation: Recommend that the Board approve 2050 Population, Household, and Employment forecast with further clarification needed on Burlington's household size and the comments of the PAC. See the attached email from the consultants for their responses.

Staff Recommendation: Recommend that the Board approve the 2050 Population, Household, and Employment forecast reflecting the recommendations and comments of the PAC and LRPC.

For more information, contact: Melanie Needle
mneedle@ccrpcvt.org *or* 846-4490 ext. *27

Memo

To: Melanie Needle, *CCRPC*
CC: Charlie Baker, *CCRPC* and Jonathan Slason, *RSG*
From: John M. Dellipriscoli and Robert A. Chase, *Economic & Policy Resources*
Date: March 8, 2017
Re: Revision to Municipal Forecasts – Population, Employment, and Households

After presenting the results of our initial population, employment, and households forecasts for Chittenden County and its respective municipalities in the February 15, 2017 CCRPC Board Meeting, EPR has adjusted each forecast. The adjustments to the forecasts take into consideration the comments from the municipal representatives to CCRPC and the Planning Advisory Committee ("PAC") in response to the materials provided in the February 15 meeting, as well as a re-specification of each forecast model based on an adjustment to the historical data. Please note that all of the adjustments were made at the municipal level, as we have accepted the county level forecasts as final. This is in line with our methodology for each forecast – the population, employment, and household forecasts are derived from the June 2016 county forecasts provided by Moody's Analytics. The municipal forecasts are correlated to the overall county forecast and don't specifically address individual indicators in the municipalities.

We will briefly provide an explanation on what has changed in each forecast and specifically address comments and questions provided to us from the PAC and other municipal representatives. If we do not address a particular question or comment specifically it is because we hope that the updated explanation of the forecast will address it.

Summary Points

Before getting into the details of the revised forecast, just a few points that can help resolve some outstanding comments/questions:

- With these population and employment forecasts, Chittenden County is expected to be the leader in Northwest Vermont and the State of Vermont in population and employment growth.
- We have focused on using "data-driven" techniques in our methodology. Rounds of revisions and reallocations of population and employment to municipal areas are done within the context of comments and questions from CCRPC staff and the PAC however are ultimately backed by statistical relevance.
- To clarify this point even further, the municipal forecasts are driven by the county forecasts. We are confident in the county forecasts although there is a significant degree of error and room for re-specification regarding the municipal forecasts. EPR typically

uses a shares-based methodology to first try and explain the variation at the municipal level and then make adjustments based on other factors specific to the municipality. This comes from our own research but mainly in this process from the comments and suggestions of the local planners and officials that make up the CCRPC. We want to get the numbers to a level that makes sense from the point of view of the municipal experts as well as have some statistical reliability and most importantly an overarching county demographic explanation.

- The 2040 – 2050 population, employment, and household numbers are projections based on the trends in the earlier years. Adjustments and re-specifications may be necessary based on the revisions however more focus should be spent on the near term forecasts.

Population Forecast Revisions

The major revision to the population forecast is a function of a correction back to the actual population estimates from the U.S. Census for the historical years. We believe the initial municipal forecast model was not correctly specified in trying to correct for the initial revision we made to the county level population forecast in December 2016. Rather than using adjustments that corresponded to American Community Survey ("ACS") data which are projections, we reverted to the actual population estimates for each municipality in order to get a more accurate view of what was going to happen in the future. You will see in the attached forecast the 2010 and 2015 population estimates correspond to the U.S. Census estimates and have not been adjusted.

We also reverted to a shares-based forecast for each municipality to start the revision based on the share of county population in 2015. After evaluating and comparing the shares-based numbers, we made adjustments similar to the previous round of forecast – accounting for 2010 to 2015 population growth as well as 2010 – 2015 housing growth provided to us by the CCRPC staff. Along with those adjustments, we ran a vector auto-regression ("VAR") for each municipality against the county population forecast and evaluated to see if it was more appropriate to use the results from a VAR forecast for a municipality rather than a shares-based forecast. The VAR forecasts were utilized for Bolton, Charlotte, Colchester, Hinesburg, Jericho, Richmond, St. George, and Underhill. The use of regression-based forecasts for some municipalities normalized their population growth and in most cases (except for Charlotte, which stayed nearly the same as the initial forecast) decreased the population in each period when compared to the previous forecast.

The reduction in forecasted population in those municipalities, as well as the reduction in forecasted population in some municipalities due to the reversion to the actual Census data and

the shares-based methodology, led to the existence of a residual population in the county that required a reallocation to municipalities. Based on the comments from the PAC and considering the data that indicates more housing in the metro-areas of the county, we reallocated residual forecasted population throughout Burlington, South Burlington, Williston, Shelburne, Essex, and Milton. This reallocation accounted for some of the scale issues that we faced in the initial forecast, namely that Williston was increasing at levels that might have been unrealistic especially when compared to other areas like Burlington and South Burlington

The attached revised forecast shows the results for each municipality as well as a comparison of the change from the initial forecast.

Employment (Jobs) Forecast Revisions

Similar to the revised population forecast, we thought it was best to return to a shares-based methodology to examine whether our initial forecast needed to be dramatically altered in order to align with some of the PAC comments and better understandings of each municipal outlook. For instance, we noted that our employment forecast for Essex (Town and Junction) did not align with the projection from GBIC. The GBIC predicted that the share of county employment would increase in Essex in the future. In our initial forecast, we had Essex's share of county employment actually falling. To arrive at a compromise, we fixed the share of Essex's employment at its 2015 level through 2050. This resulted in an increase of nearly 13,000 jobs from 2015 through 2050 for Essex when compared to the initial forecast.

For some municipalities, reverting to a 2015 shares-based methodology decreased the forecasted levels of jobs when compared to the initial forecast. This included Bolton, Charlotte, Colchester, Milton, Richmond, St. George, Underhill, Westford, and Williston. For areas in which we believed the initial employment forecast was well specified, we kept the initial forecasts results. This included Hinesburg, Huntington, Jericho, and Winooski.

Similar to the revised population forecast, after making some preliminary adjustments to municipalities' employment forecasts, there were residual jobs forecasted in the county that we needed to reallocate to other municipalities. In keeping with the theory that these jobs would more likely be found in the metro areas, we reallocated the residual jobs to Burlington, Colchester, Milton, South Burlington, and Williston.

The attached revised forecast shows the results for each municipality as well as a comparison of the change from the initial forecast.

Household Forecast Revisions

The household forecast revisions are mainly driven by the revised population forecast. In this case, we allowed the county level number of households and household population to fluctuate with the revisions to the municipal forecasts, since we did not actually do that much revision. The major change is the change in households in Burlington, which we were urged to reconsider given the residential development plans. To revise this, we simply fixed the household size forecast for Burlington and allowed the number of households to move with the change in the household population forecast, which is anchored to the revised population forecast – again, data driven but within the context of local comments. Further, we corrected for the population forecast revision for Huntington, Richmond, St. George, Underhill, and Westford. The rest of the forecasted municipality households we left unchanged.

A reminder that the original household forecast was comprised of regression forecasts based on the growth at the State level. For this reason, we thought it more prudent to keep the household levels fixed for most of the municipalities in the revised forecast but allow the population living in households fluctuate. This results in revised forecasted household sizes for the county (because we allowed the total households in the county fluctuate even though county level population was unchanged) and municipal areas.

Some comments related to the fact that some areas have rather flat household growth and this is what we would expect when we run a regression with an area which did not show strong historical growth in households, at least in the 2010 – 2015 time period.

The attached revised forecast shows the results for each municipality as well as a comparison of the change from the initial forecast.

From: John Dellipriscoli <JMD@epreconomics.com>
Sent: Thursday, March 09, 2017 12:13 PM
To: Jonathan Slason; Melanie Needle
Cc: Bob Chase; Jeff Carr; Jason Charest; Charles Baker; Eleni Churchill
Subject: RE: Comments on Chittenden County Forecast to date

Hi Melanie,

Here's what I got for the first point:

1. Household size in Burlington is a bit counterintuitive to the housing development story. It is true that the type of development is targeted to be apartment style, which would indicate that on average we would expect smaller numbers in a household. However, it is the case that population in Burlington is forecasted to grow at a relatively faster rate than households are forecasted to grow in Burlington, resulting in household size to go up. This rise is a function of the numerator increasing at a faster rate than the denominator. The household size increase is a reflection of the recent household size history in Burlington according to the US Census and its correlation to the forecasted county trends in housing. With all of the planned housing, there is certainly room for the adjustments to the household size in the future and that certainly good be the case if that housing story plays out in the next 5 to 10 years. For this forecast however, we went with what was being predicted.

For the second point, I think what Jon says below is right on about why we are seeing some confusion. That far out into the future we have to be careful. The goal is to try and get it right in the near and medium term and continue to re-evaluate moving into the future. The joys of long term forecasting.

John

EPR ECONOMIC & POLICY RESOURCES

John M. Dellipriscoli
Economist
jmd@epreconomics.com
Office: 802-878-0346
Cell: 415-900-9054

From: Jonathan Slason [mailto:Jonathan.Slason@rsginc.com]
Sent: Thursday, March 09, 2017 12:08 PM
To: Melanie Needle <mneedle@ccrpcvt.org>; John Dellipriscoli <JMD@epreconomics.com>
Cc: Bob Chase <rac@epreconomics.com>; Jeff Carr <jbc@epreconomics.com>; Jason Charest <jcharest@ccrpcvt.org>; Charles Baker <cbaker@ccrpcvt.org>; Bryan Davis <echurchill@ccrpcvt.org>
Subject: RE: Comments on Chittenden County Forecast to date

Hi Melanie,

I think some of this confusion on the difference between the 2040 and 2050 mostly is due to the fact that the last ten year projection wasn't developed by EPR and their macro modeling. It is difficult to marry different approaches. As RSG had agreed to do, was to extrapolate existing datasets to arrive at a 2050 figure but also incorporate how the existing VEIC 2050 projections could be considered in our 2050 projection.

The county population estimate developed using a combination of data sources such as annual growth rate projections by 2040, past rates of growth, and developed a basic model of birth dates and death rates and migration that has resulted in about 183,000 population by 2050. Past work done by EPR for VTrans this summer suggested that by 2040 there is a peak in the baby boomer population and a rising population of younger ages. In addition, the birth rate might be assumed to stabilize at some value. It has been on a downward trajectory for some time and at some point, it would likely reach a lower bound, I think anyway! These factors point to a period around 2035-2037 with almost zero internal growth, with increasing internal growth thereafter.

Using this population projection and then linearly extrapolating households, it results in more residents per household. This to me is logical given the forecast rising younger population in the future, living at home (ages 0 – 25). There might be some justification to increase the number of households faster than the current projection.

However, as stated earlier. The absolute magnitude of these numbers and the range of likely values that we are 'discussing' is very narrow given how far out in the future this is. I would caution anyone betting on these values by this date, but it presents an informed picture based on available data

today.

If we can eliminate the annual rate of growth for the household size, that may just make communication easier. It isn't a direct driving factor anyhow for the regional travel model.

Thanks and take care,
Jonathan

.....

JONATHAN SLASON, PE
Senior Engineer

RSG
180 Battery St., Suite 350 | Burlington, VT 05401
m 802.698.3196
www.rsginc.com

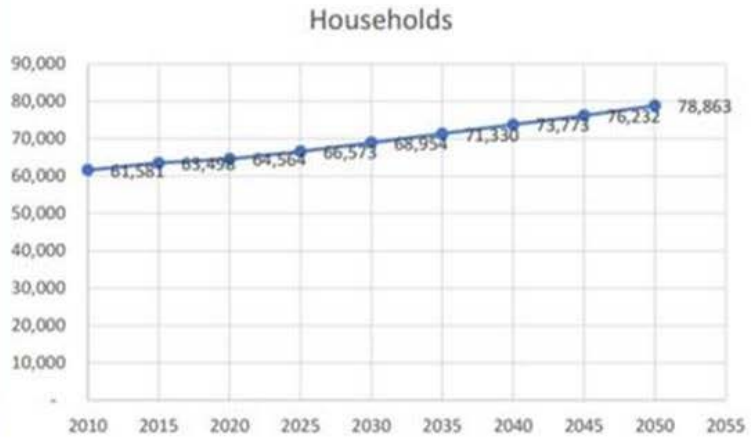
From: Melanie Needle [mailto:mneedle@ccrpcvt.org]
Sent: Thursday, March 09, 2017 11:18 AM
To: John Dellipriscoli <JMD@epreconomics.com>
Cc: Jonathan Slason <Jonathan.Slason@rsginc.com>; Bob Chase <rac@epreconomics.com>; Jeff Carr <jbc@epreconomics.com>; Bryan Davis <echurchill@ccrpcvt.org>; Jason Charest <jcharest@ccrpcvt.org>; Charles Baker <cbaker@ccrpcvt.org>
Subject: RE: Comments on Chittenden County Forecast to date

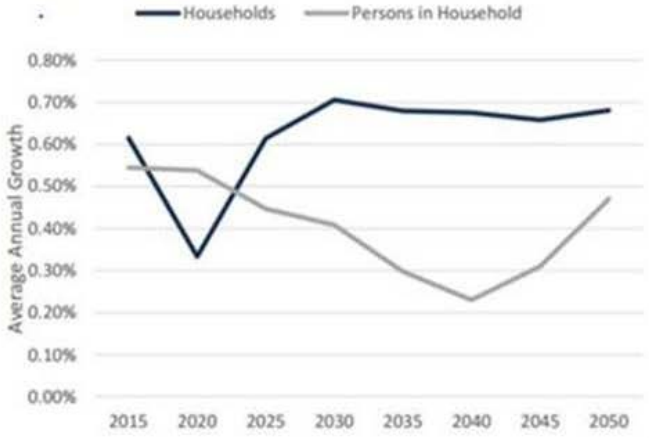
Hi John, After the PAC and LRPC meetings there are 2 items we would like answers to prior to sending out the recommendation to the Board. We are sending out the Board packet this afternoon. Would it be possible to turn this around fairly quickly? Thanks! I am working from home now feel free to give me a call if that is easier 578-3509.

1. Household size in Burlington increasing although the type of development that is happening is apartment style and will likely accommodate smaller family sizes.
2. A revised household slide (see below) that clarifies the question of whether the growth in persons in households is consistent or not with low birth rate, smaller family size, and an aging population. If it's not consistent then why not. Please make the second graph easier for people to understand because it has caused a lot of confusion, especially the increase in the growth rate between 2040 and 2050.

Chittenden County Household Forecast

- Households vs Household Population – households are rising at a faster rate than population.
  - Population growth is anchored by the consensus forecast – households are not
  - Fits into demographic narratives – smaller family sizes, decreasing birth rate, rise in 45 – 64 age cohorts share of total population in the county.
  - Municipalities driven more by their historical correlation with the county factors.





CHITTENDEN COUNTY RPC
Communities Planning Together

EPR

RSG
the science of insight

Melanie Needle
Senior Planner
Chittenden County Regional Planning Commission
110 West Canal Street, Suite 202
Winooski, VT 05404
*(802) 846-4490 ext. *27*
www.ccrpcvt.org

CHITTENDEN COUNTY RPC
Communities Planning Together

From: John Dellipriscoli [mailto:JMD@epreconomics.com]
Sent: Wednesday, March 08, 2017 2:04 PM
To: Melanie Needle <mneedle@ccrpcvt.org>
Cc: Jonathan Slason <Jonathan.Slason@rsginc.com>; Bob Chase <rac@epreconomics.com>; Jeff Carr <jbc@epreconomics.com>; Eleni Churchill <echurchill@ccrpcvt.org>; Jason Charest <jcharest@ccrpcvt.org>; Charles Baker <cbaker@ccrpcvt.org>
Subject: RE: Comments on Chittenden County Forecast to date

Okay. I think the initial household forecast is good. The revised forecast addresses some slight changes at the municipal level. I'm comfortable with either.

Chittenden County Municipal Population Forecast - Revised - March 8, 2017

Population, Share of County Population, and Average Annual Growth --Chittenden County

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate
2010	156,545	100.00%	
2015	161,382	100.00%	0.61%
2020	165,803	100.00%	0.54%
2025	169,580	100.00%	0.45%
2030	172,596	100.00%	0.35%
2035	174,764	100.00%	0.25%
2040	176,179	100.00%	0.16%
2045	178,927	100.00%	0.31%
2050	183,172	100.00%	0.47%

Population, Share of County Population, and Average Annual Growth --Bolton

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	1,182	0.76%		
2015	1,189	0.74%	0.12%	Diff (Revised minus Initial)
2020	1,198	0.72%	0.14%	-99
2025	1,203	0.71%	0.10%	-134
2030	1,208	0.70%	0.08%	-161
2035	1,212	0.69%	0.06%	-179
2040	1,214	0.69%	0.04%	-191
2045	1,233	0.69%	0.31%	-194
2050	1,262	0.69%	0.47%	-198

Population, Share of County Population, and Average Annual Growth --Buels gore

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	30	0.02%		
2015	30	0.02%	0.00%	Diff (Revised minus Initial)
2020	31	0.02%	0.54%	-11
2025	32	0.02%	0.45%	-12
2030	32	0.02%	0.35%	-13
2035	32	0.02%	0.25%	-15
2040	33	0.02%	0.16%	-15
2045	33	0.02%	0.31%	-16
2050	34	0.02%	0.47%	-16

Population, Share of Population, and Average Annual Growth --Burlington

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	42,417	27.10%		
2015	42,452	26.31%	0.02%	Diff (Revised minus Initial)
2020	43,615	26.31%	0.54%	-328
2025	44,736	26.38%	0.51%	-2
2030	45,578	26.41%	0.37%	205
2035	46,185	26.43%	0.26%	311
2040	46,581	26.44%	0.17%	392
2045	47,308	26.44%	0.31%	398
2050	48,430	26.44%	0.47%	407

Prepared by: Economic & Policy Resources, Inc.

Population, Share of Population, and Average Annual Growth --Charlotte

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	3,754	2.40%		
2015	3,861	2.39%	0.56%	Diff (Revised minus Initial)
2020	3,968	2.39%	0.55%	6
2025	4,053	2.39%	0.42%	6
2030	4,121	2.39%	0.33%	6
2035	4,169	2.39%	0.23%	5
2040	4,201	2.38%	0.15%	4
2045	4,266	2.38%	0.31%	4
2050	4,368	2.38%	0.47%	4

Population, Share of Population, and Average Annual Growth --Colchester

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	17,067	10.90%		
2015	17,383	10.77%	0.37%	Diff (Revised minus Initial)
2020	17,703	10.68%	0.37%	-137
2025	17,953	10.59%	0.28%	-201
2030	18,152	10.52%	0.22%	-252
2035	18,296	10.47%	0.16%	-309
2040	18,389	10.44%	0.10%	-341
2045	18,676	10.44%	0.31%	-346
2050	19,119	10.44%	0.47%	-354

Population, Share of Population, and Average Annual Growth --Essex

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	19,587	12.51%		
2015	20,946	12.98%	1.35%	Diff (Revised minus Initial)
2020	21,599	13.03%	0.62%	278
2025	22,137	13.05%	0.49%	231
2030	22,577	13.08%	0.39%	205
2035	22,895	13.10%	0.28%	210
2040	23,103	13.11%	0.18%	208
2045	23,464	13.11%	0.31%	212
2050	24,020	13.11%	0.47%	217

Prepared by: Economic & Policy Resources, Inc.

Population, Share of Population, and Average Annual Growth --Hinesburg

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	4,396	2.81%		
2015	4,489	2.78%	0.42%	Diff (Revised minus Initial)
2020	4,600	2.77%	0.49%	-25
2025	4,682	2.76%	0.35%	-34
2030	4,747	2.75%	0.28%	-42
2035	4,794	2.74%	0.20%	-50
2040	4,824	2.74%	0.13%	-55
2045	4,899	2.74%	0.31%	-56
2050	5,016	2.74%	0.47%	-57

Population, Share of Population, and Average Annual Growth --Huntington

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	1,938	1.24%		
2015	1,991	1.23%	0.54%	Diff (Revised minus Initial)
2020	2,023	1.22%	0.32%	139
2025	2,069	1.22%	0.45%	191
2030	2,106	1.22%	0.35%	232
2035	2,123	1.22%	0.17%	242
2040	2,132	1.21%	0.08%	248
2045	2,165	1.21%	0.31%	252
2050	2,216	1.21%	0.47%	258

Population, Share of Population, and Average Annual Growth --Jericho

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	5,009	3.20%		
2015	5,082	3.15%	0.29%	Diff (Revised minus Initial)
2020	5,146	3.10%	0.25%	-45
2025	5,202	3.07%	0.22%	-71
2030	5,247	3.04%	0.17%	-92
2035	5,279	3.02%	0.12%	-115
2040	5,301	3.01%	0.08%	-128
2045	5,383	3.01%	0.31%	-130
2050	5,511	3.01%	0.47%	-133

Prepared by: Economic & Policy Resources, Inc.

Population, Share of Population, and Average Annual Growth --Milton

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	10,352	6.61%		
2015	10,827	6.71%	0.90%	Diff (Revised minus In
2020	11,202	6.76%	0.68%	158
2025	11,504	6.78%	0.53%	185
2030	11,755	6.81%	0.43%	217
2035	11,937	6.83%	0.31%	247
2040	12,057	6.84%	0.20%	266
2045	12,245	6.84%	0.31%	270
2050	12,535	6.84%	0.47%	276

Population, Share of Population, and Average Annual Growth --Richmond

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	4,081	2.61%		
2015	4,126	2.56%	0.22%	Diff (Revised minus In
2020	4,171	2.52%	0.21%	-66
2025	4,208	2.48%	0.18%	-96
2030	4,238	2.46%	0.14%	-120
2035	4,259	2.44%	0.10%	-144
2040	4,273	2.43%	0.07%	-157
2045	4,340	2.43%	0.31%	-160
2050	4,442	2.43%	0.47%	-164

Population, Share of Population, and Average Annual Growth --St. George

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	674	0.43%		
2015	710	0.44%	1.05%	Diff (Revised minus In
2020	729	0.44%	0.54%	-119
2025	746	0.44%	0.45%	-169
2030	759	0.44%	0.35%	-211
2035	769	0.44%	0.25%	-230
2040	775	0.44%	0.16%	-246
2045	787	0.44%	0.31%	-250
2050	806	0.44%	0.47%	-256

Prepared by: Economic & Policy Resources, Inc.

Population, Share of Population, and Average Annual Growth --Shelburne

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	7,144	4.56%		
2015	7,759	4.81%	1.67%	Diff (Revised minus Initial)
2020	8,050	4.86%	0.74%	122
2025	8,280	4.88%	0.57%	110
2030	8,474	4.91%	0.46%	112
2035	8,615	4.93%	0.33%	128
2040	8,707	4.94%	0.21%	136
2045	8,843	4.94%	0.31%	138
2050	9,053	4.94%	0.47%	141

Population, Share of Population, and Average Annual Growth --South Burlington

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	17,904	11.44%		
2015	18,791	11.64%	0.97%	Diff (Revised minus Initial)
2020	19,384	11.69%	0.62%	-75
2025	19,873	11.72%	0.50%	-208
2030	20,273	11.75%	0.40%	-302
2035	20,562	11.77%	0.28%	-330
2040	20,751	11.78%	0.18%	-357
2045	21,075	11.78%	0.31%	-363
2050	21,574	11.78%	0.47%	-371

Population, Share of Population, and Average Annual Growth --Underhill

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	3,016	1.93%		
2015	3,064	1.90%	0.32%	Diff (Revised minus Initial)
2020	3,112	1.88%	0.31%	-49
2025	3,144	1.85%	0.20%	-76
2030	3,174	1.84%	0.19%	-93
2035	3,193	1.83%	0.12%	-110
2040	3,207	1.82%	0.09%	-119
2045	3,257	1.82%	0.31%	-121
2050	3,334	1.82%	0.47%	-124

Prepared by: Economic & Policy Resources, Inc.

Population, Share of Population, and Average Annual Growth --Westford

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	2,029	1.30%		
2015	2,080	1.29%	0.50%	Diff (Revised minus Initial)
2020	2,137	1.29%	0.54%	66
2025	2,186	1.29%	0.45%	83
2030	2,225	1.29%	0.35%	96
2035	2,252	1.29%	0.25%	102
2040	2,271	1.29%	0.16%	107
2045	2,306	1.29%	0.31%	109
2050	2,361	1.29%	0.47%	111

Population, Share of Population, and Average Annual Growth --Williston

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	8,698	5.56%		
2015	9,409	5.83%	1.58%	Diff (Revised minus Initial)
2020	9,745	5.88%	0.71%	247
2025	10,014	5.91%	0.55%	218
2030	10,239	5.93%	0.44%	205
2035	10,402	5.95%	0.32%	215
2040	10,509	5.96%	0.20%	218
2045	10,673	5.96%	0.31%	221
2050	10,926	5.96%	0.47%	226

Population, Share of Population, and Average Annual Growth --Winooski

Calendar Year	Total Projected Population	Share of County Population	Average Annual Growth Rate	
2010	7,267	4.64%		
2015	7,193	4.46%	-0.20%	Diff (Revised minus Initial)
2020	7,390	4.46%	0.54%	-61
2025	7,558	4.46%	0.45%	-22
2030	7,693	4.46%	0.35%	8
2035	7,789	4.46%	0.25%	21
2040	7,853	4.46%	0.16%	32
2045	7,975	4.46%	0.31%	32
2050	8,164	4.46%	0.47%	33

Prepared by: Economic & Policy Resources, Inc.

Chittenden County Municipal Employment Forecast - Revised-- March 8, 2017

Population, Share of County Employment and Average Annual Growth --Chittenden County

	Calendar Year	Total Projected Employment	Share of County Population	Average Annual Growth Rate
0	2010	124,597	100.00%	
0	2015	135,511	100.00%	1.69%
0	2020	146,589	100.00%	1.58%
0	2025	151,475	100.00%	0.66%
0	2030	156,567	100.00%	0.66%
0	2035	162,560	100.00%	0.75%
0	2040	169,671	100.00%	0.86%
0	2045	176,179	100.00%	0.75%
0	2050	182,688	100.00%	0.73%

Population, Share of County Employment and Average Annual Growth --Bolton

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	239	0.19%		
2015	221	0.16%	-1.58%	Diff (Revised minus Initial)
2020	239	0.16%	1.58%	-8
2025	247	0.16%	0.66%	-14
2030	255	0.16%	0.66%	-22
2035	265	0.16%	0.75%	-32
2040	276	0.16%	0.86%	-45
2045	287	0.16%	0.75%	-46
2050	298	0.16%	0.73%	-48

Population, Share of County Employment and Average Annual Growth --Buels gore

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate
2010	NA		
2015	NA		
2020	NA		
2025	NA		
2030	NA		
2035	NA		
2040	NA		
2045	NA		
2050	NA		

Population, Share of Employment and Average Annual Growth --Burlington

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	43,252	34.71%		
2015	46,046	33.98%	1.26%	Diff (Revised minus Initial)
2020	49,545	33.80%	1.48%	57
2025	51,038	33.69%	0.60%	102
2030	52,582	33.58%	0.60%	150
2035	54,406	33.47%	0.68%	211
2040	56,570	33.34%	0.78%	284
2045	58,747	33.34%	0.75%	302
2050	60,914	33.34%	0.73%	310

Prepared by: Economic & Policy Resources, Inc.

Population, Share of Employment and Average Annual Growth --Charlotte

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	589	0.47%		
2015	695	0.51%	3.34%	Diff (Revised minus Initial)
2020	751	0.51%	1.58%	-4
2025	776	0.51%	0.66%	-14
2030	802	0.51%	0.66%	-25
2035	833	0.51%	0.75%	-38
2040	870	0.51%	0.86%	-53
2045	903	0.51%	0.75%	-55
2050	936	0.51%	0.73%	-57

Population, Share of Employment and Average Annual Growth --Colchester

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	11,609	9.32%		
2015	12,882	9.51%	2.10%	Diff (Revised minus Initial)
2020	14,123	9.63%	1.86%	-377
2025	14,630	9.66%	0.71%	-460
2030	15,166	9.69%	0.72%	-566
2035	15,796	9.72%	0.82%	-686
2040	16,544	9.75%	0.93%	-830
2045	17,177	9.75%	0.75%	-865
2050	17,809	9.75%	0.73%	-899

Population, Share of Employment and Average Annual Growth --Essex

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	15,285	12.27%		
2015	15,842	11.69%	0.72%	Diff (Revised minus Initial)
2020	17,137	11.69%	1.58%	714
2025	17,708	11.69%	0.66%	1,080
2030	18,304	11.69%	0.66%	1,465
2035	19,004	11.69%	0.75%	1,919
2040	19,836	11.69%	0.86%	2,459
2045	20,594	11.69%	0.75%	2,550
2050	21,361	11.69%	0.73%	2,651

Prepared by: Economic & Policy Resources, Inc.

Population, Share of Employment and Average Annual Growth --Hinesburg

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	1,488	1.19%		
2015	1,489	1.10%	0.01%	Diff (Revised minus Initial)
2020	1,593	1.09%	1.35%	0
2025	1,608	1.06%	0.19%	0
2030	1,622	1.04%	0.17%	0
2035	1,638	1.01%	0.20%	0
2040	1,657	0.98%	0.23%	0
2045	1,720	0.98%	0.75%	0
2050	1,784	0.98%	0.73%	0

Population, Share of Employment and Average Annual Growth --Huntington

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	215	0.17%		
2015	221	0.16%	0.52%	Diff (Revised minus Initial)
2020	219	0.15%	-0.15%	0
2025	220	0.15%	0.04%	0
2030	220	0.14%	0.04%	0
2035	221	0.14%	0.04%	0
2040	221	0.13%	0.05%	0
2045	230	0.13%	0.75%	0
2050	238	0.13%	0.73%	0

Population, Share of Employment and Average Annual Growth --Jericho

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	926	0.74%		
2015	1,013	0.75%	1.82%	Diff (Revised minus Initial)
2020	1,088	0.74%	1.43%	0
2025	1,120	0.74%	0.59%	0
2030	1,154	0.74%	0.59%	0
2035	1,193	0.73%	0.67%	0
2040	1,240	0.73%	0.77%	0
2045	1,287	0.73%	0.75%	0
2050	1,334	0.73%	0.73%	0

Prepared by: Economic & Policy Resources, Inc.

Population, Share of Employment and Average Annual Growth --Milton

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	3,134	2.52%		
2015	3,548	2.62%	2.51%	Diff (Revised minus In
2020	3,887	2.65%	1.85%	-149
2025	4,032	2.66%	0.73%	-198
2030	4,182	2.67%	0.73%	-250
2035	4,359	2.68%	0.83%	-310
2040	4,569	2.69%	0.95%	-382
2045	4,744	2.69%	0.75%	-397
2050	4,918	2.69%	0.73%	-412

Population, Share of Employment and Average Annual Growth --Richmond

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	1,607	1.29%		
2015	1,894	1.40%	3.33%	Diff (Revised minus In
2020	1,998	1.36%	1.08%	0
2025	2,083	1.38%	0.84%	0
2030	2,172	1.39%	0.84%	0
2035	2,255	1.39%	0.75%	-21
2040	2,354	1.39%	0.86%	-47
2045	2,443	1.39%	0.75%	-49
2050	2,533	1.39%	0.73%	-51

Population, Share of Employment and Average Annual Growth --St. George

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	41	0.03%		
2015	54	0.04%	5.26%	Diff (Revised minus In
2020	58	0.04%	1.58%	-8
2025	60	0.04%	0.66%	-12
2030	62	0.04%	0.66%	-15
2035	64	0.04%	0.75%	-19
2040	67	0.04%	0.86%	-23
2045	70	0.04%	0.75%	-24
2050	72	0.04%	0.73%	-25

Prepared by: Economic & Policy Resources, Inc.

Population, Share of Employment and Average Annual Growth --Shelburne

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	4,202	3.37%		
2015	4,713	3.48%	2.32%	Diff (Revised minus Initial)
2020	5,020	3.42%	1.27%	79
2025	5,182	3.42%	0.64%	87
2030	5,351	3.42%	0.64%	95
2035	5,549	3.41%	0.73%	105
2040	5,785	3.41%	0.84%	116
2045	6,006	3.41%	0.75%	120
2050	6,227	3.41%	0.73%	124

Population, Share of Employment and Average Annual Growth --South Burlington

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	24,167	19.40%		
2015	24,940	18.40%	0.63%	Diff (Revised minus Initial)
2020	26,810	18.29%	1.46%	168
2025	27,592	18.22%	0.58%	286
2030	28,404	18.14%	0.58%	411
2035	29,359	18.06%	0.66%	558
2040	30,493	17.97%	0.76%	734
2045	31,658	17.97%	0.75%	757
2050	32,833	17.97%	0.73%	791

Population, Share of Employment and Average Annual Growth --Underhill

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	349	0.28%		
2015	340	0.25%	-0.51%	Diff (Revised minus Initial)
2020	368	0.25%	1.58%	-4
2025	380	0.25%	0.66%	-4
2030	393	0.25%	0.66%	-3
2035	408	0.25%	0.75%	-2
2040	426	0.25%	0.86%	-1
2045	442	0.25%	0.75%	-1
2050	458	0.25%	0.73%	-1

Prepared by: Economic & Policy Resources, Inc.

Population, Share of Employment and Average Annual Growth --Westford

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	214	0.17%		
2015	242	0.18%	2.53%	Diff (Revised minus Initial)
2020	262	0.18%	1.58%	4
2025	271	0.18%	0.66%	-2
2030	280	0.18%	0.66%	-8
2035	291	0.18%	0.75%	-15
2040	303	0.18%	0.86%	-24
2045	315	0.18%	0.75%	-25
2050	326	0.18%	0.73%	-26

Population, Share of Employment and Average Annual Growth --Williston

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	14,215	11.41%		
2015	17,405	12.84%	4.13%	Diff (Revised minus Initial)
2020	19,126	13.05%	1.90%	-474
2025	19,865	13.11%	0.76%	-851
2030	20,644	13.19%	0.77%	-1,233
2035	21,575	13.27%	0.89%	-1,670
2040	22,681	13.37%	1.00%	-2,189
2045	23,558	13.37%	0.75%	-2,266
2050	24,425	13.37%	0.73%	-2,353

Population, Share of Employment and Average Annual Growth --Winooski

Calendar Year	Total Projected Employment	Share of County Employment	Average Annual Growth Rate	
2010	3,062	2.46%		
2015	3,967	2.93%	5.31%	Diff (Revised minus Initial)
2020	4,366	2.98%	1.94%	0
2025	4,664	3.08%	1.33%	0
2030	4,976	3.18%	1.30%	0
2035	5,343	3.29%	1.43%	0
2040	5,779	3.41%	1.58%	0
2045	6,000	3.41%	0.75%	-1
2050	6,221	3.41%	0.73%	-2

Prepared by: Economic & Policy Resources, Inc.

Revised Households - Chittenden County and Municipalities - March 8, 2017

Year	Bolton	Buels gore	Burlington	Charlotte	Colchester	Essex	Hinesburg	Huntington	Jericho	Milton	Richmond	Shelburne	So. Burlington	St. George	Underhill	Westford	Williston	Winooski	County
2010	456	6	16,851	1,341	6,212	7,457	1,749	819	1,842	3,772	1,665	2,932	7,634	263	1,092	770	3,482	3,238	61,581
2015	527	13	16,153	1,469	6,495	8,360	1,752	758	1,927	4,102	1,569	2,982	8,289	306	1,163	742	3,808	3,083	63,498
2020	526	13	16,305	1,508	6,654	8,496	1,940	786	1,893	4,124	1,584	3,026	8,478	309	1,189	775	3,821	3,216	64,667
2025	564	13	16,556	1,581	6,919	9,003	2,020	813	1,919	4,299	1,571	3,105	8,874	324	1,219	794	4,006	3,211	66,813
2030	605	13	16,912	1,662	7,208	9,555	2,107	836	1,947	4,491	1,554	3,190	9,307	335	1,249	810	4,205	3,206	69,216
2035	646	13	17,241	1,744	7,503	10,116	2,196	852	1,976	4,686	1,536	3,276	9,747	345	1,276	822	4,408	3,202	71,607
2040	689	13	17,603	1,827	7,804	10,692	2,287	863	2,005	4,886	1,516	3,364	10,197	353	1,300	831	4,615	3,197	74,068

Revised Households - Average Annual Change - Chittenden County and Municipalities - March 8, 2017

Year	Bolton	Buels gore	Burlington	Charlotte	Colchester	Essex	Hinesburg	Huntington	Jericho	Milton	Richmond	Shelburne	So. Burlington	St. George	Underhill	Westford	Williston	Winooski	County
2015	2.94%	16.72%	-0.84%	1.84%	0.89%	2.31%	0.03%	-1.54%	0.91%	1.69%	-1.18%	0.34%	1.66%	3.07%	1.27%	-0.74%	1.81%	-0.98%	0.61%
2020	-0.02%	-0.20%	0.19%	0.52%	0.49%	0.32%	2.06%	0.74%	-0.36%	0.10%	0.19%	0.30%	0.45%	0.22%	0.44%	0.87%	0.07%	0.85%	0.37%
2025	1.38%	-0.02%	0.31%	0.96%	0.78%	1.17%	0.81%	0.66%	0.27%	0.84%	-0.16%	0.51%	0.92%	0.90%	0.50%	0.50%	0.95%	-0.03%	0.66%
2030	1.41%	0.08%	0.43%	1.00%	0.82%	1.20%	0.85%	0.56%	0.29%	0.88%	-0.22%	0.54%	0.96%	0.70%	0.50%	0.40%	0.98%	-0.03%	0.71%
2035	1.34%	0.12%	0.39%	0.97%	0.80%	1.15%	0.83%	0.37%	0.29%	0.85%	-0.24%	0.54%	0.93%	0.58%	0.42%	0.29%	0.95%	-0.03%	0.68%
2040	1.29%	-0.19%	0.42%	0.94%	0.79%	1.11%	0.81%	0.28%	0.29%	0.84%	-0.26%	0.53%	0.91%	0.48%	0.38%	0.20%	0.93%	-0.03%	0.68%

Revised Households - Change from Initial Forecast - Chittenden County and Municipalities - March 8, 2017

Year	Bolton	Buels gore	Burlington	Charlotte	Colchester	Essex	Hinesburg	Huntington	Jericho	Milton	Richmond	Shelburne	So. Burlington	St. George	Underhill	Westford	Williston	Winooski	County
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	92	0	0	0	0	17	0	0	-13	0	0	-47	-7	37	0	0	102
2025	0	0	216	0	0	0	0	38	0	0	-23	0	0	-70	-18	73	0	0	240
2030	0	0	221	0	0	0	0	54	0	0	-32	0	0	-89	-24	107	0	0	262
2035	0	0	225	0	0	0	0	59	0	0	-40	0	0	-99	-31	138	0	0	277
2040	0	0	230	0	0	0	0	61	0	0	-44	0	0	-108	-36	165	0	0	295

Revised Household Size - Chittenden County and Municipalities - March 8, 2017

Year	Bolton	Buels gore	Burlington	Charlotte	Colchester	Essex	Hinesburg	Huntington	Jericho	Milton	Richmond	Shelburne	So. Burlington	St. George	Underhill	Westford	Williston	Winooski	County
2010	2.55	5.00	2.13	2.77	2.35	2.60	2.50	2.29	2.72	2.70	2.45	2.41	2.25	2.30	2.76	2.60	2.43	2.20	2.37
2015	2.21	2.31	2.20	2.60	2.37	2.43	2.55	2.47	2.62	2.59	2.61	2.49	2.19	2.32	2.63	2.71	2.37	2.27	2.36
2020	2.23	2.39	2.24	2.60	2.36	2.47	2.36	2.42	2.70	2.67	2.61	2.55	2.21	2.36	2.61	2.67	2.45	2.24	2.38
2025	2.09	2.45	2.26	2.54	2.30	2.38	2.31	2.39	2.69	2.63	2.66	2.55	2.16	2.31	2.58	2.66	2.40	2.29	2.36
2030	1.95	2.49	2.28	2.45	2.23	2.29	2.24	2.37	2.68	2.57	2.71	2.54	2.10	2.27	2.54	2.65	2.34	2.33	2.32
2035	1.83	2.50	2.28	2.37	2.16	2.19	2.17	2.34	2.65	2.50	2.75	2.52	2.04	2.23	2.50	2.65	2.26	2.37	2.27
2040	1.72	2.55	2.29	2.27	2.09	2.10	2.10	2.32	2.63	2.42	2.80	2.48	1.97	2.19	2.46	2.64	2.18	2.39	2.22

Prepared by Economic & Policy Resources, Inc.